

BOOK OF ABSTRACTS



- **2nd International Conference On New Trends In Architecture And Interior Design**
- **2nd International Conference on New Trends in Chemistry**
- **2nd International Conference On New Advances in Civil Engineering**
- **2nd International Conference on New Trends in Econometrics and Finance**
- **2nd International Conference on Advances in Statistics**



19-22.04.2016

Hotel International, Zagreb/Croatia

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AIOC'2016

2nd International Conference On New Trends In Architecture And Interior Design
2nd International Conference on New Trends in Chemistry
2nd International Conference On New Advances in Civil Engineering
2nd International Conference on New Trends in Econometrics and Finance
2nd International Conference on Advances in Statistics
Zagreb/Croatia
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Dear Colleagues,

All In One Conferences (AIOC) is an international conference organization, aiming at the repositories of the academics, members, collaborators and all other interested participants in different academic topics.

Last March; we organised 1st AIOC event & series in Dubai with a union of 5 different topics Which are Architecture, Civil Engineering, Chemistry, Econometrics and Statistics.

During our first event we had,

- 124 Participants from 12 different countries (Turkey, Canada, Serbia, Spain, UAE, Slovenia, Italy, Algeria, USA, North Cyprus , Bahrain and Austria)
- Total 32 Poster Presentations
- Total 62 Oral Presentations
- Total 6 Keynote Talks
- Total 2 Workshops

This time we are proud to organise this conference in Zagreb – capital of the Republic of CROATIA!

For centuries Zagreb has been a focal point of culture, science, commerce and industry. It lies on the intersection of important routes between the Adriatic coast and Central Europe. Zagreb is a city of green parks and walks, with many places to visit in the beautiful surroundings..Zagreb offers numerous theatres, museums, galleries, art collections, sport centres etc.

After having a wonderful time in Dubai in March 2015, now we are working to make Zagreb city the new meeting point where all academicians meet.

Please kindly check our web site frequently where you can find latest updates on Publications, Keynote Speakers, Organising and Scientific Committee members, Pre & Post Tours, City Tours.

We look forward to see you in our 2016 Zagreb Conferences series.. For any further queries, please do not hesitate to contact us.

Best Regards,

AIOC Committee Chair

SCIENTIFIC PROGRAM

19 APRIL 2016

14:00 – 20:00 : REGISTRATION / CONFERENCE LOBBY AREA

20 APRIL 2016

09:00-10:00 : REGISTRATION / CONFERENCE LOBBY AREA

10:00 - 11:00	MAIN HALL GRAND OPENING CEREMONY & WELCOME SPEECH
Econometrics (ICNTEF)	Prof. Dr. Sevin UGURAL / Eastern Mediterranean University – North Cyprus (Conference Co Chair)
Architecture (ICNTAD)	Prof. Dr. Burcin Cem ARABACIOĞLU / Mimar Sinan Fine Arts University – Turkey (Conference Chair)
Statistics (ICAS)	Assoc. Prof. Dr. Gulhayat GOLBASI SIMSEK / Yıldız Technical University - Turkey (Conference Chair)
Chemistry (ICNTC)	Assoc. Prof. Dr. Dolunay SAKAR DAsDAN / Yıldız Technical University – Turkey (Conference Chair)

11:00 – 11:30	COFFEE / TEA BREAK
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HALL 1 - CHEMISTRY	
11:30 - 12:30	KEYNOTE SPEAKER / Prof. Dr. Frieder W. SCHELLER – University of Potsdam Title: MOLECULARLY IMPRINTED POLYMERS –NEW MIMICS OF ANTIBODIES AND ENZYMES

HALL 2 – STATISTICS & ECONOMETRICS

11:30 - 12:30	KEYNOTE SPEAKER / Prof. Dr. Narayanaswamy BALAKRISHNAN - McMaster University Title: HOW ABOUT MODELING WITH FLEXIBLE FAMILIES
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HALL 3 – ARCHITECTURE

11:30 - 12:30	KEYNOTE SPEAKER – Assist. Prof. Dr. Serhat KUT – Istanbul Kultur University Title: CYBER-TECTONIC EXPERIENCE OF SPACE: RE- UNDERSTANDING SPACE IN THE CYBERNETIC AGE
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12:30 – 14:00	LUNCH
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HALL 1 – CHEMISTRY

SESSION CHAIR	Assoc. Prof. Dr. Murat ATES	
TIME	TITLE	PRESENTER / AUTHORS
14:00 – 14:20	MOLECULARLY IMPRINTED POLYMERS FOR PROTEINS	Aysu YARMAN , FRIEDER W. SCHELLER, Katharina J. JETZSCHMANN, Maria BOSSERDT, Julia BOGNAR, Robert E. GYURCSANYI
14:20 – 14:40	SYNTHESIS and SPECTRAL CHARACTERIZATIONS of 5-METHOXY-2-(5- H/Me/Cl-1H-BENZIMIDAZOL-2-YL)- PHENOILS and THEIR ZnCl ₂ COMPLEXES	Aydın TAVMAN , Demet GURBUZ, Adem CINARLI
14:40 – 15:00	NOVEL 1,4-NAPHTHOQUINONE STRUCTURES CONTAINING AMINO GROUPS	Hatice YILDIRIM
15:00 – 15:20	INVESTIGATION OF pH EFFECT ON ZETASIZER MEASUREMENTS OF POLY (MALEIC ANHYDRITE-CO-VINYL ACETATE) - ACRIFLAVINE CONJUGATE	Dolunay SAKAR DASDAN , Azize DIZDAR, Gulderen KARAKUS
15:20 – 15:40	CONTROL OF DIABATIC CONTINUOUS STIRRED TANK REACTOR AT AN UNSTABLE OPERATING POINT	Semin ALTUNTAS , Hale HAPOGLU

15:40 – 16:00	COFFEE/TEA BREAK
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HALL 1 – CHEMISTRY

SESSION CHAIR	Assoc. Prof. Dr. Dolunay SAKAR DASDAN	
TIME	TITLE	PRESENTER / AUTHORS
16:00 – 16:20	INVESTIGATION OF SOME AZO DYES BY USING POLAROGRAPHIC AND VOLTAMMETRIC TECHNIQUES	Necati MENEK, Sasha OMANOVIC
16:20 – 16:40	SYMMETRIC DEVICE PERFORMANCES OF CARBON BASED NANOSTRUCTURES FOR SUPERCAPACITORS	Murat ATEŞ
16:40 – 17:00	SYNTHETIC STUDIES ON QUINONES BY MEANS OF NUCLEOPHILIC SUBSTITUTION	Nilufer BAYRAK

HALL 2 – STATISTICS & ECONOMETRICS

SESSION CHAIR	Prof. Leda D. MINKOVA	
TIME	TITLE	PRESENTER / AUTHORS
14:00 – 14:20	P'OLYA-AEPLI OF ORDER K RISK	Leda D. MINKOVA, Stefanka CHUKOVA
14:20 – 14:40	ON THE IMPROVEMENT FOR MEAN ESTIMATION BASED ON BALANCED GROUPS RANKED SET SAMPLING	Busra SEVINC, Selma GURLER, Bekir CETINTAV
14:40 – 15:00	PROBABILISTIC APPROACH TO THE SCHOENBERG SPLINE OPERATOR AND UNIMODAL DENSITY ESTIMATOR	M. Sami ERDOGAN , Ozlem EGE ORUC, Halil ORUC
15:00 – 15:20	THE YOUNG CUSTOMERS' PERCEPTIONS OF TOMATOES OF DIFFERENT GEOGRAPHICAL AREAS: EXPERIMENTAL STUDY	Urban ŠEBJAN, Polona TOMINC
15:20 – 15:40	A HYDROLOGICAL APPLICATION OF THE RANK OF BIVARIATE EXTREME ORDER STATISTICS	Gülder KEMALBAY

15:40 – 16:00	COFFEE/TEA BREAK
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HALL 2 – STATISTICS & ECONOMETRICS

SESSION CHAIR	Assoc. Prof. Dr Gulhayat GOLBASI SIMSEK	
TIME	TITLE	PRESENTER / AUTHORS
16:00 – 16:20	A HYBRID APPROACH FOR DETERMINING THE NUMBER OF FACTORS USING EMPIRICAL LIKELIHOOD CONFIDENCE INTERVALS, BOOTSTRAP AND PARALLEL ANALYSIS	Selahattin AYDOĞDU, Gülhayat Gölbaşı ŞİMŞEK
16:20 – 16:40	THE FACTORS AFFECTING STATISTICAL POWER OF APPROXIMATE F-TESTS IN LINEAR MIXED EFFECTS MODELS WITH LONGITUDINAL DATA	Melike KAYA BAHCECITAPAR
16:40 – 17:00	CREDIT CARD FRAUD DETECTION OF AN E-COMMERCE SITE USING DATA MINING TECHNIQUES: A CASE STUDY	MUSTAFA CEM KASAPBAŞI , Yasin KIRALLI

HALL 2 – STATISTICS & ECONOMETRICS

WORKSHOP on ORDER STATISTICS	
17:20 – 18:00	Prof. Dr. Narayanaswamy BALAKRISHNAN - McMaster University TITLE: IT'S ALL BS

HALL 1 – CIVIL ENGINEERING

SESSION CHAIR	Prof. Dr SHASHI Mathur	
TIME	TITLE	PRESENTER / AUTHORS
17:20 – 17:40	BIODEGRADATION OF A BTEX COMPOUND (TOLUENE) UNDER VARYING SOIL WATER CONTENT AND TEMPERATURE	SHASHI Mathur, Basu SHREEJITA, Yadav B K
17:40 – 18:00	A CASE STUDY: ANALYSIS AND PERFORMANCE OF AN ANCHORED PILE WALL IN WEAK SATURATED SILT	Selman SAGLAM
18:00 – 18:20	EXPERIMENTAL TESTS OF OPTIMALLY DESIGNED STEEL CORRUGATED BEAMS	Ferhat ERDAL, Osman Tunca, Serkan Taş

HALL 3 – ARCHITECTURE

SESSION CHAIR	Assoc. Prof. Dr. Pınar ARABACIOĞLU	
TIME	TITLE	PRESENTER / AUTHORS
14:00 – 14:20	A Survey On The Current State Of Lighting Design Education In Interior Architecture/Design Programs In Turkey	Sezin TANRIOVER , Kenan Eren SANSAL
14:20 – 14:40	Integration of Living Spaces to Altering Living Standards	Gamze DEMİRÇİ , Burcu KÖSE KHIDIROV
14:40 – 15:00	The Concept of Virtual Reality As Interior Interface	Tolga KILIÇ
15:00 – 15:20	Lighting Design Education and Its Association with Academic Achievement in Interior Design Courses: A Case Study	Kenan Eren SANSAL , Sezin TANRIOVER
15:20 – 15:40	Technology Supported Flexible Designs For Furniture Structures	Hande Zeynep KAYAN , Burcu KÖSE KHIDIROV

15:40 – 16:00	COFFEE/TEA BREAK
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SESSION CHAIR	Assist. Prof. Dr. Serhat KUT	
TIME	TITLE	PRESENTER / AUTHORS
16:00 – 16:20	Experiencing Infill Projects In Spatial Design Education	Ece POSTALCI , Tolga SAYIN
16:20 – 16:40	How Compact Can One City Get?	F. Pınar ARABACIOĞLU , Serhat BAŞDOĞAN
16:40 – 17:00	The 'new' museum comprehension: "Inclusive museum"	Gamze KARAYILANOĞLU , Burçin Cem ARABACIOĞLU
17:00 – 17:20	Urban Myths as the Reliever of Social Anxieties	Selim ÖKEM
17:20 – 17:40	Interior Design Under The Influence Of Periodical Effects And Cultural Traces: Centre Georges Pompidou & Centre Pompidou-Metz Designs	Burak TANSEL ; Emel BAŞARIK AYTEKİN

21 APRIL 2016

09:00-10:00 : REGISTRATION / CONFERENCE LOBBY AREA

HALL 1 – CHEMISTRY

SESSION CHAIR	Prof. Dr. Aydın TAVMAN	
TIME	TITLE	PRESENTER / AUTHORS
10:00 – 10:20	THE APPLICATION OF CONDUCTING POLYMERS AND THEIR NANOCOMPOSITES AS A CORROSION PROTECTION	Murat ATEŞ
10:20 – 10:40	REVIEW OF SYNTHESIS AND CHARACTERIZATION OF GRAFT COPOLYMERS USING RENEWABLE SOURCES WITH VARIOUS POLYMERIZATION METHODS	Abdulkadir ALLI
10:40 – 11:00	SYNTHESIS, CHARACTERIZATION AND CATALYTIC ACTIVITY OF MONONUCLEAR COPPER(II) AND IRON(II) COMPLEXES WITH NEW SCHIFF BASE LIGANDS DERIVED FROM VISNAGIN	Neslihan BEYAZIT, Cahit DEMETGUL
11:00 – 11:20	IMMOBILIZATION OF SALOPHEN DERIVATIVE SCHIFF BASE CO(II) COMPLEX ON A COPOLYMER COATED PLATINUM ELECTRODE AND ELECTROCATALYTIC INVESTIGATIONS	Didem ÇAKMAK

11:20 – 11:40	COFFEE / TEA BREAK
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HALL 1 – CHEMISTRY

SESSION CHAIR	Assoc. Prof. Dr. NAKI COLAK	
TIME	TITLE	PRESENTER / AUTHORS
11:40 – 12:00	A COMPARATIVE DNA BINDING STUDY FOR HETEROLEPTIC PLATINUM(II) COMPLEXES OF PIP AND HPIP	Ufuk YILDIZ, Burak COBAN
12:00 – 12:20	CONFORMATIONAL EFFECT ON DS- AND G-QUADRUPLEX DNA BINDING ABILITY OF PERYLENE DIIMIDE CONJUGATE SYSTEM	Fatih PEKDEMIR, Abdurrahman SENGUL, Ufuk YILDIZ
12:20 – 12:40	"LABEL FREE DETECTION OF DNA USING POLYSTYRENE-g-SOYA OIL-g-IMIDAZOLE GRAFT COPOLYMER	Izzet KOCAK, Baki HAZER
12:40 – 13:00	THE SYNTHESIS OF SCHIFF BASE; METHYL 2-((5-CHLORO-2-HYDROXYBENZYLIDENE)AMINO)-6-METHYL-4,5,6,7-TETRA HYDROTHIENO[2,3-C]PYRIDINE-3-CARBOXYLATE AND INVESTIGATION OF ITS ELECTROCHEMICAL PROPERTIES	Naki COLAK, Ayla BALABAN GUNDUZALP, Serhat MAMAS, Damla AKKAYA
13:00 – 14:30	LUNCH	

HALL 1 – CHEMISTRY

POSTER SESSION	COORDINATOR: YELDA YALCIN GURKAN	
TIME	TITLE	PRESENTER / AUTHORS
<p>14:30</p> <p>/</p> <p>17:00</p>	SYNTHESIS AND SPECTRAL CHARACTERIZATION OF A NEW ORANGE MONOAZO DISPERSE DYE: 3-(BENZYL{4-[(2,6-DICHLORO-4-NITRO-PHENYL)DIAZENYL]PHENYL}AMINO)PROPANENITRILE	Aydın TAVMAN , Adem CINARLI, Demet GURBUZ, Samet SOLAK
	SYNTHESIS OF SOME BENZOXAZOLE COMPOUNDS	Adem CINARLI , Demet GURBUZ, Aydın TAVMAN, Duygu OZATA
	SYNTHESIS AND SPECTRAL CHARACTERIZATION OF A NEW RED DISPERSE MONOAZO DYE: 3-[[4-(DIETHYLAMINO)PHENYL]DIAZENYL]-5-ITROBENZONITRILE	Adem CINARLI , Demet GÜRBÜZ, Aydın TAVMAN, Merve ERTUNÇ
	SELECTIVE CARBONIC ANHYDRASE I INHIBITORS: ELECTROCHEMICAL CHARACTERIZATION of AROMATIC SUBSTITUE SULFONAMIDE and ITS COPPER(II) COMPLEXES	Ayla BALABAN GÜNDÜZALP , Demet UZUN, Ümmühan ÖZDEMİR ÖZMEN, Ebru ERDOĞDU
	HETEROCYCLIC COMPOUNDS FROM (THIO)SUBSTITUTED NITRODIENES	M.Cigdem SAYIL
	SYNTHESIS AND INVESTIGATION OF NOVEL QUINONE COMPOUNDS	M.Cigdem SAYIL
	SYNTHESIS AND SPECTRAL CHARACTERIZATION OF A NEW BLUE MONOAZO DISPERSE DYE: N,N-DIETHYL-4-[(4-NITRO-2,5-DIHYDRO-1,3-THIAZOL-2-L)DIAZENYL]ANILINE	Demet GURBUZ , Adem CINARLI, Aydın TAVMAN, Fatma BASARAN
	SYNTHESIS AND SPECTRAL CHARACTERIZATION OF 7-[[4 BROMO/FLOPHENOXY)METHYL]-4H-[1,3,4]THIADIAZOLO [2,3-C][1,2,4]TRIAZIN-4-ONES	Demet GURBUZ , Süleyman TANYOLAC, Adem CINARLI, Aydın TAVMAN

16:00 – 16:20	COFFEE/TEA BREAK
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HALL 1 – CHEMISTRY

POSTER SESSION	COORDINATOR: YELDA YALCIN GURKAN		
TIME	TITLE	PRESENTER / AUTHORS	
<div style="font-size: 2em; font-weight: bold;">14:30</div> <div style="font-size: 3em; font-weight: bold;">/</div> <div style="font-size: 2em; font-weight: bold;">17:00</div>	THEORETICAL STUDIES ON THIOPHENE CARBOXAMIDE AND ITS Cu(II), Zn(II) COMPLEXES	Ebru AKTAN , Ayla BALABAN GÜNDÜZALP, Ümmühan ÖZDEMİR ÖZMEN	
	DFT ANALYSIS OF INTERCONNECTION OF Fe+2 IONS WITH VITAMIN C IN THE FOOD	E. Esra KASAPBASI , Merve KAYA	
	SYNTHESIS OF 1,4-DIHYDROPYRIDINE DERIVATIVES USING HIGHLY EFFECTIVE PDNİRU@GO NANOPARTICLES:	Benan KILBAS , Guven YAZICI, Tuna DEMIRCI	
	ENZYME INHIBITION STUDIES of FURAN SULFONYLHYDRAZONE COPPER(II) COMPLEXES by USING DIFFERENTIAL PULSE VOLTAMMETRY (DPV) METHOD	, Ayla BALABAN GUNDUZALP , Demet UZUN, Ümmühan OZDEMİR OZMEN, Gökhan PARLAKGUMUS	
	THEORETICAL INVESTIGATION ON STRUCTURAL AND ELECTRONIC PROPERTIES OF FURAN CARBOXAMIDE AND ITS METAL COMPLEXES	Ebru AKTAN , Ayla BALABAN GÜNDÜZALP, Ümmühan ÖZDEMİR ÖZMEN	
	SYNTHESIS, CHARACTERIZATION OF METHYL 2-AMINO-6-METHYL--4,5,6,7-TETRAHYDROBENZO[b]THIOPHENE-3-CARBOXYLATE AND ITS ELECTROCHEMICAL BEHAVIORS	Naki ÇOLAK , Ayla BALABAN GÜNDÜZALP, Damla AKKAYA, Serhat MAMAŞ	
	Synthesis of (9H-Carbazole-9-yl)-Carbothioic Dithioperoxyanhydride, Poly(9H-Carbazole-9-yl)-Carbothioic Dithioperoxyanhydride) Formation and Capacitor Study	Nesimi ULUDAG , Murat ATEŞ	
	Carbazole derivative synthesis and their Electropolymerization	Nesimi ULUDAG , Murat ATEŞ,	
	NITROPOLYHALOBUTADIENES AS BUILDING BLOCKS FOR THE NOVEL SYNTHESIS OF HETEROCYCLES	Serdar Gökşin AYDINLI	
	SYNTHESIS OF SOME NEW S-SUBSTITUTED QUINONE DERIVATIVES	Serdar Gökşin AYDINLI , Çigdem SAYIL, Nahide Gülşah DENİZ, Ayşecik ŞAHİN	
	A HIGHLY SELECTIVE COUMARIN-THIAZOLE BASED SCHIFF BASE CHEMOSENSOR FOR FAST DETECTION CN- ION IN AQUEOUS SOLUTION: SYNTHESIS, MOLECULAR CHARACTERIZATION, Pd (II)/Pt (II) COMPLEXES	Ümmühan ÖZDEMİR ÖZMEN , Ömer ŞAHİN, Burcu AYDINER, Zeynel SEFEROĞLU	

	COUMARIN- THIAZOLE DERIVED FLUORESCENT CHEMOSENSOR AND ITS Pd (II)/Pt (II) COMPLEXES	Ümmühan ÖZDEMİR ÖZMEN , Gizem ŞAHİN, Ömer, ŞAHİN, Burcu AYDINER, Zeynel SEFEROGLU
	ANTIRADICAL AND ANTIOXIDANT POTENTIAL OF Curcuma longa EXTRACTS	Yeşim YEŞİLOĞLU , Hatice AYDIN
	THE ANALYSIS of REACTION KINETICS of LYNCOMYCIN MOLECULE THROUGH DFT CALCULATION METHOD	Yelda YALCIN GURKAN , Bahar EREN
	SUPERCAPACITOR PERFORMANCE OF POLY(3,6-BIS(2,3-DIHYDROTHIENO[3,4-B][1,4]DIOXIN-5-YL)-9-TOSYL-9H-CARBAZOLE)/GRAPHENE OXIDE-FE3O4 NANOCOMPOSITES AND COMPUTATIONAL MODELLING	Yelda Yalcin GURKAN , Murat ATES
<p>ALL POSTERS WILL HANG ON MEETING ROOM WALLS IN AN ORDER. PLEASE ASK FOR PATAFIX FROM CONFERENCE REGISTRATION DESK</p>		

HALL 2 – STATISTICS & ECONOMETRICS

POSTER SESSION	Coordinator: Gulder KEMALBAY	
TIME	TITLE	PRESENTER / AUTHORS
09:30 / 10:20	LONG TERM RESERVOIR OPTIMIZATION DUE TO THE CRITERIA OF ENERGY PRODUCTION	Jadran Berbić, Eva Ocvirk
	NONPARAMETRIC KERNEL DENSITY ESTIMATION UNDER SHAPE CONSTRAINT	Kee-Hoon KANG,
	UNCERTAINTIES IN FLOOD EVENTS ESTIMATION	Eva Ocvirk, Jadran Berbić, Neven Kuspilić

10:20 - 11:20	<p style="text-align: center;">KEYNOTE TALK / PROF. DR. İSMİHAN BAYRAMOĞLU (BAIRAMOV) - IZMİR UNIVERSITY OF ECONOMICS</p> <p style="text-align: center;">TITLE: ORDERED RANDOM VARIABLES-THEORY AND APPLICATIONS.</p>
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11:20 – 11:40	COFFEE/TEA BREAK
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HALL 2 – STATISTICS & ECONOMETRICS

SESSION CHAIR	Assist. Prof. Dr. Gulder KEMALBAY	
TIME	TITLE	PRESENTER / AUTHORS
11:40 – 12:00	CLASSIFICATION OF THE STOCK INDEX DIRECTION WITH LOGIT MODEL	Begüm Nur ALKIŞ , Gülder KEMALBAY
12:00 – 12:20	Dynamic Conditional Correlations among GCC Stocks Markets, US Stocks market and oil market	Kamel Malik Bensafta
12:20 – 12:40	EVALUATION OF CURRENT EXPENDITURES IN TERMS OF HUMAN CAPITAL AND EFFICIENCY AT PUBLIC EXPENDITURES	Sinan ATAER
12:40 – 13:00	THE ANALYSIS OF POVERTY USING HETEROSCEDASTIC PROBIT MODEL: THE CASE OF TURKEY	Gulsah SEDEFOĞLU , Ebru CAGLAYAN AKAY
13:00 – 13:20	THE SUSTAINABILITY OF BUDGET DEFICITS IN THE EUROPEAN UNION COUNTRIES	Cigdem Borke TUNALI , Binhan Elif YILMAZ,

13:00 – 14:40	LUNCH
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HALL 2 – STATISTICS & ECONOMETRICS

SESSION CHAIR	Assist. Prof. Dr. Nebile Korucu GUMUSOGLU	
TIME	TITLE	PRESENTER / AUTHORS
14:40 – 15:00	ENVIRONMENTAL EFFECTS OF THE ENERGY CONSUMPTION IN URBAN AREAS	Esin BOZKURT
15:00 – 15:20	IMPACTS OF MULTILATERAL ENVIRONMENTAL DEVELOPMENT AIDS IN DEVELOPING COUNTRIES: CASE STUDY ON TURKEY	Fatih Kaan AKYAR , Fehime Ceren AY
15:20 – 15:40	THE IMPACT OF CAPITAL FLOWS ON CURRENT ACCOUNT DEFICIT FOR TURKEY	Nebile Korucu , Sinan Alçın
15:40 – 16:00	BAYESIAN APPROACH TO DEMAND ESTIMATION WITH JEFFREYS' PRIOR	Aslı GUNER , Hasan Kivanc AKSOY,

16:00 – 16:20	COFFEE/TEA BREAK
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HALL 2 – STATISTICS & ECONOMETRICS

16:40 - 17:40	WORKSHOP / Prof. Dr. Ismihan BAYRAMOGLU (BAIRAMOV) - Izmir University of Economics Title: ON MEAN RESIDUAL LIFE FUNCTIONS OF COHERENT SYSTEMS
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HALL 3 – ARCHITECTURE

SESSION CHAIR	Assoc. Prof. Dr. Selim ÖKEM	
TIME	TITLE	PRESENTER / AUTHORS
09:40 – 10:00	What Lodz Manufactura Made Me Think of Sümerbank Nazilli Textile (Basma) Factory Campus	Meral NALÇAKAN
10:00 – 10:20	Criticism of Unsustainability at Ayvansaray as an Urban Archaeological Site	Mine ESMER
10:20 – 10:40	Creating Virtual Space by Using Kinect Camera	Esra BAYIR
10:40 – 11:00	The Effects Of Inspiration in Furniture Design For Characterization of Interiors	Orkunt TURGAY
11:00 – 11:20	Kano Model And Using Continuous Improvement Method In Housing Design	Bahar KAYA

11:20 – 11:40	COFFEE / TEA BREAK
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HALL 3 – ARCHITECTURE

SESSION CHAIR	Assist. Prof. Dr. Ece POSTALCI	
TIME	TITLE	PRESENTER / AUTHORS
11:40 – 12:00	Space, Material and Interstice	Genco BERKİN, Uğur ÖZCAN
12:00 – 12:20	History Through Image and Symbol: Konya/Sille	Şebnem ERTAŞ, Elif SÖNMEZ, Zeynep SADIKLAR, Pardis KAFİL
12:20 – 12:40	Cultural Property With Touristic Potential: Example Of Sille	Şebnem ERTAŞ, Firdevs KULAK, Aslı TAŞ, Alper TORUN
12:40 – 13:00	Spatial Quality in Public Spaces	Burcu TAN, Ebru ERDÖNMEZ
13:00 – 13:20	The Effect of Using the Visual Effects on Spatial Representation: The Actual Space in Game of Thrones TV Series	Büşra ÖZAYDIN ÇAT

13:30 – 14:30	LUNCH
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HALL 3 – ARCHITECTURE

SESSION CHAIR	Assoc. Prof. Dr. Ebru ERDÖNMEZ	
TIME	TITLE	PRESENTER / AUTHORS
14:40 – 15:00	The Importance of Ergonomics on Urban Squares, Southeast Asian Examples	Çiğdem CANBAY TURKYILMAZ
15:00 – 15:20	Transformation In Residence Plan Typology From The Foundation Of The Republic To The Present Day: Konya Case	Elif BÜLÜÇ , Havva Burcu KAYNAŞ, Fatmanur BARAN
15:20 – 15:40	Approach Maximalist in Interior Design	Emine YÜKSEL , Onur ÜLKER, Murat KILIÇ
15:40 – 16:00	Reflections of National Architecture on Konya City: Case Study With Regard to 3 Buildings	Fatmanur BARAN , Elif BÜLÜÇ, Havva Burcu KAYNAŞ
16:00 – 16:20	How to Design Flexible Spaces at Private and Government Offices?	Onur ÜLKER , Emine YÜKSEL
16:20 – 16:40	Analyzing The Effects Of Spatial Equipment On Cultural Structure Via Konya Houses	Havva Burcu KAYNAŞ , Fatmanur BARAN, Elif BÜLÜÇ

22 APRIL 2016

09:00-10:00 : REGISTRATION / CONFERENCE LOBBY AREA

HALL 1 – CHEMISTRY

POSTER SESSION	COORDINATOR: DOLUNAY SAKAR DASDAN	
TIME	TITLE	PRESENTER / AUTHORS
<p>10:00</p> <p>/</p> <p>11:00</p>	ZETASIZER MEASUREMENTS OF POLY (EHTYLENE OXIDE)	Dolunay SAKAR DASDAN , Gamze TOSUN,
	Novel synthesis of SNS pincer type thioether ligand (2,6-[[bis(2,6-dimethylphenyl)sülfanyl]methyl}pyridine) and its Cu(II), Co(II), Fe(II) metal complexes: Spectroscopic (NMR, Mass, FTIR, UV-Vis) characterization studies	Mehmet SÖNMEZ , Hatice Gamze SOGUKOMEROGULLARI
	NOVEL AZO-AZOMETHINE BASED DINUCLEAR METAL(II) COMPLEXES: SYNTHESIS, DEFINITIONS, DFT CALCULATIONS AND BIOCHEMICAL APPLICATIONS	Mehmet GÜLCAN , Ranjdar Hamad BASHA SYAN, Yaşar KARATAŞ, Selçuk GÜMÜŞ, Sadin ÖZDEMİR
	SYNTHESIS, CHARACTERIZATION, CRYSTAL STRUCTURE AND BIOLOGICAL APPLICATIONS OF THE NEW THIOSEMICARBAZONE DERIVATIVES	Mehmet GÜLCAN , Davut ATEŞ, Memet ŞEKERCİ, Sadin ÖZDEMİR Ertan ŞAHİN
	ZETA POTENTIAL, MOBILITY AND PARTICLE SIZE MEASUREMENTS OF POLY EHTYLENE-BLOCK-POLY(ETHYLENE GLYCOL)	Dolunay SAKAR DASDAN , Yesim KARAHAN,
	SYNTHESIS OF A NEW ONNO DONOR TETRADENTATE SCHIFF BASE LIGAND AND BINUCLEAR CU(II) COMPLEX: SPECTROSCOPIC AND PHOTOLUMINESCENCE INVESTIGATIONS	Mehmet SÖNMEZ , Ahmet Oral SARIOĞLU
	THE FUNCTIONALIZATION OF HIGHLY ORIENTED PYRLOYTIC GRAPHITE ELECTRODES AND A DFT STUDY	Izzet KOCAK
	LACCASE IMMOBILIZATION ONTO ANTHRAQUINONE AND ANTHRACENE	Izzet KOCAK

	MODIFIED GC ELECTRODES AND HIGH-THROUGHPUT SCREENING OF O ₂ REDUCTION	
	INVESTIGATION ON ELASTIC AND MECHANICAL PROPERTIES OF INTERMETALLIC COMPOUNDS MG-TM (TM=CU, AG)	Said BOUCETTA , Boubkeur OTHMANI
	ELASTIC AND MECHANICAL PROPERTIES OF MGX (X=RU, RH) INTERMETALLIC COMPOUNDS	B. Othmani , S. Boucetta
	NEW TRENDS IN GC-FID TECHNIQUE FOR DETERMINATION AND CONTROL OF NICOTINE IN CIGARETTE SMOKE AND INDOOR AIR	Tetiana HUBETSKA , Natalia KOBYLINSKA
	SYNTHESIS AND CHARACTERIZATION OF NOVEL 3-[(4-SUBSTITUTED-1-YL)PHENYL]-1-ARYL/HETEROARYL-2-PROPEN- 1-ONES	Ayşegül KARAKÜÇÜK-İYİDOĞAN , Hussein KAKAJ MOHAMAD, Eyüp BAŞARAN, Emine Elçin ORUÇ-EMRE
	SYNTHESIS AND CHARACTERIZATION OF NOVEL 1,3,4-OXADIAZOLE-2-THIONE MANNICH BASES CONTAINING L-PHENYLALANINE MOIETY	Ayşegül KARAKÜÇÜK-İYİDOĞAN , Eyüp BAŞARAN , Emine Elçin ORUÇ-EMRE
	SYNTHESIS and STRUCTURAL ELUCIDATON of NEW 2(1H)-OXAZOLIDINONE DERIVATIVES	Emine Elçin ORUÇ-EMRE , Rabeah Adil ZAINEL, Nurcan KARAMAN, Ayşegül KARAKÜÇÜK-İYİDOĞAN
<p>ALL POSTERS WILL HANG ON MEETING ROOM WALLS IN AN ORDER. PLEASE ASK FOR PATAFIX FROM CONFERENCE REGISTRATION DESK</p>		

11:00 – 11:20	COFFEE/TEA BREAK
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HALL 2 – STATISTICS & ECONOMETRICS

SESSION CHAIR	Assoc. Prof. Dr Fatma NOYAN TEKELI	
TIME	TITLE	PRESENTER / AUTHORS
09:20 – 09:40	INVESTIGATING CUSTOMER SATISFACTION USING IMPACT SCORE TECHNIQUE	Fatma NOYAN TEKELİ
09:40 – 10:00	DETECTION PRINCIPLES BASED ON NEW DETECTOR TECHNOLOGY AND PARAMETERS	Yuksel AKINAY
10:00 – 10:20	HOW SHOULD CENTRAL BANKS RESPOND TO NON-NEUTRAL INFLATION EXPECTATIONS?	Imran H. Shah
10:20 – 10:40	FORECASTING TOURIST ARRIVALS TO TURKEY WITH GENETIC PROGRAMMING	Özlem BERAK KORKMAZOĞLU ,Gülder KEMALBAY

11:00 – 11:20	COFFEE/TEA BREAK
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HALL 3 – ARCHITECTURE

SESSION CHAIR	Assoc. Prof. Dr. Çiğdem CANBAY TÜRKYILMAZ	
TIME	TITLE	PRESENTER / AUTHORS
09:20 – 09:40	Artistic Value In Venues: Architectural Spaces Finding Value By Art	Merih KASAP
09:40 – 10:00	The Performance of the Modular Design of Hybrid Wall with Surface Heating and Cooling System	Selcen Nur ERİKCİ ÇELİK, Gülay ZORER GEDİK, Ali İhsan KOCA, Gürsel ÇETİN, Zafer GEMİCİ
10:00 – 10:20	Artistic Value of “Architectural Spaces”	Tugba TARIM
10:20 – 10:40	Evaluating Sustainability In Interior Design Through The Traditional Turkish House	Füsun SEÇER KARİPTAŞ, Fatma Ceyda GÜNEY, Özlem GÜNEY KARADIŞOĞULLARI
10:40 – 11:00	Architectural Discourse and the Labour of Sign Production	Günce EŞİNGEN

11:00 – 11:20	COFFEE/TEA BREAK
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SESSION CHAIR	Assist. Prof. Dr. Emrah TÜRKYILMAZ	
TIME	TITLE	PRESENTER / AUTHORS
11:20 – 11:40	Projection (3D) Mapping: Assessment of Light and Virtuality Relationship in Context of Interior Design	Emre DEDEKARGINOĞLU, İsmail BEZCİ,
11:40 – 12:00	Internet of Things: Thinking the Thing as Furniture	Mehmet Ali ALTIN
12:00 – 12:20	The Effects of the Formation of Past Cultural Codes on Cyprus Nicosia's Old Houses and Administrative Buildings	Zehra ÖNGÜL
12:20 – 12:40	Understanding The Design Of Mosques	Ayşegül DURUKAN
12:40 – 13:00	Use Of Architecture As A New Way Of Mesmerizing Tool Of Marketing In Shopping Spaces	Ayşegül DURUKAN

13:00 – 14:00	LUNCH
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2nd International Conference On New Trends In Architecture And Interior Design

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A SURVEY ON THE CURRENT STATE OF LIGHTING DESIGN EDUCATION IN INTERIOR ARCHITECTURE/DESIGN PROGRAMS IN TURKEY

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Abstract

Light is a fundamental design element for an interior, which by rendering the form, colour, and texture, enables human perception and creates the soul of the space. Lighting design positioned in the intersection of various space related professions require well-equipped professionals since it can affect the health and performance of the occupant, and efficiency of the work in the space. This paper summarizes the results of a survey conducted via e-mail and phone interviews with chairpersons of 61 Interior Design/Architecture Programs in Turkey to discover the current state of lighting design education in Interior Design/Architecture programs in Turkey and to determine comments related to the future of lighting design education. The scope, content and the method of delivery of courses, those are specifically about lighting design or include lighting design in addition to other building sciences such as acoustics, thermal issues were examined. Results revealed the absence of courses related to the field in the newly established programs although few; absence or insufficiency of practice hours in these courses when compared to theory; variation of weekly hours of delivery; differences in the credit values; lastly the scarcity of graduate programs in the field of lighting design.

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Keywords: Interior architecture/design education, lighting design education, lighting design,

1. Introduction

Light, the key component in perception of the physical environment and appreciation of architecture, enables us to see and understand the diverse qualities of spaces. Appropriate illumination levels and techniques, besides enabling vision for specific functions, intensifies the poetic and emotional impact of a space, generates its soul [1]. Architectural lighting design is defined as a special field in the intersection of architecture, interior architecture/design and electrical engineering professions that are concerned with the design of natural and artificial lighting systems of built environment[2].

Interior Architecture/Design as defined by IFI (International Federation of Interior Architects/Designers) is a profession that determines the relationship of people to spaces based on psychological and physical parameters to improve the quality of life [3]. Despite the fact that light is one of the most influential component of a space that physically, physiologically and psychologically affecting the user, it appears to have a scarce importance in the programs of institutions that offer professional education in the discipline in Turkey [4].

The rapid increase in the number of these programs in the last 2 decades in Turkey, especially in private institutions created doubts and concerns about the quality of Interior Architecture/Design education in general (Table 1 and 2); and Lighting Design education in particular. Doubts about the quality of lighting education take roots from the current condition of education in this discipline such as, scarcity of programs and research institutes recognizing the value of lighting design; scarcity of

facilities (laboratories, experiment rooms); and inconsistencies in the contents and teaching methods of programs; and the lack of qualified specialists in the academic field.

Table 1. Distribution of State Universities in Turkey

1700's	1800's	1950's	1970-80's	1990's
1	2	3	2	3

Table 2. Distribution of Private Universities established in the last four decades in Turkey

80-89	90-99	2000-2010	2011-2015
2	17	22	9

Currently, there are 61 programs of Interior Architecture/Design in Turkey (Table 3). Programs are operational within diverse faculties [5]. Due to organizational differences and the objectives of each institution, scope, content and the aim of the courses are diverse within these faculties. Correspondingly, this brings about suspicions about the qualifications of graduates of each program since they become equipped with dissimilar amount and type of knowledge in the field of lighting design.

Among the 61 programs of Interior Architecture/Design in Turkey, 11 are executed by state and 50 by private institutions. Fifty-two of these programs (11 government, 41 private universities) include courses related to lighting design in the 4-year undergraduate educational plans. Only 9 programs in private institutions out of 61 have not included these courses in their 4-year undergraduate educational plans of Interior Architecture/Design Departments yet due to recent establishment (Table 3).

Table 3. Undergraduate and Graduate Programs of Interior Architecture/Design in Turkey

Interior Architecture/Design Programs in Turkey	State Institutions	Private institutions
Undergraduate programs	11	50
Graduate programs	3	11

CIE (Commission Internationale De L'Eclairage) [2] formerly documented the situation of lighting education in 1983-1989 for European countries regarding the delivery hours of the course, methodology and professional training in lighting design, in which Turkey has been missed out. Doubts mentioned above have not been concretized by the scientific findings for the situation in Turkey, which this study aims at doing. Consequently, main purpose of this study is to put forth current situation of lighting design education in 4-year undergraduate and graduate level educational plans Interior Architecture/Design programs in Turkey.

2. Methodology

2.1. Protocol

In order to gather information about the lighting design education in all active programs in Turkey, a "course information form" was prepared and delivered to each chairperson of 61 Interior Architecture/Design Department in the country via e-mail to record the name, code, year, credit, course hours (h/w), language, status (M/E), course level, scope, content and objectives, delivery method and the coordinator and lecturer of the course in each institution (Figure 1).

Course Information Form		
University	State	Private
Faculty	Department	Year of student admittance to the program
Course Name		
Course Code		
Year of the course		
Semester of course		
Course Hours (h/w)	Theory: Practice:	
Course Credit	Credits: ECTS:	
Pre-requisite		
Language		
Type (Must/ Elective)		
Course Level (Undergraduate, Graduate, PhD)		
Course Coordinator		
Course Lecturers		
Course Contents and Objectives		

Figure 1. Course Information Form

For the ongoing second phase of the study, course coordinators and lecturers were contacted for their volunteer participation to an in depth interview via telephone. Currently, data compiled is being processed to determine individual comments of the specialists in the education of lighting design field, especially for their comments on the existing structure of the courses and delivery methods in each institution. Study will be concluded with discussions on the necessary revisions in Interior Architecture/Design Programs in Turkey regarding lighting design education.

2.2. Data Analysis

2.2.1. Course Information Forms

Courses included in the education plans of Interior Architecture/Design programs in Turkey were looked into according to the various faculties, graduate schools for the programs offering graduate level courses, delivery methods, years of delivery, delivery of hours per week, ECTS values, pre-requisite courses if there are any, and the status of the course as must or elective.

Undergraduate programs appear to be operational within the faculties of fine arts, fine arts and design, fine arts and architecture, fine arts, design and architecture, architecture, architecture and design, engineering and natural sciences, engineering and architecture, arts and design, engineering and design (Table 4). Majority of the courses found out to be operational within the Faculties of Architecture, Engineering and Architecture, Fine Arts and Fine Arts, Design and Architecture. Nine of 61 programs observed to lack from offering courses that introduce knowledge about lighting design, due to recent establishment and student admittance.

Table 4. Distribution of **undergraduate programs** on Interior Architecture/Design according to the **faculties**

Fine Arts	Fine Arts and Design	Fine Arts and Architecture	Fine Arts Design and Architecture	Architecture	Architecture and Design	Engineering and Natural Sciences	Engineering and Architecture	Arts and Design	Engineering and Design
8	5	3	8	12	1	1	9	3	1

In addition to undergraduate education, 14 out of 61 programs that are comprised of 3 state and 11 private university programs appear to offer graduate level courses on lighting design in the masters programs of Interior Architecture/Design (Table 5). The nature of the courses in both undergraduate and graduate levels are given in the following sections in detail.

Table 5. Distribution of **graduate programs** on Interior Architecture/Design Programs that offer Lighting Design and Building Physics courses

Graduate School of Natural and Applied Sciences	Graduate School of Social Sciences	Graduate School of Economy and Social Sciences	Graduate School of Education and Research
10	2	1	1

Lighting design education in active 52 programs of Interior Architecture/Design are structured and conducted in diverse methods. According to the data gathered from these institutions, courses related to lighting design education were grouped in two as; a general group of courses introducing general information and understanding of all subjects of building physics such as acoustics, HVAC, fire precautions and lighting design; second, more specific group of courses on lighting design only, comprising of natural and artificial lighting design principles and the new technologies in the field. The common issue for every course, whether it is a general building physics course or a specific lighting design course of any year of any program, was the absence of pre-requisite courses. Same situation was also observed for the graduate level course offerings as well.

Majority of building physics courses appeared to be must courses, while majority of the lighting design courses appeared to be elective courses (Table 6). Another issue observed was the concentration of building physics as must courses in the 2nd and 3rd years of the education plan in majority of the programs. Moreover, a common tendency regarding ECTS values recorded for building physics is 4 and for lighting is 3 or 4 (Table 6).

Table 6. Distribution of Lighting Design and Building Physics courses **according to ECTS and course status (M/E)**

	2 ECTS		3 ECTS		4 ECTS		5 ECTS		6 ECTS		7,5 ECTS		8 ECTS		Total	
	Must	Elec.	Must	Elec.	Must	Elec.	Must	Elec.	Must	Elec.	Must	Elec.	Must	Elec.	M	E
Building Physics	5	0	7	3	23	4	8	2	1	0	0	0	0	0	44	9
Lighting Design	0	5	1	9	10	8	2	2	0	5	0	1	0	1	13	31

Data in Table 6 reveals that in 44 programs building physics is offered as "must", and in 9 programs as "elective" courses; while in 13 programs lighting design is offered as "must", and in 31 programs as "elective" courses. Different from the undergraduate level, courses on lighting design in graduate programs are offered in "departmental elective" status in all of the institutions (Table 7).

Table 7. Distribution of Lighting Design and Building Physics courses according to **status (M/E) and years**

	Year 1	Year 2	Year 3	Year 4	Year 5 (Graduate)	Years 2,3,4
Must Courses	1	18	35	2	1	6
Departmental Elective Courses	0	1	13	7	16	0
	1	19	48	9	17	6

Data in Table 8 shows that 21 programs include only building physics courses and 15 programs include only lighting design courses. Meanwhile 16 programs offer both courses. Although these programs offer building physics and lighting design courses, the course statuses change from one institution to another as "must" or "departmental elective" (Table 6). Nine programs that recently became operational offer none of these courses yet (Table 8). For the graduate programs data presents a concentration on Lighting Design courses which are delivered as 3-hour theoretical courses (Table 9).

Table 8. Distribution of **undergraduate programs** that offer only Building Physics, only Lighting Design and both

	Building Physics only	Lighting Design only	Building Physics and Lighting Design	None	Total
Must and Departmental Elective Course	21	15	16	9	61

Table 9. Distribution of **graduate programs** that offer only Building Physics, only Lighting Design and both

	Building Physics only	Lighting Design only	Building Physics and Lighting Design	None	Total
Must and Departmental Elective Course	2	10	2	47	61

Delivery hours and delivery methods (theory, theory+practice) of both building physics and lighting design courses were another concern in evaluating the existing situation the education in the field. Data revealed that the courses are mostly structured as 2,3 and 4-hour courses in all programs except 2 (Table 10). Especially, 2 and 3-hour courses mostly appear to include only theoretical knowledge (3-hour theory, 0-hour practice) but no practice or laboratory work. As shown in Table 10, 2 and 3-hour courses on building physics are theoretically delivered must courses, while 2 and 3-hour courses on lighting design are theoretically delivered elective courses. Others, especially courses with 4 or longer hours appear to cover theoretical and practical knowledge together, delivered in design studios or lighting laboratories and they are only building physics courses (Table 10).

Table 10. Distribution of delivery hours of **undergraduate level** Building Physics and Lighting Design courses according to the status (M/E) and hours of theory and practice

	Course status (must/elective)	Delivery method	2 hours	3 hours	4 hours	5 hours	9 hours
Building Physics	Must	Theory	8	11	0	0	0
		Practice + Theory	0	4	15	1	1
	Elective	Theory	2	3	0	0	0
		Practice + Theory	0	0	0	0	0
Lighting Design	Must	Theory	1	5	0	0	0
		Practice + Theory	0	3	5	0	0
	Elective	Theory	15	4	0	0	0
		Practice + Theory	0	2	1	0	0
			26	32	21	1	1

For the graduate studies, data appeared to be concentrated on 3-hour theoretically delivered elective courses on lighting design specifically as shown in Table 10. There were only 3 exceptional programs. One of them include theoretical and practical knowledge on building design in a 4-hour must course in graduate level (Table 11).

Table 11. Distribution of delivery hours of **graduate level** Building Physics and Lighting Design courses according to the status (M/E) and hours of theory and practice

	Course status (must/elective)	Delivery method	2 hours	3 hours	4 hours
Building Physics	Must	Theory	0	0	0
		Practice + Theory	0	0	1
	Elective	Theory	1	2	0
		Practice + Theory	0	0	0
Lighting Design	Must	Theory	0	0	0
		Practice + Theory	0	0	0
	Elective	Theory	1	12	0
		Practice + Theory	0	0	0
			2	14	1

2.2.2. In Depth Interview with course coordinators and lecturers

In depth interviews and the data analysis regarding this stage is still in process, to be completed before the second submission of the full paper.

3. Concluding Remarks

In this study aiming to shed light on the current situation of lighting design education in Interior Architecture/Design programs in Turkey, data was investigated with regard to specific concern such as faculties that the programs are bound to, for undergraduate programs; graduate schools that the master programs are bound to; delivery methods, hours (per week), years of delivery and ECTS values and the statuses of the courses as must or elective.

Findings showed that programs offering courses related to lighting design concentrates on the faculties of Architecture, Engineering and Architecture, Fine Arts, Design and Architecture, and Fine Arts. The reason for such a concentration thought to be the nature of the field which is positioned in the intersection of architecture, interior architecture/design and electrical engineering professions. Similarly, programs that are offering masters studies in the field of lighting design are concentrated in the Graduate Schools of Natural and Applied Sciences.

When focused on courses, a general tendency of introducing the subject of lighting design appeared in two groups courses: first, building physics courses delivering general knowledge and understanding of subjects such as acoustics, HVAC, fire precautions and lighting design; second, more specific courses focusing on lighting design only, comprising of natural and artificial lighting design principles and the new technologies in the field. One-third of the programs offer courses from both groups at the same time and the rest, either one of them. Recently established programs appear to fail in offering education in the field. This means that only 1/3 of the programs. Remarkably, general building physics courses appeared to take place mostly in the 3rd year of the course plans in must course status, and to include theory and practice together. This common approach in the programs shows a general tendency of

creating a basic knowledge in the field of building physics. Lighting design courses which mostly appear in the 2nd and 3rd years in the course plans appeared in elective course status, and to focus on the lighting design field. Building physics courses appeared to have 3-4 delivery hours with theory and practice together and are valued with 4 ECTS in the majority of the programs, while lighting design courses appeared to have 2 hours mostly delivering theoretical knowledge and are valued with 3-4 ECTS. Delivery hours of the courses and ECTS values also show some similarities, which is suspected to be a result of Bologna Accreditation Process completed by the end of 2012 in Turkey.

Scarcity of the practice hours in the majority of the programs, and the existence of programs which have not yet included lighting design in the course plan, appears as the major concerns for this stage of the study. The sufficiency of hours of delivery is another topic of discussion, especially in programs with 2-hour elective courses on the subject. Besides the figures mentioned above, comments from the course coordinators and lecturers are being processed at the moment as the second stage of the study, to concretize problems and requirements related to the course contents, objectives and syllabuses, delivery methods, hours per week, credit values, and the facility conditions to include practice in education which is very significant for making light tangible in education. Discussion will be enriched by the additional material mentioned in section 2.2.2.

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INTEGRATION OF LIVING SPACES TO ALTERING LIVING STANDARDS

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In today's world people are continuously replacing because of fast population increase, wars, migrations and economic reasons. People adapt to the new places they have moved, however, give their identity on spaces, food, clothes and daily routines. They forced to keep up with spaces which refuses the past and future, called contemporary, framed with new century's technological returns and new necessities.

In this study transformation of living spaces into changing living spaces and integration of changing living standards will be examined by comparative examples. Besides, significance of living spaces in houses will be semitized, today's houses and living spaces will be evaluated.

Key Words: House, Settlement, Living Space, Integration, Industry, Living Standards

From ancient times, human beings have designed spaces which they fulfil their living activities. These spaces differentiate from region to region, furthermore they are formed with fast population increase, wars, migrations, natural factors and economic reasons. Most people have moved their first places to different ones and adapted there. Therefore, living spaces have shaped, and differentiated.

Especially regions which located on passageways and economic centres, have exposed to dense human mobility throughout history. Living spaces of those have differentiated in terms of operational, functional, usage, aesthetical etc. ways. These kind of different living spaces subsist in separate parts of today's World. Gradually changing and developing Technologies of today changes living spaces as well. In some regions living spaces are supposed to be larger household to gather and socialize, in some (metropole cities etc.) living spaces have only enough spaces to allow basic and limited activities. New gated community projects built in this kind of regions are designed in different dimensions for different users. However, generally standard houses in city centres are quite smaller compared to the traditional ones in rural areas. These kind of settlements have emerged in slowly populated small cities even though satellite cities in metropolises are denser.

In this study, how living spaces are changed against living standards until today will be examined. For this examining different house types from different regions and their changes in outgoing life will be studied.

1.Changing Value of Houses

Definition of house is a place that a person sleeps, stays except working time or a place which is a corporational home, apartment likely place, dwelling, and residence [1]. Emerging of shelters which are accepted as first houses is as old as history of humanity.

First hominids that appeared about 4,5 million years ago in Africa, did not need any shelter because of convenient climate conditions. First human beings who embraced huntsmen and collector life style,

refuged to caves or tree holes to be secure against wild animals in nature and other people. Human, who biologically is the less adaptive living creature to the environment, built shelters to avoid different climate conditions of where they settled. It's possible to come across with this basic planned, one-roomed houses almost all over the World [2].

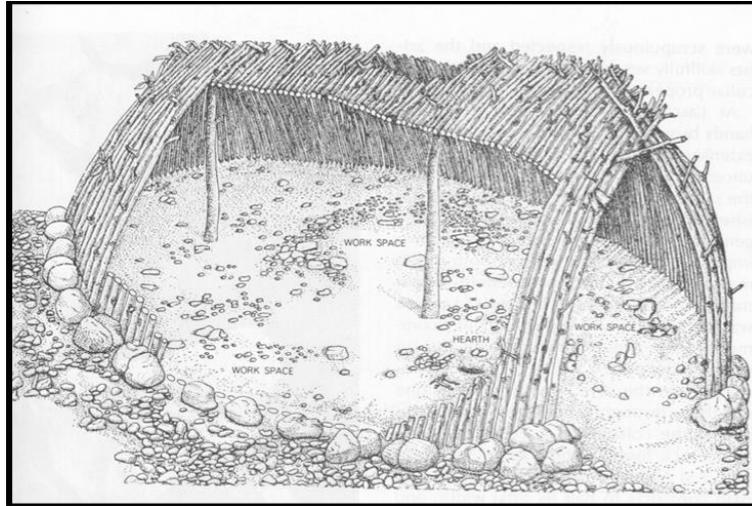


Fig.1. Terra Amata, homo erectus settlement, Nice, France

<https://www.studyblue.com/notes/note/n/arc-313-study-guide-2010-11-soo/deck/9740924>

Although they had learnt to build shelters to protect themselves from nature conditions, because of hunters and collector life style they embraced, people could not built permanent houses. When they had started agricultural activities, they also had started to built permanent shelters which they stay longer (See Fig. 1). These first human beings who had begun to settled life, started social relationships as well, so that shelters which was only for protective reasons before, had become social spaces as well [3].



Fig.2. Çatalhöyük, Konya, Turkey

<http://konya.com.tr/portfolio-item/catalhoyuk/>

Humanbeings have continued their biological evolution during their long lives which lasts millions of years. Our civilization is shaped with the collection of experiences and pursuits of human who developed by his Technologies, abilities and mind power. During this period cultural components that formed the society has started to changed. In durations human were canalized to new pursuits, components of culture from social relationships to economy, from architecture to technology were totally changed and a new system is arranged. In Fig. 2 we see Çatalhöyük, which was a large settlement 9 thousand years ago in Middle Anatolia. This kind of hill towns inhabited roughly 2 thousand years uninterrupted. Especially wideness of Neolithic settlement, its population, strong art and culture traditions were quite remarkable. 8 thousand people were supposed to be lived in the settlement. Main difference of Çatalhöyük from other Neolithic settlements is its exposing to an urban phase rather than a rural one. Residents of this settlement that was one of the oldest settlements of the World, were one of the first agriculturist communities. In the settlement, it is understood that houses were built adjacent to each other so that the walls were used as common, and there were narrow corridors reached to courtyard. These courtyards were used as a place providing light and fresh air, and a storage for litter as well. These houses with courtyards constitutes neighbourhoods; and these neighbourhoods forms the Çatalhöyük City.

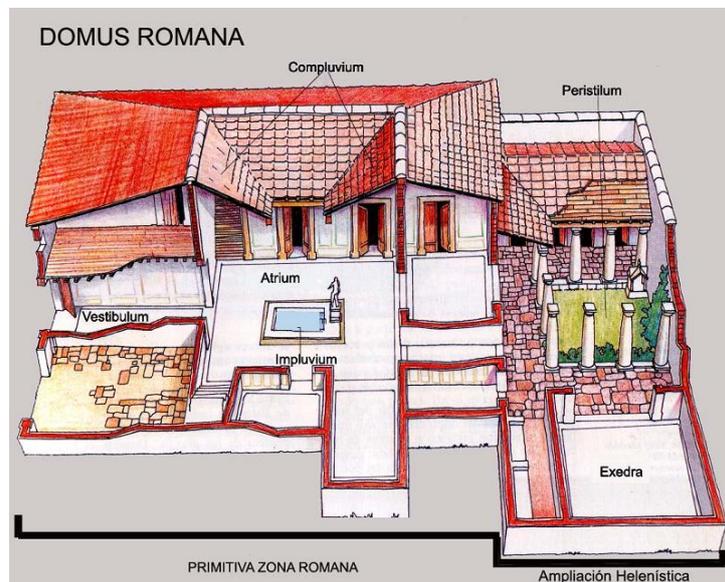


Fig.3. Domus example, Rome

<http://latiniparla-latiniparla.blogspot.com.tr/2011/12/la-domus-romana-y-la-insula.html>

Ancient Roman Civilization became a huge empire around Mediterranean from a small agriculture city in Italian Peninsula in B.C. 10th century. In cities of Roman Civilization in cities, besides houses, roads, bridges, water arches, tunnels, infrastructure and big-scaled constructions were built. In Fig. 3 private houses called Domus from Roman Civilization are seen. Daily life was spent in square or rectangular planned atriums. Atriums which used for chatting and resting, reached from the streets though corridors. The space between atrium and these corridors were an open living space.

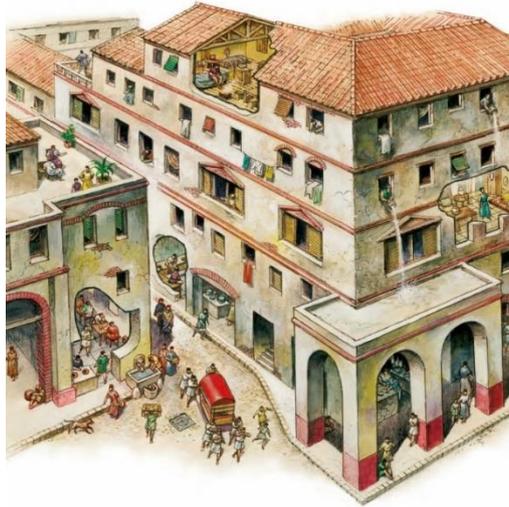


Fig. 4. Insulae example, Rome

<http://www.capitolivm.it/societa-romana/linsula-prologo-delledilizia-popolare/>

After production revolution or Neolithic Revolution which people were settled down, most significant order change was definitely Industrial Revolution. In industrial revolution because of dense population increase, diversification of social classes and change in production ways, urbanization and understanding of house reached to a totally different stage. During industrial revolution there had been developments in areas such as transportation, textile, agriculture and mining. Together with each development there had been some changes in social life and cities which was the centre of social life.

Industrial revolution force people who lived and produced in villages to move to big cities and worked in big factories. Together with migrations from rural to urban areas had made need of sheltering to turn into “need of sheltering in limited spaces”. Because of the increase in urban population boundaries of city’s started to get larger [4]. With embracing factory system there had been a big change on the society. Especially around factories, there were housings built by factory owners to reside the workers.

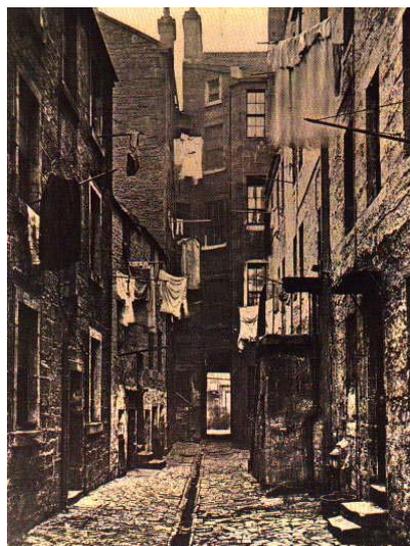


Fig.5. An Industrial Settlement

<http://www.schoolshistory.org.uk/year9/industrialrevolution/images/Street1a.jpg>

Settlement around factories spreaded to the all World through industrialization which became race of strategic cities. Accumulation after life chaos towards cities, squeezed people in those buildings by snatching them from large settlements they came. Extreme population in cities forced people to use the lands vertically. Intensive working conditions and metropole life had affected people's daily needs as well. We can see aforementioned houses and lives. These intense industrialization spreaded to the world through production of materials that allow vertical growth and spread.



Fig.6 Nashima Island, Japan

<http://abandonedplacesmap.com/hashima-island-coal-mining-facility-japan/>

Hashima Island undersea mines and vertical shafts deep up to 199 meters, industrial facilities, dormitories, and a huge concrete wall around the island. That gave the island the appearance of a battleship riding the waves (hence the nickname Gunkanjima – Battleship Island).

It is also first large concrete building to accommodate the workers. It was 9 stories high and one of the most advanced concrete buildings in the world at that time.

Just after Bolshevik revolution, in USSR commune homes (in progressive years called “commune houses”) are comprised. These houses had functions both for providing shelter to the population in crowded cities and for punishing the bourgeoisie who had a fancy life. Cruel colonization strategy in the country actually had an effect like transforming the country from an underdeveloped agriculture

country to an industrialized society; on the other hand employment blow out in city's industry, developed faster than building of needed houses. Most parts of the city's population had no chance rather than staying highly dense crowded commune apartments or sheds.



Fig 7. Narkomfin, Russia

<http://ermonom.blogspot.com.tr>

In the beginning neighbourhoods with multi-storey linear buildings with no elevator that looks similar to each other. Hence mid-60's this building model had left because of its high cost it was seen expensive. Instead of these building blocks with nine to twelve storeys.

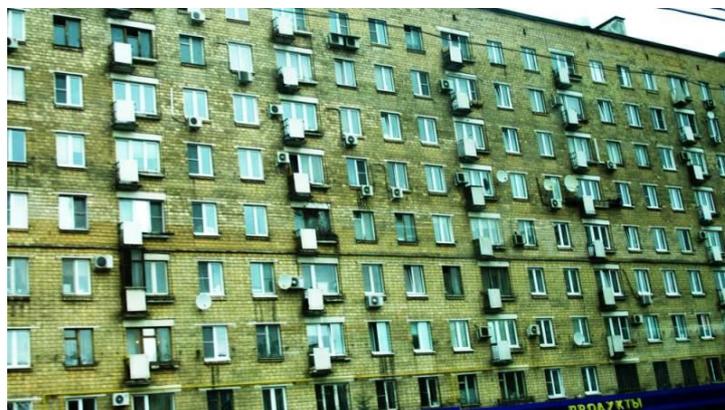


Fig 8. Moscow, Russia

http://www.gezialemi.com/IMAGES/SukranSahin_Moskova_2013_03.jpg

Construction plan that came into operation predicted an increase more than 11 million square metres. Thanks to industrialization in construction sector prefabricated pieces' percentage in sector had increased. Brick was seen as a material which was a symbol of deficiency, economically inefficient and prevented industrialization. For walls instead of brick more compressed stone was started to use; reinforced concrete with steel, took the place of rubble Stones used in building foundations.



Fig 9. Housings in Hong Kong.

<http://www.idealista.com/news/inmobiliario/vivienda/2010/11/02/268788-sera-dificil-que-los-pisos-centricos-bajen-porque>

According to Lucas, term of small came into our lives after 2. World war and subsequent 50 years with everything to get smaller. In 1960's this understanding showed up in mini skirts and mini cars, gradually gained significance in technology and architecture as well, so that small housings became important [5]. Today this kind of housings especially built in metropolises in vertical buildings with small scales. Because of limited spaces and these spaces getting more valuable, these spaces are used for many activities together such as sleeping, resting, eating and working.



Fig. 10 Housings in Hong Kong

<http://www.haberturk.com/galeri/yasam/424638-kapsul-evlerde-boyle-yasiyorlar>

Intensifying of urbanization in developing countries in last years affected city plans and architecture as well. Today population living in cities is dramatically increasing. This intense urbanization came with lots of economic, social and cultural problem. Excessive population density emerges when the number of living creatures in an area exceeds that area's ecological capacity [6]. When migrations from rural areas to big cities are out of control, it causes urban sprawl and increase in concrete mass.

2. Living Spaces of Houses

In one sense using interior spaces had emerged with human's sheltering and protection needs. In prehistoric times people fulfil their heating, sleeping, eating and storage needs in caves and rock holes with primal but practical arrangements. To understand the importance of living spaces in houses first of all it's needed to examine the developments of living spaces in history.

When human beings who were living in caves realized that sources were difficult to reach, they tried to find ways to get and produce them artificially. Change of climate, heating the earth up provided people to produce. Together with start of agriculture and animal breeding human beings had moved from caves top lain lands and changed their life styles. Besides difficulty of living together provided social life to organize. Building need is a natural result of sheltering together will of human whose number increased gradually. During this period buildings were out of materials which were easy to find in nature and easy to collect. After the change started with agricultural activities circular shelter plans got longer and shaped more rectangular in time. In living spaces we see sets for sitting, sleeping, and stoves on the walls or ground.

In ancient Greek, life was organized in housing units that arranged through compose of social environment came with social life. During this period more roomed buildings took the place of one or two roomed buildings.

In ancient Rome, house of rich and noble people's houses formed by different parts like living room, bedroom or eating room. After Roman Empire's collapse in A.D. V. Century, in feudalism period, nobles chose to live in castles surrounded by trenches. These castles formed by different units such as eating halls, living rooms, bedrooms as well.

In 19th century by using machines for production lots of fast changes had begun. New production areas generates new roads to distribute the products, and new housings for productors' sheltering and socializing needs. In this point of urbanization, there had been changes in existing house spaces. Two main reasons of seeing the effects of urbanization in housings first were transferring to nuclear family and production areas in houses had lost their old function. Streets in settlement plans and rooms in house scale started to standardization like industrial products. This situation made almost all regions to look similar to each other and architectural identity had been lost.

2.1. Living Spaces Changed by Houses

It is known that living spaces which is an important part of houses formed by culture and organized in house and in itself. Living spaces in houses are areas that people spend their time most, sometimes they rest, sometimes they cook and eat, they do cleaning, they use as storage and socialize. In the past these functions have been used more than today, nowadays this situation differ in some regions. In some communities living spaces are used both for storage, eating and resting, while it is used only for

resting in some others, and there are other spaces for other needs and functions. It changes due to the dimensions of the space.

Human beings had started to fulfil his sheltering need only with one space, gradually changing social and cultural factors, shaped with life conditions and needs, and generate new living spaces. These living spaces are quite crucial because they generally are the spaces that people spend time most. When the meaning of a living space change, dimensions of these spaces get bigger or smaller as well.

For the construction of first housing examples local materials were used. Change of these local materials from one region to another, and change of construction technique of each material, caused emerge of different housing types in different geographical regions. First housing types which had circular or square forms were quite simple and modest constructions although they were different on shape and they were formed with only one roomed plans. Each development in engineering and each architectural style had changed the face of houses in time as well.

The biggest change in living spaces definitely had lived between 18th and 19th centuries, because of the significant developments on agriculture, production, mining and transportation, during industrial revolution which socioeconomic and cultural conditions changed.



Fig. 11 Interior of Housings in Hong Kong

<http://www.milliyet.com.tr/fotogaleri/46569-yasam-kapsul-evlerde-yasam/6>



Fig. 11 Interior of Housings in Hong Kong

<http://ciricara.com/2013/02/26/foto-penampakan-apartemen-sempit-di-hong-kong/>

3. Conclusion

In time zone in prehistoric eras, from the first shelters built to solve one of human's main needs- sheltering- till today, house and term of house had developed and changed with human beings. Sheltering need of dense population that accelerated with industrial revolution, house and urban planning studies tried to fulfil easiest and most healthy way so that collective housing term had emerged; this term developed through XX. Century and reached its peak in XXI. Century.

Population increase that affected city's forming emerged during industrial revolution, continued in XX. Century as well. This increase in population causes problems such as unemployment, problems in infrastructure, environmental destruction, and sheltering problem as well. Separate housings with one or two storeys that we meet in old cities often, had changed into multi-storey collective housings which fulfilled more people's problem of sheltering.

As a result, this study examined outgoing story of housing types throughout the history and how human beings started with a single room, after bigger apartments, higher buildings and a single room again with a realistic approach.

Rising buildings with economic growth, increase in the value of city terrains, evaluating high buildings as a political enterprise goal, need of constructing monumental buildings that symbolize the power of big companies, imprison people rush in this life.

Human beings who disclaimed their living areas on rural and could not spare time and space to himself due to intensive working conditions, even though he is close to technology, actually have returned to his starting point.

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THE CONCEPT OF VIRTUAL REALITY AS INTERIOR INTERFACE

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The last century has been a period of time during which humanity witnessed technologically revolutionary developments. We can say that the aspect of these developments which penetrated into human life to the greatest extent is the innovations and inventions experienced in field of digital technology. Apparently, the effect of this occurred technological rise that increases human life comfort is not only visible in many fields, but also felt in the context of interior space. The increase in new materials and production diversity based of technological development, emergence of techniques and strategies which support the design process are also included in such changes. Some other approaches including digital based CAD/CAM programs, 2D, 3D modeling, animation, virtual image production and virtual reality practices may also be specified within the instruments belonging to this strategy. Particularly, the fact that virtual reality enables to experience physical world in realistic sense and makes progress in mobilization points out that this technology would be critically important in the forthcoming process. Intervention of virtuality into experiencing the real space in this way may be stated as a natural selection of architecture in a sense.

The purpose of this study to discuss the use of virtual reality as an interior interface and to scrutinize technically that how can virtual reality devices be used for this purpose. Elements that constitute the general structure of the study are the experience of interior organization in the virtual environment and the role of virtuality in the space-human interaction as an interface. In this context, the effect created by three-dimensional diving into the synthetic environment and virtual experience of different spatial probabilities created are mentioned. Also, the historical development of virtual reality technology and examples, the use of the interface concept and expressing at the interior point constitute another approach.

Keywords: Virtual Reality, Interior, Interface, Interaction, Technology

Mankind witnessed the use of different instruments for the transfer of thought, experience and ideals throughout its history. The recorded history begins with people that depict events on cave walls during hunting or various stories of a society [1]. Following the first paint pigment spread on cave walls, the long development journey of new communication and description technologies began. Various information and feeling transfer tools such as music, fine arts, books, newspapers, radio, television, computer and internet communication emerged over time and had a great

importance in human life. Virtual reality arises as a "special world" that the technological development promises to mankind such as other mentioned elements.

1. Definition of Virtual Reality

Virtual reality (VR) concept is a term that we often hear and familiar with nowadays by the development of computer technologies. Today, virtual reality technology is used in many fields such as vehicle and flight simulations, entertainment, product design, architectural design and interior arrangements, education, medicine with an increasing efficiency. Virtual reality is not limited by defining any technological approach or hardware fiction [5]. But it's seen that this concept is used to describe different environments and systems by different researchers. The VR terms is widely understood that it's a "non-immersive" computer simulation using 3D graphics and tools and providing interactive interaction [2]. Digital contents such as internet, graphics, multi media, etc. that are experienced only by basic components of a computer is meant here. Non-immersive VR is experienced by modern computer and game console systems in general. Users can be directed in the 3D graphical environment (without real word occlusion) by means of a flat screen monitor or television in this format and interact. Despite the fact that such systems are less immersive, they are basically characterized as a virtual environment. Virtual environments (VE) provide a system to the user, which can be accessed in a commercially widespread manner, allow interaction with dynamic, digital content by using traditional computer and game interface devices (keyboard, mouse, game pads, joystick, etc.) [5]. According to the definition of some researchers, the virtual reality technology is "immersive" systems including special I/O devices consisting of head mounted displays (HMD), gloves, haptic devices (haptic) or multiple displays and improves 3D experience of the user. As a result of these definitions, two approaches as "immersive" and "non-immersive" emerge for VR [2].

Paul Milgram et al. put forward the thought of "reality-virtuality continuum" as seen in Fig 1. (a) to describe the relation between physical reality and virtual reality [4]. Considering the diagram created in accordance with this thought, a user in the real environment perceives only the physical world. As long as moving across from real environment to the virtuality, enrichment of the physical world with virtual objects or other components, i.e. "Augmented Reality" emerges. A person in the virtual environment experiences a synthetic environment created by computer as completely isolated from the physical world. According to the definition of Ronald Azuma, virtual reality is the user entering a completely artificial environment. The user cannot see the real world that surrounds him [21]. What meant in this definition is immersive virtual reality systems.

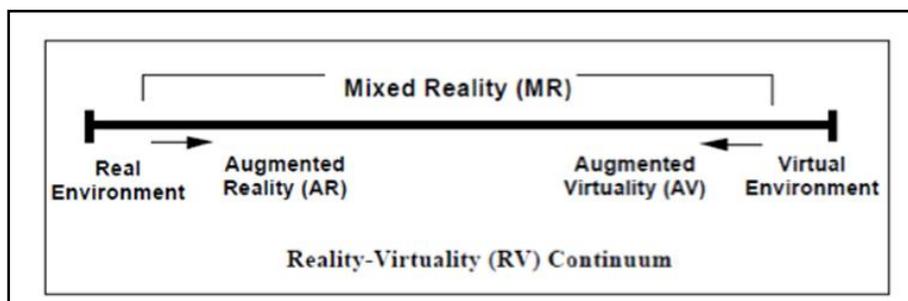


Fig 1 (a). Milgram et al. 'Reality-Virtuality (RV) Continuum, 1994.

Virtual reality environment having immersive feature is interactive computer simulations that create a mentally drift perception or perception of being in the simulation environment and allow user to interact or move [6]. Basically, a virtual reality environment is the environment, where the observer enters in an artificial and three-dimensional world by leaving the real environment, interacts such as being, walking there, change locations and features of objects and as a result of these interactions, gets sensory reactions as in the real world. Therefore, as in the cycle shown in Fig 2.(a), virtual reality should include four basic components: virtual environment, virtual representation, sensory feedback (as reaction against the user's movements) and interaction [1].

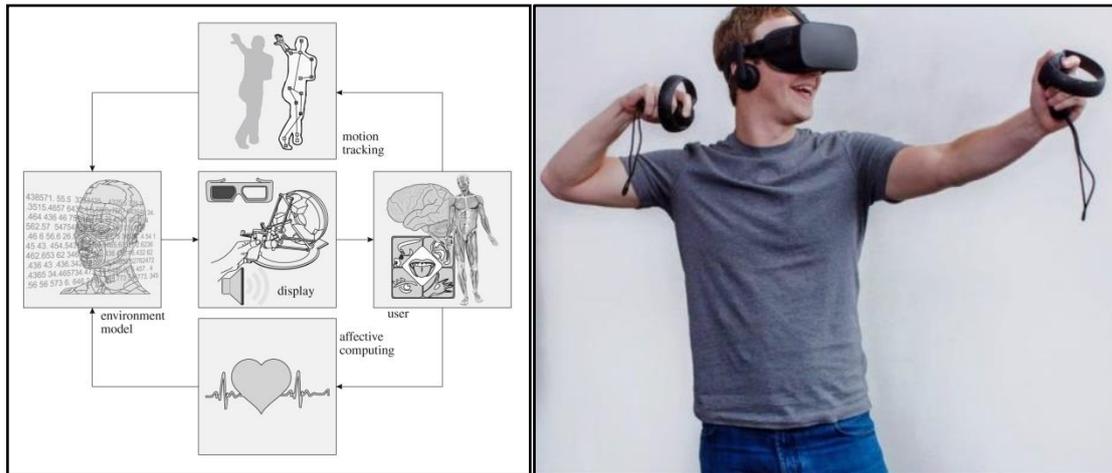


Fig 2 (a). Mihelj et al. 'Feedback Loop', 2014; (b), 'A immersiveVR system', 2016
<http://venturebeat.com/2015/11/04/zuckerberg-early-oculus-rift-sales-will-be-small-just-like-palm-smartphones/>

Sensory feedback cycle has a critical importance in virtual reality systems Fig 2.(b). The system must be able to respond to its user's movement and even optionally predict his physical and psychological status for better adaptation to the environment, he is in [6].

2. Virtual Reality and Space Relationship

Today, 3D visualization tools are used for precisely verifying of intuitive analysis and information in both direct and indirect research fields. Additionally, manufacturing process before manufacturing can be performed based on 3D visualization environment. When such a manufacturing process based on 3D visualization is compared with traditional systems, it's more efficient in terms of time and cost [9]. Virtual reality provides to users the opportunity to better formulate and realize their ideas [10]. Virtual reality provides to users the opportunity to review their conceptual designs before production without a physical prototype, to check their functionality, aesthetic structure and to perform revisions. Virtual prototyping uses a virtual model based on VR techniques instead of physical model for design review and presentation [12]. Creating a physical prototype is a process that normally cause great time and cost losses. For example, automobile industry overcame limitations caused by physical prototyping by using VR techniques [2]. Fig 3. (a-b) shows the use of virtual reality in visualization of a car's interior within this framework.



Fig 3 (a-b). Yoon et al. 'Virtual Prototyping of Automotive Interior University of Michigan Virtual Reality Lab', 2000.

This approach can be exemplified for many sectors. Architectural design medium is the most important field of these fields that use VR technique for visualization. Following the use of virtual modelling in spatial design and strategies, significant changes have been experienced in this field. Computer aided design (computer aided design and computer aided manufacturing), i.e. CAD/CAM, software are located in the center of this development. 3D CAD software are the technologies, which are used for years in spatial design. By means of these software, spatial designer has the opportunity to be able to visualize any space both as 2D and 3D even at the design stage. So, a simulative example of the space is revealed. Spatial elements such as overall design of the space, furniture used for furnishing, materials, colors and lighting, etc. can be revealed through the virtual reality technology. Thus, revisions to be occurred on the design or experiences related to the design can be realized without any limitations. On the other hand, visualization of a space through the VR support is a very useful approach in terms of presentation. Technological point in our episode, which is reached by computers, allows that photorealistic presentations or motion animations can be produced more quality. Fig 4. (a-b) shows spaces produced by using VR technology. Quality of the resulting digital visualization is increased and timing of computers to perform these processes is decreased day by day. Thus, more sophisticated spatial visualizations are possible to be produced both as higher quality and in less time.

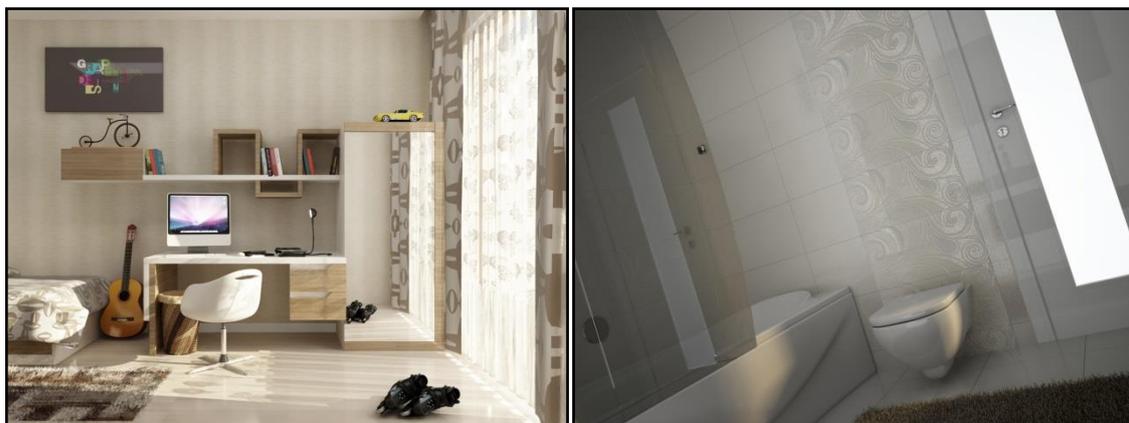


Fig 4 (a-b). Tolga Kılıç 'Use of VR Technology as Rendering Production.' 2011.

If a virtual reality world is desired to be created, it should be decided that how will thought, idea and information be represented in visual, sensory and tactual forms. This decision significantly affects the efficiency of the virtual reality. Ideas, concepts or physical characteristics can be represented by using different ways. However, some of these approaches can be more appropriate than others [6]. When the approach in question is the experience of a spatial representation by virtual reality, this importance is further increased. Because it should appeal to all our senses to fully perceive this reality. A virtual space, which is interacted only by computer screen and visually experienced, can be experienced as limited by the user. The difference here is related to the level of perception of the person experiencing virtual reality. Outputs and inputs of the previously mentioned elements such as virtual environment, virtual representation, sensory feedback and interaction should be transmitted to the user through a number of devices for increasing the level of perception. The said hardware are computer, virtual reality goggles, stereo sound equipment, gloves, tactual devices or components such as Kinect camera. Some of these components are shown in Fig 5. (a).

One of the most critical components of immersive VR systems is the above mentioned virtual reality goggles (SGG). The user wears this glasses-like device on his head. The most important feature of these systems is head tracking [15]. Accordingly, actual head location and position of the user is adapted to the virtual environment. One of the features that will make a difference for virtual environments is the stereo image [13-14]. The stereo image is to create 3D visual perception by giving the image created from different angles separately to both eyes. Thus, distances of objects in the environment can be better perceived. In this context, immersive VR systems can be defined as systems having convenient features to virtually experience a space. VR systems are today cheaper than a few years ago, so it's seen that they will become more flexible in mobilization and for end users.



Fig 5 (a). 'Compounds of Oculus Rift VR System', 2016; (b), 'A immersive VR system', 2016.
www.quadbrain.com/

3. Virtuality as an Interior Interface

Interface is described according to the definition of TDK as "the interface, where a variety of images, graphics, texts allowing computer software to be run by the user are included" [18]. "Interface" within the information technology is the interface, where the user interacted with. In another approach that interfaces are described as "entire technology and logical framework allowing information flow between human and machines", it's seen that function of the interface is more clearly highlighted [19]. The interface concept mentioned within the scope of this study is described in terms of space and human interaction.

Standardization in the majority of industrial products and some artistic design products is the reflection of today's consumption principles. Standardization understanding coming with industrial production has a great impact in architecture and interior decoration design. The resulting standardization caused different quests in spatial design and use and paved the way for customization of living spaces by concepts such as "smart home" developing in parallel to the technology. But this customization is long-term and not flexible as adapted to sudden changes [16]. At this juncture, it's required to emphasize that the mentioned smart home trend doesn't mean a spatial interface in terms of human and space interaction. Thus, interface starts the communication process by ensuring that human-space interaction is created [17].

Spatial designs created by digital technology is open for all kinds interventions in the virtual world. Intervention here means that testing different possibilities for a space and 3D visualization of these changes are possible. The important factor here is multiple design approaches can be used for a space. Customization approach is important in terms of this matter. Considering the difficulty of physical prototyping in terms of time and cost, the realistic representation of the space in the VR system has a great importance. Although the virtual reality concept is an understanding that imitates the reality, it has a very great representation potential taking into account its position today and its promised perceptual reality.

Perceptibility points out conditions related to perception in the spatial experience and the perceptual process. Body and perception of the body are some of the focal points in the spatial experience. Togetherness of objects and objects in our environment cannot be perceived without physical experience, experience is a physical perception [20]. As well as physical perception and reality sense, a virtual reality system, where physical and mental feedback are obtained at high accuracy and transmitted to the user, will be used as an interface for environment or any interior. So, different variations of a space will be able to be obtained and experienced in a realistic manner and multiple possibilities will be able to be created through the immersive virtual reality system. Experiencing different variations of a space by immersive VR system is represented in Fig 6. (a-b).



Fig 6 (a-b). Tolga Kılıç 'Bir mekânın farklı olasılıklarının VR arayüzü deneyimlenmesi' 2011.

Pilots in flight simulators are trained with VR systems. Pilot exhibits certain behavioral patterns when performing operations related to the flight. All of these behaviors are recorded by technical components of the VR system, i.e. "feedback loop" system and analysis about pilot and flight can be possible to be made. So, an approach that a support both system's and pilot's development can be obtained. From the same logic forth, creating different designs and layouts for a space will be useful for the VR system to review exhibited behaviors after users spent time in this simulation. Thus, the virtual reality interface will contribute certain parametric variables to be measured virtually and the real design to be shaped for the targeted spaces.

4. Conclusions

The digital design medium reached a seminal point today in terms of the technology's development level that promises different experiential approaches. The VR technology, that we have information about from science fiction movies and some columns years ago, gives the signs that it is about to become an essential part of our lives beyond being magazine. Today, VR applications and 3D glasses equipment developed for smart devices owned almost by everyone today began to become widespread at the same rate. These systems are mobile systems independent from computers, but they give good results by properly developed applications.

As well as end users, digital design and visualization techniques based on computer technologies having a key importance for professional designers go beyond their limits. These systems operated as connected to a computer system provide quality feedback to the user as proportional to their tactual and sensory components. As well as these developments in hardware, users having programming knowledge have also the opportunity to develop VR applications by open source software development kits (SDK). Thanks to these flexibilities of the virtual reality systems in recent years, the virtual world went beyond a visual interaction and invites users to the "new reality".

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Lighting Design Education and Its Association with Academic Achievement in Interior Design Courses: A Case Study

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Abstract

In spite of the potency of light, lighting design is treated as a subsidiary subject in many Turkish architecture and interior design schools. In order to understand whether or not this approach to lighting design education is appropriate and beneficial, a study was carried out at the Interior Architecture and Environmental Design Department of Bahçeşehir University in the Fall 2015-16 Semester. In this study, interior design students taking second-, third- and fourth-year design courses and their instructors were asked to complete two questionnaires about their attitudes towards the use light in the studio courses and the outcomes of two departmental courses in lighting design. Moreover, the grades of all interior design students who had taken these two courses were also obtained for an in-depth analysis. It is evident from the results of our analyses that most of the students do not use light effectively as a design element and have a tendency to think about it in the early stages of design. In addition, the results indicate that there is not a statistically strong relationship between the grades in lighting design courses and those in the studio courses. On the basis of these results, it is believed that a different approach to lighting design education should be adopted.

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Keywords: Design education; light; lighting design; lighting design education

1. Introduction

It has been consistently and repeatedly demonstrated that light is a critical environmental factor influencing our vision, visual comfort, space perception and overall health [1]. Given these impacts and the fact that we spend the majority of our time inside buildings [2], it seems reasonable to suggest that our general well-being is highly contingent upon the successful incorporation of natural light and artificial lighting systems into the built environment. If we accept that good lighting is a necessity rather than a luxury for us, then the question arises as to how it can be achieved. It is obvious that providing sufficient knowledge about light and its usage in architecture and interior design education is key to attaining this goal.

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In spite of its above-mentioned importance, lighting design is often treated as a subsidiary subject in Turkish design schools. While it is evident from the most recent technical report of the *Commission Internationale de L'éclairage* (CIE) on lighting design education that a teaching period of 21-60 hours only enables the fundamentals of light and lighting to be understood [3], it has been reported that both must and elective courses on the subject constitute only a small fraction of the undergraduate educational programs of many architecture and interior design departments in Turkey [4, 5].

If the fact that the use of light as a design element is not given the status accorded to many other subjects in undergraduate architecture and interior design education is taken into consideration, the question arises as to whether it is inappropriate or not for educators to expect students to highly benefit from the brief introductory courses taken in lighting design and use light effectively in their designs. In an attempt to give an answer to this question, a study was carried out at the Interior Architecture and Environmental Design Department of Bahçeşehir University in the Fall 2015-16 Semester.

2. Method

2.1. Protocol

In the Fall 2015-16 Semester, all interior design students taking second-, third- and fourth-year design courses at Bahçeşehir University (n=229) and their instructors (n=13) were asked to complete two questionnaires devised by the authors in order to understand attitudes towards the use light in the studio courses and evaluate the perceived outcomes of two departmental courses in lighting design (see Table 1 for course details). The questionnaires used for students and instructors are brief, and they are composed of seven and nine items, respectively (see Table 2 and 3 for the items). All items in the questionnaires are rated on scale of one, indicating complete disapproval, to five, indicating complete approval. For an in-depth and objective assessment of the outcomes of INT 2082 and INT 3901, the grades of all interior design students who took these two courses in the Fall 2015-16 Semester or preceding semesters were also obtained from the registrar's office.

Table 1. Course details

Name and objective	Detail
INT 2082 Environmental Control Systems Studio: The objective of this course is to familiarize interior design students with the main environmental factors influencing the design of indoor spaces.	Must course
	2 (theoretical)+2 (practical) h
	4 ECTS
INT 3901 Lighting and Color Applications: This course has been designed to provide the knowledge of how to use light as a significant and effective design tool in architecture.	Departmental elective
	2 (theoretical) h
	4 ECTS

2.2. Data analysis

For analyzing the data gathered by means of the questionnaires, the frequency and percentage of each response were computed. For the analysis of the grades, statistical dependence was determined by calculating Spearman's rank correlation coefficient. All analyses were performed with SPSS Statistical Software Package for Windows (version 20.0; SPSS Inc., Chicago, IL, USA). The level of significance was set at $p < 0.05$.

3. Results

3.1. Questionnaires

The responses given by the students are presented in Table 2. It is clear from the table that over 79 per cent of the students consider light as an important environmental factor affecting vision, general well-being and spatial quality. It is also evident that more than 56 per cent of the respondents are satisfied with the outcomes of INT 2082 and INT 3901 covering the fundamentals of light and lighting. Despite this generally positive view, 59.49 per cent of the students think that they cannot effectively use the theoretical knowledge gained through the aforementioned undergraduate courses. It can also be inferred from the table that the majority, or, more precisely, 54.69 per cent, of the respondents do not consider light and lighting in the early stages of design in spite of being encouraged and expected to do so.

Table 2. Student responses

Item	Response	2 nd -year		3 rd -year		4 th -year		Total	
		n	%	n	%	n	%	n	%
SQ 1: "Light has significant effects on vision and visual performance."	I absolutely disagree	2	3.03	1	1.82	3	5.00	6	3.31
	I disagree	3	4.55	2	3.64	6	10.00	11	6.08
	I neither agree nor disagree	6	9.09	1	1.82	4	6.67	11	6.08
	I agree	27	40.91	20	36.36	20	33.33	67	37.02
	I absolutely agree	28	42.42	31	56.36	27	45.00	86	47.51
SQ 2: "Light is an important environmental factor that affects spatial quality."	I absolutely disagree	0	0.00	0	0.00	2	3.33	2	1.10
	I disagree	3	4.55	2	3.64	5	8.33	10	5.52
	I neither agree nor disagree	5	7.58	1	1.82	7	11.67	13	7.18
	I agree	26	39.39	18	32.73	22	36.67	66	36.46
	I absolutely agree	32	48.48	34	61.82	24	40.00	90	49.72
SQ 3: "Light has significant effects on human physiology and psychology."	I absolutely disagree	0	0.00	0	0.00	2	3.33	2	1.10
	I disagree	3	4.55	3	5.45	10	16.67	16	8.84
	I neither agree nor disagree	9	13.64	3	5.45	8	13.33	20	11.05
	I agree	31	46.97	26	47.27	22	36.67	79	43.65
	I absolutely agree	23	34.85	23	41.82	18	30.00	64	35.36
SQ 4: "INT 2082 provides fundamental knowledge about light and lighting."	I absolutely disagree	1	8.33	1	2.13	2	3.57	4	3.48
	I disagree	0	0.00	2	4.26	4	7.14	6	5.22
	I neither agree nor disagree	4	33.33	16	34.04	13	23.21	33	28.70
	I agree	3	25.00	21	44.68	29	51.79	53	46.09
	I absolutely agree	4	33.33	7	14.89	8	14.29	19	16.52
SQ 5: "INT 3901 improves my knowledge about light and lighting."	I absolutely disagree	0	0.00	1	7.69	0	0.00	1	2.17
	I disagree	1	10.00	0	0.00	4	17.39	5	10.87
	I neither agree nor disagree	4	40.00	5	38.46	5	21.74	14	30.43
	I agree	3	30.00	3	23.08	11	47.83	17	36.96
	I absolutely agree	2	20.00	4	30.77	3	13.04	9	19.57
SQ 6: "In my design studio project(s), I can effectively use the knowledge that I have gained through INT 2082 and / or INT 3901."	I absolutely disagree	0	0.00	1	2.13	1	1.75	2	1.72
	I disagree	0	0.00	10	21.28	9	15.79	19	16.38
	I neither agree nor disagree	3	25.00	25	53.19	20	35.09	48	41.38
	I agree	8	66.67	11	23.40	21	36.84	40	34.48
	I absolutely agree	1	8.33	0	0.00	6	10.53	7	6.03
SQ 7: "I am encouraged to take my design decisions about light and lighting from the very beginning of my study period."	I absolutely disagree	2	3.03	1	1.89	1	1.67	4	2.23
	I disagree	4	6.06	14	26.42	12	20.00	30	16.76
	I neither agree nor disagree	18	27.27	13	24.53	16	26.67	47	26.26
	I agree	31	46.97	24	45.28	24	40.00	79	44.13
	I absolutely agree	11	16.67	1	1.89	7	11.67	19	10.61
SQ 8: "I believe that it is more appropriate to take my design decisions about light and lighting towards the end of my	I absolutely disagree	2	3.03	0	0.00	1	1.67	3	1.66
	I disagree	8	12.12	5	9.09	11	18.33	24	13.26
	I neither agree nor disagree	16	24.24	20	36.36	19	31.67	55	30.39
	I agree	29	43.94	28	50.91	25	41.67	82	45.30

study period.”	I absolutely agree	11	16.67	2	3.64	4	6.67	17	9.39
SQ 9: “My design decisions about light and lighting are considered during design studio project evaluations.”	I absolutely disagree	1	1.52	0	0.00	1	1.67	2	1.11
	I disagree	2	3.03	7	12.96	8	13.33	17	9.44
	I neither agree nor disagree	18	27.27	16	29.63	17	28.33	51	28.33
	I agree	32	48.48	28	51.85	31	51.67	91	50.56
	I absolutely agree	13	19.70	3	5.56	3	5.00	19	10.56

The responses given by the instructors are presented in Table 3. From this table, it is apparent that all of the course instructors believe light to have impacts on vision, general well-being and spatial quality. It is also clear that most, or, more precisely, 84.62 per cent, of the respondents perceive their students to have difficulty in using their knowledge of light and lighting. Moreover, all instructors report that their students take design decisions about light and lighting in the late stages of design despite their efforts to avoid it.

Table 3. Instructor responses

Item	Response	n	%
IQ 1: “Light has significant effects on vision and visual performance.”	I absolutely disagree	0	0.00
	I disagree	0	0.00
	I neither agree nor disagree	0	0.00
	I agree	0	0.00
	I absolutely agree	13	100.00
IQ 2: “Light is an important environmental factor that affects spatial quality.”	I absolutely disagree	0	0.00
	I disagree	0	0.00
	I neither agree nor disagree	0	0.00
	I agree	1	7.69
	I absolutely agree	12	92.31
IQ 3: “Light has significant effects on human physiology and psychology.”	I absolutely disagree	0	0.00
	I disagree	0	0.00
	I neither agree nor disagree	0	0.00
	I agree	2	15.38
	I absolutely agree	11	84.62
IQ 4: “In design studio projects, students can effectively use their knowledge of light and lighting.”	I absolutely disagree	1	7.69
	I disagree	8	61.54
	I neither agree nor disagree	2	15.38
	I agree	2	15.38
	I absolutely agree	0	0.00
IQ 5: “I encourage my students to take their design decisions about light and lighting from the very beginning of the study period.”	I absolutely disagree	0	0.00
	I disagree	0	0.00
	I neither agree nor disagree	1	7.69
	I agree	9	69.23
	I absolutely agree	3	23.08
IQ 6: “Students generally take their design decisions about light and lighting towards the end of the study period.”	I absolutely disagree	0	0.00
	I disagree	0	0.00
	I neither agree nor disagree	0	0.00
	I agree	12	92.31
	I absolutely agree	1	7.69
IQ 7: “I consider students’ decisions about light and lighting during my design studio project evaluations.”	I absolutely disagree	0	0.00
	I disagree	0	0.00
	I neither agree nor disagree	3	23.08
	I agree	9	69.23
	I absolutely agree	1	7.69

3.2. Grades

Various descriptive statistics regarding the grades of the students who took INT 2082 in the Fall 2015-16 Semester or preceding semesters are presented in Table 4. The results of our analysis indicate that there are statistically significant positive correlations between the grades in INT 2082 and those in two of the interior design courses. It is apparent from Table 5 that the grades in INT 2082 correlate only with those in INT 2002 (Spearman's $\rho=0.304$; $p<0.01$) and INT 3001 (Spearman's $\rho=0.192$; $p<0.05$). A further analysis of the statistical dependence between the grades in INT 3901 and those in the interior design courses provides some support for these findings (see Table 6 for the descriptive statistics concerning the grades of the students who took INT 3901 in the Fall 2015-16 Semester or before). It is evident from Table 7 that the grades in INT 3901 correlate only with those in INT 3002 (Spearman's $\rho=0.679$; $p<0.044$). No other correlations reached statistical significance.

Table 4. Descriptive statistics regarding the grades of the students who took INT 2082 in the Fall 2015-16 Semester or before

Course	n	Mean	S.D.	Minimum	Maximum	Median
INT 2082	131	2.37	0.99	0.00	4.00	2.33
INT 2001	12	1.81	0.74	1.00	3.33	1.67
INT 2002	82	2.20	0.85	0.00	4.00	2.00
INT 3001	109	2.13	0.71	0.00	3.67	2.00
INT 3002	76	2.12	0.63	1.00	3.67	2.17
INT 4001	63	1.95	0.76	0.00	3.67	2.00
INT 4002	24	2.03	1.14	0.00	4.00	2.33

Table 5. Correlations between the grades in INT 2082 and those in interior design courses

Spearman's rho		INT 2082
INT 2001	Correlation coefficient	0.423
	Sig. (2-tailed)	0.171
	n	12
INT 2002	Correlation coefficient	0.304
	Sig. (2-tailed)	0.005
	n	82
INT 3001	Correlation coefficient	0.192
	Sig. (2-tailed)	0.045
	n	109
INT 3002	Correlation coefficient	0.104
	Sig. (2-tailed)	0.369
	n	76
INT 4001	Correlation coefficient	-0.041
	Sig. (2-tailed)	0.751
	n	63
INT 4002	Correlation coefficient	0.069
	Sig. (2-tailed)	0.747
	n	24

Table 6. Descriptive statistics regarding the grades of the students who took INT 3901 in the Fall 2015-16 Semester or before

Course	n	Mean	S.D.	Minimum	Maximum	Median
INT 3901	28	1.14	1.20	0.00	3.00	1.17
INT 2001	15	2.40	0.61	1.33	3.33	2.33
INT 2002	21	2.22	0.79	0.00	3.33	2.33
INT 3001	18	2.33	0.68	1.33	3.33	2.33
INT 3002	9	2.33	0.62	1.33	3.33	2.33
INT 4001	5	2.73	0.43	2.00	3.00	3.00
INT 4002	5	3.07	0.55	2.67	4.00	3.00

Table 7. Correlations between the grades in INT 3901 and those in interior design courses

Spearman's rho		INT 3901
INT 2001	Correlation coefficient	0.475
	Sig. (2-tailed)	0.074
	n	15
INT 2002	Correlation coefficient	0.345
	Sig. (2-tailed)	0.125
	n	21
INT 3001	Correlation coefficient	0.425
	Sig. (2-tailed)	0.079
	n	18
INT 3002	Correlation coefficient	0.679
	Sig. (2-tailed)	0.044
	n	9
INT 4001	Correlation coefficient	0.344
	Sig. (2-tailed)	0.571
	n	5
INT 4002	Correlation coefficient	0.460
	Sig. (2-tailed)	0.436
	n	5

4. Discussion

Despite the fact that light not only enables us to see but also has been demonstrated to be instrumental in enhancing our general well-being, many Turkish architecture and interior design schools, regrettably, do not attach great importance to it. It must, therefore, be asked whether or not the current approach to lighting design education is erroneous and needs to be reconsidered. Our findings indicate that it seems necessary to adopt a different approach. It is evident from the findings that, in spite of our best efforts, most of the students do not and to use light effectively as a design element and have a tendency to think about it in the early stages of design. It is also evident that there is not a statistically strong relationship between the grades obtained by the students – in other words, having a theoretical knowledge of light and lighting is not strongly related to being successful in designing courses.

If the assumption that expecting students to highly benefit from the brief introductory courses taken in lighting design and use light effectively in their designs is incorrect, then it is important to think about how lighting education can be improved. Given the elusive character of light, one possible way of improving it is to give students the opportunity of gaining hands-on experience. In order to demonstrate the possibilities of using different luminaires and light sources, it would be useful to construct mock-up rooms and establish laboratories [3]. In addition, organizing field trips to see real-life design solutions and visit lamp and luminaire factories would also give students insight into practical issues [6].

It is important to emphasize a major limitation of the current study that needs to be taken into consideration. Our study sample is limited to a single interior design department. Because of this reason, it is hard to draw firm conclusions from the above-mentioned findings for other departments. Therefore, it is clear that more research is required to understand the true nature of the problem.

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TECHNOLOGY SUPPORTED FLEXIBLE DESIGNS FOR FURNITURE STRUCTURES

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Humanbeings have been interested in structural systems since their existence, they established load-bearing systems which resisted to gravity by building shelters to continue their lives safely. They kept on designing furnitures in spaces they lived in, that eased actions, presented a beauty with their texture, color and shape. In this sense just like spaces, furnitures were formed as open to natural conditions and constant loads. Most of furnitures are required supporting system similar to the ones some creatures need to stand their shapes. System works as carrying loads affecting the furniture and distributing forces to all elements. Each creature in nature has a structure which develops according to material and environmental circumstances. Structure, that helps furniture to be formed, is the system consisting of specially gathered components; it becomes a whole with shape and material. Developing technologies, changing user needs and profiles, renewing environmental conditions necessitate furniture structures to be updated by time. Furniture is handling over again with different perspectives; pursuit of flexibility which is the ability of adapting the changes in design, affects structural formations.

In this study, structure in furniture and flexibility concepts are described, flexible uses of furniture designs improved by technology are emphasized, subject is explained through supportive current visual examples.

Key Words: Furniture, structure, flexibility, technology, design

Humanbeings have been interested in structural systems since their existence, they established load-bearing systems which resisted to gravity by building shelters to continue their lives safely. They have continued to design furnitures which eased their actions, and presented a beauty by textures, colors and shapes in spaces they lived in. In time, furniture has been in a parallel change with living conditions, understanding of civilization and aesthetic views and formed in different shapes.

1. Furniture Structure, Technology and Flexibility

Furniture is described as elements and/or systems which deal with main physical necessities of people such as sitting, laying, working, storage though their social and cultural dimensions

and which aim to fulfill safely and comfortably [1]. Furnitures are shaped through natural conditions and constant loads like spaces. Most of them needs a similar load-bearing system that some living creatures do to stand their figure up. In this sense, all creatures in nature have a developing structure depending on material and environmental conditions. Structure, which free-stands designs, helps to form furniture's shape, is a system that parts that are gathered with a special order; comprises a whole with shape and

Structure has different describes as, "a phenomenon that developes in a system to generate form and act as a whole" [2] as "knitted texture of space component" [3]. Entities and binding elements are the most basic components of the system. Materials and entities that shaped with them, formal features generate the structure of construction [4].

In furniture designs and structure search, use of technologies especially developed after II. World War in industry and use of new production techniques and new materials on production of daily objects accepted as a significant step. Improvements in production methods and industry brought the use of different techniques together. Plastic, paper and textile materials that were an alternative to oftenly used wood and metal helped to reach effective results. Seting form and function relation up accurately in furniture designs, allows the product become enough flexible for responding more than one needs. According to this; key word flexibility in changable, adaptable, formative designs; while furniture's ability to adapt the changes from different reasons during its lifetime, its supporter is accepted as technology. "Technology; if it is used in correct place and time, is a tool when it is accurately unified with design; it also emerges as a source of new opportunities [5]. Search for flexibility under the wings of technology affects structure formations towards re-handle with different perspectives.

From this point of view; furniture flashes on technological developments on its era due to their functions taken over. They emerges as products which aesthetic and technique came together depending on representing structure of furniture clearly or burying it.

2. **Effective Factors in Stucture Formation**

Most of the furnitures needs a load bearing system similar to some living creatures need to stand their figures up. System works through carrying the loads that's effects the furniture and spreading the forces to all the elements.

All living creatures in nature have a structure that develops due to environmental conditions. The important thing is to form the relation between human and product in the most basic sense but using the most accurate technology. In this sense; "All the textures in nature are generated to fulfill a function. Each texture is a marker of an aim. Humanbeing inspected how the nature works in each product s/he created for needs, utilized nature's limitless source of admiration as much as possible [4]. They saw the possiblity of inspecting natural systems through terms such as 'comb, sandwich, scissor' as a whole.

"Assigning furniture's material is related to environmental conditions –availability of the material- economy and product technology as well as design problems like furniture's function, shape, place of use. Human used the niche on the wall of the cave he lived as storage; he formed sets to lay down and to sit. He utilized the trees on forest regions, made stuff by whittling the wood. In time human beings, as long as he discovered various materials

and manipulation methods, he could produce more and comfortable properties to fulfill their needs. From ancient times, technology has been in a continuous development to cover the necessities; it also made design's improvement and diversity as well" [6].

2.1. Material and Production Technology

"Beylerian ve Dent [7] According to Material Connexion source, with respect to the results of interviews done with famous designers, designers see materials as a tool to express their ideas. They are affected by the infinite source materials present them. They choose to use multi-functional materials. They prefer lightweight ones but strong, durable and cheap. They emphasize materials always appropriate to function and aim" [4]. In addition to these, Kara Johnson expresses that "materials are so closely related to color, texture and structure". [8]

Material that are used to define product's existence, puts it into practice; by covering furniture's surface or forming the structures itself, is the physical and visual relation point, therefore first it is seen.

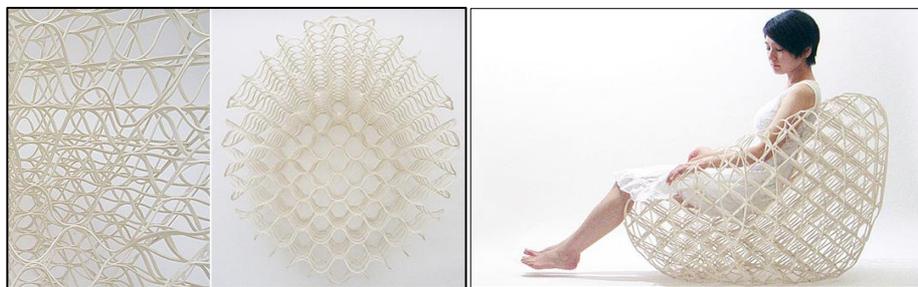


Fig 1 (a-b). Ryuji Nakamura, 'Hechima 4', 2008
www.detnk.com/node/3256

Ryuji Nakamura has used rigid paper material in her design 'hechima 4' (see Fig 1.). In structure that Paper's being cut as grids and molding as layers and become unified texture factor is highlighted.

In historical development, in materials and methods used in furniture design, technological improvements of the periods, experiences of designers and peculiar pursuits are kept on the foreground. For example; metal material that had used as integration element, ornamental stuff or carrying, today can be used as formation of the furniture itself. Bronze, gold, silver and iron are the metals that has used in furnitures of the past, whereas steel and aluminum is used in furnitures of today. Metal's being flexible but tough has bring new opportunities to furniture design. Thanks to positive and fast developments in production technology, metals are accepted as easily shaped materials. Design opportunities are widen, and structures have the samples that stretch the boundries. Besides, spreading of mass production in 1950's, plastic material was depreciated aesthetically; although it was introduced as cheap and disposable product, in 1960's it was accepted as a landmark material especially in structure formations through improvement of injection molding and shaping in the hands of accurate designers such as Vico Magistretti, Joe Colombo etc. Although its section is slender but it is strong, it may return to its first phase under high heat, limitless color alternatives etc. it has characteristics commonly used.

“Frank Gehry’s ‘3pc’ collection (see Fig 2.) which launches by Heller Company in 2004, produced by rotational molding method and by using polymer material. Rotational molding technique provides plastic materials to produce empty, as single piece and solid” [9].



Fig 2. (a-b) Frank Gehry, 3pc, 2004
www.hivemodern.com/pages/products.php?sid=773

“Payne [10] clarifies that new materials are used to produce shapes and constructions which was not possible before, especially foam rubber and moulded plywood are used to achieve shiny, strong, not-integrated stripes, and soft but tough siluets.” [11] Besides texture, physical and visual features, product’s structure and material used both have great contribution to product’s interoperability. Texture is physical expression of product’s function at the same time.” [4]



Fig 3. (a-b) Matthias Pliessnig, Sculptural Seats, 2012
<http://inhabitat.com/matthias-pliessnig-steam-bends-strips-of-wood-into-stunning-sculptural-seats/>

Matthias Pliessnig’s quite good looking organic benches (see Fig 3.) strike a perfect balance between the the subjects such as sculpture, furniture design, and wood & art. The designer creates these astonishing sculptural seats by shaping ash and white oak strips with a low-energy, ancient technique called steam bending. Originally used for building bows and boats, steam bending works by shaping wood with heated vapor that allowing designers to create curvaceous structures like these dynamic furniture pieces which is very lightweight at the same time. To make his furnishings, Pliessnig first sketches his designs with a computer, allowing the ideas to grow into fantastic organic shapes. He then steam bends long strips of wood, changing the flat, rigid material into these fluid and functional shapes. A perfect marriage of craft and technology.

“Texture is a fact that located on the object as an envelope, and chracterize it. All natural and artificial objects has a celular form that repeated regularly. On the outer surface of objects, one form is repeated through a mathematical order or freely” [4].

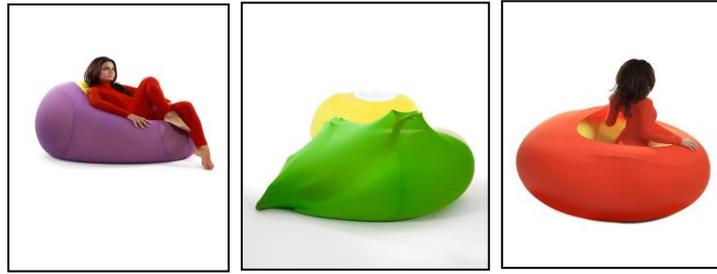


Fig 4. (a-b) Expandpouf, 2011
www.expandpouf.com/en/

Besides this, “shape shifting smart material” that we oftenly meet in new designs; depending on conductivity, dielectric, piezoelectric, magnetoreologic, electroreologic and light, temprature, pressure, magnetic area or a chemical effect may change shape or dimension. Some materials can change their shape but save their dimensions; and some can do both parametres at the same time. ‘Expandpouf’ which has elasticity and durability features and produced out of senthetic microfiber material (see Fig 4.) is an active memoried seating unit that takes the sitter’s shape and returns to its original shape when the sitter stands up.” [9]

2.2. Computer Technology

Computer usage affects furniture types structurally by making design and production of complicated geometries easy. Forms that could not be produced because of not having an appropriate technique before, could be produced easily and in short time. In digital environment all forms and shapes can be built.

II World War’s recovery time which helps to accelerate technological studies, afterwards ambitious information-communication era and especially 90’s were the times that directed the design World. Types of approach to design, that period’s user needs, aesthetic view and production technology and all kinds of supportive computer technology that used to reach to the final product have a role on this system effectively.

As a result of developing Technologies new synthetic materials are produces on laboratory environment. These new products help a lot of design problems. Digital production machines, computer Technologies, three dimensional CAD modelling programs, new synthetic and smart materials helped designers and producers to realize their designs. ” [12]

This sofa is called “Sofa So Good” (see Fig 5.) which has been admired from the nature, spider nets and silkworm cocoon. Sofa is made out of copper and chrome covered metal pieces that maket he furniture quite lightweight and durable. This sofa was created through 3D printer that is a new method used in furniture industry. The sofa is only 2,5 kg weight and can resist up to 100 kg’s.

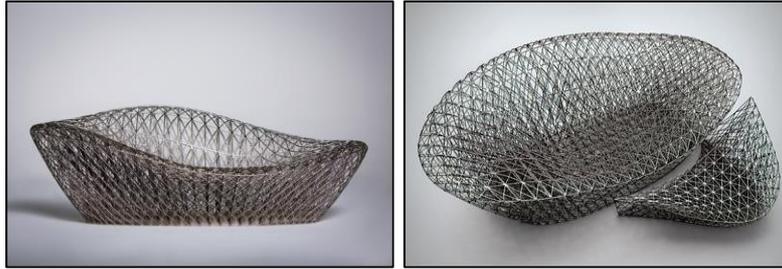


Fig 5. (a-b) Janne Kytanen, Sofa So Good, 2015
<http://www.jannekyttanen.com/#modal17725238825>

Discovering a new material means a very intense and accurate study in formation of structure which free-stands the design and accomplish it. In this respect, improvements in computer technology, variety in drawing programs, manipulation of the material like cutting, mowing, shaping opportunities provides to reach more qualified results. Today computers are not only ordinary piece to use technical drawings, but also something conducive that directs design, give opportunity to solve many mathematical problems in shorter time so become a timesaver for users, provides each surface on the screen coming true in real life. Integration with internet is also accelerating communication and supports sharing information.

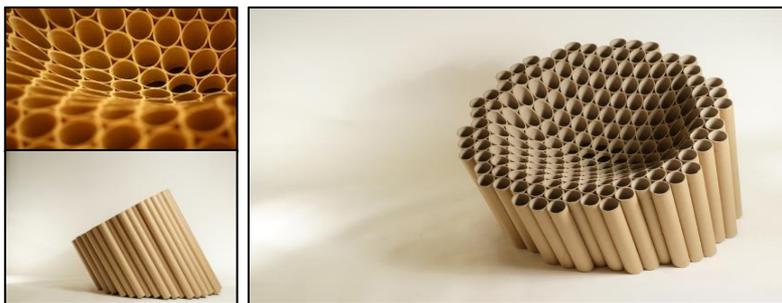


Fig 6. (a-b-c-) Ron Arad, Slice Chair, 2008
www.Matthewlaws.com/index.php/projects/slice-chair/

Slice Chair is (see Fig 6.); “It formed cardboard tubes attached each other and cut on CNC machine. On CNC machines production is made through two and/or three dimensional drawings on programs like Corel Draw, Autocad and for cutting process Mac serie programs and G-code which means numeral coordinates is used ” [9].

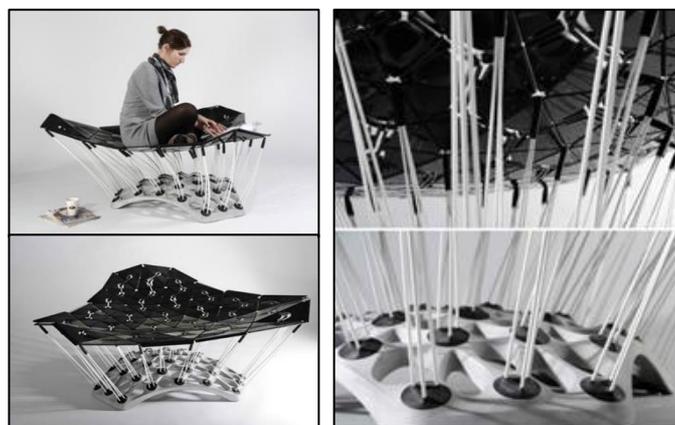


Fig 7. (a-b-c-d) Thomas Hiemann and Markus Dilger, Flying Carpet Chair, 2012
<http://www.core77.com/posts/24102/Thomas-Hiemann-and-Markus-Dilgers-Iterative-1001-Furniture-Piece>

Conforming to the curves of the human body, the Flying Carpet chair (see Fig 7.), stool and bed combination has a geometric surface supported by dozens of flexible rods. Each triangle-shaped component of the seating surface bends to accommodate the user's desired position to make the chair as comfortable as possible, whether sitting or lying down. The Flying carpet chair was created by using the latest CAD technology. Designers wanted to achieve both form and function with a modern, cutting-edge piece of furniture that's as tempting as an old armchair. More than 30 clusters of elastic rods are mounted onto the rounded base in groups of three to support the reclining surface as gently as possible. The top part swaying and tilting in response to the sitter's movements while the base remains immobile.

2.3. Changing User Needs

In time users may ask their furniture which they use to ease spaces and their lives due to their physical, spatial, psycho-social, aesthetic, health etc. needs and become adoptable to furniture's changes and different arrangements. Designs should be flexible and adaptable to social, number of users, technologically worn out, economic standards etc. changes to reach with ease both physical and technical means.

Today especially furniture designs and structures are reconsidered and revised because of dense population, space need after migration from village to city, presented small spaces and flexible furnitures to become compatible with them, cultural changes vb. to use small volumes more efficient. Developing systems that supported by every technology, user needs are on the foreground.



Fig 8. (a) Emanuele Magini, Sosia Sofa, 2011

<http://www.dezeen.com/2011/04/20/sosia-by-emanuele-magini-for-campeggi/>

Sosia sofa (see Fig 8.) was designed by Emanuele Magini for an Italian furniture company Campeggi. It is a contemporary, cozy and convertible sofa. From sofa and armchairs to L-shaped conversation nook, face-to-face sitting area, day bed and even a private enclosed space that can be used as a dressing room. Sosia sofa lets you configure its two seats

and flexible fabric flap, to accommodate a variety of different seating needs and scenarios. A mutant object, dynamic and snug, ready to fit with different everyday life situations.

Furniture are not only a phenomenon for living and fulfilling requisite needs in different culture, different function and different time periods, by communities passing to settled life, but also a fact comes together with socialising. Material used are shaped without losing its nature and comes with a touch of human hand brought features to the product properties. [13]

2.4. Renewed Environmental Conditions

Examining material in a more detailed way depending on developments in material and production technology, semtinizing nature's structure caused ordinary rigid geometric forms to break off. Especially, radical changes in architectural designs since the beginning of 20. Century, starting of use of organic architectural forms, accelerating the speed in communication and computer technology and improvement of digital world came with new structure and new form pursuits in furniture design. If its thought that communciation is easy now on internet setting and global boundries have destroyed, it is seen that boundries of the physical world of user and designer has also enforced.



Fig 9. (a-b) Nina Helena Olsen, Power'Nap Chair
www.decoholic.org/2012/09/11/powernap-chair-by-nina-helena/

Cultures have different interactions due to universalization; and utterly different forms arise from these cultures influence. Origami's being a folding art (see Fig 9.) which emerged in Japan, and today it has known almost everywhere in the world because of increasing inormation flow and inspired designs might be a sample to this [9].

3. Use Methods of Flexibility in Structures

“Visual expression methods that have achieved through top surface practices, stripes and colors in design world before, together with changing materials have developed on different directions today. Objects and interior spaces with simple forms are generally presented uncoated, bare to expose their inner features. This design approach gained more strength through new equipment, shaping methods and new expression environments.” [14]

3.1. Volume Change / Dimension Decrease – Dimension Increase

Main aim of structure system is carrying the load and ensuring a static balance which has determined before. Perfect balance between designer, user and furniture, and changes in dimensions of furniture's structure bring along opportunity to use in different spaces and different functions.

Systems that can become smaller and bigger when necessary, allow furnitures to use for different aims. These furniture structures that preferred especially in small spaces, to use volumes more efficiently or to pick up when furnitures are not in use so that spaces become wider, are detailed with developed material technology. By picking up the components of the furniture, furnitures can create a volume in itself when necessary, therefore its occupying a place in the space is prevented. Hinge, track, joint etc. auxiliary systems components that provide moving opportunity and removing ease can be designed and developed by computer technology's support.

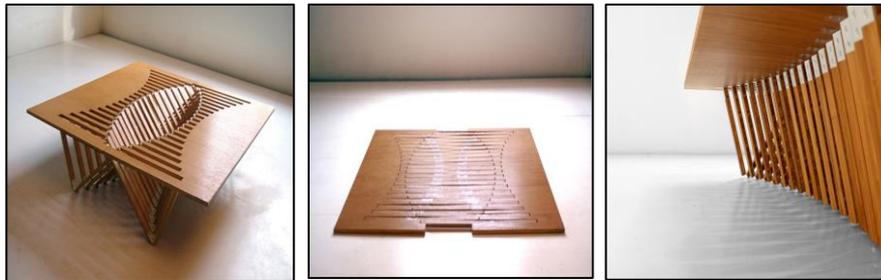


Fig 10. (a-b-c) Robert van Embricqs, A Flexible Wooden Table, 2013
<https://www.behance.net/gallery/10671491/Rising-Table-by-Robert-van-Embricqs>

The designer Robert van Embricqs created a table (see Fig 10.) that simply flexible and foldable. The idea behind the project was to create a wooden table that is not like the ordinary flat surface of the ordinary table design. Therefore, there are little openings added on the top make the design look dynamic, elegant and intriguing. The furniture is a flexible design that can be adjusted according to the desired position. It is also a space saver when it is not in use.

3.2. Modularity / Standardization

Modularity approach; especially became popular after 1960's, designed units which utilized technological developments, enables multi functional structures to be formed by putting together inside a system and gathering alongside and/or over and over. The important thing in modular systems to be able to make solutions to change the relations. In this sense 'Cloud modules' (see Fig 11.) that reproductive as added to each other and serves as a storage and partition can be shown as an example. Furniture structure produced as monoblog, by using Polystyrene and polypropylene provides to put forward the design's function through a homogenous look at the same time.

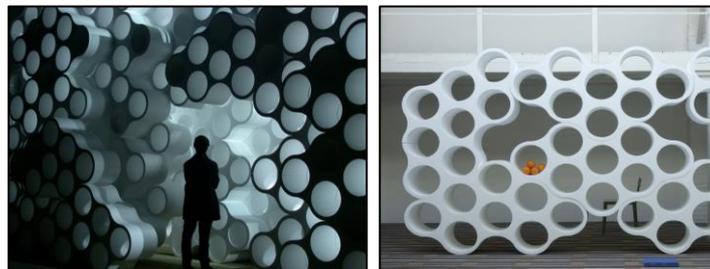


Fig 11. (a-b) Ronan & Erwan Bouroullec, Cloud Modules, 2002
www.bouroullec.com/

“Setting off growing principles of creatures in nature, works on geometry and golden section, embodying fractal patterns with mathematical algorithms and turns into a system ‘fractal table’(see Fig 12.) is a prototype designed by Gernot Oberfell, Jan Wertel and Matthias Bar

and produced by Materialise with epoxy resin. In easel design that branch forms that evocates tree trunk becoming more regular, on the surface getting smaller until it forms a surface, computer programs Nurbs Modelling 1/ Polygon Modelling and Stereolithograph production technology. Design was developed in 2010 and turns into a modular system” [9].



Fig 12. (a-b) Gernot Oberfell & Jan Wertel & Matthias Bär, Fractal Table, 2008 & Module. MGX, 2010
www.mgxbymaterialise.com/limited-editions/mgxmodel/detail/detail/59

In designs which gave importance to going from part to whole logic, systems provides to multiply in any dimension with opportunities of dimensional features. It is especially appropriate for small spaces because it gives flexibility by dividing or unifying, or adding furniture if it become needed in time. [11]



Fig 13. (a-b) Ron Arad, Do-Lo-Rez- Sofa
http://www.ambientedirect.com/en/moroso/do-lo-rez-sofa_pid_642_3953.html

Do-Lo-Rez sofa (see Fig 13.) designed by Ron Arad, includes several soft, square or rectangular based cube- units of various heights. The units are arranged in rows having the shape of the bank, and attached to a platform with steel pins. The modules can be re-arranged to form a great variety of forms and compositions, therefore the piece becomes quite flexible with its addible parts.

3.3. Featheriness / Portability / Mobility

New systems that emerged after the developments of industry era and especially composit materials appering in design, made the furniture’s structure become with minimum number of elements and made the featheriness possible as well. For example, structures from carbonfibre which is more lightweight but more durable also contributes a lot to visuality. C-Bench (see Fig 14.) seating unit which has designed by this approach, generated through carbonfibre’s twisting around the wished form and pouring the inside parts, so that structre is showed up.

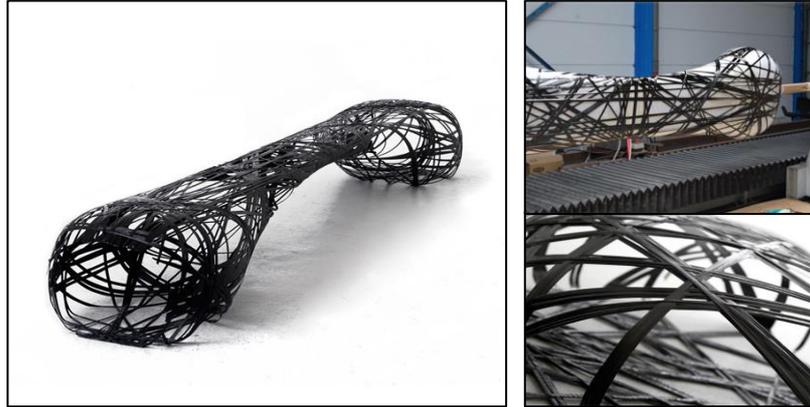


Fig 14. (a-b) Peter Donders, C-Bench, 2010
www.dailytonic.com/carbon-fibre-seats-by-peter-donders-be/

Metal that makes slender but strong sections in structure, lightweight pliable plywood, plastic that can mold by color and texture alternatives – furniture with foamed plastic polystyrene achieved by foamed liquid fill up with air, blow-up furniture produced by seam welded pvc, cardboard strength by corrugated surfaces vb. techniques and material types; could be moved in another places after the need is fulfilled. In that way user can use the furniture more flexible in the space. Otherwise, for increasing the usage space’s sake, wheels added to furniture structure which is heavy, or with locating auxiliary elements that sometimes hardly to fold or move, is a wrong way of arrangement.

More weight could make the folding hard to do, and make the joints of the furniture bended, and deformed as well. Portability decision should think parallel to correct material preference and correct structure setup.



Fig 15. (a-b) Ana Mitrano, Cardboard Chair, 2015
<http://interieurites.com/sieges-en-carton/>

The architect who has made it possible to mould different shapes out of recovered cardboard is Ana Mitrano, in Brazilian Design Fair. The shapes have been assembled out of pressed cardboard plaques (see Fig 15.) and are as comfortable as they look. Available in multiple colors, these pieces would add that extra effectiveness factor to their surroundings. The point which can’t be missed is that the furniture has a capacity to support over 100 kg’s of weight.



Fig 16. (a-b) Bina Baitel Designs, Snug & Tarah
www.binabaitel.com/

“Striking new technologies in modern textile, covers the gap between art, design, engineering and science worlds gradually. Together with the developments on engineered textiles, from now on lighter and hybrid materials are started to use”[4]. Bina Baitel who achieved their designs (see Fig 16.) by this understanding, with her works; Tarah which she integrated storage and carpet, Snug which she integrated lighting fixture and matt, she presented a different comprehension. Integrating two different function in furniture in an unconventional way, hybrid products have emerged.

3.4. Spatial Change / Connexion with Structural Components Foldability / Demountability / Storability

Different use method pursuits in furniture structures brings reconsidering the existed elements again. Users and designers prefer flexible and changable furnitures that fulfills more than one function at the same time. Each surface which is designed systems that allows personal use should be thought with transformative feature. ‘Land Peel’ (see Fig 17.) which is designed with this perspective, becomes a leaning and working surface if required, and it is a flexible matt that can fold and port due to user needs.



Fig 17. (a-b-c) Shin Yamashita, Land Peel, 2010
www.designboom.com/design/shin-yamashita-land-peel/

“Foldable surfaces takes less place when they are folded. It becomes more resilient to lateral pressures. Storing Japanese screens when they are not in use, using them in different dimensions and their ability to freely stand is an example of this. ‘Softwall’ series of Canadian ‘Molo’ company consists of foldable paper or textile screens, and these screens are

designed to divide open spaces into private and provisional spaces. Screens (see Fig 18.) become 3cm thick when they fold, and when they open they extend up to 6 metres. Because they are lightweight and free-standing, it is easy to change its place and shape” [4].



Fig 18.(a-b) Molo, Softwall
<http://inhabitat.com/molo-paper-wall/>

4. Result

Developing technologies, changing user needs and profiles, renewed environmental conditions are making necessary to update structure of furniture over time. Furniture is being discussed again and again from different perspectives: quest for flexibility such as ability to adapt to the changes in design effects to the formation of furniture structure.

In today's furniture design, computer, production, communication, technologies, researches, research and development studies and determination, designer approaches, cultural changes, material selection and with statement of all these factors on product, takes it beyond of conventional manner and structure logic. Number of needs and current trends depending upon social environment and living conditions brings with it flexibility and technology oriented design.

Inclusion of digital technologies in design process both resulting of complex models, original lines, curved forms, strong changes in form-structure-material threesome and opening big gate to production of creative ideas. Lighter, smarter and thinner use of materials effects on conception of structure with taking visuality and aesthetics to the first plan. The goal of the furniture structure became to showing difference in each way rather than ensure standing of furniture on its own with transmitting a load to the legs. New manufacturing techniques, economic constraints or freedom influences the embodiment. Updating of traditional materials came into consideration with bringing another dimension to the design process.

Social effects, balances that destroyed during life cycle, globalization, migrations, working necessity, decreasing human use areas and structural volume changes depending on compulsorily decreasing volumes, featheriness, portability, storability, multi-functionality and flexibility which fulfils all these.

Depending on all these changes in technologic and social life, by material technology and related computer systems that more free, more flexible, more free-standing aesthetic designs are foreseen with innovations on computer systems in furniture structure in the future.

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EXPERIENCING INFILL PROJECTS IN SPATIAL DESIGN EDUCATION

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Istanbul has been reconstructed very fast in last few decades. The urban tissue can be hardly conserved while urban transformations and new constructions for the crowded population go on. This paper is about the “Infill projects” of the course Spatial Organization in Mimar Sinan Fine Arts University (MSFAU) that is found necessary to study in architectural education.

Urban infill is defined as ne development that is sited on vacant or undeveloped land within an existing community, and that is enclosed by other types of development. [1] In the urban planning and development industries, infill has been defined as the use of land within a built-up area for further construction, especially as part of a community redevelopment or growth management program or as part of smart growth. [2] Redevelopment or land recycling is development that occurs on previously developed land. Infill buildings are constructed on vacant or underutilized property or between existing buildings. [3]

The Spatial Organization is an obligatory course at the 6th semester in MSFAU. The aim of the course is to design a space (house, café, shop, office) with its furniture, lighting and materials. The tutors change the project areas every year. The student is free to choose any of the given places and propose the subject he/she wants to design. Urban infill subjects have been in list of project areas of the course in last few years. The students show interest to design in blighted and/or vacant parcels in İstanbul. Since the given infill project areas are mostly between existing buildings, the projects in these parcels are rather small and the student has enough time for interior details.

This paper discusses different approaches of architecture students in MSFAU to infill projects in İstanbul. While some consider the built environment, some think that a new building would play a role for the new spatial identity of the place. Different subjects take place in the course and the Infill projects form a group in these subjects. The other subjects of the course vary from extensions to old buildings, reuse of historical buildings, designing in vernacular architecture, etc. The student proposes a concept considering the social and economic needs of the place and the user. He/she puts a concept for the interior details of the project and takes it as a whole. The tutors also adopt different approaches to infill projects, which is another section of the paper.

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Key Words: (*Infill project, architectural education*)

INFILL PROJECTS

INTRODUCTION

The reconstruction of the city is one of the fields of interest of design studios in architectural education. Istanbul has many urban transformation projects in last few years. The municipalities put “big transformation” projects on their programmes since the blighted areas, constructions without earthquake-proof, abandoned buildings, deserted areas decrease/reduces the economic productivity. Some of the subdivisions were on the municipality’s empty property and available to be constructed.

Infill parcels are perceived as “voids” in urban pattern. The urban infill is experienced as an effort for completing the city. The integration of infill with the city is a challenge as the parcel of the land is limited.

The terraced houses are considered as a typical European urban pattern developed inside the city walls in Middle Ages and continued during the industrial revolution in 19th century until new urban morphologies occur. As space/land allows a narrow façade in condensed urban structure; the proportion of the narrow width of the parcel to its’ length is the main criteria for design concept.

The modernist “object in a field” understanding in 20th century raised an alternative urban organization to terraced housing. Still the historical environments have attached structure and there is current interest for attached structure in design field. The design issues peculiar to adjoining buildings let us think about the search for new approaches to the voids of old urban patterns. In historical environments urban infill is appeared as housing. Today the social organism and morphology of cities transform so fast that multi use of buildings emerges. The functions have to change so fast within the urban transformations in Istanbul and there is an academic debate on achieving the social sustainability. Therefore the urban infill needed to have complex programs for mixed use. The spatiotemporal conflicts between the new necessities of new life styles and static urban morphologies raise new design approaches on urban infill in spatial design education.

Infill projects are getting more important in architectural education by bringing the mentioned structural issues to educational platform and discussing the relationship between the urban realities and architectural space. The researches for new typologies and the relationship between the urban scale and the existing typologies are some of the structural issues in education.

The methodology

The methodology of this study is based on discussing the approaches of architecture students in MSGSU to infill projects in different neighbourhoods of İstanbul. The projects are selected from an obligatory course Spatial Organization at 6th semester. The content of the course includes interior details of the project that the student designs. Structures built as infill may contrast with the existing old buildings. The student encounters the issue of designing a new building in a historical settlement in architectural education, which increases awareness of cultural heritage.

Since design education is a multi component process, the student has to consider the environmental data with social issues at the same time. In this article, we grouped the issues that the students deal in designing exemplified infill projects in three groups;

- Developing a design concept considering the built environment,
- Proposing a subject considering the social structure of the neighbourhood,
- Designing the façade considering the neighbourhood,

The materials used in this article were six students projects selected from course Spatial Organization. The infill projects took place in three different neighbourhood in İstanbul that have historical qualities; Cihangir, Balat and Kuzguncuk. The project areas have spatial identity since they have been settled for more than two hundred years. The infill projects were examined in terms of plan typology, façade and fullness/emptiness on Table 1.

The Infill Project Examples

Infill Projects in Cihangir

Cihangir is a quarter in European shore, settled on a hill close Cihangir mosque. It has been a crowded settlement in 19th century and had a non-muslim population. Between 1930-1950 many clubs, restaurants, luxury apartments and offices were active and had lively life until 1960s as the habitants left the district.

Example 1: Craft house in Cihangir.

The concept is a studio-shop selling items made from reused materials. The materials used in the building are uncovered and not coated in conformity with the minimal concept. The ground floor is designed for exhibition, workshops and café for enjoying the garden. Cihangir is a cosmopolitan neighbourhood and it attracts artists, designers and writers, who may show interest to such designers' shops. The student suggested an inviting atmosphere for these potential visitors.

The façade of the building is simple; the student suggested a façade, which is not conflicting the neighbourhoods. The building is not attracting though has the signs of the concept with its wooden rolling shutters on windows.

The student suggested back garden and created a green space between the blank façades of buildings, which is attractive for such an intense structuring. The glassed terrace is used for workshops in integrating the garden. The student also used the topography to create embankments for sitting.

Example 2: Bookstore and café in Cihangir

The concept is creating a space for displaying and selling books and a social space for lectures and presentations while enjoying a café at the back garden.

The façade of the building is a two-storey high window, which opens the interior to the street. The interior, opening to the street with a two-storey height window is designed like an amphitheatre. The amphitheatre like stairs serve as a storage and display stand for books at the same time and let the customers to sit and watch the street life. The space can be closed to street with blank curtains and create space for social activities;, lectures, presentations, etc.

gap/hollow space in the middle and with differentiated elevations of the street floors on both edges of the parcel. By dividing the volume/building into two volumes/parts, the proportions of each volume stayed in the same limits of the neighbourhood and the harmony between the buildings in urban block is achieved.

The façades and interiors of the wings/volumes/masses are shaped oval /rounded to have an effect of fluid surface. All the furniture and lighting equipment are designed in this concept.

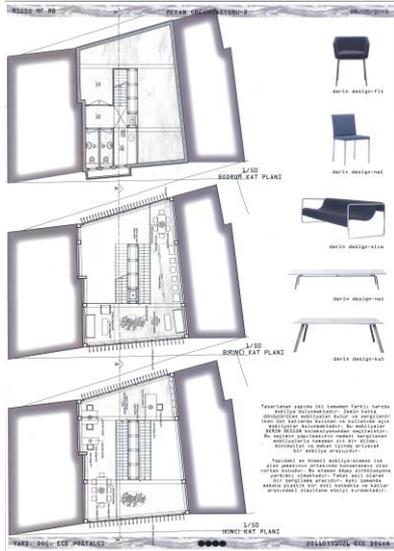


Figure 3. Furniture Store and Design Office
(Ece Doğan, Tutor: Ece Postalıcı)

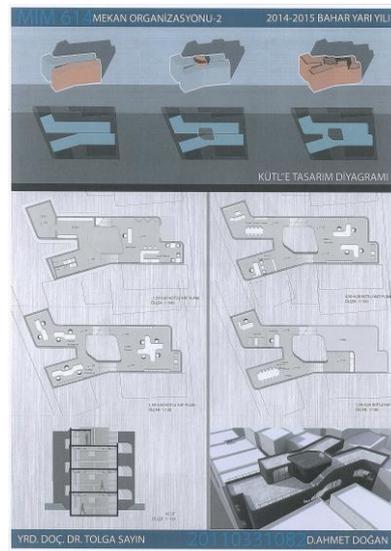


Figure 4. The Architectural Office
(Ahmet Doğan, Tutor: Tolga Sayın)

Infill Projects in Kuzguncuk

Kuzguncuk is a Bosphorus town in İstanbul, which known as the first Jewish settlement in Asian shore in 17th century. The population of the town was formed/consisted by Armenians and Greeks in the past, but today they are minor societies in Kuzguncuk.

Example 5: The Writers' House

The concept for the writers' house is atypical example from the plan typology of the historical buildings in the street. The spatial organization is arranged/designed around a modular structural frame made of steel and wood. The structural frame divides the parcel in diagonal and forms two triangle-based volumes in interior space.

Diagonal structure orientates the space towards the green park in front of the project area. The blank surfaces of the parcel are used for circulation spaces and toilets. The stairs are carried by the structure and each level/floor one side/part of the floor is used, so that each space looks towards a two storey high gallery. The modular structure frame helps to organize the bookcase, stairs and separators in a rhythmic system while forming a dynamic interior space. The student suggested a contemporary façade in coherent with the existing silhouette.

Example 6: Bicycle Atelier and House

An atelier and a house for a bicycle merchant is a multipurpose infill project takes place in Kuzguncuk. The shop and the house have different entrances from the street but have visual

relation inside. One can reach the atelier a few steps down from the entrance that the space have high ceiling. There is also a meeting room at the back of the atelier reached with stairs. The house has its own entrance separate from the atelier. There is a living room at the 1st floor and bedroom at the second floor.

The concept is the interpenetration of two spaces with different functions having/sustain the visual relation/connection while keeping the entrances separate. By using the elevation differences, the perception of spaces is enriched; the atelier can be perceived from the meeting room while the living space and even the entrance of the atelier is seen from the sleeping space.

The building has two entrances from for different uses; house and atelier but have visual relation inside.

The three storey high ceiling of the atelier is used for the exhibition of bicycles. The bicycle hobby/recreation of the user is integrated with his lifestyle. The air circulation between the spaces is kept with heat and sound insulation. The spaces are separated with half conductive glasses in order to achieve the visual integrity. The functional hierarchy is considered in spatial organization. The façade is designed with an asymmetrical dynamic composition, which reflects the different functions of the interior.

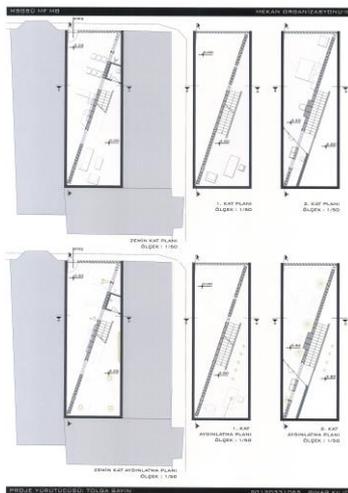


Figure 5. The Writers' House
(Pınar Kılıç, Tutor: Tolga Sayın)

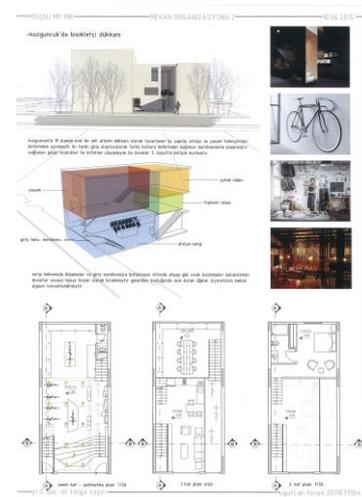


Figure 6. The Bicycle Shop and House
(Uğurcan Torun, Tutor: Tolga Sayın)

THE EVALUATION

The evaluation of projects is based on reading Table 1. The exemplified projects have atypical plan typology except for one. The circulation of the building is the determining factor for this typological analysis. Two examples, example 3 and example 6 do not take place in both of the groups since entrances and stairs show typical spatial organizations while the façades are atypical, designed considering the function.

INFILL TYPOLOGY	Plan Typology	Façade	Fullness/emptiness (parcel)	Fullness/emptiness (interior)	Program
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Example 1	typical	homogenous surface	with spaces(green)	no galleries	atelier-shop
Example 2	both	specialized according to plan	with spaces (green)	with galleries	cafe-bookstore
Example 3	atypical	homogenous surface	Full infill	with galleries	design-store
Example 4	atypical	specialized according to plan	with spaces (green)	no galleries	office
Example 5	atypical	homogenous surface	Full infill	with galleries	House
Example 6	both	specialized according to plan	Full infill	with galleries	House-atelier

Table 1.

The students suggested neither homogenous surface for the façades of their projects nor privatized for the functions of the buildings.

The infill student projects exemplified for this study is selected from in-between buildings, varying from two sided or three sided blanks. Two examples in Balat have two façades to different streets. These two examples filled up the parcel completely. The examples in Cihangir have the possibility to design landscape space for the projects together with half opened spaces.

The example 5 is the only project that the student suggested to use part of the parcel reserved for public use.

The students are encouraged to enrich the spatial perception in terms of transparency, continuity, and fullness/emptiness in design process. These trends/tendencies appear in students' projects as galleries, different elevations and dynamic spatial organizations. The exemplified infill projects show/exhibit these attempts of design concepts.

CONCLUSION

Infill projects let student design in a strong context in architectural education. The typology of the project is considered with the neighbourhood parcels. The façade should be considered in the street silhouette. The discussion/course on projects is the relationship between the building and its' context. The dimensions of the parcel let the student study/work with a holistic design approach, starting from concept to construction details. Both the urban scale and interior design scales are practised in design process of exemplified infill projects.

The exemplified projects show that the urban infill is an architectural practise, which develops students' perception of spatial possibilities in a limited parcel of land. The mixed-use of projects contribute to the social life of city in students' projects, considering the relationship between the social and physical shaping of urban environments.

Social sustainability is one of the branches/subdivisions of sustainable development for cities together with environmental and economic sustainability that is supposed to combine “design of the physical realm with design of the social world”. The programs of exemplified projects have multi use programs such as; dwelling/housing, production and commercial functions which support the activities of the neighbourhood.

Since the social sustainability of the neighbourhood is one of the concept criteria, the students suggest multi functioning buildings for mix uses that would contribute to lively urban life.

Specialising in maximising the potentials of neighbourhoods in İstanbul; urban infill is used as a design tool for spatial exercises in architectural education.

How the neighbourhood character of the historical settlements, which is vanishing with the urban growth, in architectural scale is discussed in design process. This approach searches the ways of escape from destroying the urban structure and context with capitalist consumption. Re-evaluating the old typologies and parcels that were shaped according to past circumstances is questioned and discussed in this process.

The flexibility of the exemplified projects can be criticized, as the spatial organizations of the projects do not envisage the different uses of the buildings in the future. As the course intended to orientate the student to focus on interior space, a holistic approach to use of space is expected in projects.

Social Sustainability is defined as that “*a process for creating sustainable, successful places that promote wellbeing, by understanding what people need from the places they live and work. Social sustainability combines design of the physical realm with design of the social world – infrastructure to support social and cultural life, social amenities, systems for citizen engagement and space for people and places to evolve*” (S.Woodcraft et al (2011) *Design for Social Sustainability, Social Life, London*)

How Compact Can One City Get?

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Abstract

As a living presence the city's being in a constant renewal and change is inevitable while on the other hand the sustainable urban development has become a recently often discussed topic with the general consensus of its importance. Cities are the living spaces of most intense human activity and the center of consumption of natural resources. Nevertheless, sustainability issues not only with the consumption of natural or environmental resources but concerns also economic viability, liveability, social justice and social equity as well. Hence, considering that the built environment and sustainability have formed a significant interaction, it has become a necessity to reconsider urban form and its density, and to create new strategies for metropolises in terms of sustainable development. In recent years' numerous architects and urban planners introduced ideas about intense and effective use of city centers and developed sustainable urban form models. The main strategy presented in this sense is to keep the active districts within the city center and create a twenty-four hour living, safe, mixed used, dense urban forms where the motor vehicle use decreases due to more efficiently use of urban space and building stock. Thus, the compact city approach supports the sustainable urban development which is a combination of economic, social and environmental factors. Within the scope of this research compact city strategies will be examined and alternative ideas for revalorization of built environments of cities will be discussed on micro level.

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Key Words: compact city, urban form, sustainable urban development, urban sprawl

1. Introduction

While maintaining vital activities, the human being is constantly in a mutual interaction with the social and physical environment of which himself is a part and creates permanent changes around in order to ensure more appropriate living conditions for himself. A new interaction with this reshaped environment and therefore a continuous interaction cycle can be mentioned as a result. These interactions may lead to positive effects but at the same time negative ones as well. [1].

This action of changing-converting the environment which started with concerns of living in better conditions, especially accelerated with the industrial revolution and moved a good distance from the initial

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purpose of the impact of globalization in recent years. In the information age we live in, while the possibilities brought by technology and innovation in science support our lives to a large extent, their conversion into an investment vehicle in favor of global powers have led to fundamental changes in society lifestyles. Information and communication technology have replaced the natural resources as a new revenue source, and these resulted as imposition of new forms of life.

Under these circumstances, the present development practices, have not only led to increasing of already existing environmental problems such as environmental pollution, ecosystem destruction, depletion of natural resources, global warming, growing health problems but also carried them to dangerous levels. Imposed new lifestyles increased the income gap between the world's wealthy classes and the rest. Economic and social inequalities, disappearing cultural and social values, disappearing or transforming lifestyles and identities resulted as unhealthy, anonymous environs and societies with lack of aesthetic values.

All these problems have led to ongoing ecological and socio-cultural approaches and dozens of ecological debates continue today under a more inclusive name 'sustainability'. All disciplines have initiated studies for environmental, social and economic sustainability for present and future generations and in the name of a better world.

One of the most concrete reflections of the destruction in physical environment and social life emerges around the habitats ranging from building scale to urban scale. Unplanned urbanization and unplanned construction, especially in the less developed and developing countries results in the city with losing their historic structures, both natural and cultural features.

All over the world, and especially in recent years in Europe, the social upheaval taking place both against the repressive policies of ruling governments and increasing practices that destroy nature, cities and habitats, reveals the changing requirements of the current development policy. David Harvey's definition "While producing our city collectively, we also produce ourselves collectively. Our projects of how the city should be, are projects of the human possibilities, who we want to be or who we do not want to be "[2] draws attention to the intermingling of economic and environmental issues.

In the structural scale, as well as environmental dimensions of sustainability, the social dimensions such as the relationship of building with its environment, user profiles and the local context, should be taken into account in order to achieve users' happiness and prosperity of the region where it is located and the city's social and physical development. This is of great importance in terms of providing a positive contribution.

2. Relationship between Urban Planning and Sustainability

2.1. Concept of Sustainability

"A society must be supported by the residents now and in the future. Certain places, by their unique combination of features as physical, cultural as well as perhaps by their spiritual characteristics, would inspire people and communities to show care and respect. Such places are the ones with the most chance to achieve sustainability"[3]. This approach of Muscoe, reveals that how multi-dimensional and extensive this thought is referring to sustainability's environmental, social, cultural, social and temporal dimensions.

The word "sustainability" derives from the Latin root "subtenir", meaning "keep, support" or "support from below" [3]. According to Gilman sustainability is that a community, ecosystem or any system continue to

function until an uncertain future without collapsing due to the depletion of its main resources which it is dependent on. [4]. Tekeli, defines the concept as "an ethical principle which emerged within the environmental movement, is quite widely accepted and which content is attempted to be permanently redefined in the political process"[5]. In Hart's approach, the economy exists within the society, society coexists with the economy within the environment and the way to achieve sustainability, are only possible where the environment, society and economy are all discussed together. [6].

According to Urban Science Dictionary the concept of "sustainable development" can be defined as "environmentalist world perspective that aims to ensure economic development using environmental values and natural resources without extravagance, considering rights and benefits of present and future generations."[7]. Macmillan Dictionary of the Environment, defines sustainable development as, "economic growth based on constant consumption of renewable resources in a limited damage on the environment, (in a way that protects the final borders of the environment)."[7]. The most widely used and accepted definition of sustainable development is made by the World Environment and Development Commission, and used in the Brundtland Report, published in 1987, is as follows: "Sustainable development is to guarantee to meet today's needs without risking the ability of future generations to meet theirs" [8].

Often sustainable development is used in the sense of environmental sustainability and conceptualized as a process of change which is one of the goals of environmental sustainability. Conversely, sometimes it has been interpreted as "continuous growth", "constant change" or simply "successful" improvement [9].

Despite the different definitions and interpretations, it would not be wrong to say that the idea of sustainability is the conceptualized shape that is composed of environmental, economic and social components and reflects the field of application in terms of defining/improving the human-environment relations [10].

The more comprehensive definition of sustainable development which is also located in the Brundtland Report, says "it is the process of change that increases the future and recent potentials to meet the people's needs and desires while the use of resources, the direction of investment, the orientation of technological development and institutional change are all in harmony." [8] It not only highlights different aspects of the development, but also underlines the need that these different aspects should match. [11].

The impact of Sustainable development on the government policies and individual behaviors are often very complex. Munro's discussions are very useful to illuminate these issues of what is "development" and what is to be "sustained". According to Munro development covers all activities and process for raising the capacity of people and the environment, to improve the quality of human life and meet human needs. He also highlights that development not only covers the physical development of the living environment but should equally care about subjects as health, social security, education and cultural activities. "Development is a set of activities based on social, economic, mundane and intellectual resources that enable people to have a good life" [11].

Although these definitions make it clear why a development should be sustainable, the questions of how to sustain the progress and what the obstacles are, which brings up the paradigm of worlds limits. When we examine the past and present growth rate of the world, the capacity to withstand the growth and consumption is a condition that can be queried from the beginning. Sustainability has been originally defined as environmental sustainability, but with increasing discussions, differences of opinion on if the natural systems or human activities should be sustained arose. A growing number of social scientists agreed that economic, social and cultural sustainability also should be a part of sustainable development in addition to environmental

sustainability. Moreover, links between these different dimensions should be taken into account and not be disconnected from each other [11].

Sustainable development and idea of sustainability forming his essence have different approaches and definitions. All the common point of this approach, now and in the future, is the aim of a better quality of life for all living things, a healthy environment, developed and high welfare society. Discussions of how to achieve these goals, which are still being debated today, are creating new literature / disciplines, questioning our way of life. They stand just in front of the humanity as a series of problems to be solved on a global scale, not local.

2.2. Sustainable Urban Development Models

2.3.1. Theoretical approaches

The scale of urbanization growth might be considered as dramatic. While in the beginning of the twentieth century only 13 % of the population was living in cities, the rate has increased to 47% at the end of it. “According to UN Estimates the global level of urbanization will have increased from 37.7% to 61.1% and the total population living in cities will have risen from 1.58 billion to 5:06 billion-an average annual urban growth rate over the period of 2.38% of.” [12]. This has and will lead to the increase of spatial scale. Cities have grown both in terms of population and density which was followed by spatial growth as well.

The concept of city planning, is dealing with urban development according to its economic, social, societal, environmental and physical dimensions and their mutual interaction. As a result of the increase in the general rate of urbanization the interest in the physical development of urban planning and urban plans has grown as well [13].

Starting with 1972 United Nations Human Environment Conference and continuing with other international meetings such as Rio Summit, Agenda 21, Habitat II, Johannesburg Summit; integration of social, economic and ecological systems, has become a big debate and affected urban planning policies. Thus, one of the basic principles of urban planning in the 21st century, has become to create sustainable cities. The sustainable city planning on the other hand is a phenomenon that can only be realized by monitoring but more importantly taking responsibility during the whole process of identifying problems, evaluating them, producing alternative solutions, making decisions [14].

To fulfill the environmental sustainability objectives, the urban planning should reflect; local climate, ecosystems, materials, energy, water and the stream of resources. Such planning will integrate communities with natural landscapes, reduce dependence on automobile, use resources more efficiently and reveal the identity of the place. Sustainable urban planning concept, is based on the human and ecological values and not on achieving economic efficiency and profits. Walkability, human scale, diversity, strong / live housing, offices, public facilities are the basic elements of existence.

Sustainable urban form must meet the following specifications [15].

- Intensive housing design,
- the relatively high degree of concentration in residential areas,
- The access to the city center as fast as possible,
- an average size of the settlement.

When these are established, it reveals three types of urban models. These models are respectively as follows [16].

- Large concentrated centers,
- Decentralized but concentrated, compact settlements linked by public transport,
- Dispersal in self sufficient communities,

The first signs of unsustainable urban development, are environmental degradation and resource consumption. These problems rise mostly from poverty, illegal urban sprawl and insufficient infrastructure.

The most suitable models to the principles of sustainability are the "self-sufficient city" and "compact cities" forms. "Self-sufficient Cities" is part of the green city ideal. Its purpose is to protect natural resources and to design cities to integrate optimally with nature. Among this model; small decentralized populations should adopt a nature centered lifestyle with increasing ecological awareness and thus reducing the consumption of natural resources. The model aims to realize the economic and environmental activities with its own internal dynamics. The implications of this city in terms of land use, are small and compact cities with a variety of land use and open space [13].

The second model, the "compact city" introduces more limited spaces, higher density residential areas, mixed land use that will allow less energy consumption. The compact city has a human-centered perspective and contains less natural regions than "Self-sufficient Cities". It is based on holding the city's harmful effects in a restricted area, and aims to reduce the negative external effects. It also brings an urban management policy with a minimum level of damage to the environment, effective and efficient use of existing resources, controlled urban growth through land planning, and minimized urban mobility [13].

3. Compact City Model and Sustainability Relations

It is widely supported throughout the recent years that a planning approach should rather intensify residential areas without losing quality than spreading them as fragmented, structured in a distributed manner into the natural environment. This attitude brings the concepts of "urban intensification" or "compact city" on the agenda [17].

In recent years, many architects and planners have revealed ideas and new urban form models regarding the use of efficient and sustainable urban centers. In this sense, the main strategy developed was to keep the vital functions within the city center and develop a safe, mix-used, dense city form which lives 24 hours with low amount of use of motor vehicles and efficient use of urban infrastructure. Therefore, the compact city approach supports the sustainable urban development where economic, social and environmental factors are coexisting.

"The compact city model" can be defined as a single or multi-focused urban development model where mixed land use pattern is blended, intertwined and high-density construction decisions for optimal use of urban land are aimed. [18].

Compact urban phenomenon in the academic literature, has been under discussion since the late 1970s and the early 1980s [19]. But these discussions addressed the problem of sustainability around 1990 [20]. In the literature, the compact city phenomenon is discussed through four major characteristics [21]. First, compact cities must have a more sustainable and efficient transport system. Because the compact city has a structuring

of land area that allows a high population density and mixed-use where living and working spaces are not far from each other. Second, they allow the use of a sustainable space by reducing the spread spaces. Thirdly, social structure, density and mixed use concepts are considered together with the concept of cultural development - unification and diversity. This also allows justice to the city, because the opportunities are accessible to all nature. Finally, the quality and provision of urban infrastructure become more economic [22].

3.1. Critical view of the compact city approach

One of the most important issues of the contemporary city to be considered is to use the existing building stock and alternative public spaces more efficiently and in favor of all segments of the society instead of open up new areas for development. Considered from this perspective the reuse and revalorization of historical building stock might lead to an interpretation of the compact city model.

Today transformation projects are initiated for numerous reasons, and their points of origin and goals may vary in this sense. Transformation in historical quarters should be considered as a feasible-affordable solution to desolation and a transformed historic quarter may turn into a dynamic district, lively at all hours. The model in this paper is significant for it supports sustainable urban form development as a model that improves and revitalises existing building stock and creates alternative functions and space. Existing texture can be utilized more efficiently and be employed as an alternative solution for low active zones in city centres.

Suburbanization is a major urbanization model that marked the past century. Country life we long for was idealized by Howard and can be attained by today's technological means. But that aside, suburbanization leads to exploitation of nature and lands, transportation based on private and motor vehicles, and communities isolated in housing estates. Some people in the post-modern world claim that conventional urban lifestyle, social relations and secular forms face extinction. Ideas are generated and solutions are offered to prevent this.

Historical cities with intensely used centres (accommodation, trade, culture etc.), can be regarded as a correct application for compact city approach. There is great benefit in asking the following questions and looking for answers for cities in the light of revalorization of built environments.

- How to restructure built environments in terms of infrastructure, building typology, density (or vacancy), relation of public-private spaces?
- How to create healthy neighborhoods in terms of functional restructuring of areas and buildings, new functions, multi-functional uses, adaptive reuse strategies, opportunities for businesses (commerce) and art?
- How to create cultural and functional diversity: adaptation of existing building stock and addition of new buildings and functions in order to improve quality for citizens and attract newcomers. Rehabilitation, Revitalization, Renewal, Regeneration etc. strategies?
- How to transform city centers in terms of real estate development perspective? High and best use analysis, cash flow analysis, feasibility studies in order to use the knowledge of real estate investment criteria?
- How to value social and economical costs of vacant buildings?

3.2. Revalorization of built environments as an approach

The physical spaces the societies have created at different periods are reflecting the cultural structure of that society. The reflection is described as “old” in common parlance and this description refers to both physical

and functional obsolescence. As being part of the culture, spaces are sheltering the historical quality. These cultural heritages constitute our historical environment.

Historical urban patterns are spaces arranged in human scale and reflecting the former civilization social, cultural and economic structure, philosophy of life and aesthetic concerns.

The environment is the expression of a culture and a historical conglomeration. Parallel to the human being the environment gets born, grows up and develops. The last image of the environment bears the imprint of its all existence just like a human being. These patterns are the traces of the social, cultural and economic structure and the constituents of the historical environment.

In fact history is not only about the past, is also a part of today since we are creating history of the future generations right now. The time therefore has to be taken as a whole and the past has to be evaluated under the same light. Only then a historical consciousness can be mentioned.

“The traces of the historical environments bearing have been created by different generations of different periods, according to different possibilities and conditions. This means a continuous renewal where the new and old cases become a mesh. History is a dynamic process formed throughout the time with the dialectic development of actions belonging to the mankind” [23]. The monuments set out ever since the humankind existed have provided the intergenerational continuity, while this continuity has led to an order towards the future. In the same context the architectural monuments have been used either as untouched or changed. As the social and the eco-cultural structure changed, the physical structure didn't remain the same as well. And this new physical structure has led to changes in the society's structure.

The balance between the urban and rural areas impaired and the physical environment got affected by this deterioration. According to this new balance urban patterns were started to be re-planned and the application of these plans followed. As a result, the historical pattern that had existed until then got ruined in order to make space for new functions [24].

The causes of destruction of historical environments can be listed as:

- Changes in social living conditions
- Senseless interventions and insertions in accordance with providing the terms of contemporary comfort
- False restorations
- Economic imperatives: lack of financial power to finance the costs of conservation, applications not based on researches and documentation during planning fast precautions
- Lack of respect on the case, lack of public awareness, lack of training about conservation
- Coercive effect of laws and restrictive decisions / adverse reactions
- Lack of a master plan or its being performed senselessly
- Reluctance and insouciance of local authorities, unawareness of the decision to be carried out, being not sufficiently clear and convincing the lack of sources.
- Disassociation with the past according to rapid technological developments

Today especially in some regions, the historical environments have been abandoned for the reason of not meeting today's requirements. Abandoned due to lack of maintenance the depreciation of the buildings led to a dramatically change on user profiles and thus the deterioration of the pattern and a conscious approach to the environment fell flat. Accordingly, the conservation approaches not performed correctly caused a further

attrition while the advent of investment led to a deliberate destruction. Continuity on planning couldn't be provided and the main problem in the present remained as the unawareness.

Contrary to these negative aspects historical environments are actually providing a way of life the society is longing for subconsciously.

Experiments reviewing the environmental quality people are appreciating had results as follows

Environment samples that are composed as a whole, well matched with the natural, historical and social environment, green as possible, beyond ordinary, authentic, containing innovation, well planned and maintained are being evaluated as beautiful in terms of architecture.

If a building shows the features of belonging to a place and time containing a certain level of innovation and the qualities deriving from natural and socio-cultural values, the requirements for the notion of beauty in architecture is considered to be complete and aesthetic appreciation comes into picture.

People are willing to see the impacts of tradition and culture among the built environment/architecture samples as well as the innovations connected to these. They are in a need of getting ideas about these innovations and discoveries. In fact, this is an outcome of their nature [25].

Historical urban patterns have been very successful on transmitting the life style and philosophy of the time, culture, period they belong to, to the physical space. It can be observed that on these environments the match between the user profile and social economics, technologic and aesthetic aspects of the culture is reflected from object to building, from building to building groups and the urban level. Even today with the development of technology and science, this match was expected to be reflected more on living environs, and the consciousness to be more spread. On the contrary these conditions have become unprovidable. However, this match of space and human has to be ensured sustainable between past, present and future. That the positive aspects of the historical environments and patterns are researched, interpreted and reflected to the recent architecture and space consideration makes a dramatic point.

A continuity cannot be mentioned, unless an awareness is achieved that is drawing the lines of historical qualities in a holistic way.

At this point not the reawakening of the cultural awareness, but its continuing existence would have led us into different directions.

Societies reflect their identity as long as they can maintain their historical and cultural value and make its connections to the contemporary lifestyles. One way to prevent these values from destruction is to revitalize these historical environments with necessary function transformations and add these into the social life.

Historical environments and its conservation as a living presence is a complex phenomenon. It's a whole with its cultural, social and economic dimensions. The most important purpose of conservation has to be re-evaluating the historical environment with new urban functions. An active and multidimensional approach which is carrying social and economic solutions instead of a passive conversation containing bans and preservation.

The re-evaluation-revalorization means the revival of the values of the heritage, to uncover "history", making it readable, visible and perceivable. It is to repair and keep the sanitary of the traditional place assets

and provide a re-use according to today's needs. It is the rediscovery of the traditional architectural and urban values which have not yet lost their validity.

4. Conclusion

Industrial societies in developed world countries have evolved into information societies, and industrial production has moved to underdeveloped or developing regions. Following these phases, global economic actors stepped in once more to revitalize old city centers. The investments in question initially targeted the abandoned industrial zones after industry shifted to the periphery and urban transformation of the building stock. It eventually spread to the areas with dysfunctional or decayed building stocks. Numerous cities which economically or culturally integrated to the world or made efforts, were also affected in this period. While cities that evaluated the conjuncture and produced strategic plans in accordance with modern needs correctly managed the process, cities that prioritized economic concerns or generated short-term plans have experienced difficulties.

The areas of interest for revalorization of built environments can be as follows:

- Correct determination of modern needs- building functions
- Correct determination of population and density
- Transportation planning
- Correct determination of urban functions and density
- Preservation of urban memory and identity
- Correctly establishing transformation models in accordance with properties of existing building stock
- Correctly establishing financial tools
- Building a legal infrastructure to benefit public welfare and public conscious
- Fair and equal distribution of economic income etc.

In conclusion, in historical city centres, urban transformation activities frequently become current and applications within the context are widely criticized. Urban transformation activities have been criticised as exaggerated and misunderstood implementations. We have gone and currently go through a phase where empty spaces or green areas in city centres are allocated to five-star hotels or shopping malls, and urbanites living in city centres are forced to move to the periphery. With increasing hotel, office and shopping mall projects, estate values in city centres rise and urbanites mainly in middle and low-income groups are forced to reside outside city centres. Transportation issues emerge in cities as well where main economic activities take place in city centre, and city goes through an unbalanced development in this sense. There are indications that lots of cities are about to face major environmental and social issues in the near future. In this sense, urban transformation with inner city redevelopment, is regarded as an urban model referred to as "compact city" in the literature, which provides essential clues and references with the sustainable outcomes.

Today, we need to rethink historical built environment with regard to sustainability is widely accepted due to the apparent interaction between urban form and density. Compact city approach has become a valid settlement suggestion with regard to sustainability.

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The 'new' museum comprehension: "Inclusive museum"

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Abstract

The concept of museum, which has known from Ancient Greek till today, has changed in many ways. Museum' initial functions such as collecting and conservation have been replaced by conservation, research and communication in course of time. The museums which have the most effective role in creation of a global culture are influenced by the technological developments which had caused radical alterations on social life, both museologically and architecturally. In this context; the exhibition styles of tangible and intangible heritage have undergone many transformations by the new visual technological experiences. 'New' museum is inclusive and gets in touch with its user interactively.

In this study; the ideological changes of the museums that have become part of the culture industry is questioned and the relationship between the 'new' museum architecture and the museum user is examined.

Keywords: New museology; inclusive museum; sustainable museum

1. Introduction

The concept of museum, which has known from Ancient Greek till today, has changed in many ways. Museum' initial functions such as collecting and conservation have been replaced by conservation, research and communication in course of time. The museums which have the most effective role in creation of a global culture are influenced by the technological developments which had caused radical alterations on social life, both museologically and architecturally. In this context; the exhibition styles of tangible and intangible heritage have undergone many transformations by the new visual technological experiences. 'New' museum is inclusive and gets in touch with its user interactively.

21st century museums function as educational constitutions being shaped and reflected by society as well as with their community-enhancing features. Modern man acts with the motivation of changing and improving things they are included that define the city and in this sense; themselves. In this context; it can be said that the individual is not an observer and passive to the products and spaces that's presented to them but participatory. The individual takes an effective part in the new museums in a way that would further strengthen the organic ties between the museum and society. Now, museums are defined as places that reflect the actual values of the society, they give an identity and architectural value to the city. With the "democratic museum" goal, contemporary art museums aim to abolish the exclusionary approach that has been created in the collective memory of society that art would appeal to a certain class.

In this study; the ideological changes of the museums that have become part of the culture industry is questioned and the relationship between the 'new' museum architecture and the museum user is examined.

2. The New Museum Comprehension

The ideas called the new museum comprehension began to be discussed in the United States in 1950s. The historians of the period wanted to interpret the material culture, daily life and the ordinary objects politically and economic. However, these ideas have been reflected to the museums since the 1970s. [1] Peter Vergo was the person to use the term "new museology" for the first time. Vergo has criticized the methods being highly dependent on the legacy of museums, has said that museums will perish if not renewed with profound changes. [2]

New museology highlights the "informative" and "educational" features of museum. The changes and the process of transformation of museums are dating back to 1950s. As a result of a social-oriented approach; museums have emerged with an active role as one of the democratic institutions in the public domain, they aim to integrate with the individual. New museology embraces the efficient, dynamic and participatory approach on the basis of communication, education and instruction. These cognitive changes have transformed the museum into an institution which's user interacts with the museum collection and shaped by the social needs.

In early stages of museum buildings, it can be observed that the exhibition spaces are consisted of thin, long galleries, organized and observed sequentially. Systematic, chronologically sequential approach of artwork is associated with the concept of "order". This approach had been valid until the 19th century. [3]

Nowadays, museology is implemented with two different approaches simultaneously. The first and more traditional one identifies the museum as an education and research center which's focused on the permanent collection. It embraces a social policy which aims the art to be internalized by the viewers aesthetically. The second approach is called; "the new museology" or "21st century museology". This approach acknowledges the museum as a popular place of an entertainment, education and culture center and also a "commercial machine". Accordingly, the museum has an important role in the entertainment industry. The banners and billboards in front of the museum buildings indicate how close the museums are to fairs and mass entertainment show business. [4] The new museum is focused on temporary exhibitions. There is no permanent exhibition or the permanent exhibitions are of secondary importance. The main reason for this change is the communication opportunities that have been increasing on a global scale for half the century. Traditional museums has lost their position with the widespread use of computers and the Internet's being one of the primary means of communication, information sharing with the printed and virtual media has begun the process of adaptation to global change by questioning the function of museums.

21st century museums aim to communicate with the public by evaluating the traditional curatorial practice and began to leave the old museum approach. According to the new approach; by strengthening the relationship with the city and society, museums are producing strategies for making progress in this area. Postmodern museum is described as the cognition of "new museum". New museums are places of contemporary structures where users can see objects of culture, historical ruins and share their experience. [5] Unlike the classical museum concept, they are not places that exhibit cultural objects representing a particular community. Since the second half of the 20th century, the museum's function and purpose has been questioned. With the reduction of permanent exhibitions, "museum visitor" is identified as "museum user". In order to achieve this; museums have been working on some development programs like improving the area of expertise of the

museum staff have been concentrating on the museum's educational function with the aim of establishing visitor development systems in order "to understand the community to create a society". New museum comprehension aims a modern approach to provide an environment by communication, learning, and self-recognition in which the individual is not socially excluded. In this context, museums must be sustainable. Sustainability is the prior element for providing an intensive participation of the museum users to the diverse activities of the museums.

2.1. Sustainable and Educational 'New' Museum:

Museology has gained evolving roles by altering in the culture industry. The desire for access to information has led people to search the new and old, the tangible and intangible cultural heritage at the open gates of museums. In the new museums, a target audience is selected while building up the collection and the type of the collection is determined accordingly. By aiming the target audience to interact the collection at least partially, the museums have altered from being strict institutions to active, innovative, inquisitorial and live institutions. [6]

Main issues set out in the new museum concept can be handled in three main topics:

- The main source of museums is "information". The value of knowledge and the notion of transferring method are questionable.
- The necessity of the development on the relationship between museum and the museum user is emphasized.
- In museums, specified functions that are managed separately from each other should be used in social works simultaneously.

Hereby, the educational aspects of the museums come into prominence. Museums should generate new methods by acknowledging and understanding the public and the target audience.

In this context; the new museum tended to change the organization, function and the management structure with the methods that facilitate the transfer of knowledge by improving the relations with museum users. Sustainability of the museums depends on this. A museum structure that has an increasing public share becomes a part of the society and shows improvement. From being an institution exhibiting the past, it will become a socializing space.

Today's museum buildings cease to be just an exhibition area by adding new spaces to their structures. They take the form of multi-functional cultural buildings. Educational spaces in museums are required to do all the activities carried out in conjunction with the museum users, within the scope of the museum in the management of the instructors. [7] Libraries, theaters, multimedia classrooms, digital archive, bookstore, show areas such as conference rooms and meeting rooms offer users the opportunity to come to the museums to spend time there without intending to visit the exhibitions. Libraries are the top places of information-oriented areas in museums. If the structure of the museum is proper, the archives may be opened to the public in a controllable manner. In this context, museums moved their relationship with the museum user beyond the permanent and temporary collections by placing emphasis on education and museums' social functions have become sustainable.

3. New Museum and the Concept of “Inclusiveness”

Museology is a specialty of serving the community today and the museums protect works of art against vandalism and physical environmental conditions. They are “fortresses” for people prolonging their existence forever. [8] Today, these attributes have been added on the museum's mission to be educational. The new museum defined as the inclusive museum; offers more social opportunities to its user, in order to develop the community for public interest.

According to the definition of The Turkish Language Institute "to be inclusive of" means "to comprise, to get into borders, to include". The word “inclusive” defined as "the definition including all features and subtleties, against vicious cycle". Inclusive museum; sees its users not as "museum visitors," but as the efficient, variable and open for improvement, contributing part of the museum's sustainability. According to David Fleming who defends the necessity of socialization of the museums; inclusive museum contributes to social democratization. Inclusiveness; assists the process of social change and regeneration of society by introducing new ideas, aims to contribute individuals recognition and personal development. [9]

The key word for inclusiveness is "correlation". [10] When curators are organizing the pieces for exhibitions, they relate to the culture, history and lifestyle of the people addressed. In this context; the pieces in the collection should relate in a manner, to the natives of the city. On the other hand, it should have a universal language to relate to the people who have special interest on the exhibited artwork. When the objects put in museums, taken out of context; they may lose their original values. Thus, the objects become isolated from establishing relationships with targeted audiences. The resolution is to attach inclusive descriptions explaining the context of the object is presented in a comprehensible language beside the exhibited works. In inclusive museums; it's important that the object is presented in a people-oriented approach. Thus, the object which has lost the identity of where/who it belongs, is being presented with the mentioned qualities to the museum user. "Object-oriented" approach is now seen as much less and usually, these are the places that display objects from a narrow point of view which remains from the past centuries. The responsibility of today's museum is; consulting the community to facilitate the review of objects with new methods of presentation by investigating the context of the objects in the collection, rather than object-oriented, narrow point of view.

There are two types of museums that apply the concept of inclusiveness: [11]

- Social museum
- Community museum

Social museums are; “the museums sharing the same goal to examine the evolution of humanity in social and historical components, to transfer the watersheds to understand the diversity of culture and society.” (Vaillant, 1993)[12] These goals incline museums to an interdisciplinary field that produces exhibitions on topics affecting the world community such as the food crisis, immigration and ecology. The management of community museums can be seen as part of the social museum movement. Continuity of the community museums depend on the socio-cultural, occupational and geographical groups they represent directly. Although they usually professionally managed, it is observed that they work with the local initiative supports at the same time. They handle issues concerning the functioning and the identity of the group that is addressed directly. In this context; it is observed that social museums are more broadly, interdisciplinary museums that incorporate the community museums. Even though both museum types have designated an inclusive attitude towards the

audience; social museums are reflecting themselves as multinational, responsive, cultural and educational centers, identified as the “new museum”.

4. Conclusions

The new museum is dynamic. Reflecting this dynamism to the society and ensuring the sustainability of the museum, can only be achieved with establishing comprehensive relationships with the city and the museum users. By their mission, contemporary museums are seen as multipronged centers that contribute to the culture of society. Besides from the duties of preserving and improving the collection, the museums are coming into prominence with the educational aspects and becoming increasingly socialized structures.

In conclusion; the inclusive museum should; [13]

- Aim to serve the community.
- Create a collection and be able to interpret the content.
- Be in collaboration with other disciplines.
- Embrace all parts of the society and be in contact with the museum user.
- Create awareness to integrate the differences.
- The museums which were known as cold and distant places evocative of holy structures until the 20th century; should now get through with the collection based management programs and be directed to the visitor-oriented planning.
- Implement educational public programs and see the museum as an "event space".
- Make the museum user as a priority factor of the museum.
- As an important part of the culture industry, museums should; make activities that impact the urban culture, be an agent of social development and the promotion of different cultures.
- Museum architecture and interior organization should be updated according to the museum users' needs and be sustainable.

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Urban Myths as the Reliever of Social Anxieties

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Abstract

A myth, in lexical terms, is used to define an archaic narrative consisting of stories that relate to common fears humans experience against the rage of natural forces or against any phenomenon that makes them feel despair in bringing to a resolution. 20th century anthropologist C. Levi-Strauss states that myths come out as functional narrative tools that although not completely capable of resolving them, are devised to dissipate the anxiety caused by such contradictions of man in primordial groups or societies. Urban Myths, in the context of this paper is used as a conceptual term to define the architectural and urban discourse brought about by the modern utopia. The emerging structure of the modern society both have inspired and concerned the architects and urban designers along with the ingenious people from other cultural disciplines leading them to give products that tackle the problematic issues of the social setting both existing and still to come. A retrospective contextual analysis of the modern architectural topos portrayed by those actors could be devised to lay out a portrait of how the concerns or anxieties of modern society stemming from environmental issues, population growth, energy shortage and social inequality, etc. could be relieved. The aim of this study is to bring a phenomenological approach in determining this reciprocal relationship between the architectural topos and social structure within the range of given examples and to bring discussions on how this episteme could affect the contemporary architectural discourse.

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Keywords: Urban Topos; Modern Utopia; Architecture; Phenomenology

1. Introduction

Utopias are usually considered to be novelistic narratives that envision a society and a topos in which to live, in somewhat a distant future: a neverland, a dreamworld or a realm which is impossible to both technologically and ideologically get a grasp of. Yet, this lies as a superficial definition compared to what the Utopia is truly capable of within its discursive functioning. More than being just a visionary narrative portrayal of a futuristic society and a yet to come urban setting, the real function of utopia can be stated to bring a critical review of the very society that it depicts. Utopia criticizes how the power is controlled and exercised in a social structure, and how social behavior takes shape in reaction with it. Under the figuration and guise of a desirable realm lies the critique of social concerns like the crime and the punishment, distribution of wealth and power, inequality, urban poverty, right to live, so and so forth. In between the lines, utopia signals the anxieties of the society brought about by those concerns.

Since the early examples, utopias in the domain of Architecture and Urban Design also have dealt with similar concerns generated within the social context, which in turn helped define the Modern Architectural discourse. Architectural utopias prior to modernity have been utilized in questioning the transition from an agriculture-oriented society to an industrial one, the spatial requirements of which were little known at the time. The definition of type buildings, their formal and functional principles, the modern city image, all owe something to the emergence of the architectural utopias. Urban Myths, in the context of this paper is used as a conceptual term to define the architectural and urban discourse brought about by the

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modern utopia. The emerging structure of the modern society both have inspired and concerned the architects and urban designers along with the ingenious people from other cultural disciplines leading them to give samples of cultural products that tackle the problematic issues of the social setting both existing and still to come. Utopias or urban myths, make the contradictions visible that are caused by the production relations in the society presence of which is felt in the urban topos. Although not being able to overcome them completely they relieve the social anxieties caused by those contradictions.

2. Diachronic Reading of the Myths

20th century anthropologist C. Levi- Strauss states that myths come out as functional narrative tools that although not completely capable of resolving them, are devised to dissipate the anxiety caused by contradictions of man in primordial groups or societies. To exemplify this, he introduces the diachronic reading applied to the Oedipus Myth. A sample of diachronic reading of any text or phenomenon Strauss gives, is through a series of abstract events which can be marked by the following sequence of numbers I, 2, 4, 7, 8, 2, 3, 4, 6, 8, I, 4, 5, 7, 8, I, 2, 5, 7, 3, 4, 5, 6, 8. If one is to read this series of events synchronous to the elapse of time, a story will be told. [1]

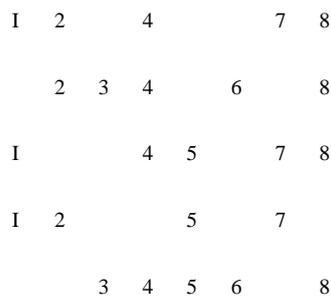


Fig. 1. Diachronic Reading

However, to get to know what this story is really about, one is to group the recurring events in different narrative sections. Fig. 1. shows the same sequence of events grouped in columns sectioning the chronological development of the story. As opposed to synchronic reading, diachronic reading of a story involves a thematic reading of the narrative events.

When Strauss applied a similar approach to the Oedipus Myth, he saw that the recurring narrative events can be grouped in oppositional binary groups under 4 columns, which means that events in each binary column will oppose to each other.

Table 1. Diachronic Reading of the Oedipus Myth

Overrating of Blood Relations (<i>A</i>)	Underrating of Blood Relations (<i>A'</i>)	Denial of the Autochthonous Origin of Man (<i>B</i>)	Persistence of the Autochthonous Origin of Man (<i>B'</i>)
Cadmos seeks his sister Europa, ravished by Zeus		Cadmos kills the dragon	
	The Spartoi kill one another		Labdacos (Laios' Father) = <i>lame</i> (?)
	Oedipus kills his father, Laios	Oedipus kills the Sphinx	Laios, (Oedipus's father) = <i>left sided</i> (?)
			Oedipus = <i>Swollen foot</i> (?)
Oedipus marries his mother, Jacosta	Eteocles kills his brother, Polynices		
Antigone buries his brother, Polynices despite prohibition			

Observing the events given in Table 1. that occur in the Oedipus Myth will show that the first group of binary oppositions is set in between the first two columns Overrating of Blood Relations (*A*) and Underrating of Blood Relations (*A'*). The second group of binary oppositions is set in between the two columns Denial of the Autochthonous Origin of Man (*B*), and the Persistence of the Autochthonous Origin of Man (*B'*). Actors in the first group of binary oppositions (*A-A'*) either take care of (*A*) or harm each other (*A'*), knowingly or without knowing that they share a relation based on kinship. In the second group of binary oppositions (*B-B'*) actors with corporal (bodily) defects fight monsters unwilling to permit men to live on the surface of the earth. Those (chthonian) monsters are born from earth and have to be killed in order that mankind be born from the earth. The oppositional relation in this group is set between the actors fighting earth born monsters (*B*) and bodily deficiencies of men that prohibits them to stand erect on the surface of the earth (*B'*). [2]

What does this story tell basically? To Strauss, the Oedipus Myth provides a kind of logical tool, which relates the original problem -born from one or born from two? -to the derivative problem: born from different or born from the same? [3] Let us assume that we have forgotten all that we know about man's creation. How is it that we do not have only one procreator, but a mother plus a father is a though contradiction. Do we share the same origin with other creatures on this world or placed on it as human beings all along from the beginning? Did we evolve to become human or were we created as one? Are we a product of evolutionary process or created as is? Although the problem obviously cannot be solved, the myth provides a logical tool to ease and relieve the anxiety the contradictions arise.

3. Taxonomy of the Urban Myths *_the Utopia*

A retrospective contextual analysis of the modern architectural topos portrayed within the Utopias as the Urban Myths could be devised to lay out a portrait of how the concerns or anxieties of modern society stemming from environmental issues, population growth, energy shortage and social inequality , etc. could be relieved. To do that a thematic reading of the industrialization process can be carried out with respect to the energy use.

Contrary to the common view, industrial revolution is not consisted of one but three different stages. This periodical classification follows the technological changes in energy use (Fig.2.) The first stage takes place in between 1780 and 1840, which involves the use of steam power. The second stage consists of the period from 1860 to 1930 in which new energy forms like petrol and electricity emerge. According to this classification, the third stage would occur after the 1950's the foundation of which depends on the technology of nuclear energy developed during the WWII. [4]

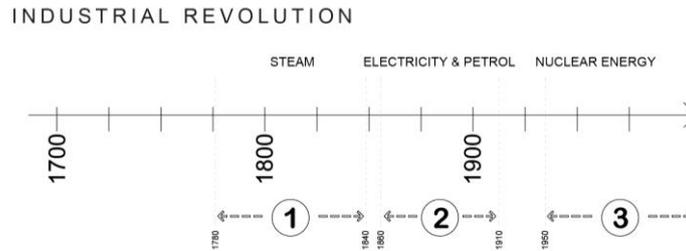


Fig. 2. Stages of Industrial Revolution with Respect to Energy Use

Starting from the primary stages of the industrial revolution, as being the images of the ideal city, utopias kept exalting the process of mechanical production. After the WWII the attribute utopias take on is to relieve the anxieties caused by the population growth and the environmental pollution created by industrialization. According to this categorization the stages of the industrial revolution refer to distinctive changes in the character of Utopias. The first stage of the industrial revolution that involves the use of steam power portrays utopias located in between the countryside and the factory whereas the utopias of the second stage that date back to the use of electricity and petrol refer to the idealization of the mechanical processes. Finally, the third stage of nuclear energy use finds its counterpart in in the eradication of the environmental concerns.

3.1. In between the Countryside and the Factory

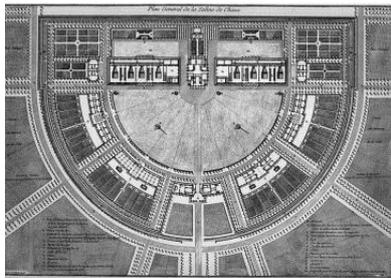
Claude-Nicolas Ledoux's 1775 dated utopia settlement that functions as a salt production facility for the Royal Family in the South of France exemplifies the first stage of the industrial revolution and the character of the utopia that stands in between the countryside and the factory. The office and living space of the head of the facility defines the central axis of the semicircular plan and the entrance. Either side of the facility are the offices of the administrative staff and the production spaces. The living units of the workers are located within the circular form with common kitchens placed in between them. A high exterior wall surrounds the complex and just right next to this exterior wall is spared for the storage of the wood used in the boiler to produce salt, and gardens for the farming activities for the workers.

Robert Owen's New Harmony proposal in Indiana, USA in 1825 for the Harmony Commune is circled by an exterior wall and includes a mechanical production facility, social spaces, dwelling units and a garden for farming in between the exterior wall and the dwelling units. Similarities with Ledoux's saltworks complex include an organized mechanical production facility however the social structure is as dependent on agricultural processes as it is on mechanical one. The utopias of this period is in between the countryside and the factory . [5]

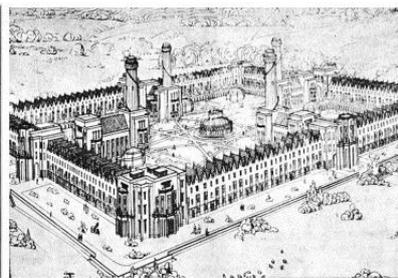
Charles Fourier's Phalanstère which he designed for an imaginary community in 1842 significantly relates determinants of the industrial production processes such as specialization and modularity to architectural space. Fourier suggested the creative activities of man such as industry, arts & crafts, and agriculture were a result of man's liberated desire and that 12 different types of desire would define 810 individuals with differing character and skills that

would require 1620 phalanx units. [6] Despite being quite fictional, Phalanstère questions the idea of modulation and modular coordination.

Utopias in the first stage of Industrial Revolution can be said to face with the contradictions raised by the transition of the society from agriculture to industry-based production. A similar transition is being experienced in today's societies as well for information based production processes are replacing the industry-based production. A new city of the information society is anticipated to emerge in the near future however our knowledge on what this image will look like is no clearer than that of the societies in the past that experienced the transition from agriculture based production to industry based one (Fig.3.).



Claude-Nicolas Ledoux's Royal Salt-works, France, 1775



Robert Owen, New Harmony, 1825

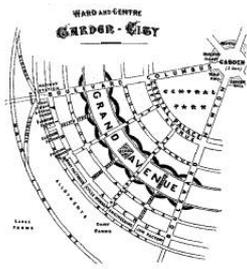


Charles Fourier's Phalanstère, 1842

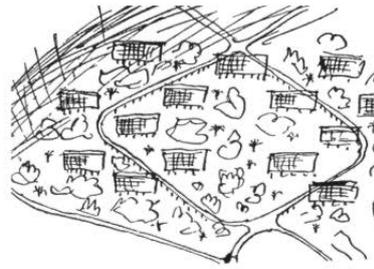
Fig. 3. Utopias in between the countryside and the factory [7] ,[8], [9],

3.2. Idealization of the Mechanical Processes

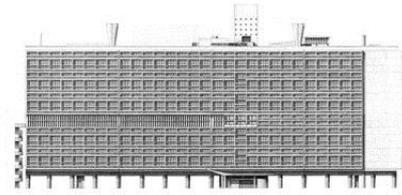
Ebenezer Howard's Garden City vision that he developed in 1902 involves settlements for 32,000 people separated from each other by green areas. Despite that it was not realized, the ideas developed from within this project have affected the mass house production in the 20th century. In the visions of both Howard and Le Corbusier, the green is introduced as an urban function. Green is defined as an urban function to keep the negative effects of industrialization and vehicle traffic such as conglomeration, contamination and noise away from the living units. In the housing development in Marseilles, the standardized living units are raised from the ground on columns to enable a continuous green. Le Corbusier's Unite d'Habitation in Marseilles in 1947 introduces the idea of the living unite as a machine which he says is an interpretation of Fourier's Phalanstère. Four basic functions take part in the operation of this machine: Dwelling, Production, Recreation and Circulation. Settlements and buildings idealize the industrial mechanical processes and multiply them by recreating those processes in the architectural space. The society, the living environment and the city are all considered as a machine. The unit to whole relationship to define the mechanical assemblage, and the terms to define mechanical processes like hierarchy, specialization, modularity find their reciprocal counterparts both in the architectural space and in the envisioned social structure. The users of the urban space live in the modular and standardized units while the production takes place in hierarchical organizations in which the spatial differentiation and specialization gains more importance. Social life is defined as a unity of the contributions of all its individuals (Fig. 4.).



Ebenezer Howard's, Garden City, 1902



Separation of traffic and green, Unite d'Habitation, 1947, Le Corbusier

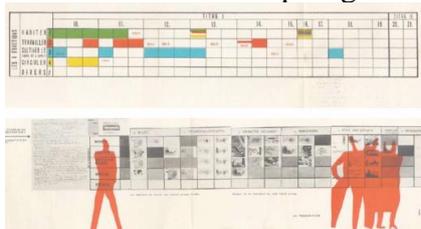


Unite d'Habitation, 1947, Le Corbusier

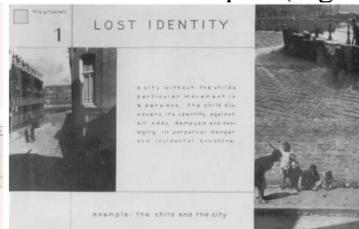
Fig. 4. Utopias that idealize mechanical processes[10], [11], [12]

3.3. Eradication of Environmental Problems

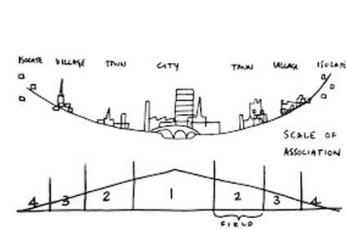
It can be said that anxieties, in general, prevail the third stage of the industrial revolution. The basic functions of the city is gathered under four topics as stated in the 1943 Athens Charter of the International Congresses of the Modern Architecture CIAM, Initiating from the *Ville Radieuse* which is published by Le Corbusier in 1935 the urban functions are simplified and transformed into a grid diagram according to which the city will be divided into zones according to those functions and the function of work will be located at the center. Reducing the city into four functions and locating the function of work at the center of it is an appearance of the idealization the machine which in turn has lost its indisputable position with a simple question raised by a formation of a group from within CIAM in its 1954 meeting that named themselves as TEAM 10. The question they uttered was so simple yet well directed: 'Why would the city not be a place where the house and the street is located at its center?', and 'Why would the life on the street, which gives the city its identity not be consisted of the playgrounds for children?' Team 10's motto 'The city is like a large house and the house is like a small city' indicates that the urban space could no longer be considered as a replica of the mechanical processes. On the contrary, this statement refers to ways in which the architectural manner would take form against the negative aspects of industrialization and remains to be the first concrete critique against the modernist utopia. (Fig. 5).



CIAM Grid



TEAM 10, Lost Identity



TEAM 10, The Doorn Manifesto

Fig. 5. CIAM & TEAM 10, concerns against modernist utopia. [13], [14]

The vertical development of the cities appear as a generic solution to the problems of population growth and the shortage of natural resources that the industrial societies of the 60's started to confront. The fact that land is a nonrenewable and limited natural resource led Yona Friedman to propagate the urban space by raising the buildings above the street level. Similarly, Yona Friedman and Guy Rottier create urban spaces above the street level in his *Nice Futur* vision. In both the projects the recurring idea is the propagation of the urban spaces. The fact that land is a nonrenewable and a limited natural resource especially in a country like Japan has led Arata Isozaki and Kenzo Tange, to conceive a futuristic vision in which the urban development takes place on water from the city center towards the

convolutions of the Tokyo Bay. Utopias that propose the use of the sea and the ocean for the development of the city come out as a generic vision for the future (Fig. 6.).

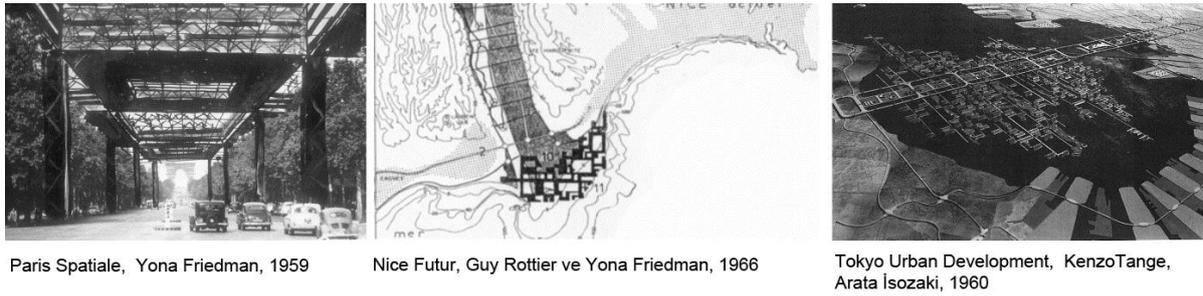


Fig. 6. Utopias that confront the problem of population growth and shortage of urban land as a nonrenewable resource. [15], [16], [17]

Nuclear energy and systems approach are among many technologies and perspectives developed during the WWII. Buckminster Fuller's geodesic dome structures can span an infinite distance in theory. In his Manhattan vision, the whole city can be contained under the isolation of a geodesic dome that could protect cities from the contamination of an unexpected nuclear pollution. A different use of geodesic dome can be associated with extreme climate geographies like deserts and poles of the planet that are not suitable to sustain human settlements (Fig. 7.).

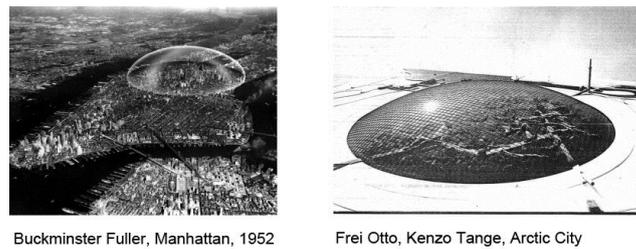


Fig. 7. Utopias for environmental pollution and extreme climate. [18] , [19]

Systems approach depends on the idea of the components to come together to make more than their total sum. Systems approach involves the components to work together to form an expandable, flexible, and evolvable system that became a repeating pattern for the utopias during the 60's. In Archigram's Plug-In City, and Capsule Tower, and Moshe Safdie's Genetic Code New York projects, prefabricated units come together in a systems approach to make a three dimensional development possible for the urban settlements (Fig. 8).



Fig. 8. Utopias and systems approach. [20], [21]

In the third stage of the industrial revolution, the utopia confronts the problem of the exhaustion of the urban land as a nonrenewable resource. The WWII induced a seamless growth in the world economy triggering a population explosion, which in turn led to the confrontation with the fact that the natural resources of the planet were finite. The utopias designed in this era bring the environment related anxieties into focus.

4. Conclusions *_the city is not an island*

The historical comparison reveals both positive and negative aspects of the utopian projects in defining the modern city image. As stated earlier, just like the myths, utopias relieve the society from anxieties caused by the production relations and the technology. They do not show exactly where the solution lies or the ways to eradicate the problems yet; they envision how the design of the built environment can be utilized to bypass those problems. Applicable design ideas, like the ones presented in the CIAM meetings are immediately adopted by the modern architectural paradigm. Others confronted us with the price we have to pay if we do not counter act. In both cases, utopian projects enhanced and encouraged the construction technology, and besides functioning as reliever of the social anxieties, they came out to be innovative agents in the field of architecture.

The negative aspect of the utopias is that they produce an ideal city image and reduce the conception of it into an island. Starting from Thomas Moore's Utopia in which he depicts an ideal society and its habitat, utopian projects in the field of architecture conceived the city as island. [22] Utopian projects often time envision an isolated and introvert urban setting for a society withdrawn from the rest of the world in terms of its economic and political relations trying not to solve the real problems but to externalize them; leave them on the doorstep. This is most evident in the utopian projects of Fuller and Otto, or Archigram as they propose a condition of homeostasis for the environment in which variables are regulated so that internal conditions remain stable and relatively constant at all time for an autonomous society. However the city is not an island. Cities are a function of circulation and of circuits. It is defined by entries and exits: something must enter it and exit from it. It imposes a frequency. It is a phenomenon of transconsistency, and a network [23]. It is a complex structure that builds relations with its own social, cultural, economical, political and geographical context. Idealization of the city may lead to the cities that fall apart from the idea of the city.

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Interior Design under the Influence of Periodical Effects and Cultural Traces: Centre Georges Pompidou & Centre Pompidou-Metz Designs

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Abstract

Centre Georges Pompidou, with its milestone design, brings a breath of fresh air to museology approach and architecture in Paris. In this regard, it has made a great contribution to the area and has been an important reference point for Centre Pompidou-Metz. These two Museums have the same names; however Centre Pompidou-Metz has built after roughly 30 years from Centre Georges Pompidou to seal the fate of Metz. Both are award winning projects in contests and their iconic expressions are quite strong. Centre Georges Pompidou's structure can be a reference to the era's architectural approach with its universal language and the used multidisciplinary program which has never been applied before; therefore, in this context, it creates the first step in France. This multidisciplinary program has been harmonised with traditional traces and technology of the era, then applied to Centre Pompidou-Metz. Metz, considering its architecture and target audience profile, constitutes a more modest structure than assertive and bustling profile of Paris. Based upon this modesty, together with Japanese traditional motifs, the structure of the museum is visible in itself and compatible with the city in which it is located. In both museums, architectural approaches of the era and cultural traces can be easily observed. However, in Centre Georges Pompidou, influence of the era has dominant effect whereas local traditional traces have the dominant effect in the design of Centre Pompidou-Metz. Therefore, in sub titles Centre Georges Pompidou will be studied in terms of the influences of its era of design and Centre Pompidou-Metz will be studied in terms of the influences of its architect's culture.

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Key Words: (Design, Museum, Architecture, The Centre Georges Pompidou, The Centre Pompidou-Metz, Influence of the Era, Trace of the Culture, Form, Space)

1. Introduction

Design emerges from an idea and evolves with creativity process. In this progress, the identity of creator, the time period and the place of the prospective product, who and/or what is designed for are influential factors on the design. Moreover, the approaches which are yielded by the time period and the cultural traces have a substantial impact on shaping the form, technology, the materials and detail usage in the production process. All nations have different connotations for particular concepts in their own culture. Cultural traces arise under the complex influences of the living places, the relationship between climate and environment, and the flow of events. Therefore, they lead individuals to have a specific approach towards the events and facts. Political events, economic structure and the relative tendencies that occur during the same time period of the design, are the other factors which influence the approach of the design.

In this context, architectural designs of Centre Georges Pompidou and Centre Pompidou-Metz Museums, which are constructed in different times and different French cities, will be examined by considering the periodical effects and the cultural traces on them. So, both common and different reference points of these Museums which are designed by different architects under the sole name, as part of the same subject and aim will become evident. Moreover, there will be a referral to the language approach and imposed meanings in these two projects which are designed by European architects, Renzo Piano (Italian) and Richard Rogers (Italian born British), and Far Eastern architect Shigeru Ban (Japanese).

Centre Georges Pompidou, which was a design of Richard Rogers and Renzo Piano whose project was registered as a result of a competition in 1971, was designed in pop style with a radical approach for Les Halles region of Paris and was dedicated to Georges Pompidou who was a conservative politician. It was opened to visit in 1977. The museum was designed to have a simultaneous cultural centre feature which was an unusual idea in general museum understanding; and it played a catalyser role in the transformation process of the region. [1] Architectural identity of the museum accommodates *pop art* (1950's and 1960's) which was originally developed in Great Britain, *post modernism* and *neo-conceptualism* (1970's to 's) effects. According to British artist Richard Hamilton, pop art which is the reflection of an artistic belief oriented towards society's changing values; is qualified as a mass audience, popular, young, glamorous and transient solution. [2]

Centre Pompidou-Metz, which was also a selected project of a competition in 2003, was designed by Japanese architect, Shigeru Ban and it was opened to visit in Metz, France in 2010. Based on the fact that Centre Georges Pompidou had established its existence for the whole world in 30 years, Centre Pompidou-Metz was designed with an aim to carry Centre Georges Pompidou's success forward, to reach a broader audience, to develop and accelerate the city of Metz which was relatively monotonous. [3] Shigeru Ban demonstrated his talent on his cardboard and paper emergency shelters projects to prevent the adverse effects of disasters such as Japanese earthquake. With an inspiration of traditional Chinese boaters, he used the same fabric and the splices to design the upper cover with a small construction and used light raw materials in all details of the museum to prevent their pressure.

In spite of the fact that these architecture designs are continuation of each other with 30 years between; they have different approaches. Centre Georges Pompidou reflects an international universal approach, and the effects of the construction period. In its general structure, consolidation, build on and contrast tendencies are observable. [4] On the other hand, in Centre Pompidou-Metz, local signs are more visible, which the architect reconciled with the place and his own culture, brought solutions linked to these. Beside this, the common features of these museums are that both of them well suited to their locations, became the attractive points and the icons of the cities.

2. Methodology

In this study, the top covers and interior designs as well as the design approaches of these two Museums will be analysed. Despite of the fact that both the effects of the era and culture can be observed as influential factors in both designs, for the purpose of this research, the dominant influential effects will be focused. In this context, after giving a general explanation about the era and culture influence on designs, the dominant effects in the designs of the Museums (i.e. influences of the era for Centre Georges Pompidou and traces of the culture for Centre Pompidou-Metz) will be focused. Both of the buildings will be studied in terms of their (i) space organisations, (ii) relation of material and form, and (iii) relation of color and form. Photos and notes taken after seeing both museums and analysing them will create a more convenient ground for the evaluation process. Such illustration will be used to provide an idea about the structural features, exterior facade and space organisation of the Museums. At the end of the comparison between the Museums and the dominant effect on their designs, we will propose our conclusion.

3. Factors on Living Space Design

On today's living space designs, we see a focus on attractive, striking, charming designs in which the opportunities technology bring to materials, forms and building techniques are made advantage of. Recently, in the museum architecture, we observe designs which show outstanding features on the look of the city and function of the places and the exhibitions are quite left behind comparing to the architectural core. There are various subjects which have an effect on this embodiment of modern art museums. Some of the subjects which customize the buildings are target population, location, its constructor and the approach to be used during the construction. In addition, traditional architecture styles, typologies and architectural movements are quite influential in museum architecture. Centre Georges Pompidou - a symbol of the era and Centre Pompidou-Metz - contains traditional architectural factors - museums are appropriate examples to be analyzed within the scope of these subjects which are important in living space designs, with the influences of the era and cultural elements.

3.1. Influences of Era

The world of architecture has created an awareness of that the past is a different category comparing to the present and the future, while creating the term 'historicity' on the other side. It can be said that every era has a unique soul expressed by means of art and culture. The world is full of many concepts and objects belonging to different eras. The designer interprets these concepts and objects with a perspective of his/her own time and location and creates new designs. Design is a means of notification as much as it welcomes a function. It is based on a documentation system beyond just a perceptual experimentation and sometimes it is expressed as a reaction. The factors which influence life such as religion, politics, economics, art and technology are the factors which

influence the soul and the approach of the era.

In architecture, the present values and the understanding of era can be seen as stylistic references. Some artistic principles are common in the eras in which architecture is in affiliation with other arts. For example, in renaissance era, spaces were drawn in little, like in today's architectural perspective options, in order to create the distance feeling. Bauhaus aimed to unite architecture – a synthesis of arts for artistic unity – with other arts. When we take a look at postmodernism, we can see structural themes such as iconography and identification in postmodern era architecture. We can also encounter such similarities in current art. [5]

3.2. *Traces of Culture*

Culture is a tool which shows the extent to which humans dominate its natural and social environment used for creating all material and nonmaterial values built during the process of community development and handing them down to the next generations. [6] Culture is, on an individual basis, comprised of personal experiences and savings as long as s/he continues to exist. The designer comes into being in social environment as a person with his/her world view, education, arts and aesthetics view. An outer ring of personal culture is local culture. Every community divergent and unique values and local culture is comprised of these values. Climate and geographical conditions of the area are also effective on the local culture.

There are some factors which are prominent and some steps which are required throughout the design process of a space. Where, when, by whom and with which approach the space is going to be designed, and to whom it is targeted, are important determinants of the design. Social and cultural characteristics of the space or the designer's culture which affects his/her approach may be expressed as local traces. In this sense, there are unique buildings which do not resemble any of the buildings in the same area because of the different local traces they have. Alvar Aalto states that function cannot be isolated from the cultural meanings of a building type and other former examples of it, and there is no content in styles to express but they have meaning in a system of acceptance in cultural context, referring to relation of *type, function* and *design*. [7]

4. Influences of the Era and Centre Georges Pompidou

Architecture, besides from the aesthetical problems, is a product of political, philosophical and ecological matters drawing its power from the cultural discourses of the era. There are some approaches which unite a architects' community on specifying a form and adopting a distinctive attitude. These approaches are ever-changing in the light of the developments in the world. Form is sometimes a means of expression for an era, or a tool for sense-making. Throughout this process, sometimes meanings buried into the cultural tradition come to light. Transparency, for example, is about various different thoughts. It has generally been a good criterion for the modern architecture. It has strong, spiritual and mystical tones in expressionism. While it is associated with an endless abstract space in De Stijl, it is used with its connotations in Pompidou Centre. The building is seen as an object which is available for everyone.

4.1. *1970's*



Fig.1. (a) Lloyd Building in London by Richard Rogers,1978-1986 ; (b) Detail from the Facade (c) Interior View of theBuilding

The architecture theory was under the effect of forms of determinism and populism in 1970s. Throughout the period from 1960s to 1970s, social progressivism values continued to expand and gave a new insight to the detached and systematic approach of minimalism. Conceptualists who share the serial logic of repetition of the

units creating a building of minimalism, Douglas Huebler's (1924-1997) documents of places of which photograph records he took in every 24 minutes, American performance artist Vito Acconci's (1940-) "Step Work" for which his photographs were taken as he got up and down a stool in particular hours for months are some examples on this subject. Apart from these experiences which were recorded on particular times and locations, projects on which the experiences are narrated are gaining more importance.

In the beginning of 1970s, while High Tech architecture which emerged as an alternative technology means electronics, computers, silicone chips and robots in electronic sector, it means a particular style in architecture. Within the last 35 years, High Tech has become a label for any structure to be designed by Michael Hopkins, Nicholas Grimshaw, Richard Rogers and Norman Foster. In High Tech architecture, metal profiles and machine-like buildings become more prominent. Used metal and glass material adds a different view of aesthetics and turns to a technology show, which has influences on many. Structures like this are taken as a tool which is used in everyday life and it is highlighted that they need to be functional and practical. [8] Instead of conventional materials like solid concrete, bricks and mortar, factory production, porous and transparent pieces, easily assembled material like glass and metal are preferred.

4.2. *Centre Georges Pompidou* *Renzo Piano ve Richard Rogers, 1971-77, Paris-Fransa*



Fig.2. (a) General View of Centre Pompidou; (b) Entrance of Centre Pompidou

In 1969, Paris, it was decided to build a contemporary art museum which would exceed the limits of general museums and the idea that it should also be lively, colorful a center of culture. With this new approach, Centre Georges Pompidou was established as a culture and arts center connecting with the community, living in the era and constantly getting updated instead of a center which is in isolation from the community. On the preparation process of the project, Rogers and Piano charted the architectural shape of Paris and took socio-cultural structure of the city into account. In this sense, the idea of designing the museum as a laboratory, an exhibition on society and architecture and a playground was adopted. [9] With this approach, Centre Pompidou was developed in a different way of expression and became a symbolic representation of pop culture when its construction was finished. [10]

4.2.1. *Space Organization*

Centre Georges Pompidou, in a general description, is both technological and popular. Technology was like a locomotive in spatial design and increased the iconic power of the building. Rogers highlighted the usage of technology because technological factors are effective in visual design and technology allows him to design new open spaces. In the building we can observe spaces which can later be transferred into various functions and contemporary art spaces which are fully open and adaptable. For example, the Statue Terrace in which Calder's and Takis' works are being exhibited make up the most delightful observation platform to be in. Centre Pompidou, when its general view is examined, looks complete so the floorings and other elements can be attached and detached to the building. Some elements which require changing or repairing in every 15-20 years such as services, installation pipes, elevator motors are taken outside the building, which facilitates the maintenance process.

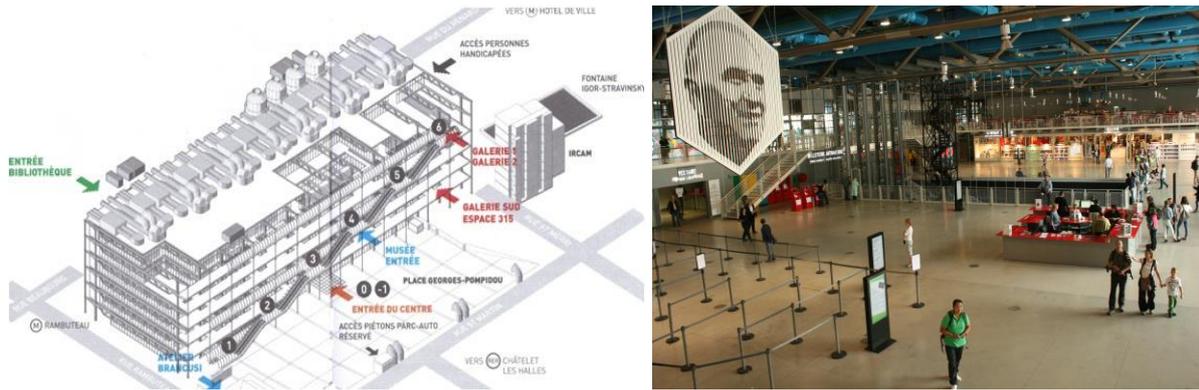


Fig.3. (a) Perspective View of Centre Georges Pompidou; (b) Entrance of Centre Pompidou

4.2.2. Form – Material

For the structure of the museum which has many functions to be accessible for everyone and visibility of the spaces from the outside, transparency has the utmost importance. The idea of a grand space without any bearing elements for support requires steel as an irreplaceable material for the building as it enables passing great gaps. Shiny and thin material to provide flexibility and transparency on the building, walls, roof and bearer structure system is preferred. The structure with a modular concept consists of a mixture of material integrity, practical labour and prefabric industrial pieces with particular codes.

4.2.3. Form – Color



Fig.4. (a) Image of Colored Plumbing Tubes; (b) Grand Hall of the Museum

Some factors which are left behind in terms of architecture are transferred into a design tool for the architect. All the sections of the building can be seen from the outside. The building which has big and elastic spaces has opened itself and the way it is meant to be seen to the outside world. Every color used in the building represents a different function. For example (i) red is for human walking patterns, (ii) green is for water cycle, (iii) yellow is for electrical parts and (iv) blue is for air cycle. [11] Centre Georges Pompidou is like a transparent box which is made to be carried to a steel and concrete structure. There is a gridiron system which consists of prefabricated columns and cross buttresses in all facades. Tube-like spiral walking pathways are found on the front façade which cut the building diagonally. These architectural factors carry the insides of the building to the outside with service chimneys of different colors with different functions on the back façade.

Centre Georges Pompidou contains various spaces in which people can add up to their cultures and have quality time such as a big public library, National Contemporary Arts Museum, Industrial Design Center, Continuous Exhibitions, Acoustic and Music Research Coordination Institute. This function of the Centre makes it “high popular culture united with a new radical style of architecture”. [12] According to Buchanan; for Renzo Piano, in his designs, the building expresses itself with its sections rather than the plans. The reason for this is that the designer uses the two opposite approaches such concern of carrier system and concern of surface which is of great importance in postmodern approach. [13]

While designing the structure which can be seen as a crazy chaos made of pipes, cables, buttresses and almost cat paths, the designer adopted an approach which has the culture of 1970s, with socialist and consumerist factors. The building clearly shows the mechanical services put out of the structure. This method presents a design which reveals approximately 50 m deep open spaces which allow flexible use. It sets the building in motion and liberalizes the space in the structure. Centre Georges Pompidou hosts many visitors in its museum collection, continuous exhibitions, library, bookstore and gift shop, café and restaurant throughout the day. The intense program which was proposed to the museum with a new approach in 1977 has had an important role in the shape of the contemporary museums of today. In addition to these, the Centre has symbolized the market as a new type among many public buildings and created a neutral cup for the indefinite, non-classifiable culture load.

5. Traces of the Culture and Centre Pompidou-Metz

It is known that the brain transforms the notions of the designer acquired with experiences to the form during the process of producing. This mental act is about the values the designer has personally and culturally. Shigeru Ban has developed an approach in accordance with his country Japan's cultural approach and local tones. He is a famous architect due to his invention of recycled channeled carton tubes in Japan, a seismic zone. According to him, being an architect is a product of space, time and nature. He is known for his design principles uniting local materials and high technology.

5.1. Traditional Architecture of Japan



Fig.5. (a) Outer View of a Japanese House; (b) An Interior of a Japanese Structure

Japanese architecture can be summarized with minimalism and simplicity, the close relation between architecture and nature, expert material use united with technical perfection and light construction. These are the features which are based on Japanese cultural identity and Japanese aesthetics. Free space approach is highlighted in these buildings which have light construction standing on the columns. Roof structures of the buildings were hidden in completely seen elements before. Later we see that the main beams of the roof can be seen from the outside. Centre Pompidou-Metz is a good example for this approach.

5.2. Centre Pompidou-Metz, Shigeru Ban 2010, Metz- Fransa



Fig.6. (a) Outer view of Centre Pompidou-Metz; (b) Entrance of the Museum

Centre Georges Pompidou is an institution which makes a distinguished name for itself with its surprising and innovative exhibitions in Paris. The museum established itself in the world in a 30 years period after its construction. Centre Pompidou-Metz is one of the most important projects to contribute to the museum for the purpose of taking this success forward. The architect of the building, Shigeru Ban designed houses covered with giant horizontal covers to open when requested, with no walls on their façades and with light construction as the country is in the seismic zone. He made his ecological designs actual by means of using recyclable material and presented nature-affirming buildings thanks to the culture in which he was born.

5.2.1. Space Organization

Centre Pompidou-Metz was built by means of putting three rectangular parallelepipeds on each other from different angles and covering the surface with a curvilinear organic form roof (a cage made of curved laminated wood parts). The exit source and the form of the roof covering which designates the characteristics of the structure is the traditional “straw hat” of the Japanese people. The wavy roof which covers the building has a fibre surface with a diameter of 170 m. The surface is covered with 80.000 square meters of membrane-polytetrafluoroethylene (‘PFTE’) and semi-transparent fiberglas. Unity of the free movement of units under the curved and organic form roof create a light structure. There are constant gaps between the units which are connected to each other with flowing details. The transparent roof is what gives the fully breathing structure its iconic value. Wright’s Guggenheim Museum in New York is an example of this subject. [14] Each of the concrete tubes with huge windows at the start and the end of the tube which are mounted on top of each other with different angles are 80m in length. The façade of northeast facing tube sees old Metz and the cathedrale while the southeast facing tube sees the train station and new amphitheatre.

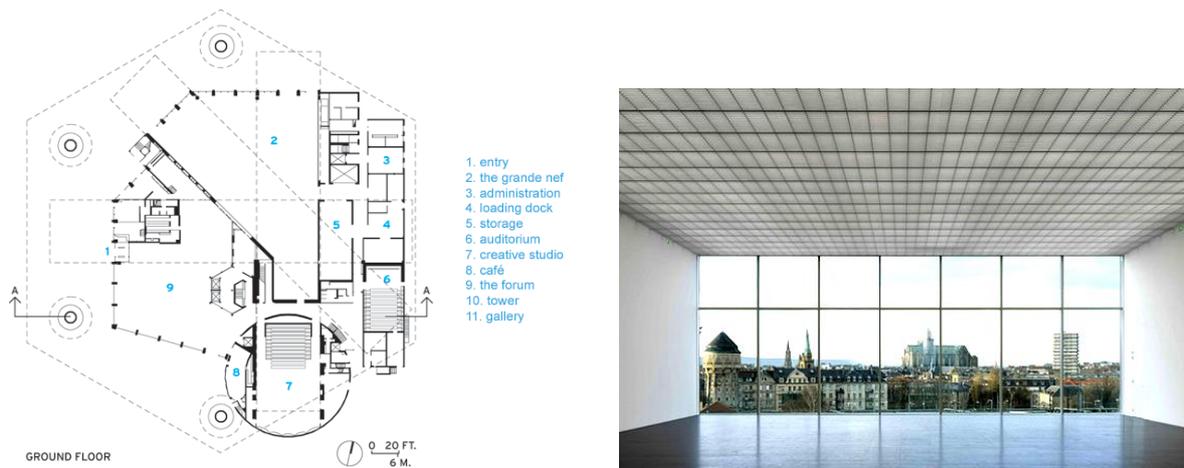


Fig.7. (a) Ground Floor Plan of Centre Pompidou-Metz; (b) A View from the Inside of Metz Pompidou

5.2.2. Form-Material



Fig.8. (a) Detail of the Roof; (b) Interior View of Centre Pompidou-Metz Ticket Sales and Information Desk

The light is intensely absorbed in the entry hall in which patchworked units create a transparent unity. In the entry hall, around which is covered with glazing with pvc profiles on steel construction and induline-plexi façades, some surfaces are covered with mirrors and the ground is covered with epoxy and PVC. Using light materials like pvc and plexi often is preferred so as to create a lighter building structure. This lighter building approach is one of the prominent features of Ban.

When entered into building, a striking height and interior wood carcass of the roof attracts the attention. Roof covering, elevator tower and information office and ticket selling office fully covered with mirror on the left are the architectural elements of the building which grab attention. Using mirrors give a wider feeling to the building and created a surprise illusion effect; thus, with the visual effect of the mirror, the building gained continuity in the light structure. Just next to the Centre of Research, one can go into the first gallery space from the hole. This space is prepared specially for the concept of exhibition with separating walls. The high ceiling space proposes all kinds of elasticity and possibility for the structures.

The plain and bare white concrete blocks of the structure gives out a serious and vulgar effect of the building. Laminated wood construction with white membrane cover top cover relieves the weight of this serious and hard integrity. The roof cover is seen to be home to Japanese influences, the identity of designer of the building, when analyzed in terms of materials used and forms. In entry hall, on which parted structures create a transparent integrity, daylight is fully absorbed inside. In entry hall which also has glass covering with PVC profiles on steel construction and is covered by ondulane-plexi façades, some surfaces are covered with mirrors and the floor is epoxy and PVC tiled. By using light material such as PVC and plexi, a reduction in weight is determined. Creating a weight reduction effect is one of the prominent features Ban suggests.

The information office of galleries of museum is made of double empty edged long and thin ferroconcrete boxes laying on top of one another and going out of the façade. The edge borders (short border) are completely glass and they are screened with vertical venetian blinds. The architecture on the passage hole of 4th floor makes the visitors experience something new. The top of horizontal block on the information office continuing from the façade is covered with mirror. The mirror covered surface reflects the wooden carcass wood cover of the building. When looked at this mirror from the 3rd floor, the visitor thinks between whether this view is real or it is just a reflection. This perfect illusion created by Shigeru Bun captures its audiences.

5.2.2. *Form – Color*

The structure is dominated by light colors. White concrete blocks placed on a flat wide surface and transparent white membrane covering the top of the blocks are in a harmony. Placements on the various axes are affecting the direction and the amount of light creates differences in tones in façades. This difference supports the contrast relation with the color of wood and the white membrane used on roof covering. This contrast provides more visibility to roof covering and underlines the characteristics of the building. Especially on night view, all colors are evened out and the museum turns virtually into an object of enlightening. In order to protect the effect of whites dominating the building, metal materials are also painted in white. This approach creates a light and soft effect on the building.

6. **Conclusion**

As a result of this research, these two Museums with the same name but are located in different cities, have both common and different features. Both of them are the icon of the cities in which they have been located. However, they have been designed by different architects who have different approaches. The different approaches of the designers can be explained through the influence of the eras and cultural backgrounds of the designers on the designs.

Centre Georges Pompidou, a design of Piano and Rogers, belongs to an approach which is based on a movement after 1920's prime actions which is the source of the contemporary movement. According to this approach, in terms of architecture, leaving the architecture in the hands of functions such as space typology and human use is advisable. The structure presents itself as a beautifully designed cup and a service station which backs away as humans come alive. The effort of uniting modernism, traditional institutionalism, populism and memorialism evolved the structure in to today's shape. [15] Centre Georges Pompidou, within the limit of its era, offers a sense of simplicity as a solution and openness as a different alternative which made of different and elastic space constant in the region. This form and shaping approach offer a brave solution without taking into account the region and provide the museum a neutral identity. In this context, Centre Georges Pompidou which was designed in a universal language with the arts and architecture approach of the era can be analyzed as a cultural supermarket.

According to Raymond Williams, "culture" is in the same class with the concepts like class, industry, democracy and arts which appear after the Industrial Revolution. Every country has a different way while developing its culture. However, there is an interaction between local cultures and communities. In this

interaction, local cultures exchange beneficial acquisitions with the other cultures and these acquisitions are implanted, modified and finally initialized by different cultures. Japanese architect Shigeru Bann, who is one of the most significant representatives of Japanese architects, shapes the architectural design of Centre Pompidou-Metz considering the local tones and structure functions of his culture. Therefore, he contributed to the iconic architecture of Centre Pompidou by providing a new and modest identity which is compatible with its cultural and topographic environment. This new identity is a result of Japanese architects principle which requires respect to nature and states that an architect should design a building in connection with the nature, without destroying or imposing any burden on the nature.

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WHAT LODZ MANUFACTURA MADE ME THINK OF SÜMERBANK NAZİLLİ TEXTİLE (BASMA) FACTORY CAMPUS

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Abstract

This paper focuses on the ignored potential of industrial plants founded in Turkey in the Early Republican period, citing Sümerbank Nazilli Textile (Basma) Factory Campus as an example, with the thoughts of a day spent in an old chintz factory which was founded in 1871, in Lodz, Poland, and restarted production in 2006 by the name of Manufactura. The foundation stories of Poznanski's Cotton Empire and Sümerbank Nazilli Textile Factory Campus don't resemble each other in point of fact. Contrary to Poznanski's empire, state-owned Sümerbank Nazilli Textile Factory was the first textile (basma) factory of young Turkish Republic. However, both factory campuses and living environments in these campuses show similarities. These campuses were able to supply all physical, social, cultural and psychological needs of employees, and production continued for many years. The museum and multivision hall in Manufactura bring obscure memories and museum users together. These memories aren't about only Poznanski's empire's, but also employees and their families'. Being a very small part of Manufactura, this museum also offers personal experiences to the visitors. Besides production buildings, research and development laboratories, and ateliers, there are also living space for employees and their families in the factory campus; lodging buildings, a theatre, a concert hall, a hospital, markets, a church, a fire department, even a private train station. Manufacture closes in 1992, and Apsys Polska starts the renovation process between the years of 1999-2002. In 2006, the factory comes into service as Manufactura. At the present time, this complex, as a long-termed project to transform Lodz into a magnet point, consists of a big shopping mall which is built additively, a movie theatre, concert and exhibition halls, playgrounds, concept cafes, restaurants, a convention centre, a kindergarten, souvenir shops, all realized by adaptive re-using the heritage buildings. Furthermore, a four-star hotel is located in this open and closed thousands of square metres area.

On the other hand, Sümerbank Nazilli Textile (Basma) Factory, which was founded in 1937 within the scope of

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Social Factory Project and closed in 2002, wasn't as fortunate as Manufactura, and lost in value, was made available for Adnan Menderes University in the end.

In this study, both campuses will be semitized in detail and considered with a holistic approach.

In conclusion, giving identity to the cities that they are in, it shouldn't be forgotten that these campuses, being living data of industrial archaeology, are the cultural properties which still have the potential to maintain historical and cultural continuity, add spatial relationships and dimensions through intersections to the contemporary country life, and reinforce the sense of belonging.

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"Atatürk is the greatest of us all, and he is all of us"*

*Canvas banner prepared for the opening ceremony of Nazilli Textile Factory

What has triggered this current study was a one-day visit to an old textile factory, which was established in 1871 in Lodz, Poland and reopened as "Manufactura" in 2006. The study aims to draw people's attention to often ignored potentials of industrial facilities of early Republican period of Turkey through an example case: Sümerbank Nazilli Textile Factory Campus.

In fact, the stories leading to the establishment of Cotton Empire of Poznanski (Manufactura) and Sümerbank Nazilli Textile (Basma) Factory Campus are not similar. Unlike Poznanski's Empire, Nazilli Textile Factory Campus was founded by the government of the period as the first state-run textile factory of young Turkish Republic. However, the development of these factory campuses and the social facilities built shows certain similarities. Both campuses fully satisfied physical, social, cultural and psychological needs of the employees by reflecting the prevailing organizational culture without sacrificing the projected production levels and investments. In addition, they affected the spatial development, life styles and the overall identities of the cities where they are located in to a great extent.

Although the similarities between "Manufactura", whose story dates back to 1871, and Nazilli Textile Factory Campus, established in 1933, are mainly about spatial relationships shaped by functions, certain differences exist when it comes to architectural approaches and materials used in the buildings. In addition to production relationships and functions, these campuses were also highly influenced by Capitalist and Socialist models, technological developments and socio-cultural structures.

CULTURAL PROPERTY AS A SITE OF MEMORY

Keeping personal and social memories alive from past to future is directly related to and proportional to the continuity of the existence of landmarks and traces in physical environments. Extended following the development of preservation theories, the concept of monument has gained cultural meaning and covered almost everything as the time progressed. "Cultural Property" is a concept suggested in 1976 by UNESCO by extending an existing terminology to cover all physical entities related to cultural traditions. This concept, which was also used in "Legislation for the Preservation of Cultural and Natural Properties" - enacted in 1983 and law no: 2863-, involves all goods and works that provide concrete data about the art mentality, scientific and technical levels and social lives of different civilizations and whose preservation is believed to bring advantages to public benefit[1].

According to this definition, Manufactura, Lodz and Nazilli Textile Factory are "cultural properties". "Public benefit", an important component in the definition of cultural property, is a universal criterion used while making decisions about the future of such spaces such as giving them a new function or the practices of urban renewal projects.

In this study, my "Spatial Relationships and Intersections

" approach based on Kıray's "Buffer Mechanisms and Intermediate Forms" social change theory[2] and "Bridge" example of Heidegger[3] are strikingly important. The buildings on such campuses provide valuable ideas to encourage creative thinking and production accompanied with spatial relationships and intersections they established at various levels both with the city as a whole and among themselves through time dimension. According to Nora[4], who believes that talking about memory quite often is due to the lack of memory anymore, emphasizes that sites of memory are important multi-dimensioned meeting points by stating: "The essence of continuity is on spaces. Since there are no more environments of memory, there are sites of memory". In short, he highlights that sites of memory have historical, ethnographical, psychological, political and literary dimensions and it is not possible to explore them all.

Two factory campuses examined in this study are "sites of memory" bridging between the past and the future not only for the cities and countries they are located in but also at universal level. The concepts "Place" and "Genius Loci [5]" make spatial readings in these campuses an important component of creative process.

The reason for choosing Sümerbank Nazilli Textile Factory from the Turkish context for comparison is its being the first factory founded in Turkey that is similar to Lodz Manufactura. The presence of Atatürk, the founder of Turkish Republic, in the opening ceremony also gives this building a special meaning.

Following some theoretical backgrounds, a detailed literature review was conducted to obtain information about the conditions leading to the establishment of these campuses and underlying historical process until the present time. The literature review revealed a number of scientific studies about this campus, though the

number was quite limited.

In addition, the personal web blog created and administered by İlhan Öden[6], an ex-employee of Sümerbank, provides firsthand memories related to the campus and is successful in setting a public agenda about it. The literature review also showed that Kayseri Textile Factory Campus, another industrial investment of early republican period, was redesigned by architect Emre Arolat as AGÜ Campus area and the site received an award for its design. Moreover, Denizli Textile Factory Campus was demolished and replaced by luxurious shopping centers and housing estates recently.

To summarize with, this study is more than just a paper to be presented in a conference since it is based on strong theoretical foundations. Therefore; a clear and easy-to-understand language was preferred without using too much theoretical terms so as to reach more audience. The section giving information about Turkish context in this paper should be considered as an introduction for a more comprehensible study in the field.

MANUFACTURA: FROM PAST TO PRESENT

A literature review of Poznanski's Empire reveals the following information about its history:

1851 - Izrael Kalmanowicz Poznanski marries Leonia Hertz, who is dowered with „materials trade (shop)”, worth 750 roubles. This marriage enriches Izrael Poznanski's, a master of „weaving profession” at the time, fortune by a manufacture worth 500 roubles,

1852 - Kalman Poznanski transfers to Izrael his shares of 2150 rubles in the „ell materials trade” by notariat act, thus joining the family capital. Izrael starts to develop his weaving manufacture, dealing effectively at the same time in cottonware,

1859 - Izrael Poznanski owns not only 50 weaving workshops, with 75 workers, but also a dynamically developing trade office,

1860 - The significant increase in wealth allows Izrael Poznanski to enter the estate market and to buy land in the Lodka river valley, on the east side of Nowe Miasto (from the side of Helenow),

1865 - Having over 6000 zł in his possession, Izrael Poznanski joins the Tradesmen Association of the city of Łódź and successfully operates among others Scheibler's Textile Works,

1871 - Izrael Poznanski buys his first building lots on the west side of Nowe Miasto, along Ogrodowa street. Soon his "cotton empire" will start to develop on this land, including multi-storey workers' houses,

1872 - He builds and opens his first one-storey weaving plant, furnishing it with 200 mechanic looms powered by a steam machine which constituted a technological breakthrough in the textile industry,

1874-1875 - He adds another 1040 looms to his weaving factory as well as textiles finishing department,

1877 - He buys a building plot on the corner of Ogrodowa and Zachodnia streets with a one-storey house, which is to become the basis for the largest future palace residence in Łódź – he built the most beautiful factory building of the textile works along Ogrodowa street equipping it with 3600 spindles,

1878 - He increases the productivity of his weaving works to 50000 spindles and is awarded a bronze medal for the products presented at the Exposition Universelle, the World's Fair in Paris

1879 - Until 1889 he purchases further properties along achodnia street in the direction of Drewnowska street,

1880 - He opens a new threading department beside his ground-level weaving plant,
1883 - Poznanski funds a gas plant for his factory
1884 - He establishes a repair shop, which will later be turned into electrical workshops as well as an iron-works (later to become the steam-engine workshop),
1885 - His factory receives its own dye works
1887 - He now imports Russian and Persian products, instead of American, Indian and Egyptian, which allows him to lower costs.
1888 - He adopts a new premises for old wooden town church
1889 - He changes the business into a public company
1890 - He establishes a fire department for his factory
1891 - He develops his factory even further, adding a paintworks department.
1895 - 98 - He builds the so-called tall weaving works and the tall warehouse in the west end of the factory complex.
1900 - His wealth exceeds 11000000 roubles. The same year he dies and his eldest son, Ignacy, takes over the business.
1902/3 - construction of Poznanski's palace is finished.
1904 - The company establishes a workers' canteen.
1905 - The company opens its own railroad station.
1908 - Ignacy Poznanski dies. The company is now run by Jakub Hertz - Izrael's son-in-law.
1912 - The new power plant is opened.
1913 - The number of employees exceeds 7000 before World War I
1914-1939 - Due to World War I business problems begin for Poznanski's empire.
1940-1945 - The Germans take over the factories
1945-1950 - The factory is nationalized after the communists assume power.
1971 - The historical buildings conservator announces that Poznanski Palace and the factory are among the four most important monuments in Lodz
1981-1989 - This decade passes on constant decrease of employment and production.
1990 - Business loses its financial stability
1991 - The Ministry of Finance declares the factory bankrupt.
1992 - The factory closes.
1993 - Negotiations between potential investors and public receiver begin.
1999-2002 - Apsys Polska starts the renovation process.
2002 - The City Council gives permission to begin construction works.
2003 - Construction work begins
2006 - Grand opening of Manufaktura! [7]

In addition to the production facilities, laboratories and workshops on the campus, many buildings were established to meet all kinds of needs of employees and their families such as lodging housing, theater hall, hospital, shopping center, church, fire department and even a train station. The factory closed in 1992 and Apsys Polska started the renovation process at 1999-2002. Later, it reopened its doors as Manufaktura, in 2006.



Fig.1 Poznański' s Cotton Empire and Manufactura, Łódź

The museum and multi-vision hall in Manufactura introduce the vague memories of the past to the “museum users”, which are not only about Pozanski Empire but also the employees and their families. Although it is a small museum, it offers different personal experiences to its users.

Today, a long-term planning and application process has been launched to make Łódź a center of attraction. The campus now has cinema, concert and exhibition halls designed by giving historical buildings a new function, playgrounds for children, cafes having different conceptual designs, restaurants, convention centers, a day-care center, and a souvenir shop. Moreover, there is even 4-star hotel on this wide campus, which has both

open and closed areas.

It is necessary to carry out detailed research about the possible effects on nearby environment before launching such a comprehensive restoration and renovation projects in such a large area. There are certain inadequacies and imperfections in this practice as well. Kleim highlights the climatic dimension of these;

The Manufaktura redevelopment project will convert the abandoned textile buildings into a modern and functional centre of culture, entertainment and commerce. The project comprising of 12 buildings with the construction of modern retail complex. Manufaktura fits perfectly into the history of Lodz cleverly echoing its industrial development, and creating a new image for a large sector of the city centre. Thanks to Manufaktura this so far neglected part of the city will soon become a modern and extremely attractive.(Klemm, K. 2005.) The revitalization of post textile industrial areas in the old city centers causes the significant changes in building arrangements. The old factories were located near the rivers's valley. The valley enabled fresh air to ventilate the city . On the spot of the river bed new buildings arisen. It had a significant influence on climate both in urban and local scale, [8].

On the other hand, “the transformation from a post industrial area into a multifunctional one with the dominant function of trade on prices and marketability of apartments located in the vicinity of the complex”[9].

However, Manufaktura, Lodz is still an outstanding example of urban renovation projects since it was successful in achieving its ultimate goals: being associated with the city it is located in and raising awareness about cultural continuity.

SÜMERBANK NAZİLLİ TEXTİLE (BASMA) FACTORY CAMPUS

The factory is one of the five campuses of Sümerbank which were founded following the 1933 five-year Industrial Plan. The campus was built by a joint project of Russia and Turkey. The construction began on August 25th 1935 and the factory celebrated its grand opening on October 9th 1937, which was honored by the presence of Atatürk and Celal Bayar. The presence of Atatürk in the opening ceremony makes Nazilli a special place.



Fig.2 Sümerbank Factories in Turkey (İlhan Öden photo collection)

There are a number of speculations about the choice for the location of the factory. However, it seems that the following advantages were the main motives for choosing Nazilli for the factory campus: geographical location, transportation (being close to İzmir-Aydın railway), climate and weather conditions, being close to water resources as well as the nature of the project and the suggestions of Russians, who support the project financially. I personally believe that Celal Bayar and the role of Nazilli in Kuva-i Milliye (national forces) movement might have brought the town an advantage over other rival towns and cities.

The campus is located in Lower Nazilli region, which was later renamed as Sümer neighborhood and still has typical two-centered settlement. Thus, the following buildings were constructed for production, socialization and recreation in the production area on one side of Bozdoğan Road: entrance unit; factory (thread + fabric + textile facilities), ginnery, storehouses, workshops, construction maintenance unit, boiler room, fire department, garages, water tower, central station unit, administration building, community center, workers' canteen, worker control unit, guesthouses, movie theater, sports hall, cycling park, and lodging house for white-collar employees which are similar those in Kayseri. On the other side of the road are lodging houses for white-collar employees and blue-collar employees, Sümer Primary School, EKONOMA (shopping market) and a guesthouse [10].

According to Arıtan [11], “Early Republican Era Architecture” shaped by the effects of modernization and its ideological variations inspired the design of Sümerbank campuses. The modernization concept in these projects was evaluated as a progressive, universal, critical and homogenizing conceptual unity which is based on rationalism, industrialization and surplus value economy. Therefore in this point, modernization exists in the forms of approaches that are based on capitalism private ownership, class society, capital-centeredness, equal/common use of the surplus of socialism, class-free society, worker-centeredness, the intervention of the state and collective life . While analyzing “social factory campuses”, it is inevitable to take into consideration the effects of Early Republican era and traditions and socio-cultural effects of the past, which are mostly ignored - even deliberately.



Fig.3 Main Gate of Sümerbank Nazilli Textile Factory Campus (İlhan Öden photo collection)

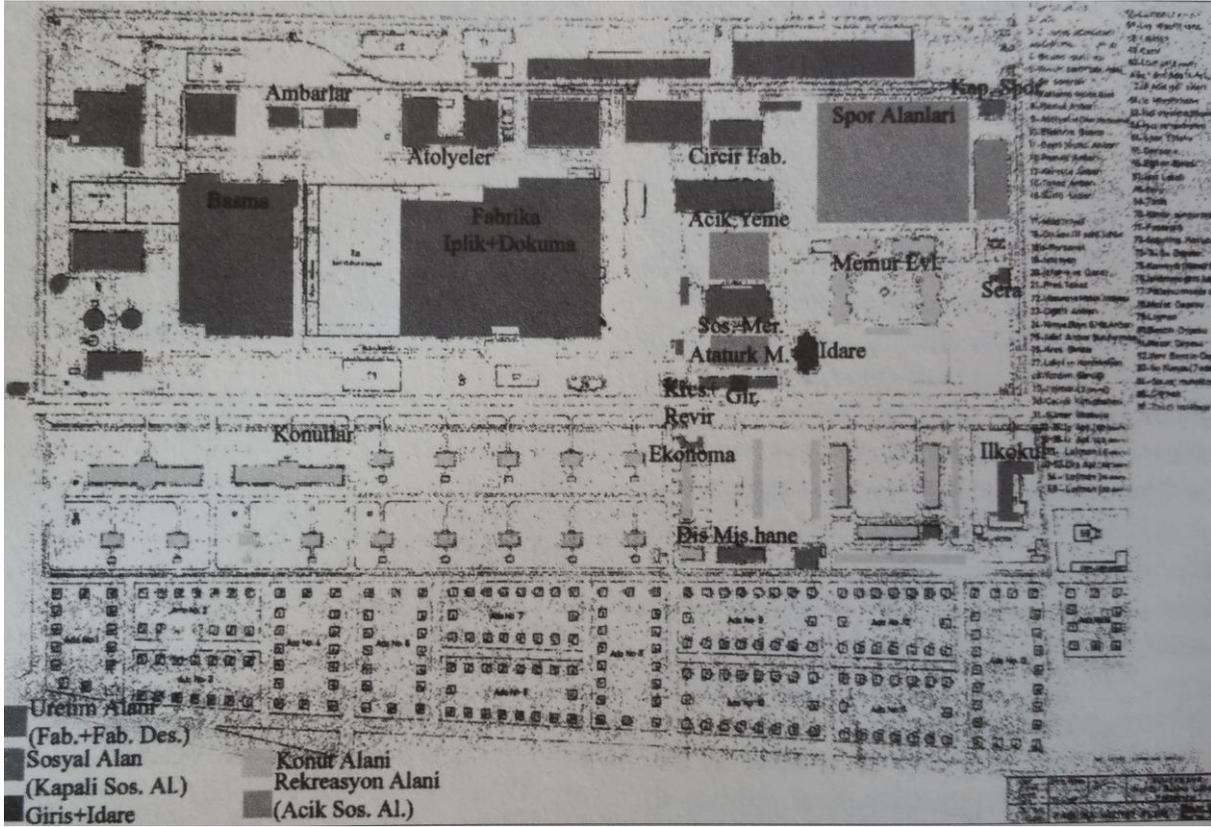


Fig.5 Sümerbank Nazilli Textile (Basma) Campus Situation Plan before 1950, [11]

These campuses are given meaning more easily by those who live there. The process applied here can be considered by outsiders or those who try to define it with a positive science mentality as the practice area of standardizing doctrines of Kemalist ideology. They contribute to the life of employees through educational activities and various multi-dimensional practices. All the activities and practices were carried out as a way to introduce organizational culture, the principles of Kemalist ideology and the life style of modern world by being respectful to employees' socio-cultural differences and personal preferences. These campuses were also designed as environments to provide opportunities for the employees and their families to realize and improve themselves. This method is similar to today's popular life-learning approach in many aspects.

In addition to sharing their gains with the city, employers and new investments, these campuses also create a strong feeling of belonging. People from various geographical locations and educational backgrounds in the country live and work together there. It clear from the videos available in the museum that a similar situation was also true for Manufactura, which shows a transformation in the structure of "Industrial Revolution" that was initially oppressive and valued nothing but production. An additional motive for Nazilli experience is the

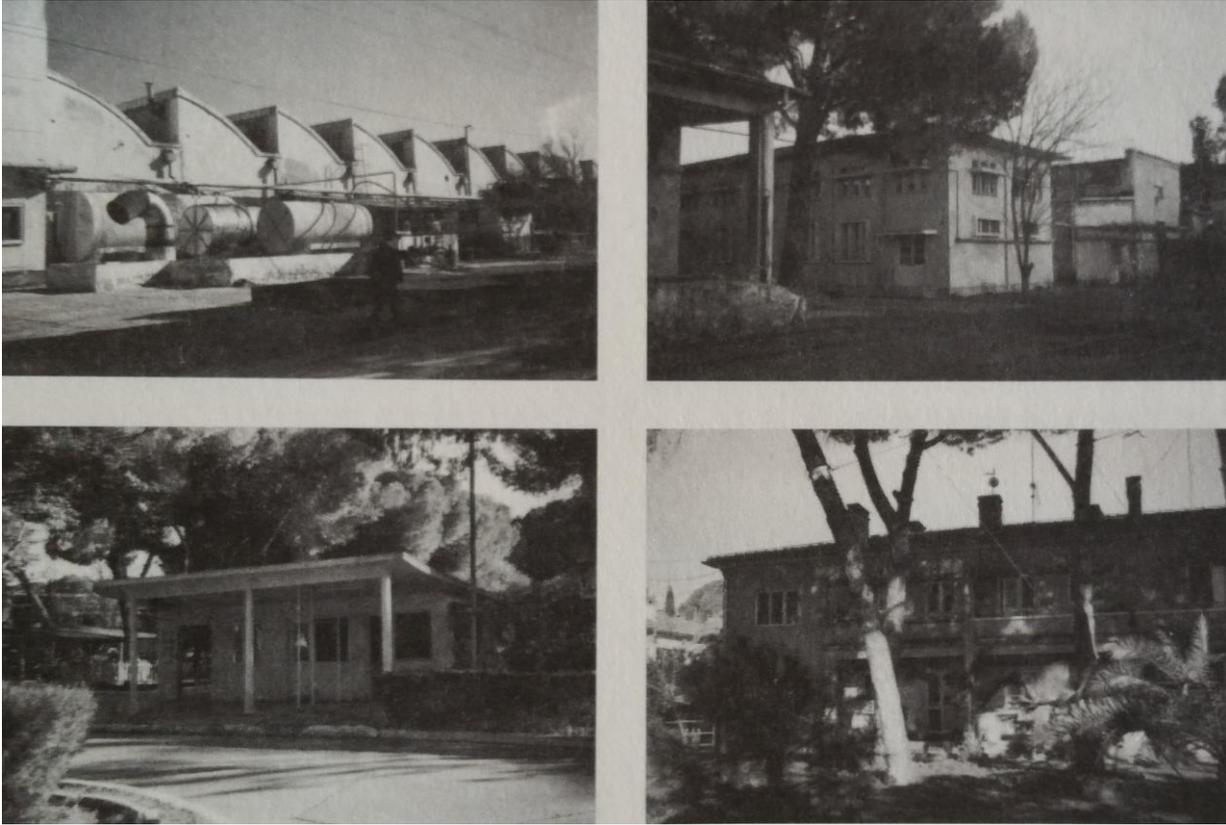


Fig.6 Varies Views from Sümerbank Nazilli Textil (Basma) Campus, [11]

encouraging effect of the attempts of a nation to exist. Established as a joint project of Turkey and Russia, the factory had considerable contributions to the country in terms of economy, culture, social life and art. Nazilli residents were lucky to see all the innovations in every field and social life on this campus. To illustrate with, Sümer Primary School, established on September 1945, had a nursery school with its different spatial design and furniture suitable for children. The children of working women were looked after for free in the daycare center available on the campus, [12].

In summary, popular concepts of modern working life today such as Job safety and Workers' health, social rights of working women, organizational identity, organizational commitment were the indispensable components in Sümerbank Nazilli Textile Factory Campus and the similar factories of the era.

SÜMERBANK NAZİLLİ TEXTILE FACTORY CAMPUS FOLLOWING THE CLOSURE

Sümerbank Nazilli Textile Factory Campus is located on both sides of Bozdoğan Road. In 2002, outer lodging (dış vazife evleri) area was allocated to the municipality; and production facilities, administrative and social facilities and inner lodging (iç vazife evleri) area to Adnan Menderes University.

The research about this campus also revealed the following:

- No holistic documentation and restoration work has been launched in Nazilli Textile Factory Campus since its closure in 2002.
- The unity of the campus was impaired and ownership structure was altered by ignoring its public benefit as a cultural property.
- Outer lodging houses (diş vazife evleri) were demolished after their allocation to municipality and the traces to ensure cultural continuity were destroyed by the municipality administration of the period.
- No records were available in Preservation Committee regarding outer lodging houses, which were demolished without any official registration and documentation.
- The buildings and the machines-equipment in the area allocated to the university got damaged since simple repairs were not made on time.
- Some machines – equipment were missing
- The logos placed in different locations on factory campus, and “Nazilli Textile Factory” signboards and other signboards giving directions inside the campus were removed as soon as it was allocated to the university.
- Especially, the signboard writing the motto “Accurate Tare Weight, Cash Money” (Hakiki Dara Peşin Para) and showing the daily price of cotton was also removed although it was a valuable memory reflecting “cotton purchase” procedures of the period as cultural property [12].
- This campus and the demolished lodging houses are places offering valuable data for the research on the development of housing in Turkey and historical and cultural continuity. Removing such spatial relationships established in the campus and the city creates great gaps in the memory of society as well as the physical environment. Unfortunately, no traces of Sümerbank Nazilli Textile (Basma) Factory, which is most probably the first trademark of our country, are now visible for those who travel on this intercity road. However; the original clock above the workers’ entrance door in Manufactura is still there as a trademark.

When some parts of the campus were allocated to Adnan Menderes University, it was announced that a museum will be established, a decision that was triggered by the constant demands from the public. Later a special commission (Desen Komisyonu) was formed under the presidency of the lecturer Mükerrerem Kürüm. Although some projects were planned following self-sacrificing attempts of the committee, no progress has been made for the museum yet. Moreover, since some buildings are used without a comprehensive restoration process, they are far from meeting the needs of the university.

Good news about the factory is that the train called GIDIGIDI, which carried workers and passengers between

the factory and Nazilli in the past but did not operate for a long time, was renewed after a comprehensive restoration work by the municipality and started its nostalgia tours.

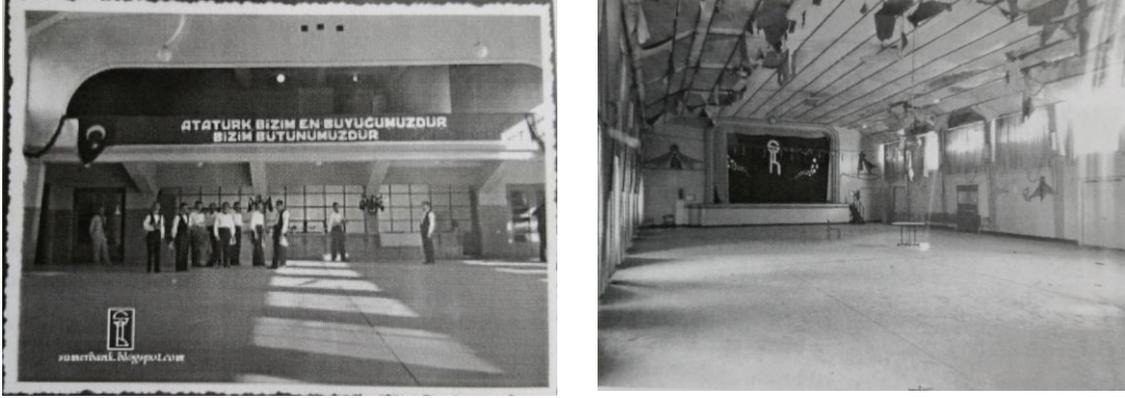


Fig. 7 Views of Movie theater of Nazilli Textile Campus in opening time and after closer, [11]

CONCLUSIONS

Sümerbank Nazilli Textile (Basma) Factory Campus was established following the resolution suggested during İzmir Economy Congress chaired by Atatürk in 1923. This main resolution was the “establishment of industries for the raw materials available and produced in the country” and the projects of the factory and its location were finalized through careful work accordingly. Therefore, their demolition and removal should have been that much organized and planned. They should have been registered as cultural properties, examined holistically in detail and evaluated carefully before they were privatized or closed by claiming that they completed their mission.

These factory campuses considerably contributed to country’s economy and social life and gave an identity to the city they are located in. Thus, they should not have been neglected or forgotten as both urban site areas and living data of industrial archeology in today’s world since they were the cultural properties which may provide opportunities to

- enable historical and cultural continuity
- add different dimensions to the modern life of the city through spatial relationships and intersections
- enhance awareness and feeling of belonging
- ensure spatial readings so as to communicate with what is available, to understand it and to learn

something out of it.

In conclusion, the new plans and projects for these factory campuses, which have already fulfilled their missions and responsibilities according to their establishment goals and objectives, should be launched as soon as possible. The different practices from Turkey and the world should be analyzed to identify their strengths and weaknesses. In addition, the identities of the cities they are located in, their distinctive features, their expectations and wishes should be emphasized in a realistic and multi-dimensioned way. All these attempts should be free from prejudices and commercial concerns, and public benefit should be emphasized. Later a plan should be prepared with a holistic approach and applied accordingly. As for Nazilli example, Adnan Menderes University should be aware of the importance of the cultural property it has, and using this opportunity for the welfare of the region and the country is a responsibility for the past and future.

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Criticism of Unsustainability at Ayvansaray as an Urban Archaeological Site

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Abstract

Ayvansaray is an urban district, situated at the northwest corner of the Historic Peninsula in Istanbul where the Golden Horn Sea Walls meet with the Land Walls and The Quarter of Blachernae was located during the Late Roman Period. Therefore, starting from 3rd century AD, Ayvansaray is known to be inhabited during Roman, Byzantine, Ottoman and Republican periods and today presents an urban heritage with multiple layers of cultural and historic stratification which stems from eighteen centuries of continuous settlement. Therefore the quarter is both an urban and an archaeological site which should be a subject of multi-disciplinary approach for any kind of intervention.

There are various factors that affect the sustainability of the historical urban landscape and archaeological heritage, which is an important part of the preservation and conservation practice, at Ayvansaray. These can be summarized as fires, earthquakes, demographic changes, changes of functions in the building stock, Republican town planning activities in the 20th century, Ayvansaray Urban Transformation and Renewal Project and independent projects for the monuments and for the civil architecture in the area. This paper aims to give an insight to Ayvansaray as an urban archaeological site by making a comparison of urban context as before and after throughout its history and evaluate it according to contemporary conservation and preservation principles by criticising the factors which interrupt the urban sustainability. And it suggests some methods for a better, sustainable, physical, social and economic context for Ayvansaray.

Keywords : urban conservation; urban archeological site; unsustainability; ICOMOS charters; World Heritage.

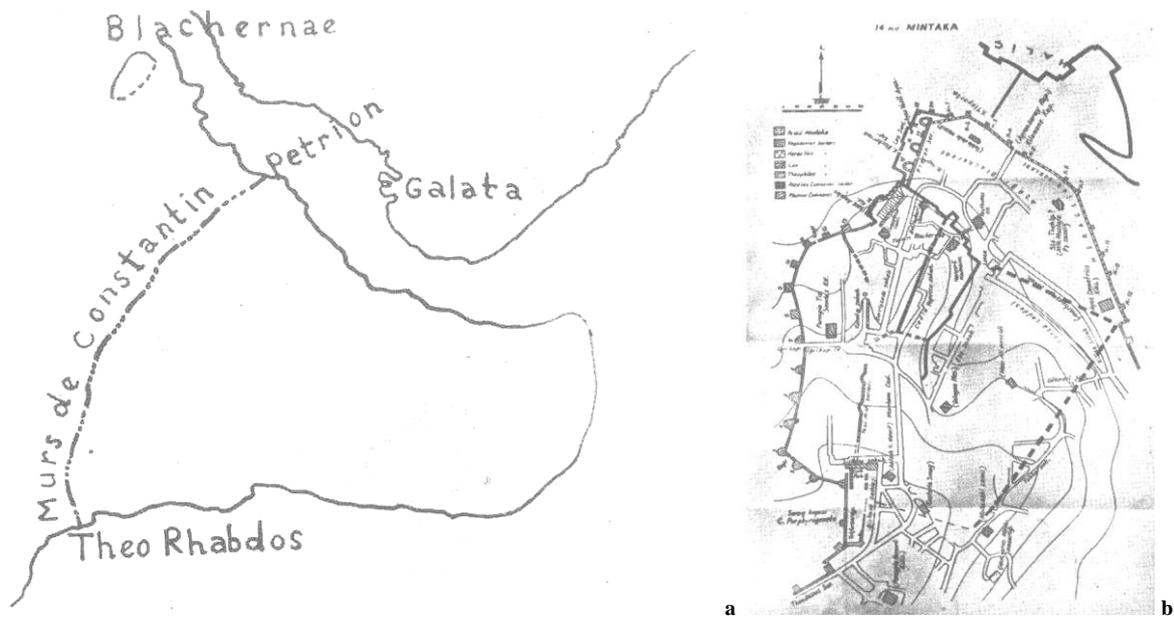
Main text

1. Why should we consider Ayvansaray as an urban archaeological site ?

Ayvansaray, is a district located at the northwest corner of the walled city of Istanbul, which today, is often mentioned as the Historic Peninsula. In other words, the district can be defined as the semi-circled area where the Land Walls meet the Golden Horn Sea Walls. The district is located on the south shore of the Golden Horn, in Turkish "Haliç", which is an estuary that joins Bosphorus at the immediate point where the strait meets the Sea of Marmara. Haliç, simply meaning "estuary" in Arabic as a common noun, was used as a proper name for the Haliç of Istanbul, starting from Ottoman Era because of its importance for the city. As a natural harbour, the Golden Horn has always been a major economic attraction and strategic military advantage for inhabitants of the area.

One of the earliest written sources about Ayvansaray is Notitia Urbis Constantinopolitanae (Notes on the City of Constantinople), which is an ancient book giving a list of monuments, public buildings and civil officials in Constantinople during the mid-5th century (between 425 and the 440s), the reign of the emperor Theodosius II¹. According to the abovementioned source, Ayvansaray which was called as Blachernae, was a suburb, enclosed by a wall of its own (Fig.1a). Its encircled area was housing a church, a palace, a lusarium (an area for games), a bath, a fountain, a wooden bridge, five bakeries, 167 houses².

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-Fig. 1. a. Blachernae in IV.th century, b. close-up of the Blachernae Area and some hypothetical directions for the Blachernae Walls³.

From the walls of the Blachernae, east and north sections are totally destroyed, west section has transformed much due to the construction of the Blachernae Palace⁴. Blachernae Walls stretched from Tekfur Saray (Porphyrogenitus Palace) by the Mumhane Walls away to B14 Tower (so-called Anemas Prison), from there passing to Lonca and reaching out to Hagios Demetrios Church⁵. The most detectable part can be assumed as the Mumhane Walls with half-circular towers, however they are covered so heavily by shanty structures that it is neither possible to reach nor even to take a photograph of them. Parts of the Blachernae Walls, representing characteristics of Late Roman Period, can be observed partially, in Anemas Prison, Tekfur Saray, and by the Hagios Demetrios Church (Fig.2).

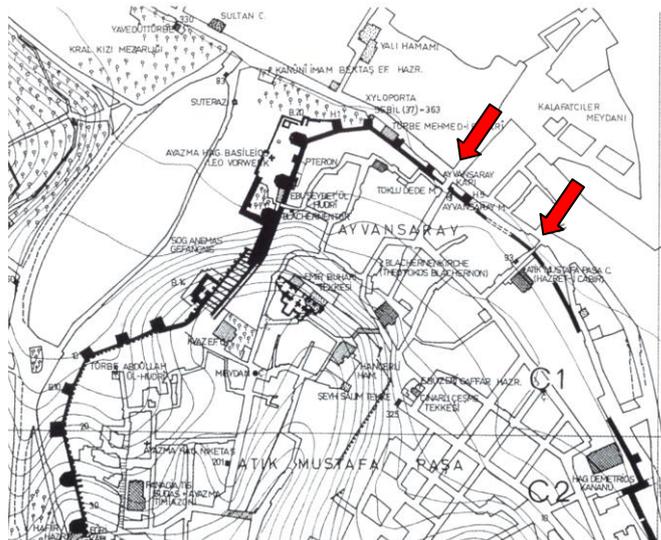


-Fig. 2. Fragments of the Blachernae Walls by the Hagios Demetrios Church at Aylvansaray (Esmer, 10.01.2013).

Blachernae united with Constantinopolis, as an integral part of 14th Regio, during the reign of Theodosius II, when he expanded the city by building his Land Walls between Kazlıçeşme and Aylvansaray, to the west of the Constantine Walls⁶. But the walls were only encircling upper part of the Blachernae, which commenced from the plateau where today Hancherli Bath is located⁷. The lower part with the Church of St. Mary of Blachernae was open to raids⁸. In 626, after Blachernae was raided by Avars, Emperor Heraclius built the Sea Walls, today known as the Heraclius Walls, with 12 towers in order to protect the lower part of Blachernae⁹. Later, at the beginning of the 9th century, in order to strengthen the defence, a new wall to the west of Heraclius Walls was constructed (Fig.1b). Further on in the 9th century, between 821-842, Golden Horn Walls were repaired and namely B15, B16 and B18, three pentagonal towers were added to the Heraclius Walls¹⁰. Additionally a perpendicular wall from the second tower (H2) of Heraclius Walls stretching towards Golden Horn was added on which was located the Xyloporta, that was later named as Dideban Kapısı in Ottoman Period, in order to protect the area in front of the Sea Walls¹¹.

The gates on Golden Horn Sea Walls, which connected the city with the shores, were named in Turkish during Ottoman Period and some of them survived until today (Fig.3). At Aylvansaray, there were two gates on the Sea Walls, namely the Hagia Anastasia (Atik Mustafa Pasha Gate) and the Porta Kiliomenè (Küçük Aylvansaray Gate/ Κουλιωμένη Πόρτα), a

short distance to the east of Xyloporta, connecting the neighbourhood to its Golden Horn shore¹². Today Porta Kiliomenè is not existing, though it is known to exist until the beginning of the 20th century¹³, but its place and the street leading to the city is preserved, from this street one can reach to the Church of St. Mary of Blachernae, which is a 19th century structure. But in the Early Byzantine Period, there was a pre-existing church in its place by the same name which was visited constantly by the emperors who came to the port at Ayvansaray by boats (Fig.4). The port, as it is today, is located across the area where Porta Kiliomenè used to exist, and after visiting the church, the emperors and their companions rested in the various palaces/mansions at the upper part of the Blachernae, which were accessible by an inclined path to the south of the Church of St. Mary¹⁴. Today still there are stairs leading to upper Blachernae to the south of the church (Figs.3,9)



-Fig. 3. Ayvansaray Area where the Land Walls meet the Golden Horn Sea Walls, two gates opening to Ayvansaray is seen¹⁵.



-Fig. 4. Byzantine emperor Theophilus (r. 829-842), on horseback, visits the Church of St Mary in the Constantinopolitan suburb of Blachernae¹⁶

Inside the city, perpendicular to the walls and to the east of Porta Kiliomenè, there was a Byzantine structure which is thought to be the Embolos Cariana which is part of a complex, built by Emperor Maurice (582-602)¹⁷. The above-mentioned structure, which was used as a storehouse for coal before 1950's, was demolished shortly after¹⁸. Inside the gate of Hagia Anastasia, Atik Mustafa Pasha Camii, which is a Mid-Byzantine Period Church, from the second half of the 9th century, exists. Within the walls, approximately, one hundred meters to the east of the Atik Mustafa Pasha Camii, the Church of St. Demetrius is present. Although the present structure is of eighteenth century, the original building was a Byzantine foundation adorned with mosaics and surmounted by a dome¹⁹. This church was used as the Greek Patriarchate between years 1597-1601, when the Greeks were deprived of the use of the Church of the Pammakaristos²⁰. Another Byzantine Church to the west of Atik Mustafa Pasha Camii was Toklu Dede Mesdjidi, former St. Thekla, in the quarter of Blachernae²¹. It was partially demolished in 1929²², after that gradually denuded and eventually disappeared from the historical topography of the city in the 80's²³.

In the Mid-Byzantine Period (843-1261), Ayvansaray became known by the Blachernae Palace it was housing²⁴. The core of the Palace was most probably based upon the Triclinium, the existence of which is learnt from Notitia²⁵. In the 10th century, a complex palace was already established on the plateau which today stretches towards Ivaz Efendi Mosque and where Hancherli Bath is located on its northeastern edge and in 11th century further additions were brought to the palace²⁶. In 12th century, in order to keep the palace further away from the dangers which can come out of the city walls, a new line of walls with towers were added to the west of the existing Theodosian Wall and walled area was expanded²⁷. B14 Tower, the so-called Anemas Prison was added to the complex, the top floor of which was used as a view terrace²⁸. B14 Tower, was indeed only the sub-structures of the palace²⁹. From the Blachernae Palace Complex, only some sub-structures and Tekfur Saray (Porphyrogenitus Palace), which is an independent structure with three floors and a courtyard, encircled with walls survived³⁰. The substructures of the palace, on the plateau which today Hancherli Bath and Emir Buhari Tekke are located (Fig.3), were identified in an archaeological excavation in 1958 and the findings were published³¹.

During the Ottoman Period, Ayvansaray developed as a muslim neighbourhood because of the tombs of the “sahabe” who were the Arabian martyrs which came to besiege Constantinople in the beginning of the 7th and the first quarter of the 8th centuries³². Many tombs were built for those martyrs at Ayvansaray after the Turkish conquest. Because of the numerous tombs within and around the district, Ayvansaray housed a population of Muslims in majority during the Ottoman Era, unlike the neighbouring Balat and Fener, which involved mostly Jew and Greek populations respectively. Because of this fact, the traditional wooden Turkish houses were densely constructed and even used as mesdjids apart from lodgement function. They were an indispensable characteristic feature of civil architecture for Ayvansaray during Ottoman Era and the area kept its character more or less until Early Republican Period. 18th century Ottoman historian Ayvansarayi Hüseyi Efendi, who is the author of “Hadikat’ül Cevami”, which an important historical source for the mosques, was born at Ayvansaray. His grave is believed to be at “Toklu Dede Hazire” in the area named as “Pteron” which lies between the Leo shield wall and B15,B16 and B18 towers. This archaeological area, Pteron, houses both the graveyard in the name of Toklu Dede and a holy spring of Orthodox Greeks, namely *Αγία Βασιλης Αγιασμα*. The deeds of the Ottoman Royal Family, boat building activities on its shores from late antiquity until 1980’s, organic plans of the street fabric, narrow alleys with bay windows of traditional wooden houses were a part of the continuity chain which was putting emphasis on multi-layered urban historical character of the place and enabled sustainability at Ayvansaray (Fig.5).



-Fig. 5. A street at Ayvansaray, with traditional civil architecture with bay windows leaning against the Land Walls and in front of them some grave stones and pathways with trees, at the end of the 19th century by Abdullah Brothers.

2. Factors for the Unsustainability of the Physical, Social, Historical and Architectural Context at Ayvansaray

There are various factors that affect the sustainability of the historical urban landscape and archaeological heritage at Ayvansaray. These can be summarized as fires and earthquakes, demographic changes, changes of functions in the buildings, town planning activities of the Turkish Republic as previous and Ayvansaray Urban Transformation and Renewal Project and independent projects for the monuments and for the civil architecture in the area as current factors.

In Byzantine Period, Ayvansaray is known to be affected from fires in 1069, 1203 ve 1434 respectively³³. In 1434 fire, the Church of St. Mary of Blachernae was burned to ashes³⁴. In Ottoman Era, 1727 fire has devastated largely the whole Ayvansaray and Balat area and 1755, 1773, 1862, 1864, 1880 ve 1911 fires are known to give damage to structures in the area³⁵. Istanbul is well-known with earthquakes, of which the main ones occurring in 447, 542, 1296, 1509, 1719, 1766, 1894, 1912, 1935, 1963 ve 1999, caused serious damages. We can follow some of the earthquake damages, from the traces on monuments, such as Atik Mustafa Pasha Camii, for which it is known that the main dome of the naos was rebuilt after it

collapsed in 1509 earthquake³⁶. Also its minaret is known to have collapsed in 1894 earthquake and the structure was heavily damaged³⁷.

As a second factor, serious demographic changes and changes of functions in the buildings occurred starting from 19th century. Until 19th century, Golden Horn coastal area has accommodated multicultural residential area for summer which also housed defensive, commercial, administrative functions, but in 19th century these functions, by the consent of the state abandoned the area gradually for settling of industry which first developed on the coastal areas due to ease of accessibility³⁸. Factories in various dimensions affected the socio-demographic composition of the Golden Horn area, summer resort character was abandoned and multi-ethnic population dissolved first by the 1923 Change of Populations, then by the heavy taxes taken from the non-Muslims during 30's-40's, followed by the 6th-7th September 1955 events, leaving the area to industrial workshops of various sizes and to a population of immigrants from Anatolia and low-income-group. Consequently the urban landscape has lost its specific character by the raid of industrial and shanty structures to the area, as well as maintenance problems for the civil architecture and monuments that were deprived of their original users.

In the Republican Period, town planning activities for Istanbul started as early as 1933 with H. Elgötz who suggested clearing the industry from the Golden Horn, taking all industrial development out of the Old City, as well as preventing the port expanding over the area³⁹. However, two years after a new agreement was made with the town planner, H. Prost, who started to work on Istanbul's master development plan. In Prost's plan, which came into force in 1938, unfortunately, industrial development was left to proceed in the Golden Horn Area, by the result of which, in the following fifty years, Golden Horn turned into a mud pool where even small boats were unable to float in some areas⁴⁰. Certainly, it was not only the Prost's master plan, but also his successor town planners and politicians who followed his faulty decision in leaving the Golden Horn Area to industry, called forth this consequence.

In 1984, the Mayor of Istanbul, Bedrettin Dalan, wanted to build collectors in order to reclaim and purify the Golden Horn (Fig.6). But his unplanned demolition of the structures on the coastal area and drainage of the collected water to the Sea of Marmara, resulted only in loss of industrial and civil heritage of the historic urban fabric and moreover pollution in the Sea of Marmara. The historic neighbourhoods such as Fener, Balat and Ayvansaray lost their integrity and unity with the Golden Horn Coast, and besides the Golden Horn was not thoroughly cleared⁴¹.



-Fig. 6. Press clippings about Ayvansaray and Golden Horn from Cumhuriyet Newspaper Archives (1984).

As we come to the 21st century, what is left from the original physical, social, historical and architectural context at Ayvansaray was still an important issue. But first in 2006, a new law, known as the Renewal Law no. 5366, came into force, which presumes that renewal areas have lost their unique cultural heritage and it enables total reconstructions of the physical environment. And although the Land Walls are on the World Heritage List, the abutting area, Ayvansaray, which involves the above-mentioned heritage, was declared as “renewal” area.



-Fig. 7. View of the Ayvansaray Renewal project between the Heraclius Towers H4-H3 (Esmer, 05.02.2016).

A renewal and urban transformation project was prepared by the Fatih Municipality and it was put into practice by the first months of 2013 and it is about to be completed by now, by the beginning of 2016. The project was titled by the municipality as “Ayvansaray Turkish Neighbourhood Urban Renewal and Transformation Project” and applied in the blocks (islands) namely, 2867, 2868, 2869, 2872, which are encircled by Kafesçi Yumni and Toklu Dede Streets of the Atik Mustafa Pasha neighbourhood (Fig. 7).

First of all in the project the local users were deported by force, while Law. No. 5366 gives priority for right of expropriation to state, so that the houses of the above-mentioned islands were expropriated for very low prices. Secondly, archaeological urban area was excavated by motor grader and parcels were united which should not be applied in urban historical areas in order not to cause a change in the historical fabric according international charters⁴². None of the examples of the civil architecture were preserved, all of them were totally reconstructed. However, according to internationally accepted charters on preservation, any total reconstruction is acceptable only for the not-standing or totally lost structures under certain circumstances⁴³. And lastly, the change of traditional uses, functions and the local users caused consequently the loss of the spirit of the place.

Apart from the transformation area, projects carried out both for civil architecture and the monuments around, named under restoration are only total reconstructions regardless of the international principles for the conservation and preservation of the cultural heritage and of which Turkey is also a party to. Among these projects can be shown restorations carried out at Tekfur Saray, Emir Buhari Tekkesi and Haremlik-Selamlık Building, two examples of civil architecture on Mustafa Pasha Bostanı Street which leads to the Ayvansaray Urban Transformation Area on its west end (Figs. 8,9,10,11).

Tekfur Saray was the only standing structure from the Blachernae Palace Complex, as an example of Late Byzantine imperial lodgement in Istanbul. Some irreversible interventions took place in its latest restoration. Tekfur Saray, considering its uniqueness and historic value, should have been treated as as an archaeological edifice. However, in the latest restoration work, too much re-integration and reconstruction were made. For instance, approximately 20 columns were inserted in the ground floor, vaulted masonry floors were constructed on them, which could bring to the existing walls an immense load especially for a structure that is deprived of its sheltering roof over hundred years ago. Re-integration work on the façades is also low-quality and the materials chosen for the joinery is not harmonious with the monument. The work has been completed without taking into account that the archaeological heritage is a fragile and non-renewable cultural resource⁴⁴. Whereas, the protection of the archaeological heritage should be considered as a moral obligation upon all human beings⁴⁵.



-Fig. 8. Retaining walls of the plateau housing Blachernae Palace a. in 1958⁴⁶, b. in 2011 (Esmer, 23.11.2011).



-Fig. 9. Shanty structures on retaining walls of the plateau housing Blachernae Palace (Esmer, 23.11.2011). The stairs leading to upper Blachernae are modern construction but their location is a continuity from the Early Byzantine Period.

For Emir Buhari Tekke and its Haremlik-Selamlık Building, they are totally new structures, replicas of the previous buildings which have no historic value. Moreover they are partially over the substructures and retaining walls of the Blachernae Palace⁴⁷. Therefore it is clear to the naked eye that these archaeological findings were destroyed by the new added parts of the retaining wall and other interventions (Figs.8. a,b). There are also two recent restorations of civil architecture in the area (Figs. 10,11). For both of the restoration works, plan schemes, original materials and building techniques were neglected, and besides portland cement was generously used. However, according Valletta Principles, a protected urban area is any part of a town that represents a historical period or stage of development of the town. It includes monuments and authentic urban fabric, in which buildings express the cultural values for which the place is protected⁴⁸.



-Fig. 10. Badly restored example of civil architecture on the corner of Mustafa Pasha Bostanı Street and Mustafa Pasha Bostanı dead-end; **a.** before (Esmer, 16.09.2009) and **b.** after (Esmer, 05.10.2015) the restoration.



-Fig. 11. Badly restored example of civil architecture on the corner of Mustafa Pasha Bostanı Street and Kundakçı Street; **a.** before (Esmer, 16.09.2009) and **b.** after (Esmer, 04.02.2016) the restoration. Figs. 9 and 10 are important examples to unsustainability for one of the most important characteristic features, the civil architecture of the area.

3. An Alternative Scenario or Some Suggestions for a More Sustainable Ayvansaray

As we summed up the problems about Ayvansaray and its vicinity, it is obvious that there are must be taken concrete steps to prevent further damage to the archaeological and architectural urban context of the area. Already the above-mentioned heritage is under a great risk of total extinction/destruction. Projects for the rehabilitation and conservation of the area, regarding international charters and principles should be developed and they should be a subject of multi-disciplinary approach. The Ayvansaray district in the first place should be taken out the scope of the No. 5366, Renewal Law and should be taken within the scope of No. 2863, Law of Conservation for Cultural and Natural Assets. The area should be regarded as an Urban Archaeological Site, further construction should be banned or taken under strict set of rules. For Ayvansaray, it is not important to build a new a Turkish neighbourhood, but rather, the important thing is to preserve the civil and monumental architecture which is representative of its long past.

Sustainability is accepted as an important part of the preservation and conservation practice. Sustainability requires the continuance of the socio-economic conditions as well as the physical and architectural context and therefore in recent years, the urban regeneration is promoted instead of total renewal and transformation. The Golden Horn Area has lately been a part of the city where university campuses are settled one after another. The first initiative starting with Kadir Has University, is a successful re-use project from factory to university. At Ayvansaray, there is also a higher education college which even has an architectural restoration program. This college is using the structures of the district as they are, neither building new structures nor uniting the parcels for this aim. Therefore, it is an important example for the regeneration and re-use of the building stock at Ayvansaray which is currently a ghetto. Locals from the district are employed and the young generations can take education. The municipality can manage even better partnerships and co-operations, between these universities and the local people. The Golden Horn Area, can regain its multi-cultural identity and social context which can be more balanced with the students and academics of the universities, who can settle around the Golden Horn. In that way, the area can be rehabilitated in a way that it is 24 hours used, not only one function like tourism becomes dominant which kills the spirit of an urban context. The archaeological remains, after precise documentation and projects are prepared in a detailed way, can either exhibit themselves as urban archaeological parks or some of them, like the towers of the Blachernae Walls can be transformed into for instance "Medieval Museum" for defense, history, arts, military etc. and some activities for children can be organized within to create awareness for cultural heritage and its preservation and to supply point of view on history.

4. Conclusion

The term sustainability appeared in the early 1970s as the rapid growth of the human race and the environmental degradation associated with increased consumption of resources raised concerns. Finding a way for consent between environment, advancement, and well-being of the world's poor was discussed in the United Nation's 1972 Stockholm Conference⁴⁹. Today, it is fundamental to consider heritage as an essential resource, as part of the urban ecosystem. This concept must be strictly respected in order to ensure harmonious development of historic towns and their settings. The notion of sustainable development has gained such importance that many directives on architectural planning and interventions are now based on policies designed to limit urban expansion and to preserve urban heritage. An alternative definition for sustainable development is stated as the path to balance social, economic, and environmental needs.

For Ayvansaray, architectural heritage and sustainability have degraded drastically in the 20th century but special accent should be put on recent project of urban transformation for this degradation. For other parts of the neighbourhood to be taken under control and not to be the victim of such an exterminating transformation, we should see benefits of preservation not only for history, heritage but for a sustainable environment as well. Historic buildings are inherently sustainable. With our threatened environment, it is imperative that we make sustainable living a part of our lives. The public benefits of both preservation and sustainability are very clear and there is no reason why these goals cannot work together. Preservation maximizes the use of existing materials and infrastructure, reduces waste, and preserves the historic character of older towns and cities. The energy embedded in an existing building can be significant of the embedded energy of maintenance and operations for the entire life of the building.

The Burra Charter adopted by Australian ICOMOS in 2013⁵⁰ outlines the steps in planning for and managing a place of cultural significance. These can be summarized in the table below (Fig.12). We have Site Management Office for the whole Historical Peninsula but the area is far too large and the problems are very complex. Therefore a zoning would be of great help in diminution and solution of the problems for historic preservation. Projects can be developed by the co-operation of the universities-the Ministry of Culture and Tourism and Fatih Municipality. The projects can have different aspects such as elevation design, material usage (retain, repair, or upgrade historic fixtures, rather than replace them) guidelines for architecture and urban design, social, economic, educational projects for the national agency of development. Such projects should consider awarding points for the repair and continued use of old building elements where significant improvements in energy efficiency are demonstrated. Some modern building elements such as windows, doors have a relatively short lifespan and can be difficult, if not impossible, to repair. Once modern materials fail, there are few ways they can be

recycled, and they will likely end up in landfills. This begins an environmentally insensitive cycle of removal and replacement. Also, above-mentioned projects should promote use of appropriate salvage historic materials for restoration of lighting, hardware, and other specialty items. Early paints and stains featured pigments made from natural plant materials and minerals, using low volatile organic compounds (VOC) finishes which are very important for environmental issues as well as for the preservation-conservation policies.



-Fig. 12. Burra Charter (2013)'s process scheme for community and stakeholder engagement.

Urban environments are composed of innumerable layers, starting from the hidden archaeological remnants deep in the ground, including historical dominants of the skyline and the diversity of morphologies in circles of the town fabric. Today, global challenges put increasing pressure on local built characteristics in both developing and regressive areas. Unlike single monuments, urban historic areas cannot be isolated from development. The challenge of our time is to balance the urban transformation in a sustainable way which can be achieved by preservation.

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Creating Virtual Space by Using Kinect Camera

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Abstract

Today, computer technologies offer us a virtual reality in which we can live independently from physical boundaries and experience forms by having a similar exercise on cognitive basis even though we can not enter the space physically. With unrestrainable fast development of digital transformation, technology creates a revolutionary change in architecture by including intellectual, aesthetical and perceptual transformations and increasing interaction between the concepts of space and time with virtual spaces through computer assisted tools and designs. Now, architecture has gone beyond the act of constructing in a physical environment and offers opportunities to design and produce on a digital platform which has its own specific terms. Therefore, architects and designers have started to adopt a design method with which they are able to create 3 dimensional virtual spaces by using computer-aided design tools in their design and production process.

Kinect camera consist of a 3D depth sensor and a RGB camera is a technology of creating 3 dimensional virtual spaces, which captures the movement and perceives the depth. This camera, which is being increasingly explored by many disciplines including industrial product developers, animators, architects and game developers, creates 3D virtual spaces with its technological features that provide navigation model with natural hand gestures disabling model of circulation with keyboard and a mouse in other model creation environment. These spaces, created not only create a base for animation and game spaces with their powerful capacities such as the geometrical quality of obtained data, depth, resolution and easy calibration, but also allow for creating 3D virtual environments serving different purposes including 3D architectural modelling, 3D scanning, 3D reconstruction, 3D depth measurement and 3D mapping.

In this paper, kinect camera at the human-technology interface intersection has been investigated under architectural perspective by reviewing literature. The sensor having different roles in producing virtual spaces, will be queried in terms of the possibility of offering a modelling or design approach which guides to architects-designers and supports creativity in digital modelling, and its contribution to the architectural modelling and production process.

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1. 1. Introduction

In recent years, three-dimensional (3D) modelling technology has been extensively developed by researchers from a wide variety of scientific areas. [1] Also, 3D models play an important role in architectural design since

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they allow architects to review, communicate and present design proposals to clients. [2] Moreover, 3D modelling technology bring on the agenda the notion of virtual space. This concept is necessary to be able to create 3D model in virtual environments. Virtual space is a computer-generated, three-dimensional representation of a setting in which the user of the technology perceives themselves to be and within which interaction takes place; also called virtual landscape, virtual environment (VE), virtual world. [3] VE have proved efficient for training in three-dimensional spaces. It is therefore not surprising to find architects using VE to intuitively conceptualise 3D space. Traditionally, VE have required users to familiarise themselves with the complex techniques and equipment required to fully experience the 3D space. [2]

3D virtual environment is network-based desktop virtual reality which users act and interact in three-dimensional simulated environment. Interactive 3D virtual environment is represented with user's 3D virtual characters called avatar. They can act, walk, run and also fly in 3D virtual space by controlling their avatars with keyword, mouse, other tools. Furthermore, users can change appearance of avatars as wish. [4] 3D model creation technologies have continued to develop rapidly because of increasing need VE for modelling. But, it is necessary to softwares supporting strong-rapid and cost-effective data collection process, for the development of 3D modeling methods.

Today, for 3D modelling, some of used computer aided design systems (CAD) include autodesk products (autocad, 3ds max, maya, revit, sketchbook, infrastructure design, product design, building design, factory design, flow design, hsmworks, inventor, plant design, infrastructure design) rhino, google skecth up, lumion, blender, k-3d, softimage|xsı mood tool, z modeller, topmod 3d, auto 3d community-3d editor, 3d plus, 3d canvas, edrawings, blink 3d, minos, free cad, bishop 3d, k3dsurf, design workshop life, g.design, sweet home 3d, true space, a libre design xpress, 3dvia shape, 3d experiency , photomodeler ect. [5][6][7]

Although, these technologies offer opportunities to experience VE with features such as 3D interactive environment, they differ in terms of their methods and aims. Kinect camera is one of the technologies used to create a 3D virtual space. Kinect kamera is preferred in this study so that it can transfer 3D objects to virtual space because of its features such as RGB (Red Green Blue) image capture, depthmap, low cost. The purpose of this paper, having growing contribution to the creation virtual space, kinect camera is to investigate its role on 3D architectural modelling.

2. 2. Kinect Camera

Originally, the Kinect was developed by Microsoft to give the possibility playing without any controller as a user interface for the Xbox 360 gaming platform in USA in 2010. [8] Microsoft has made it bit to make life easier for graphic artists, 3D printing aficionados, industrial designers, animators, architects, and games developers. Kinect sensor is consist of a RGB camera and a depth sensors combined with a monochrome integrated circuit production technology CMOS (Complementary Metal Oxide Semiconductor) sensor for stereo measurement. [9][10]

This system perceives movements and locations of hand and body because of projectors emitting invisible infrared rays and software in itself at very short time. In this software included in Kinect, there are millions of cases and movements, people be able to do. It captures these images in the format of 3D point cloud data (PCD) of the external environment. A point cloud will include all the topography points, curves, and organic forms of the site without extensive hand measuring and dimensioning. Special codes are used for definition of these case and movements in Kinect software. After, these scenes and movements are captured, data received by Rays is reversed to command in a colour image CMOS and an light sensor (Infra-Red-IR) with CMOS seonsor. [11] Thus, the codes converting commands are sent to computer system as a virtual environment. Meanwhile, these codes have an image-based 2D and 3D reconstruction algorithm. [12] Commands are able to arrive in a shorter time than a second depending on the quality of the operating system. What is more, speed commands required to happen in 3D graphics are ensured by a computer software. Kinect is only responsible to deliver commands. [13] [1] This mechanism enables Kinect to see what is in the field of view in real-time 3D

in almost any light condition. It is sensitive to extreme light concentrations such as light bulbs or direct sunlight. [14]



Fig 1. Kinect component

Kinect system architecture consist of some technical features. Items in related to RGB are 1.3 megapixel colour camera, Micron MT9M001., IR filter (Infrared), 32-bit colour and 30 frame/sn, 640 x 480 pixel resolution. Items related to Sensor are colour and depth lens, Audio microphone, Tilt motor. The features in related to Field of view (FOV) are Horizontal viewing area: 57°, Vertical viewing area: 43°, physical tilt area: 27°, Depth sensor area: 1.2m - 3.5m. Items in related to Data Flow, 320x240 16-bit depth - 30 frame/sn, 640x480 32-bit colour- 30 frame/sn, and 16-bit audio kHz. [4] Current used kinect softwares can be categorized into four types as Xbox, Microsoft SDK, Avatar and Fusion sensors. [15] [9] Avatar Kinect takes ordinary video calls into a fully virtual environment giving each user a facial expressions and gestures-reproducing avatar by utilizing Kinect's motion tracking and facial recognition. It allows the user and up to seven other people to choose one of 24 virtual chat environments. [16]Microsoft's Kinect used for the Xbox 360 provides enhanced gaming and entertainment experiences by combining multiple technologies based on the use of RGB cameras, depth-sensing, and careful user interaction design. [17] Microsoft® has released the software development kit (SDK) to the public in an effort to drive innovation. The Windows SDK provides the tools and APIs, for Navigation and Interaction both native and managed, that you need to develop Kinect-enabled applications for Microsoft Windows. [18] [19] [14] Kinect Fusion provides 3D object scanning and model creation using a Kinect for Windows sensor. The user can paint a scene with the Kinect camera and simultaneously see, and interact with, a detailed 3D model of the scene. Kinect Fusion can be run at interactive rates on supported GPUs, and can run at non-interactive rates on a variety of hardware. Running at non-interactive rates may allow larger volume reconstructions. In addition to 3D model construction, Kinect Fusion can also be used for 3D augmented reality applications and taking 3D measurements. [18] [16] [20]

While originally developed as a game controller, the kinect is now used in a wide variety of field such as movie, animation, healthcare - surgery, engineering, urban planning, architecture, autonomous mapping of buildings, computer-aided design (CAD), art, advertisement, odometry, education, business, underground exploration, remote exploration, visualisation of dangerous areas, medical imaging, and ect. (11) (7) (9) (12) Nowadays, this sensor system allows to propose new attractive solutions for robot navigation problems like 3D modelling, 3D scanning, 3D mapping, 3D navigation, 3D reconstruction and 3D depth informations. [11] [21]

3. 3D virtual spaces with Kinect

A 3D virtual space consists of non-movable and movable objects to provide more real environment, where movable objects can be transformed by translating, rotating and scaling. [22] Kinect have special features such as colour- dept information, fast, easy, smooth modelling in VE. Besides, kinect technology offers to create 3D virtual space by using hand and body gestures without mice and keyboards although in most virtual

environment systems, the movement of objects can be performed by mice and keyboards. This system also provides opportunities to generate different 3D virtual spaces depending on different needs and industries. [21]

3.1. 3D Scanning with Kinect

Today, there are a lot of technologies to scan three dimensional objects. Some of 3D scanners are 3D digitizers, laser scanners, Laser triangulation, white light scanners, Structured light, Photogrammetry, contact scanner, industrial CT, LIDAR and others. [23] Laser scanners typically measure only a single point or a line of geometry in the time, so aren't very suitable for real-time applications. For large distances the most common technique is time-of-flight, where a short laser pulse is sent toward the object and the device measures the amount of time for the pulse to return to the sensor. These can be quite accurate, but slow since they can only measure one point at a time. Otherwise, Kinect use Depth-from-Focus and a speckled infrared dot pattern to specify rough depth information. They have a clever hardware solution for projecting these dots in a way that relates depth to eccentricity of the resulting ellipse. This produces an (rough) depth-map of the entire frame all at once. [24]

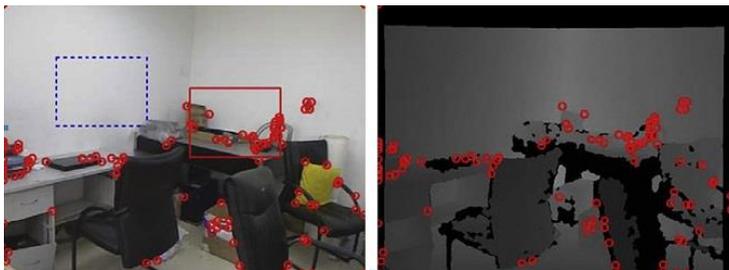


Fig. 2. an indoor scene captured by kinect (a)colour image; (b)depth image

According to a study in 2013 in china; it is proposed traversable areas analysis for human beings as a fast 3D modelling algorithm only working with a single Kinect sensor First every color image is scanned by Kinect camera. Then a spiral search strategy is utilized to select the region of interest (ROI) covering enough feature corners. Next, the iterative closest point (ICP) method is applied to the points in the ROI to align consecutive data frames. Finally, the analysis of which areas can be walked through by human beings is presented. Thus, some solutions are provided about sophisticated 3D model integrated information and large areas problem, for urban planners. [1]



Fig. 3. modeling result (a) color image captured by a camera; (b) constructed 3D model

In a research in 2012 in French, 3D model of a house has been created with skanect software by using kinect. Because, microsoft kinect has its own 3D mapping software, usage for Windows and short capturing time for 3D colour images. Initially, 3D all objects in the room has been scanned by kinect. Then, skanect have ensured to rotate around a room with kinect. The users are able to zoom in or out of, rotate and navigate an on-screen

3D version of whatever was scanned. At the end of this study, it is understood monochrome scanning performs well, but the colour scanning is still a work in progress. [25]

3.2. 3D reconstruction

3D reconstruction is an important issue in virtual environment. Past decades had witnessed significant achievements in applications of certain 3D reconstruction techniques. Computation of depth perception image is essential in 3D image reconstruction by scanning. It is used in autonomous navigation, map building and obstacle avoidance. Also, 3D scanning of objects could be used in inverse engineering and non-destructive testing applications. 3D reconstruction of city buildings is essential for 3D city models, which can provide large amount of information to city or urban planners. [1] Also, significant applications include generating 3D models in the real-estate industry for visualization, in building renovation projects for surveying, and during construction for inspection of fabrication and on-site assemblies. [26] [32]

According to a paper in Illinois Institute of Technology, Chicago, it has explored two different types of 3D image reconstruction methods to achieve a new method for faster and higher quality 3D images. It is acquainted a novel 3D image reconstruction method using the 2D image from a high resolution webcam combined with the Kinect 3D depth map. Depth information has been obtained together by a Kinect and a web camera. Kinect is very fast, but it has low resolution. Otherwise, webcam has quality resolution for 3D image reconstruction. Thus, the high resolution system has a broad range of applications including 3D motion sensing of human body, hands tracking and finger gestures. [9]

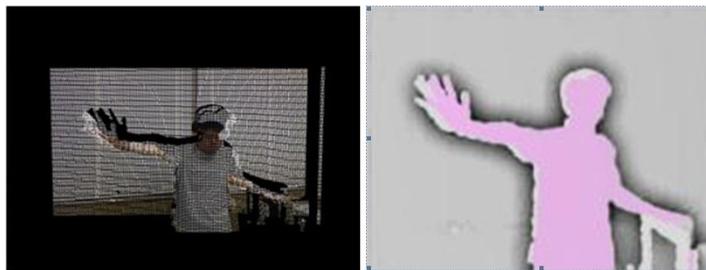


Fig. 4. kinect 3D image reconstruction: (a) 3D image; (b) depth map

Julius Schöning has researched 3D reconstruction and modeling technique in terms of weaknesses of existing methods in 2015. To overcome this weakness he started to implement the proposed semi-automatic and interactive architecture for image-based reconstruction as software prototype. He come up with a discussion of how an interactive process could overcome existing weaknesses and propose a possible working process for the interactive creation of non-monolithic CAD-ready 3D models with flexible subparts out of defined material. Such CAD-models allow manufacturing each subpart on CNC-machines or 3D printers. A monocular hand-held camera is used first Instead of an image collection Pollefeys to build visual models of scenes for fusing real and virtual scenes. Then, Kinect camera is used as a RGB-D for hand scanner. The reconstruction of objects on consumer mobile phones which are moved around the object of interest is described in. Finally, optimistic an interactive 3D reconstruction tool could create CAD-ready models of real world objects which can be translated back to the real world with 3D printers and CNC-machines. [20]

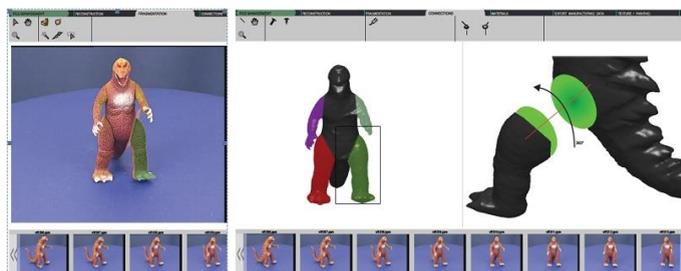


Fig. 5. mock-up of interactive 3D reconstructor, several subfigures

In a project conducted in Spain, it has been investigated the use of the neural gas (NG), a neural network that uses an unsupervised Competitive Hebbian Learning (CHL) rule, to develop a reverse engineering process. This is a simple and accurate method to reconstruct objects from point clouds obtained from multiple overlapping views using low-cost sensors. An accelerated implementation on the GPU, considerably accelerating the original algorithm compared to the CPU version. A fully integrated framework is created to perform 3D object reconstruction using low-cost RGB-D kinect sensors. In contrast to other methods that may need several stages that include down sampling, noise filtering and many other tasks, the NG automatically obtains the 3D model of the scanned objects.

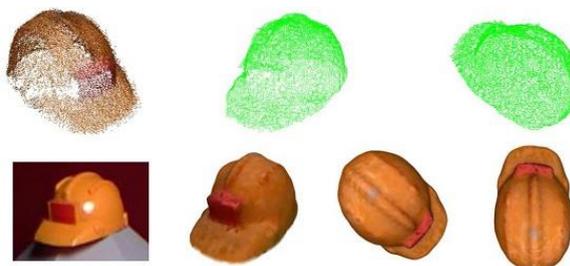


Fig. 7. (a) point cloud obtained using the Kinect sensor (b)) RGB image

To demonstrate the validity of the proposal it is tested the method with several models and performed a study of the neural network parameterization computing the quality of representation and also comparing results with other neural methods like growing neural gas and Kohonen maps or classical methods like Voxel Grid. It is also reconstructed models acquired by low cost sensors that can be used in virtual and augmented reality environments for redesign or manipulation purposes. And finally an extensive study of the proposed method, comparing the obtained results with those achieved by related methods under different noise conditions. [27]

3.3. 3D Depthmap

3D vision is very important since it describes not only the shape, texture, and color, but also the depth and distance from the object. Hence, it is commonly used in diverse set of applications. Reliable depth estimation is one of the basic techniques in a robotic control system. OpenCV (Open Source Computer Vision Library) stereo vision is a widely used method to reconstruct the 3D image including the depth map. Recently, Microsoft announced Kinect, a new low cost and flexible game controller peripheral. Kinect uses IR projector and receiver to construct a 3D depth map very fast in real-time. Multi-purpose design of Kinect offers a variety of visual applications. The depth map generated by Kinect can not only be used for 3D image reconstruction but also for skeletal tracking. [9]

Song Tiangang and others have offered a search a 3D reconstruction plan for indoor scenes using a very low-

cost depth camera, the Microsoft Kinect sensor. The system includes four steps: data pre-processing, pose estimation of the sensor fusion of the depth data and 3D surface extraction.



Fig. 8. 3D depthmap processing – (a) Raw depth map and color image, (b) Point-clouds generated from fused Model and from raw depth map, (c) The complete model.

First, the raw depth map is obtained from Kinect sensor using Kinect SDK, then applied the bilateral filter function in OpenCV to the raw depth map, next generated the point-cloud and normal map from the filtered depth map. Later, the registration between neighbor frames are performed using ICP algorithm. Moreover, The depth data is fused using TSDF with the camera pose of each frame estimated. It observed that the fused model is much smoother than the original one. Finally, a complete rendered model is occurred as in the above photo. [21]

In another research, a novel approach is used to creating realistic occlusions of virtual and real objects placed inside a real environment in an augmented reality system. Augmented reality is an interesting system having several applications, such as architectural planning, gaming and even technological devices like Google glass. Generally, the main problem of this system when dealing with occlusion is that usually there is no depth information of the scene. Estimation of the depth information is computationally expensive. So, in this work, rather than estimate the depth of the scenario, the Microsoft Xbox Kinect TM sensor is used to get this information.



Fig. 9. (a) Real objects behind and between the two virtual objects, (b) Virtual object between real objects. (c) Virtual table rendered over a real chair and a real object between the virtual object.

System architecture is composed of Kinect depth camera and the AVRLib. The real environment is virtually recreated with dots in a three dimensional space, where the X and Y coordinates and color are taken from the RGB video taken from the Kinect and the Z coordinate from the depth camera. Afterwards, the virtual object is placed in the scene in the position obtained by the marker detection system. After all, the final scene is rendered in a perspective projection, where, for each point representing the real environment, is applied a transformation to its coordinates to simulate an orthographic projection. This way, the final render uses different projections for the environment and the virtual objects. The system is talented of rendering any virtual model in the scene, given there is a correct model file describing the object. Moreover, the system renders everything in realtime. [28]

According to a study performed in Polit'ecnica University; a segmentation algorithm is put forward to detect objects, essentially on indoor environments, using CIE-Lab and depth segmentation techniques. The color and depth images are provided by the Kinect sensor for proposing a visual strategy with real-time performance. Initially, an algorithm was developed in the MATLAB software, in a PC with an i7 2.2 GHz Intel microprocessor and 4 GB of RAM. Microsoft Kinect sensor is used to provide the RGB-D information. The efficiency of our algorithm is determined by performing several tests in a typical indoor environment, using two or more objects of similar color but positioned at different depths. Then, a point belonging is selected to a particular object that we want our algorithm to detect. The objects have the same color in both images, the highlighted for better depth information. So that, the depth images will provide us the necessary information for discarding undesired objects in the scene.

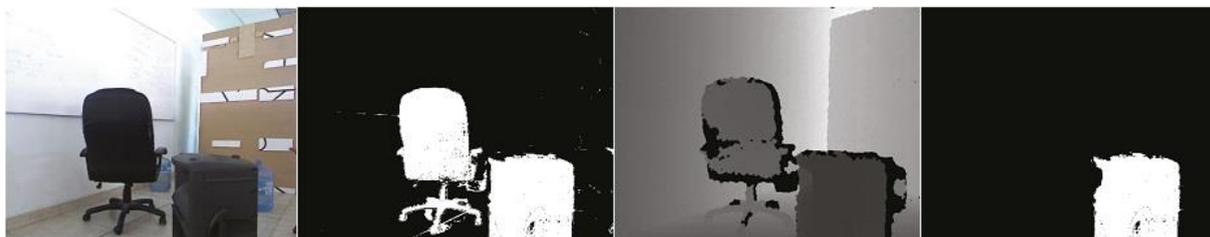


Fig. 10. (a) RGB color image (b) Initial mask. (c) Depth image (d) Resulting image segmentation.

At the end of the process, the probatory outcomes show that the algorithm can effectively detect one object of interest by color and depth, though more objects of the same color are in the field of view of the sensor. This algorithm demonstrates a satisfactory frequency of performance allowing users to propose this strategy as a feasible solution in the challenging issue of robot visual navigation. Besides, it is relatively cheap in comparison to other technologies like LADAR or SICK sensors and more robust than stereo vision systems. Also, this strategy can be applied in multiple tasks such as object segmentation, human detection, tracking, and activity analysis of a robot. [29]

3.4. 3D Mapping and Navigation

Most 3D mapping systems contain three main components: first, the spatial alignment of consecutive data frames; second, the detection of loop closures; and third, the globally consistent alignment of the complete data sequence. Most mapping systems require the spatial alignment of consecutive data frames, the detection of loop closures, and the globally consistent alignment of all data frames. Specialized cameras and laser scanners commonly are used for 3D mapping (180°). 3D RGB-D Mapping builds a global model using small planar colored surface patches called surfels. While pure laser-based ICP is extremely robust for the 3D point clouds collected by 3D laser scanning systems such as panning SICK scanners or 3D Velodyne scanners, RGB-D cameras provide depth and color information for a small field of view (60 in contrast to 180) and with less depth precision (3cm at 3m depth). The limited field of view can cause problems due to a lack of spatial structure needed to constrain ICP alignments. This system enables the approach to estimate the appropriate location, surface orientation, and color extracted for each part of the environment, and to provide good visualizations of the resulting model. [10]

In a research conducted by software engineerings, a three dimensional mapping system has developed an application to teleoperation of robotic vehicles by using kinect sensor and Octree mapping system (octomap) used in 3D applications for years. In this robotic system, collected 3D point clouds from Microsoft Kinect are combined with a navigation solution from the robotic base to transform the data points into a common map frame. Then these map datas are transferred to simulation environment for teleoperation. After all, it is observed how 3D octree maps can be used in teleoperation effectively with Kinect sensor and has described the

design of a system to utilize the benefits of octrees in this area. [30]

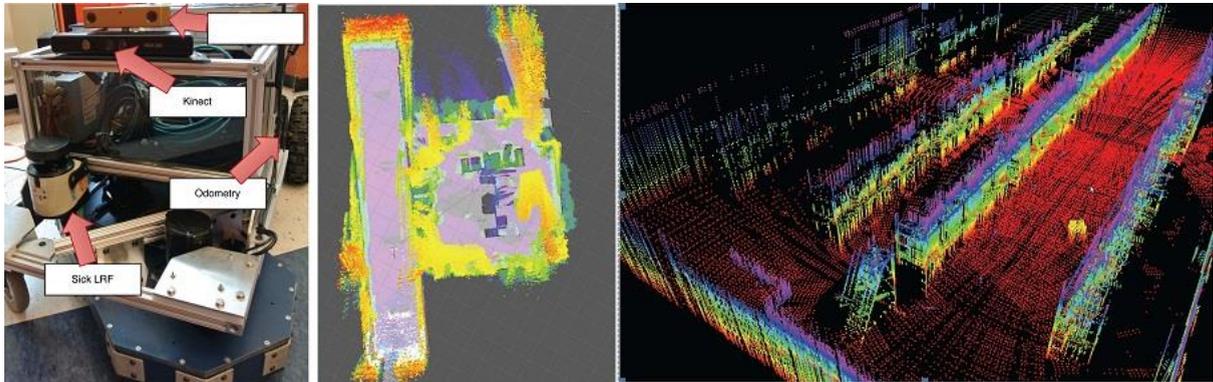


Fig. 11. (a) Custom autonomous lawn mower robotic platform, (b) A top down, (c) orthographic view of a 3D map generated from Kinect data, simulation environment

4. 3D Architectural Modelling with Kinect

Architectural modeling studies with Kinect continues to increase and attract attention each passing day. Kinect camera has been used for architectural modeling in two ways in studies so far. First, by scanning depth and color information of three-dimensional objects in the real environment is transferred to drawing environment with a special software. After objects are scanned, they can be rotated, navigated, moved in 3D virtual model. Researches study mostly over scanning speed, scanning accuracy and software stability for 3D Scanning. The second is the possibility of drawing by hand and body movements instead of tools like WIMP (windows, icons, mouse, keyboard, pointers) on the drawing environment. Although a lot of work on the Kinect, related to architecture is quite low. Therefore, it is focused mainly over only two projects. [2] [20] [31] [32]

In a master thesis, it is investigated the Kinect as an alternative to laser scanning for creating point-cloud models. In case, a benefit can be applied to existing buildings being prepped for renovations. Scanning a building would capture interior conditions “as is” with extreme accuracy. This would ideally save money and time by freeing architects from having to dimension every detail and spend hours taking photos of all required details. It could also serve as a base point for a BIM modeling.

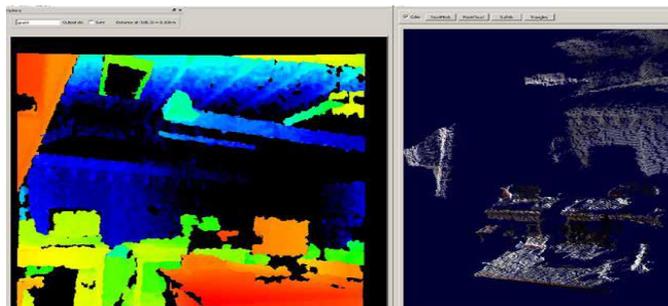


Fig. 12. (a)Space 2 Depth Map; (b) Space 2 3D View (RGBD)

For this system, some datas have prepared such as hardwares, softwares and three real interior spaces. Hardwares are Seville Commercial Utility Cart, XBOX Kinect Toshiba PC Laptop (Windows 7 64-bit, INTEL Core i3 - 2350M @ 2.3Ghz - 6GB DDR3 SDRAM - Basic Intel HD Graphics Family), 50' Extension Cord, 3

Outlet Surge Protector. Softwares are RGBDemo, Brekel Kinect, Point Cloud Library, Brekel Offline Scan Processor (Brekel Kinect) MeshLab V1.3.2, Autodesk® Revit 2013, Microsoft® SDK & Drivers, Whitegoods Lightmeter®. Firstly, all spaces are scanned via RGBDemo, brekel kinect and PCL.

Points of improvement are determined for the Kinect and associated open-source software. Then, all datas have transferred to SDK screens. Capturing 2D and 3D images have tested on some parameters such as speed of scanning, accuracy of the scan, stability of the software. Later, Kinect point clouds are imported into Autodesk® Revit and convert into a 3D model as XYZ file type. After, all images examine on drawing window, it is observed that all images can be imported to drawing environment as 2D and 3D model, but some objects are missing. From the point cloud it is impossible to determine where the window actually begins and ends.

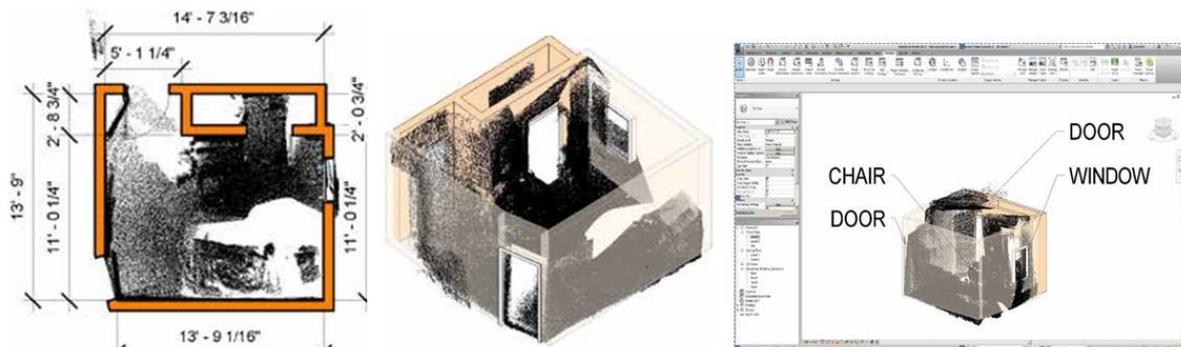


Fig. 13. (a) Autodesk Revit Floor plan; (b) Autodesk Revit 3D model

The reason of this, Kinect was never required to scan points beyond its viewable range of 15-25 feet (1-1,5 meters). So, Objects in the distance are difficult to detect and transfer software. This would create serious problems for a remodeling project that involved a space with large or numerous windows. Zooming into the point cloud does not reveal more detail. But, Kinect can scan smoothly and fast by keeping track of all its keypoints from one frame to the next. With a small bedroom the margin of error might be low because of the short spans. Despite the numerous struggles, the Kinect camera itself performed in different light levels, lightweight, durable, and easy to set-up. Also, logistical benefits of it is cost only \$100 and cheaper than laser scanners like the 3D Scanner Trimble TX5 cost around of \$93,000. RGBD had good results in a small environment while Brekel Kinect had potential in larger spaces.

The Kinect camera itself is held back by a few technical shortcomings. Primarily, A resolution quality of 640x480 cannot compare to laser scanners such as the Trimble TX5 which boasts a 70MB resolution ("Trimble Inc."). This lack of detail leads to a heavy dependence on the software to manipulate the image. This is accomplished be either softening the image by artificially adding pixels or by stretching the image to simulate blended pixels. Both of these techniques are damaging to image quality. Without software manipulation, the point cloud is often a random scattering of points that only marginally captures distinct surface elements and textures.

At the end of study, when comparing two different technologies like the Kinect and laser scanning, it is important to consider their respective roles and expected performance value. For instance, the Kinect scores high in the cost and availability sector, while laser scanning is slow and expensive. But the high cost of the laser comes with a high expected return. Scanners like the Trimble TX5 have the power to be used for large and complicated projects. Data from this project suggest this is something the Kinect would not be able to compete with. The Kinect's strength appears to be in small, enclosed rooms that are easily photographed in a single sweep. Although, projects such as RGBD Slam suggest that when programmed correctly with custom software, it is possible to scan entire buildings. [14]

In another architectural modelling research, it has discussed a proposed framework for a noncontact Multi-Hand Gesture (MHG) interaction technique for architectural design. The prototype system consists of a software that is developed to recognize and interpret the MHGs captured by the Kinect sensor which does real-time scanning of three-dimensional space and depth. In a non-contact MHG interaction paradigm, a gesture recognition system is used to detect hand and finger movements, and their positions in real time 3D space. These gestures are then translated into specific commands or tasks in the CAD software. The gestures which are suitable to be mapped and used for architectural design activities are: point and select, move, rotate, scale, zoom and pan, and extrude. Also defined gestures are shown for controlling the window system for a vision-based system. This system can interpret a user's gestures in real time to manipulate windows and objects within a GUI.

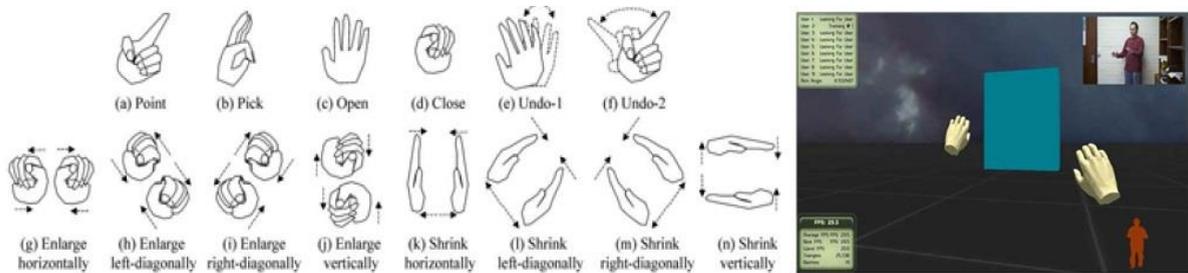


Fig. 14. (a) Gestures defined for controlling windows by, (b) Testing the prototype system

Reference identified four main components of the building structure; the vertical components (vertical to the building plane, including main walls and column), the transverse components (items parallel to the building plane - such as foundation, floor, roof and beam), doors and windows, and staircase. All vertical structures are expressed by vertical hand gestures, such as vertical palm (a) indicates a wall, while vertical (d) indicates a column. These gestures are designed for the left hand only while the right hand controls/holds a Marker Pen to input geometry such as location, size and shape.

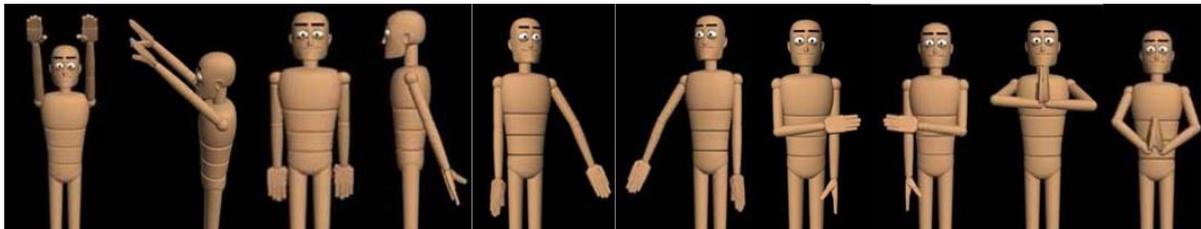


Fig. 15. Navigation. (a-b-c-d) move forward-backward, (e-f) rotate left-right, (g-h) strafe left-right, (i-j) move up-down

The gestures have been categorized into four different types; navigation, object creation, object selection and object transformation in the VE. An object can be selected by its face, vertex or line edge, and object transformation includes moving, rotating and scaling. Figure 14 shows some of the proposed gestures for a noncontact MHG system for architectural design in a VE. Even though the implementation of the basic gestures for navigation, object selection and object transformation have been implemented; further testing is required to confirm that the gestures are truly suitable for the specific architectural design task in the VE.

In a shared space, users can collaborate and perform tasks such as creating and reviewing designs. There are two main benefits that can be realized from the application and implementation of a non-contact MHG interaction technique in the architectural design domain. First, when creating designs, architects can experience a more natural and intuitive interaction with their creation. Second, architects will find that their ideas and creativity to be less restricted, thus more expressive due to not having to use intermediary and invasive

interaction devices such as the mouse and keyboard. [31]

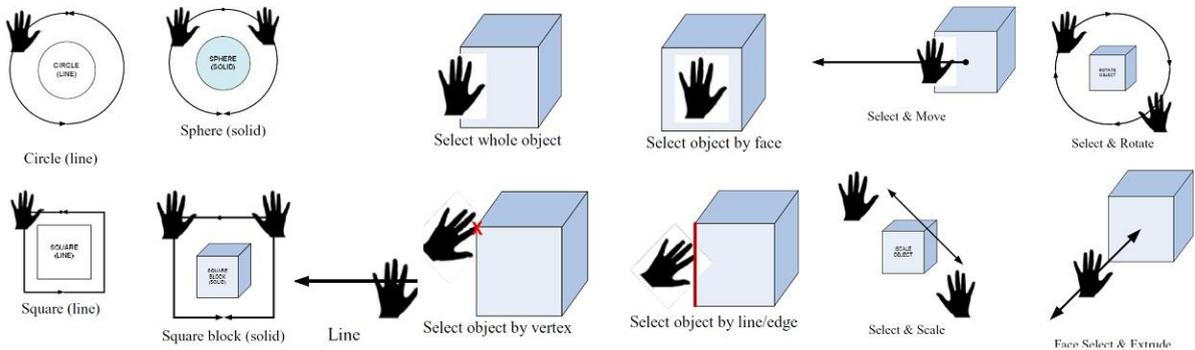


Figure 16. (a) object creation, (b) object selection, (c) object transformation

5. Conclusion

Using of Kinect sensor camera in 3D virtual space has been researched in this paper. The presented study is researched explorations and developments into the direction of interacting with Kinect Camera to model 3D images in VE. The purpose of this paper, having growing contribution to the creation virtual space kinect camera is to investigate its role on 3D architectural modelling. The reason for preferred Kinect is that it can transfer objects fast, smoothly and easily 3D objects to virtual space. Also, it has some spacial features such as RGB (Red Green Blue) image capture, depthmap, low cost. Therefore, kinect technology access 3D model fast, easily by giving information of depth and colour about object, increasing dependence on CAD systems, it directs attention of architects for a new different 3D modelling system.

In studies related to architectural 3D modeling, Kinect camera are used in two ways. First, by scanning depth and color information of three-dimensional, objects in the real environment is transferred to drawing environment with a special software allowing rotate, navigation, move in 3D virtual model. Researches focus this way with three methods in terms of scanning speed, scanning accuracy and software stability. The second way is the possibility of drawing by hand and body movements instead of tools like WIMP (windows, icons, mouse, keyboard, pointers) on the drawing environment. Datas on kinect is tried to import generally to CAD.

When creating designs, architects can have experience more natural and intuitive interaction with their creation. Besides, architects will find that their ideas and creativity to be less restricted, thus more expressive due to not having to use intermediary and invasive interaction devices such as the mouse and keyboard.

Kinect has speed scanning and high resolution for close-range, but difficult sense and low resolution for far-range. Kinect could be a viable alternative to laser scanning due to cheap more than laser scanner. But it needs software more stable and user friendly, wide angle degree, high resolution, farther distance perception.

Rendering a 3D model in real-time is a very resource intensive process, which may be problematic for very large building models. But Kinect may be a solution if softwares will be improved with higher powered computers. Having professional drawing products most preferred by Architects and Engineers, Autodesk may bring innovations related to Kinect for all modelling and rendering problems. Increasing the widespread use of kinect in various sectors might increase the demand for the professional programs that Autodesk offers. Furthermore, with the arrival of Microsoft Kinect sensor, its huge market potential will open up many new possibilities for augmented reality, human-computer-interaction and other field.

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THE EFFECTS OF INSPIRATION IN FURNITURE DESIGN FOR CHARACTERIZATION OF INTERIORS

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Abstract

Design action as a condition that occurs in the world of images is concerned; during the design process mind works at the level of the duration of the abstraction, the fact that most of the sources of inspiration for non-existent abstract concepts are seen. In the creativity, the most important point is as a source of inspiration for reality that does not coincide with anything, with the help of vision that is evaluated as imagination to create abstract concepts and visions, differs from conscious activities, to create new sensory or intellectual reflections in human consciousness.

A designer as well as being an inventor who expresses his or her creativity must have an inspiration source. Creativity is calling an imaginative force to solve the design problems together with the abilities to expand limitations of ideas and concepts. To reach to the creative final product, “creativity” is certainly an essential ability that a designer has to reach and internalise to his or her designer identity. An original design has to be specified by the designer’s different angled way of thinking and approaches. In furniture design, there are many different methodologies and approaches to reinforce types of skill, sensitivity and quality of works; promoting the creativity of the designer during the characterization of an interior.

Furniture has always been a symbolic aspect of the life style and cultural richness of mankind according to the usage of form, structure or materials both for aesthetic and practical purposes. Furniture design has a rich history of styles and precedents and a close relationship with fashion which makes practice in this area distinctly different from many product design areas.

The usage of furniture, choosing material, production methods and detailings are playing important roles to identify the characterization of interiors. In this sense it can be said that furniture is very strong instrument to emphasize and transfer the main idea of the interior and its designer. Furniture designers explore solutions to meet marketing, manufacturing and financial requirements and arrive at the optimum design of a furniture item. They consider both functional and aesthetic aspects and pay attention to ergonomics, those factors that relate to ease of use and human behaviour.

This study is aimed to underline the importance and effectiveness of furniture design is not only for aesthetic purposes of interiors, but also the characterization of the interiors can effect to concepts of mental behavior, visual perception and awareness of the users.

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1. Introduction

Design action as a condition that occurs in the world of images is concerned; during the design process mind works at the level of the duration of the abstraction, the fact that most of the sources of inspiration for non-existent abstract concepts are seen. Interior Architecture is one of the important basic discipline in design that is rapidly developing, renewing itself according to the rapid change in technology and living standards in daily life.

The usage of furniture, choosing material, production methods and detailings are playing important roles to identify the characterization of interiors. In this sense it can be said that furniture is very strong instrument to emphasize and transfer the main idea of the interior and its designer.

Within the scope of this study, the importance and effectiveness of furniture design is to be examined not only for aesthetic purposes of interiors, but also the characterization of the interiors which can effect the concepts of mental behavior, visual perception and awareness of the users.

2. Creative Idea & Inspiration Source

Design is a key element and outcome of functioning human brain that means process of thinking and solving a problem. Designing is something that all people can do; which is depend on the ability of human intelligence. The ability to design is widespread between all human, but some of them are better designers than the others according to their awareness.

A creative design solutions begin with a good *design concepts*. This means the concept will lead the way and give a direction for design decisions, than final product.

Each design item is unique according to its inspirational source of possible new innovation and is fully adapted to give meaning to its own close environment. Inspirational sources can vary according to the imagination of its designer. The most important effects of inspiration source are directly related with the design's identity in such its forms, textures and colors. Using inspiration source while designing is a kind of problem solving methodology that can help to create new standards for interior architecture, users, design field and society.

A design concept is the idea behind a design process and the final product. It's a kind of the “plan” on controlling the design process and solving the design problem. But before the constitution of design concept, there has to be a inspiration source which is going to support the design concept. This inspiration source is the underlying logic, thinking, and reasoning for how the final product reflects the main design idea. In accordance with the inspiration source the design concept is installed. And then the design concept will lead the aesthetic choices of forms, textures and colors which means the design concept determines the general framework of all design decisions.

A designer as well as being an inventor who expresses his or her creativity must have an inspiration point or source. Creativity is calling an imaginative force to solve the design problems together with the abilities to expand limitations of ideas and concepts. To reach to the creative final product, “creativity” is certainly an essential ability that a designer has to reach and internalise to his or her designer identity. An original design has to be specified by the designer’s different angled way of thinking and approaches. In basic design, there are many different methodologies and approaches to reinforce types of skill, sensitivity and quality of works; promoting the creativity of the designer

Designing and the design process involve the concept of “creativity”. Creativity requires mental activity that in a sense, to be able to think, produce new things, install new relations see objects or situations from different point of views to evaluate and this skill can be gained through the experiences after many designing processes.

The design product is a kind of reflection of abstract concept that is created in mind and based on the interrelations of ingredients in consideration of inspiration source. According to the inspiration source, the concept, the principles and the elements to install the end product completes its abstract journey initiated within the mind by transforming into a concrete final product. Thus, design has its physical/plastic form that can be decoded and identified by its concrete characteristics in which is created through inspiration source.

Design process is required to enable individuals to think, analyze, define, relate, synthesize and apply their knowledge to their designs for changing the environment. The designer should learn to wonder, imagine, observe, search and evaluate available hints to be able to find alternative solutions and approach problems with a criticizing and creative manner.

Metaphors, whose origin is the description of an abstract concept or idea are generated as a result of the revelation of a quality embedded inside the context; in this sense, they may not be perceived directly. Therefore, the generative potentials of the design problem’s context is based on the qualities of mental and perceptual processes of the designer’s performance during the analyzing.

The most important stage of the design process that leads designers from abstract concept to concrete product by emphasizing the relational potential of design by considering usage of analogies/metaphors. Thinking and designing by analogies through metaphors can be a powerful path finder in undiscovered concepts and inspiration sources.

Nature provides wealty of the information sources that could be used to explore new usable information (systems, processes, organizations, functions, structure, form etc.) as inspiration into design. In this sense, the awareness of interior designers about ‘nature’ and ‘nature- inspired design approaches’ and place of those approaches in design process. In this context, nature inspired design approaches such as biomimicry, biomimetic, bionic and biognosis, generative design, are focus on learning from nature for improve the creativity.

Biomimicry proposes the study of nature from a systems point of view, in which all elements are interdependent. Also it is a kind of design approach that has two main categories such as direct and indirect approaches. In the direct approach, a design directly mimics strategies of an organism, an animal’s or a plant’s a behavioural pattern or a system in nature with aid of an analogical translation system. In the indirect approach, the design uses abstract ideas and concepts as principles from those apparent in the domain of nature (Gamage & Hyde, 2012).

3. Furniture

Furniture design can be considered to be a specialist area of industrial/product design. However the specific ergonomic knowledge that a designer must apply and the specialized construction methods and pre-manufactured components that undergo constant change in the furniture industry make this a large area of specialization. Furniture design has a rich history of styles and precedents and a close relationship with fashion which makes practice in this area distinctly different from many product design areas.

Furniture is the mass noun for the movable objects intended to support various human activities such as seating (e.g., chairs, stools and sofas) and sleeping (e.g., beds). Furniture is also used to hold objects at a convenient height for work (as horizontal surfaces above the ground, such as tables and desks), or to store things (e.g., cupboards and shelves). Furniture can be a product of design and is considered a form of decorative art. In addition to furniture's functional role, it can serve a symbolic or functional purpose. Furniture can be made using a variety of many materials, including metal, plastic, and wood.

Furniture design is also undertaken by interior designers and, traditionally, by architects. Furniture designers explore new solutions to meet marketing, manufacturing and financial requirements and arrive at the optimum design of a furniture item. They consider both functional and aesthetic aspects and pay particular attention to ergonomics, those factors that relate to ease of use and human behavior.

Quality of materials and technique in furniture construction has a major impact on both its durability and its proper use. Generally the details of construction of a piece of furniture are at least partially concealed in the finished piece. Because of this, the reputation of a particular manufacturer, published specifications, and price are all clues to the quality of construction.

Just how sturdy a piece of furniture needs to be depends on its intended use. Whatever its intended use, good furniture is characterized by good materials, techniques of construction, and finishes at an appropriate level of durability.

The furniture is emerged with the selected components and materials resolve assembly and manufacturing details and produce digital documentary instructions for others involved in the manufacturing process. They organize and oversee tooling to prepare for production and develop and oversee subsequent adjustments and refinements to the furniture.

4. Integration with Interiors

The era that we are all live in is based on “consumption”. The spaces, interiors, concept and all their items are consumed rapidly. The member of this “consumption society” has more information, his/her needs, desires, tastes change very rapidly individualized. Rapid process of innovation and renewing of the technology creates variations about the main purpose of furniture.

Interior space is the phenomenon of other components that make up itself as a fiction. In a paradoxical structure of life and fluctuating of the time that individuals live, gain some experiences by give meaning to spaces that thanks to the the images were created by using the forms. The design of interior space (space) only when associated with the attributes, inward-looking place, it is the reflection of the shell (outer mass) is a reflection of the global outward-looking place. Therefore, they were not against to each other even if they are nested, complementary to each other by overlapping.

Furniture is not only an aesthetic or functional solution, but also to identify the interiors main characteristics and affect to the users' awareness both in visually and behaviorally. Furniture has a complementary purpose for physical features of the interiors we live and work in influence how we feel and act.

Furniture has always been a reflective effect of its user in a manner that life style, statue, taste and cultural situation. Form, structure, use of material, detailing can be a interface to emphasize these abstract concepts. In this sense furniture is very strong instrument to emphasize and transfer the main idea of the concept, the interior and its designer.

Interior architects have to choose appropriate furnishing that is strongly related with the interior's concept to provide memorable experience of the user perception.

When the inspiration sources are examined for the furniture design to characterize the interiors, two new trends are become prominent: "parametric design" and "biomimicry".

Generally, parametric design is used for designing interiors and also furnitures to reflects the design concept. Parametric design thinking can be defined as having three characteristics: thinking with abstraction; thinking mathematically; and thinking algorithmically (Woodbury, 2010). As a method thinking with abstraction is a base that enables parametric design as a generative approach for producing different alternatives and it also enables parts of the parametric model to be reused. In parametric design the designers can change and modify their own rules to give form to their ideas, see Fig 1.



Fig.1. Parametric Wall design by Jenny Wu, Marcos, Sanchez

In parametric design, that the most trendy design approach nowadays, thinking mathematically refers to the theorems and constructions that used to define the scripting language for design representation and generation. On the other hand, thinking algorithmically means that the scripting language provides functions that can add, repeat, modify or remove parts in a parametric design. So it can be said that parametric design method will provide many alternative forms as inspiration source to create new form interiors and furnitures, see Fig 2.

Fig.2. Murena Bench is the result of parametric design by Oleg Soroko.

In biomimicry the main inspiration source for the designers is nature. When the main idea of biomimicry is examined it can be defined as imitating or taking inspiration from nature's forms and processes to solve



problems for humans (Benyus, 1997). Biomimicry is more than just imitating or reproducing a natural object or system and convert it into a spatial design or furniture. Biomimicry is an applied science that derives inspiration for solutions to human problems through the study of natural designs, processes and systems. The widespread and practical application of biomimicry as a design method remains unrealized; interior architecture commonly use biology as a library of shapes (El-Zeiny, 2012).

The role of biomimicry in interior architecture is to lead to newest ideas and innovative solutions that have many potential advantages. For example, the curved spiral shell house which designed by Senosiain Arquitectos and was inspired by a sea shell, see Fig 3. Inside the home, the odd forms of the exterior continue to wrap through and connect each space.

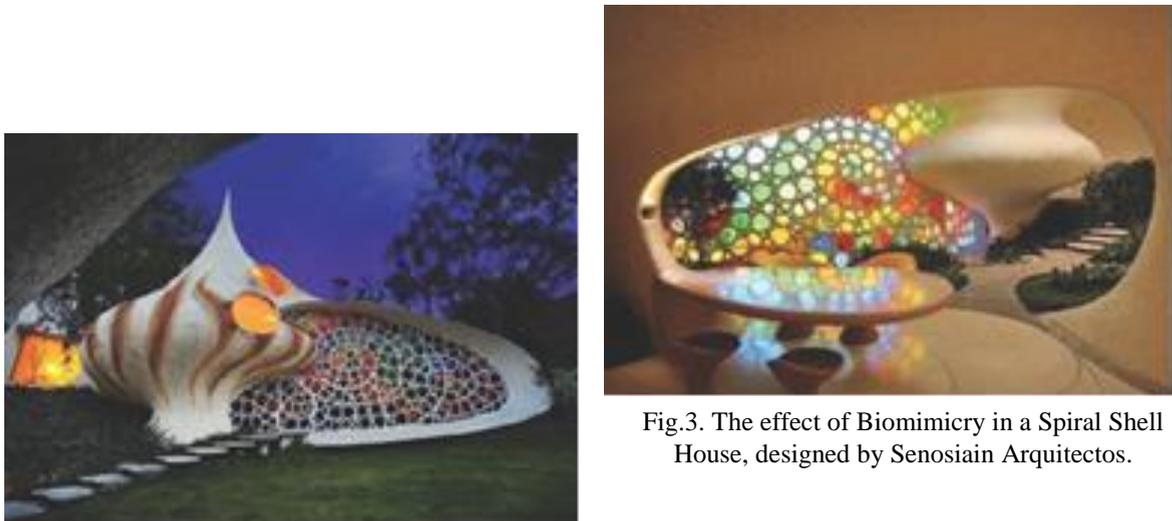


Fig.3. The effect of Biomimicry in a Spiral Shell House, designed by Senosiain Arquitectos.

5. Conclusion

If the design process and its methodologies are analogically analyzed it can be emphasized that the meaning of a sentence is different than the meaning of the total of its words, it is also different to see a series of phenomena as a characteristic whole, rather than the sum total of its components.

It can be said that analogies between things/objects by generating metaphors is also a method of expression/creation in designing and it's all practices. The meaning of thinking and designing through analogies and metaphors is multi layered and complex. In this manner, transition to more creative thinking methods may be made, thinking with qualitative values rather than quantitative data may be carried out and more synthesis than analysis is performed.

It is assumed that in furniture design, the effects of inspiration for characterization of interiors which constitute a gradual process, learning knowledge of not only nature but also close environment by exploration, analyzing this knowledge, making accurate determinations, and transforming knowledge of environment into design knowledge by making connections will increase the creativity of design students.

Even if the inspiration source could be parametric design or biomimicry for furniture design or interiors and seems unusual in the future, the interior spaces we live in and the workplaces we work in might be designed to function like living organisms, specifically adapted to the context and able to provide all of their needs for energy and water from the surrounding nature.

In this study, the important point that generates a discussion on design thinking and its practices based on analogies, develop the design process through an inspiration source aiming at creating different perspectives with the methodology of design. This kind of way of thinking intends to improve designer' designing abilities by providing the sustainability of creation process. And also enrich the interiors in use of creative furnitures to improve spatial perception of user to use bravest design solutions.

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Kano Model and Using Continuous Improvement Method in Housing Design

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Abstract

Quality is defined as meeting needs and conformity to use. In housing design, Kano Model and Continuous Improvement is one of the methods aiming to meet customer needs and expectations. In this model, customer demands are rated and assigned to satisfaction aspects: basic quality, expected quality and excitement quality. Continuous improvement includes two fundamental principles: preservation and improvement. Voice of the customer and voice of the process are the source of continuous improvement. Deming Cycle, which is used to improve the process, consists of planning, doing, checking and acting. Deming Cycle begins with housing design. Customer needs are determined during the design phase. Post-design production is planned. The production plan is implemented. Following the production, how well user needs are met is asked and the response is added to the system as feedback. The quality expectation of the customer is met and the way to create excitement design is opened.

Keywords: Quality; design quality; conformance quality; housing quality; customer satisfaction; Kano Model; basic quality; expected quality; excitement quality.

1. Quality

Quality stands for the attributes of a product that best meet consumer needs for a certain period of time and offer sufficient and fulfilling use. The common aspect in the definitions proposed by leading experts of quality, such as Crosby, Juran, Deming, Feigenbaum and Ishikawa, is meeting needs and conformity to use. Deming thinks quality is the ability to fulfill needs. Feigenbaum argues that quality is the degree to which a product conforms to design and attributes.

Kano states quality is to meet, and even surpass, human needs. According to these definitions, basic elements of quality fall into two categories: [1] The first is the desired attributes and the second is conformity to these attributes. The former is related to customer satisfaction whereas the latter is about perfection in production (Fig 1). Design quality depends on whether or not a product or service has the desired attributes. Design quality largely depends on taste, need or preference. Customer wants and needs must be taken into consideration in product design. Design quality is when a product has all attributes, expected or unforeseen by the customer.

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There is a close relationship between design quality and product performance. Product performance is measured by how well product attributes meet expectations. [2] Design quality eliminates most of the errors that may emerge later on. Design quality is determined by the product's physical structure and its attributes. Conformance quality is to scientifically determine how well a product conforms to specified attributes. Conformance quality can be measured as the degree to which a physical product conforms to the attributes specified by design quality. In this aspect, quality involves subjective (personal) values. Quality based on subjective assessments varies between countries and is directly or indirectly influenced by factors like standard of living, social structure, educational level and financial status. Therefore, what customers mean about a product's quality is also variable. However, product quality that is measurable, determinable and most of the time, specified by quality standards or relevant regulations is objective. [3]

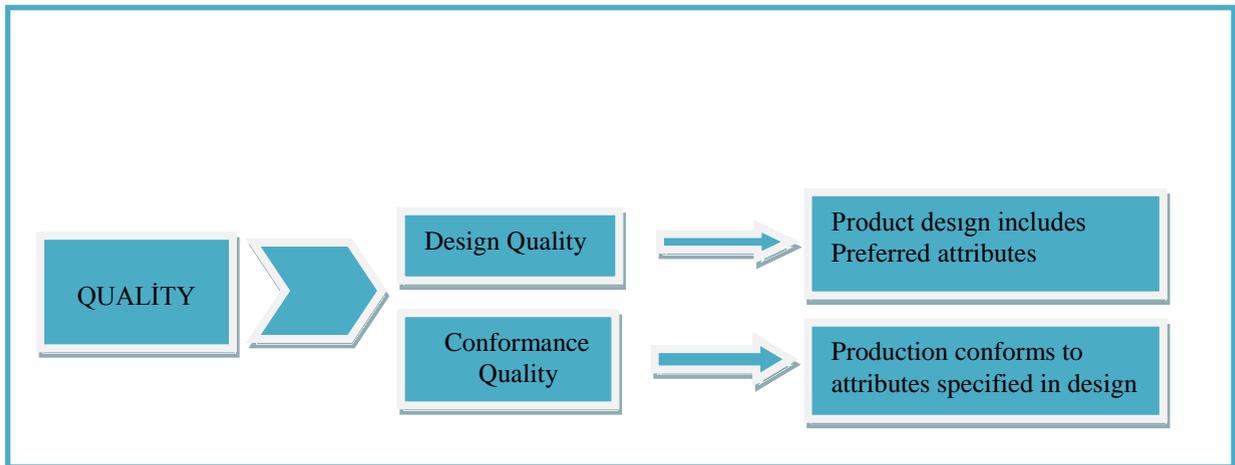


Fig.1. Two Dimensions of Quality

2. Housing Quality

Although their structure and materials vary, houses have always provided for people's need for accommodation and safety as well as their psychosocial needs. Basic needs for accommodation and safety do not change; however, psychosocial needs depend on cultural values, educational level, income, age, profession and lifestyle. Quality in housing determines quality of life for residents and improves their comfort level.

Garvin argues there are 8 aspects that determine product quality. When these aspects are applied to construction, attributes of quality of space become evident. [4- 5]

2.1. Performance and Functionality

Conformity of the building to intended use. Performance aspect is constituted of a building's conformity to use and meeting of expectations. For instance, elements and spaces that create a house determine housing quality. Positions, areas and relationships of a house's functions, acoustics, lighting, heating, ventilation etc. have significant influence on housing quality. It is important for current legislations, standards and regulations to be updated in order to keep up with the times and design, project, material, application, technique and attributes to be used correctly on a building. The most important condition for a building to be high quality is that these

attributes meet the level of human needs. [6] All fixed and moving elements in interior design for functions like sitting, eating, cooking, sleeping, working, bathing and resting must conform to their purpose and meet the expected level of performance.

2.2. Structural Attributes

Structural and technical attributes of components constitute the second element that determines quality. Structural system and the technology used to build it, selection of construction materials, layout of the design and details affect quality. Design, materials and structural attributes of fine construction materials, such as doors and windows, furniture, kitchen cabinets, bathroom cabinets, built-in closets, furniture and fixed hardware in the bedroom or dressing room are important.

2.3. Reliability

A house is reliable when it does not lose performance within its lifetime. A house should be reassuring in the sense that it will meet expectations. Reliability is confidence in a house to perform without problems. The house and its materials should be durable and sanitary, resistant to fire, earthquake etc. and give a sense of reliability. A house should offer safety of life and property and its interior design should function to satisfaction. Materials used in design should be long lasting and not contain hazardous substances on human health.

2.4. Conformity

A building's design, shape, carrier system and materials should conform to user expectations. The building must also be in harmony with its surroundings and have a design that does not damage the environment while functioning as a house. Socioeconomic and cultural status and expectations of the user must be taken into account in user-oriented housing design. Interior design project should be based on user expectations and needs and, at the same time, build a healthy and sustainable space.

2.5. Durability

A building is durable when its entirety, materials and details are preserved to be as good as new in the long term. In housing design, materials and fine construction components should not include fast wearing materials that require repair or replacement. The design should take into account the properties of interior design materials, such as their strength, permeability of heat, water, humidity and noise, and resistance to fire.

2.6. Serviceability

The presence of necessary attributes to solve problems that may emerge during use. A house's quality is influenced by the presence of predesigned solutions to resolve problems easily and as soon as possible. For instance, when there is a problem on the roof, easy access to the problem and enough space to do the repairs gains importance. Accessibility to electric, water and ventilation installations makes it easier to solve problems in a short period of time. Also, an easily accessible fire escape that meets standards improves quality.

2.7. Aesthetics

A house should satisfy the visual taste of its user. Colors and shapes used especially in interior design should meet user expectations. Materials used in interior design should be in harmony.

2.8. *Perceived Quality*

The level of satisfaction a user feels. This is subjective because people have different values and feelings. Recognizing psychosocial and cultural values is as important as knowing user activities and actions in housing design.

3. **Kano Model and Continuous Improvement Method**

Organization ensuring and sustainability of quality generally concerns the entire construction industry. [7] Designers should have information on all elements that may directly or indirectly influence design decisions. The goal is to foresee possible problems and create solutions before they arise. In Turkey, answers given to questions about how well housing production meets quality attributes are mostly unfavorable. There is inclination towards changing physical or aesthetic attributes to meet user expectations and wants after the house is sold. When the house is used for a certain period of time, faulty craftsmanship, worn-out materials etc. begin to require repairs. Also, due importance is not given to building physics problems, such as heat, water and noise insulation, which determine the comfort level of a house, and buildings are raised independently of sanitation system or ventilation installations. [8] These factors lead to additional costs and loss of time and effort. In houses designed for the high-income group, which have specific users and are designed in interviews with users according to user expectations and needs, problems still emerge, stemming from design or application phases. Houses designed for the medium or low socioeconomic levels, the users of which are unknown beforehand, even more problems emerge and they have to be solved. All customers cannot be expected to possess the knowledge and experience designers and architects working in housing design have. Customers mostly want their own needs and expectations to be provided for. This problem should be solved by adopting "human-centered" housing production. Therefore, it becomes very important to gain information about customer expectations and needs. Kano Model and Continuous Improvement is one of the methods aiming to improve customer satisfaction. The model, developed by Noriaki Kano, categorizes customer needs and assigns attributes expected by the user into three categories. Kano Model rates customer wants and determines their satisfaction level: basic quality, expected quality and excitement quality. [9] (Fig. 2)

3.1. *Basic Quality*

Basic quality is defined as must-be quality and stands for the customer's absolute expectations from a product. The presence of this quality does not improve satisfaction and it does not cause dissatisfaction when not fulfilled because it represents the minimum, or rather, basic functions of the product. It is perceived as "normal" when basic quality is met. It is the quality the user hopes for in a product. Basic quality in housing design is a house conforming to activities and user behavior in the house. Actual needs of the user must be determined to create the correct function scheme. Private and public spaces in the house must be separated and the design should meet psychosocial needs by balancing communication and privacy. Physical conditions of the house must protect human health, and ensure comfort and safety. In house-space organization, activities should be diversified and enriched through qualities like spatial gradation, including of the house, house group and layout plan, creation of individual identity and group identity, belonging to the space and individualization of space at various levels, and appropriate physical conditions. [10] Spatial, thermal, audial, visual, security and health requirements, which are physical user requirements in a house, are included within the context of basic quality. Position, size and numbers of the spaces in a house should be arranged according to interspatial

relations. Moreover, privacy and aesthetic requirements should be provided in housing design as basic quality. Living spaces should be positioned next to the front façade, which overlooks the scenery, and let in daylight and temperature during the day. Wet areas should have the sufficient equipment. Bedrooms should look eastwards or southeastwards and have natural ventilation to let the air in. All spaces must have heating and ventilation systems to afford a comfortable and healthy life. Temperature, water and sound problems should be solved in the house to achieve basic quality.

3.2. Expected Quality

Expected quality is the answer to the question what a customer expects from a product and concerns expectations ascertained during customer interviews. Fulfillment of these expectations leads to customer satisfaction while nonfulfillment leads to customer dissatisfaction. To ensure the expected quality in housing design, designers must know the user, i.e., user's age, educational level, culture, lifestyle, family structure, customs and traditions, past experiences, expectations and socioeconomic standing. If a house does not fit the user's lifestyle, it lacks expected quality. The user constantly has to do alterations in the house to adapt it according to his or her needs and expectations. It is important to design a house that is flexible to new purposes and adaptable to changing conditions. Spatial and modular harmony in interior design provides flexibility for different uses. Adaptability in housing design can be defined as the ability to meet individual needs through the approach of flexibility and diversity in design, production and using phases. [11] The concept of adaptability is defined as tools and forms that allow harmony between individual spatial needs of users and borders of the house. [12] At the spatial level, the number and relationships of spaces, their size, their angle towards the sun and their window aperture can change based on expectations. Quality is improved when users are allowed to choose between hardware options, such as doors, window systems, kitchen, bathroom and washroom design and fittings, heating-ventilation systems, and lighting elements. Moreover, wall and floor coverings in interior design selected according to user wants improve expected quality. The number and sizes of rooms go up along with the addition of new individuals to the family. Expected quality dictates that the number of bedrooms should be arranged according to the number of family members, the house should have suitable areas for children to play and study, and provide for needs like parents' bathroom, dressing room, study room and storage. Each child should preferably have his or her own room. The equipment used inside the house should be designed separately for each space. A cloakroom and equipment of storage should be designed in the entrance. There should be at least one sofa group, a television set and an eating area in the living spaces. Customer expectations and needs include the necessary storage, preparation, cooking and eating areas in the kitchen. There should be beds, storages and changing areas in bedrooms. The bathrooms should be designed according to users' bathing habits and their number should be increased for crowded families. High quality, durable and aesthetically satisfactory materials should be used in the interior space. There are more studio apartment designs in large cities for people who live alone or students. House types like 1+1, 2+1, 3+1, 4+1 and 5+1 are designed to meet various needs.

3.3. Excitement Quality

Excitement quality is a type of quality customers rarely mention in interviews. This type of quality goes beyond customer expectations. Excitement quality is designed by "creative leaps," which are based on observation of customer comments and behavior. [13] These are unexpected and surprising attributes for customers. Their absence does not have any negative effects but their presence has positive influence. Creative ideas that will help create excitement quality should be given importance. This makes it possible to know the actual needs of customers and cater for them. Beginning by reducing errors, quality reaches the point of creating and offering superior designs. [14] A point to consider here is the fact that customer expectations and needs change rapidly. A feature offered as excitement quality loses its appeal in time and becomes a default feature. Manufacturers need to advance and improve their products constantly in order to preserve quality.

For excitement quality, houses are designed with customized, flexible and creative designs. Standard plans are rearranged to fit personal needs and personal apartments are designed. Therefore, structure systems that can afford changes should be preferred. Today, safe, self-sufficient, high quality high-tech buildings that offer social opportunities and can service its residents are designed as "residences." Projects include open-closed parking garages, security, open and closed sports areas, pools, children's playgrounds, green areas, stores and social activity areas. A residence needs management to offer these services. Walls, flooring materials, window and door systems, and all equipment (wardrobes, white ware, armatures, and vitrified elements) are chosen according to quality standards. There are heating and ventilation systems with central and private options. Residences offer fire services, elevators and security. Materials can be chosen according to users' preferences. Superior quality in a house improves the satisfaction level of its residents and meets expectations.

The concept of quality is a systematic approach, which begins from the procurement of production input by top management and ends in user satisfaction and searches for perfection through constant development and aiming to do the best on the first try. [15] Everyone working in the production process must try to ensure quality and prevent errors. Continuous improvement requires two basic principles: preservation and improvement. Preservation stands for activities to maintain the current situation and standards while improvement stands for enhancement of the current situation and standards. [16] Settling for the current situation hinders continuous improvement, which is the effort to constantly improve, question, and reach perfection. This must be the fundamental approach adopted by everyone contributing to a production process. Quality is a precaution. It provides solutions to problems before they emerge and adds superiority and the quest for perfection to the product structure through design. [17] Therefore, conformance quality cannot surpass the design quality of a product. The two real sources of continuous improvement are voice of the customer and voice of the process. The customer and the process provide the information necessary to improve the process. Kano Model allows designers to gain information about customer expectations and how to meet their needs. Data obtained through the process frequently come as feedback from direct and statistical output measurements and allow the means to determine how process goals are stably and extensively met. The opportunity to improve based on the voice of the customer is the difference between what the customer wants and what he or she gets. The opportunity to improve based on the voice of the process is the difference between what is wanted as an output and what is actually produced. Data procured from these two sources gives the opportunity for continuous improvement. [18]

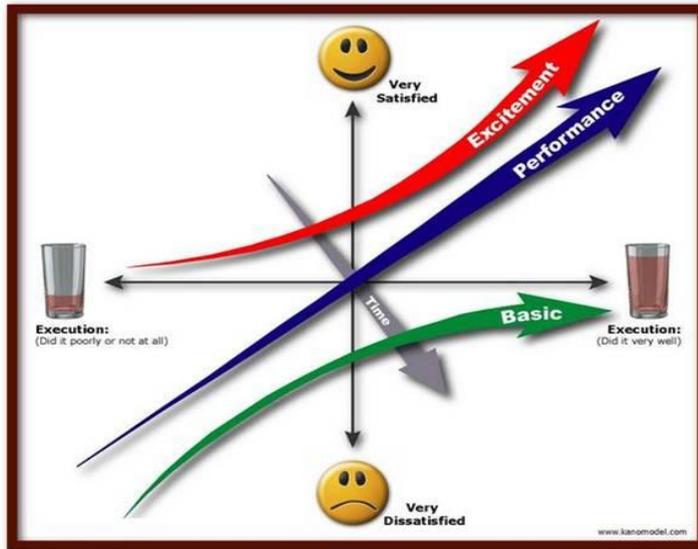


Fig. 2 Kano Model

Deming Cycle (Fig 3) requires three types of information to improve the process. These are; what do the customer and the process need, what does the process really produce, what can be done to improve the process? Deming Cycle has four phases used to improve the process. These are; plan, do, check, act. Plan: Changes for process input or input use methods are determined and improvement measurements are created. Do: Data is collected to analyze the new performance. Check: Results of the new performance are compared to improvement measurements. Act: Future steps are designed. Future improvement opportunities are considered and researched. Deming Cycle begins with product design. What potential customers need is researched during the design phase. A product is designed to meet the needs and production is planned. In the second phase, the production plan is implemented. When the product is sold, how well it meets customer needs is evaluated, which constitutes the checking phase of the cycle. An investigation is performed about how well customer needs are met and what sort of changes are needed and the system is provided with feedback. This is the last phase of the cycle. Giving equal importance to the voice of the customer and the voice of the process will eliminate the difference between design and application, quality expected by the user will be provided and the way for excitement quality will be saved. Measurements are necessary to improve this process. Measurements are used to detect tendencies, problems, and improvement opportunities in the process.

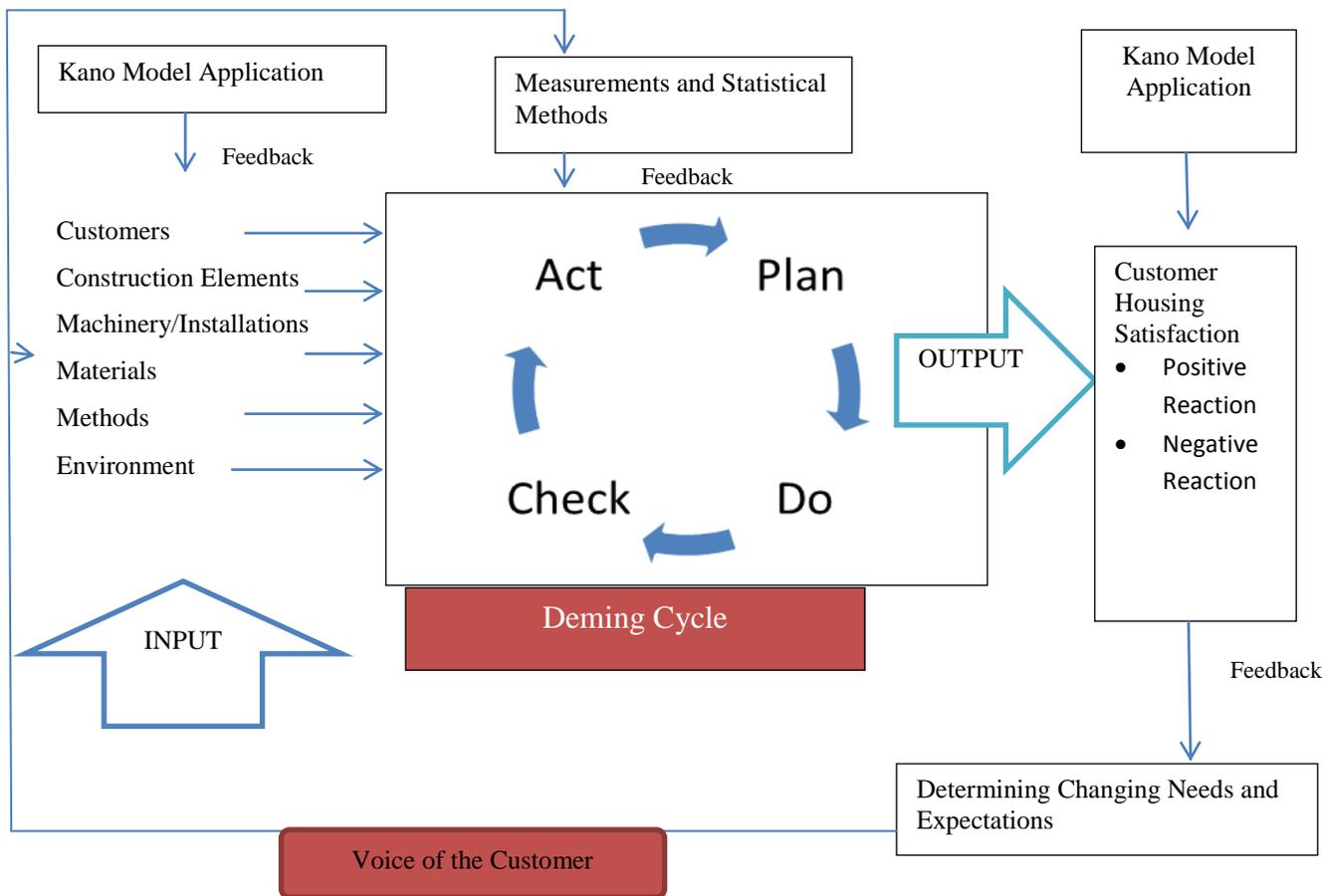


Fig.3 Deming Cycle - Continuous Improvement Method.

Conclusion

Housing quality is a process that begins with design quality and continues throughout the process. Housing design should conform to relevant regulations and standards as well as cater for user needs, preferences and tastes. In Turkey, there is inclination towards changing physical or aesthetic attributes to meet user expectations and wants after the house is sold. This leads to additional costs and loss of time and effort. For a "human-centered" approach in housing production, user expectations and needs are determined by conducting surveys, making observations and having interviews. The information obtained is analyzed and used in the project design phase. Information gathering from house users continues post-implementation. Voice of the customer should be incorporated into the process as user expectations and needs change in time. Designers make houses

more habitable and constantly improve them by using modern technologies, advanced materials and carrier systems.

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Space, Material and Interstice

Genco Berkin - Uğur Özcan

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Abstract

The use of material in architecture is a conscious choice. The senses and messages driven from spaces through materials require a more detailed research. We as architects give certain roles to each material apart from loadbearing and coating functions. These roles could be announcing the space's aspiration of existence, coding or re-coding memories, regulating priorities within feelings. These can be enforced with tools of secondary roles like solids and voids, or transparency and opaqueness. The recent innovations in material technology offer us to create impossible forms. We are facing an architectural era which exceeds the material capabilities to constitute conventional structures in the trace of unique space experiences.

Key Words: Space, Material, Solids and Voids

1. The Lost Meaning of Architecture

Let's figure out what is architecture: Is it only the problem of loadbearing function? Or architecture is the eco-shelter for humans to survive. How much aesthetics do we need to put into our design? Do we have to start design process with a functional program? Or can we start the design from a detail? All these questions show us that there is something lost in the meaning of architecture.

Today we have enough technology to shape, strengthen and modify building materials to make durable for extreme severe conditions which deteriorate them. We are also capable to make them smart. Innovative technology has provided architecture to evolve in the structural capability of matter. We witness more materiality than spiritual thinking in architecture nowadays. Architects are form givers. The building finished could last for centuries. So, the product would be the next generation's artefact. Buildings might carry some messages to the future. This means an architect has to foresee whether his/her ideas would be still valid. Architects may want to express their thoughts through semantic forms of matter. This approach is carried out by implementing symbols drawn from daily life and combined with universal rules. The Architects' buildings can be seen as a manifestation of their personal vision, thought, ideals, and dreams.

Modern architecture has detracted material from form. Modern architecture's obvious sources of visual inspiration are basically simple or the zeitgeist of simplicity. Modern design offers a formula to join machine aesthetics and function: exposed materials in their natural state.

We should give materials hierarchical roles to be able to compose a fiction. Thus materials could become building elements which affect the space by their attitude. Similarly the joint can be the focal point of the

space. The joint is the point where matter changes. All surfaces are in effect joints, a merger or connection between solids and voids.



Figure1: Aero Saarinen, Chapel wall. Bricks used as ventilation elements

Spaces should reflect their era they are built in via materials. Glass is used as a transparent wall material in Reichstag New German Parliament so as to symbolize democratic regime by Norman Foster. In past it had thick opaque walls to secure and obstruct what decisions are given by the Nazi government. It was also a determination to make the building more accessible to the public.



Figure 2: Norman Foster, Looking down from Reichstag's glass dome



Figure 3: Norman Foster - Interior of Reichstag

Architects can be more creative when they seize and follow the patterns of life. One of the few is Louis I. Kahn. Kahn, through his philosophy of internalization, was the first architect to mention the spirit of the matter as a part of architectural theory. He tried to create a second macro-cosmos full of values. Kahn has distilled the monumental effect within the materials' dignity. According to his ideas every perfect construction in a specific material has its own very distinct character, and cannot be rationally carried out in the same way in another material. This individual separation of one material from the other forbids any complete mixing of different materials during construction, wherever one material, the internally complete and perfect, supersedes the other. Only in this way they may create a sense of order. Thus Kahn could have reached to create a transcendent space. His famous quote depicts this thought:

“Design is not beauty. Beauty emerges from selection, affinities, integration, love.”

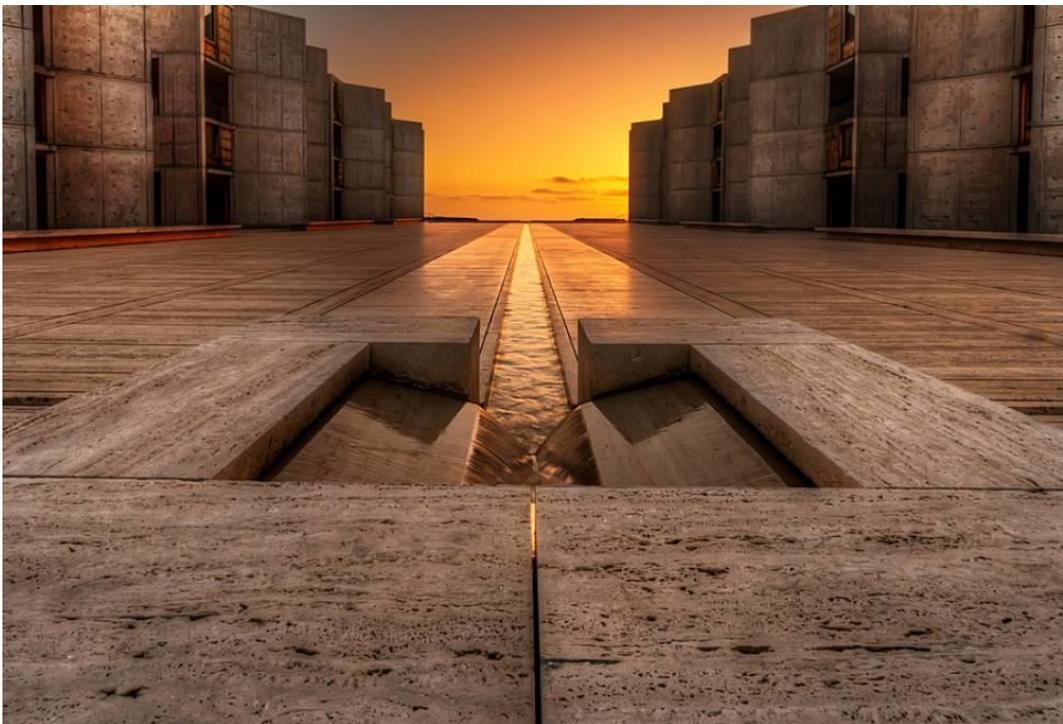


Figure 4: Louis I. Kahn, Salk Institute



Figure 5: Carlo Scarpa, Olivetti Company Entrance

Each material should recall physical phenomena. The use of stone in buildings evokes eternity. Carlo Scarpa has used marble naturally so as to constitute a look on the façade aging of the material. Thus he created an image that Olivetti Company has a sophisticated background.

Japanese tradition of paper use in building' panels, windows and doors had inspired Shigeru Ban's paper buildings: He has designed paper church, paper house, in the light of sustainable environment. This kind of approach to living reminds us that our possessions is temporary.

2. Innovation versus conventional

Modern technology has provided architecture to evolve in the structural capabilities. We can build larger spaces with more light and thinner elements. Nowadays the scientists can modify the atom packing and the interstice in between them. This phenomenon lead impossible forms to come through. There is a rising tendency to use parametric data to produce organic space define, encode, form finding method in design. Nano technology lead

to smart materials with various opportunities. Smart materials enable ease in production, ease in application, ease in installation. Using communication, collaboration and maintenance technologies by implementing sensors, detectors, transducers and actuators smart materials might have shape memory or can respond to parametric changes. They are not only innovations for construction industry but also formgivers for parametric designers. The recent researches on nano materials have showed us improved properties of building materials are superior to conventional ones. The nano technology can enhance fire retardant, self-cleaning, loadbearing or insulation properties of any material. Nano technology is the designing functional systems at atomic level. Nanotechnology may generate possibilities to infeasible constructions. The space syntax seems to be expanding by the new capabilities of nano-materials.

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The data presented in this paper is mainly based on the lectures of architecture given by Genco Berkin in several universities.

History Through Image and Symbol: Konya/Sille

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Abstract

Since their construction, cities have been exposed to economic, cultural or technological changes. Although these changes sometimes change the city identities, city identities along with their symbolic and imaginative realities have big impact on individuals' minds.

Theoretically speaking, a symbol refers to a sign, an object or a mark that a community attributes some meaning through consensus [1]. On the other hand, image is abstract or concrete representation of accumulation of knowledge in people's mind [2]. With respect to this, symbol and image have big impact on shaping behaviors, relation between people and environment, perception of environment. When individuals in the same environment are thought to be a group, it is supposed that they make an agreement on certain symbol or image.

There are universal images/symbols as well as special ones belonging to a certain city. It is possible to encounter symbols representing cities. These symbols are figures developed with city's historic and cultural sources. These figures can be the description of a human, an animal or a plant as well as a structure made by humans. For centuries, Buddy Bears is the symbol of Berlin taking place in seals, coat of arms and flags [3]. Likewise, New York State is one of the cities who have many symbols and most popular ones are Statue of Liberty and The Big Apple. Over time, these figures have become symbols along with the fact that they have been internalized by public or the world.

This work aims at revealing the identity of Sille with symbols and images as it becomes historical focus and alternative tourism area for Konya. Sille, 8 km away from Konya, is a town rich in culture and history where Muslim and non-Muslim communities used to live together. Nowadays, with its historical texture and natural beauty, Sille is an archaeological site which is important for tourism. Therefore, Karadeniz Technical University, Department of Interior Architecture has a contest among students who took the elective course, namely "History Through Image and Symbol: Konya/Sille". The aim of the contest is to put an emphasis on traditional texture and identity of the town which have historical value. So, throughout the course, as the students internalize Sille, imaginative values are designed under the category of Image in third dimension, Symbolical expressions are designed under symbol category in two dimensions.

Before the contest, didactic presentations on Konya Sille and Symbol/Image concept had been held. After the contest, products have been ranked by the jury of six people. When products are evaluated, it can be said that three dimensional products may be future symbol of Sille and two dimensional symbols can symbolize the town if transformed into three dimensions on the condition that they are internalized by the public.

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Keywords: City; city image; Sille; Image; symbols

1. Introduction

The city is not only what we can see through our eyes, but mostly what we feel behind what we can see. The individual is not limited in the visualization of the city in his mind. Identities of cities usually leave their mark in people's mind through their symbolic or imaginary realities.

The changing identity of the city is depicted through looking at the culture and physical elements of the city which evolve parallel with it, and the integrity of the identifying and descriptive imagery of socio-economic and socio-cultural structure of urban symbols which are becoming extinct and are under protection [4].

Expressed in a more concrete manner, the meaning of the city is shaped by the continuous motion in its symbolization. It is possible to locate the cities in the imagery memory with the elements of their silhouettes which symbolize them by words. On the other hand, cities become inseparable parts of our memory with the expression of social traditions, attitudes, behavior and habits, life styles, agreements or oppositions besides their symbolized values. Social life is the give and take of imagery and the interpretation of symbols [4].

There could be symbols which carry a universal value and which all communities accept as well as those which belong to a specific city. It is possible to encounter images which represent cities all around the world. These images are common figures which emerge from the historical or cultural resources of that specific place. While these figures can be figurations of humans, animals or plants, sometimes they can be man-made buildings as well. For example, the Berlin bear, has appeared in seals, coat of arms and flags as a symbol of the Berlin city. Similarly, faster than any other word, Statue of Liberty associates with the city of New York, Vatican with Rome, the gondolas with Venice and the Bosphorus and Closed Bazaar with İstanbul.

An image is the representation of the environment produced in the mind with the accumulation of concrete and abstract knowledge. In the relationship between people and the environment, the image has an important role in perceiving and getting to know the environment and in shaping behaviors accordingly. Every individual who lives in the city has his own personal image; however, besides this a collective image composed of the accumulation of all personal images can be mentioned.

The concept of image has been the subject of urban branding which aims at getting its share from the capital, investment and touristic resources in the recent years and has been seen as a great opportunity. The basic purpose of urban branding is to create an attractive image for the city by using characteristics of the place and the like and providing a positive value for the city in the global race. To that end, urban design and architecture, come forward as primary tools in the transformation of the urban image through creating new urban environments and the realization of large scale projects [2].

The study was carried out in the scope of the 7th semester elective course: "Urban Furniture" at Karadeniz Technical University, Interior Architecture Department in 2015. In the study, the relationship between city and symbol and the concept of image was emphasized. The study concluded with the design competition themed "History Told Through Symbol and Image: Konya/Sille" which included studio process and emphasized the texture of traditional Sille identity towards the future by also encompassing its historical values.

2. The Concept of Image and Symbol

Conceptually, an image is named as sensation evoked in the mind spontaneously without the presence of a stimulus; in other words, trace of senses perceived by sense organs left in the brain. It is evident that images are more detailed and developed than schemes and that adequate, conscious and controlled cognitive activities with an object are required for the creation of an image [5]. On the other hand, a symbol creates a meaning link between its signified and the object and is based on association as well. Within the signifier classification of Klaus (1973) a symbol is defined as, "a purposeful, non-qualitative signifier which does not show resemblance with its signified" [6].

According to Ersoy, all personal signs which naturally invite into the mind something which is non-perceivable or not ready in accordance with a symbolic correspondence and which represents something else are 'symbols'. These can be patterns, objects, pictures, names, dialogues, allegories, people or institutions. Not what a symbol is in itself but the message it wants to convey is important [7].

The hidden meaning inside the symbol can be revealed by the analysis of imagery elements that are handled individually. Symbols are beyond being clear and explicit. A symbol is an object which is attached a meaning through intense emotional and semantic connections. For example, the bay leaf and white dove symbolize peace, the lion symbolizes power and courage, fire symbolizes movement and revolution and the scales represent justice.

Symbol is often perceived as a concept which substitutes image. Hegel defines symbol as "an image showing a thought". The relationship between the image and the thought it shows, is not haphazard unlike in the linguistic signifier, but shows a natural quality. For example the circle represents eternity and order [6].

While defining the symbols which signify a city, they could also be called images belonging to that city. In fact, while a city is examined, the image is a meaningful whole produced by its creator's impressions; and a symbol is a kind of signifier for the creation of this meaning. For instance; as one of the symbolic buildings of the 20th century, the image of Sydney Opera House can be shown as an example of a symbol. Besides the emergence of Australia as a country with its building image in the mind, it makes an association to a sail and a sail ship with its roof [4]. Yazıcı (1997) who deals with the distinction between symbol and image also approaches the subject similarly: "in a communication cycle, two determiners (signifier and signified) come together and point to something else, that is the sign. In other words, the part which we perceive with our senses - signifier, comes together with the conceptual part- signified and carries us to the sign. An image is an expression of a semantic dimension which is a single unit made up of a combination of three determiners – signifier, signified, sign. The image is a wholeness; however, the symbol is a complementizer which achieves completeness. Therefore, meaning is hidden in what is meant; that is, in the image. The symbol is only a signifier which carries us to the image [4].

3. The Concept of Image and Symbol

Sille is an old settlement in Central Anatolian Region which is located 8 km northeast of Konya, between Takkeli and Karabuğa Mountains in the form of a valley, in the North of Sille River. While it was a municipality until 1980s, after 1989 it became a district of Selçuklu Province [9]. Sille which carries great importance for tourism, is an urban protection site which has an important texture with its natural beauty and historical past.

At Sille whose history goes back to very old ages and which is located on the Silk and Spice Roads seen as important commercial centers, the co-existence of Muslims and other religious groups (Christians, Jews etc...) has caused the settlement to become a center of commerce with its diverse culture [9]. Sille, which is a very rich settlement in terms of history and culture, is an important region, which has lived with these values to our day and which continues to preserve its social life at present like in the past.

In the scope of this study, it was aimed at determining the identity of Sille which has become an important attraction center, historical focus and an alternative tourism area for Konya through images and symbols. For this reason, a competition regarding Sille, with the theme of "History Told Through Symbol and Image: Konya/Sille" was organized in the scope of the seventh semester "Urban Furniture" elective course in Karadeniz Technical University, Interior Design Department with the participation of 9 students who are taking the course. The purpose of the competition, was to emphasize the traditional textural identity of Sille towards the future which is inclusive of the historical values. In this regard, in the studio process, the participating students designed the imagery values which have formed in their mind while they internalized Sille under the

category of image at third dimension; and the symbolic expressions in two dimensions with a linear language in the category of image.

The competition had two stages; first of which took place within the studio process and the second at the end of the studio process. The competition process has been summarized in the diagram below (Figure 1).

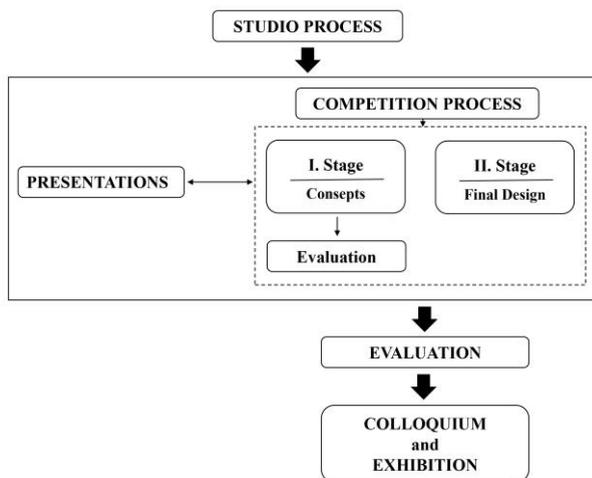


Fig. 1. Study Process

3.1. Studio Process

Prior to the competition, a studio process took place in the scope of the “Urban Furniture” course. During this process; in order to guide students in the right direction, informative presentations were made on the subject and concepts in the scope of the course by the coordinator and the students.

- By the coordinator, general information was provided about Sille which was selected because of its historical importance and location.
- The students made presentations about the historical process of Sille, its past, its life experiences, architectural monuments, stones, arches, streets, houses, traditions and similar subjects.
- By the graphic designer, presentations were made about necessary information on logo and graphics design.
- Students were informed on general definitions on the concepts of symbol and image with examples from the world by the coordinator.
- Through discussions of image and symbol concepts in the course, the correct perception of the concepts by the students was targeted with necessary activities.

The first stage of the competition took place during the studio process, and afterwards in the scope of the above mentioned class, it continued in the form of subject, concepts and presentations. Finally, the studio process ended in the scope of the announced competition with students detailing the symbol and image studies in line with the purpose, preparing according to the conditions and making applications.

3.1.1. Competition process

The competition was open to students who were taking the “Urban Furniture Design” course. The purpose was laid out as emphasizing the texture of traditional Sille identity in the images and designs towards the future

in a way which includes past historical values and at the same time. The competition was comprised of two stages. The poster prepared for the announcement of the competition was displayed on the Interior Architecture Department's website and on the bulletin boards in the department.

At the first stage, the students were asked to identify a characteristic of Sille according to the presentations made and their research through which they could define Sille in terms of image and symbol and carry out studies based on this subject with its reasons and concepts. At this stage, no elimination was made. The first stage was carried out in order to provide support for the perception of the competition subject for the students. The first stage of the evaluation was realized within this process.

At the second stage, the students who were to submit under the category of image were asked to prepare a presentation frame sheet which included the name of the design, its concept, short information on the design and the computer aided model and a 1/2 scale model of the image. At the symbol category, on the other hand, they were expected to make a two dimensional linear design which reflected Sille and to produce a slogan. The slogan was expected to be a short, memorable statement reminding Sille which is harmonious with the symbol. For the symbol category, the participants were asked to include the abstraction stages which tell about symbol design process, the final design and short informative notes on the design on the presentation frame sheet.

3.2. Evaluation Process

The products which were submitted to the two-stage competition "history told through image and symbol", were evaluated by a jury of 7 people; chairman Prof. Dr. Öner Demirel, jury members Assist. Prof. Dr. Şebnem Ertaş, Assist. Prof. Dr. Funda Kurak Açııcı, Res. Assist. Elif Sönmez, graphic designer Pardis Kafil, architecture and art historian Erdal Zeki Tomar and honorary jury member Selçuklu Mayor Uğur İbrahim Altay with the rapporteurs Res. Assist. Zeynep Sadıklar and Res. Assist Aslı Taş.

In the competition which students attended individually, at the end of the provided time, 9 products in the image category and 9 products in the symbol category were submitted by students. In the two different categories, products which ranked first three were determined.

At the first stage, the jury emphasized the need to pay attention to the designs, which were developed in relation to the selected concepts, in terms of aesthetic value, originality, functionality and effects. The students were given evaluation reports which were thought to provide support for the second stage and the development of their concepts.

At the second stage, the following evaluation criteria were taken into consideration:

- The originality of the design,
- Representation of Sille's traditional texture and harmony with the texture.
- Inclusion of historical values,
- Applicability,
- Selection of material,
- Preparation according to participation criteria.



Fig. 2. Jury photographs from the second evaluation process

3.3. Colloquium

The award ceremony of the competition titled “History told through symbol and image Konya/Sille”, the colloquium and the exhibition activity was done in KTU Osman Turan Culture and Congress Center, Fahri Kuran Hall (Figure 3).



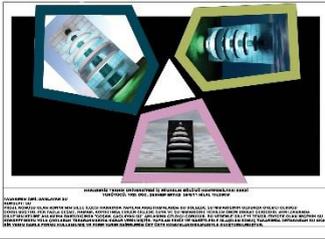
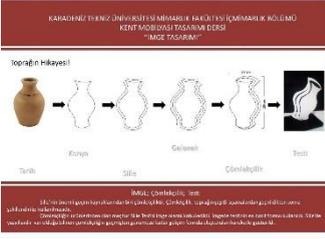
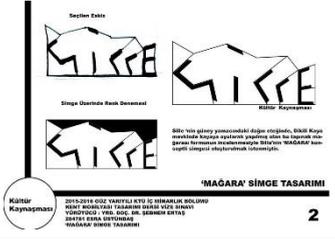
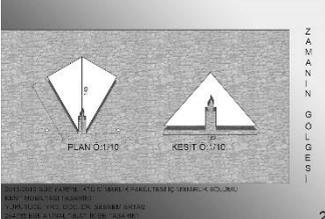
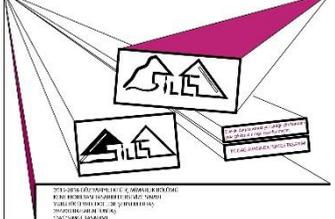
Fig. 3. Poster and invitation

During the colloquium which started with opening talks, a video presentation themed ‘Sille through the eyes of students’ was made by the students. In the video fictionalized and shot by themselves, students shared the impressions that Sille left in their memory. The program started with the opening talk by Jury Chairman Prof. Dr. Öner Demirel and he mentioned why Sille is describing through concept of symbol and image also stated support of publicity for similar studies. The program continued with the presentations by jury member, architecture and art historian Erdal Zeki Tomar titled “A Dream of Infinity: Sille Time Museum” which tells the history of Sille and the reason behind transformation of chapel to the Time Museum and by Assist. Prof. Dr. Şebnem Ertaş titled “Studies Done on Konya/Sille in order to Reveal the Tourism Potential” which gives information about studies carried out with students since 2012 and scientific studies after 2015 held in Konya/Sille. At the end of the program, awards were given to the students who ranked in the first three in the categories of symbol and image (Table 1).

In symbol category, design in the first place is inspired by water, the word meaning of Sille and design in the second place is inspired by a traditional product, pitcher. Lastly, in this category, design in the third place is inspired by a traditional product again, candle.

In image category, design in the first place is inspired by mountainous terrain of Sille and design in the second place is inspired by cave churches of Sille. Design in the third place is again inspired by mountainous terrain of Sille.

Table 1. Ranks by categories

	Image categorie	Symbol categorie
First Prize Hilal Yıldırım		First Prize İrem Bekar 
Second Prize İrem Bekar	Second Prize Esra Üstünbaş 	Second Prize Bahar Altuntaş 
Third Prize Esmâ Ünal	Third Prize Bahar Altuntaş 	Third Prize Bahar Altuntaş 

Afterwards the exhibition and the cocktail were done. In the exhibition, the frame sheets and models of the ranking products were displayed (Figure 4).



Fig. 4. Colloquium and exhibition activity

4. Results

When the products were evaluated, according to their internalization by the public in time, it was thought that the images obtained in the third dimension could become Sille's symbols in the future and in addition, the two dimensional images could be used with the purpose of logo or could represent the city by being transformed into the third dimension.

On the other hand, it was observed that the students who were awarded in the competition joined similar competitions, which showed that this activity increased students' consciousness about competition. In this manner students could bring out their talents and improve their competence with similar competitions and the like. This competition is also suggestive for similar competitions.

Acknowledgement

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CULTURAL PROPERTY WITH TOURISTIC POTENTIAL: EXAMPLE of SİLLE

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Abstract

During the recent years, touristic activities have had an important development, in parallel with world economy and political and technological developments. In this period, it may be seen that demand of going to mass tourism places have decreased. People are more after for non-famous touristic places in these days. Over times, tourists expectations have changed highly, they are not seeking for “sea-sand-sun” but more they are after exploring some new traditions. Therefore, tourism has become a tool for this new demand. In a globalized World, tourism sector itself has changed its definition swiftly to afford these demands of customers. In the same period, cultural tourism has taken a place for itself too. Because of its nature, cultural tourism has become the most effective scope of business which keeps feeding itself with its sustainable rich legacy [1]. It is a kind of tourism sector where a region’s items turns into an attractive object. Items which may be entitled as attractive objects are; museums where artificial works are shown, theatre, opera (and same musical events). Besides; works of art, handicrafts, traditional modes of living and, furthermore all stuff what local people uses from everyday objects to styles of praying [2]. A regions’ traditional configuration and character of its constructions plays an important role in constituting a cultural tourism. One of the builders of sustainable culture is “architecture”. As an important fact, sustainability of architecture may only be provided with restoration work and protection of it. In our country, which owns a big percentage of World Heritage, to provide sustainability to these heritages, a number of exercises have been done considering protection-using-sustentation principles.

Konya, which has a large tourism potential, provides such great alternative tourism experiences besides belief and cultural tourism. In this perception” Konya’s tourism map” has been put out with paying regard to culture, cave, health, hunting and congress tourism. Based on this map, to reach out other districts of Konya (which are apart from city centre), a corridor has developed to spread culture tourism into these areas. Also Sille shows itself as being one of these districts [3].

Sille which has been built in very early ages of humanity was an important commercial centre in history of humanity. Sille was also built on the area where silk and spice road used to pass. The city provides us a rich viewing of its mosques, churches, streets, fountains and its houses, which are done in a cubic style and has flat rooftops. Sille is constructed 8 km. away from Konya’s North-west where people from all religions lives together. It may be diversified from its likes with its culture, tradition, customs, life style and geographical position (Fig.1), [4].



Fig. 1. Konya- Sille

In 2001, a process commenced to make Sille an attractive centre for tourists. Based on a construction plan, Sille was going to be made again a touristic and recreational place which would cause a touristic activation. This positive process was run properly and after positive effects, restoration has started in Sille [5]. With its geographic location, environmental specialities, socio-cultural group, local people (in old times Turks and Greeks, now only Turks), different style of living, traditions and beliefs Sille is still different from its similars. Because of all its different specialities, Sille's sustainability shall be supplied. In the position paper, Konya/Sille's architectural constructions, which has tourism potential, were determined in the way their equivalent's are being used as cultural tools nowadays. Constructions were separated into 5 as; religious constructions, water structures, public structures, civil structures and graveyards. They were all considered in their own way and examples were given for all of them.

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Keywords: Sille, Tourism, Sustainability, Cultural Tourism, Cultural Values

Introduction

All of the relations and events occurred by the temporary stay of people who are foreigners to the location covering the travel and accommodation factors while not becoming a permanent residence with the condition of not initiating any income generating activity are called tourism [6]. Tourism is an essential sector as it generates economic, environmental and socio-cultural impacts while being in relation with many sectors. As a result of developments occurred in economic, technologic, politic and social areas after the World War 2, tourism showed a very fast development and became one of the fastest growing sectors nowadays [7].

With the social, economic and technological changes occurred in the globalized world, changes occurred in the scope of the tourism as a result of the changed requirements and demands of the people [8]. People's shift in the choice of holidays from sea-beach-sun composition to extraordinary activities and different attractions was effective on this scope change. As a result of this, tourism types like special interest tourism, rural tourism, and eco-tourism are occurred besides leisure, entertainment, health and sports tourism types. Especially on the

recent years, it can be said that culture is the biggest factor for people to travel [9]. Presenting new areas, re-discovering of the old and different cultures and efforts to present these places are expanding the supply possibilities in a shrinking world with the increased transportation and communication. Especially developed countries are started to develop policies for cultural tourism after 1980s [10].

Culture tourism described as an excursion type which covers the monumental or civil architectural structures, art products, collections, cultural identities and languages, sharing and recognizing all the tangible and non-tangible products of cultural heritage [11]. Culture tourism, a tourism type where the cultural values of an area is the main attraction, covers the tourism where the life styles or art products in the ancient cities presented in museums and theatres where cultural qualities occur. Besides these, attractions considered within the cultural tourism covers; art products, handicrafts, traditional life styles, all the events and objects ranging from the tools used by the local populace to religion [2]. In this manner, Anatolian geography by its natural, historical and cultural wealth carries Turkey to an assertive position in cultural tourism. While cultural tourism have important opportunities for preserving and maintaining the cultural heritage of our country, it especially brings up new job opportunities, economic development and competition force increasing options to small scaled historic cities [11].

Tourism must provide benefits to the host populace while it must provide opportunities for protecting and preserving their cultural heritage, and encourage them in these paths. These relation must be managed sustainably for current and future generations [12]. Sustainability is an important term aiming high efficiency and providing ability of continuance while preserving and protecting the function resources of a system by maintaining economic and ecological continuation [13]. Sustainability terms are also applied to tourism sector as it is applied to agriculture and industry, sustainable tourism aspect was developed under the leadership of World Tourism Organization and United Nations [7]. According to World Tourism Organization (WTO) sustainable tourism is; a resource management where the needs of the host country and the tourists are compensated while the opportunities for the future are developed and maintained. With this resource management, cultural integrity, ecological processes and biological variety are sustained while socio-economical and esthetical needs are compensated [14]. Main idea that reveals the requirement of sustainable tourism is, the usage of the environmental and cultural values without distortion or minimizing the possible negative effects [15]. At this point relations between tourism and cultural heritage resources or values is dynamic and it must be sustainable.

In the guide published by ÇEKÜL (Environmental and Cultural Values Protection Foundation) [11] 2011 it is stated that; Sustainable cultural tourism requires an intense planning and method and in order to achieve this, starting point must be designated clearly. Also as per the International Tourism Code; while considering tourism as a positive power for preserving natural and cultural heritage, it must be sustainable as per natural and cultural tourism development policies [12]. For this reason in order for cultural tourism to be sustainable, designation of the cultural assets of the residential area is also essential. Sille is an already enriched settlement to be considered with cultural and natural heritage which holds a corridor role outside the city centre of big tourism potential Konya. A new plan draft is being prepared for making Sille as an attraction site in terms of touristic and recreation besides the Reconstruction Plan for Protect. It is considered that this new Reconstruction Plan for Protect will be beneficial for Sille in terms of tourism. For this reason, map positions and current condition photographs of tourism assets of 2015 as per the classification of cultural assets in which Urban Conservation Area in accordance with Sille Reconstruction Plan for Protect [16] are designated on the map of tourism aspects.

1. Sille in the manner of Sustainable Culture Tourism

Sille stationed 8 km north of the Konya City centre in Middle Anatolia Region hosted many civilizations as Greeks, Seljuks and Ottoman Empire during its 5000 years of history. In Sille stationed on the Silk and Spice Roads which are considered as the trade centres in history coexistence of Muslim and Non-Muslim populace caused cultural variety and caused settlement to become a trade centre [17].

It can be understood that, as Sille was a settlement economically very developed with a population reaching 18000 as it had 16 villages where the activities of trade, carpeting, winery, masonry, and chandler had lost most of its Greek population by the population exchange between Turkey and Greece as a result of the Lausanne Treaty at the beginning of the Republic Era and suffered economic damage. While it was a separate municipality till the 1980s, it became a district of Selçuklu municipality after 1989. Nowadays, only the remnants and foundation traces can be seen on the hill sides and the population of the settlement decreased back to 1500 [17]. Even though Sille lost its old socio-economic and cultural values and lost its liveliness, Sille still maintains its current city identity. For this reason, in the manner of sustainable cultural tourism, cultural assets of the settlement are considered under five different groups by describing their original features [16].

1. Religious Constructions
2. Water Structures
3. Public Structures
4. Civil Structures
5. Graveyards

1.1. Cultural Assets of Konya/Sille with Tourism Potential

Cultural traces, historical places and areas belonging to many different nations are mostly still living in Sille. Churches, mosques, fountains, historical mansions, traditional Sille houses are inspected by the Cultural and Natural Heritage Preservation High Board of Konya as an Urban Protected Area with the ordinance number 4328 dated 19/11/2001 [17]. Structures registered as urban protected areas within the Sille settlement are classified as follows [16]:

1. Religious Structures: All of the churches belonging to Christian communities and mosques belonging to Muslim communities
- ❖ Churches; Church structures belonging to the Christian community are comprised of a monastery, a grand church, one chapel, and church caves [16]. The monastery around Salasorma does not survive today, and the Ak Monastery is not included within the boundaries of the Urban Conservation Area under consideration. (Fig. 2).
 - Aya Elenia: Biggest church of Sille settlement. It is renovated and called the Aya Elenia Museum nowadays.
 - Tepe Chapel: Also known as Süt (Milk) Chapel. It is renovated and called the Zaman (Time) Museum.
 - Kriakon (Hızır İlyas) Church: Considered under Caved Churches
 - Komesis Tes Panagias Church: Considered under Caved Churches



Fig. 2. (a) Aya Elenia Church; (b) Süt Chapel; (c) Kriakon Church

- ❖ Mosques: 7 Mosques are present within the Sille settlement belonging to the Muslim community nowadays. Except the Subaşı Mosque, all of the remaining six mosques are renovated as per the originals [18], (Fig. 3).
 - Ak Mosque
 - Çay Mosque
 - Karataş Mosque

- Kurtuluş (Mormi) Mosque
- Mezar Yaka (Kayabaşı) Mosque
- Orta Mahalle Mosque
- Subaşı Mosque



Fig. 3. (a) Mezar Yaka Mosque; (b) Çay Mosque; (c) Orta Mahalle Mosque

Water Structures: Registered water structures within Sille Settlement comprised of 2 baths, 1 laundry, 1 dam, 2 aqueducts, 2 bridges and 16 fountains [16]. Mormi Water Way Küçük Su is not survive today, Himmet Ölçmen Dam is not included within the boundaries of the Urban Conservation Area under consideration.

❖ Baths (Hamams), (Fig. 4)

- Ah (Hacı Ali Ağa) Bath: Designed as a dual bath.
- Subaşı Bath: Constructed symmetrically on North-South axis.



Fig. 4. (a) Subaşı Bath; (b) Ak Bath

❖ Laundry: A structure stationed to the west of Subaşı Bath which is constructed as open yard design (Fig. 5).



Fig. 5. (a) Laundry [19].

- ❖ Aqueducts: Even Sille settlement has a stream running through city centre, water had been brought from distant areas and for this reason it has 2 aqueducts constructed.
 - Mormi Water Way Büyük Su (Şeytan Köprüsü – Devil’s Bridge): Shows the specifications of Ottoman Era (Fig. 6), [16].



Fig. 6. (a) Mormi Water Way Büyük Su – Devil's Bridge.

- ❖ Fountains: There are 16 registered fountains in Sille Settlement. Bağyolu İki Lüleli Fountain is not included within the boundaries of the Urban Conservation Area under consideration. Kavaklı Fountain and Nuri Paşa Fountain are not dedicated in Urban Conservation Area. Names of these fountains are as follows; (Fig. 7), [16]
 - Hacı Ali Street Fountain
 - Hacı Kamber Street Çeşmesi
 - Mezar Yaka Fountain
 - Hassioğlu Fountain
 - Mescitli Street Çeşmesi
 - Mormi Mosque (Veli Paşa) Fountain
 - Sadettin Street Fountain
 - Hacı Şaban Fountain
 - Hacı Mustafa Ağa Fountain
 - Hacı İsmail Ağa Fountain
 - Özkoyuncu Street Fountain
 - Karataş Mosque Fountain
 - Hükümet Street (Tatköy Way) Fountain



Fig. 7. (a) Hükümet Street (Tatköy Way) Fountain; (b) Hassioğlu Fountain; (c) Hacı İsmail Ağa Fountain

- ❖ Bridges: There are 2 bridges in Sille Settlement (Fig. 8).
 - Stone Bridge (Taş Köprü): Stationed on the west of Çay Mosque over Sille Stream dating back to 19th century.
 - Sille Entrance Bridge: Bridge stationed at the entrance of Sille on the junction point between Hükümet Street and Dam Street, lost its originality due to the newly constructed concrete bridge for expanding the road [16].



Fig. 8. (a) Stone Bridge; (b) Sille Entrance Bridge

2. Public Structure: Two public structures reached to our days from 19th – 20th century, (Fig. 9).
 - Culture House: Constructed as a two story school in 1941 and used a culture house nowadays [16].
 - Arsenal: This structure had been renovated and used for cultural and social services [20].



Fig. 9. (a) Culture House; (b) Arsenal

3. Civil Structures: Civil structures in Sille as per the classification of Tomar, separated as residences and plots. Residential structures are referred to as having the port number by the Selcuk Municipality, the parcels are no house numbers are made (Fig. 10).
 - Residences: There are 21 registered residences in Sille Settlement.
 - Plots: There are 31 registered plots [16].



Fig. 10. (a) 14 no. Residence; (b) 16 no. Residence; (c) 20 no. Residence

4. Graveyards: Graveyards belonging to Muslims and Christians are present within Sille Settlement. 5 graveyards belonging to Muslims and 3 graveyards belonging to Christians are confirmed (Fig. 11), [16].



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Spatial Quality in Public Spaces

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Abstract

Urban spaces must be evaluated not only physically; they are to be thought as a whole within social, sociological and psychological perspectives. As Aristo stated, what makes a city whole is the difference of lives of those who live in it, their relationship with each other and the reflection of this social structure to the city. The city is not a form that can be used or directed as an investment tool through only physical spaces. It has to be thought as a structure where different parts of community can live in peace, based on democracy, equality and discrepancy.

Though public spaces carry different meanings for every single individual, they are common spaces, in which different social groups gather and interact. These areas must be highly accessible and they have to provide certain physical conditions for the interaction and activities which are to be held. Spatial quality of these areas highly depend on whether these conditions are provided or not. Streets and squares (plazas) are the most important public areas in urban space.

Quality of space is evaluated by the common sense of the users. Spatial quality is evaluated by the determination of various parameters in today's urban design and architecture literature. The aim of the evaluation works is to use these parameters determined in public spaces and by doing that, to increase the quality of existing public spaces.

Selected as the case study area of this study, Besiktas is a county of Istanbul which is near to the historical center. Having become a dense habitat since the end of 19th century, Besiktas is an important meeting area in terms of public spaces. The downtown area, which is the most efficiently-used area of the county, will be evaluated with regard to its public space patterns, according to the parameters of spatial quality. Parameters are determined by performing deep literature research and adapted to the case area.

Within the study; the general physical conditions and historical development of Besiktas are examined, borders of the case study area and its physical evolution since 20th century are stated and supported with maps and the area is analysed in physical and social scopes. Survey studies are performed with the users, and evaluations are made on the subject of users' activities in public areas. In the last part, the streets and squares in the case study area are evaluated by the spatial quality parameters and the results are explained.

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Keywords: public space, spatial quality, urban space, quality

1. Introduction

Public spaces are the urban areas which provides a common social life that is open for people who lives there. A city's social, economic, cultural and spatial variety are improving in parallel with variety of public spaces. Existence of an individual and the meaning of the city to an individual are related with the activities

that took place in public places. If this relation supports the social life and collective events in a social and physical way, this means that this relation is strong enough.

Starting point of this study is to analyze the concepts of environmental interaction and physical environment, public space and urban memory. Thereupon, this study aims to show the dynamics of public places that are connected with urban spaces.

In this study, it was also aimed to show how public places effect an individual's life and relations between public places and social structure. The improvement of Besiktas and the study area is aimed to show in parallel with the historical period of Besiktas and the area's criteria. The public places in the area were analyzed with the approach of how people define these places and why they use them.

1.1. Location and Borders of Study Area

Besiktas is a town which is located on the west side of Istanbul . It is surrounded by Bosphorus from the southeast, Beyoglu from the southwest, Şişli from the west and Sarıyer from the north. It is a town that has very important structural features and it has two piers on Bosphorus watercourse and a bridge that is a very important connection to the city.



Figure 1. Besiktas and The Study Area Location

The area that is going to be studied is stated as Koyıcı which is known as the centre of the town. The area is limited as; Besiktas is on the south, Barbaros avenue on the east, İhlamurdere and Şehit Asım Street and Masuklar hill on the west and Abbasaga Mosque on the north. (Figure 2)

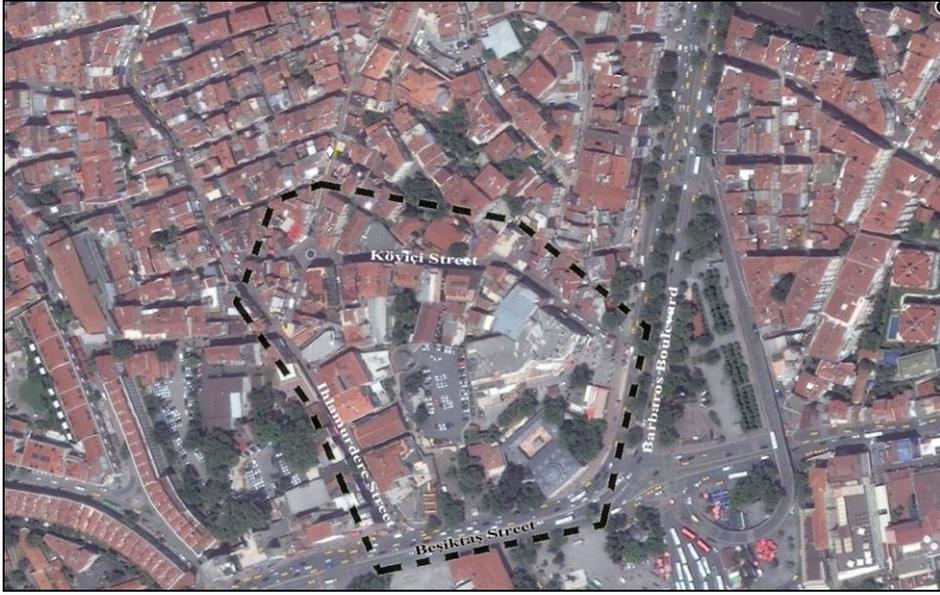


Figure 2 . The Location of The Study Area in Besiktas

1.2. Historical Developments

Depending on its geographical location and its proximity to the historical peninsula and Galata which is located on the opposite side of Halic, it could be said that this fact seems like an advantage. However this town had security problems in period of antiquity and mediaeval age and that was the main reason for underdevelopment. During the Byzantium period, Bosphorus was attacked by looters who came from Blacksea area. The damage and fear that are caused by these attacks effected the improvements of settlements located out side of the walls. Besiktas became an essential location for Ottoman Empire and this was because the Ottoman Empire took the control of Blacksea area.

After the conquest of Istanbul, because of the rebellion politics of Fatih the conqueror made the city a very populated place. The topographical structure of Galata and its trade based location made muslims to settle in the north coast of Halic and Bosphorus. Besiktas is the first settlement area for Ottoman Empire on the cost of Bosphorus.

Besiktas became an important place especially for maritime in the period of chief admiral Barbaros Hayreddin. He used the Besiktas cove to moor to Ottoman ships.

In 17th Century it could be seen that the favor of Besiktas changed. Dolmabahce cove was enlarged and the settlements started. The coast of Beşiktaş was equipped with tens of palaces that were built and modernized. These palaces were owned by members of house. These palaces were used as summer palaces. In Spring, a migration edict published and because o f this people moved here. In Autumn, they were back to winter palaces because of an edict.

In 18th Century, the settlement in Besiktas was enlarged along with Besiktas and İhlamur stream. But then Serencebey ridges were opened for housing .

In 19th Century, Sultan II Mahmud left Topkapı palace and stayed in Besiktas palace in winters. This situation was not very welcomed by governors. However Sultan II Mahmud stayed in Beşiktaş, Cırağan palace and Yıldız. After renewing the Besiktas palace, he left Topkapı palace and he did not come back. Along with the emporor, the members of the house and state dignitaries started to settle in Besiktas.

When the Republic of Turkey announced, Besiktas was a part of Beyoglu. It was dependent to Beyoglu lieutenant governor. During the first 15 years of the republic, urban development was often seen in Ankara and Izmir because these cities were financially damaged. Because of this fact, Besiktas and Istanbul did not developed.

In that period, Besiktas continued to be a city which maintained urban-country connection and flower gardens surrounded beyond Ihlamur.[1].

1.3. Process of Change in The Study Area in 20th Century

A wide town planning started by urbanist H.Prost who was hired by mayor Lütfi Kırdar. This planning was approved in 1939. The quality of Zincirlikuyu - Besiktas road and Ihlamurdere street which connects the central area of the town to the main road was improved.

The second town planning that changed the urban texture started in the period of democratic party that came into power in 1950. Dolmabahce street was enlarged in 1956. Between 1956 - 1958, Barbaros avenue which divided the settlement area into two and connected Besiktas to Zincirlikuyu was opened and so the town lost its cultural assets.

Besiktas central protected the wood texture and gardens until mid 1960's. After that, buildings started to exists. Bosphorus Bridge was opened in 1970 and it caused traffic in Besiktas because of belt highway. However the fact that the transportation was easy made demands increased [2].

2. Analysis of Besiktas

Principals of urban design evokes what is good for a successful site design to the designer. In order to determine the principals of urban design theory ,linkage theory, Lynch principals were approached and studied. When assessing the area at hand according to the spatial quality policies, The information determination has been completed, some visual technics such as photography-mapping have been applied and charts-tables are prepared. The squares and streets of the public area at hand have been assessed by questionnaire and suggestions have been presented.

2.1. Conceptual And Theoritic Frame Work

In figure-ground theory, physical relations shows the specific characteristics of specific areas. The texture of the town or physical space or packness which is a construct of visual tendency are used to fill space analysis.

Connection theory was established on main axis organization which connects different areas of towns. As it was emphasized in shape - ground theory, places don't create scheme, cycle creates it.

Maki has been approved as the most important dimension of urban places and their connections. In the direction of this idea, three basic approach were determined. They were identified as compositional shape, mega shape(constructual approach) and group shape(consecutive order approach) [3].

Maki was identified as the characteristics of spatial organization in many historical settlements. When the shapes are studied, it is possible to determine the Besiktas-Central area as group shape. It was formed when it was located next to secondary classification that aligned along with an axis. Connections were not noticed. Organically, it was formed with natural ways. The analysis that were made for the central Besiktas shows the natural ways of formation.

A very intense settlement and construction could be seen in the area of central Besiktas when it is determined as figure-ground and packness-space. The great Besiktas market includes big constructions such as Sinan Pasa business district.

When we compare the sizes of parcels and their formations, it is seen that middle size and big size parcels exist. It is also possible to observe that they have organic form.

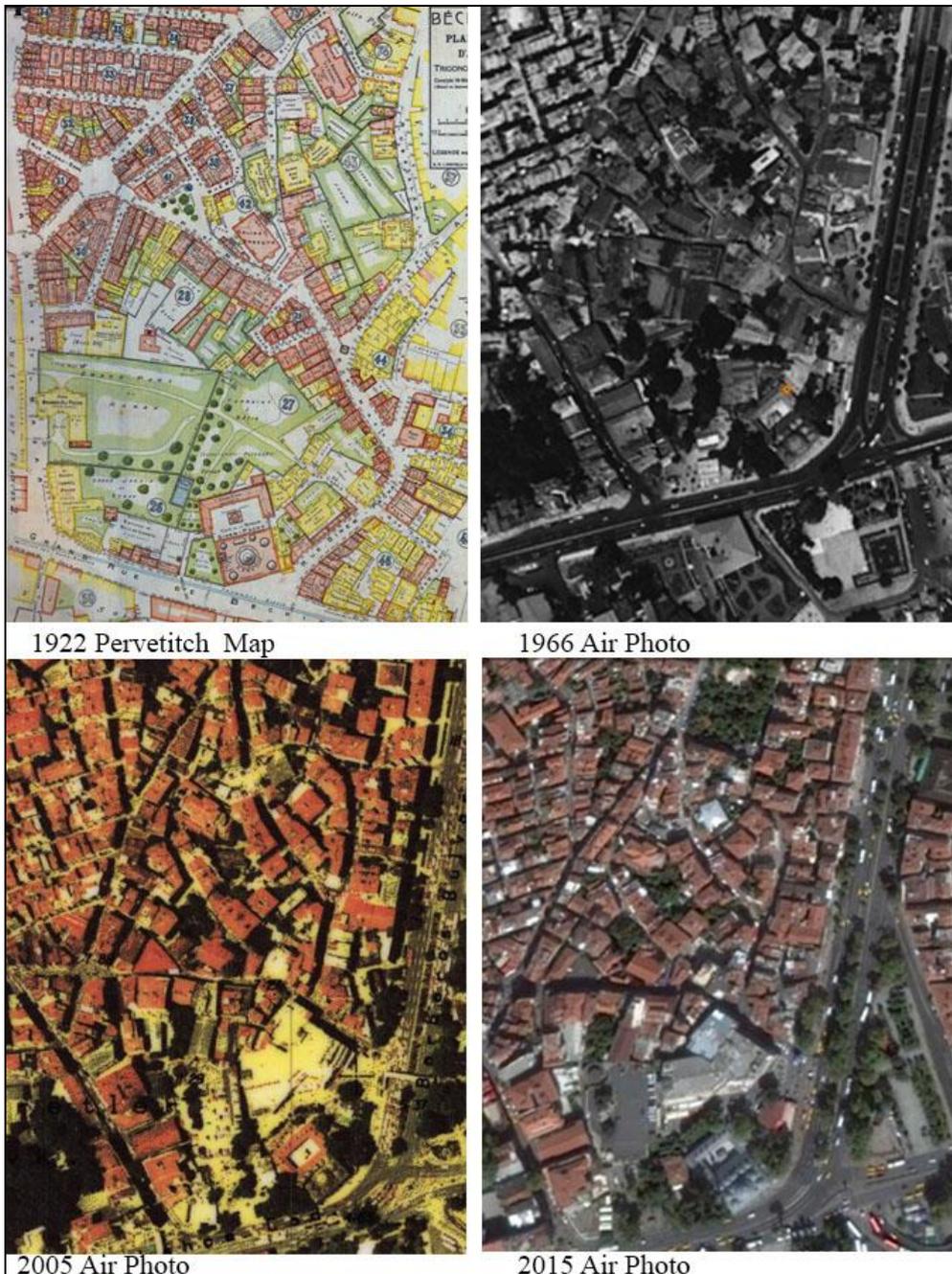


Figure 3. Central Besiktas 1922 – 2015

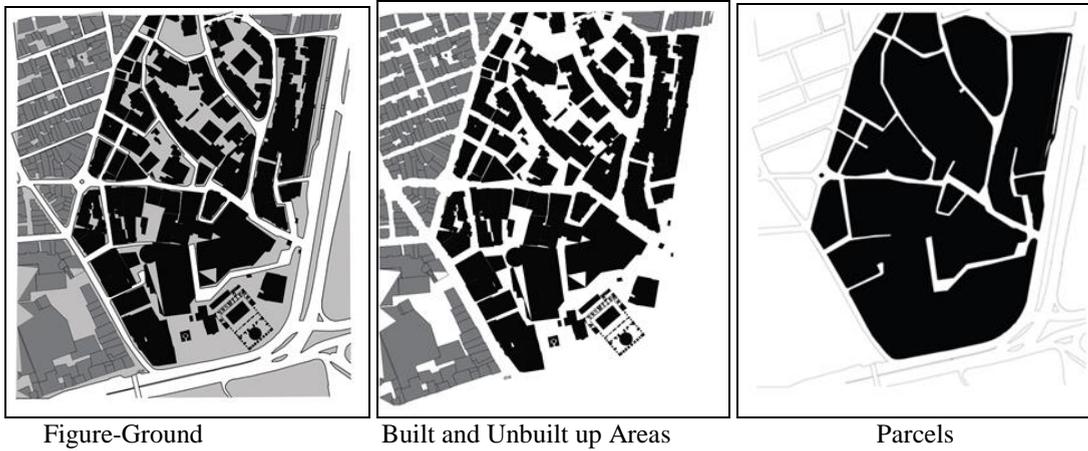


Figure 4. Analysis of Study Area

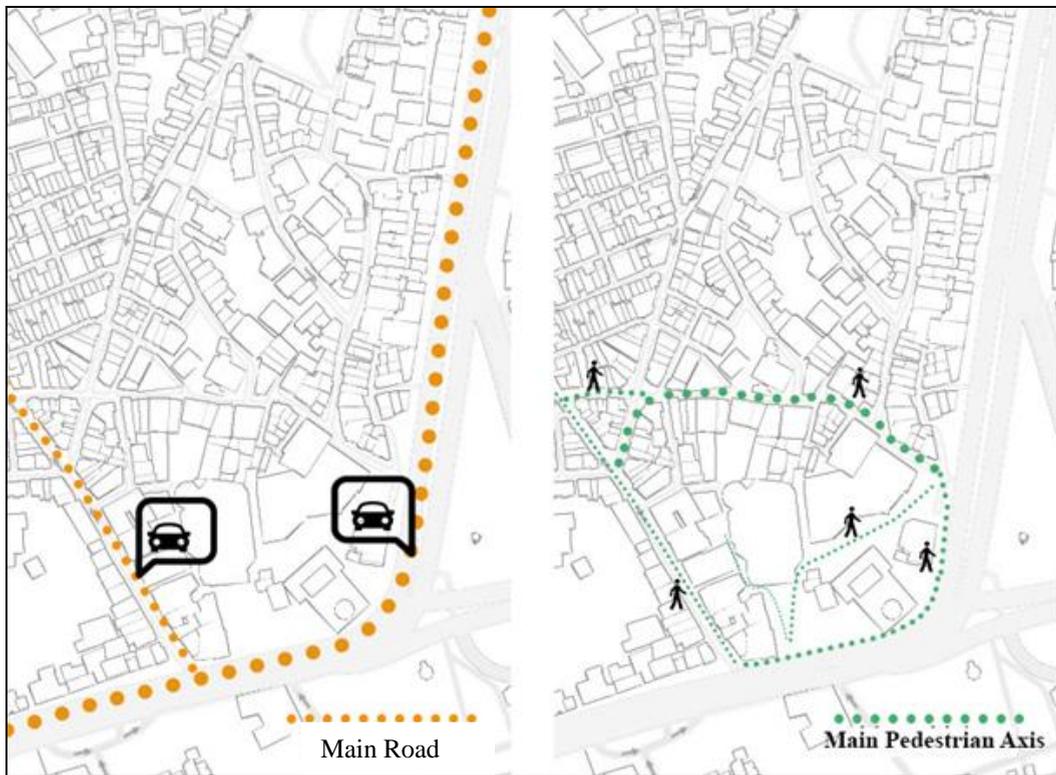


Figure 5. Movement in The Study Area

The monumental buildings in study area are Sinan Pasa Mosque, Historical Greek School, Panayia Greek Orthodox Church and Asdvazazin Armenian Church. Locations of the buildings could be seen below.

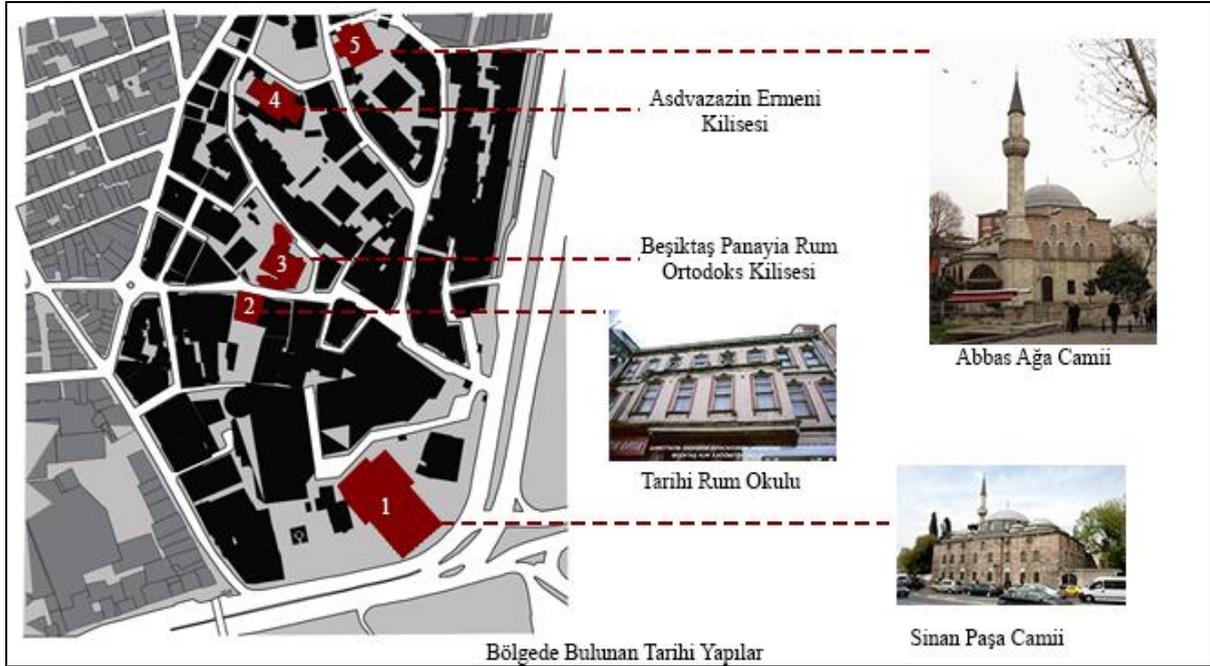


Figure 6.The Monumental Building in Study Area

Lynch has come up with an image that was formed with the physical conditions of the town's readability. Considering roads, borders/corners, focus / node points, an analysis study was started in Besiktas/central. Public places in the area were divided into four area depending on their features. These areas were studied with the approach of Lynch tests.

2.2. Spatial Quality Analysis

The environmental, physical and social analysis has shown that there are 4 areas that carry square qualifications. These are Eagle Statue (Kartal Heykeli), Beşiktaş Cultural Centre square (Beşiktaş Kültür Mezkezi Önü), Market Entrance Point (Çarşı Giriş Noktası) and Sinan Paşa Mosque. In this part, the evaluation of these areas have been carried out parallel to “public space quality parameters”.

Among the public place parameters, the ones that suit are determined with the approach of the study of sources. The most important factors in the determination process of public places are; accessibility, rate of crowd and comfort, variety of activity and opportunity, quality indicators, security, physical attraction, esthetic worry and functionality[6].



Figure 7. Examine the Study Area by Dividing into Four Sub-area Depending on the Lynch tests.

Table 1 . Public Space Assessment Principles[5]

SPATIAL COMFORT	Comfortable spaces used efficiently and have a good image.
SPATIAL QUALITY	Various activities and facilities in public spaces are basic elements of creating successful places.
ESTHETIC - CULTURAL IDENTITY	Physical attractiveness and care, one of the most important factors in creating successful places.
PROXIMITY	When people are found worked ,lived in close proximity to the public space it is increasing the use of public space.
ACCESSIBILITY	Physical structure and types of streets affects the availability .

Table 2: Spatial Quality Parameters [4]

SPATIAL QUALITY PARAMETERS			
FUNCTION QUALITY USES & ACTIVITIES	AESTHETIC QUALITY	BUILD QUALITY	MAINTANENCE AND QUALITY OF SERVICES
ACCESSIBILITY AND PARKING FACILITIES	ORDER	DETAILING	REGULAR MAINTENANCE
ACCESSIBILITY AND EFFECTIVENESS	COMPATIBILITY	MATERIAL	SERVICE QUALITY
	OPENNESS	GOOD WORKMANSHIP	PUBLIC AND PRIVATE SERVICES
FLEXIBILITY	CONTINUITY		
SECURITY	BALANCE		
SPATIAL ORIENTATION	ID		
SOCIAL RELATIONS	FOCUS		
WELL-BEING	UNITY		
COMFORT (OPERATIONAL AND VISUAL)	CHARACTER		
DIVERSITY	FEATURE (EXCLUSIONS)		
SUSTAINABILITY	EFFECT		
	SCALE		
	RELEVANCE		
	LIFE		

NoiseExistance (AcousticComfort)

The area at hand (Beşiktaş) is one of the most intense sites in the city and daily life is observed to be very busy. The area is a knot point for both transportation and pedestrian usage. Barbaros Boulevard and Beşiktaş Street confine Çarşı (Market) entrance and Sinan Paşa Mosque and these areas are exposed to motor vehicle noise, resulting in negative effects on the quality of the area. Beşiktaş Cultural Centre and Eagle Statue areas are exposed to daily life noise as they are on the stems where pedestrian access is very intensive.

Shading

Istanbul and its surroundings have a climate that is hot in summers with humidity. Shading in public areas are important quality parameters for thermal comfort. When the study area is analyzed, it is seen that high trees exist which provides a wide range of shade next to Sinan Pasa Mosque. These trees are pretty effective to shade the area and they are ecologic solutions. At the entrance of the market area in Besiktas, natural or unnatural factors are seen. Besiktas Cultural Centre and Eagle Statue areas are connected to passenger axes and this situation does not provide enough shading.



Figure 8: Trees in Sinan Pasa Mosque (Left) Entrance of The Beşiktaş-Çarşı (Right) - There is No Shading Factor

Visual Esthetics

Problems in determined areas caused negative visual existence. These problems could be listed as disordering of signs that belong to trade areas. It is seen that courier vehicles are parked next to the Eagle statue. A common language was not used on the signs of trade areas and their color and shape are different, therefore this effects the users of the areas in a negative way. There are also parked cars in the area that is next to Sinan Pasa Mosque. This creates a negative visual effect and limits movement space in the area.

Topography

The study area does not include areas that is close to the sea, therefore there are no topographic problems.

Architectural Esthetics

When the structures which limited the areas are studied, it is seen that these structures are not related with a specific period or stlye. These structures do not have esthetic values because of wideness and height of structures. The signs of the trade areas make it difficult to observe buildings. Sinan Pasa Mosque has esthetic factors due to its relation with a period of time and style.

Freedom of Movement And Accessibility

It is a feature that increases the accessibilty and perceptibility of transportation with the use of land and it also gives priority to pedestrians.

There is no accessibility problem in the area of Sinan Pasa Mosque however parked cars cause problems in this area and they prevent movement. There isn't any accessibility problem at the entrance of the market place

however gradation limits the movement. There are not any factors that limits accessibility in Besiktas Cultural Centre and Eagle statue area. However, the existence of motor vehicles in these areas limit the movement.



Figure 9: - Parked cars next to Sinan Pasa Mosque (Left) Parked courier vehicles and jerry-built frontal (Right)



Figure 10: Signs At The Entrance Of The Market Place

Flexibility

Gradation at the market place and fixed settlements allow a change. Trees and fixed settlements have a negative effect in the area that is next the Sinan Pasa Mosque. Besiktas Cultural Centre and Eagle statue are not flexible areas due to their connection to source areas.



Figure 11: Gradation at the Entrance of the Market Place

Continuity and Closeness

These are the features that determines the difference of places and continuity of street fronts.

When the area that is next to Sinan Pasa mosque was studied, the structure of the mosque is limited with the great Besiktas market on the north and quran course, on the east Kazan restaurant and on the south Besiktas street. The square closeness feature that provides increment of space was shown by the structures that determines the square. The square that is located at the entrance of the market was determined as Sinan Pasa Business Centre and Hakan pastry shop. However the channel that is located between great Besiktas market and Sinan Pasa Business centre connected to the square and this fact creates a negative spatial perception. The area of Besiktas Cultural Centre and Eagle statue are located on the main transportation axes and thus they could not be determined clearly due to their lack of open areas, in fact closeness feature is seen.

Identity and Character

“Every urban space should have special characteristics that separate them from other areas.”

The only area that created its own identity among the four areas is the Eagle statue. This area is a special place for Besiktas soccer team supporters. They meet on this spot before the game and this creates an alliance spirit. Social communications are on high levels in this area. In the other areas are similar and they do not have characteristic values.

Readability and Transportability

The area of the Eagle statue, Besiktas Cultural Centre and the entrance of the market area are accepted as positive factors due to their location on the main transportation axes. This situation makes these areas as places where people often try to find their way to somewhere else. Although the square that is located next to Sinan Pasa Mosque is connected to the square at the entrance of the market place, this pass is provided by unclear channels and this fact is a detractive factor that effects the square's readability.

Variety

The main texture is located on places such as shopping, market, amusement and food-beverage. Except Besiktas Cultural Centre, the fact that not many cultural activities took place in this town is accepted as a negative factor.

Section Assessment

When the areas which is located in the study area through quality parameters are examined, it is seen that these places don't meet some criteria that are necessary for these places. Visual esthetics meet the four areas which are examined by their flexibility. Architectural esthetics and continuity - closeness parameters only meet four areas. In addition to this, variety is not seen in this area. The study showed that the average is 5/12 of quality parameters for four areas. In conclusion, It seen that the areas that were studied were not good enough to meet spatial quality and comfort parameters.

Table 3: Spatial Quality and Comfort Parameters and Study Area Evaluation

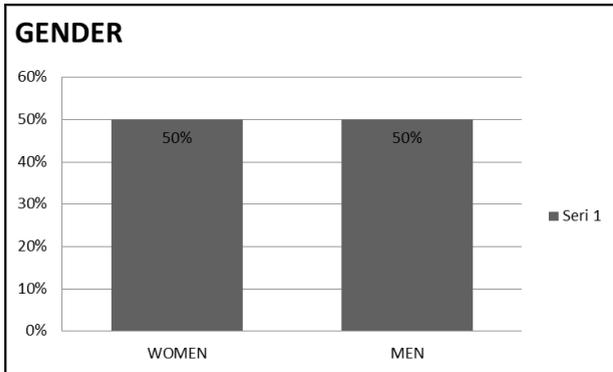
		DISTRICTS OF STUDY AREA			
		1.DISTRICT	2.DISTRICT	3.DISTRICT	4.DISTRICT
STUDY AREA (KÖYİÇİ) SPATIAL QUALITY ANALYSIS PARAMETRES	NOISE CONTROL	-	-	-	-
	SHADING	☺	☺	-	☺
	VISUAL ESTHETIC	-	-	-	☺
	TOPOGRAPHY	☺	☺	☺	☺
	ARCHITECTURAL ESTHETIC	-	-	-	☺
	ACCESSIBILITY AND MOVEMENT	☺	☺	☺	☺
	FLEXIBILITY	-	-	-	-
	CONTINUITY AND CLOSENESS	-	-	-	☺
	IDENTITY AND CHARACTER	-	-	☺	-
	READIBILITY	☺	☺		-
	DIVERSITY	☺	☺	☺	-

2.3. Social Environment analysis

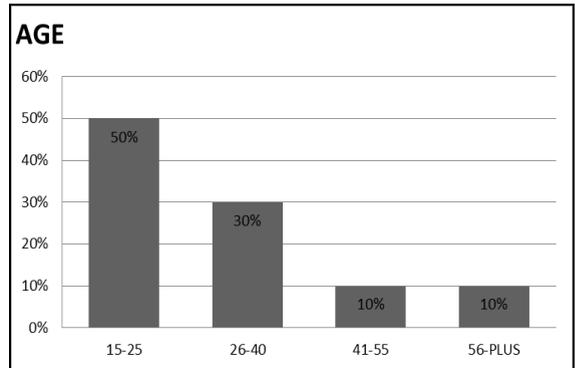
A survey study was made in the area. It was aimed to show how people thinks about the use of the area and its affection of use. A survey study was made in the area. It was aimed to show how people thinks about the use of the area and its affection of use.

Subject Profile

In the survey study, half of the profiles are male and the other half is female. % 50 of the profiles are under 25, %30 of them are between 26-40 and % 10 of them are over 56.

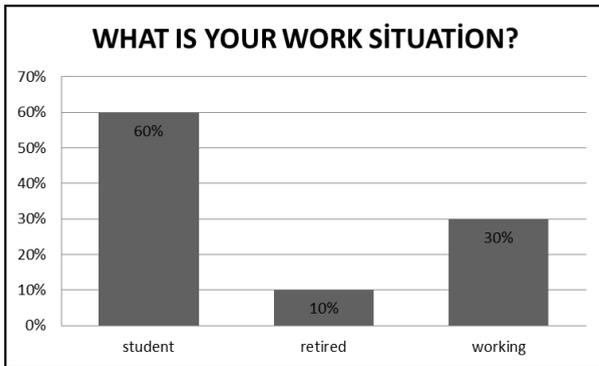


Graphic 1: Gender Profiles of Users

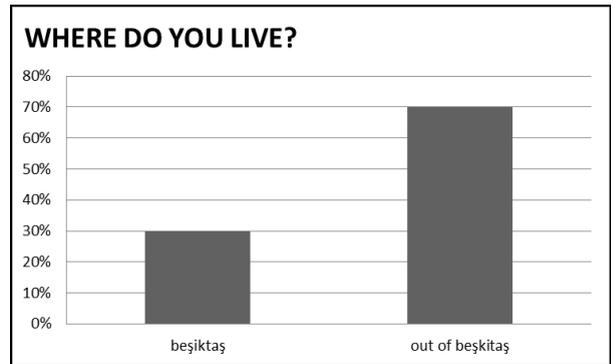


Graphic 2: Demographic Profiles of Users

%30 of the profiles live in Besiktas and %70 of them live outside of Besiktas. %60 is student and %10 is retired people.

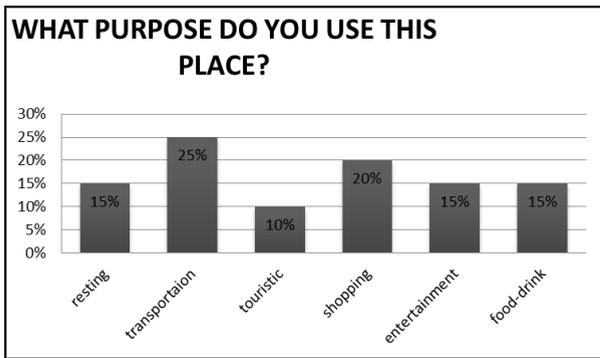


Graphic 3: Work Situation of Users

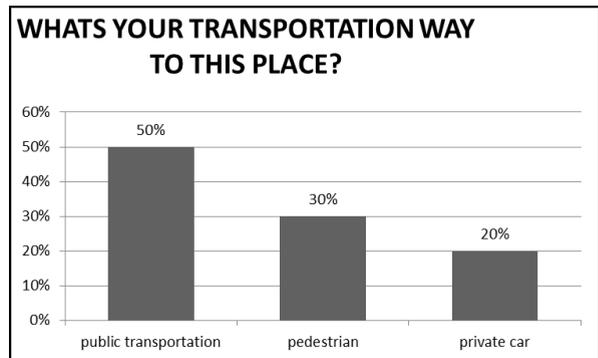


Graphic 4: Living Places of Users

The main transportation vehicle to this area is public transportation. People use less of their personal vehicles. Yet there are many places for shopping, amusement and food-beverage, it is still used as a busy stop.

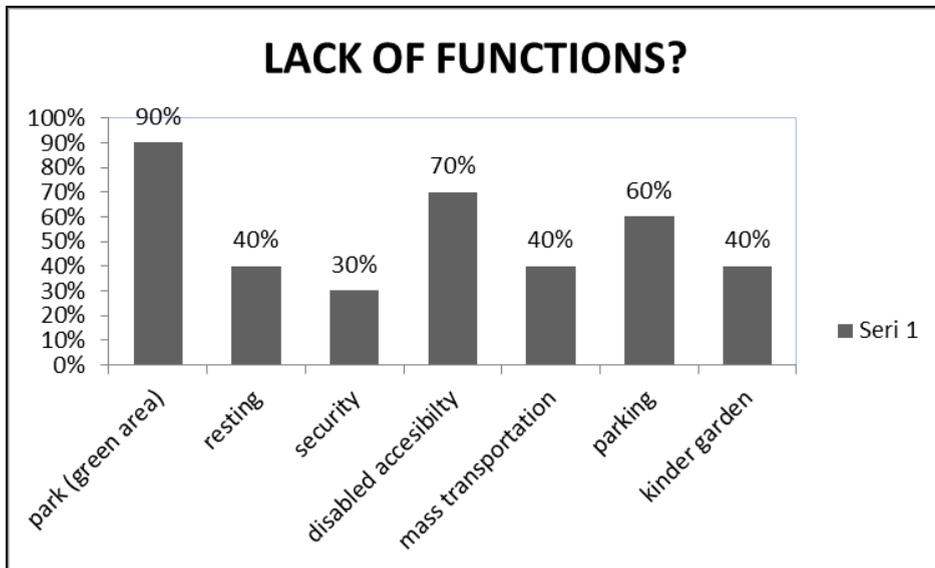


Graphic 5: Using Purpose of Users



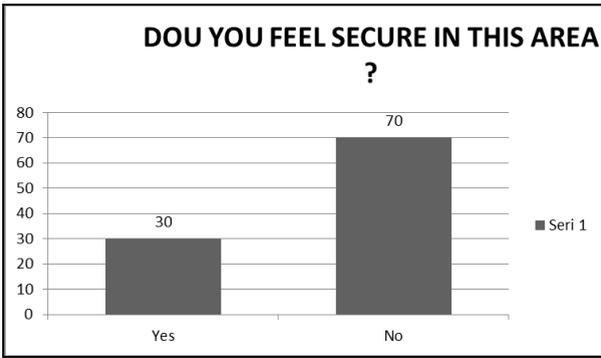
Graphic 6: Access way of of Users

In the study " what are the missing factors in public places?" question was asked to people and the %90 of the answers were about parks and green areas, %70 of them were about disabled transportation and %40 of them were about parking lots.

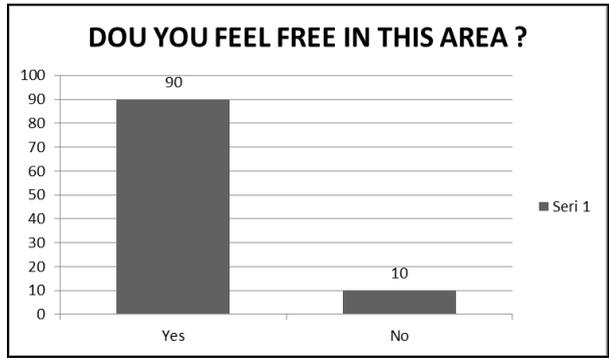


Graphic 7: Lack of Functions of Study Area

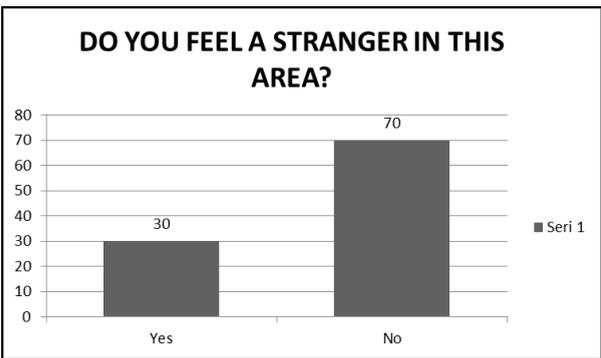
By focusing Besiktas market square area; the question " How do you feel in this area?" was asked and %90 of the answers were freedom and confort. %80 of the answers were loneliness and %70 of them were insecure. People also answered the question " Do you feel like like a foreigner?" . Most of the answers were "no".



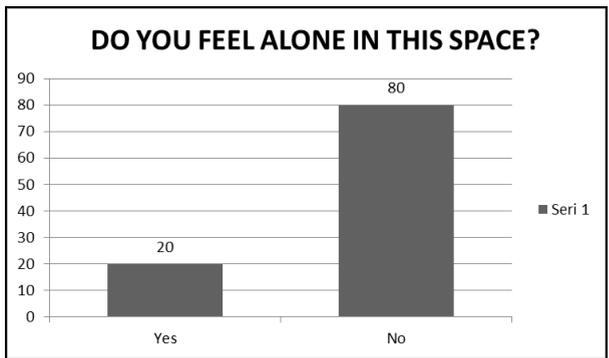
Graphic 8: Feeling of Users – About Security



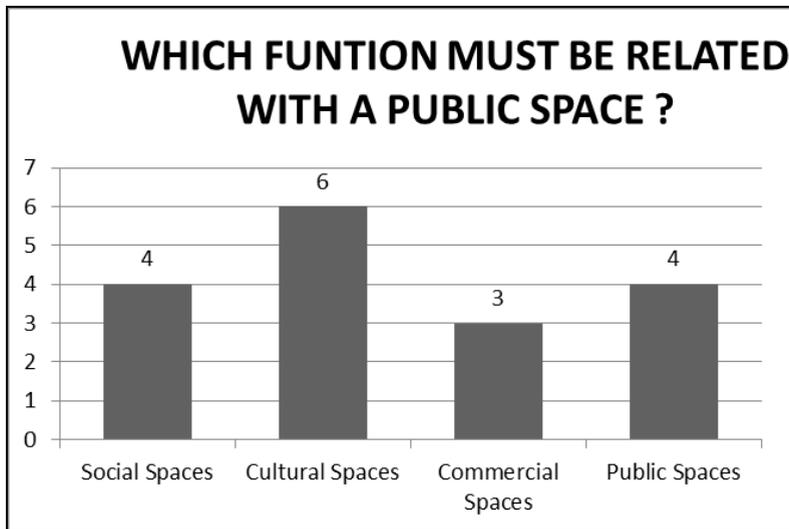
Graphic 9: Feeling of Users– About Freedom



Graphic 10: Feeling of Users– About Isolation



Graphic 11: Feeling of Users– About Desolation



Graphic 12: Definition Public Spaces Functions

People answered the question " What do you think about public places and streets' function should be related to?". %35 of the answers were cultural places, %24 of them were social places and %23 of them were public places.

In conclusion, lack of green areas and transportation problems are seen in the usage of the public places that are located in Besiktas market area. Users feel relaxed but not safe. In the study area, they want to see cultural activities in the public places along with shopping, amusement and food-beverage

3. CONCLUSION

Beşiktaş had saved the wood texture and gardens by the middle of 1960s and the centre has been concreted since then. Bosphorus Bridge, which was opened in 1970s, and the connected roads from the highway to the centre have started traffic problems as well as raising the demand for easy access (Gökyay, 2009). In 1980, the enterprises to make Beşiktaş a centre of business and finance by the new government caused a dense housing and increased the height of the buildings. Public places and green areas have been destroyed. Except for the historical mosque "Sinan Paşa Mosque" and the public areas around it, there is almost no public places left.

Considering the physical analysis, it is addressed that Beşiktaş Çarşısı (market) area has an organic structure with group shapes and dense housing. There are some areas that can be defined as squares at the empty spaces around the buildings. It is a site with intense vehicle and pedestrian traffic at every hour during the day and with various reference points including important historical buildings and public spaces.

Taking the questionnaire results into consideration, it is highlighted that there is deficiency of green areas and transportation problems in the public spaces in Beşiktaş Çarşısı. It is demanded that cultural activities and social sites should be increased in the meeting point that is used by all users. Users feel confident but not secure.

When public areas are evaluated in terms of spatial quality, several parameters do not have good results. The squares that have been assessed are inefficient in terms of visual esthetics, ease of movement and flexibility. The results are not good when shading, architectural esthetics, continuity-closeness and identity parameters are reflected. The only place that can provide quality parameters is the side square in Sinan Paşa Mosque area. It has been concluded that the areas are of poor quality and comfort and can not satisfy the users.

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Internet Resources

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<https://picasaweb.google.com/102358549153107478316/BesiktasPervititchHaritalari?feat=directlink>

<http://www.hayallem.com/besiktas-meydani-eski-ve-gunumuzdeki-hali/>

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figures 1,2,4,5,6,7,8,9,10,11 and table 3 are belongs to the authors.

The Effect of Using the Visual Effects on Spatial Representation: The Actual Space in Game of Thrones TV Series

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Abstract

When an actual space is thing that perceived and experienced virtual space is representation of actual space. It is possible to say that it is reconstruction of reality or a new reality. The cinema produces representation of actual space as a part of translation of space from 3d environment to the 2d and to be caused fragmentation of time and space. Today actual space is used by manipulation due to developed computer technologies. And it means a new way of representation.

The aim of this study is to analyze the effect of using the visual effects on spatial representation in cinema. The word of cinema has been used instead of video, movie and cinema. The study is about research of actual and virtual space in the widest sense. So in the second part of the study it will be analyzed the concept of actual space and in the third part the concept of virtual space will be analyzed. In his context first the concept of perception, space and spatial perception will be commentated. Then the notion of representation and spatial representation will be explained in third part. In the fourth chapter it will be examined that spatial representation and the using of visual effects in cinema. And in the last part the study will be exemplify with Game of Thrones tv. series. In this chapter it will be analyzed that the visual effect scene in the Game of Thrones and its effect on spatial representation.

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Keywords: Type your keywords here, separated by semicolons ;

1. Introduction

It is possible to say that the cinema have a very important role about spatial representation. The concept of time has not been used in spatial representation until the invention of cinema [1]. The most important specialty of the cinema is that it includes the motion. In another word before the invention of cinema spatial representation has been estimated without motion. However the motion is the most important thing about space perception. In this context it is possible to say that cinema is a kind of perception that examined the spatial experience like in the physical environment. Representation of space is made three different ways in cinema;

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translation of space from 3 dimension environment to the 2 dimension, fragmentation of time and space and using the visual effect.

The visual effects are using for producing the unreal space or spaces that are very expensive and dangerous to produce. The aim of using the visual effects in cinema is to create the sense of reality in audience. The sense of reality causes to increase of attentions of audiences for video. Today the using of the visual effects increases by means of development of computer technologies. So visual effects use in not only big budget Hollywood movie but also use in tv. series. Even the smart phones enable to generate simple visual effects.

The cinema imitates the perception of actual space. In this context to start this study, concept of perception, space and spatial perception should be analyzed.

2. Concept of Perception, Space And Spatial Perception

2.1. Concept of Perception

The mean of perception in Dictionary of Philosophy is;

to transfer of objective environment to the subjective conscious or to design of image of objective environment in memory [2].

The mean of perception in Dictionary of Art is;

To transfer of knowledge come from the objective environment to the sense organs in conscious. In another word perception is to realize the things and recognize them [3].

In this context it is possible to say that perception is a relationship with physical environment. Lang has said the perception had two processes; environmental perception and environmental cognition [4]. The connection of these two parts provides by means of sense organs. Environmental cognition is different for every person. The previous experiences, social, cultural and politic environment that been on effect to change of environmental cognition. On the other hand every new perception renews conscious. So the perception is phenomenon that change continuously and vary from person to person.

The perception is mediated through articulating of every new knowledges to the previous one. And this means that every new situation is under the influence of the previous one. Our relations with environment since the childhood are like that; to gather the data, to code it, to classify it, to produce the meanings, to prefer or remember it. Knowledge of space is used like this.

2.2. Space and Spatial Perception

Pallasmaa said the space is a phenomenon that we lived and we experience [5]. The concept experience in this definition means that the space can be experience. According to definitions of space of Leland M. Roth; physical space is a volume with visual border and space with no visual border is a perceptual space. Cognitive space is to reapproximate of the parts of perceptual space in conscious. Also cognitive space is a plan or cognitive maps in mind. Ersoy said cognitive space resemble fictional space in cinema [6].

Spatial perception is to gather the data that belong to space and process it. People gather the spatial data in mind with cognitive maps. Montello say cognitive maps are subjective represent of data from the environment and spatial feature [7]. Mendoza says cognitive maps include not only visual datas but also gustatory or auditory datas like and pain, drought, toxicity [8].

Kevin Lynch, explained the relations between urban and people in “The Image of the City” and mentioned about factors that effects to cognitive maps;

- Roads,
- Road intersection,
- Landmarks,

- Regions or areas,
- Edge and lines without use facilities [9].

Mendoza explain the spatial experience with three phase; 1. informing and Gathering the data of space, 2. making the cognitive maps by using spatial data and socio-cultural structure, 3. giving the meaning to space by compounding cognitive maps and personal aims and values [11]. In this context it is possible to say in the process of perception of space the person have a role as a subject. In contrast with in cinema this role belongs to the director. So the cinema provides to watch the spatial representation not to experience of it [12].

2.3. *Space in Cinema*

Space is the basic component of cinema and it is the place of setting. The space in cinema makes the background for body and motion or takes place in scene as a focus [13]. Both of these two situations the physical space uses by fragmenting. In cinema space use for create the sense of reality. Space definite the time of movie and motion of the figures [14]. So it can be said that the changing of the space causes the changing of the time in the movie.

The space of movie composes of actual spaces, sets and fictional spaces. It is very important that which scenes are transferred to the audience form the actual space. Although the physical space is experienced by using the five senses the space of cinema cannot experienced like this. Ersoy said that the space transfer to the image and voices in the cinema [15].

The most important factor of emerging of the space of cinema is transformation of space from 3 dimension environment to the 2 dimension. Lewis Jacobs say the space of the movie consist of recording, ordering these records and the relations of them [16]. The other factor of emerging of the space of cinema is ideas of the director and his/her fiction. The director organizes the image from the actual space according to fiction. These organizations be required some actual or visual changings. So it can be claimed that space of cinema is manipulation or deformation of actual space.

3. **Concept of Representation and Representation of Space**

3.1. *Reality and Representation*

Concept of representation should be paired with reality. The means of the concept of representation is;

To act on behalf of someone or a community, reflecting someone or something.

In this context it can be said that representation is a secondary situation. In another word it is reflection of truth. Truth is a specialty of existing or some of them [17]. So it can be claimed that representation is not real. But according to Pythagoras the reality has a two faces; “main real” and “shadow real” [18]. So the representation is a new reality.

According to Zettl the representation is to decontaminate, reinforce and interpret of phenomenon in nature [19]. Representation is a narration of phenomenon. There is community for this narration. And representation form to this community. The aim of representation is to canalize of someone’s perception [20]. Representation is to decontaminate of phenomenon in nature according to wanted specialties and to generate new phenomenon according to previous knowledge. This process is a kind of modification. Like cinema, other art branches use this method to produce too. Rudolf Arnheim says that art is the reconstruction of reality [21].

3.2. *Representation of Space*

Representation is an imitation of perception as mentioned before. It is valid for representation of space. The aim of the representation of space is to imitate the perception of space that experienced in physical

environment. In another words representation of space is to transformation of cognitive maps that emerging in physical environment to another cognitive maps.

Conventional methods for representation of space are using the drawing, perspective and model. Today computer technologies are used for representation of space. Moreover computer technologies include of all other conventional methods. Computer added animation and rendering are very important part of the representation of space. To prepare a visual space for photo or shoot a video is “rendering” and to make a video from this model is “computer added animation”. A single image that composed of computer added animation is a representation method like a photograph and a video that composed of computer added animation is a representation method like cinema [22].

4. Representation of Space in Cinema and Using the Visual Effect

4.1. Representation of Space in Cinema

It is possible to say that the cinema have a very important role about spatial representation. The concept of time has not been used in spatial representation until the invention of cinema at the beginning of the 20th Century. The most important specialty of the cinema is that it includes the motion. In another word before the invention of cinema spatial representation has been estimated without motion. However the motion is the most important thing about space perception. In this context it is possible to say that cinema is a kind of perception that examined the spatial experience like in the physical environment.

Representation of space is made three different ways in cinema and this show how to make representation of space in cinema. One of them is transformation of space from 3 dimension environment to the 2 dimension. In physical environment space can be experienced due to motion. It can be motion of body or eyes. In cinema the camera provides this motion. Images that obtained from motion of camera are sequenced and space is total of these fragmented images.

The other situation that effect representation of space is montage. Montage is very important because of enable to use space and time fragmentary. Images are arranged according to the preference of director. It prevents the continuity of perception in the physical environment. For example in a movie first we see the upper story of a building instead of entrance hall. Or we see the scene that recorded one year before first and then one week before.

Using the visual effects is other situation that effect representation of space.

4.2. Using the Visual Effect in Representation of Space

Using the visual effect causes reproducing of space like other methods of representation of space. The visual effects are using for producing the unreal space or spaces that are very expensive and dangerous to produce. Fig 1. The aim of using the visual effects in cinema is to create the sense of reality in audience. The visual effect techniques used in cinema are as the following;

Practical Effects: Practical effects are made during shooting. The important point about this method is not to using of computer. Using of model is a practical effect. “Allien” (1979) and “Predator” (1987) are example of the using the practical effect [23].

Animatronic: In this technique real sized models use by programing or remote control. Characters of “Jaws”, “E.T.” “Jurassic Park”, and “Terminator” are consist of using animatronic techniques.

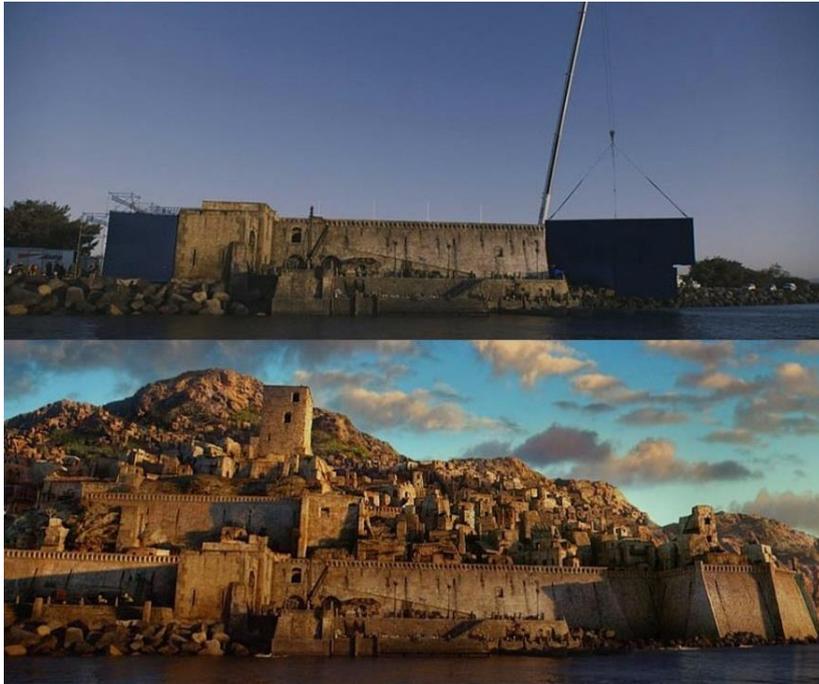


Fig 1. The Chronicles of Narnia: The Voyage of the Dawn Treader (2010) (www.onedio.com)

Green Screen-Bluebox: This technique is consisted by clearing off blue or green background and replacing visual environment. If it is impossible, very dangerous or expensive to place an actor/actress, the scene shoots another space and then compound with other one [24]. Green screen-bluebox is the most common technique. Life of Pi (2012) is shoot by using this technique. Fig 2.



Fig 2. Life of Pi, 2012. (www.digitalsynopsis.com)

Stop Motion: This technique provides changing and motion to inanimate objects. In this technique none of the objects move. Objects shoot then they replace and shoot again. Images derive from this shooting are sequenced by 24 images in one second.

Bullet Time: In this technique to emerge a scene the object scanned from 360° and then these images composed. For this technique the camera should move fast. Consisted image is static. The best example for this technique is the pass of bullet in Matrix (1999).

Motion Capture: Motion capture calls also Motion Tracking and Mocap. In this technique first a 3D model is designed. Then the real character is shot. Lastly to make this model movement more realistic these two shootings are composed. In shootings of real character some devices are put on the actor's body. And her/him movement are recorded to the digital media. The best example for this technique is a James Cameron movie "Avatar" (2009). Fig 3.



Fig 3. Avatar (2009) (www.davidbordwell.net)

Warping and Morphing: This technique provides to warp all of the pixels. This technique can be used to enlarge someone's eye or shrink someone nose.

Crowd Duplication: Crowd duplication is the most common technique today. It uses especially in war and sports game scenes. In this technique first the available figurants are shot and then this image is duplicated. Some scenes of the Mad Max (2015) are emerged with this. Fig 4.



Fig 4. Mad Max (2015) (www.gizmodo.com)

Atmosferics: The natural facts like fog, snow, smoke, rain, light beam are created with atmospherics technique.

Wire Removal: In some movie scene wires are used for provide the motion of the character which climbed to escarpments, flied or skidded with effect of strike. These wires are cleared from the images.

Set extension: In this technique a part of the scene is constructed in studio. Then remind part of scene is rendered in computer.

5. The Effect of Using the Visual Effects on Spatial Representation in Game of Thrones Tv. Series

Game of Thrones is an American fantasy drama television series created by show runners David Benioff and D. B. Weiss. It is an adaptation of A Song of Ice and Fire, George R. R. Martin's series of fantasy novels, the first of which is titled A Game of Thrones. It is filmed in a Belfast studio and on location elsewhere in Croatia, Iceland, Malta, Morocco, Northern Ireland, Spain, Scotland, and the United States, and premiered on HBO in the United States on April 17, 2011. The series has been renewed for a sixth season, which will premiere on April 24, 2016.

The series is set on the fictional continents of Westeros and Essos, and interweaves several plot lines with a large ensemble cast. The first narrative arc follows a civil war among several noble houses for the Iron Throne of the Seven Kingdoms; the second covers the attempts to reclaim the throne by the exiled last scion of the realm's deposed ruling dynasty; the third chronicles the rising threat of the impending winter and the legendary creatures and fierce peoples of the North.

The first season of Game of Thrones had an average of 2.5 million viewers for its first Sunday night screenings, and an average gross audience of 9.3 million viewers per episode including all repeats and on-demand viewings. For its second season, Game of Thrones had an average gross audience of 11.6 million viewers. The third season was watched by 14.2 million, making Game of Thrones the second most-viewed HBO series after The Sopranos. In the fourth season, HBO said that its average gross audience of 18.4 million viewers, later adjusted to 18.6 million, had beaten The Sopranos for the record.

For the large amount of visual effects in the series, HBO hired the VFX companies BlueBolt, based in Great Britain, and Screen Scene, based in Ireland, for season one. Most of the environment builds were done as 2.5D projections, to give the viewer a good sense of perspective, but also to keep the amount of programming from becoming too overwhelming. The season one finale "Fire and Blood" was nominated for an Emmy Award for Visual Effects in 2011.

Because the effects became more complex in the subsequent seasons, including CG creatures, fire, and water, the job was passed on to Pixomondo of Germany. Starting with the second season, Pixomondo served as lead VFX producer. For season two, nine of its twelve facilities contributed to the project, with Stuttgart serving as the lead. Additionally, some scenes were produced by Peanut FX (Great Britain), Spin VFX (Canada) and Gradient Effects (U.S.). The episodes "Valar Morghulis" and "Valar Dohaeris" earned Pixomondo the Emmy Award for Visual Effects in 2012 and 2013, respectively.

For season four, HBO added Mackevision, also based in Germany, to the project. The season four finale "The Children" won the Emmy Award for Visual Effects in 2014. Additional producers for season four included Rodeo FX (Canada), Scanline VFX (Germany) and BAKED FX (U.S.). The muscle and wing movements of the adolescent dragons in seasons 4 and 5 were based largely on those of a chicken. Pixomondo retained a team of 22 to 30 people, focusing solely on the visualization of Daenerys Targaryen's dragons, with the average production time per season ranging between 20 and 22 weeks. For the fifth season, HBO also added Image Engine (Canada) and Crazy Horse Effects (U.S.) to its list of main VFX producers [25].

One of the most important part of the series is the ice wall. According to fiction The Night's Watch are protect the wall during the thousand years. In figure 5 the characters climb the wall. But actually the real space of this scene is a studio. The wall is a model. In this scene the green screen and wire removal techniques are used.



Fig 5. Wall in Game of Thrones, (www.digitalsynopsis.com)

In figure 6 actual spaces is used as photography. To emerge this scene some images are dropped and some of them are added. For example the big building in the right side is dropped and the hill in the right side is added to images. In this scene the people in the street have never been there. They have walked in the studio according to the street form. And then images from the studio are composed with the real images. The urban fabric in the scene isn't different from we show in daily life. Fig 6.

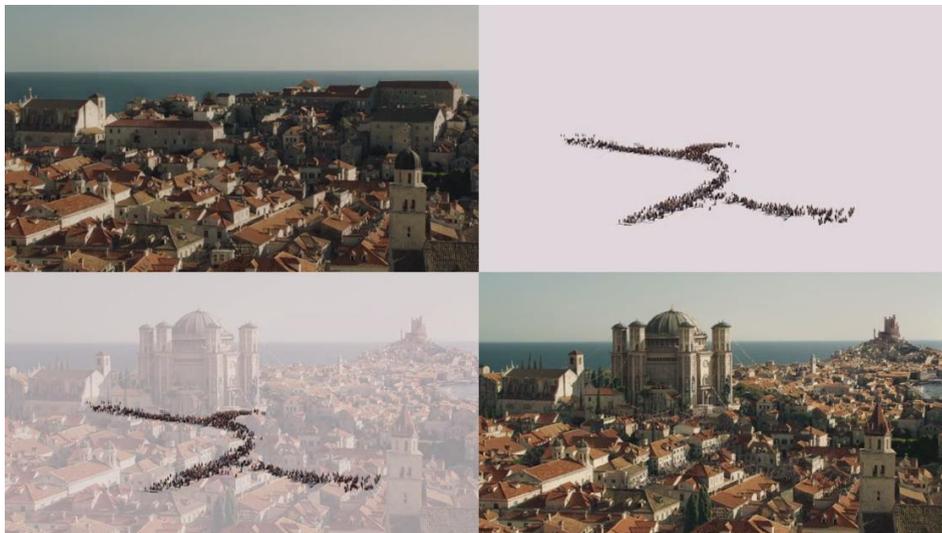


Fig 6. (www.onedio.com)

The scene is produced totally digital in figure 7. We saw a ship that sailing in the open sea in this scene. But actually none of things we saw is real in this scene. In this scene not only artificial objects are reproduced but also the natural one is reproduced. The ship and the sea are rendered first and then they are textured. Because of texturing they look like a real object. Fig 7.

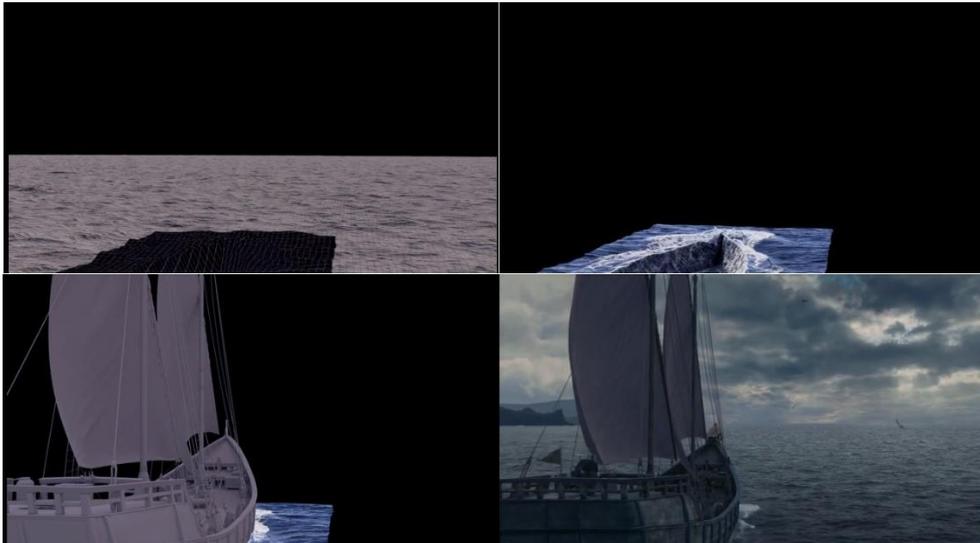


Fig 7. (www.onedio.com)

We can see some of the spaces of series in daily life. To see some of these spaces in daily life affects the sense of reality positively and negatively. When we saw these spaces in the television we want to match them in our conscious. The spaces that we experience in physical environment and we saw cannot be matched. So the sense of reality decreased. Fig 8.

In physical space we use not only eyesight but also sense of hearing and sense of smell to experience of space. Moreover the usage of the space in daily life affects our experience and the meaning of the space. In figure 9 in the left side we see a bazaar in the street. But in the series this space transform to different function. This is a reconstruction of space.



Fig 8. (www.onedio.com)



Fig 9. (www.onedio.com)

6. Conclusion

In this study it is analyzed that the effect of using the visual effects on spatial representation in cinema. The word of cinema has been used instead of video, movie and cinema. So in the second part of the study it was analyzed the concept of actual space and in the third part the concept of virtual space was analyzed. In his context first the concept of perception, space and spatial perception were commented. Then the notion of representation and spatial representation were explained in third part. In the fourth chapter it was examined that spatial representation and the using of visual effects in cinema. And in the last part the study was exemplify with Game of Thrones tv. series. In this chapter it was analyzed that the visual affect scene in the Game of Thrones and its effect on spatial representation. In this context it is possible to say that the using of visual effects provides a new way of representation of space.

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The Importance of Spatial Quality on Urban Squares, Southeast Asian Examples

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Abstract

There is a close relation between the creation of urban spaces and spatial quality. In order to make new stimulating and satisfying urban spaces, spatial quality criteria are considered. In this study, urban squares from three Southeast Asia countries (Indonesia, Malaysia, and Singapore) are examined. Site observation is done by author. Selected urban squares are evaluated by site observation according to the classified spatial quality criteria including: Flexibility, Accessibility, Efficiency and Comfort. Strong and weak points of chosen squares are discussed and some suggestions are proposed.

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Keywords: Spatial quality, urban squares, Southeast Asia.

1. Introduction

If well managed, cities offer important opportunities for economic and social development. Cities have always been focal points for economic growth, innovation, and employment. Indeed, many cities grew historically out of some natural advantage in transport or raw material supply. Cities, particularly capital cities, are where the vast majority of modern productive activities are concentrated in the developing world and where the vast majority of paid employment opportunities are located. Cities are also important social and cultural centers that house museums, art galleries, film industries, theaters, fashion houses, and other important cultural centers.

City is the most powerful expression of civilization and a displaying area of social life. In a city, there are different types of urban spaces such as parks, recreation areas, sports areas, shopping areas, squares streets, boulevards, pedestrian ways etc. Among them, urban squares are essential because they provide spaces for interaction, communication, participation.

Squares have very important role in people's lives. Urban squares keep public communications and participation alive and provide the terrain for social interaction. Urban squares not only fulfil people's political and cultural needs, but they also satisfy their physical and mental requirements. This helps sustain the

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humanization of the society through gathering, lingering and wandering through, and engaging together into various human activities and can make significant contributions to the cultural development of communities [1], [2].

There is a close relation between the creation of urban spaces and spatial quality. In order to make new stimulating and satisfying urban spaces, spatial quality criteria are considered. In this study, urban squares from three Southeast Asia countries (Indonesia, Malaysia, and Singapore) are examined. Site observation is done by author. Selected urban squares are evaluated by site observation according to the classified spatial quality criteria including: Flexibility, Accessibility, Efficiency and Comfort. Strong and weak points of chosen squares are discussed and some suggestions are proposed.

The study consist of four parts. In the first part of the study, why Southeast Asia taken as example are described and brief information on the chosen cities are given. In the second part, research on urban spaces are briefly discussed in order to form the theoretical basis of the study. Case study are explained in the third part. Conclusion and future perspectives are discusses in the fourth part.

2. What Makes the Southeast Asian Examples Different From Others?

Asia is the largest region, with 30% of the global land mass and 60% of the world's population. Given its vast geographical expanse, Asia-Pacific is perhaps also the most diverse region in terms of society, culture, economy, environment and human settlements. The region's 58 countries and territories have been grouped into five geographic sub-regions: East and North- East Asia, South-East Asia, South and South-West Asia, North and Central Asia, and the Pacific.

South-East Asian (SEA) countries are Brunei Darussalam; Cambodia; Indonesia; Lao People's Democratic Republic (Lao PDR); Malaysia; Myanmar; the Philippines; Singapore; Thailand; Timor-Leste; Viet Nam. B [3].

In spite of the growing research interest in the phenomenon of global cities, the empirical studies thus far have been almost exclusively focused on cities the developed world, such as London, New York, Tokyo etc. Therefore, it is not surprising that very little is known about this process in cities of the developing world, which are also called "the secondary world cities", including cities in the Asian developing countries. Tokyo is the preeminent Asian global city, followed by Hong Kong, Singapore and Seoul. The next layer include Bangkok, Kuala Lumpur and Jakarta [4].

Jakarta, Kuala Lumpur and Singapore are three eminent cities of Asia.[†] The three cities are among global cities in the world and the rate of urban growth and development is expected to be approximately 2.3% between 2010 and 2030. With a metropolitan population of more than 20 million and rising, Jakarta is one of the world's largest cities in the world, while Kuala Lumpur is one of the most important IT producer in the world. All now rank among the top trading cities in the world and in fact, the level of gross national product (GNP) per capita in Singapore exceeds that of many European countries [5], [6].

2.1. The Southeast Asian Rising Cities: Jakarta, Kuala Lumpur and Singapore

With a metropolitan population of more than 20 million and rising, Jakarta is one of the world's largest cities, the biggest city by a wide margin in Southeast Asia, and the coming urban center off Indonesia, the

[†] The author has been in this three cities several times. Bangkok has also similar characteristic with mentioned three cities and move towards becoming a global city. However, the author have not been in the city of Bangkok before.

world's fourth most populous country. It is also an outstanding example of an overburdened Third World metropolis struggling with problems of overpopulation and inadequate housing, employment, transportation and environmental quality [7], [8].

Jakarta is situated in the Western part of Java, the most populous of Indonesia's 16,000 islands. Behind the city are green foothills and the high volcanic peaks of the Parahyangan high-lands of the island's interior. Because of rich volcanic soils and ample rainfall, the general area is agriculturally productive. Paddy rice is the dominant crop. The climate is tropical and rainy with the months October through March being the wettest. Because the city is low lying, flooding has always been a serious problem during the rainy season [7], [8].

Jakarta, has been described as a city of *Kampungs*. *Kampungs* is the shanty towns of Indonesia. Approximately, 60% of Jakarta's urban population is estimated to reside in *Kampungs*. Establishment of these *Kampungs* is partly on public, partly on privately owned agricultural land which gradually becomes urbanized and changes hands informally to its new resident. Much of the *Kampungs* are high density with 600 persons per hectare. Relocation of *Kampungs* from river bank or to make room for real estate developments has been an issue of never-ending conflict for decades [9].

The city of Jakarta, then, has extraordinary contrasts between the world of prosperity and poverty, and significant challenges ahead for continued development as a global metropolis.

Asian cities are re-imagining to remain competitive in the global marketplace. The range of strategies often seems to mirror developments in Western cities. Despite the many contestations on over-consumption and replication of cultural capital. Kuala Lumpur has in the past decade actively expanded its heritage conservation, cultural precincts, festival marketplaces, iconic cultural centers [10].

After its formation at the confluence of the Klang and Gombak rivers in the 1850s, Kuala Lumpur grew rapidly from the end of the nineteenth century to become the administrative center of the Federated Malay States. Nonetheless, even prior to independence in 1957, Kuala Lumpur remained essentially a provincial town overshadowed by Singapore. Since the early 1990s, Kuala Lumpur has undergone a reorientation from federal capital to aspiring national "node" in global networks [11].

Two mega projects at the beginning of the 1990s signify city and federal authorities' increasingly global outlook and aspirations. First is the Kuala Lumpur City Centre (KLCC) project which, at its unveiling in 1992, was proclaimed as being "among the largest real estate developments in the world" [11].

The second globalizing megaproject in the early 1990s was the Kuala Lumpur International Airport (KLIA). In 1991, a 10,000 hectare site around Sepang (some 60 km south of Kuala Lumpur) consisting mostly of oil palm plantations, was chosen for the development of a new regional and international "transportation hub" serving the city and nation [11].

Singapore was accorded a self-government status in 1959 by the British, and the People's Action Party came to power that year and has remained in office to date. Singapore gained independence from the British in 1963 when it became part of Malaysia, but the merger did not last long. In 1965, Singapore separated from Malaysia and become a sovereign state on its own [12].

Singapore is an island, roughly 20 miles across and 15 miles wide. No two destinations are more than 40 minutes apart by car. Singapore is not just small but almost without any natural resources. Apart from its geographic advantage of being located on the intersection of international air and sea routes, it has no other gifts from nature. Even the water Singaporeans drink is piped from neighboring Malaysia. The one—in fact the only—resource Singapore has is its people [12].

Singapore is particularly distinguished by its high density—6060 persons/km²—relatively low crime rate, even though 86% of its population lives in high-rise and densely populated public housing, its cultural heterogeneity—Chinese approximately 75%; Malays 13%; Indians 9%; and Others 3% [13] [14]. Beside today, Singapore is one of the richest countries of the world according to the level of gross national product (GNP) per capita [5], [6].

3. Research on Urban Spaces

Urban space means all kinds of built or natural environment that easily accessible for people. It includes all streets, squares, roads, open places, parks where people may enter with any restrictions all day. Unlike the exclusionary character of private space, the main feature of urban space is its inclusion. It is the one of the most important tool for integration. Even there is no any common things among the users of the urban space, they share the same space all the time. In urban spaces, citizens transfer their culture to the city spontaneously.

The need of having a center is related with the existence of the community. Urban space represents the existence iconically and gives life pressure to the city. It symbolizes the intersection of cultures and offers us some clues on living in semantically. Throughout the ages, urban spaces have changed in parallel of the variation of living conditions. The preference of urban spaces are determined by users of the spaces. According to Alexander (1977), urban spaces are “living organisms” that capable of responding socio-economic and cultural transformation of the city [14].The public messages and ideas are shared and transferred in urban spaces. It also provides coexistence and social cohesion. The loss or destruction of these places can cause the decline of human relations the city life.

This paper is based on the researches made by Kevin Lynch [15], Sherwin Greene [16], DQI [17], CABA [18] and PPS [2]. These studies have shown some spatial quality criteria of urban spaces. The determined features are summarized at Table 1.

Table 1. The criteria of urban spaces

LYNCH	GREENE	CABA	PPS
Accessibility	Functionality	Character	Identity
Sufficiency	Order	Continuity	Attraction
Suitability	Identity	Quality	Comfort
Variety	Attraction	Freeness	Accessibility
Flexibility		Readability	Flexibility
Openness		Efficiency	
Security		Harmony	
Efficiency		Comfort	
Stress		Variety	

4. Examples From Southeast Asian Cities

4.1. Wayang Square

The first example is “Wayang Square” from Jakarta city. The square is located Kota Tua district, the poorest and most crowded part of Jakarta. The area is also called “old city”. In the rainy season, the area faces with the serious problems of flooding, and in the dry season there are heavy and intense odor problems.

Among the Southeast Asian city, Jakarta is the first one with the density of shopping malls. Some of them are designed to be connected to each other, particularly located in the city. This shopping malls have even special connection bridges or doors with hotels. So, it is possible to sustain a life without any relations with street level, even this case is a daily way of life for people living in the Jakarta center. In Kota Tua, life is on the street and squares compared the more develop part of the city.

Public transportation is such a huge problem in Jakarta. Throughout the city, the accessibility depends on only personal vehicles, notably automobiles. Bicycle is a common vehicle but just inside in Kota Tua district and for locals. Wayang Square is only accessible by automobiles.

Wayang Square, allows users to easily enter each point. The orientation in square is easily understandable by users. It can be considered as physically accessible[‡]. A similar situation also exists for psychological accessibility. Locals and visitors can settle comfortably together in Wayang Square.

The location of Wayang Square is a convenient spot in Kota Tua. Unlike Singapore and Kuala Lumpur, the offered facilities and services are limited in the square, especially eating and drinking are more limited. The quality of services cannot be considered as appropriate. Although the square has quite a large covered ground, there is no enough vegetation. Heat is one of the major problems because there is not a single shading elements. Therefore, it is not possible to talk about a diverse and efficient space order as a whole in the square.

Wayang Square has no flexible arrangement. It does not seem possible to add a different function without changing its built properties. The inadequate seating areas are not designed according to user preferences or needs. If people cannot find seats in the crowded time, leans on the trash cans or sits down.



Fig 1. (a), (b) Views from Wayang Square, Photos: Çiğdem Canbay Türkyılmaz

Wayang Square, does not qualify as comfortable. Seating areas are not arranged in a way to allow socialization. Urban furniture are not suitable for human size and also uncomfortable. There is no any single solution to protect people from sun, heat or rain. Odor problems are seen in the dry season. The lighting elements are not in compliance with the order of the square. The square is surrounded by a fence system that is inconvenient with the square arrangement.

4.2. Taman KLCC

Taman KLCC, the major city square of Kuala Lumpur, is the second example. A wide variety of functions are located in the area. Jogging paths, children parks, water fountains, ponds are located in the area. Beside there is a mosque in the square. The space can describe as outer meeting area of Petronas Tower.

The square is accessible both public transportation and private automobiles. Underground metro is one of the most common way of transportation in Kuala Lumpur and Taman KLCC is also accessible with metro.

[‡] It does not mean that mentioned square is accessible for all, including disabled people. The city of Jakarta does not qualify as a disabled-friendly city.

While it is possible to reach on foot, it is not preferred due to the climatic conditions of the city. Despite Taman KLCC allows users to easily enter each point, the orientation in square is not easily understandable by users because the information signs and plates are limited. It can be considered as physically accessible. A similar situation also exists for psychological accessibility. Locals and visitors can settle comfortably together in the square. Users of the square are mostly tourists. Due to Malay customs and traditions which limit free movement of women and men in the outside, locals are the secondary group of the square.

The location of Taman KLCC is a convenient spot in Kuala Lumpur. The quality of the service is the high level. It includes different facilities serving different user profiles. As designed together with Petronas Towers, it is possible to get some side services inside the building. As a whole, the square has an adequate arrangement. It can also be accepted successful design in terms of dimensions, materials, setting order, lighting elements etc.

The flexibility of the arrangements of Taman KLCC is open to discussion. Each field is separated by clear boundaries in visually. There is no flexible arrangements in square, even the pursuit of excellence is too much in all over the square.



Fig 2. Taman KLCC, Photo: Çiğdem Canbay Türkyılmaz

In terms of comfort Taman KLCC is considered a successful example. All the elements such as urban furniture, lighting elements, pavements are organized by complementing each other. Sitting units organized around the water, enables users to socialize. However, there are limited arrangements to protect the users from tropical heat and humidity. Although more problems are not observed in terms of security, some sources are mentioned in the robbery.

4.3. Newton Food Square

Compared with Jakarta and Kuala Lumpur, Singapore, is the city where the square are used most actively. To meet squares and to chat over dinner is a part of everyday life especially in the evening. In Singapore case, it is possible to talk on a special type of urban spaces called food square.

Newton Food Square is the example of urban squares from Singapore. As its name suggests, the square is mainly dedicates for eating and drinking. The square is accessible both public transportation and private automobiles. Underground metro is one of the most common way of transportation in Singapore. There is enough parking spaces for private vehicles. The square allows users to easily enter each point. The orientation in square is easily understandable by users. Information plates and signs are located in properly. The square can

be considered as physically accessible. Both locals and tourists are the users of the square. The square are full of people, notably at the evenings.

Newton Food Square is located in a convenient spot. The quality of service is at the good level. In terms of the arrangement of dimensions, materials, seating, lighting etc. The square can be considered in good level of quality, but starting from February 2016 new arrangements are under construction to improve the quality of space. All enterprises serving in the square are categorized as A, B and C, that is the label indicating the hygiene and cleanliness.



Fig 3. (a), (b) Views from Newton Food Square, Photos: Çiğdem Canbay Türkyılmaz

Newton Food Square is designed flexibly. It does not have clear boundaries in visually, the areas fit together to arrange cozy environment. Especially in the evening, there is a huge increase in the number of the user. The flexible seating units can arrange according the needs of users. It is possible to make different variations with the flexible units.

In terms of comfort, Newton Food Square is considered as a successful example. All the elements such as urban furniture, lighting elements, pavements are organized by complementing each other. Dining areas, allow users to socialize. However, the square is a little fusty due to intensive use. All area is cleaned regularly. No problems are observed in terms of security.

5. Conclusion and Future Perspectives

Southeast Asia, contains considerable potential for both Asia and the world. Jakarta, Kuala Lumpur and Singapore have their own dynamics and they are all strong candidates to become a global city in the next 20 years. According the researches, it is not expected to be an order in the urbanization in Asia and, all estimates indicates 2026-2030 interval as the time to reach the highest point of urbanization in Asia.

In this respect, Jakarta, which is still in the early stages of urbanization, has the greatest potential in terms of the arrangements of urban spaces. Although the city face with many problems such as congestion, air and water pollution, densely traffic etc., it also has significant potentials, notably geographical location and ethnic populations. Compared with Singapore and Kuala Lumpur, Jakarta has spontaneous solutions in terms of the use of urban spaces. If the city is able to plan proper urban spaces, it will be a better position in Southeast Asia. For this to happen, urban policies must become part of national development policies, and must include a clear focus on the development of all parts of the city growth for the next decade.

Even with a high level of urban development in physically, the social dimension of urbanization is very questionable in Kuala Lumpur. In contrast with Jakarta, one of the world's most populous Muslim city of the world, Islamic gender relations comes into play in all urban spaces in Kuala Lumpur, beside it's diverse ethnicity. Women and men suppose not do handshake when they meet. Malay, Indian, and Chinese populations share their value for not hugging each other when they encounter each other in public places. Interpersonal interactions in public areas are strictly polite and quite formal even dining out in outdoor and in public domains.

Singapore offers a particularly instructive case. The city is deeply embedded in the process of globalization. The national ideology is to preserve Singapore's multicultural Asian identity while building a meritocratic society. All daily life and routines are based on merit with no discrimination on ethnic, religious or socio-economic grounds. This approach can also be seen in the formation of urban spaces. Urban spaces in Singapore are designed as accessible as for all people.

A collective identity is a social construct and trust relationship that requires time and a common place to develop. For Singapore case, a key question is the logic of location. However, the desired collective identity rather than ethnicity and the global homogeneity rather than locality carry the danger of a serious brain drain in Singapore for following years.

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Transformation In Residence Plan Typology From The Foundation Of The Republic To The Present Day: Konya Case

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Abstract

Developments in social life throughout the history caused transformations and changes in every area as well as architecture. Residences which meet the shelter needs of human beings are architectural products affected by these changes. Change in these factors in residences which are shaped due to many socio-cultural, economic, politic and technologic factors make the change in the typology of space inevitable.

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Keywords: Residence; Cultural Changes; Residence Plan Typology; Transformation of Residence

1. Introduction

The relationship of residence [1] rather affected by the culture of society than being merely a shelter or a structure with culture has made its presence felt in every era. In our country, the foundation of the “Republic”, which brought social, cultural and economic transformations with itself, is one of the main factors [2] that transform the architecture of residence with regard to modernization. When the socio-cultural conditions [1] which are the main factors in the shaping of residence started to change, changes in the plan typology of residence also started. Traditional patriarchal Turkish family which includes large amount of family members left its place to nuclear family, and also together with the increasing population in the cities due to urbanization the need for residences increased. As a result of formation of different styles, traditional residences with a plan system including hall (sofa) and yard (avlu/hayat) left their places to multistoried apartment buildings.

Residence structure in the form of apartment buildings is an important move in the transformation of traditional residence culture [3]. The effect of westernization and the changes in socio-cultural factors of the society made changes in the need of spaces, too. In Konya, which is in the process of development, the effect of increasing population and developing technology brought along cultural changes with itself. In the plan schemes of traditional Konya residence [3] with inner hall due to the regional conditions, no significant transformations were seen until the foundation of the Republic; however, after the foundation of the Republic, as the social life started to change, the plan typologies of residences in Konya also started to change. This change which started with Hayat Apartment –the first apartment building in Konya built in 1937- started the modernization period in Konya.

2. Purpose and Method

The purpose of the study is to put forth the transformations in the residence plan typologies from the beginning of the Republic until today and the reasons of this transformation. Within the scope of this study, changes and transformations with regard to space in residence architecture are determined through plan schemes of the five residences which belong to the period between 1937 and 2016 in Konya. This study includes a method that uses both qualitative and quantitative methods. In the study, after scanning of the literature composed of thesis, articles, books and journals, a conceptual foundation was formed. The residences with which the study is to be conducted were chosen from the scanned resources, and after an analysis stage, the study was concluded with an evaluation and a conclusion. As a result of the study, it was determined that the gradual cultural change due to changing living conditions transformed the residence plan typologies, but the culture of the past is not totally forgotten.

3. Changes in Residence Plan Typology

In its simplest meaning residence is a space which meets the shelter need that is one of the main needs of human beings. According to Zorlu, residence is a multi-dimensional concept which harbors meanings beyond meeting both physical and psycho-social needs of its user [4]. Rapoport defines residence as a space in which a product, a process, an identity, a personal value and status is expressed [5].

Residence plan which differs in accordance with its location and era develops and is transformed parallel with the financial opportunities, living conditions, mentality and needs of countries. In this respect, examining the plan typologies of shelter units that have been used by the Turks in time will enlighten the influences which affect the shaping of the transformations it has faced.

3.1. Traditional Turkish Residence

In Anatolia, Turkish peoples have formed two different settlement groups: settled and nomadic [6]. People who used tents as shelter units during nomadic life formed new specific shelter units via combining the plan system of tents they used and the local characteristics of the area they settled. Starting from 15th and 16th centuries, together with the synthesis of all the civilizations inside the borders of the Ottoman Empire, “Traditional Turkish House” [6] formed by the Ottoman culture became the shelter unit of the settled people. Although traditional residence was shaped variously as with inner hall, middle hall, outer hall and without hall in accordance with the regions’ climate and topographic characteristics, it is notable to see that there are no differences in the spatial organization. It is seen that traditional residence which is shaped in accordance with cultural and social habits has similar characteristics with the spatial organization of tent which was a shelter unit for nomads (Figure 1).

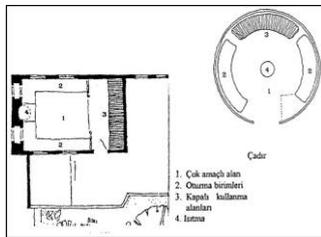


Figure 1. Comparison of Spatial Formation of Turkish House and Tent [7]



Figure 2. Traditional Turkish House Plan Typology [2]

When we observe Turkish house in terms of function, hall, yard, rooms and service units (kitchen, toilet and storage) form the spatial plan set-up of the traditional residence (Figure 2). *“Hall and rooms form the most important spaces of Turkish houses and they harbor distinctive accessories. In accordance with the climate conditions in which the house is found, hall which is placed as open or closed is in the center of the plan. Hall is both a service and a living area in which family gathers and spends time”* [8]. With the effect of family structure that is patriarchal in traditional residence, all the rooms are designed to serve all the functions. Thus, all the rooms can be a residence in themselves. Rooms with such a characteristic are transformed into spaces in which in day time meals and coffee are cooked, daily activities are carried on and in night time they are transformed to bedrooms with mattresses taken out from closets or bath is taken [8].

3.2. Transformation of Plan Typology During the Change From Traditional Residence to Apartment Building

The foundation of Republic which is the start of the social and cultural change in our country is also the start of transformation in residence plan typology. Changes in social order started to change the life style of the people; change in the socio-cultural mentality also brought the change in the physical conditions. Firstly, the notion of apartment entered into our lives as a symbol of western life style in our country, which entered the westernization period together with the foundation of the Republic; however, it was later considered the best solution to the increasing need for shelter [9] – the need for residences increased due to the social and economic changes and the migration from rural areas to cities. Thus, from traditional, detached and single or double-storied Turkish houses with yard to apartment buildings which are multistoried and in which many residential units are placed around a core. After apartment buildings occurred, traditional residence typology in which many functions are met in a single space left itself to a new system in which every room has a different function. Transformation which began with the increase of space based of function in apartment buildings has made the change of the plan typology inevitable.

At first, it is seen that the hall which was the main element of a traditional residence and which was both a service and a living space left its place to lobby in years due to losing its function. However, the first examples of apartment buildings having both the hall and the lobby show that the hall unit is not lost at once, but was transformed in time as far as its function is concerned.

The second big transformation in the spatial organization is the inclusion of kitchen, toilet and storage which were named as the service areas of the traditional residence and set-up outside the living spaces into residences. In the first example of apartment buildings, although there are examples in which toilet and is in a separate space and the sink is in the hall, it is seen that due to the changing needs, toilet and sink were united in a single space.

Later on, rooms in which many functions such as living, sleeping, eating, taking bath in the traditional residence had been met were specified as bedroom, dining room, bath in apartment buildings. Especially, in the apartment buildings built between 1950 and 1980 lounge and dining room unit which became a status symbol attracts attention [9]. Although the transformation of units with single function became a problem in the gathering of these functions in the first examples, in time, this problem was solved via the night hall.

Lastly, yards which were semi-open spaces in the traditional residences transformed into balconies in apartment buildings. Yards which were designed with the notion of privacy left their places to extrovert balconies as semi-closed spaces of apartments.

These transformations in the planning of residences appear as a result of changes in the socio-cultural structure of the society due to the effect of westernization in a long period. Patriarchal large family structure left its place to nuclear family, thus, the needs and expectations of the users changed. As a result, with the foundation of the Republic, changes caused by the interactions of socio-cultural, technologic and economic

factors affected the values of the users, and this situation made the changes in the residences which are living spaces inevitable.

4. Field Study: Spatial Changes in Apartment Buildings of Konya

Konya city, which developed around Alâeddin Hill -an old tumulus, became host to many civilizations and took its present form through the effects of different cultures. In Konya houses, which developed from a plan without the hall to a plan with inner hall, the design of the living units such as rooms and the hall and their aesthetic shape are common with the general Turkish house plan [10]. The difference occurs in the materials used and the shaping of the houses which carry the characteristics of the region due to the climate and topography.

Westernization movement which developed together with the Industrialization continued to be effective during the Ottoman era and later on, and this situation became the start of the transformation in residences. However, specific to Konya, residence buildings built until the foundation of the Republic were shaped in accordance with the traditional culture; there were no significant change in the spatial organization until the republican era. Innovation and zoning movements which were started for the development of the city after the foundation of the Republic brought the increase in the population of the city, thus the need for residence in the city increased. Fast urbanization, increase in population due to migration, the will to reach the comforts of modern construction technique, efforts in Westernization and constructing apartment buildings before making time to examine the interaction of all these have started to take its place in the process of the transformation in Konya house architecture [11].

Hayat Apartment, which is the first apartment of Konya, was built in 1937, so the process of building apartments began in Konya [12]. However, the economic recess continued until 1950's, and no other apartment buildings were constructed during this period. After the 1950's, together with the effect of economic and technologic developments, buildings in the form of apartments as residences were built as a sign of modernization. Constructing apartments continued parallel with the change of culture; this continuity happened within the limits of continuous change, not with sudden intervals [12].

In this respect, within the scope of the study, during the eighty years period since the foundation of the Republic, the transformation in the residence plan typology were determined through the spatial analysis of the five apartment buildings chosen especially for Konya city. Taking the changes happening in a long period into consideration the criteria in the chosen samples were selected in accordance with the differences in the spatial organizations. In this context, Hayat Apartment (1937), A.S. Apartment (1953), Karatay Apartment (1973), Altan Apartment (1993) and Parkmahal Residence (2016) were chosen to be examined. Transformations in the plan typologies of apartment buildings in Konya in periods of two decades are summarized in Table 1.

Table 1. Changes in the spatial organization of apartment buildings

	Façade	Plan	Plan Typology	Transformations
Hayat Apartment (1937)			<ul style="list-style-type: none"> -At the entrance lobby and the hall unit in connection with it is found. -Bedrooms and living spaces are reached via the hall. -Wet areas are reached via the lobby. -The unit which is reserved for guests is through the living space which is reached via the hall. 	<ul style="list-style-type: none"> -Hayat Apartment, which was built in 1937, is important as it is the first apartment building in Konya. -As it is the first example of transition from traditional life to apartment building, transformations stated in 3.2. are valid for this example. -Transformations in plan typologies after that date are the main subject of this study.
A.S. Apartment (1953)			<ul style="list-style-type: none"> -At the entrance, the lobby and in connection with it the toilet, the living unit, the guest unit and the hall is present. -The sink is separate from the toilet and it is placed inside the hall. -The kitchen is reached through the hall. -The bedrooms and the bath is through the night hall which is connected to the hall. 	<ul style="list-style-type: none"> -The hall is both the living area and the connection area as well as the service area. -The connection between the living area and the guest unit is lost. -The toilet and the sink are located separately. -The night hall is used for the first time.
Karatay Apartmanı (1973)			<ul style="list-style-type: none"> -All the units are reached via the lobby found in the entrance. -The kitchen, children's bedroom, the living unit and the guest unit are reached through the lobby. -The bedroom and the bath are reached through a passageway in connection with the lobby. 	<ul style="list-style-type: none"> -The hall is lost. -Connection between the living area and the guest unit is provided in a different manner. -The toilet and the sink are placed together. -The night hall lost its function.
Altan Apartment (1993)			<ul style="list-style-type: none"> -The kitchen, sitting room and guest unit which are in connection with the lobby are found at the entrance. - The bedroom, the bathroom and the toilet are reached through a passageway in connection with the lobby. 	<ul style="list-style-type: none"> -Connection between the living area and the guest unit is lost. -The night hall emerges but it seems that it cannot fulfill its function properly. -It is notable that there is a unity in the plumbing of the bath and the toilet units.
Parkmahal Residences (2016)			<ul style="list-style-type: none"> - The kitchen, lounge and toilet which are in connection with the lobby are found at the entrance. -From the night hall which is in connection with the lobby the bathroom, bedrooms and the laundry room are reached. -There is a parent's bathroom reached from the main bedroom. 	<ul style="list-style-type: none"> -Two new functions –a parent's bathroom and a laundry room- are added -The night hall is functional.

5. Evaluation and Conclusion

As a result of the study, it is seen that the change in the social order made the transformation of plan typology in residence which is the most common architectural product used in the society inevitable. It is seen that this change has happened in a long period and without separating its ties with the traditional culture. It is determined that innovations that were brought by the westernization were mixed with the traditional culture and plan solutions seen in today's residences. During the period since the foundation of the Republic, transformations in the plan typology can be listed as follows:

- Having lost its function, the hall which was used as a living space left its place to lobby
- Living and sleeping units were separated from each other via a night hall function
- Sitting room and lounge connection is eliminated
- Unity of plumbing was maintained, except the kitchen
- Increase in function is determined to be in line with the needs of the users
- Gathering of the spaces with different functions and their relationships is provided functionality

In approximately eighty years, the most important reason of the transformations in residence plan typologies is the changing of life style. The change in the government brought socio-cultural and economic changes, and thus, living conditions expectations and needs changed. The reflection these is seen in the spaces that are used. As a result, during the existence of humanity, change will be an inevitable notion in our lives.

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Approach Maximalist in Interior Design

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Abstract

Maximalist came into being in 1960s in the field of pictorial art, as a reaction to very complex interpretation of minimalism. In the same years, as a reaction to minimalism, a movement of maximalist emerged. After the 1990s, this movement highly affected the areas of architecture and internal space design. The more simple and rigid understanding of minimalism has been criticized by many designers, thus a more extravagant and splendid design approach was substituted. Thus, the philosophy of “less is more” of the minimalism is replaced by “less is bore” giving rise to new interpretation in the field of interior design. In this study we deal with the contributions made on the interior space designs and the today’s popular styles affected by the transformation from the minimalism to maximalist. Firstly, it explains the introduction of the maximalist and its principles. Secondly, we search the literature concerning with the subject matter. As a research method it is concerned with the investigation of studies undertaken by the pioneers of interior space designers and architects. In order to foster this research method, a survey by Curbid Staff has been undertaken with regard to various people. The findings of this study have been evaluated at the conclusion section.

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Keyword: Maximalism, Minimalism, Interior Design, Movement

1. INTRODUCTION

This paper examines the effect of maximalist approaches which is very influential in the fields of art and architect. The term means “the biggest amount” derived from the “the most, the greatest the highest” in Cambridge English Dictionary. while in Oxford Dictionary it means “at most, the greatest, the highest”. Maximization came into being as a reaction to minimalism, in the picture art in 1960s. Thus, maximization approach to replace the minimalist movement of 1960s was firstly used in the field of plastic arts.

The term maximization was used to describe the works by graphic artists such as historian Pincus Witten, Julien Schnabel and David Salle after the New Expressionism Movement became popular at the end of 1970s. This movement was with a special forms reflected in the pictures made by Gary Stephan in 1960s. Charlette Rivers stated that richness of maximalism has been associated the Works Julie Verhoeven and Kam with decoration, sentimentality, luxury and whim (Wikipedia:Maximalism). Today, artists in Far East countries are producing work in this manner. Among these artists Micheal Lin who designed some works that he prepared for Istanbul Banel in 2001, claimed that the space can be used as a design element with flower covered sitting arrangements. This Works can be shown as the examples of first maximalist approach works in Turkey.



Figure 1: From Thailand Artist Michael Lin Works (<https://www.google.com.tr/search?q=michael+Lin,date :22.01.2016>)

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In the philosophy of maximalism there is such a saying, “Less is more”, opposing to “Less is boring or Robert Venturi said that more is more”. The first statement reflects minimalism and the other is maximalism. Thus, based on the postmodernist movements, some metaforic buildings were built whose functions were definitely defined.

Maximization contains its most perceptible and exaggerated characteristics of its philosophy. Thus, a strict practiced attitudes and designers in using light colours was replaced by the ordinary use of colours and forms (Cuito A. 2002:10). In this type designs geometrical forms and ornamentation were given the priority. New movements started to question the originality in architecture an home individuality between 1970 and 1980s. On the other hand there was another movements started in departing from simplicity, functionality and anonym interpretations. However, there is such a tendency returning to these stills through maximizing movement these days (Klickowski H. 2003:8)

The following table shows the breakdown of the movements of minimalist, maximalist and their mixture. According to the studies undertaken by designer Curbed Staff shows that 50 % of participants preferred a mixed of minimalist and maximalist approaches. 35 % of the participants preferred maximization while the 15 % preferred minimalism.

Table 1: Curbed Staff Are You a Minimalist, a Maximalist, or Somewhere in Between? (<http://curbed.com/archives/2015/10/06/decor-style-minimalism-maximalism.php> date :24.01.2016)



1.1. Maximalism

Origin of maximalist decoration is Victorian period. Victorian interiors have rich and luxury materials. One of the samples this style in our country is Grek house. This old Greek house is located on Heybeliada, one of the four island group called Princess' Island, one hour boat trip away from the old town of İstanbul. The house contains Western style of decorative component that connects different eras of the 18th, 19th and the late centuries with contemporary aesthetics. This property was built 300 years ago by a Greek master, during the

both Ottoman and Modern Turkey' periods. However the maximalist decoratives of the interiors spaces are associated with Byzantium times. After many renovations undertaken in 1970s, the external appearance took a kind of Turkish styles shown by figure 2. The entrance hall, living room, kitchen and second story hall contains many elements of maximalist decorations as explained below.



Figure 2 : Facade of the Greek house in Turkish Style (An old house sample from Maria-Louise House, Heybeliada,İstanbul)

Below these pictures there are some ornamented pieces on the table as in figure 2. There is also (commode) in two part and there are many small pieces in between in representing religious artifacts. The living room differs in size from that of the Turkish style of buildings. In Turkish houses the hardest area is allocated to the living room as compared to bed rooms without maximalist decoratives. On the other hand Turkish living rooms are not decorated with the religious objects, giving rise to minimalist decorations. Opposing to the Turkish living rooms, the size of the living rooms of Greek houses is not that large. Thus, a small living room in these houses gives such an impression of having many elements of maximalism. The walls of the living room is painted with the wall papers in light colors, which goes perfectly with the more intense bold coloring of the sofa and armchairs. The walls of the living room was decorated in some pictures of decayed family members. Some corners shows that there are a statuette group of Apollo and Artemis, and at the top of the group there is another statuette of Napoleon whom the family respects.

The living room has been set aside for informal gatherings. The is generally visited by both Turkish and Greek families living on the island. The living room is decorated in a very simple style, so that it allows for relaxation and friendly conversation. However, all decorations are set aside forming an maximalist form of the interior space, even though it wasn't designed in this way. Comparing the other buildings on the Island this is the only home that exhibiting the elements origin sample of the maximalist design.

There is a very special place on the top of the steps leading to the kitchen. Table (5) shows this section containing many elements of icons. These icons represents a kind of nostalgia for past associated with Christian culture. Complementary figures of this section recaptures rococo and baroque elements that coexist alongside the three centuries. On the wall of the kitchen hall there is Turkish carpet decorated with the small ornemental pieces on a small table as shown by figure... This example of Greek house in the Princess Island shows that maximalist style of interior design represent many elements of civilizations. Apollo and Artemis statuettes represents Antic Greek period, whereas statuettes of Napoleon represents modern ages and Western civilization. In addition to these icons are associated with the Christian culture where as, carpet on the wall is a popular decoration of Turkish style. All these elements of decoration of a Greek house express a personal philosophy of the owners of the house giving rise to a kind of maximalist decoration. This type of decoration can also be associated with a different way of the understanding of the world. Some objects in decoration of this area can hardly found in second hand shops or flea markets. Since, number of the Christian families in the Island is about only 15 families these pieces can be considered as an antiques.

The maximization concept used for the last 10 years affected architects and interior design fields. This approach of maximalism has been used to define in the more complex and eclectic manners. Matt Tymauer, the author of *Vanity Fair* and Liane Hansen from the National People's Radio discussed the tendencies of maximalist movement and its effects on science and architecture. They stated that the style of Bilbao Museum by Frank Gehry was a mixture of both maximisation and minimalism. Aurora Cuito, a Spanish writer defined the minimalism as a new and complex eclectic style. He stated that maximalism opposes to modernisation movement, due to its essentialism and mystical purity structure.

The features of minimalism are spacious spaces simple lines, straight drawings, single and monochrom colors. Contrary to its simplicity and purity characteristics of minimalism, maximalism associated with the highly rich colors, complex drawings and striking appearances. Although, both minimalism and maximalism involve in comfort, however minimalism opposing to maximalism gives priority to the simplicity of the interior space. The main differences between minimalism and maximalism are briefly shown in table below.

Table 2. Comparing Minimalism and Maximalism

Comparing Minimalism	Maximalism	and	Minimalism A (t)	Maximalism B (T)
			Simplicity	Richness
			Straight Line	Curved Line
			Clearness	Chaotic
			Acute Corner	Round Curves
			Concealed	Luxury
			Luxury	Plurality
			Singularity	Bold Color
			Light Colors	

a) *Maximalist Interior Spaces*

The maximizing principle “more is more” introduced by Robert Venturi was the main idea against minimalism. This term also used to distinguish both movements in 1960. With the collaboration of historical post modernism, the chaotic buildings whose function were not properly defined were produced. The modern exhibition building in Rome, known as Roma Maxxi designed by Zaha Hadid, as shown by the following photos are the best example of this movement. It is also accepted that the Lounge of the complex in maximalist style, has been designed by Zaha Hadid.



Figure 3 : Interiors of Maxxi Contemporary Modern Art Museum (<http://www.zaha-hadid.com/architecture/maxxi/>)

Since it gives rise to use of perceptible and extravagant styles, designers employed extraordinary forms and colours instead of light colours and strict understanding of traditional approaches. Various geometric patterns, textures are being widely used in a uncommon style in architectural products. The appearance of the interior and the coats of the exterior of the DZ Bank, designed by Ghery and his associates, and the Gasonometre B Building (house, cultural complex and other building connected to main building) are the extraordinary examples of this approach(Bekleyen ,2007:25).

Complexity is the main characteristics of maximalism which leads to use of complex methods and styles. For this reason it is widely used in interior space in textile products. Interior spaces contains large drawings, complex colours, various designs and materials, impressive forms and styles, and very expensive sculptures. On the other hand, interior spaces are arranged in order to give such a very specious and colourful atmosphere. The following pictures are the examples of these luxury interiors.



Figure4:The interior space and external pictures of DZ Bank building (<https://www.google.com.tr/webhp?sourceid=chrome-instant&ion1&espv=2&ie=UTF-8=frank+gerhy+dz+bank>)

b-Decorations in Maximalism

Another features of the maximalism is that, it's complexity, plurality and the use of collage. For this reason, maximalism is widely used in textile products with the large drawings and striking tissues. Thus, complexity in colors, different tissues and drawings, influential figures, very expensive sculptures are the dominant features of the maximalism used in interior designs.



Figure 5: Designs by Alex Papachristidis (<http://www.housebeautiful.com/lifestyle/fun-at-home/g1678/maximalistdecorstyle/?slide=1> [http://www.dekoryasam.com/dekorasyondasadeliginonemi/\(erişimtarihi:23.01.2016\)http://curbed.com/archives/2015/02/26/maximalist-decorating-tiny-apartments.php](http://www.dekoryasam.com/dekorasyondasadeliginonemi/(erişimtarihi:23.01.2016)http://curbed.com/archives/2015/02/26/maximalist-decorating-tiny-apartments.php))

Some designers argue that minimalism and maximalism are the extreme movements. For this reason some designers employ the mix of these two opposing movements. The following photos show the use of both models leading to very interesting interior spaces, designed by Ukrainian designer Pavel Pevlov.



Figure 6 : Works by Ukrainian designer Pavel Petrov Ell decor dergisisi, (<http://www.elledecor.com/design-decorate/news/a7366/designer-creates-half-minimalist-half-maximalist-room/>)

CONCLUSION

The trend in design generally creates new movements contradicting to each other leading to born of a new movement as synthesis. To up to date the new movement to make it more interesting, it is the most important factor to generate the creativeness of designers. Actually, maximalism became popular today, because the former post modern movement was based on crowded and eye weary designs. However, some designers found minimalism monotonies and boring. In order to solve this problem maximisation was introduced as a reaction to minimalism using the mixture of one or some other styles. Thus, the strict and the simplest form of minimalism is replaced by maximalist have the following characteristics;

1. All the surfaces are full. This means that there is no empty space left.
2. Maximalism employs all the former movements such as Post Modernizm, Victorian, Country, Art and Craft styles,
3. Colors are charming and there are many gradation of colors,
4. Expensive sculptures and authentic ornaments dominate the interior spaces,
5. The sense is dominated by complexity, and
6. The pattern and texture is very important

I conclude that, maximization replacing the minimalism played important role in creating new techniques and styles. Thus, new styles in designing the interior designs enables interior space organisers to introduce new styles.

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Reflections of National Architecture on Konya City: Case Study With Regard to 3 Buildings^{**}

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Abstract

Technological, economic, political and cultural changes in the social structure also have affected the architecture profession. Developments in the West led the modernization process in Turkish architecture. However, in this process, developments in Western architecture did not affect our country until 1930's, and our architects embraced First National Architecture Period style in which they tried to keep the past alive by returning to the past. This style that is applied as a new trend in architecture in early republican era was seen in Konya which hosted many civilizations, and buildings that affected the identity of the city were built.

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Keywords: National Architecture; 1st National Architecture Movement; New Trends in Architecture; Modern Architecture; Konya

1. Introduction

In the 16th century, besides discoveries and imperialism, development in commerce and industry areas was increasing. These changes in technological, economic, political and cultural areas led to the changes in architecture profession. Westernization movements that started in the last years of the Ottoman Empire continued in the Republic era and started the modernization period. During the Republic Era, Turkey has experienced dilemmas such as east-west, national-universal etc., the search for new trends in architecture continued and different styles followed each other. Structures of 1st National Architectural Movement, which is considered between 1908 and 1930 in Turkish architectural history, continued its transformation with regard to modernization program which started in the Westernization period and went on through the edict of Political Reforms [1]. First National Architecture Period style is seen in Konya, which hosted many civilizations and harbours many cultures in Anatolia.

2. The Purpose And Method

In this study, 1st National Architectural Movement, which is a new trend of early period style in Turkey, its effects on Konya city and the cultural changes are taken as the research subjects. Analysis were made on Yapı Kredi Bank (Old Ottoman Bank) (1921), PTT Building (1926) and Ziraat Bank Building (1929), which are

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** PTT Building and Ziraat Bank Building examined in this study are exhibited with a poster presentation in DOCOMOMO 2015: "11th Local Expansion of Modernism in Turkish Architecture"

situated on Mevlana Street, were taken as samples with regard to public buildings. Plan constructs, façade characteristics and their importance of the chosen samples are discussed with regard to their importance in the transitional period to modern architecture. Being on the historical center of Konya together with other buildings built on different eras, these three samples are chosen as criteria in terms of reflecting the features of their era in the historical texture. In the study, on-site examinations, technical drawings and photographs are used for documentation, and archive researches and interviews were made to define cultural reflections.

3. 1st National Architecture Period

Return to classical Ottoman architecture with the effect of Turkism ideals, which were raised by Ziya Gökalp, started in 1910's and continued until 1930's as a result of the ideological environment [2]. Although more innovative developments were expected in the years that follow the traces of the 2nd Meşrutiyet (Constitutional Monarchy), it is seen that our architects tended towards historical heritage. In the first years of the Republic, nearly most of the limited number of architects adhered to National Architecture Movement for many reasons [3]. In the same years, in line with the developments in architectural environment, while architects were withdrawing from façade arrangements and dense ornamentation and working on the reflection of the developing technology to architecture by giving weight to functional values, our architects preferred to use the past values in creating national awareness [3]. This situation which is an effort to keep the past alive by turning back contradicted with the new environment in which new revolutions were being made.

The unity of ideology and architecture in the First National Architecture Period, manifested itself in the form of the use of Ottoman architectural elements (dome, arch, portico, crown gate, etc.) and ornamentations especially in façades [2]. In this period, wide eaves, corner towers, high entrances were the basic elements seen in the buildings. It is observed that design of façades was given more importance than floor plans, and it is specified as a period in which the buildings are defined aesthetically [4]. In the buildings of that period in which façades were chosen as the first element to be settled, arches of different shapes, glazed tiles stone and metal ornaments in façades and marble pillars in the entrances were used. This situation in this period's buildings on which the façades were not used equally –the main façade was given the most importance- shows variations in accordance with the importance of the building and the condition of the place of the building. First National Architecture Period style seen in especially in administrative public and service buildings was used in the residences from time to time, and its reflection is seen in many buildings from the rural areas to the city.

4. The Reflection of 1st National Architecture Period in Konya

When we examine the process of Konya from B.C. 6000 to 19th century, the city centre of Konya, which hosted many civilizations, is determined to be Alâeddin Hill and its vicinity, and in time settlement texture increased in this surrounding. Religious, public, commercial and residential buildings built during Seljukian era, period of Beylics and the Ottoman era in the historical city centre, in the historical axis between Alâeddin Hill and Mevlana Shrine (Mevlana Avenue) brought a strong identity to the city. Also, 1st National Architecture, as the other architectural styles of the past, took its place in the city centre as an identifier and a complementary element of Konya architecture. Together with the Republic, studies for zoning plans were made in Konya as it was in many cities, but no physical change was seen in the city until 1960's [5]. Different from Ankara, in Konya, works of 1st National Architecture Period were built with the support of new establishments filled with the ideas of a new government form and the ideals of Tanzimat (reforms made in 1839), not with the incentive of the Republic in spite of the change in the government and the ideology as it is in Istanbul [1].

When we examine the buildings' design under National Architecture title in Konya, it is possible to list educational, public and religious buildings. In this study, public buildings that carry the typical features of First

National Architecture Period, have important positions in the city and that reflect the style of the era are preferred. Three public buildings which carry the style of First National Architecture Period in Konya's historical city center, in which buildings constructed in different eras exist together, are chosen. Although the ideology of the era in which the buildings were constructed went out of existence, these buildings have been used and they are embraced by the citizens of Konya.

4.1. Yapı Kredi Bank Building (1921)

Yapı Kredi Bank (Former Osmanlı Bank) Building is found in Karatay District, Şemsitebrizi Neighborhood, block no.: 3097, parcel no.: 8 in Konya. The building, which had been built as Osmanlı Bank in 1921, was used as a telegraph office and CHP city building for a while and it serves as Yapı Kredi Bank today. The building is one of the buildings that surround the large square known as 'historical plateau of squares' [6] on Mevlana Avenue in Konya city center. The building is surrounded with commercial and public buildings, Şeraffettin Mosque (1336) and Konya Governorate (1988).

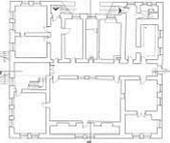
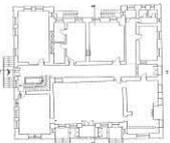
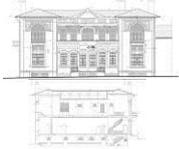
Table 1: The analysis of the location, spatial set-up and façade details of Yapı Kredi Bank Building

Location and Definition of The Building		Location	Ground Floor	Floor Plan
		1930s	Basement	Section-Front
				
				
<p>-The building is situated on the east-west main axis and its main entrance is integrated to the square.</p> <p>-The building consists of a basement, ground floor and first floor.</p> <p>-In the plan set-up of the building, which is symmetrically built on the entrance axis on the façade, it is seen that the symmetry differentiates.</p> <p>-The building is stone masonry.</p> <p>-The windows and doors of the building are wooden.</p>		<p>Planning</p> <p>-Banking services are conducted on the ground floor in the great hall to which the entrance opens. On the north of the entrance hall ATMs are present in a partition.</p> <p>-On the first floor service divisions and the manager's office are found.</p> <p>-Basement is used as archive.</p>		
<p>Front Features</p> <p>Front</p>  <p>Flank Front</p>  <p>-As the characteristic of this period's buildings, the entrance façade of the building is important due to its ornamentation details and designs.</p> <p>-Stone material was used in rustic style on the façade.</p> <p>-Ground floor windows are with round arches and have rectangular pediment.</p> <p>-First floor windows have lancet windows and their pediments are covered with glazed Kütahya tiles.</p>		<p>Front Detail</p>    <p>-The entrance gate which is elevated via 5 steps was recessed with a round-arched opening.</p> <p>-There is a balcony for addressing people over the gate. On the pediments of the arches there are Ottoman flower motives and ornamented panels</p>		

4.2. PTT Building

Konya PTT Building is found in Meram District, Şukran Neighborhood, Mevlana Street, sheet no.: 108 block no.: 876 and parcel no.: 42 in Konya. The building was designed by Architect Falih Ülkü, who executed the buildings designed but not completed by Architect Kemalettin. It was registered by the High Council of Estate, Relics and Monuments on October 18th, 1975 with decree no.: 8652. PTT building, which has been preserving its function, still serves as a public building. It is situated in Konya city center, in the historical axis between Alâeddin Hill and Mevlana Shrine (Mevlana Avenue) on Kayalı Park Square. Next to the building, Telekom building is found. İplikçi Mosque (1201), a monument of Seljukian Era, Ziraat Bank (1929), Hacı Hasan Mosque (1800), Konya Governorate (1988) and the historical covered bazaar surrounds the building.

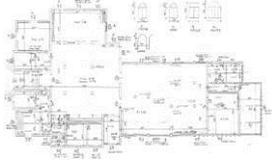
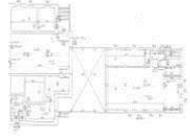
Table 2: The analysis of the location, spatial set-up and façade details of PTT Building

Location and Definition of The Building		Location		Ground		Floor Plan		
		1930s	Basement		Section-Front			
Location and Definition of The Building		<p>-The building is situated on the east-west main axis and its main entrance is integrated to the square.</p> <p>-The building which consists of a basement plus two floors is symmetrically built on the entrance axis. This symmetry is emphasized via wide closed eaves from east and west ends.</p> <p>-The two floors on the ground were built via massive brick (70 cm) over a basement made of stone walls (80 cm)</p> <p>-The windows and doors of the building are wooden. The angles of the building were made of ashlar.</p>		Planning Detail		<p>-There is a corridor that extends throughout the building and its plain plan scheme is composed of rooms situated around the corridor.</p> <p>-Postal services are provided in the long-span hall to which the entrance axis opens.</p> <p>-On the ground floor, cash-desks, directorate of telephone, the manager, storage areas, tea room, counters, customer and service halls are arranged.</p> <p>-On the first floor, subscription division, manager, assistant manager, chieftain of counters, officer and archive departments are found.</p> <p>-Basement floor is composed of service areas, dining hall, storage area and archive.</p>		
Front Features	Flank Front		Rear Front		Front Detail			  
	Front Features		<p>-The design of the arches over the windows, which are different in every floor as the general characteristic of the period, are lancet on the first floor and flat on the ground floor.</p> <p>-On the pediments of the arches there are Ottoman flower motives, ornamented panels and stone centrepieces.</p> <p>-The façade on two floors were given motility via straps and frames at the same alignment around the windows.</p>		Front Detail		<p>-There is an arched pediment on the outer façade in the middle in pencı style, which looks like the upper floor windows and defines the entrance at the same time.</p> <p>-While the pediment was seen as lancet style and has a big city clock in it in the colored façade drawings of Falih Ülkü, the size of the clock was shrunken and the arch was made in a different style during the construction [6].</p>	

4.3. Ziraat Bank Building

Ziraat Bank Building is found in Meram District, Şükran Neighborhood, Mevlana Street, block no.: 876, parcel no.: 21 in Konya. It was registered by the High Council of Estate, Relics and Monuments on November 13th, 1982 with decree no.: A-3861. The building, which has been preserving its function and authenticity since the day it was built and which was last renovated in 2013, is still used as Konya Central Ziraat Bank. It is situated in Konya city center, in the historical axis between Alâeddin Hill and Mevlana Shrine (Mevlana Avenue) on Kayalı Park Square. Also, İplikçi Mosque (1201), a monument of Seljukian Era, PTT Building (1926), Hacı Hasan Mosque (1800), Konya Governorate (1988) and the historical covered bazaar are situated around the building. The square in which the building is situated is surrounded with commercial, public and religious buildings.

Table 3: The analysis of the location, spatial set-up and façade details of Ziraat Bank Building

Location and Definition of The Building	Location		Ground Floor	
	1930s		Basement	
		Planning Detail		Floor Plan
<ul style="list-style-type: none"> -The building is situated on the north-south main axis and its main entrance is integrated to the square. -While the building which consists of a basement plus two floors is symmetrically built on the entrance axis, the symmetry is lost in the additional building which is situated on south and in which the hall and the service offices are situated. -The main building was built in 1929 and the additional single layered building on the southern part was built in 1960. -The building was built with ashlars [6]. -The windows and doors of the building are wooden. -The building is entered from the façade facing the square. 		<ul style="list-style-type: none"> -There are corridors which reach from the entrance hall to the manager's office and the stairs. -Customer waiting hall, cash desks and areas where personal services are provided is found in the long-span hall to which the entrance axis opens on the ground floor. Retail banking services are held in an open office area in the additional building. -The first floor was arranged with closed offices. There are tea room, meeting rooms and unused office rooms. -The basement is used as archive and money storage area. 		
Front Features	Flank Front		Rear Front	
	<ul style="list-style-type: none"> -Basement floor receives sunlight from the road elevation. -From the rear and lateral façades of the building there is a passage to the basement from the ground floor via an area which is supported by columns only. -On the additional building, motility was provided on the façade via lanes some part of which is blank and some part of which has window openings and which emphasize the vertical line. -The façade on two floors were given motility via straps and frames at the same alignment around the windows. 		Front Detail	
		<ul style="list-style-type: none"> -There are 7 types of windows on the façade of the main building. -The windows of the front façade which varies in accordance with the space sizes and the two windows on the lateral façades are arched, the other windows are flat. -The façade on two floors were given motility via straps and frames at the same alignment around the windows. -French balcony is seen on the façade of the first floor. 		

5. Evaluation and Conclusion

The movement which is referred to First Architecture Period and which shaped the architectural form of a city was fed by a culture of nationalism, supported via a western education but emerged as a more Turkish and a more authentic style. The works of First National Architecture Period determined in Konya reflects the socio-cultural, economic and architectural structure of the era to the present. The findings which were obtained after examining the works of this era in Konya city center are as follows:

- As well as carrying traditional and national architecture, innovative approaches are observed.
- Generally, symmetrical block arrangements are present in the buildings.
- Elements of structural and decorative ornamentation of Ottoman architecture are used in the façade ornamentations.
- Arches over the windows, which were designed different in every floor are also seen in these buildings as the characteristics of the period.
- Rich façade designs in the main façades differ from the other façades that are plainer.
- Top of the buildings were covered by hipped roofs with wide eaves.

As a result of the study, First National Architecture Period Buildings as a new trend in architecture which were examined brought a new perspective to the city culture of Konya via their new building types, scales, construction techniques and authentic ornaments, and they carry modern architectural features while being affected by the architecture of the past periods. The successful application of these buildings which constitute a historical unity with the buildings of different eras on the historical axis maintained the protection of their rightful places as a part of the historical texture in Konya city center today. The examples which reflect the architectural understanding of an era are immovable cultural heritages due to their value with regard to urban and historical texture.

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How to Design Flexible Spaces at Private and Government Offices?

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Abstract

In this study, the "flexibility office spaces" and "how to be flexible / able to remain the flexibility offices" were investigated experienced by users in the office sector. The process of the concept of flexibility in the architecture and in the last century has produced new strategies to find a solution to solve this problem. The study was supported by a plan view of the sample projects and pictures. As a result, the flexibility problems depends on from the space to space and vary from user to users. In fact, functionality, and flexibility that has been shown to lead mixed with more than flexibility in the work place strategy.

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Keywords: Flexibility; Design; Office Spaces; Modularity

1. Introduction

Furniture users encountered at every stage of our lives as supply and demand situation in our own identity, our personality and our pleasure as we make choices appropriate unimaginable natural rights. That's why one of the most important cases to human life or the desire to make choices that best fit as you want in the workplace or is required to have the option to make the elections more precisely.

In first and second World War II changed life styles, especially in working life and working conditions of people, most parts of in Europe. Particularly after World War II there was an urgent need for factory and office in many European cities, cities that were destroyed had to be rebuilt quickly. So far from an identity in this period and office furniture manufacturing aesthetic ones as a result of production faster and cheaper, quality, be functional, quality, personality and even as far away from the basic features were completely lacking. When the post-war needs for the period considered, the first priority of and manufacturer designer based on that day were in demand to produce fast and very number in the office and home, then has directed a variety of designers and architects to search for finding new solutions and uncovered flexible and productive new ideas for offices as a result.

2. Determination of the Flexibility Problem

Identifying the problem of flexibility and office spaces. The fact that in order to give answers, questions must be asked about the problem or problems to be determined. Current approaches to the concept of flexibility for office, 'What?', 'How?', 'Is it possible?' 'Necessary?', 'How to obtain and sustain?' "Answers to this question is actually us a problem and the solution made against these problems. This question will be asked to create problems and to find solutions to these problems the people, architects, designers and manufacturers are.

But that will survive are the users and the potential problems that people experience. So it is actually the basis of factors that contribute to this problem user, or users without admixture. Office users in Turkey divide into two different groups, Group one public employees, and Group two are private sector employees. These two groups have very different work techniques and strategies under study. Front office applications typically used in the private sector, closed offices are used in the public sector. The important question is: which concepts of flexibility used in the public sector or the private sector? How important is it to working needs? We need to search for answers.

In our country (Turkey), the DMO State Supply Office, (Devlet Malzeme Ofisi) provides office furniture manufacturers through different public institutions. This working philosophy has jumped the last 10 years, important steps have been providing innovative office design to public employees. Due to the popularity of more economical and more ergonomic product developments and technology it has been shown to particleboard panels of furniture used in public buildings. But the main problem here is not furniture space and user context. The most important element is to use the new design of the former applied to public buildings and installation problems. The same problems exist in the private sector is not usually experienced in meeting spaces with innovative design and innovative.

3. Flexibility at Architecture and Design

At least in all areas of our daily lives no longer "popular" with the word "flexible" and "flexibility", because of their value as irrelevant and inadequate use of the concept and began to lose its importance began to come up. Last ten years Turkish offices being flexible and may have to, we are living in today's world and society, as a result of deformation brought our language in every shape and can take on any character, it has become remote from acquiring identification approach. But actually having the flexibility to be flexible and, where necessary, time and situation to change and to adapt to the conditions required to give rise. It should be underlined parts, which could come to the concept of "all" instead of the word "should" is the word. According to situations where flexibility is not against making generalizations should be to customize the case. Flexible fixed, with no means certain. In need of social relations, as well as organizational change when the decision referred to the concept of flexibility in the model is meant to be and needs [1].

Present as the cause of every day more come up at every stage of our lives as a user the flexibility of changing concepts and showing a parallel proportional to the changing technology and evolving standards we can show our evolving life.

Flexibility nomenclature was founded by Gropius after the II. World War is expressed as an agenda item. An architect of the functionalist trend continues this attitude as well as Gropius and projects; flexibility, we observe a good architecture and serves as a natural method that is not the right road to take in the words of the debate in 1950 [2].

The buildings, monuments, and working offices should not think like them but to think like containers that can serve the unpredictability of life, and with this fiction must be flexible enough to restore harmony to create a plan to deal with the dynamism of modern life [3].

Flexibility is not the notion of architecture inclusion for the first time in 1950. While flexibility in the 1920s and 1930s as part of the contemporary architectural culture, architectural historians and critics by pre-war

strategies flexibility are placed in a different location from the post-war. After 1950s years flexibility strategies, efforts to anticipate and identify precisely criticized Koolhaas. According Forty "flexibility strategy, especially after 1950, when the arguing and uncertainty; functionalism is aimed at ridding the deterministic excesses" [3].

Van Eyck was unchanged the environment and to be flexible so hard circles noting that he sees as a dangerous and flexibility greater than the mean installed, uses the metaphor of a glove in this context; Once likened to a flexible space that can be entered into any hand glove, this glove have designed to actually warn someone's hand [6:360]. Implies the search space that can be adapted to each function would result in ignorance [4].

Still the notion of flexibility to protect its currency, even without being aware of the criticism in the 1960s; and an absolute extreme possibility invisible discourse in the molten state, its production is used as a reliable solution in practice. It is sufficient-condition for the existence of that intended. But flexibility fictional contradictions embodied in the architectural design, where the notion of instrumentalization enters the circulation disregard. In some cases, it generated flexible spaces, in architecture been able to go even beyond the murderer of other problems and personalize the solution of them. Flexibility is actually a layered structure consisting of components and terms. Many layers, overlapping, side by side, form the concept of flexibility through nested. (Fig.1)

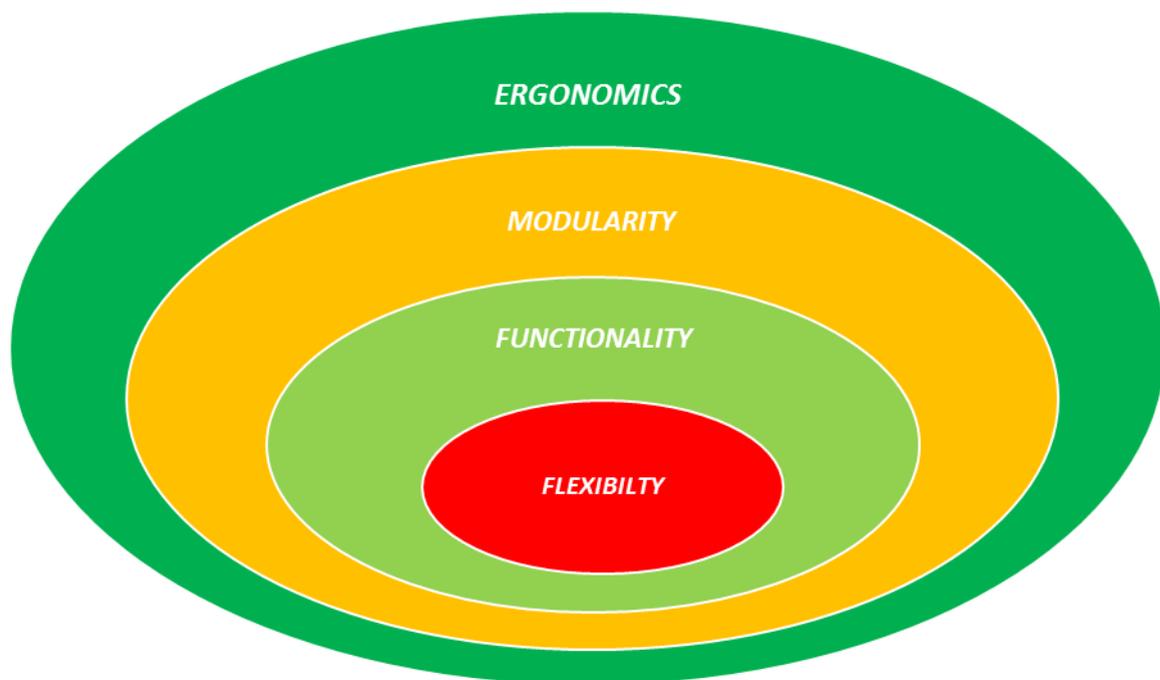
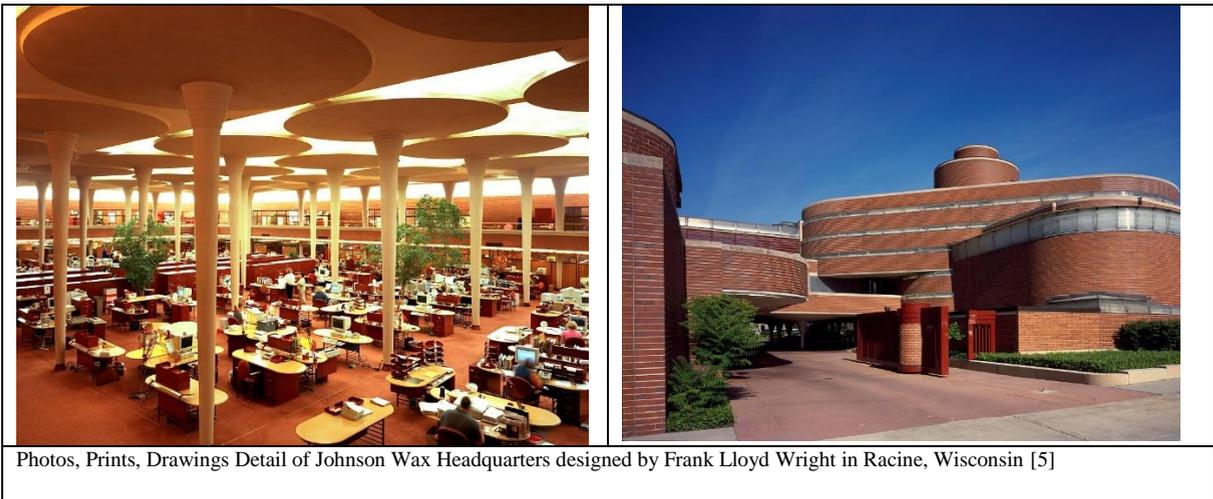


Fig.1. Flexibility topic associated with the other topics,

The concept of quantity or quality and quantity of the type of design, the user can vary depending on topography and culture. The change or transformation design time, some of these layers as needed, while maintaining constant mold functions and values, can provide the flexibility of a part of changing and transforming. Whenever any of these layers can be flexible themselves.

3.1. The sustainability of office space flexibility

The open plan isn't a new concept: Frank Lloyd Wright used the scheme in the Johnson Wax headquarters building in Racine, Wisconsin, to group employees of similar functions (in this case, secretaries). But over the decades, as corporate workers increasingly performed isolating tasks, they were insulated in offices and cubicles, working their way up to bigger and better spaces that signaled their rising status within the firm. The office of the future may not be about trappings or technology as much as the exchange of ideas, with a focus on employee engagement what some experts are calling the "new sustainability" (fig.2).



Photos, Prints, Drawings Detail of Johnson Wax Headquarters designed by Frank Lloyd Wright in Racine, Wisconsin [5]

Fig. 2 The interior and exterior photograph of Johnson Wax Headquarters [5]

"It's certainly not as critical as it once was," says Bruce Fisher, an architect in the New York firm Kohn Pedersen Fox Associates. "What's becoming more important is the breadth of the floor, and as much visual continuity as possible so you can see someone all the way across the floor. It's not about Big Brother, but more about staying involved and knowing what's going on" [6].

What works, industry experts say, is a space that fosters transparency, offers multiple choices as to how and where to work and an environment that imitates life outside the office, little surprise, technology companies set the mold and lead the pack, says Sonya Dufner, principal and director of workplace strategy at Gensler, a global architectural planning and consulting firm [7].

It's a trend born of Silicon Valley and creeping eastward. In New York City, it's often combined with the sensibilities of Brooklyn's DIY maker movement, which has flourished in incubators such as the Brooklyn Navy Yard's New Lab and Industry City. It's also apparent in places like the midtown Manhattan office for internet music-streaming company Pandora, designed by Andrew Bartle's abastudio. "Our design strategy played the new against the old," Bartle says. "The kids that work in those places all live in Brooklyn, and it works with their lifestyle and what they wanted to be a part of. Their separation between work and life is probably less so than in our time" [7].



Fig. 3. The interior photograph of Pandora's small meeting spaces [8]

Pandora's office interweaves lifestyle amenities such as Ping-Pong, stocked open pantries and a yoga room with work areas that reflect the company's dual needs for interaction and privacy. Abastudio designed a series of chat rooms in the form of phone booths, banquette and benched seating, huddle areas and conference rooms, and a grand staircase between the two floors that doubles as seating for "all-hands" meetings(fig.3). In this way, Bartle says, the plan accommodates up to 150 employees per floor, more than the typical capacity for similarly sized floor plates. The elastic design allows the company to expand and contract as needed. When Pandora has a full house for events such as music performances or town hall meetings, employees utilize an amphitheater or other large assembly spots in the office [8].

3.2. *Certain samples for flexible office applications*

More than 75 percent of U.S. offices have open plans, say researchers from Kahler Slater, an experience-design firm based in Milwaukee. Once the domain of creative services, the studio model has trickled into professional services such as real-estate agencies and financial firms. Last year real-estate brokerage firm CBRE adopted a "free address" open plan in its 200-person Los Angeles office, doing away with assigned desks in favor of work "neighborhoods" with couches, "hot" desks (those that are not assigned to a specific employee but can be reserved for mobile workers or whoever may need it) and even treadmill desks [9].

"Financial firms are losing employees and not able to attract MBAs who are going from school to technology companies, and that's making these pretty traditional organizations rethink the future," Dufner says. "They're looking at what some of those technology firms are doing and asking how they create culture within their workplace and what are those things that attract people. Financial firms are starting to talk about themselves as technology firms and their business is really changing, so their space needs to reflect those changes" [10].

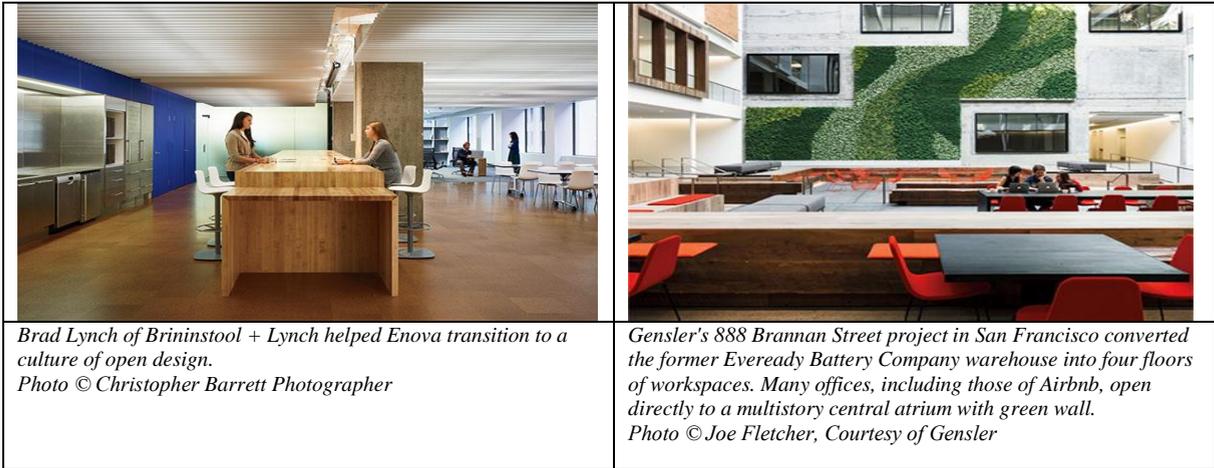


Fig. 4. The interior photograph of Brad Lynch of Brininstool and Gensler's 888 Brannan Street project [11]

On the other hand, the change for Sterling Partners was a "huge risk." The 60-plus-person firm radically changed its model, moving from the suburbs to the city. New furnishings included stand-up desks and lounge chairs with 360-degree views of the city, to be enjoyed by all. The reception area was reimagined to facilitate interaction and mobility among support employees, who could act more like concierges than secretaries. "When people came into the space, they didn't want to seem hierarchical. They wanted to seem welcoming and that [everyone] was part of the experience," Lynch says of Sterling Partners. "They created an increased opportunity for collaboration, and they really treat the space as an opportunity for mentorship". [11]

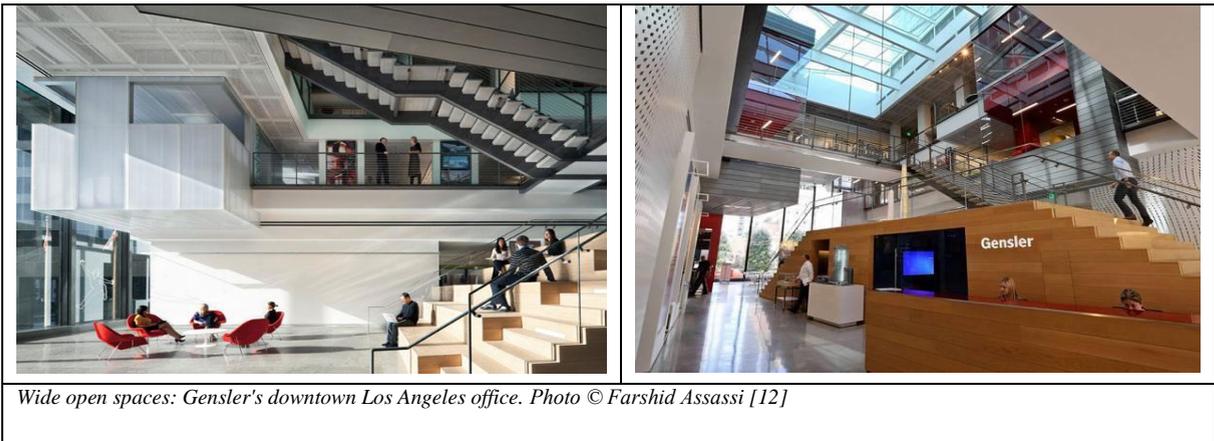


Fig. 5. The interior photograph of Gensler's downtown Los Angeles office [12]

As financial firms nudge toward the great undivide, some business sectors, such as law firms, are still firmly entrenched in the traditional office layout, according to Doug Zucker, a principal at Gensler's San Francisco office. "It's really a profession that's bound by tradition and precedent, so people are loath to be the first to do something new," he explains [12].

Indeed, Gensler's survey of knowledge workers showed a 6 percent drop in workplace performance in open offices when collaboration and focus were weighed, with 53 percent of respondents saying they were disturbed

or distracted by co-workers. It's an issue even at the most forward-looking tech companies. Bartle says acoustics played a large role in Pandora's design, and careful attention was paid to balancing audio and visual privacy. "It tries to look casual and is, in fact, very casual, but the efforts that go into it are extremely detailed," he notes. Zucker says that when workplace changes do occur in the legal sector, offices may end up resembling consulting firms, with Gen Xers and Millennials driving the changes toward collaboration and "soft" amenities like flex space and work that is creative and mission driven over entitlement amenities like corner office [13].

Sustainability has taken on a new meaning for the office, shifting from a focus on the environment to one on the whole being. Reclaimed materials, toxin-free substances and energy efficiencies are "nearly automatic now," says Chicago architect Lynch, while the new sustainability is human-focused, paying attention to body and soul, thanks to growing evidence that a happy employee is a loyal and productive employee. To that end, pantries are stocked with healthful food, assembly spaces double as yoga rooms, and in-office kitchen events enable employees to prep food and dine together. Furniture is more active, too. Gensler's Dufner says orders for sit/stand desks are on the rise, in recognition of the notion that "sitting is the new smoking." Many offices are adding treadmill desks to the mix. Also trending: the addition of outdoor spaces as areas of respite.

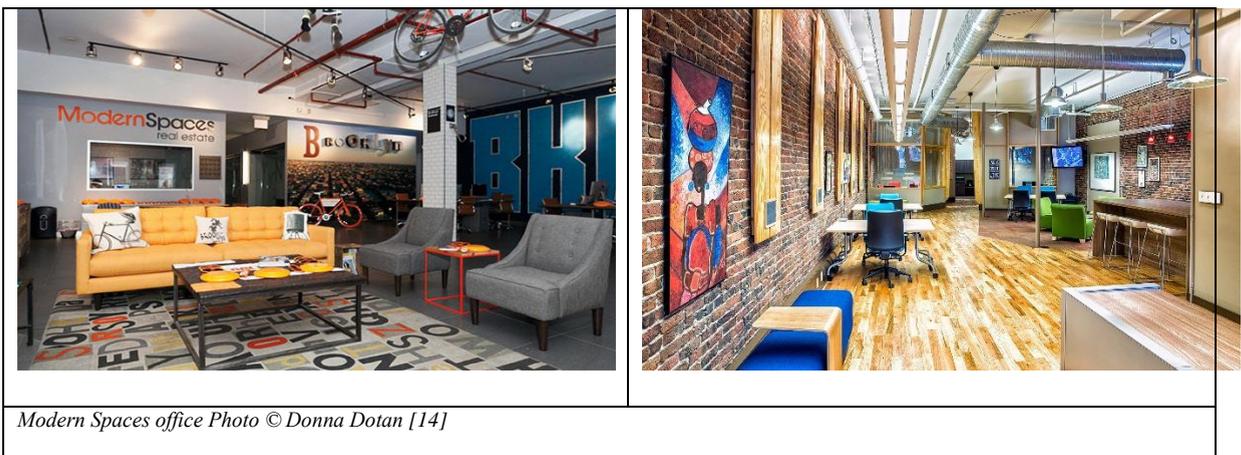


Fig. 6. The interior photograph of Modern Spaces real-estate firm office [14]

In Brooklyn, Eric Benaim, founder of Modern Spaces, a boutique real-estate firm with five offices and 70 employees, created a hybrid office with an artisanal coffee shop opening out to the street. His agents conduct business at either a desk or over communal tables in the shop. Benaim says the connections feeds the soul [15].

3.3. Design flexible offices with office stuff ideas

To those who think office design is irrelevant, "Think again. And think like Apple co-founder Steve Jobs." Odds are high that you are devoted to or dependent upon some type of Apple device. The most likely reason is because it was primarily designed with you and your experience in mind. Design that prioritizes "user experience" isn't just good for the user. It's good for the bottom line. It's one of the reasons Apple has revenue double that of Microsoft, which doesn't prize design for simplicity. And it can be applied to more than just tech products. Companies that focus broadly on the user experience are learning that it's also a crucial component of workplace productivity. Workplace interiors that prioritize a simple, intuitive and beautiful "user experience" are places where employees are more engaged. And highly engaged employees have 37 percent less absenteeism, 28 percent higher gross margins and 18 percent higher productivity. In our experience, one design factor alone can have a significant impact on increased engagement: the ability to choose a workspace based on

the task at hand. Office space must be flexible and offer not only offices and workstations, but also a variety of unassigned spaces. Phone rooms for personal phone calls. Headache rooms with dimmable lights. Team rooms suitable for brainstorming sessions.



Fig. 7. The interior photograph of Work cafes and the modern office [16]

Well-designed workspaces now have built-in controls to make people comfortable and therefore happier and productive. We often recommend task lamps that are dimmable. Some of the more robust lamps even let users adjust between warm and cool tones.

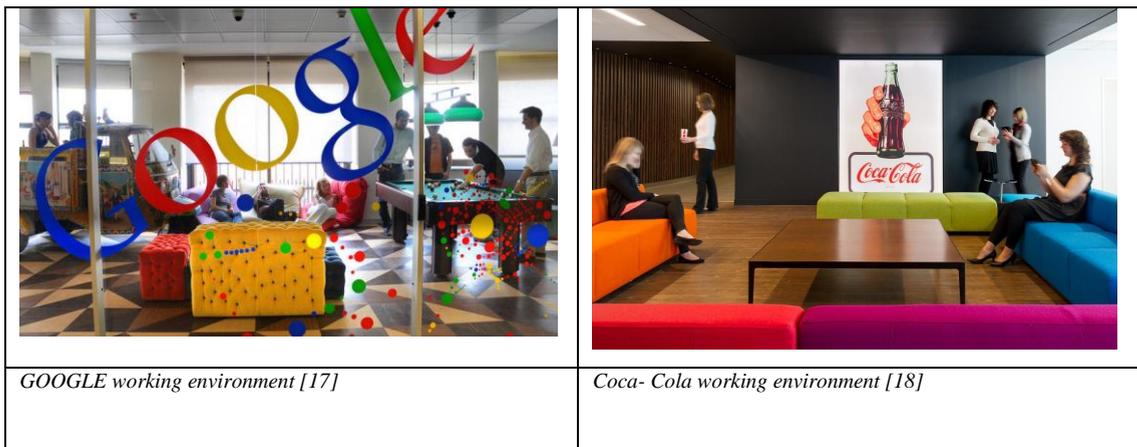


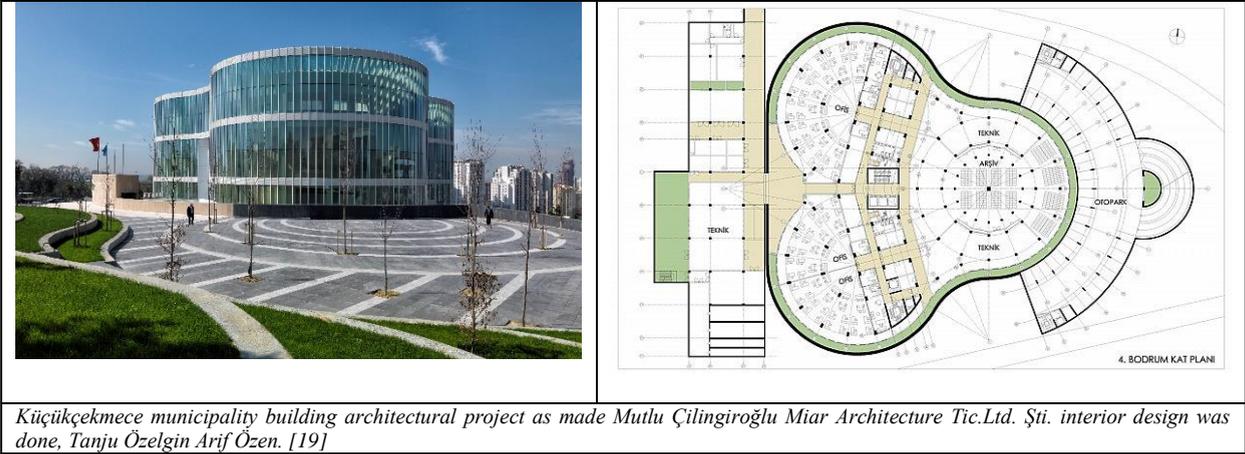
Fig. 8. The interior photograph of google office and Coca-Cola office [17-18]

Underfloor air systems allow individuals to close and open vents to suit their internal thermometers, and white noise systems reduce distraction by emitting a low-frequency hum. The point, of course, is that when it comes to motivating people to perform at their peak, form doesn't follow function. They go hand-in-hand. And the companies that have mastered this principle have profited. In the past 10 years, design-driven companies like Apple, Coca-Cola, Herman Miller, Nike, Starbucks and Starwood outperformed the Standard & Poor's 500 by percent.

3.4. How to design flexible government offices?

After 1990s government buildings and offices changes their structure. They try to be clear and visible. Many countries such as Germany, Sweden, England and USA try to be use open office systems. After 2000s Turkish Government used open office systems. It was not easy to use modern style office layouts at government buildings. There are many obstacles, to use modern style,

- Hierarchy
- Security
- Management
- Confidence



Küçükçekmece municipality building architectural project as made Mutlu Çilingiroğlu Miar Architecture Tic.Ltd. Şti. interior design was done, Tanju Özelgin Arif Özen. [19]

Fig. 9. The exterior photograph and Plan layout of Küçükçekmece Municipality service building [19]

Turkey has the distinction of being the first green certificates for public buildings Küçükçekmece Municipality service building, BREEAM (Very Good) was awarded the certificate. Küçükçekmece Municipality, which is a reputable organization in sustainability in Europe and all certifying eco-friendly buildings in the world UK-based Building Research Establishment (BRE), which is authorized by BREEAM - Very Good (Excellent) were awarded certificates. In this project-BESPOKE BREEAM (tailor) criteria were used and BRE-Global unique tailor this project, the climate and prepare the criteria designed by the building type.

Kucukcekmece service building claims to be pioneering and exemplary public. Wise use of natural resources and designed with the principle of sustainability awareness. Natural lighting and natural ventilation have been resolved with the possibility of double-skinned facade case. Democracy and transparency is emphasized, considering assembly and with a design that puts the heart of the system. Building, high-tech, economic, functional and accessible, barrier-free design foreseen. Recycled and maintenance-free materials, products and plant extracts were obtained with a green roof and building.



Oldies style and modern style at Turkish government offices [20]

Fig. 10. The interior photograph vintage and modern Turkish government office [20]

As it is seen from figure 20, Turkish office style were changed by the time. In new offices civil servants use more ergonomic and flexible offices. It is important for the next decades. These pictures show us differences between old and new offices at last ten years.

4. Conclusion

The architects and interior design flexibility is one of the most important issues is trying to overcome the interior designer. I. and II. After World War showed that in compliance with the growing phenomenon of urbanization and modernization efforts of humanity in modern society.

It examined the movement from past to present concept of the office, flexibility of the space and the furniture has been seen as a result of human psychology of which is attached. The most important concept of the collection could take the stress of working in the office space and the availability of large spaces.

Today 5 important elements effects of flexibility in the office spaces:

- Functionality
- Recreation areas in the workplace
- Ergonomics
- Mobility
- Modularity

When these topics examined expect the private sector initiatives in public buildings would be wrong, but it offers the private sector if employees are considered to be under heavier stress compared to those working in public Google and Coca-Cola work areas such as in the case of relaxation and emotional intelligence application opportunity.

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ANALYZING THE EFFECTS OF SPATIAL EQUIPMENT ON CULTURAL STRUCTURE VIA KONYA HOUSES

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Abstract

The increase of the capital in Europe is named as the industrial revolution. Industrial revolution caused many changes in Turkey as well as throughout the world. Residences in which the solid reflection of culture is seen was effected from this change fast. Changing conditions from the equipment in residences to the plan set-up caused the changes in daily life and thus, the culture of living in time.

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Keywords: Residence; cultural structure, spatial equipment, transformation in house, transformation in equipments

1. Introduction

In the historical process, residence is created to satisfy the need for shelter, and underwent changes in time. The reasons that cause change are construction technique, materials used and technology.

After Turkish people left the nomadic life, they met their need for shelter with a residence type called Turkish house. Turkish house and the tents used by nomadic life have similar characteristics in terms of spatial organization. Room in Turkish house is designed as to meet all of the daily needs like tents.

In the late 19th century, westernization effects began to be seen in The Ottoman's living culture. Westernization and the industrial revolution caused mass migration from rural areas to city centers. This migration has brought the housing problems. And it tried to solve housing problem by building mass housing. This situation caused a change in the life style of the society in Turkey. As a result of the changes in Turkish house(when space and accessories are concerned), the biggest changing is seen on space setup.

At the end of the 19th century, the first example of building seen in Istanbul, began to be built in Anatolia with the proclamation of the republic and technological development. The first sample of the apartment, as plan scheme appears to have similar characteristics with Turkish house. This similarity is reduced by with use of the European-style furniture. And transformation depends on used furniture it is seen to the spaces. Transformation of spaces leads to socio-cultural change in the traditional Turkish family. Turkish family having patriarchal family structure has become a elementary family and they started to live apartment. Living culture, includes daily necessities such as dining, leisure, culture, washing and sleeping, has undergone drastic changes with new housing concept.

Examples of the first apartment building in Konya begin with Hayat building made in 1937. With this new housing concept, the culture of living has begun to change and the transformation of space has continued

to change.

2. Purpose and Method

The purpose of the study is to analyze the effects of the changes; which was occurred on the range of time from traditional housing up to the present by the industrial revolution and the following improvements that caused change on many areas of life. The westernization movement, which began during the Ottoman period, increased its impact after the Proclamation of the Republic and Industrial Revolution. Industrial Revolution; which provided mass production and easy access to the products; caused changes on human life and habits. The differentiations, which were caused on life culture and directly related space setup, and their results were examined. As a study area; 4 houses of different periods were selected from Konya province. Over the plan diagrams of the selected houses; spatial variations, which were experienced with the changes in life culture were reviewed. The study is prepared upon constructing a framework after a research of thesis, articles and journals. After the resources are examined, analyses were made, residences were chosen and a conclusion is reached. As a result of the study, it is seen that cultural structure is effective on space via industrial changes and demand for modernization, also it is determined that daily activities change based on new equipment used in space in time.

3. Changes in the Housing Notion

Throughout the history human beings have needed to take shelter in a closed space in order to protect themselves from the outside conditions and dangers. In order to meet this need, they used hollow trees and inns which are natural formations. After the satisfaction of the need for shelter, human beings have been using equipment to create comfort and for the sense of belonging in the spaces they live.

According to Özturan, when reviewed in historical process; the development of the construction conditions such as housing, construction techniques and material; development and change of the living concept has been a continuously self-renewing fact with the cultural diversity. Despite there are not any change in physical conditions and vital activities of the users; with the changing needs and objectives, housing formation and configuration issues appeared with the differences and repeated itself. Therefore; the meaning of the house diverged from shelter and house has begun to be perceived as the community of the systems that move together with the user [1].

Reviewing the period before Industrial Revolution; it is seen that the main feature of economic life is craftsmanship and limited production. Craftsmanship is usually based on house production. In hand looms; there is a non-standard, artisan specific production. Certain works have been done by certain families with the methods passed from generation to generation. Under these conditions; it was not been possible to exceed a certain production capacity and there was not major changes in economic life [2].

Renaissance and reform movements that emerged in 16th and 17th century in Europe paved the way for the industrial revolution. As the liberal thinking became prominent; scientists had more favourable working environment. Thus; technology has developed and the formation of industrial revolution started. With the industrial revolution; that is accepted as a major turning point in design and civilization history; machine-based production came to the fore and the hand made products stayed in the background. With the end of hand made products and failure to provide an adequate income for people living in rural areas with agriculture increased migration to urban centres. In this period of increased industrialization; immigration met the manpower needs of the factories. Migration has revealed the housing problems in urban areas. This problem has been tried to be solved with the help of technology with multi-storey housings.

According to Usal, mechanical production and factory labour have taken the place of the workshops; the changes have revealed themselves firstly on architectural works and then on spatial designs. While the

number of the structures built on 19th century is more than the past; the unique style of the buildings has started to disappear [2].

Mass production; which is one of the contributions of the industrial revolution, has been quite effective in changes on daily life. With the mass production; the costs of the goods decreased and their accessibility increased. This caused a decrease in the status differences within the community.

3.1. Turkish Houses And Space Setup

Turkish House, is a Turkish cultural product, which is seen in the regions within the Ottoman Empire borders and affected by this cultural tradition and which is formed in various ways depending on the economic conditions, regional-natural data and application techniques. Traditional Turkish home is usually single storey. But; over the time the number of floors increased two and three. In two-storey houses; downstairs used to be allocated for the uses other than living area. In villages and towns; the barn, stony ground in urban houses and cellar are in downstairs. Sofa, is an important factor affecting the design of the Turkish house and connecting the rooms. This area is a gathering area while providing movement area inside the house. Its parts apart from the moving area are allocated for seating [3].

When the traditional Turkish houses are examined, it is seen that there are similarities in the space set-up with the tent they had used during the nomad life. As it was in the tent, single space is intended for meeting all the needs. Every room has the qualities of a house. There is a stove for cooking. A closet which is used to store beds and as a bathroom when it is empty. Thus, sleeping, sitting, cooking, eating and taking bath are solved in one room.

3.2. Housing in Turkey Industrial Revolution And After

The change in housing fact in Turkey began with the westernization movement that emerged in the late Ottoman period in the 19th century. Turkey has entered into a major change with the proclamation of the republic and the effects of the industrial revolution.

In 20th century when great changes were experiences all over the World; Turkey was the scene of various changes that were not similar to the previous periods. "Continuous change" and "Disengagement from tradition" which are basic features of modernization process were emerged in Turkey. In our century; housing and settlement layout have lost their traditional features; universal solutions, which are globally accepted, have replaced them. The main issues defining the sheltering format are now economic, political and social improvements [1].

The first examples of residence as a presentation form started to be built with the announcement of the imperial edict of Gülhane in 1839 during the Ottoman Empire. As a result of the removal of construction bans and restriction of settlement for non-Muslims living in Ottoman borders; construction of apartments started although in a limited area and in few numbers. During this period, traditional residence concept continued. Although façade and ornaments of the few examples built in Istanbul were under the influence of western culture, sofa which is one of the important part of traditional Turkish residence was used in their plan schemes [4].

With British Commerce Agreement in 1838 at the beginning of the 19th century; the Ottoman economy was opened to the capitalist world economy and went into a major turning point in the movement of Westernization; hence, European goods were spreaded all over the empire. After all, with similar agreements made with other European countries, the Ottoman Empire was transformed into an open market and daily life and production and consumption patterns of the Ottoman people changed. Even in the 19th century; Ottoman Empire can be described as a consumer society rather than production [5].

The visible start of the Westernization movement in shelter culture was started after 1860s initially with use of a knife and fork in meals; and the using chairs and seats instead of cedar and divans. This change indicates a rearrangement in body posture during sitting and eating [5]

According to Emiroğlu, armchairs and sofas, chat tables, chairs, coffee tables were the status defining components in the hall venues and over time furniture set concept has been prominent in the spaces. Cuisines were used to be constructed outside the house in traditional housings with the fire concern; however, with the increasing use of items, they started to be constructed in the house. Apart from the traditional bathing system in Ottoman houses; bathing tub using habit was firstly seen in the houses of Armenian minority. As the cities expanded and the number of storeys in the houses increase; toilets outside the housings extincted in time and hamam culture started to wipe out [5].

4. The Effect of the Spatial Transformation of the Equipment in Konya Houses in the Culture

Space which is formed by people to continue their lives is in direct relationship with culture of living. People organize spaces with the help of equipment in order to feel themselves comfortable and safe. According to Gür, space is the expression of the gap, the distance and the relationship of a person with another and with an object or of an object with an object; in short terms, it is the three dimensional expression of the vacancies that surrounds us [6] . According to Ching, furniture is an intermediary between architectural structure and the users of space. It provides transmission between the inner space and the individual on the basis of form and scale. By adding comfort and usefulness to inner spatial activities, it renders these spaces useful [7] .

We come across furniture which is the basic indications of cultural structure not only as an object that meets the shelter and necessary needs after the human beings settled in different cultures, in different time periods with different functions, but also as a notion brought via socializing. It is the point where our life style transforms into shapes [8].

During the historical process, it is seen that in Konya houses no big changes occur until the foundation of the Republic. Traditional Konya houses are built with a traditional plan solution as far as spaces are concerned, and mud-brick and stone are used as materials. After the foundation of the Republic apartments were built in the centre, the city let in a lot of immigrants and the culture of living started to change.

4.1. Traditional Konya Houses

When we examine Konya houses we see 3 kinds of plan schemes which are called houses with hayat (yard), houses with mabeyin (clearance) and houses with sofa (hall).

Houses with Hayat: Inner yard which is called a Hayat is created with houses with one or two rooms in a garden [8] . In these houses generally rooms open to a balcony which is called tahtaboş (terrace).

Houses with Mabeyin: These houses are composed of a mabeyn and rooms on the side of it on a basement (isba). They are single layered. Mabeyin acts as a sofa but it has not yet evolved into sofa. Thus, we can regard houses with mabeyin as a transition phase between houses without sofa and houses with inner sofa.

Houses with Sofa: It is an evolved kind of houses with mabeyn. There is a stair from the ground floor mabeyn to the upper floor sofa [9].

4.2. Konya Houses After the Foundation of Republic

Construction of apartments started with Hayat Apartment in 1937, which is the first example of apartments in Konya. It was constructed on Alaeddin Street which connects Alaeddin Hill to the shrine of Mevlana. In 1950's the construction of apartments increased on the West side of Alaeddin and then to the center of the city.

The effects of traditional plan scheme are seen in the first examples of apartment buildings. However, family structure and social structure which changed in time were reflected on the plan schemes of the buildings,

and transformations began.

Table 1: Transformations of apartment's plans type

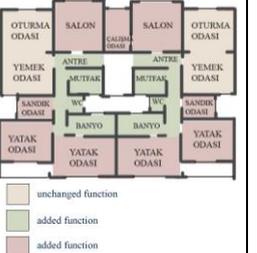
	Facade	Plan	Spaces	Transformations
Hayat Apartment (1937)		 <ul style="list-style-type: none"> unchanged function added function 	<ul style="list-style-type: none"> -Entrance -Hall -Rooms -Living Room -Kitchen -Bathroom -Wc 	<ul style="list-style-type: none"> -Hayat apartment is the first apartment building constructed in Konya in 1937. -Although privatization started in spaces, it is seen that the structure of the hall was preserved. -Kitchen and bathroom were completely detached from the rooms.
Ağabeyli Apartment(1952)		 <ul style="list-style-type: none"> unchanged function added function added function 	<ul style="list-style-type: none"> -Entrance -Lounge -Living Room -Dining Room -Work Room -Storage Room - Bed Rooms - Kitchen - Bathroom -Wc 	<ul style="list-style-type: none"> -The hall was used with its broader purpose. -Living space is eliminated and sitting and dining rooms were added instead. -The lobby and the night hall were separated from each other. -Storage room was added for the purposes of storage.
Güvez Apartment(1982)		 <ul style="list-style-type: none"> unchanged function added function added function 	<ul style="list-style-type: none"> - Entrance -Salon - Living Room - Bed Rooms - Kitchen - Bathroom -Wc 	<ul style="list-style-type: none"> -The lounge and the sitting room were united in a single space. -Dining room was eliminated. -The night hall was not used.
Zer Meram Housing Estate (2019)		 <ul style="list-style-type: none"> unchanged function added function added function added function 	<ul style="list-style-type: none"> - Entrance -Hall - Lounge - Dining Room - Living Room -Work Room - Bed Rooms -Parents Changing Room -Parents Bathroom -Servant Room -Servant Bathroom - Kitchen - Bathroom and Sauna -Wc 	<ul style="list-style-type: none"> -The first transformation that attracts attention in Zer Meram houses, which is planned to be completed in 2019 in Konya, is the increase in the number of rooms. -The lounge, sitting room and the dining room are separated from each other and they are privatized. -A dressing room and a bathroom are added to the parent's room. -There is a sauna near the bathroom. -A study room is added separate from the bedrooms. -A servant's room with a bathroom in it is added.

Table 2: The effects of changing spatial equipment on space planing

Equipment used in traditional house	Equipment used in buildings made after republic	Specialized spaces
Sedir, cushion, divan	Couch, chair	Living room
Floor table	Diner table, chair, cupboard	Dinning room
Shakedown bed, yüklük	Betstead, wardrobe	Bed room
Gusülhane	Bathtub, sink, closet	Bathroom

5. Evaluation and Conclusion

As a result of the study, during the period between the foundation of the republic and the present day, it is observed that the effect of the industrial revolution which affected the whole world caused great changes in the culture of living. The society which underwent the westernization period experienced radical changes in the daily life traditions which constitute the basis of the social culture. We can express these changes as follows:

- The single places used for daily needs in traditional housings were specified according to their functions in the buildings constructed after Republic.
- Sofa has lost its feature as living area and it was replaced by hallway that only provides access to different rooms.
- While the culture of eating in traditional housing was on floor table and at the same place the relaxation was ensured on cedar and divans; in new structures, these functions were separated from each other as dining room and sitting room with the armchairs, chairs and dining table that were newly introduced to daily life.
- Bedrooms have been privatized when the beds and wardrobes started to replace the shakedown and bedding closets. Besides; in recent examples, dressing rooms have been added to the master bedrooms and wardrobe has been removed.
- With the bathroom equipment's; bathing cubicle were transformed into main bathrooms. In the following periods; it is seen that private bathrooms are added to master bedrooms.

Westernization which accelerated due to the foundation of the Republic and the changing technology caused radical changes in the culture of living. The constant change of living culture in new houses with socio-cultural, economic and technological causes led to an increase in spatial functions. As culture is a vital notion, it will continue its presence through changes in time. Being affected by cultural, technological, social and economic changes, spaces and equipment will also continue to be effective on the culture of living.

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International Conference on New Trends in Architecture and Interior Design

Artistic Value In Venues: “Architectural Spaces Finding Value By Art”

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Abstract

Venue refers to the composition of elements limited on a defined or an undefined space. Furthermore, a venue is a phenomenon including intellectual, spiritual and social activities of humanity as well as the artistic expression. Considering the expression forms covered by modern art in terms of space design, various perspectives appear. On the other hand, art is a discipline revived with space design and architecture. Describing the architecture in combination with art shall form the starting point for design. The architectural literature rising with artistic norms reveals indelible and imaginary concept venues. Using a venue as an artistic element, the designers presents a dialogue between art and space by means of abstraction. By this dialogue, as mentioned by Vasari, “Design refers to a painting created with expertise.”

In this study, the interaction between art and space is analysed together with the concept formed accordingly for relevant space. In addition, the theoretical aspect is also addressed within the instances created by relations between art-artist and architecture-space. Consequently, art and architecture shall be considered as different disciplines. Based on common theoretical literature, several norms defining space as an artistic expression exists. Building art in combination with space and handing down the next generations are significant steps for venue designers.

“A venue gains significance by involving people as well as to become professional with art”

Key Words: (Art, Architecture, Space, Concept, Fiction)

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1. Introduction

In this study, it is intended to the interaction between art and space is analysed together with the concept formed accordingly for relevant space. In addition, this study defines “by relations between art-artist and architecture-space” by underlining the design activities.

1.1. Method

Literature review has been conducted primarily as the research method. Following the processing of venue design and imaging concepts, the planning model has been developed accordingly and the books have been searched together with internet sources. The concept of art has been analyzed in terms of design activities by tracking current artistic publications.

2. Architectural Spaces and Design

Architecture space is a concept that is central fundamental to many different areas of study and has varied meanings. In addition, venue refers to the composition of elements limited on a defined or an undefined space. Design of a space which has been created by structural boundaries and the human interaction within these boundaries. Design is the creation of a plan or convention for the construction of an object or a system. Also designing activity, by its nature, is a consequence provided by the existence of science and art together in harmony. The starting point created in the light of designing capacity refers to the backbone of this activity.

Understanding a space refers to the combined analysis of physical messages transmitted by the space (dimensions, color, texture, luminary, odor, rhythm, sustainability, order, motion, etc.) together with the entire experiences of individuals perceiving stated messages.

Masses and voids are the fundamental physical properties that form the architectural spaces. Also interior architecture has masses and voids properties for becoming forms. Furthermore, function must follow forms. So that, when designers create new forms art and forms helps them.

3. Art and Architecture

“A picture is a poem without words” Horace.

Art is a diverse range of human activities in creating visual, auditory or performing artifacts – artworks, expressing the author's imaginative or technical skill, intended to be appreciated for their beauty or emotional power. [1]

The nature of art, and related concepts such as creativity and interpretation, are explored in a branch of philosophy known as aesthetics.

Aesthetics, or the philosophy of art, is the study of beauty and taste. It is about interpreting works of art and art movements or theories. As well as being applied to art, aesthetics can also be applied to cultural objects. Aesthetic design principles include ornamentation, edge delineation, texture, flow, solemnity, symmetry, colour, granularity, the interaction of sunlight and shadows, transcendence, and harmony. [2]

The interaction between the in architectural and art is discussed and described with examples from the history and today. So a lot of words can be explained with these disciplines.

Le Corbusier and Art

Le Corbusier was born Charles-Edouard Jeanneret-Gris in Switzerland on October 6, 1887. In 1917, he moved to Paris and assumed the pseudonym Le Corbusier. In his architecture, he chiefly built with steel and reinforced concrete and worked with elemental geometric forms. Le Corbusier's painting emphasized clear forms and structures, which corresponded to his architecture.

Pictures from below famous architecture Le Courbusier - Chapelle Notre Dame du Haut-(1950-54), Ronchamp- France. The abstraction of reality and meaning is in the architectural and art. Plane demonstrated expression sometimes intersect with each other in this discipline and occurs dialogue.



Fig. 1: Le Courbusier - Chapelle Notre Dame du Haut (1950-54), Ronchamp- France.

"Surrealism is a key to other late works of Le Corbusier, most notably the church at Ronchamp, France, of 1950-54... Notre-Dame-du-Haut was a more extreme statement of Le Corbusier's late style. Pragmatically,...the church is simple—an oblong nave, two side entrances, an axial main altar, and three chapels beneath towers—as is its structure, with rough masonry walls faced with whitewashed Gunite (sprayed concrete) and a roof of contrasting beton brut. Formally and symbolically, however, this small building, which is sited atop a hillside with access from the south, is immensely powerful and complex." [3]



Fig. 2: (a,b) Le Courbusier - Chapelle Notre Dame du Haut (1950-54), Ronchamp – France

Le Corbusier is one of the most influential and controversial figures in modern urban planning, architecture and art. Ranging from outstanding works like Le Corbusier's oil paintings and original models of major architectural works like his famous church in Ronchamp and Unité d'habitation in Marseilles to small personal items dear to the master: French postcards, pipes, stones that he collected on the beach, and his favourite book Don Quixote by Cervantes, which he had bound in the skin of his late dog. The exhibition thus contrives to provide new insight into this highly controversial figure and to illustrate how the artist changed our way of looking at art, architecture and urban planning in the present day.[4]

El Lissitzky's Proun Room



Fig 3.(a,b): El Lissitzky, Proun Room, 1923.

In 1923, El Lissitzky's 'Proun Room', is a chamber articulated with Proun motifs in two and three dimensions, abstract but possibly symbolical; the original was made for a major exhibition in Berlin, a reconstruction is in the Stedelijk-Van-Abbemuseum, in Eindhoven (Netherlands).

“The image is not a painting, but a structure around which we must circle, looking at it from all sides, peering down from above, investigating from below.”

Trained as an engineer and architect, Lissitzky was one of the first modern artists to experiment with the viewer as an integral part of a work of art. For the Great Berlin Art Exhibition in 1923 Lissitzky translated his geometric Proun compositions into a room-size environment. He intended the wall-size abstractions to engulf visitors and allow them to feel as if they were floating in space. [5]

Richard Serra. The Matter of Time



Fig 4 (a,b) : Richard Serra. The matter of time, 2015, Guggenheim Museum

Bird's-eye rendering of the Arcelor Gallery with layout of installation "The Matter of Time" Image courtesy of Richard Serra:

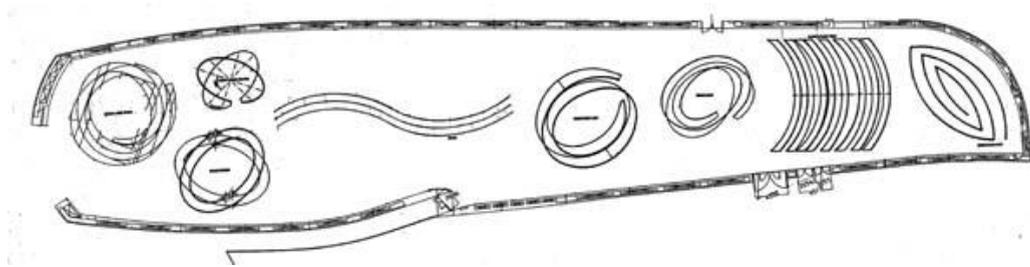


Fig 5: Richard Serra. The matter of time, Plans, Drawing

The Matter of Time (1994–2005) is Richard Serra's most complete rumination on the physicality of space and the nature of sculpture. Permanently installed in the largest gallery of the Frank Gehry-designed museum, seven new commissioned sculptures join Serra's Snake (1994–97)—created for the museum's inauguration—and comprise a site-specific installation of a scale and ambition unrivalled in modern history. The Matter of Time enables the spectator to perceive the evolution of the artist's sculpted forms, from his relatively simple double ellipse to the more complex spiral. The final two works in this evolution are built from sections of toruses and spheres to create environments with differing effects on movement and perception. Shifting in unexpected ways as viewers walk in and around them, these sculptures create a dizzying, unforgettable sensation of space in motion.

NY, Solomon R. Guggenheim Museum-1955-59, Frank Lyod Wright Aten Reign-2012, James Turrell

Human beings throughout the ages actions in space realized, it has been detected in space and in space respectively. In order to reflect the objectives of the external contacts understanding spatial relationships and these relationships venue , must be to combine with concept. [6]



Fig. 6 (a,b) : Exhibition: James Turrell ,Venue: Solomon R. Guggenheim Museum 1071 Fifth Avenue, New York

James Turrell's first exhibition in a New York museum since 1980 focuses on the artist's ground breaking explorations of perception, light, color, and space, with a special focus on the role of site specificity in his practice. At its core is *Aten Reign* (2013), a major new project that recasts the Guggenheim rotunda as an enormous volume filled with shifting artificial and natural light. One of the most dramatic transformations of the museum ever conceived, the installation reimagines Frank Lloyd Wright's iconic architecture as one of Turrell's *Skyspaces*, referencing in particular his magnum opus the *Roden Crater Project* (1979–). Reorienting visitors' experiences of the rotunda from above to below, *Aten Reign* gives form to the air and light occupying the museum's central void, proposing an entirely new experience of the building. Other works from throughout the artist's career will be displayed in the museum's Tower Level galleries, offering a complement and counterpoint to the new work in the rotunda. Organized in conjunction with the Los Angeles County Museum of Art and the Museum of Fine Arts, Houston, *James Turrell* comprises one of three of major Turrell exhibitions spanning the United States during summer 2013. This exhibition is curated by Carmen Giménez, Stephen and Nan Swid Curator of Twentieth-Century Art, and Nat Trotman, Associate Curator, Solomon R. Guggenheim Museum. [7]

Anish Kapoor , Cloud Gate, «Bean», 2004 Chicago

What I wanted to do in Millennium Park is make something that would engage the Chicago skyline ... so that one will see the clouds kind of floating in, with those very tall buildings reflected in the work. And then, since it is in the form of a gate, the participant, the viewer, will be able to enter into this very deep chamber that does, in a way, the same thing to one's reflection as the exterior of the piece is doing to the reflection of the city around.—Anish Kapoor[8]



Fig 7 (a,b) : Anish Kapoor , Cloud Gate, «Bean», 2004 Chicago

Cloud Gate is a public sculpture by Indian-born British artist Anish Kapoor, that is the centerpiece of AT&T Plaza at Millennium Park in the Loop community area of Chicago, Illinois. The sculpture and AT&T Plaza are located on top of Park Grill, between the Chase Promenade and McCormick Tribune Plaza & Ice Rink. Constructed between 2004 and 2006, the sculpture is nicknamed The Bean because of its shape. Made up of 168 stainless steel plates welded together, its highly polished exterior has no visible seams. It measures 33 by 66 by 42 feet (10 by 20 by 13 m), and weighs 110 short tons (100 t; 98 long tons). [9]

Kapoor's design was inspired by liquid mercury and the sculpture's surface reflects and distorts the city's skyline. Visitors are able to walk around and under Cloud Gate's 12-foot (3.7 m) high arch. On the underside is the "omphalos" (Greek for "navel"), a concave chamber that warps and multiplies reflections. The sculpture builds upon many of Kapoor's artistic themes, and it is popular with tourists as a photo-taking opportunity for its unique reflective properties. [9]

Zaha Hadid & Suprematism

“I’m into fashion because it contains the mood of the day, of the moment - like music, literature, and art.”

Zaha Hadid.



Fig 8 (a,b) : Zaha Hadid & Suprematism, Galerie Gmurzynska Zurich, 2010.

Zaha Hadid (*1950 in Baghdad), recipient of the Pritzker Architecture Prize, designed and curated a groundbreaking exhibition at Zurich’s Galerie Gmurzynska, comparing works of the Russian avant-garde with those of Zaha Hadid Architects. A fierce explosion of Russian works tore through the contemporary works by the architect in a dynamic black and white design. Created specifically for the venue, the projection of a two-dimensional drawing onto a three dimensional space transformed the gallery into a spatial painting in which the threshold of the picture plane expanded and could be entered. Zaha Hadid translated the warped and weightless space of Russian avant-garde painting and sculpture by Kazimir Malevich, El Lissitzky, and Alexander Rodchenko into her very own architectural language. [10]

Vitra Fire Station / Zaha Hadid Architects

1993 Vitra Fire Station on the Vitra Campus, Weil am Rhein, the first-ever built architectural work by Zaha Hadid. The first building designed by the Iraqi architect rapidly became an icon with its expressive, dynamic appearance. It was originally used as a fire station, but now serves as a space for exhibits and events and continues to be a highlight of contemporary architecture on the Vitra Campus in Weil am Rhein.



Fig .9 : Vitra Fire Station / Zaha Hadid Architects, in Weil am Rhein, Germany, 1993.

The pointed exterior, with a dramatic overhang, converges above the entrance, and gives way to an interior just as angular and sharp; lighting is provided by florescent strips embedded in the ceilings and walls, and the design of the locker room was influenced by Richard Serra. While the large garage for the fire trucks illuminates the vehicles from below, no effect can compete with the drama of the building itself.

Malevich & Art

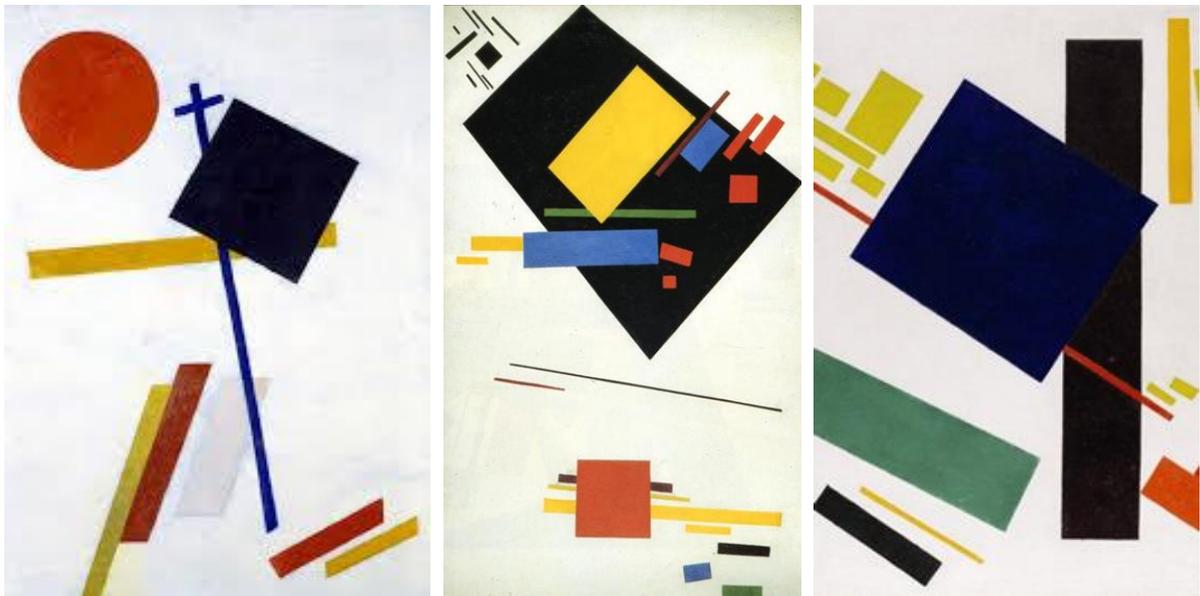


Fig 10 (a,b,c): Tate Modern: Exhibition, 16 July – 26 October 2014, The Eyal Ofer Galleries, Level 3

Kazimir Severinovich Malevich[nb 1] (February 23, 1878 – May 15, 1935) was a Russian painter and art theoretician.[11] He was a pioneer of geometric abstract art and the originator of the avant-garde Suprematist movement.

Suprematism, like Constructivism and Futurism, among others, represented an explosion of new artistic movements in early twentieth-century Russia, many of which spread quickly across Europe. This development in artistic expression came about when Russia was in a revolutionary state, when ideas were in ferment and the old order was being swept away. Like many of his contemporaries, Malevich's movement fell victim to the emerging cultural orthodoxy of Socialist realism in the 1930s. The revolutionary movements were either silenced or driven underground. Kazimir's works are looks like architecture so that form arises only in the new "non-objective" art. This is why the "non-objective" arts have had to rid themselves of the contents of various ideologies and also of the entire material side of everyday life, the system of which has been developing on a basis harmful to painting. Thus, for example, the table, house, motor, wedding, marriage did not develop as a result of people's perceiving life artistically and expressing elements of this perception, as a revelation of artistic Weltempfang, in the form of a table.

Characteristic examples can be found in the new architectural work of such artist-architects as Zaha Hadid, Le Corbusier, James Turrell. At the end we could not think without art with architecture.

4. Conclusion

"Art is a discipline revived with space design and architecture."

The possibilities of design with art has an effect on especially human perception. The formation that constituted by art and space, not thinkable idea that art and space separated phenomenon. Both are colored if they are thought together. It constructs the main door by talking about architecture using art. By that way relation between art- artists, architecture-architecture takes an important role. The space designers shall have an opportunity to give social messages in social venues through this awareness.

Forming art with various phenomenon and feeding architectures with art creates dynamic, unforgettable,

rich against stereotyped spaces.

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The Performance Evaluation of the Modular Design of Hybrid Wall with Surface Heating and Cooling System

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Abstract

Reducing the use of mechanical heating and cooling systems in buildings, which accounts for approximately 30-40% of total energy consumption in the world, has a major impact on energy conservation. Considering the formation of buildings that have sustainable and low energy utilization, structural elements as well as mechanical systems should be evaluated with a holistic approach. From this point of view, in this study it is proposed that wall elements, which are vertical building elements, and constitute a broad area within the structure, are regulated with a different system concerning the reduction of building energy consumption ratio. Within the scope of this study, integration of modular wall elements with surface heating and cooling system which are convenient for using hybrid energy, into the buildings will be evaluated.

One of the aims of the study is to determine the direct impact of the product on architectural design process and identify the issues that will affect the process, and need to be resolved. In design, implementation and usage phases, integration of technical combination and montage details of modular wall elements, together with issues regarding energy saving, heat-saving, and other environmental aspects will be discussed in detail. As a result, the ready-wall product with surface heating and cooling modules will be created and defined as hybrid wall and will be compared with the conventional system in terms of thermal comfort. After preliminary architectural evaluations, certain decisions that will affect whole architectural design processes (pre and post design) such as the performance in implementation and use, maintenance, lifetime, and renewal processes will be evaluated in the results.

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Key words: Modular ready-wall element ; hybrid, architectural design ; thermal comfort ; energy saving ;

1. Introduction

Reducing the use of mechanical heating-cooling systems which is a great part of the energy consumption in buildings has a significant impact on energy conversation. Considering the formation of buildings that have sustainable and low energy utilization, structural elements as well as mechanical systems should be evaluated

with a holistic approach. From this point of view, in this study it is proposed that wall elements, which are vertical building elements and constitute a broad area within the structure, are regulated with a different system concerning the reduction of building energy consumption ratio. Within the scope of this study, integration of modular wall elements with surface heating and cooling system which are convenient for using hybrid energy, into the buildings will be evaluated.

This study was compiled from the predesign studies of the project conducted within the scope of San-Tez project coded under 0462.STZ.2013-2. In the ongoing project, studies are continued to detail the modular hybrid wall product architecturally and mechanically and accommodate it for the use in buildings.

2. Modular Hybrid Wall Elements

In the design of ready-wall elements, the stages of

- Setting certain standard and sizes in terms of architectural design,
 - Detailing of the wall element according to its area (internal partition wall, external wall),
 - Solution of junction points,
 - Obtaining surfaces suitable for the building from the aspects of both design and structure
- will be addressed to create those elements [1].

The advantages of surface heating-cooling systems include increasing comfort, energy efficiency and being eco-friendly, comfortable and flexible design, low operating and zero maintenance costs, and quiet operation and rapid installation.

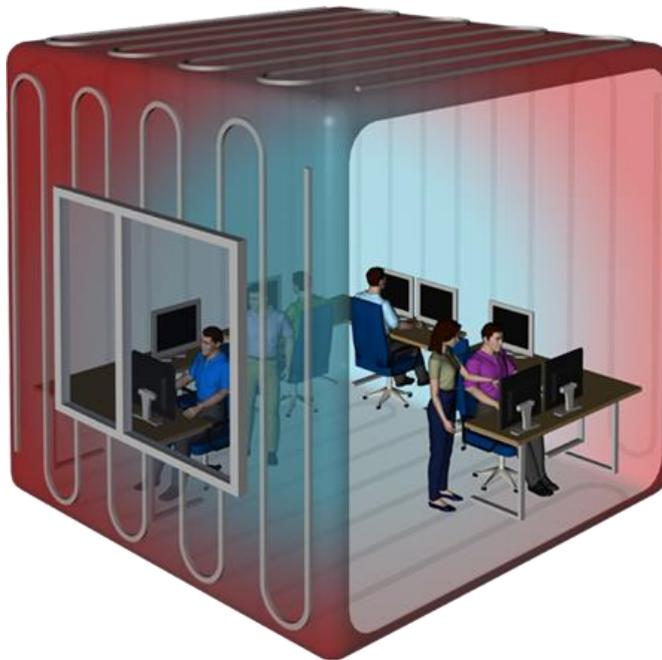


Figure 1: Surface heating-cooling systems [2].

Named as radiant systems, the working principle of these systems is that they do not interact with air in the space but with the users and equipment directly. When in heating mode, the heat on the heated surface transmits onto cold surfaces (people, furniture).

2.1. Design Criteria

An architectural design process begins with the schematic design phase, continues with the development of the design and ends with production-application phase. These phases affect each other; there is a cycle, an interaction that occurs between the processes. During the schematic design phase, different design alternatives can be produced by gathering all information on the building together. Gathering the product information and the properties of the building forms the designing strategy of the project. It is necessary to try and decide many options during the design development. Furthermore, the results to be obtained from the practice need to be estimated beforehand. The post-application feedback is needed for the application of new technologies. It is important to know the details on performance, maintenance, lifecycle and renovation processes in practice and usage, and all these details have an impact on the architectural design.

As a result of the design decisions, modular hybrid wall modules provide building users, investors and designer-practitioners with different benefits. No fan sound allows for quiet operation. Low air movements enable the building to provide its users with comfortable conditions. The placement of mechanical system in the panels by keeping the panel combinations in mind aims at obtaining clean and hygienic designs.

With regard to the benefits for the investors, availability of the heating and cooling mechanism in a single system and small channels reduces the surface area of the panels. Moreover, thanks to production module planning, panels with low operation and zero maintenance costs can be produced. Panel-scale channel connections, availability of inspection and montage hatches for each panel and modularity of the panels allow for fast and reliable assembly.

Smaller surface area coverage offers more creative and continuous design opportunity to the designers and assemblers. Being suitable for any type of building (new and renovated) makes it more easily marketable and preferred more.

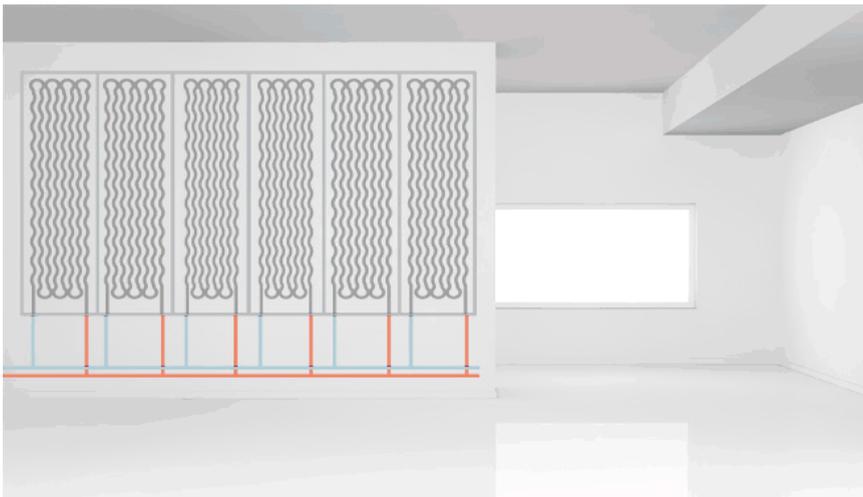


Figure 2: Schematic hybrid ready-wall element [2].

Design and use flexibility provides more advantages compared to the wall elements created with traditional systems. Its modularity, making mold design and production easier and possibility of using the same mold for the production of different size of elements enable the design process to be easier. Its form, dimension and weight not increasing transportation costs will ensure easy construction and low costs. Thanks to its modularity

feature, plastering (especially on the outer façade) and scaffolding are not needed, which can be considered as an additional contribution to the construction process. Fast assembly decreases workmanship costs and project completion time.

2.2. Structural Criteria

The resistance of the product to different levels of force, shape constancy and resistance are of significant factors that should be taken into consideration in the creation of the ready-wall element cross-section and structural design planning. Easily processable and achievable dimensions that optimally comply with the performance-cost parameter should be used in all ready-wall alternatives. Parameters such as restrictions by zoning regulations, structural function, carrier system, axis ranges should be taken into consideration for certain standardization for the building function and construction systems where the wall element will be used.

The most importance structural criterion is that the panels should ensure minimum connection and insulated jointing. The panel width should be determined according to the spaces on the buildings to ensure that dimensional deviations do not cause any difficulty when assembling.

Sufficient resistance and impermeability by the assembly system and material of the alternative cross-sections to be used on the structure surface, its allowing thermal movements and its having sufficient heat transmission resistance should be planned to improve thermal comfort and cross-section features. No thermal bridges should be established either within the panel or on joints to ensure that the thermal comfort conditions stay within the desired values in the space.

Variables that should be taken into consideration in the design of the modular hybrid wall installation are as follows:

- Heating and cooling pipe arrangement, distance between pipes, desired flow rate, pipe diameter,
- Determining heat fluxes of the surface heating and cooling system based on the building heating and cooling loads,
- Suitability of the installation distribution system.

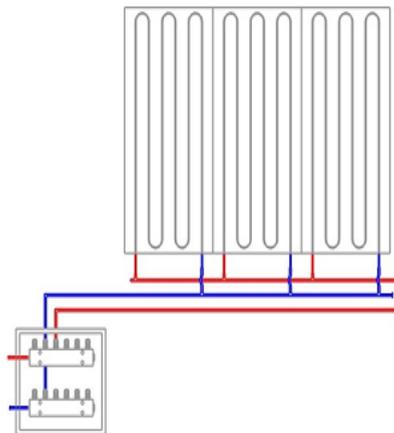


Figure 3: Modular hybrid wall installation design [2].

2.3. Performance Criteria

In terms of performance, the product is expected to be used by deciding on the alternative material to be used on the structure surface to provide effective heating - cooling with the integration of surface heating and cooling system to the hybrid structure and improving thermal comfort conditions in the space. The building product will increase the performance by creating a lighter product compared to other wall implementations. Developing a hybrid ready-wall product with heating and cooling system instead of wall systems created with other structural elements such as bricks etc. will ensure faster and easier implementation.

3. Hybrid Wall Element Studies and Evaluation

This study uses the experiential results of the project coded under TEYDEB 3100577 and supported by the Scientific and Technological Research Council of Turkey (Tübitak). A test room was created to perform analyses and measurements within the scope of this previous project. The test room had five different volumes as follows: ceiling (volume 1), internal volume (volume 2), external volume (volume 3), floor (volume 4) and working volume (volume 5). The walls of the test room with a surface area of 24 m^2 ($6\text{m}\times 4\text{m}$) were 3 meters in height. Thermal transmittance coefficient of the walls was determined according to TS 825 standards [3]. The window on the northern wall in the test room facing the external volume has double-glass [4].

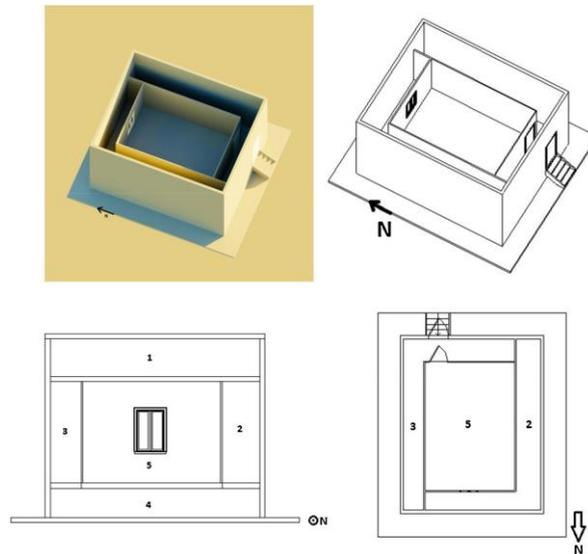


Figure 4: Photos of test room [4].

Radiant panels were placed on wall surfaces with 3 different working volumes to create test rooms. Analyses were made on 7 different heat values between the range of 30 and 42°C on the hot water distributed from the main hydraulic system for each condition.

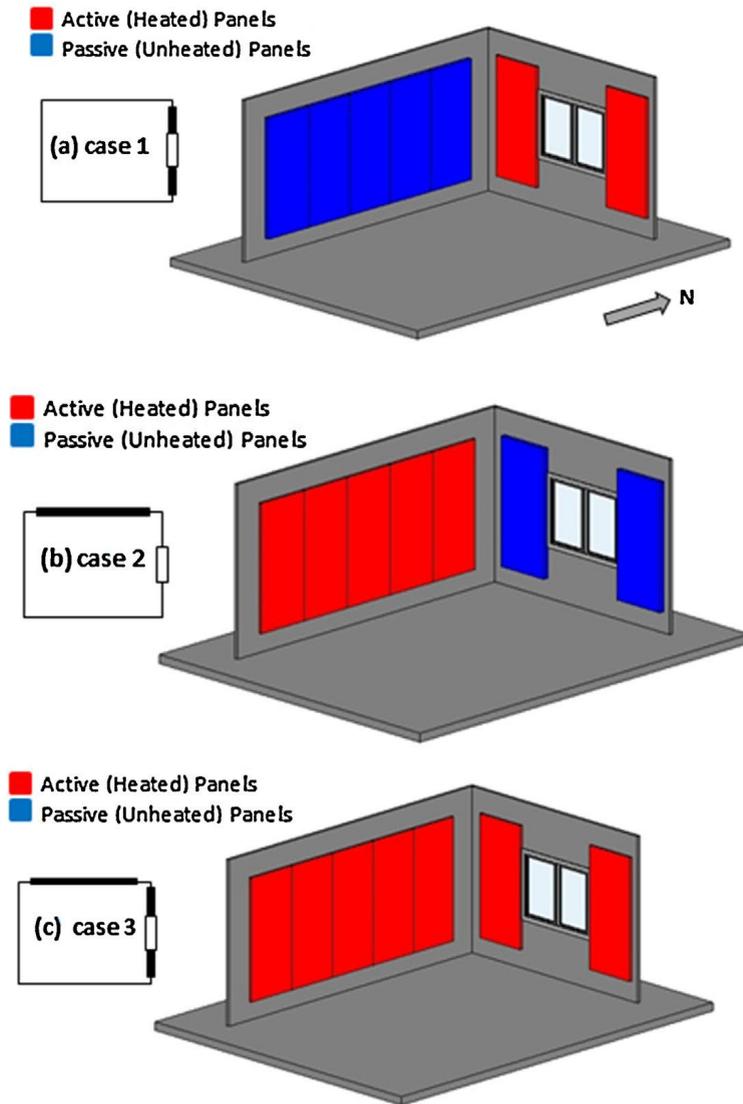


Figure 5 : Radiant heating wall panel arrangement[4]

According to the test results, panel heating was more dominant compared to conduction heating. Panel heating transfer rate is 68% in average. Different configurations of the radiant wall systems affect the panel heating transfer by around 10% on all sample test setups. However, each alternative arrangement affects the conduction heating transfer value by around 25%.

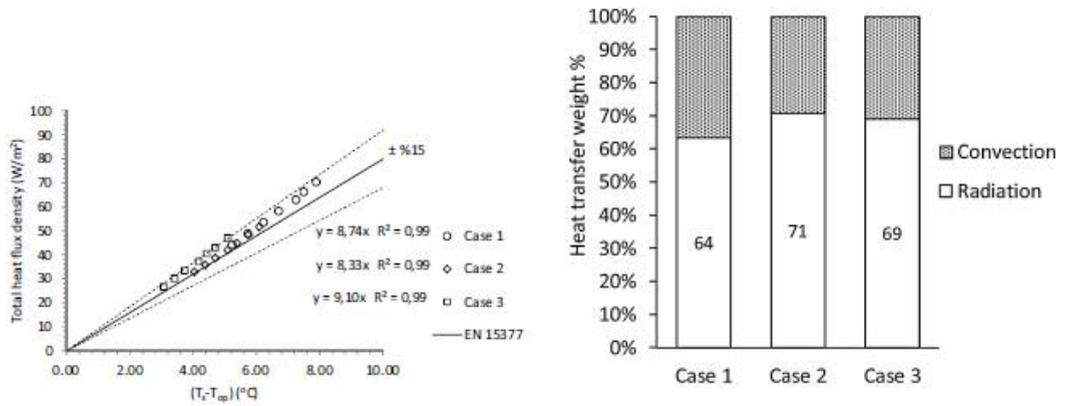


Figure 6 : Heating capacity of radiant heating wall panel system [4] Figure 7 : Radiant heat transfer weight [4]

Within the scope of San-Tez project continued based on the data provided by the predesign works, modular hybrid wall elements are systematically created by explaining the election and implementation reasons for sizing, wall product classification, cross-section formation and assembly - implementation details and tested for performance evaluation.

3.1. Comparison of Traditional Wall and Modular Wall Element

Information such as zoning regulation dimension restrictions, structural function, carrier system and axis ranges was compiled from the preliminary studies. Based on such information, the building function (residence) where the wall element will be used the most was compared in terms of different parameters in Table 1 below by taking into consideration the construction system (carrier system and axis ranges).

Table 1 : Comparison of Traditional Structure Surface and ready wall with heating and cooling system [5].

		Traditional structure surface cross-section	Ready-wall with heating and cooling system
Dimensions	h:height	Variable	2.80m, 3.00m
	d:width	Variable	0.60m, 1.20m
Design and implementation		Common	Less common
Construction speed		Slow	Fast
Standardization		Yes	No (not yet)
Quality control		Yes	Unspecified
Cost analysis		Yes	Variable
Changeability		Yes	Unspecified

The ready wall product is defined as a ready wall with heating and cooling system and the traditional system and the system where wall and heating - cooling systems are separated and compared in terms of thermal comfort in Table 2 below.

Table 2 : Thermal Comfort Comparison

Ready wall with heating and cooling system	Separate wall with heating and cooling systems
<p>The ambient air temperature pattern is homogenous in heating and cooling from wall. Therefore, the heat exchange between the human body and the environment is also homogenous.</p>	<p>The regional temperature differences are high in conventional heating and cooling and therefore, the heat exchange between the human body and the environment is not homogenous.</p>
<p>The wall with heating and cooling system is compliant with renewable energy systems and alternative energy resources since it can reach the comfort temperature with water with low temperature (35-45°C) in the wall. Therefore, this system can work both with the conventional (gas, oil, power) and alternative energy resources.</p>	<p>Since the conventional heating system requires reaching high temperatures, the renewable energy systems and alternative energy resources are mostly not efficient by they can work more efficiently with conventional (gas, oil, power) fuels.</p>
<p>The pipes in the walls with heating and cooling system distribute the heat equally to every corner of the venue. Heat transfer mostly occurs through panels. Since the wall being the largest surface area surrounding a space transfers heat via panels, it provides comfort at lower ambient temperatures compared to the conventional system.</p>	<p>Panel and convection heat transfer occurs in conventional heating system via regional heating elements with high temperatures. Fans are needed for air movement in the internal space in some systems. The point where the heaters are located within the room heats more and hot air rises to the top of the room fast. The temperature difference between the ceiling and surface is big. More energy and time is spent to reach the comfort temperature.</p>

4. Results

This study with a limited scope evaluates the modular hybrid wall elements with modular surface heating and cooling system whose experiential analyses are ongoing. The predesign studies of San-Tez project coded under 0462.STZ.2013-2 and the test results of the project coded under TEYDEP 3100577 are compiled for thermal comfort, energy efficiency and energy saving of the ready wall product.

This new product created to improve the energy use and comfort conditions provides advantages in terms of construction, transportation and assembly stages compared to the traditional wall systems. The wall elements with surface heating system is known to provide total heating energy saving of around 20% compared to the floor heating system [2]. The study aims to increase the comfort condition regarding use and efficiency by decreasing energy and economy costs. Carrying out more researches with experiential studies to ensure that the ready wall product created is a good alternative to the traditional systems will increase the effect level of the thermal comfort parameters.

Acknowledgements

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Artistic Value of “Architectural Spaces”

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Abstract

In terms of art, space is the area around, above and within an object. “Architectural space” is created by the interactive relationships between people and people inside building and/or outside of it. Also, architectural spaces are the main integration tools of a city or town. They are citizen’s or different user’s, such as tourist, places that they can both share and transfer their cultural heritage.

In this study, in parallel with the developments in the world, the parameters of space quality to be used were determined for the architectural spaces in our country to be redesigned and renewed in the context of the quality of space.

As a result of this study, architectural space that establish a dialogue with urban, transform the space and both transform and gain value in itself has discussed to what kind of cultural extents that city need. On the other hand, it has examined the relationship between the value of those living in the city, habits, live forms of citizens and architectural spaces.

Key Words: *Architectural Space; Art; Citizen*

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1. Main Text

Humanity, with the power of nature, has changed the nature since prehistoric times and has established a link between their intellectual and physical presence. Our civilization affected by both the nature and its mechanism. Thousands of years in the process, changing relationships between man and nature, has played a major role in the emergence of new art forms as well as being the primary factor in the formation of culture.

Nature and natural phenomena, for thousands of years in people's imagination, has been evaluated in different ways in life. Artists who witnessed the time, generations in the works over the years, have been documented visually the landscape of environmental concerns at the forefront in terms of their perspectives. However, in all the works of artists and art movements, including those considered current, has seen the philosophical, social and political discussion periods projection. Therefore, in this study, one of the main concerns of environmental art movement artists problems expressed in an artistic platform bringing create social awareness about it is accepted as the basic assumptions. Thus, the relationship between art and nature in the context of environmental, artistic transformation of nature and natural materials aimed to investigate the ecological and artistic ecosystem.

The paper held in the fields such as urban-environment sociology, urbanenvironment psychology have gained great importance when it has been understood that man has been influenced by the environment directly created by him, and also has the capability and power of changing and modifying the place he lives in. It has also academically been proved that the places enriched with art have contributed in creation of healthier environment, intellectual, biological, psychological, physical and public point of view.

“Today man has to spend the large part of his day in common public places compared to past and has to use public or private transportation vehicles many times during the day, (the clean and lively silhouette of a city which has small water channels, sea, forest, well protected historical texture, positive colors and on the other hand just contrary to this, a city silhouette transformed metaphorically into concrete jungle are completely different from each other and create different feelings) and it’s a reality that this silhouette has a very positive effect on human psychology in view of art and nature.”^[1]

Basicly, space is the boundless three-dimensional extent in which objects and events have relative position and direction.^[2]

Physical space is often conceived in three linear dimensions, although modern physicists usually consider it, with time, to be part of a boundless four-dimensional continuum known as space time. The concept of space is considered to be of fundamental importance to an understanding of the physical universe.^[3]

On the other hand, “space effect”, shape and contour of the surrounding area when forming a structural system on said surface occurs. If you installed the observer's point of view, where fitted, it finds a place for itself in the same place where the other person to like. In this case feel the absence of spatial coordinates required to determine the distance. An object may become meaningless due to their environment. This event occurs when it is not recognizable in a relationship with the circumference of the object location.^[4]

As well as the space has a static structure in the physical sense. Naturally, the structure of spaces can not move; but when people moves in space, the constituent parts of the positional relationship with the space varies dimensional space with their relationship with each other. With the continuous change of perspective people have different details about the space that they create in their minds the impression of bringing together public venue. For example, if you look at the views from a cubic form, the information obtained about it is that its cube. However, information on the place, but can be achieved by moving in. On this way Arnhem has gathered venues in two groups, including dynamic and static. According to this idea, a corridor has a static effect. Because the user has to scroll on only one axle. Therefore it remains in the user's mind always the same effect.

This is not the same for a room; when a “person views from different points he/she will be detected in different ways, it will have a dynamic effect on the visual sense. Besides all the architectural structures and spaces, it can fully understand the geometric layout and dimensional relationship, but has an advantageous point of view can not be fully seen. All these statements in accordance with the word of Doxiadis in the city of Piraeus and the Acropolis is the point of view of his views on a number of other features on the perception of space has also revealed. Doxiadis said (for Acropolis) point of view has determined that the two-point perspektivel positioned to create a view and advantageous point of view of the entire sanctuary was decided that the entrance door. (resim) From this point, the longer the visible surface of the structure is directed at the farthest point so as to follow each other. Thus, the eye, the closest the away end reading all the dimensional relations in space are locked in the most remote locations. Here, attention is understood that work continuously strengthening the farthest point of pulling depth perception. ^[5]

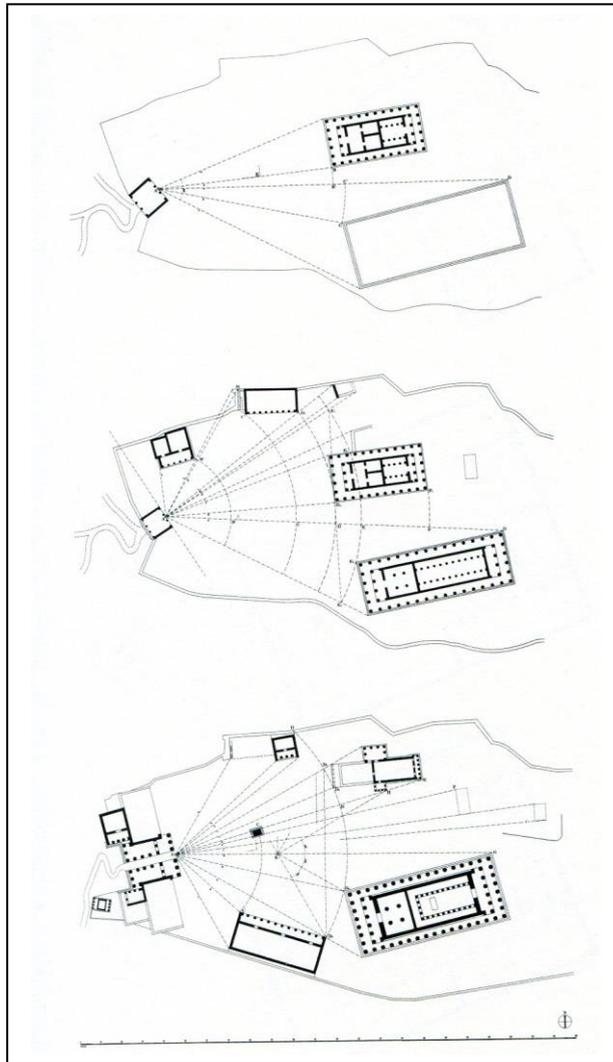


Fig. (a) Doxiadis_Architectural-Space-in-Ancient-Greece_Athens-Acropolis-I-II-III^[6]

The Acropolis in Athens this characteristic is observed in Säynätsalo Headquarters building modern architects Alvar Aalto's design. Construction, pinned on a square plan and left an inner courtyard in the middle. Any mathematical rules they have created without relying on traditional Anatolian neighborhood, the same results were obtained on the basis of mathematical rules created with the Acropolis of Athens. For example in Turkey, Istanbul, Arnavutkoy following roofs and organic shapes in different angles of the eye to come out of the houses bay side by side provides continuous accurate navigation to remote locations like Aalto's building. The narrow streets of the increasing dynamism gives a visual features to increase her perception of space.

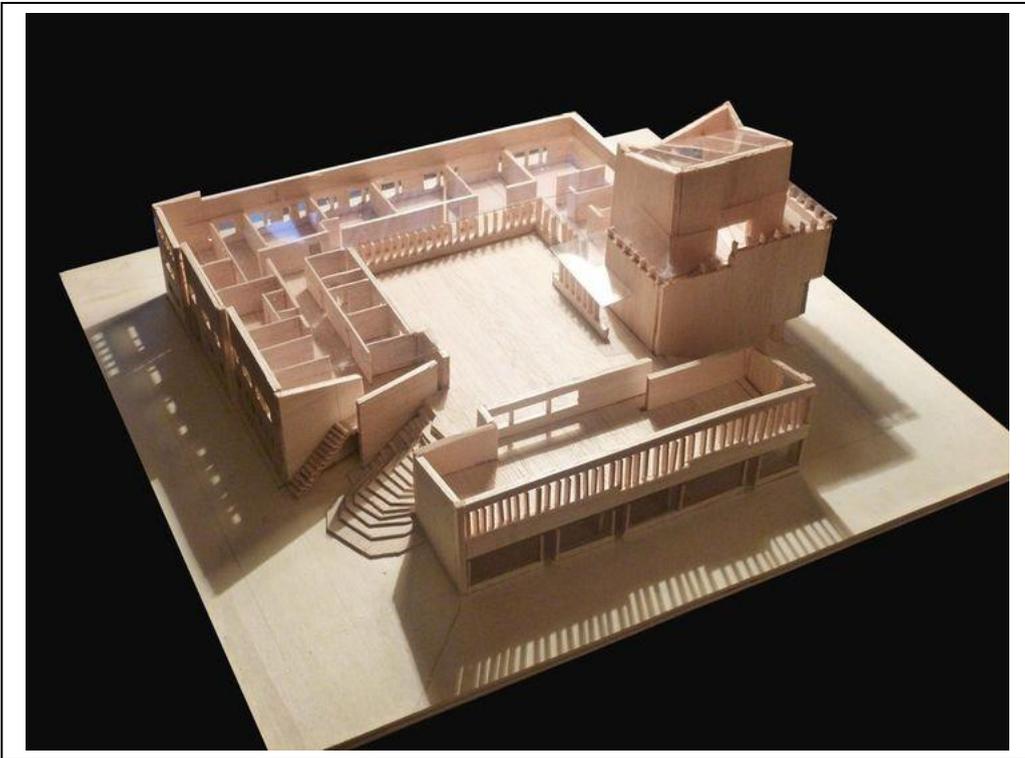


Fig. (b) Säynätsalo Headquarters Buildings ^[7]

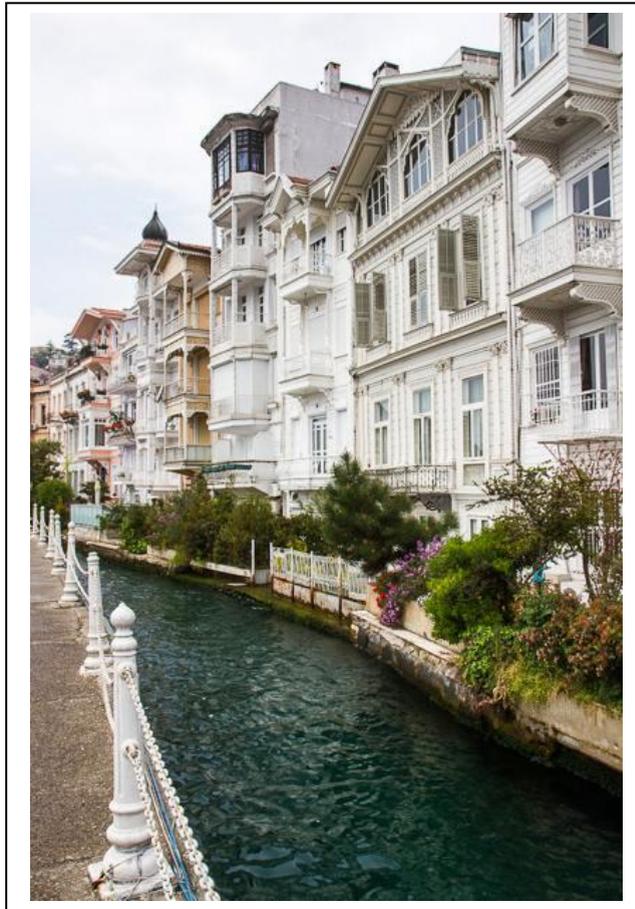


Fig. (c) Arnavutkoy, Istanbul, Turkey ^[8]

That is really important for a creating space effect, when the statue of David (made by Michelangelo, 1501-1504) put on Piazza Signoria people started to watch it, the statue had so unbelievable effects on peoples mind so it made an connection between people and itself. Then the connection called “space effects”. This just an example from Renaissance.



Fig. (d) Statue of David, Florence, Italy ^[9]

When we look at the Gibbs Farm, Kaipara Harbour, New Zealand, we can see lots of artworks on the area. For example “Horizons” from Neil Dawson, tells us “this is not just a hill”. It suggests a piece of corrugated iron blown by the wind. The spectacular sculptures dot the landscape. And so they become places.

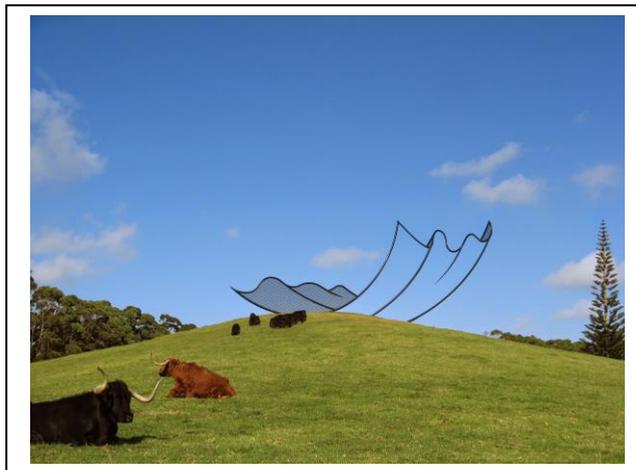


Fig. (e) Gibbs Farm, Kaipara Harbour, New Zealand ^[10]

The people in the 21st century has increased the desire to see more interesting architectures. Because the interesting architectures or different places give people inspirations and make them more peculiar. These kind of effects can called “cognitive” effects. Cognitive architecture has been described as "the study of the effects in people’s minds." [11] It also investigates "how peoples may see their world." Attention's place in this architecture is to help us structure our internal world so that the thoughts, emotions, or motivations that are most relevant to our goals will get preferential processing through the brain, explain Princeton University neuroscientists Timothy Buschman and Sabine Kastner in a review of attention research.

The Moscow Committee for Architecture and Urban Development presented the exhibition “Moskva: Urban space” at the 2014 Architectural Biennale. This retrospective of Moscow urban development reflects on the past one hundred years, leading to today’s vision for a new cultural center and downtown landscape anchoring the Russian capital. The new Zaryadye Park, designed by an international team led by Diller Scofidio + Renfro, will host vegetation and sensations representing the primary Russian landscapes - Tundra, Steppe, Forest and Wetland. Moments with seasonal temperature, humidity and climatic characteristics create an immersive human experience while blending into the landscape and providing a retreat for Muscovites. [12] Changing moments created some cognitive architecture effects on peoples mind. Augmented Atmospheres – a life-size fragment of the Zaryadye Park concept for human experiences - reconsiders our relationship with light, energy and thermodynamics as a fundamental condition of public space in the 21st century.



Fig. (f) Zaryadye Park, Moskow, Russia [13]

On the other hand, Cloud Gate is a public sculpture by Indian-born British artist Anish Kapoor, that is the centerpiece of AT&T Plaza at Millennium Park in the Loop community area of Chicago, Illinois. Kapoor's design was inspired by liquid mercury and the sculpture's surface reflects and distorts the city's skyline. Visitors

are able to walk around and under Cloud Gate's 12-foot (3.7 m) high arch. On the underside is the "omphalos" (Greek for "navel"), a concave chamber that warps and multiplies reflections. The sculpture builds upon many of Kapoor's artistic themes, and it is popular with tourists as a photo-taking opportunity for its unique reflective properties.^[14] As visitors walk around the structure, its surface acts like a fun-house mirror as it distorts their reflections.^[15] The artist often questions and plays with such dualities as solidity–emptiness or reality–reflection, which in turn allude to such paired opposites as flesh–spirit, the here–the beyond, east–west, sky–earth, etc. that create the conflict between internal and external, superficial and subterranean, and conscious and unconscious. Kapoor also creates a tension between masculine and feminine within his art by having concave points of focus that invite the entry of visitors and multiplies their images when they are positioned correctly. Kapoor says “I hope what I have done is make a serious work, which deals with serious questions about form, public space and an object in space. You can capture the popular imagination and hold other points of interest, but that is not what I set out to do, although there is inevitably a certain spectacular in an object like this.”^[16] “How a steel bean gave Chicago fresh pride”.^[17]



Fig. (g) Cloud Gate, Chicago, Illinois, USA^[18]

2. Result

As a result, architecture and its subject of space has been most affected by the rapid socio-economic conditions of social development. People have been forced to create spaces with different functions by religion, gradual increase in the human population, the development of different dimensions of daily life etc. The spaces used today can remain unusable and guidelines for the next period. But as seen in the example of the social, cultural and technological development, if people change the changes, space perceive methods, it has been a constant venue languages.

Before antiquity role in enhancing the spatial effect of light, perspective, places, issues concerning the perception of space as light and dark space relations have obtained some experience; these experiences, from the Roman era, have been transferred from generation to generation until the Renaissance and modern architecture.

If we analyse the effect of these buildings or statues on visitors, we can see these:

Performance

Special effect

Ambiance and mood

Immersion and synaesthesia

Architecture as design expertise engaging with other disciplines

If it observed that the cities and the public places that create urban joint points have been the places that recent mediocre culture and civilizations emerged and developed and also mean that the decadence of the cities, it will clearly be seen the importance of the physical (all architecture, esthetic, art, technique etc. elements) environments in creating the identity of man.

3. Acknowledgements

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Evaluating Sustainability In Interior Design Through The Traditional Turkish House

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Abstract

An approach to sustainable design requires one to address many criteria from material choice to internal space organization. Environmental factors as well as climatic data that plays a large part during the design process of a structure. This is the reason, why especially when designing at ‘house’ scale the choice of the correct sustainable materials, spatial organization is harmonistic with the environmental and climatic conditions aids in creating a space that has the intended comfort standards possible.

When examining the housing examples that carry the traditional architectural characteristics, we can see that that sustainability approach have been adopted before. Taking the planning features of these houses into consideration from the perspective of issues such as climate conditions and material selection, it is evident that they host today’s sustainability principles and that small changes to these principles allows to promote solutions that highlight the health and comfort of people.

A vast majority of today’s energy and material resources are consumed by the construction industry. Whether it is the wrong choice of materials and building techniques on the envelope as well as the interior of the building, or the senseless use of natural resources and as a result the design act that disregards the human health has resulted in the aforementioned energy consumption to reach high levels. The technological process that has been moving forward swiftly since the industrial revolution has caused the climate, environment and space harmony that traditional architecture harbored to disappear with time. This is the reason why single type structures that have the same form and spatial layout are implemented.

This proves that environmental analysis need to be the foundation of the factors that effect the design. This means that when designing according to the environmental and climatic factors, the material selection and spatial arrangement has to be done with taking in to mind the conditions of that region.

The design principles of the traditional Turkish house with its spatial arrangement, layout structure, material selection along with its environmental and climatic approach has the ability to achieve high comfort for the user and the rational way it uses the components that make up the structure as well as the building itself can be seen as an example to today’s housing designs.

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When the traditional Turkish houses is examined taking in to account the era it was designed in, they reveal to have the design criteria that is human orientated, hosting the respect for traditional values and with a sustainable approach according to the attributes of that period. A study done in this context will shape the sustainable design criteria according to the traditional housings structural comfort conditions and climatic attributes [2].

Correct distribution of functions, material selection allows for the criteria such as heat insulation, ventilation that plays a large role in the design of a structures as well as energy conservation to be achieved at the desired level increasing the lifespan of the structure and allow the users to prolong a healthy life within the correct comfort conditions.

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Keywords: Sustainability, traditional housing, sustainable design criteria, Turkish House ;

1. Intro

Architecture, changes according to the sociocultural conditions and the environmental and technological opportunities of the era it is situated in. The traditional house architecture is the reflection of the living standards that change due to these data to space and design. The increase of technologic advances with time has caused the traditional structure that is made up of knowledge accumulated of centuries, to lose its effect. In today's settlements, the climatic conditions have been disregarded in the design and application buildings. As a result, the coherence developed by the traditional architecture has disappeared with time. This situation has caused people to steer away from the traditional housing architecture and therefore loose the effectiveness of the understanding of compatibility with the environmental factors. By overseeing the climatic data, a 'single type housing' settlement understanding has been allowed to develop that disregards energy saving and thinks that the materials and its sources are inexhaustible [1].

Complying with today's requirements, the progress that is seen in the construction sector that is trying to meet the needs of the increase in population, although possessing innovation, still represents an approach that is distant from the natural. However, the fear of the risk of losing the resources that we have, has forced the humankind to search for new solutions. As a result of different pursuits, the idea of using what we have correctly without exhausting it and “choosing sustainability in design” by having a respectful manner towards nature and designing with that principle, has been suggested. In fact, this is an approach that is not far from traditional architecture, and it has the potential to solve many environmental issues that is caused by the hunger of consumption of the human race.

The search for the solutions to these problems is constantly kept on the agenda in order to allow for people to live hand to hand with nature without harming it. Along with the industrial revolution a consumer society has formed causing new techniques to be used in the construction industry, making energy seem cheap and inexhaustible and increasing the general energy consumption. As a result of all of these issues, a sustainable architectural understanding has arisen that aiming to minimize the energy consumption during the design and material selection of the building by taking in to account the information from the existing site, climate and environment that the building is placed in. Sustainability is an approach that aims to design with taking into account at first human health, the economic and environmental needs; in order to allow for the current and future generations to prolong a comfortable life.

Industrial revolution has brought with it many environmental problems such as high rate of increase in

population and the increase of technology and the depletion of natural resources due to it. This has caused pollution and global warming. The sustainable design notion in that context is seen as the correct approach to solve the aforementioned environmental issues. Therefore whether it's in building design or product design; adopting the sensitivity of environment; prioritizing the use of renewable resources; using energy, materials, water and most importantly the environment effectively; making products and buildings protecting the health and comfort of people will be the intention [2].

2. Traditional Turkish House

Traditional architecture reflects the attributes of a society such as their culture, customs, traditions and habits. This study handles the traditional architecture within the framework of the house. The house being the smallest of living spaces is for the Turks, as it is for all civilizations, the symbol of adopting a settled lifestyle. Anatolia has been the settling and spreading ground for many civilizations. Creating a bridge between Asia and Europe, the Anatolian lands, it has hosted many societies and has harbored their characteristics such as their lifestyle and their culture. As of 1701, the Turks have settled in to Anatolia, carrying on their migratory lifestyle [3]. Traditional Turkish house notion have been formed by Turks bringing their own lifestyle and traditions to the existing architecture formed by the impact of the people that have been though Anatolian land. As the Ottoman Empire started to spread over a large area, the form of the "Turkish House" started to shape up in those areas. According to another definition the Turkish House; "A plan and style that tries to addresses the family lifestyle culture and traditions of the traditional Turkish family, it is a housing typology that has answered the needs of the Turkish people for centuries [4]. "

The Turkish Houses plan layout is a unique design that can adapt to different situations, can be used in urban housing and palaces, can even sometimes address the contemporary needs. The layout is based on a modular system. The smallest piece of these modules, the room, is surrounded by the service areas adjacent and in front of it. Within all the traditional housing categories, the Turkish House has many features that makes it stand out from the other types. These can be listed as;

- plan schematics
- number of floors
- form of the roof
- facade characteristics
- manufacturing technique

2.1. Plan schematics

The Turkish House has formed within the Ottoman boundaries and during its continuity has undergone many changes and improvements. These changes that came about are due to the climatic changes and the difficulty in adapting to the local building materials. The failure to fully adopt the local traditions is also another reason for the formation of different plan typologies [4]. Despite these differences, the plan types are the similar within certain parameters and though miles away from each other one can spot these similarities between the plan types.

The Room (oda) is seen to be most important element of the Turkish House. Shaping the plan types, with the number of rooms and their sizes, is at the same time related to the functional use of the space. Each room is planned to host the foundation of the 'house' concept such as living, eating, cooking, sleeping and shelter. Therefore, although the sizes and the forms of the rooms have changed, their attributes have remained the same [5].

The Central Hall (Sofa) in the Turkish House is the most important element that defines the design of the house connecting the rooms together. Sofa allows all the rooms to open up to a common center. This is the most important difference between the Turkish House plan type and the European ones. The placement of the Sofa in the building defines the forms of different plan types. The plan type without a Sofa, the plan type with an outside Sofa, the plan type with an inner Sofa and the plan type with the central [4].

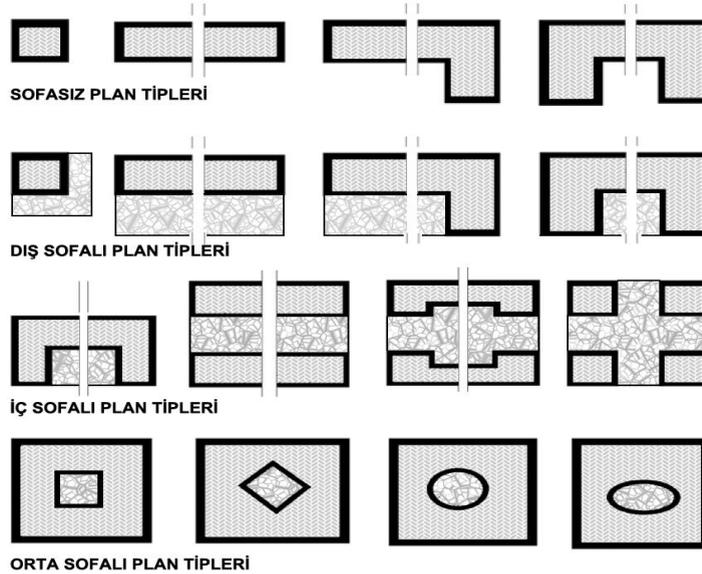


Fig. 1. the placement of the sofa

2.2. Number of floors

The Turkish House is generally considered to be a single floor structure but within time although the number of floors increased the main floor was designed as a single floor and on the top level. The reasons for these are to achieve natural ventilation, to make good use of natural sunlight and orientating towards the view.

2.3. Form of the roof

The roof of the Turkish House is a pyramid hip roof with large eaves. These characteristics are very important to the Turkish House.

2.4. Facade characteristics

There are no specific characteristics to be found in the early years of the Turkish House. Because in accordance with the era it was in, there was no importance in facade design. Along with the rise in population, the houses in time became two or three floors. There were no windows on the ground floor to stop this floor being seen by the street but the higher floors were thought to have window openings. Because the courtyard and garden boundaries got smaller the upper windows allowed the connection to the street and in time these spaces started to extrude out on to the street making these cantilevers part of the floor plan. This is also a great

method to make good use of the natural sunlight and ventilation.

2.5. Manufacturing technique

It is possible to sum up the manufacturing techniques of the Turkish House in accordance to their structure and materials. Timber frame structures that have a wooden roof carried by struts and pillars filled with adobe or brick in between. (The walls of these structures are rendered with lime plaster from inside and outside and their roofs can be flat or covered by a roof): Houses that carry this type of building technique are generally seen in Marmara, Aegean, West of the Black sea region and north of Central Anatolia, Balkans, Kahramanmaraş, Gaziantep, Adana regions.

- Wood masonry houses: These types of houses are found in, East of Black Sea region and Bolu.
- Adobe structures: This type of houses is found in Konya, center of Eastern Anatolia (between Van and Kayseri).
- Stone or brick with timber frame and cladded structures: Mostly found in Istanbul and Sinop.
- Stone masonry houses: This type can be found in South-East Anatolia region, Bodrum, Kayseri and Nevşehir [6].

3. Examining The Traditional Turkish House In The Context Of Sustainability

When designing the traditional houses, many important factors such as the traditions, cultures of the people living in those areas as well as the climate and topographic attributed of that geography are in effect. But when examining houses that are designed with today's conditions, most of these criteria are seen to be neglected in the design and planning stage. Our country that has regions with different climate, historical progress, topography and the materials and building techniques developed by their social diversity, has the potential to be formed into an ecological model [7]. Examining the Traditional Turkish House under the ecological context the following titles can be used.

1. Use of land and topographical compatibility
2. Climatic suitability and energy efficient approach
3. Building envelope and source efficient approach in material selection
4. Interior of the structure

3.1. Use of land and topographical compatibility

When planning the Turkish House was done, it is evident that the geographical factors were not disregarded and that the different climatic data and attributes of the land were taken into consideration. Especially designs that are in accordance with the land information and that stuck to the topography for the layout of the rooms and their arrangements were made. A sustainable structure design needs to have these principles. Traditional Turkish House has been placed in accordance with the geographical and climatic information of the area they are situated in. This way they can take advantage of the dominant wind preventing any additional air conditioning. Facing the view is an important factor in the placement of the structure. At the same time the high surrounding walls acts as a barrier to the high intensity lights or sound. These high walls reduce the effect of

the sunlight creating shadowed areas.

In rural areas, single floor in a garden and in the more tightly packed and space less urban areas two or three floors. The main floor is placed as high as possible so that it can benefit from the natural light, sun, air and view.



Fig. 2. orientating towards the view in the traditional Turkish House

3.2. Climatic suitability and energy efficient approach

When the traditional Turkish Houses are examined in the ecological context, it can be seen that in different climates, with certain changes, they can be made suitable to the climate and energy efficient. Structures can be planned according to the climatic data benefiting from heat, light and wind enough and natural ventilation is achieved. The facades are generally facing south and south-east. This way during winter, the low angled sunlight coming through the south facade penetrates in therefore achieving natural heating. In summer the steep angled sunlight heads south and do not go into the rooms therefore keeping them cool.

When designing the building energy efficient the orientation and envelope-mass relationship is important. A Turkish House with a terrestrial climate is generally planned as a rectangle direction east-west. This way during summer the unwanted east and west surfaces of the building is minimized. Local heating is preferred leaving some of the spaces unheated. The stove in the kitchen is used for heating as well as for cooking. Also each house has places suitable for summer and winter living. Open, semi-open and closed spaces allow for all the climatic features to be experienced. By creating an air cushion between the rooms on the upper floor and the roof, the settlement is fully integrated with the topography and climate conditions.

3.3. Building envelope and source efficient approach in material selection

One of the ecological design standards is the protection and saving of sources such as water and materials. It is important to choose materials that does not harm the environment, can be recycled, energy efficient in production and application, local and baring the correct specifications for the local climate. In the context of sustainability, materials used during the construction of the building need to be easy to obtain. Because the applied material is a part of the ecosystem. In the traditional houses generally made up of one or two story, wood is used as the main material and adobe and brick is used as fillers. On ground floor, wooden floor material is used. In some examples, wooden floor is nailed on to the compressed soil. On the upper floors,

timber supported floor is again laid with wood [1]. It is positive to use wood in structures from the perspective of energy efficiency. Wood is natural and easily renewable therefore can be produced and dispersed with very little energy. Natural materials craftsmanship is easy and requires very little energy to be processed and place itself in the structure. Building materials used in traditional structures, along with the reasons explained above, contribute to the overall energy efficiency of the building.

3.4. Interior of the structure

The buildings are made up of rooms to address the needs of all functions. Thus every room benefits from natural light, natural ventilation, scenery etc. In the planning of the traditional Turkish House room layouts can differ in accordance to the Sofa (central Hall). In winter, rooms located in the south are used whereas in summer the rooms facing north are used meaning the structure is used effectively in each season.

Instead of shaping the mass in the Turkish House, in case of the environment changing due to natural circumstances, changes but keeping the inside the same. When a tray is placed in the middle that room is a dining room, when the bedding in the closets are laid that room becomes a bedroom. They can be sat in, serve different in house functions as well as host guests. The outside environment is stable.

The placement of the courtyard in the Turkish House is also variable due to climatic data. In cold areas during winter, it is protected, in summer courtyards opening outwards aims to benefit from the sunlight and the heat in the correct amount. The courtyard in cold areas is enlarged allowing maximum use of winter light and to reduce the negative effect of the heat, smaller courtyards with higher walls are planned.

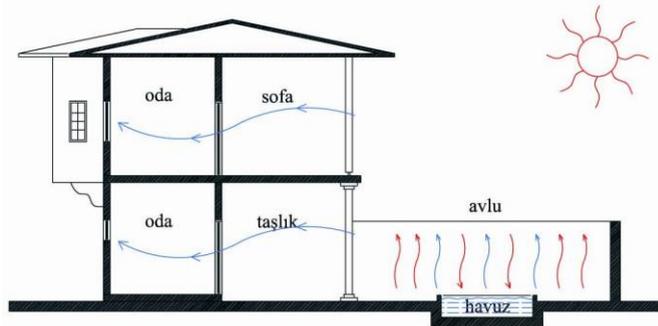


Fig. 3. the spatial effect of evaporating water with heat

Furniture in the rooms is generally fixed. The long couch (sedir), stove, closet etc. is planned during design stage. Also there are shelves and niches embedded in to the walls.

It can be seen that traditional housing carries the principles of having maximum efficiency with using minimum energy. In these structures, one of the most important criteria in sustainable design 'energy conservation' is achieved and it can be seen that the plan layout is done accordingly. The energy needed for all the needs of the building such as lighting, ventilation, heating etc. is achieved correctly by functional planning and spatial layout during the design stage. With the help of evolving technology, correct planning and spatial organization, like in the traditional houses, energy preservation can be achieved in today's housing. Therefore it is possible to say that with these principles of the design and planning, the Turkish House can set an example to contemporary housing in the context of sustainability.

4. Conclusion

By interpreting the building strategies used in traditional architecture with today's technology and materials, designing a building that uses the limited energy sources as little as possible is an issue that designers who have adopted an ecological and sustainable architectural understanding should be aware of. Using technology in our lives has brought with it some environmental problems. Searching for solutions to environmental problems is constantly on the agenda due to allow people to live together with nature without harming it. Along with the industrial revolution a consumer society has formed causing new techniques to be used in the construction industry, making energy seem cheap and inexhaustible and increasing the general energy consumption.

The spatial organization, material and component selection and layout order of the Turkish House, whether with its appreciation of environmental and climatic factors or its clever use of structural system components, can be seen as a fine example. Traditional Turkish House carrying old clever and humane values and its use of ecological approach of its time is one of the best examples to explain the traditional Turkish architecture.

Sustainable architecture that has come as an answer to environmental problems, bases itself on the systems of traditional architecture. Different suggestions can be given in that context. Architectural planning that considers the topographical and climatic attributes of the structure allows it to be with compatible with the environment. Because a structure that considers environmental factors in its arrangement means that it is highly efficient to the user as well as being efficient in preserving environmental qualities. All planning stages from the entrance of the building to the interior layout should be pursued taking into account the direction of the sun and direction of the prevailing wind. Also with the correct arrangement, functional shadow protected areas can be created from the envelope the building is made up of. Just like the Turkish House, quality ventilation can be achieved, by opening doors and windows in rooms to create natural ventilation. This way, cross ventilation between spaces, is provided. By applying this to housing today, we can achieve natural ventilation that thinks about the climatic attributes of the structure and as a result in a major decrease of energy needed for artificial ventilation. Spaces that create heat such as kitchens have an important role in spatial organization. In warm climates, these spaces must be organized so that it does not affect the rest of the building, and if possible placed outside the building. Apart from this, the water features within the garden of the building, can be placed toward the prevailing wind direction to balance the humidity. The materials that are used in the building are all part of the ecosystem and therefore must respect nature and the environment. Materials that require the minimum amount of energy during its production and transport should be used. Materials, when used, should have the correct attributes to create the comfort in the building according to the climate it is placed in. In warmer climates, the materials chosen in the buildings making, should help the inside stay cool.

In that case the knowledge of sustainable design has to be formed and embraced in order to leave a better and cleaner future to the upcoming generations. It is important that buildings using today's technologies take into account the concept of environment during planning and construction phases. Data from the traditional architecture must be incorporated and with the light this data sheds, the technology and user needs should be applied to the design. In buildings that are designed with a sustainable approach, it should be accepted that the priority is the allowing for a quality, healthy and comfortable lifestyle.

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Architectural Discourse and the Labour of Sign Production

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Abstract

The discursive production in architecture reproduces itself within its own narration. This narrative form constitutes itself directly as an ideological act which regulates the units of social system. Thus, discursive formations within architectural sphere become a supra-mode of production that triggers several modes of practice operated within that sphere. Then it is needless to say that the process of discursive formation has its own labour; the labour of sign production. In architectural realm, the labour derived from discursive formations functions as a social force which motivates the sociocultural aspects of architecture and leads social action; that implies the transformative capacity of architecture. Therefore, architecture becomes the field involved in the process of social change.

According to Manuel Castell, social change is generated by the reciprocal action between cultural change and political change. While the former indicates a change of values in individual scale, pertaining to masses in magnitude, the latter occurs via the change of institutionalized values extended through the culture of society. [1] This introduces the multimodal state of architecture embodied as a social power. Either individual or institutional adoption of new values, norms or beliefs leading change in the structure of society, come into being and express themselves via discursive formations. Hence, the transformation originated by individual or collective practice is immediately subjectified. However, it would seem possible to align counter views that confines the authority of architecture engaging with cultural or political action;

Jorge Silvetti asserts that: “[architecture] is an inefficient mode for effecting change when compared to literature or painting or film, and particularly so when compared to real political action- an option open to all of us as citizens but rarely used by architects. Above all, the construction of the physical world is neither initiated nor controlled by architects; they are just part of a process in which they are often in conflict with other agents. It needs to be said without shame: architecture is always and necessarily implicated in the representation of power.” [2]

The possibility to conduct architecture via its representational identity can be directed to the power relationships; whether enacts for the maintenance of existing social order; instrumentalized for the construction of a ruling class or is contested by resistance to unmask the strategies of dominant discourse, since architecture comes into existence through expression; a performance that constantly present and represent. Therefore, the discursive formations are produced as a result of that process; which is constructed through reading, writing and rewriting the dialectic relations between form and content. Such a narrative manifestation of architecture foregrounds the questions into the mechanism of signification. The labour of sign production unfolds the disciplinary critique of the Architecture and this study will try to open up a new horizon on that how the representational capacity of architecture turns into an apparatus for exercising power.

[1] Manuel Castells, *Communication Power*, New York: Oxford University Press, 2009, p.300.

[2] Jorge Silvetti, “After Words,” *Assemblage*, No.27, Tulane Papers: The Politics of Contemporary Architectural

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Discourse, 1995, p.78.

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Keywords: Architectural discourse; Sign production; Representational capacity; Political apparatus.

“This is the big story, a kind of quasi-philosophical claim about the status of objects that is built into our endless conversation about buildings.” [1]

“All forms of discourse are constructed by the social space in which they are enunciated.” [2]

The inquiry focuses on architecture constructing the social space first-hand, which also constructs the modes of production in architecture through its discursive formation. The status of architecture based on the reciprocal interaction leads a further investigation on how its representational capacity transforms its material products as well as material processes. Architectural discourse can be read as structured through ideologemes, which “signifies an infinitization of discourse.” [3]

“Ideologeme is the smallest intelligible unit of the essentially antagonistic collective discourses of social classes. ... the individual text and its ideologemes know a final transformation, and must be read in terms of what I will call the ideology of form, that is, the symbolic messages transmitted to us by the coexistence of various sign systems which are themselves traces or anticipations of modes of production.” [4]

The relations of production in architectural sphere are motivated by the social space in which, architects as productive actors, enrolled actively and to certain level manipulate. Architecture itself as a complex system of signs is subjected to the network of social contracts which stimulates its discursive production as well as material processes. Therefore, the intellectual discourse assigned on the basis of social relations is definitive in the system of values transforming architectural expression. However, it is important to map such a discourse with full respect to its differentiation from other definitions; regarding its ideological interest and control capacities. The differentiation of the meanings of discourse as put forward by Terry Eagleton in response to Hindess and Hirst’s all-inclusive concept of discourse is foregrounded as follows: “Two meanings of discourse are falsely conflated: those which are said to constitute our practices, and those in which we talk about them.” [5] Particularly, he emphasized the differentiated status of the relationship positioned “between an object and its means of representation” and “between a material practice and its ideological legitimation.” On account of his statement, it is central to posit the potentiality of intellectual discourse within the domain of architecture, whether it has the capacity to transform existing architectural norms and forms together with spatial habits and social order established on, or whether it is merely ‘talking’ on and about built space and telling series of stories manifested by the narrative character of architecture? However, the inquiry on such a discourse can address to Eagleton’s critique on the seamlessly-welded condition of language as both representation and construction. It is possible to read those two meanings of discourse for architecture not as conflated; fused-into-one total discourse but through an integrated perspective; as diverse referents working in the sphere of “discursive formations” as introduced by Michel Foucault. Consequently, they can be stated as the “points of

diffraction of discourse;” both the mere representational means of the object and its ideological legitimization act similarly on the level of language. However, it is not always possible to say that the former is detached completely from the latter, since it is subjected to choice. Following Eagleton’s account, there is not such a condition through which “the signified can be represented *only* in this way; and in which the signifier in no sense alters the signified, but remains a neutral, transparent medium of expression.” [6] Thus, it directs the signification process by questioning the validity of the sign whether it is constituted by the collective mapping of utterances.

These points (points of *diffraction* of discourse) are characterized in the first instance as points of incompatibility: two objects, or two types of enunciation, or two concepts may appear, in the same discursive formation, without being able to enter — under pain of manifest contradiction or inconsequence — the same series of statements. They are then characterized as points of equivalence: the two incompatible elements are formed in the same way and on the basis of the same rules; the conditions of their appearance are identical; they are situated at the same level; and instead of constituting a mere defect of coherence, they form an alternative: even if, chronologically speaking, they do not appear at the same time, even if they do not have the same importance, and if they were not equally represented in the population of effective statements, they appear in the form of ‘either . . . or’. [7]

The displacement of such points causes difficulty to understand the overall picture and produces a situation where there is no clear definition for which circumstances one appear in the form of other. Thus, the complexity to map the points of *diffraction* in architectural discourse evokes non-literacy for the implicit subtext. And it obscures the relations of production in architecture and problematizes how the rhetoric operationalizes in daily life through the medium of architecture.

One of those operations is settled through “the communicative action” which regulates the signification processes in architecture -the production of meaning through *stories*. Mark Wigley, in his presentation titled “Story-time” enrolled in the public forum held by the *Assemblage* editorial board; “Tulane Papers: The Politics of Contemporary Architectural Discourse”, asserts that “architecture is only ever discourse” and he mapped the recognition of architectural practice to its capacity of storytelling. [8] He construes the stories as transactions within intellectual discourse. What marks buildings exceptional for him is “the extent to which they precede the stories we might tell about them or the stories they might themselves tell.” [9] Hence, buildings are part of architecture’s discursive formation; as non-discursive productions of discursive action.

In that sense, discursive production in architecture cannot be restrained; it only exists through interpretation. So, it is freed from a state of equilibrium in which its modes of operation can be determined and specified with clear cut definitions. It continuously reproduces itself within its own narration. And this narrative form constitutes itself directly as an ideological act which regulates the units of social system. Thus, discursive formations within architectural sphere become a supra-mode of production that triggers several modes of practice operated within that sphere. Then it is needless to say that the process of discursive formation has its own labour; the labour of sign production.

“The labor of sign production releases social forces and itself represents a social force. It can both produce both ideologies and criticism of ideologies. Thus semiotics (in its double guise as a theory of codes and a theory of sign production)

is also a form of social criticism, and therefore one among the many forms of social practice.” [10]

In architectural realm, the labour derived from discursive formations functions as a social force which also motivates others rather than it and leads social action; that implies the transformative capacity of architecture. Therefore, architecture becomes the field involved in the process of social change. According to Manuel Castell, social change is generated by the reciprocal action between cultural change and political change. While the former indicates a change of values in individual scale, pertaining to masses in magnitude, the latter occurs via the change of institutionalized values extended through the culture of society. [11] This introduces the multimodal state of architecture embodied as a social power. Either individual or institutional adoption of new values, norms or beliefs leading change in the structure of society, come into being and express themselves via discursive formations. Hence, the transformation originated by individual or collective practice is immediately subjectified. However, it would seem possible to align counter views that confines the authority of architecture engaging with cultural or political action; Jorge Silvetti asserts that: “[architecture] is an inefficient mode for effecting change when compared to literature or painting or film, and particularly so when compared to real political action- an option open to all of us as citizens but rarely used by architects. Above all, the construction of the physical world is neither initiated nor controlled by architects; they are just part of a process in which they are often in conflict with other agents. It needs to be said without shame: architecture is always and necessarily implicated in the representation of power.” [12] His critic on the efficiency of architecture as a mode of production in social change can be substantive from the perspective of a redefinition or reconceptualization of the term *architecture*; what does architecture mean or how it implies a constitutional meaning?

“Was Architecture that higher art, supported by metaphysical elegance or arrogance, awareness or naivety, a social formula applied to carry out its own promise to itself? Or was Architecture that lower art, nearer the ground, less of the heavenly about it, dignified by the passion of building and construction, veering away but always lifted by heroism, architects and their metaphysical aching to be asked to perform more?” [13]

Regarding the inquiry posited by Roger Connah, it is crucial to extent the questions through architecture’s epistemological boundaries and weave what is problematized right into the specified mode of architecture. The possibility to conduct architecture as a practice in such a crystallized manner entails further disciplinary discussions on how it is signified and gained an institutional setting, until then, its representational identity can be directed to the power relationships; whether enacts for the maintenance of existing social order; instrumentalized for the construction of a ruling class or is contested by resistance to unmask the strategies of dominant discourse. Accordingly, the illustration of power is necessary to reify its reflection as a constructive component on architectural domain, especially in urban transformation decisions.

“Power is the relational capacity that enables a social actor to influence asymmetrically the decisions of the other social actor(s) in ways that favor the empowered actor’s will, interests and values. Power is exercised by means of coercion (or the possibility of it) and/or by the construction of meaning on the basis of the discourses through which social actors guide their action.” [14]

It is also argued that “the construction of the physical world” is independent from the initiations of architects; concerning its commodified image based on the premises of exchange values, which ordines architecture

under the surveillance of construction economies. Koolhaas in his book *Generic City* specifies the relationship of generic city with the authoritarian regime with a straightforward statement: “Usually the cronies of the ‘leader’-whatever that was- decided to develop a piece of ‘downtown’ or the periphery, or even to start a new city in the middle of nowhere, and so triggered the boom that put the city on the map.” [15] Although, urban planners, designers and architects are part of a vast range of agents with limited control in orienting the building capital, they are productive social agents who contribute to *form* the public space. Thus, the representational capacity attributed to the built space which is under the supervision of urban designers and architects, gains prominence. The public space has the role to hold together the entire communicative interaction in which social movements and politics rise and live. [16] Therefore, the spatial dimension brings significance to the relations between form and content.

Within architectural sphere, regarding K. Michael Hays’ approach to those relations; the form is seen as an embodiment of the content; determined and constructed by it: “If architecture is structured like conceptual-objective thought itself and is an activity whose content is determinately social and socially useful, it is precisely because architectural types mimic conceptual processes and social content at the level of form.” [17] His account is in convergence with the traditional Marxism which overemphasizes content with respect to form that is devoid of autonomy. However, architecture can be reduced neither to form nor to content; it is a mode of production in practice which proceeds through the dialectics of form and content; “the varying *relations* between the two.” Eagleton highlights the artificiality of the distinction between form and content on the subject of *practice* referring to Hegel who wrote: “Content is nothing but the transformation of form into content and form is nothing but the transformation of content into form.” [18]

“The basic politics of the discourse is determined by our shared commitment to the proposition that architecture is a unique kind of object in our culture because it in some way both precedes and enables discourse. When a building becomes architecture by talking –yes, that’s all architecture is, the talking building, or the idea of the talking building –this talk supposedly comes out of the building itself. The outer layer that talks, the surface, is meant to convey the inner order, or even disorder, of the building; and the discipline this surface, to regulate it by trying down, making every visible shift in its texture corresponds to some unseen condition.” [19]

Wigley’s assessment brought architecture into the ground that its meaning has been constructed through the consensus on its cultural engagement. Its disciplinary specificity acquires building process to entangle with discursive practice; a process which demand continuous interpretation. Thus, architecture, molded by “a social formula applied to carry out its own promise to itself”, refines its place within other social practices. It comes into existence through expression; a performance that constantly presents and is represented. Therefore, the discursive formations are produced as a result of that process; which is constructed through reading, writing and rewriting the dialectic relations between form and content. Such a narrative manifestation of architecture foregrounds the questions into the mechanism of signification. The labour of sign production unfolds the disciplinary critique and opens up a new horizon on that how the representational capacity of architecture turns into an apparatus for exercising power. Therefore, architecture takes a key position right into the ideological critique and incorporates the political discussion within its own dynamics.

“Ideological critique operates on the level of the theory of the building, and on the manifestos and on the constraints of these things in the realm of analysis and of thought and of programs, and so forth. I would think that one very important new

possibility that all of this has added to cultural and political criticism is that everything about the discussion of architecture itself is now political; and also that political discussion somehow seems quite impossible without reference to architecture, that is, to space generally, to the way the urban organized, to the way geo-politics is organized. This is the new spatial dimension of things.” [20]

Hence, even in the state of supermodernity, within the cities emerging out of tabula rasa, within the gated communities “immune” to the outside world, in-between the contradictions arose from the gap between the ideal “purified” community and the new ideals of new community, the dystopia that is presented in a form of theater brings along a greater anomie that contributes into the dark route. What is left for the deposited community is to seek consciousness in all scale of constituents of the metropolises that is in an unceasing process of sociospatial transformation. In order to correspond to the excess and extremes of urban life without failing into the intensification of nervous stimulation, minding Georg Simmel’s instruction in his seminal article “The Metropolis and Mental Life is crucial.” “Since forces of life have grown into the roots and into the crown of the whole of the historical life in which we, in our fleeting existence, as a cell, belong only as a part, it is not our task to accuse or pardon, but only to understand.” [21]

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Projection (3D) Mapping: Assessment of Light and Virtuality Relationship in Context of Interior Design

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Abstract

Interior design means to interact with many disciplines, exemplarily its closely linked interaction with the media arts. Media arts bring out the concepts such as virtuality and quantitative, which affect the interior design directly. In the media arts, projects with virtual images which are reflected on physical objects to attract the attention and light is the most essential component of these projects. Tadao Ando states that "Light is the origin of all being...Light grants autonomy to things and at the same time, prescribes their relationships...Light: the creator of relationships that constitute the world; yet although the origin off all being, it is by no means an immobile source. Light is, rather, tremulous motion out of its ceaseless transformation, light continually reinvest the world." [1]. Today, light can be used as a material which is transformable into various tissues, colours and densities. Purpose of this study is to investigate the effects of light sourced by projection display technique. The study includes analyses of projects which used projection display related with interior design. The analyses showed that projection mapping can present a combination of reality and virtuality in a spatial setting to the audience, participant and the user. It was an important observation of the occurrence of unusual spatial experiences as a result of the combination of light and virtual images. As a result, it was seen that projection mapping uses light as a material and also creates art with providing an enhanced plastic value to the spatial settings.

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Keywords: Projection mapping; 3D mapping; Projection display; Light; Virtual reality; Light art; Media art

1. Introduction

As an important phenomenon of the physical world, light bears a vital role in the perception of architectural works. For ages, light rendered the built environment visible and used as a design component which characterizes the spatial dynamics within a space. In architecture, light has been adopted as a tool for providing perception that adds different perceptive attributes to the space via different methods. The invention of

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electricity and the developments which were achieved after Industrial Revolution paved a path for expanding the potential of architectural lighting beyond a symbolical meaning. The introduction of artificial lighting in architecture provided a base for different lighting manipulations and illumination modifications. By these developments, it was “possible to change the look and atmosphere of individual buildings or urban quarter – analogous to changes of theatre stage design” [2] and the artificial lights started to stand out as a detached architectural element that enhances the architectural forms. The manipulations on the characteristics of light (like the intensity, hue or direction...) enabled different effects and shadowed/bright area formations which change the interpretation of the architectural works. The recent developments in lighting and computer technologies provided radical improvements which had brought computerized graphics, light art and spatial configurations together, nevertheless making it possible for applications like projection mapping.

As the usage types and areas of light broadens, the perception towards the light also differentiates. Besides its functional purpose and physical materiality; light can also act as a material and as an art.

According to the Arabian scientist Alhazen, light and the vision must be separately considered. He points out light as “a material produced by luminous bodies” [3] like sun and fire and the vision is occurred via the light reflected from the objects and entered into the eye. As a more design-wise approach, Adam Yarinsky denoted light as a material in his speech “Almost Nothing”, with providing an example from a now defunct spa-center in New York, which his architecture firm had exclusively designed, see Fig 1. According to Yarinsky, light was used as a primary material throughout the spa-center in order to “eliminate extraneous elements” and “convey illuminous quality within space” [4] and other material selections were made to “reinforce the primary perception of light” [5].



Fig. 1. Qiora Store&Spa

It can be said that, due to the increasing potential of building surfaces and systems, lighting design is now a more integrated domain with architecture, design and engineering. “Light has become an increasingly important ingredient in the pursuit of optimal and unforeseen material effects” [6]. The developments in optical technologies and the widespread opting of energy saving strategies rendered the invention of new materials and tools which can transmit, present and capture light possible. Due to its increasing importance and applicability as a design component, light repositions itself between a matter and energy, thus transforming into a material.

Being an important ingredient inside art, light can also act as the art itself. The developments in artificial lighting brought diverse applications of light for artists to convey their artistic expressions in different ways. Light can emphasize an element, enhance a composition, provide a mood or atmosphere, reveal form, texture and detail and support a technical installation in a sensual way. As Livingston implies “At its most abstract and refined, light is its own form of art and sculpture” [7].

As it was noted earlier, the invention of electricity and the usage of artificial lighting greatly affected the spatial design and provided a base for the architects and designers to experiment with different usage scenarios in interior spaces. The technological developments in lighting and lighting devices which had happened in 20th century catered a new perspective to light usage in interior spaces and took the priority of light beyond “rendering a space visible”. Moreover, light has been transformed into a material which is obligatory in interior architecture. These progressions created new concepts like light art or media architecture that cross over to the field of architecture in order to enrich the spatial experiences with light.

A term coined by Christian W. Thomsen in 1994, *mediarchitecture* explains buildings which are “decorated with electronic images” and “mixtures of text/image/decoration on the building’s skin” [8]. The term promotes a new type of space which is not being defined by traditional architectural elements, it rather benefits from images and media. “In mediarchitecture everything that once was called function, form and space; in architectonic terms has become eliminated. Their roles are taken over by computer programs, by electronic images and virtual spaces” [9]. Thomsen also mentions about the potential of mediarchitecture to become “multimedia and multidimensional” and develop its own “colourful poetry of light” [10].

Mediarchitecture concept tries to see buildings and interior spaces as a screen or a medium that provides new forms of communication and puts less emphasis on their static structures, therefore new applications (like holograms, laser-based technologies or projections...) and usage patterns of technology, light and media become vital with great importance. Since the visual capabilities of contemporary technologies go beyond the rectangular screen, it is now possible to map a space with the desired settings via digital media.

2. Projection mapping (3D mapping) technique, samples and analysis

“Success which is necessary for today’s architecture depends on effectiveness of new forms which depends inter-disciplines studies. Interactive environment reveals by the common creative studies of artists, architects, designers and other experts (not only the software engineers or mechanic specialists but also frequently scientists). Interactive environments are the bridges between virtual reality and physical reality such as the virtual reality projects instead of being produced completely by computer systems. In history these kinds of studies have been the interest area of media artists. But architects also transformed architecture a real time tool by assimilating the technology and digital techniques and digital media was approached by this way. That has been one of the factors which provided architecture to transform in to a cultural activity. In this process, media artists started to handle their projects more spatial approach. Digital technologies are fed with various discipline mixtures and spatial studies are now the responsibilities which are not only the responsibility of architects and architects don’t limit themselves with traditional visual arrangements and spirit sources” [11].

Today, light could be fictionalized with different dynamics, its density could be changed and thanks to the developments in illumination field, it can supply various colour alternatives with using common discipline studies of media and light artists. By this means light is able to create a perception of the physical place with different identities and dynamics. Techniques that provide aforementioned potential are interactive or light sourced applications such as; laser technology, projectors, illusions and holography.

Projection alignment is one of the recent developments of lighting technology which provides rich applications and has a high potential for future improvements. Functionally, projection mapping has the same operating principle with the cinema technique: images, which are aligned distinctly from the silver screen, are reflected to three dimensional objects. The surface where the reflection is to occur on should be identified correctly. According to the definition of Atiker; “Reflection surfaces are divided into three parts such as; continuous planar, non-continuous planar and partial planar” [12]. (see Fig 2.) These surface types are generally defined according to the organization and formal structure of an interior space.

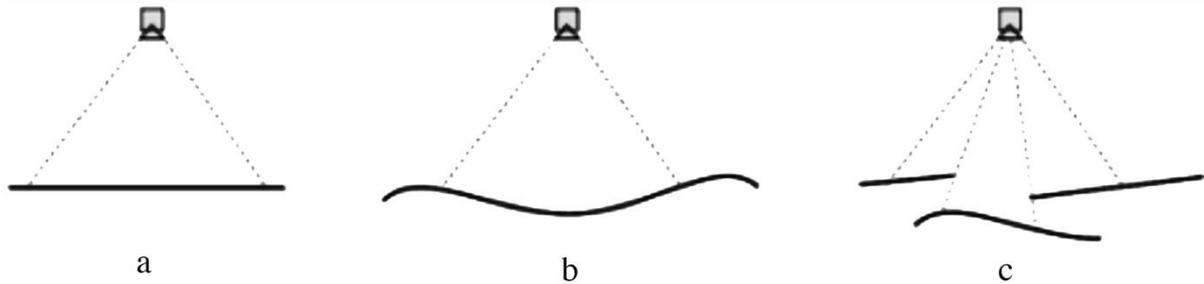


Fig. 2. a. Continuous planar, b. Non-planar (inclined) surface planar, c. Partial planar

The projection mapping technique is an extension of the augmented reality studies that continue for many years. According to Azuma; “Three essential characteristics of augmented reality are determined following: 1) not limiting by some technologies, 2) combines real and the virtual one, 3) it is interactive in real time and aligned as three dimensional” [13]. The definition of Azuma; in brief, states that augmented reality is about real time combination between the three dimensional numerical images generated in virtual environment and the surrounding objects.

“Projection alignment projects reference to the surfaces that they are applied upon and they cannot be integrated to another surface or object... The inexistence of any other light source increases the quality of projected image. Perfect alignment is one of the most important problems of projection alignment technique. As long as real objects and virtual images aligned perfectly to each other; reflection between the worlds can be achieved” [14].

“Spatial augmented reality which examines the interaction between virtual and real worlds according to the environment where it is located; it is a speed developing field which includes everybody working in art and media fields” [15]. Following a different functional procedure than other augmented reality applications, spatial augmented reality technique can be applied directly to the environment in which the audience is situated, therefore making the audiences perceive the numerical area as a physical field. Also with this technique, the physical space can be organized completely different or can be further emphasized.

2.1. Sample Works

Within the scope of study, sample works, that provided experiments with projection mapping technique in context of benefitting the light as a material, are analysed. As a consequence, it was determined that applications with projection alignment technique provides new experiences, characteristics and nuances to the interior design.

2.1.1. The Official Ralph Lauren 4D Experience – England, London

Holding one of the flagship stores of Ralph Lauren, the building, which is located in London, Bond Street,

has hosted a spatial augmented reality experiment, see Fig 3. The application consisted a projection alignment study where visual interaction was the main priority. In order to celebrate the new technological developments, products under Ralph Lauren trademark were presented to the audience in a modern, innovative and different fashion show experiment.



Fig. 3. Ralph Lauren store in London

Real images, which are stored in computers, and virtual images, which are created with numerical codes, were combined and transferred onto physical objects, see Fig 4. The reflection surface had to be at the equivalent ratio with the images that were to be projected upon the surface.



Fig. 4. Real images and numerical images

The images can add depth by enhancing the emphasis on the physical space or create variations with providing different colours and textures, also they can transform the space into a completely different spatial setting. In Fig 5., the transformation of the shell into an interior space can be seen.



Fig. 5. Transforming the shell into an interior space

It is also possible to map the space radically different than its own character. The example in Fig. 6 shows the projection of a product on the space, thus altering the perception of the physical setting. This technique can be beneficial since it can promote a product without physically modifying the space, thus reducing the costs and offering a flexible promotion solution.

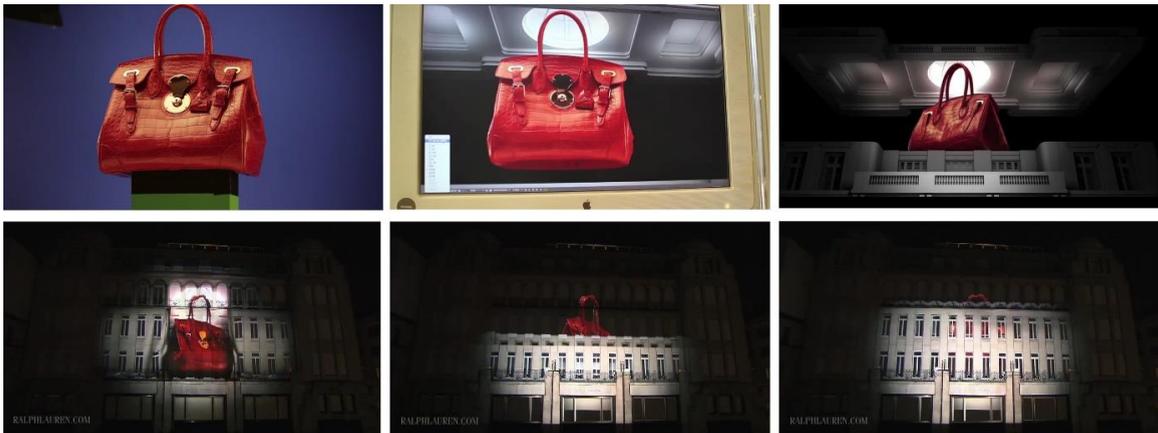


Fig. 6. Identical transformation of the shell and its transformation phases

The projection mapping can also render a façade completely transparent or opaque therefore the interior spaces can be programmed to be exposed, completely transformed into a different setting or to be hidden. (see Fig. 7)



Fig. 7. Rendering the façade transparent

The application in this experiment brought various observations. The usage of projection mapping offers a new “podium” experience to the audience and changes the communication and attitude of the object or person whom are to present a product or a service. Briefly, with the possibilities brought by the different usages of light; the space becomes a tool to form the communication between the user and the designer.

2.1.2. Nike Kichijoji 3D Projection Mapping – Japan, Tokyo

Contemporarily, surrounding the physical spaces with dynamic and rich multimedia application acts as a representation of the information age. The application consists of an alignment work on a displaycase in order to offer a different shopping experience to the users. For the application, numerical images, which were created exclusively for a Nike shop in Tokyo, were reflected to the displaycases. As it can be seen in Fig. 8, a fixed displaycase is provided with various dynamical images that create perception and rendition of different displaycase designs via projection.

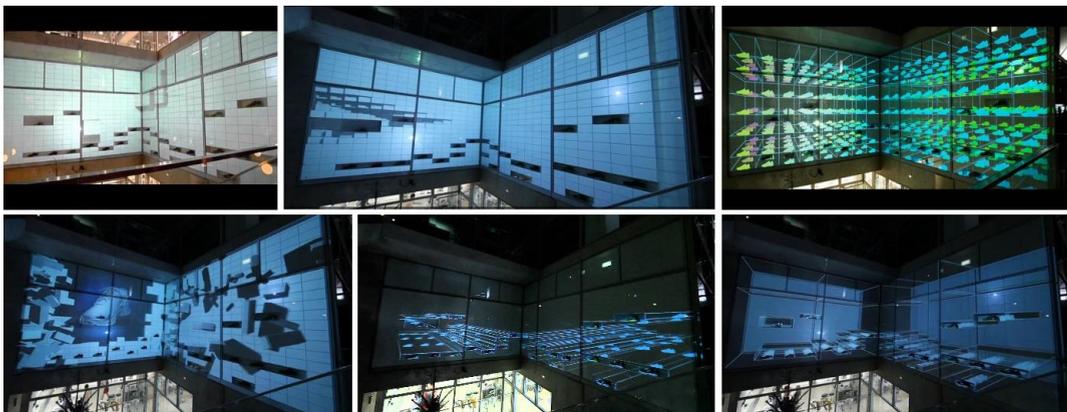


Fig. 8. Projection alignment scenarios

As a solid and stable setting with less depth, retail displaycases can be identically transformed into a dynamic setting via alignment technique. In the application, the displaycase is projected a grid system that bears an infinite depth and defines a different spatial identity thanks to the vivid light installations.

“Each object in the real world could become a base for projection alignment technique. After all, the reason

for creative applications is the possibility to the everything as a base. A showcase mannequin, an electronic circuit or a car could be used as a base for projection alignment projects” [16].

2.1.3. Acciona Pavilion, Expo – Spain, Zaragoza

Projection mapping applications can track and behave accordingly to the user’s actions via motion or audio sensors like microphone, movement detection sensors and tracking systems. In an application held at Acciona Pavilion, projection alignment technique was used to react interactively to the users’ actions. The changes on the surfaces are completely related with the movements and actions of the users inside the space. (see Fig. 9)



Fig. 9. Interactive 3D mapping example

Including the user into a space and providing flexible spatial solutions within a space are preferred approaches of contemporary designers in order to enrich the spatial experiences since the interaction between a user and a spaces provides better visual experience and perception.

3. Conclusion

Light is an important and vital component of interior design. The ongoing developments in lighting technology bring new potentials and application possibilities to many areas and interior design is also greatly enhanced by these developments. Moreover, light becomes a shaping and identifying tool, passing through the borders of a space and creating diverse variations.

“Studies of several artists for integrating their experimental works with perception, psychology and additional concepts move ahead of “making architecture visible”, inspired from the significant developments in illumination technology” [17]. With the possibility of projecting the images upon surfaces, projection mapping technique brings a new perspective into interior design discipline.

“Augmented reality comes with light that enriches the interaction of audience with the real world” [18]. At this point it is possible to deduce the audience’s interaction with space is enriched by augmented reality applications. Light can reveal an existing space or render it transparent or non-existent. The spatial organization

of a space can be altered according to the aim of the designer. The interaction formed between the user and the projection system can provide different space organizations and interior schemes. It can be said that media technologies also start to influence interior design and spatial design and bring new perspectives and approach with their dynamic multimedia content.

The concept of projection mapping incorporates the technologies that involve light and offers complex installations which are known as “light art” and “media architecture”. These developments can be categorized in three different articles:

- The scope of projection mapping shifts from being an artistic activity towards being a supporting technology for architecture and interior design what is being used in residential houses, urban spaces, offices, shopping centres, multipurpose halls...
- Combining new environments with new methods which have not been possible before, offering to the audience/participant/user together
- By using the technological developments in interior design discipline, it would be easier for the designer to achieve an aesthetic and functional design solution which also uses the technology on its behalf.

Projection mapping technique provides impressing advancements while utilizing the light as the primary material and a new art form. The experiments held in various projects offer different and interesting design approaches and surely, with the oncoming improvements, it will provide more stable and concrete solutions to interior design discipline while enhancing the concepts of user, space and spatiality.

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Internet of Things: Thinking the Thing as Furniture

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Abstract

Advances in technology form our lives. It changes the way we work, inhabit, communicate and interact. Human communicate with each other and interact with surrounding objects. New technologies have large effects on communication. Today, reading a daily newspaper or waiting for newscast in front of a TV screen are seen as elderly habits. Internet connects people to people and people to information in anytime and anywhere. We do this by computers which are seen as bulky table top devices or handheld smart phones. Technology also changes surrounding objects. Everyday more objects are being mentioned as smart. They have their own dedicated abilities and an extra of connecting to internet. These are tiny footsteps of a new concept which is once mentioned by Mark Weiser as “calm technology”. Weiser explains this term as “dwelling in a computer”. The computer takes the role of the house and its contents and human interact with them but not the computer which is imbedded in them. Today this concept becomes possible by another concept called “internet of things”.

In this paper, “Calm technology”, Ubiquitous computing” and “Internet of things” concepts will be discussed in a perspective of interior design and furniture design.

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Keywords: Internet of things; Interior design; Furniture Design; Ubiquitous computing; Smart home

1. Introduction

Interaction is a way of framing the relationship between people and objects designed for them. [1] Technology forms our surroundings and changes the way we interact with things. Interaction design is a wide field of research which contains many topics relating to things. Nowadays these research mainly focuses on human computer interaction (HCI). For many years HCI is limited in a triangle of screen, mouse and keyboard. We still have this image but also others as touch screens, VR glasses, smart phones and smart everything. As technology develops and things started to be smaller and cheaper, micro controllers take part in everything which means most of the house appliances have power of computing and controlling the device itself. House appliances have had these changes in a development of several years. Computers have a similar development. The first general purpose computer ENIAC had been announced in 1947, it needed an air conditioned room, 6 expert people were programming the device through a complex structure of plugs and cables. ENIAC was performing one task at a time and reprogramming it was like redesigning the whole machine. According to Mark Weiser it was the first era of computers in which one mainframe computer was shared by many people. The second era has been the personal computer era. In this era one person is interacting with one computer. According to Mark Weiser the next era will be Ubiquitous Computing in which people are shared by many computers. He expresses his vision by new concept of HCI which he names as “calm technology”. All these development is finding their way in a new concept which is firstly mentioned by Kevin Ashton in 1999 as “Internet of Things” (IoT).

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Nomenclature	
HCI	Human Computer Interaction
UbiComp	Ubiquitous Computing
IoT	Internet of Things
GUI	Graphical User Interface
RFID	Radio frequency identification
AR	Augmented Reality
M2M	Machine to Machine
P2P	Peer to Peer
TCP	Transmission Control Protocol
IP	Internet Protocol
BAN	Body Area Network

2. Ubiquitous Computing and Calm Technology

Marc Weiser who is called as “Father of Ubiquitous Computing” first mentioned the term in 1988. He criticized the view of HCI as a personal computer which is driven on a GUI. He declares that “We believe that people live through their practices and tacit knowledge so that the most powerful things are those that are effectively invisible in use.”(ubiq.com) He emphasizes his thoughts on invisible technology. He also criticizes HCI as being in the center of attention and mentions writing as the first information technology and tells that we never put writing in the center of attention, writing is in everywhere we unconsciously read signs, newspapers or TV spots, it is already become invisible. He and his colleagues in XEROX PARC proposes a new concept of computation suggesting computation be at the periphery of attention allowing to have more attention for other tasks. He explains the concept of calm technology as “A calm technology will move easily from the periphery of our attention, to the center, and back.” [2] According to Weiser 3 main principles of calm technology are:

- The user’s attention to the technology must reside mainly in the periphery. This means that either the technology can easily shift between the center of attention or the periphery or that much of the information conveyed by the technology is present in the periphery rather than the center.
- The technology increases a user’s use of his or her periphery. This creates a pleasant user experience by not overburdening the user with information.
- The technology relays a sense of familiarity to the user and allows awareness of the user’s surroundings in the past, present, and future.

He propose a reality of this by connecting every computational device to each other and communicating them. These devices will be as ordinary daily objects like a sofa, coffee table, coffee cup and clothes giving needed information at the time it is needed. He suggested these devices be connected by internet. This will allow smarting everything. Smart cars, smart home, smart TVs and so called smart phones are only e few examples. Most of these improvement aims the periphery and everyday objects thus it makes use of architecture and its interior be smart also.

3. Internet of Things

Internet of Things is a term first coined by Kevin Ashton, David Brock and Sanjay Sarma in 1999 at MIT Auto-ID Lab. At first it is well accepted by large corporations to track every object individually. One very common example is auto detection of passing vehicles through pay tolls in highways. Every vehicle is tracked with an individual id. This is done with RFID tags which eliminates the time and attention needed in pay tolls. RFID tags are passive elements which are activated by RF energy when they are needed. This new technology replaces common use of barcodes, they do not need any activity like touching or seeing. The process goes in background without the active entry of the user or object. It makes RFID be a calm technology as Weiser told once.

An explanatory definition of IoT is “An open and comprehensive network of intelligent objects that have the capacity to auto-organize, share information, data and resources, reacting and acting in face of situations and changes in environment.” [3]

When we go back to the example of high way vehicle identification system, there is just one small RFID tag attached to the wind shield. By these unique tags millions of cars are tracked real-time so another huge data highway is formed in background. These data are processed and the highway price is collected from vehicle accounts. This creates another concept called “Big Data” which is connected to IoT. Process of big data needs fast data transfer, fast computation and connection to other networks-in the example of highway price collection this is bank accounts of drivers.

Nowadays IoT is effectively performed by large corporations but it is not only limited to just tracking presence or whereabouts of things. With advents of technology micro processors are getting smaller and more effective, wireless transfer technology gets cheaper and less power consuming and there are many new inventions on sensor technology. All these creates new possibilities for IoT even for unusual things which seem as nothing to do with computing.

3.1. Usage scenarios

According to Luigi Atzori, Antonio Iera and Giacomo Morabito, IoT has possibilities in the following domains:

- Transportation and logistics domain.
- Healthcare domain.
- Smart environment (home, office, plant) domain.
- Personal and social domain.

In transportation and logistics domain, there are subtopics as logistics, assisted driving, mobile ticketing, environment monitoring and augmented maps. In healthcare domain subtopics are tracking patient, identification, authoring, data collection and sensing. In smart environment known subtopics are comfortable homes and offices, industrial plants, smart museum and gym. For personal and social domains the subtopics are social networking, historical queries, losses, thefts. There are also futuristic scenarios which has no reality but signs of realization as robot taxis, city information models, enhanced game rooms. [4]

Some of the more familiar realization of IoT in daily life is in gyms. With cards or key holders, people are cycling between different gym sporting tools. These connected tools reads the exercise program of the user and automatically adjust its settings to suit that individual program. The exercise fulfillment information is stored for the next exercise time. For the industry taking control of assembly line, finding out the optimum storage management, automatic order of needed parts at the needed time, tracking worker and work performance are the most essential tasks covered by IoT.

3.2. Accompanying concepts

IoT applications started to occur prior its maturation and standardization. One of the main problems in IoT applications is that there is no common protocol which is agreed by a consortium or a foundation. There are several different approaches for creation of an infrastructure but most of them are not wrapping various establishments and dedicated special needs for those. An attempt to have an umbrella of categories is propounded by ITU (International Telecommunication Union). It explains IoT by dividing it into layers. These layers are:

- The Sensing Layer
- The Access Layer
- The Network Layer
- The Middleware
- The Application Layer [3]

Sensing layer is the initial part of collecting data. Network layer is about how we transfer that data. Middleware is the software part, how we deal with data. Application layer is the actuator part, how we act after the process.

There are also other concepts related to Iot which are explained in following text.

3.2.1. M2M

M2M networking is an analogy of P2P networking between computers. As in traditional client server model, computers firstly connect to a server and then to their desired destination. In P2P model of networking computers connects to another computer directly bypassing the server. M2M is the connection of objects without the need of a server direction.

3.2.2. IPV6

In theory IoT connects every atom in the world to each other. This will bring an addressing problem. As anything in anywhere will connect in anytime brings an issue of identification. As the number of things connecting to internet grows exponentially protocols of internet already used to serve existing internet needs will not be sufficient. Existing TCP/IP V4 protocol limits devices connected to internet back bone. This limitation brings a new approach of IPV6. Theoretically by IPV6 there will be space for connecting the count of every atom on earth to internet. (2^{128} unique addresses) [3]

3.2.3. Big Data

IoT applications deliver enormous amounts of data to be processed and used. These data needs to be collected securely and error free. It must be stored securely and processed in a smart way. These needs must be solved in the computation and programming side of the whole task.

3.2.4. BAN

BAN is the network of wearable devices. These could be devices worn outside or implanted inside the body. Devices connecting to BAN are used for collecting and transmitting data related to body functions and conditions using advanced sensor technology. Pulse detectors, body temperature sensors, blood pressure sensors or AR glasses and smart watches, shoes and anything carried on body could be in BAN. BAN could also be used to transfer data from surroundings and as a range extender for other devices. An application of BAN could be exemplified as cars sending other cars about the condition of traffic in their surroundings. Sensors transmit data of motion when motion get stuck in a position other cars are informed by connecting each and sharing information.

3.3. Problems, difficulties and short comings in IoT

There are no agreed protocols or standards for IoT yet and this situation makes IoT implementations risky for unforeseen problems. Some issues for problems are as follows:

3.3.1. Privacy and security issues

There is vast number of sensing technology in IoT applications. They have different needs of connectivity and while transferring data they use various methods. This variety puts data security in a risky position. Also in example of BAN the collected data is sensitive which makes privacy concerns get louder.

3.3.2. Cost

Sensing devices are still not cost effective for applications be popular. Sensor must be cheaper and smarter.

3.3.3. Power consumption

Power consumption is one of the most important issues of IoT. For free movement of things every technology on them must be wireless. Communication made easy by RF or Wi-Fi technology but power transmission needs to be wired in any way. Battery operated devices is a limited solution. By less consuming devices batteries operate more than before but they always have an end in operation. Energy harvesting is another alternative for powering small devices. Energy could be harvested from light, from temperature changes, from motion and vibration. These provide very small amounts of energy which is collected and stored. Powering the devices when they are needed and leaving them in deep sleep at other times is another approach which drastically extends battery life.

3.3.4. Fault tolerance

Fault tolerance is another issue in IoT applications. Sensors are getting more sophisticated everyday but they are counting unexpected data. Data could be lost during entry or transfer. In application these kind of malfunctions must be tolerated. It puts IoT reliability in a risky position.

4. IoT for interior design and furniture

In 2015, 3 Billion consumer devices are connected and about 1.8 Billion devices are connected in industry. In 2016 4 Billion consumer devices and 2.2 Billion industry devices are expected to be connected. In 2020 expected number of connected consumer products is 20.7 Billion. [5] These figures expose that there is an expanding trend on end user products be connected. These are mostly technology driven devices like cars, PCs, tablets, smart phones, health care devices, refrigerators, washing machines, heating systems, TVs, electronic watches and etc. These devices are always seen as technological devices they arrive with user's manual. For this reason interaction with them is not familiar as laying on a sofa, opening a drawer, turning a knob, pulling the tap header to wash hands or looking through the window to see if the weather is cloudy.

Calm technology proposes a connected world in which everyday objects do their work as usual with an extra of sensing and reacting which is done as a background process and does not affect how people live their lives. This means not only TVs or phones be smart but also a chair or a bathroom mirror will be smart.

Smart home is one of the most promising areas of IoT. There are lots of devices working with electricity and lots of them are also controlled by small micro chips. If these devices connect each other their potential will be released. Most of these improvements will be firstly occur in the most device occupant part of the house, the kitchen. It is better to start discussion in that space. Nowadays lots of products are on the market having benefits of IoT. There are cooking ware delivering information to smart phones about cooking, kitchen scales working together with smartphones to find recipes through internet and scale ingredients, smart forks connected to a smart phones can warn you of your eating habits. Most of these products are being connected to smart phones and tablets and through those they connect to internet. In these scenarios smart phones are used as gateways and middleware. Most of the improvements are on branded mass produced consumer products. These products are promising better user experience. Expectations about smart home for the future concentrate on three main aspects:

- Resource usage (water conservation and energy consumption)
- Security
- Comfort [6]

4.1. How will connecting things will effect interior design?

Interior design as many design disciplines has two aspects: form and function. Form in interior design is set by visual properties of objects in interior space and their overall composition. These objects somehow emerge with their remarkable properties of function or visual properties. As in the example of a lamp shade which is part of an interior design project; it could be in any material and any form but at least it must serve its main function of shading the light coming from the lighting device. Most of today's IoT enabled devices are the ones that were previously serving for function. They connect and their functionality expands in unforeseen ways. But in interior design there are also visually remarkable objects which affect the overall composition of space. Wall painting, curtains, ceiling, flooring and more than all furniture is affecting the way one experience the space. Most of today's IoT enabled objects have their own eco system, most of them are connecting internet as a client and users benefit IoT as having a remote control of connected devices on their smart phones. These connections and feasible scenarios are the easy initials of the way to a calm technology. Because installing a wireless control unit to a refrigerator and programming it to deliver data from internet is not as difficult as changing the softness of a sofa while one changes his/her position on it.

4.2. Custom furniture design and production

Interior design is not always choosing ready-made objects and having a composition in space with them. There are also custom objects designed and produced specifically for the needs of the space. Most of these objects are furniture. Wardrobes, kitchen cupboards and many other types of furniture are designed and produced specifically for the measures of the space. For custom production of furniture there is still domination of craft production. It makes a dilemma of old techniques for a new technology while enabling IoT for them.

Custom furniture are made out of components: the structure, the cover, connections and accessories. Structural components are visible or invisible components making the furniture stay solid, they bear the whole weight of the furniture Cover is the component covering the furniture which are the most visible parts of the furniture and affects the visual appeal of the object. Connections are small and durable parts connecting other components or sub components. Structural components made up of many sub components which are connected by small connections. Connections connect cover to structure also. Accessories are ready-made components for function, these can be hinges, drawer rails, knobs. Most of these

components can be classified by different properties for example by their material, durability, mobility, being functional etc... These classifications are made for a normal production line. In order to have a project of IoT enabled furniture a new classification of components are needed in order to understand the potential. Previously mentioned properties of IoT installations could be a good starting point for evaluation of furniture components.

4.3. IoT for furniture design and production

IoT applications always come with a scenario. They are not installed on objects as a ready-made system. IoT devices vary, sensors, actuators and network devices, middleware elements are some of the main components. The scenario must be created among these facts. Enabling technologies on the market must be researched. Suitable components must be selected. Operation requirements of those components must be determined. Designed furniture must be virtually disassembled into its components. Component alternatives must be researched. Furniture components and IoT devices must be evaluated in order to have an optimum design-production integrity. Production must be guided by designer. In order to create an embedded system, IoT components must be hidden well in furniture components.

Due to the reason that most of the furniture are moveable objects, they need a wireless connection. For example a chair must benefit from wireless connection also other furniture like a coffee table or a sofa must benefit an energy efficient or no power solution in order to be freed of cables. Energy efficiency could be achieved by energy harvesting. There are lots of moving and vibrating parts in movable furniture. Drawer rails and hinges are opened and closed many times a day and they may provide enough energy to power energy efficient sensors.

IoT applications on furniture is not limited to smart home. Commercial places will need IoT for tracking their services. For example, a restaurant can benefit of tracking its tables if they are clean and ready for the next customer. Self-arranging furniture can be another scenario for commercial places. Furniture could move, rotate or change shape autonomously.

5. Conclusion

As statistical figures has shown and forecasting experts say that the next 5 years will be the years of connecting everything. We are already connected virtually by smart phones and social networking. Smart phones seems to be the center of connection. This image is still far away from the vision of calm technology. Technology is still outside instead of being embedded to everyday objects. Spaces where people dwell with objects will also be affected by this change. After easy transfer of appliances to IoT there will be a leap in everyday objects which are not produced with sophisticated materials technology. One of these objects is the furniture. Furniture seems to be an aesthetical interface to the functions interior space in daily life. With IoT application to furniture these functions will be extended be comfortably performed but it must be without leaving characteristic properties of furniture. Especially on custom furniture production a new approach should embrace craft production and imbedded technology. New scenarios for furniture use will be lighting the way to future interior spaces.

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The Effects of the Formation of Past Cultural Codes on Cyprus Nicosia's Old Houses and Administrative Buildings

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Abstract

“Culture” defined as a living life experience of societies, in short it is related to the past and to the whole constitution under the meaning of physical and spiritual. Societies which were shaped and enriched with the elements or codes that belong to the culture identify gained identity. Rapoport indicates that the “culture” is not a “thing” but an idea, a notion/concept, a configuration; it is a kind of label that people think about, believe about and to do about [1]. Related to this explanation it is not wrong to say that culture is a kind of thought type, a constitution, fully extending regulations that oriented, conscious or unconscious, being a society as a society and individuals as an individual.

Culture code is a key to understanding the type of culture, unique cultural features encoded in some form of information to identify the culture [2]. In architecture, related to the living habits, these codes arise especially on plan organizations and various architectural features on elevations. Culture which is shaped by various inputs, especially intensify its meaning with the possessions of codes that reached from the past to today and are not destroyed. The codes which emerge from architecture are especially important. They create an atmosphere to help feel and visualize the texture, culture and traces which belongs to previous cultures. These architectural features create the character/ language for every culture. These unique architectural elements are the codes or the signs of the cultures. They help to lighten the history.

Because of its geographical situation, Cyprus has been home to many civilizations which have bequeathed us a valuable heritage. These buildings which acted as a piece of living environment are consistency situated in Nicosia which has been the capital for 1200 years. The general layout and architecture which was based on houses, was shaped during the Lusignan, Venetian and especially Ottoman periods. After the Ottoman, English period was emerged nearly 72 years in the island. Especially, English period is effected on administrative buildings. Today the main layout of Nicosia has come from the Ottoman period. Beside the English period, basically many architectural features (like oriel window, clerestory, ...) are came from Ottoman period.

The main aim of this paper is to find the cultural codes of the Ottoman-Turkish, the Ottoman-Cypriot, English and English-Cypriot architecture. Beside the general layout, the level of the plan and the structural material, especially the interior organization and elevations which were an important characteristic feature of Ottoman and English architecture will be analyzed. This study will help to look at these two cultures and their valuable codes especially the interior approach and elevation view.

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Keywords: culture; code; Cyprus; ottoman period; English period.

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1. Introduction

The whole of a society's moral and material life experiences and formations is defined as culture. Culture is not constant, on the contrary, it continues to change from past to present with its relativist, artefact and historical aspects. Several kinds of input form culture by shaping and moulding together. Especially the existence of values which were handed down from generation to generation strengthens the meaning of culture. It is impossible to measure the value of today's cultural elements which bear ancestral meanings shaped by life experience [1]. The values of each culture, either its own or formed due to coexistence with other cultures, are in fact symbolised in different forms or codes. The repetition of such elements within certain cultures defines them as codes of the culture. Cultural codes play a key role in defining the culture, its type and the information encrypted on authentic special cultural elements in different forms [2]. Cultural codes cover the whole semantic symbols and systems related to a certain proportion of the society. However, it is necessary to analyse the build-up over the years and therefore the repetition of the conventional roots in order to understand these cultural codes [3]. The values that are seen particularly in architecture bear high importance as they make possible the touchable and visible observation of ancestral culture. A significant amount of information can be reached by reading cultural codes which can be seen in various scales such as urban scale, street scale, building scale, space scale, user scale, plan scheme, space formation and functions. In this regard, architecture is of high importance as an irreplaceable component of human and life. As a result of being human-oriented, architecture inevitably reserves many cultural codes which are shaped by elements such as lifestyle, function, climate, material, etc. From this point of view, the walled city of Nicosia has been chosen as an example to be analysed based on houses and administrative buildings.

2. Cyprus, Walled City of Nicosia

Cyprus has been a frequent destination for several cultures and communities due to its geographical position and today it still harbours plenty of ancestral values legated by them. The historical ruins date back to 7000 BC in Cyprus, the second biggest island of the Mediterranean. Following the Persian, Greek, Arab, Egyptian, Lusignan, Venetian, Ottoman and English periods respectively, the island has been divided into two parts as north and south as in 1960 a result of the conflict between Greek Cypriot and Turkish Cypriot communities. The common ancestral cultural remains in the northern Turkish Cypriot area and southern Greek Cypriot area, the architectural structures and texture that constitute the cities in particular are the most important witnesses of the history. The capital of 1200 years which densely contains remains of the communities that have influenced the island throughout history, Nicosia is still an important city as the capital of both communities of the island (Turkish Republic of Northern Cyprus and Republic of Cyprus (southern Greek area)).

The architectural development of the city corresponds to the Lusignan period (1192-1489), Venetian period (1489 – 1571) and Ottoman period (1571 – 1878). The first walls were built by the Lusignans and the defined city is located in the mesarya plain with Beşparmak Mountains in the north and Trodos Mountains in the south. The most remarkable structure that was built in the same period is St. Sophia Cathedral which was later converted to a mosque. Gothic religious structures like St. Sophia Cathedral are among the most valuable cultural elements of the city. The walls which were reshaped and narrowed down demarcate the borders of today's walled city of Nicosia. Venetians, who are known for the importance they place on defence, have built the new walls by mostly demolishing the original Lusignan walls. This period which includes the construction of residential buildings along with the fortification walls has ended following the invasion of the island by Ottomans in 1571. The main texture of the city starts to be formed and shaped in this period. Structures with different functions such as the inn, Turkish bath, mosque, shrine, library and covered Turkish bazaar have been built in this period. Arab Ahmet mosque, II. Sultan Mahmut library, mevlevi dervish lodge, the grand hamam, baths of tandi, korkut bath, Saçaklı ev, Derviş Paşa mansion, Kadı Menteş Efendi mansion, the grand bazaar, gamblers inn and laleli mosque are among these structures. Some of the structures were constructed on top of existing Venetian and Lusignan buildings in this period [4].

Great Britain rented the island from the Ottomans and ruled for almost 100 years (1878 – 1960). During this period, especially administrative and educational structures such as courthouse and government offices have been constructed [5]. Due to the increasing population, the city has expanded outside the fortification walls. New residential areas with different functions started to be formed during this period in direct proportion to the needs of the increasing population. The development during the English period continued differentially to the common language and identity [6]. However, in the following years, the rapid development of the city texture and

language has evolved into irregular urbanisation and left the city and its architecture with no identity and definition due to the lack of a development plan and definition of identity and character [1].

3. Housing in Nicosia city texture

The city texture of the walled city of Nicosia, which completed its main development during the Ottoman period, is influenced by climatic characteristics with its narrow and organic formed streets and dense residential areas. It has unique characteristics such as bay windows and cul-de-sacs. In early conventional Cypriot houses, windows are positioned above eye level, whereas in the following times they were designed as larger spaces. Numan and Pulhan explain this development as follows: “With time, the traditional Cyprus Turkish houses transformed into extroverted house forms and became more open to street life than earlier Turkish houses of Anatolia. As a consequence, cumba (bay window) was converted into balcony; number and size of windows on the ground floor increased; semi-open transition space on the street façade formed; and street used as an outdoor social-interaction space in front of the houses.” [7].

The existing Lusignan and Venetian structures have been redesigned based on the lifestyle of the new predominant culture of the island in addition to the Ottoman architecture, which was already suitable for it [8]. As a result of this development, a new city texture has raised which contained architectural elements of different cultures (Lusignan-Venetian) as well as Ottoman architecture. The unique architectural elements of Lusignan and Venetian periods, in other words codes, are commonly seen as round or lancet arches on the ground floor of the structures. In some structures, Raising street codes over the years resulted in insignificant arch spans which have lost their functionality. The arms of the county families of these cultures can be found in some structures, located at the top of the arch as stone rubbing. This kind of structures are generally found on the ground level of the buildings whereas, upper floors are characterised by Ottoman period architectural features and plan schemes.

These structures generally consist of ground floor and first floor [fig 1] . Ground floor consists of service spaces (kitchen, storage), multi-functional rooms, toilets, bath, sofa (sündürme) and patio, whereas first floor consists of multi-functional rooms and sofa (sündürme). The functions that take place in the plan scheme are generally positioned with direct connection to the sofa. This passage between different functions and the patio, which can also be used as a preparation space takes an important place in the plan scheme of the houses in the walled city of Nicosia. On the first floor of the houses, particularly in the bigger and more majestic ones, one of the rooms is generally bigger and more spacious compared to the others. Probably formal guests used to be hosted in these rooms (usually male guests – who used these rooms as “selamlık” (the proportion of a house reserved for men) which were also used as meeting room and living room. In addition to being bigger and more spacious, these rooms typically have bigger window openings. Especially these rooms become prominent in the structure because of its coffered ceilings.

The house plans of the walled city of Nicosia are shaped based on the nuclear family structure of the Ottoman period. In some structures it is possible to find miniature structures which are multifunctional and self sufficient living spaces. In this regard, rooms take palace in these houses in which a family can meet their basic needs such as eating and sleeping. These spaces also contain storage spaces called yüklük in which habitants of the house could keep pillows, bed sheets and pots and pans. On the other hand, spaces called kavukluk and lambalık take place in these rooms which were used to hand or place lamps. In some houses, spaces called gulushane can be found as an extension of yüklük in which the residents used to take a bath. In these rooms, cedars and sofas use to be placed along the borders of the space in a way that left the centre of the room empty. Kitchen, storage, bath and toilet are positioned separately inside the patio [7].

On the other hand, Bağışkan states that “it is possible to observe construction techniques used in Anatolia in conventional Ottoman style houses which were built by using local material in the walled city of Nicosia. Closet fittings, amulet fittings and a Wall construction system called bağdadi made of wood, stone and adobe take place among these structures”. Marble from marble quarries of Cyprus were used for the tiles of the ground floor whereas the wood was used for upper floors [8]. The Wall surfaces are generally covered with plaster on both floors. The beam-straw-soil ceilings which are generally used in the countryside take place in these houses as structural elements. In addition to this kind of ceilings, it is also possible to find wooden ceilings. The beams which are covered with straw are generally cut round or rectangular. Bağışkan states that “these beams used to be brought from Turkey in sailing vessels because the juniper trees that provide long and strong wood to make them cannot be found in Cyprus [8].

4. English Colonial Period – The Administrative Buildings

The walled city of Nicosia has been the administrative centre of the city since the Bizantian period. Several administrative structures have been constructed near Lusignan palace and the city centre. The governor's mansion which is near the Venetian square has been combined with the ruins of Lusignan palace in the Ottoman period. With the arrival of the English rule, instead of using the Ottoman administrative organisation, a new and systematic model has been constructed under the British Empire. In this sense, several urban and architectural regulations have been brought regarding infrastructural, educational, public and administrative structures. Tozan explains these practices as the modernisation actions of an external elite administrative group [9]. Tozan states that the administrative structures that were built in this new system in line with the requirements of various purposes were influenced by the requirements that raised in the early period (1878 – 1918). Some of these structures were built in order to symbolise the status of the new administration, whereas other buildings with simple solutions were built to provide spaces for various purposes [9].

In order to reflect their own design and style, English people wanted to apply their own architecture especially on the centre line which leads to the Venetian square and they have constructed a number of administrative buildings in the main square with the same perspective. In this context, it was decided to construct a courthouse complex in 1896. The construction started in 1900 and has been completed in four years. The post Office, which is another administrative building, was also constructed across from the courthouse complex.

The courthouse building [fig 2] which is a structure that surrounds a square shaped patio was constructed by using yellow Stones. The plan of the structure consists of series of single file rooms that open up to the semi-covered space. The structure consists of the ground floor and the first floor on top. On the ground floor, a semi-covered veranda with round arcades on the outer façade is positioned in front of the inner spaces. The same plan scheme is also applied on the first floor. On this floor however, the veranda is completed with wooden X shaped hand rails. The slopped roof that covers the veranda is supported by the wooden double columns which are placed on a line with the arcades on the ground floor. The rhythm and light-shadow effect which has been provided by using existing elements Show that the façade has been designed for set purpose. In order to strengthen the symmetry at the centre of the façade, the Victorian face stone portico formed part of the building which has a clock on the triangular fronton has been designed to stretch out from the façade to the front. The strong/massic slopped roof is covered with red French Marseilles roof tiles. In line with the requirements, new parts have been constructed in the following years on the east and West sides of the building with similar style. These new structures also consist of series of room which meet various functions and the corridors, arcades or verandas that run along the rooms. Costas states that, , these new structures also have the characteristics of the English colonial period along the sam eline with the main structure [10].

The post Office building [fig 3] is in a cubic form and positioned across from the courthouse complex. With its monumental body, front façade arrangement and architectural details, this building has the convenient representative quality for the centre point of the capital city. Using face stone as building material, positioning the entrance behind the arches of the semi-covered veranda at the symmetry centre of the façade on the ground floor, emphasising on the same attraction by using korynite headed columns on the upper floor and placing the vertical rectangular window spaces at even distances on the surfaces are the details that contribute to the monumental effect of the structure [9]. The front façade that is positioned parallel to the Sarayönü Street consists of three round formed arcades on the ground floor. The entrance at the centre of these arcades leads to the main hall. The first and second floors of these arcades carry four korent columns, architrave and cornice which raise along both floors. Marble railings take place between the columns. There is a triangular fronton above the door that opens up to the central balcony. Fitted columns around the other window on the façade are defined with yellow stone blocks. Yellow stone arcades take place on other façades of the structure as well. The eave hipped roof is covered with French type terracota roof tiles. On the ground floor behind the main hall general offices take place, whereas administrative offices are located on the first floor. The rooms on the second floor are used based on changing needs. The basement is used as customs Office.

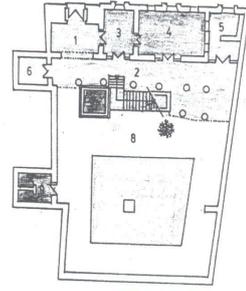
The architectural design of the structure is characterised more by the English architectural features of the time rather than the English colonial period. The scale of the post Office building has been built regardless of the Cyprus scale. The structure has been reorganised in 1989 and 2003 and continued to be used as the post Office [10].

5. Assessment

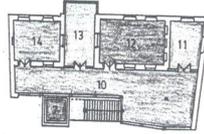
One of the values that reflect a culture's in the most effective way is undoubtedly architecture. Architecture includes spatial systems which can be analysed in order to understand the cultural, social and economical structure of a society [11]. It is the transformation of abstracted and symbolised lifestyles of a culture into cultural codes that harbour human life within. The repetitive usage of these symbols assimilates them into the culture they originate from and they take place in the architectural culture as cultural codes. Conventional and cultural inputs are inevitably serious inputs in the sense of spatialisation. These codes can be distinguished in the plan scheme as functional arrangements/constructions and especially in the elements that take place on the façade.

In this regard, Yıldız states that “the traditional Cyprus Turkish house can be defined as the most identical house form, in which Latin and other architectural components originated from historical background of the island are synthesised and reshaped by the Turkish character in urban areas of the island [12]. However, while its outward appearance reflects a multi-cultural achievement, spatial organisation of the house is completely Turkish in character. Due to structure and lifestyle of the Turkish family, space requirements, organisation of spaces and consequent form elements were Turkish-specific aspects of the house. In terms of plan organisation, the house has also certain relationships with traditional Turkish houses in other places under the Ottoman control [13]. In addition to the plan scheme of the housing architecture, Kuban states that “the space called sofa (sündürme) originates from a cultural background related to the Syrian and Iraqi Life housing scheme of 15th or 16th century” [14]. Therefore, generally in the housing plan scheme, it is the covered passage/preparation space facing the patio that has played an important role in shaping the Anatolian/Turkish architecture. It may be called differently based on the area of use (i.e. sergah in Ankara, Hanay in İzmir, divanhane and tahtaboş in other areas) [15]. In the plan scheme of Cypriot architecture, the same function is called sofa (sündürme). It would be accurate to define the appearance of the Anatolian life plan scheme in the architecture of the island following the Ottoman invasion in the 16th century as the architectural codes of the predominant culture of the island. On the other hand, along with its elements and symbols, codes in other words, miniature houses that serve for various purposes based on the family settlement take place in the Turkish Housing Definitions of Reha Günay. This shows that the housing architecture of the walled city of Nicosia has been influenced by the cultural codes of Turkish Housing [16]. In the construction of administrative buildings in the walled city of Nicosia, which were constructed during the English colonial period, yellow face stones were used as building material and the plan and façade of the buildings were characterised by the symmetrical arrangements. According to Tozan, the purpose of these preferences was to build an official identity for the new administration. These structures are defined as the first examples of the colonial architecture on the island by Schaar and others [17]. According to Costas Georghiou, in these structures, the ground floors are characterised by Victorian classical/Renaissance Revival architectures whereas the first floors are characterised by the English colonial bungalow style. Costas Georghiou also states that the post office building is the last example of the English Renaissance Revival period and the building was constructed by working on a plan which was brought to the island from England [10]. Tozan, on the other hand, suggests that the building was characterised in a way to reflect the official identity of the new administration in the early period [9].

In this regard, it can be concluded that the house plans of the walled city of Nicosia which were initially characterised by the codes that define Turkish housing have gained local codes through the changes that happened on the facade in time, whereas the administrative structures of the city are characterised by the monumental codes and administrative functions of the English period.



ZEMİN KAT - GROUND FLOOR



BİRİNCİ KAT - FIRST FLOOR

- | | |
|---|-------------------------------------|
| 1. Giriş (Entrance) | 9. W.C. |
| 2. Veranda | 10. Veranda |
| 3. Dinlenme - Sattı Odası (Information - Souvenir Room) | 11. Sekreter Odası (Secretary Room) |
| 4. Tezgah Odası (Weaving Room) | 12. Sobbet Odası (Coffee Room) |
| 5. Büfe (Buffet) | 13. Dinlenme Odası (Rest Room) |
| 6. Vestiyer (Cloak Room) | 14. Toplantı Odası (Meeting Room) |
| 7. Havuz (Pool) | |
| 8. İç Havuz (Inner Courtyard) | |

Fig 1. Nicosia old house [8]



Fig. 2 Court Building [10]

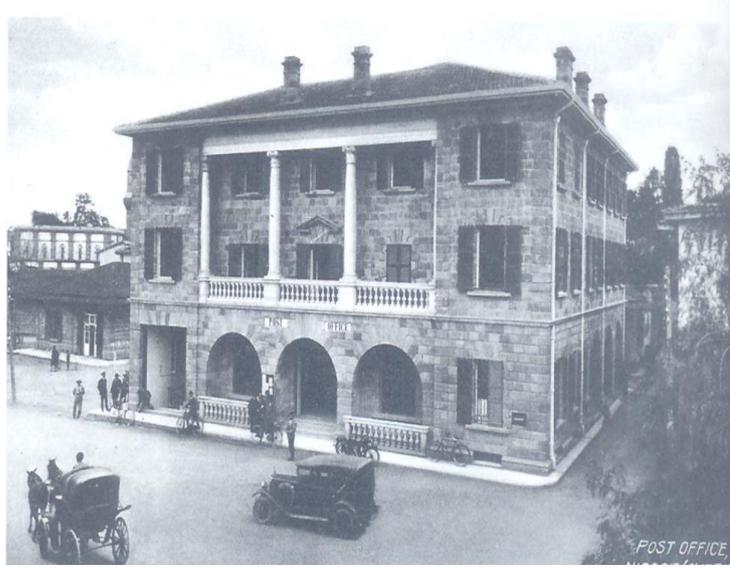


Fig 3. Post Office [10]

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Understanding The Design Of Mosques

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Abstract

Man-made spaces always build for a reason. Satisfying the needs of manhood uniformly becomes the core value of architectural studies. Design of architectural spaces is developed with the aim of appealing to the needs and values of manhood. Architecture is the result of a reason. Reason occurs from a need, which has a concept or an idea. Concept can be described as the main order of architecture. It can also called as the “essence” that determines the form. [1] The essence of the building is given by the concept and it cannot be changed after it is built. This fact emphasizes the importance of conceptual study before actual building activities. An architectural space cannot be seen as a whole and become an art form just because of its structure or appearance but because of its concept and the consistent essence behind it. [2] Concept of an architectural form is the soul that is given inside and outside of the specific space. Architectural spaces serve mankind in many different manners. These spaces fulfill tangible and intangible expectations. Sacred buildings are the places where the need of intangible expectations can be appealed to the most. Because of this reason the deep understanding of concept is required in order to built these structures. Mosques are the places in which religious practices of Islam take place. Like other religious buildings, in mosques reflections and representations of religious doctrine are emphasized by architectural components as a language of mysticism. Each mosque is built as a reminder of paradise. In order to achieve a heavenly space, the inner atmosphere of mosques is built in harmony. [3] Indirect light is used within mosques also for this reason. The inner space is decorated with Islamic paintings, which are composed of geometric patterns and calligraphy. Philosophy of the religion depicted by these highly sophisticated geometric patterns. These geometric patterns are depicted on the walls and the domes of the mosque. These patterns are used in order to reflect the abstract perception of the belief system. This tendency of symbolizing pure imagination is trying to be evoked by these symbols. Believer of this religion is wanted to be silent in mosques just to examine the codes of the symbolism in the name of practice their religion. Water is also used in mosques as an instrument of philosophical approach. An evoking empty space is achieved in mosques with the use of the great domes in the centre of the building. This empty space emphasizes universe, enables believers to pray alone with theirselves, but with the congregation as well. Philosophy of the religion is depicted by use of architectural items in Mosques. With the use of highly symbolism these sacred buildings also function as source of informative art works especially in XVI century. The mystic language of mosque architecture stands as book of symbolism to read and which also can be used as a guide to using the new symbolism system. The “essence” of Islam has been emphasized within the architectural forms of mosques. Symbolism in mosques was used as a way of depiction of the religion without

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using silhouettes. It was a way of narrating stories with geometric forms. This tradition of depicting the soul of the religion into the building comes from the beginning of the history of mosque design [4]. Therefore, it seems to be vital to be acknowledged about the art of Islam and the religion itself before designing a mosque in a good manner.

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Keywords: Essence; Form; Concept; Architecture, Symbolism, Mosque, Interior Design

1.1. The Essence

The history of mankind starts with their struggles with nature in the name of existence. The story of humanity continues on and on against the hard conditions that they have been driven. During their non-stop adventures only the spirit of inventions was with them to depend on. The idea of making (may be later building) shelters was to protect them from the threatening notions. Shelters were probably built by them in order to be protected by animals, may be by the darkness as well. Shelter as a tangible form built by human being. Its material varied according to where it is made when it is made. Beyond the construction and the material of the shelter the main idea is not changed. The most important of all is the essence behind a form. More than the presence of the physical entity of a structural element, its essence gives the power of strength to human being to live in a chaotic order. The essence can be described as the main order of the architecture. It can be resembled the seed in nature that combines the codes of form.

1.2. Essence of Form: Architecture

Architectural process is way of diminishing tangible and intangible expectations of mankind by building physical entities. In the name of appealing the expectations while designing an architectural form the importance of the essence must be foreseen. Since the form is determined with the spirit of the essence, and it cannot be changed once the architectural form has built. The unseen, undefined notions cause subversive impact on human being. They always tend to limit the limitless territories in the name of to feel the sense of security. The established limits become their perception of world, and then city walls, then become a wall of an architectural building. The tangible architectural spaces become a protected field in the chaotic order. This notion is very well explained by the philosopher Lao Tzu who lived around 6TH century BC known as the reputed author of the Tao Te Ching.

*“...Cut doors and windows for a room; It is the holes, which make it useful.
Therefore profit comes from what is there; Usefulness from what is not there”. [4]*

The strength of the architectural form doubtlessly comes from its unity. It embodies an abstraction of the psychosocial needs of mankind. The soul that is implemented to architectural form is the essence what we call concept nowadays. Concept is a notion that requires to be understood before designing. It encapsulates the form gives its entity a meaning.

1.3. Sacred Buildings

Sacred architecture designed as intermediary between physical and symbolic units. The strength of the religion generally implied with the immense structures. These solid structures are erected as the physical appearance of the sacred values. Symbolism can be perceived all over the sacred building. Religion is the utmost intriguing concept. The design of sacred buildings is inspired by the philosophy of the related religion. The enchanted concept is very well examined philosophically and scientifically. This devoted interest in studying the concept results with nourishing aspect to the philosophy that transforms into magnificent works of arts. Sacred buildings are designed as a book or a visual art forms implementing the features and the philosophy of the religion it represents. They are designed to be representing the religion with their form both from outside and inside. The viewer of these buildings tried to be welcomed by the messages that are given by the tangible building itself.

People from different cultures, different time periods or different religions always devoted considerable resources for their sacred architecture. Impressive, permanent monolithic buildings created by believers in the name of glorifying their belief. The holy structures, which are built from different periods, have survived till today. Now they are standing as a proof of history, combining the information of past and its beauty. The sacred buildings evolved over centuries. This sequence can be seen in the sacred buildings. Within the sacred buildings expressing and stimulating religious sensibilities is achieved. They stand as the architectural and artistic replicas of the religion they represent. The belief is depicted as three-dimensional work of art in which believers can practice their religion within its territory. *“They are reminders of the strong foundations upon which their value systems and dreams were built. These places provide a sense of security and promise”*. [5]

1.4. Philosophy of Islam and Islamic Architecture

Religious practices of Islam take place in mosques. Mosques also serve as the gathering places the believers of this religion. The spirit of unity is provided with these buildings, they are considered as the as the centre of the religious life. Mosques regarded as *“Allah’s House”*. The sovereignty and modesty of the sole creator tried to be gloried with mosques. In the name of achieving this divine duty idolized objects and notions are not used within these buildings. In the name of understanding the architectural formation and essence of mosque, the religion of Islam must be understood.

The very first message of Islam was *“Read”* that came to messenger Mohammed. It continued with: *“Read in the name of your Lord who created has created all that exists”*. [6] These very messages became the core values of Islam. This code that is dictated by the religion has caused improvement in writing and reading in among the believers of that period. Islam is the third of the monotheistic religions. This religion defines itself as the *“Allah’s mercy for the entire universe”*. The term *“Allah”* used for the sole god of the universe. The main source of Islam is Al-Quran and Al-hadist. Reading, searching, and studies in the name of understanding universe is very much appreciated by this religion. This tendency caused scientific developments in many areas. According to Islam in the name of reaching the love of Allah, he has to be comprehended by his believer’s. Believers’ interests in science and arts have increased in the name of paying the duty of the religion. Searching for the unknown considered as the way of praying. Studying any kind of science or art is supported. Mathematics, medicine, physics and the astronomy are expected to give the answers to unknown questions. During this period many scholars have been raised like Alfarabius, Avicenna, Al-Kindi and many others.

Figural arts does not welcomed by Islam. The intangible art forms are appreciated. Depicting figural arts in figurative forms regarded as confinement. From Islamic view, figural arts restrain the perception of the soul.

According to this perspective the depiction of the figures as the way it looks is creating obstacles for viewer to realize its real identity. Instead of depicting figural looks as its tangible forms in reality, it is required to depict the forms with their meanings. In art and architectural works the unknown dimensions tried to be reached by taking advantage of the disciplines of mathematics, physics and astronomy. Having been restricted by figural forms Islamic art forced to develop itself. Islamic art have found algorithm to express its philosophy by geometric forms. Geometric decorations were symbolizing infinity and became the basis patterns of the Islamic art. Geometric patterns have seen in different art forms with rhythmic rehearsals. [7] The presence of these patterns can be seen on walls, domes, carpets and rugs as well. [8]



Fig. 1. Terracotta frieze fragment, 11th century. [9]



Fig. 2. (a) Seljuq prayer ruq [10], (b) The façade of Şifahiye madrasah, 1217 Sivas, Turkey. [11]

The geometric patterns that used were all symbolized spatial notions. The viewer expected to dream about the possibilities of the infinity by the rhythm of the geometry that surrounded all over the mosque. Geometrical forms surround the interior of the mosque. These forms meets calligraphic writings located at the junction points of the buildings. An infinite harmony in geometry gains three dimensionality with use of muqarnas

(stalactite). Muqarnas is inspired by increasing sequence system of mathematics. The form of muqarnas is designed like a heavenly way. In addition to its beauty, it serves as vault. [12] Muqarnas' are used in different areas of the mosques. It can also be seen in niche of a mosque indicating the direction of Mecca.

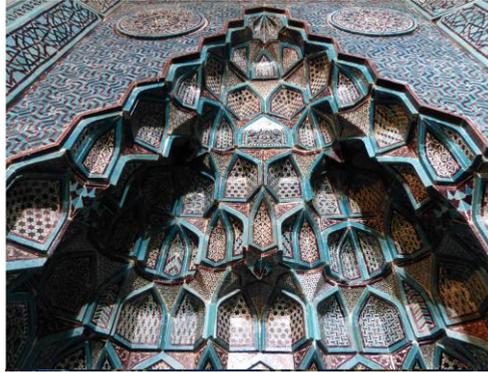


Fig. 3. Muqarnas (stalactite) of Eşrefoğlu Mosque, Beyşehir, 1299, Turkey. [13]

Interior of the mosques designed in the name of reaching the intangible unity with the use of science and art. The tangible forms are used for this very aim. [14] With the same ideology the Arabic writing, which has used to in writing Koran has developed so enormously that it becomes an art form. And it started to be used as decorative element in architecture and handi crafts.



Fig. 4. (a) Cenotaph cover with Qur'anic writing art, 17th–18th century [15]. (b) Süleymaniye mosque arch detail with writing as art depiction, 1558, İstanbul Turkey. [16]

Architectural activities held in order to serve human being. This discipline focuses on the visual and functional art with the conceptual understandings. Mosques become the symbol and the central feature of the Islamic way of life. In this sense it is not right to tell to Islamic architecture depend on certain era or period but it can easily be said that especially the mosques were built at the XVI. century were more sensible to the “essence of the form”. Eternality of form is hidden behind its philosophy. In the name of building mosques of any age the philosophy of Islam must be very well understood. Are these words all about to be said for the

mosques? May be not. The most important think in mosque architecture that should be emphasized is a mosque must be designed as a House of Allah. It must welcome everyone. In order to achieve this purpose they have to be build closer to residential areas. While the traditional Islamic forms can be used in these buildings new architectural technologies should also be applied always in the modest way.

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Use Of Architecture As A New Way Of Mesmerizing Tool Of Marketing In Shopping Spaces

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Abstract

As a dynamic science, marketing aims to satisfy the needs of a target market at a profit. Marketing science also aims to help business entities to survive in the competitive market conditions of today's. This fact causes marketing science to develop itself. In the name of coping with the hard market conditions marketing science started to use interdisciplinary approaches. Understanding customer needs and expectations become one of the main focuses on marketing. Marketing science started to use psychology to understand customer behaviors. It was the first question they asked: what is the main factor that causes happiness? The answer they found was "experiences". As it is proven by psychologists experiences makes people much happier than material purchases. [1] Experiences have the power of affecting people's life in a good manner and give them joy. From this point of view marketers started to focus on presenting experiences to customers. This kind of tendency caused marketers to see customers as individuals. Presenting experiences in marketing attracted people in a positive manner. This caused the development of "experiential marketing method". Experiential marketing is based on the entire experience a consumer has with a product or service. This method allows customers to try the product or service during the stage of shopping. According to this method customers are presented different kinds of experiments that are strategically designed by marketers. Design experiments emphasize the positive manner of the product or service and it should be unique for each of the business entities. The interdisciplinary approach of experiential marketing suits customers' needs and expectations at the high point. This tendency also causes success in terms of profit making. The key point of this method comes from understanding individuals and their expectations. The idea of experiential marketing can be adapted by architectural design in terms of shopping spaces. The architectural design of shopping spaces generally focuses on just functional and esthetical values. Paying attention to the experiential marketing method during the architectural design stage of shopping spaces can be helpful both for creating unique projects and profit making. Since it has been proven that presenting customers, strategically designed experiences enable business entities to gain of distinctiveness in a good manner. Designing architectural shopping spaces with experiential marketing method can lead to success of shopping spaces at the highest point. [3]

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1.1. Nature of Marketing Science

Marketing is a science, which can help to improve cash flow. This bare fact simply clarifies the reason behind the popularity of marketing. Offering economical solutions to competitive markets always welcomed warmly. Marketing as a science produces solutions for every economical units. It also presents solutions to business entities that are struggling to keep up with competitive market conditions. In the name of analyzing and producing innovative solutions marketing becomes a very dynamic science. Marketing is a science that keeps developing. Likewise the dynamic nature of marketing its definition is also changing and developing by time. In the name of understanding and gathering information about marketing The American Marketing Association (AMA) is established. AMA forms a platform in which marketers and academics works to provide both marketing solutions for today and solutions for tomorrow. The last confirmed definition of marketing approved by July 2013 is as follows: “Marketing is the activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large”. [1]

The main concentration of marketing is to develop programs to attain and retain customers. Understanding customers’ patterns of consumption is the focus of marketing management. Supply and demand perspectives are seen as the main indicators of market according to marketing. In order to understand the patterns of consumption demanded by customers, market researches are applied. Brand positioning and service developments are also designed by marketing science. [2] Both of these activities requires to spent great deal of money. This fact simply means that in order to gain money in the market, you have to spend much more money in the name of managing marketing activities. Marketing success is correlated with customer satisfaction and loyalty and regarded as necessities nowadays. These necessities tried to be satisfied by presenting customers benefits or solutions. In the name of coping with these targets the product is considered to be the centre of the problem. Positioning the logo representing the brand is also considered as a basic issue. Furthermore, brand itself regarded as much more important the product. This tendency causes commercial enterprises to focus their attention on building ‘brand equity’. In the marketing industry phrase of brand equity is used for the value of a brand with goodwill and name recognition can generate higher volume sales and profit margins against competing brands.

Marketing management can be held with four-stage processes. Understanding the current situation of the market considered as the first criteria. Marketing strategy is designed to exploit market opportunities and meet the organization's objectives and it stands as the second stage of the management program. The third stage is developing programs to implement marketing strategy. The fourth stage is to track efficiency and effectiveness of the programs that have been developed. [2] Varying degrees of skill and effort are used in marketing science activities all derived from absolute knowledge, practice, and aptitude. The market and absolute logic is over emphasized.

1.2. Who are the Customers?

There are lots of questions to be asked or the programs to be developed in the name of increasing profit margins. The hardest issue of all seems to be to satisfy the needs of customers who are treated as a source of profit, not as persons. It has been realized that there is a one simple question that did not asked before. Who are

these customers? To whom all of these marketing strategies are designed? What are their expectations? What make them happy? Or it is better to ask what does make them happier?

Concentrating on profit growth with full concentration lefts the most important factor in market to be unnoticed, which are the actual people. People can be better analyzed by the discipline of psychology. It is an applied science that concentrates on understanding individuals and groups by establishing general principles and researching specific cases. [3] [4] American Psychological Association describes psychology as “the study of the mind and behavior. The discipline embraces all aspects of the human experience”. [5]

Several psychologists question the notion of the happiness. Abraham Maslow is one of the professors who question this phenomenon. He addresses this subject formerly: *“For many of us, deciding how to invest our resources to maximize happiness is a challenge: We wonder whether we are as happy as we might be, given the resources at our disposal. We wonder whether more money, more leisure, or more stuff would make us happier. These queries may not apply to everyone, of course; individuals with severely limited resources may (rightfully) worry more about satisfying basic needs such as food, shelter, and clothing”*. [6] Does the material possessions or the unique experiences make people happier? A tangible answer was in need. A scientifically approved answer was required. In the name of finding the answer, several surveys have been undertaken by psychologists. In these surveys respondents from various demographic groups were chosen. Each of them is presented different opportunities about earning and spending money and having experiences. *“The discussion focuses on evidence that experiences make people happier because they are more open to positive reinterpretations, are a more meaningful part of one’s identity, and contribute more to successful social relationships”*. [7] With this survey it has been officially approved that happiness comes with experiences rather than by having things. As it is mentioned by Aristotle (4th century B.C.) *“...men fancy that external goods are the cause of happiness” but claimed that “leisure of itself gives pleasure and happiness and enjoyment in life”*. [8]

Psychological researches can help us to understand and interpret people. This understanding can lead improvement in many different areas of science. The discipline of psychology has proved the notion of “experience” is the strongest stimulus to make people happy. Aforementioned survey provides the inspiration for successful example of interdisciplinary collaborations. This perspective has been the basis for new branch of marketing called “experiential marketing method”.

1.3. Approaching Customers from a Different Angle

When psychologists figured out the importance of the experiences in person life during the year of 1990 marketers found this information very inspiring. The necessity of understanding customers was purely realized by marketers. Developing marketing strategies without empathizing with customers, started to be seen as going on a mission without directions. With this point of view new surveys have been done concerning shopping experiences. These surveys have figured out the fact that people feel the joy the most when they experience a phenomenon while shopping. This information barely reveals the necessity of designing and presenting experiences to customers. Experiences should be presented to customers, because they cannot be acquired if they are not available. As psychologists indicates that individuals will live happier lives if they invest in experiences more than material possessions. There is to opportunity lies to attract customers by giving the chance of happiness through presenting “experiences”.

The method of “*Experiential Marketing*” is developed on this basis. Thanks to the psychological contributions to this method the meaning of the customers started to be thought. Before developing marketing strategies understanding the importance of the human needs is understood. As a result of the strong impact of psychology: the dreams of people, and their ideal characters in their mind have also been researched.

The very aim of the experiential marketing method can be defined as to appealing the needs of people. In order to meet these requirements people and their needs are examined delicately. Before creating a brand and its marketing strategy its target market is analyzed through this process. The benefit of developing empathy with customers is also used during experience design. The whole design is developed according to customers’ expectations and dreams, brands identity, the product. By the way brand presents an experience to its customer in which customers can feel themselves special. The uniqueness of experiences makes the brands unforgettable for customers at the same time. Customer equity can be reached without expending great deal of money but paying attention to human senses and expectations is reached with this very simple way.



Fig. 1. The Hug Machine of Coca- Cola [9].

The Hug machine of Coca-Cola is one of the many examples of experiential marketing method usage. A Coca-Cola vending machine is placed in public with ‘hug me’ written on it. The machine gives free coke once somebody hugs it. It went viral and very appreciated by consumers even amongst the ones who usually drink coke.

Presenting tailor-made experiences to consumers is doubtless a striking method. But it is still not enough if it is not designed to appeal consumers’ senses in a holistic manner. According to Kant “*All our knowledge begins with the senses proceeds, then to the understanding and ends with reason.*” The attention of men can be

evoked through his senses as psychologists' states. In the name of providing integrity while appealing senses to the most, the strategic experiential modules are developed by marketing specialists. [10] This module is designed for each brand in a way to reflect its identity and its target market. The first module of strategic experiential modules is *sensory experiences*. The necessity of provoking five senses of the consumers is underlined with this module. By this way it is getting easier to evoke consumer senses and take their attention. The second module is called *affective experiences*. Through this experiential module the consumers feelings' are tried to be touched. The third of the strategic experiential modules is *creative cognitive experiences*. Such experiences contain humor or intelligence. These experiences are designed to trigger consumers to think. The bond between product and the consumer is abled by cognitive progresses. The fourth module is designed to take consumers in action. It can be used in *physical experiences*, behaviors and lifestyles. The last of these modules is the one that enables consumers to relate themselves with groups. These experiences are generally *social-identity experiences* that result from relating to a reference group or culture. [11]

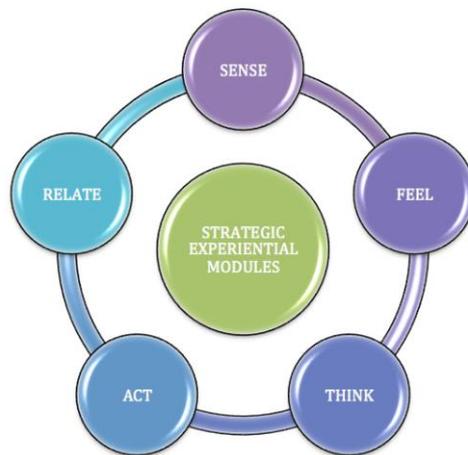


Fig. 2. The diagram of strategic experiential module.

The method of experiential marketing has been used in the market since 1990's. With the use of this method marketing specialists have improved their point of view by using psychological data into their discipline. This interdisciplinary tendency caused great success both in the name of understanding the consumers and profit making as well. When we consider the hard competitive nature of the 21st century market the advantageous proceeds of this method is getting clearer to be seen.

1.4. Experiential Shopping Spaces

While working for developing a new perspective to science, contributions of interdisciplinarity have non-negligible impression. Like other disciplines in architecture there is always problems and questions to be solved. The architectural design of shopping spaces is one of the most popular topics of nowadays. Under today's economic conditions business corporation' expectations from architectural design have been risen too much in order to gain power to their competitors. This situation causes a competition between architects who design shopping spaces. From this point the architectural questions emerge: How to design shopping spaces to satisfy the expectation of the owner of shopping places? Does the uniqueness' of design in architectural terms

is enough to achieve a success in terms of shopping spaces? Is it possible to sustain attraction by architectural design?

Some of these questions have already been asked. And tried to be solved with the use of marketing science. With this point of view the design of shopping places have been started to be supervised by marketing specialists. Customers are defined as “*the actual or prospective purchaser of products or services*” by marketing science. [12] The spaces that have been designed with this understanding have become soulless places. These shopping spaces contain subareas that can perfectly perform a stage for the each phase of shopping activity. In terms of architectural design they also present the viewers almost art forms. Still the expected achievement of satisfaction cannot be reached. After all of the studies of customers do not like to spent time in shopping spaces.

Changing of the definitions and the tendencies that have been done might be the solution for this problem. Since the use of experiential marketing method caused beneficial result in marketing activities, it can also help with the architectural design of shopping spaces. Embracing this methods’ point of view can lead new perspectives to shopping spaces design. In the name of adapting experiential marketing method it would be a better start to define customers as human beings who have desires and dreams in the name of reaching happiness. As it is stated formerly, the strategically designed experiences have the power of presenting persons happiness. Architects can make use of this knowledge. Since it is proven that method of experiential marketing composes a model of both happiness for customers and profit growth in the market.

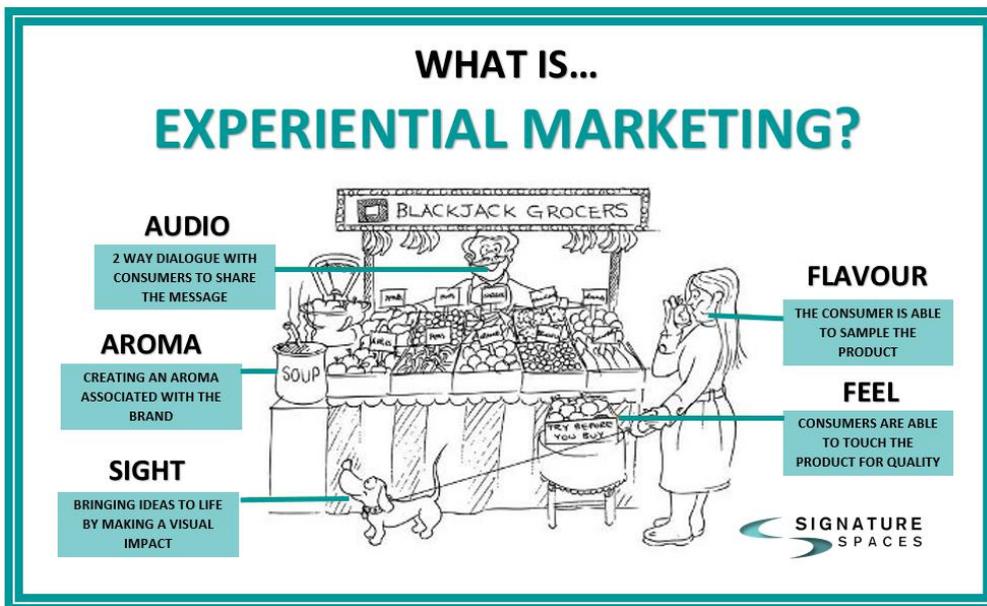


Fig. 3. Experiential marketing ideas. [13]

Architects can apply the method of experiential marketing first by understanding the necessity of developing empathy with customers. Use of this methodology comprises uniqueness; from this reason when it is said customer it refers the target market of the specific brand and the product. Understanding their needs and dreams

becomes the key point before starting with the design issues of the shopping spaces. The architects who like to use this method must be well informed about experiential marketing method or collaborate with specialist. The brand identity and expectations must be examined. Experience design should be developed in line with marketing strategy of the company. Designing experiences is one of the most important and demanding issues. During this stage the identity of the brand, product and the expectations of the customers are analyzed. Strategies are developed through the feedbacks. According the attribution of the product(s) that will be exhibited in the shopping space the experiential design of the actual architectural space can be developed.

Customer-centric spaces will be designed with this point of view. This tendency will also satisfy the needs of presenting unique architectural designs. [14] Expectations from the design of shopping space design is beyond the known essential criteria of shopping spaces design In the Determining experiential areas in shopping spaces transforms shopping spaces into *experiential shopping spaces* [15] in which customers can experience their dreams.

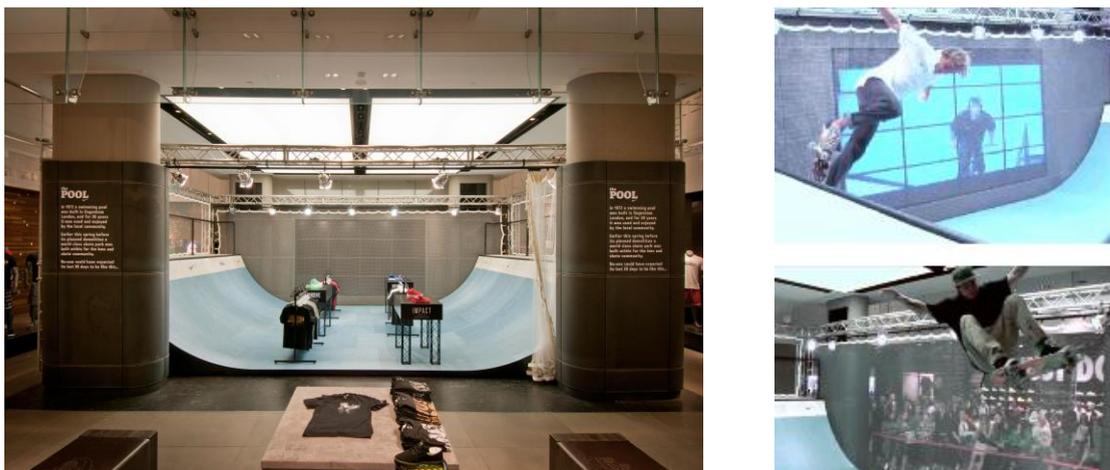


Fig. 4. (a) Experiential area in a shopping space in which products of the related sports are on the sale (b) customers experiences the products [16].

Experiential areas in shopping spaces can be designed with use of strategic experiential modules as much as possible. Experiential areas are designed for the use of target market. The relaxation and happiness of the target market is focused within these areas. Presenting such areas in shopping spaces enables customers to spent more time in shopping space. Since examining the brand identity, product, target market are the main determinants of experience design each shopping space designed with this methodology will be unique. The design of such places will be distinctive because of the methodology. Addressing different virtues of notions in strategically designed experiences and architectural design has the power of mesmerizing the target market. Sensuousness in shopping space design can establish a bond between the brand and target market. This recommended method in architecture can be a method of dealing with the competitive market conditions of todays. The model of experiential shopping spaces differentiates from its competitors. This differentiation causes customer loyalty and equity. Thus, in experiential shopping spaces customers can feel themselves very special. They can explore the experiences, which are especially designed for them in a unique and different architectural form.



Fig. 5. (a) The display area of the products (b) experiential area [17].

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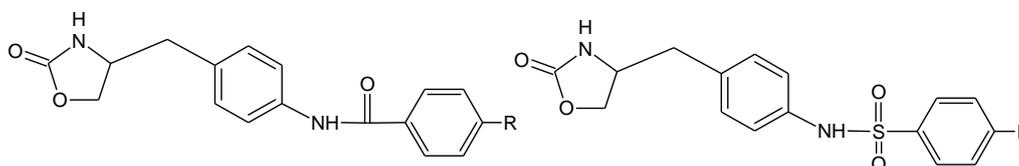
SYNTHESIS and STRUCTURAL ELUCIDATION of NEW 2(1*H*)-OXAZOLIDINONE DERIVATIVES

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Arylamide/sulfonamide derivatives are attractive pharmacophores for drug candidates due to their applications as antibacterial, antifungal, antituberculosis, antiepileptic and anticancer pharmacological agents [1-5]. In this study, we aimed to synthesize some new *N*-{4-[(2-oxo-1,3-oxazolidin-4-yl)methyl]phenyl}benzamide/benzenesulfonamide to find more active and less toxic antibacterial compounds. Amide/sulfonamide compounds were synthesized by treatment of 4-substituted benzenesulfonyl chloride or 4-substituted benzoyl chloride with (*S*)-4-(4-Aminobenzyl)-2(1*H*)-oxazolidinone. All the new compounds were characterized by elemental analysis and spectroscopic data (¹H-NMR, IR and Mass).



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Key Words: Sulfonamide, amide, oxazolidinone

A HIGHLY SELECTIVE COUMARIN-THIAZOLE BASED SCHIFF BASE CHEMOSENSOR FOR FAST DETECTION CN⁻ ION IN AQUEOUS SOLUTION: SYNTHESIS, MOLECULAR CHARACTERIZATION, Pd (II)/Pt (II) COMPLEXES

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Fluorescent chemosensors are highly valuable in a variety of fields including environmental chemistry, analytical chemistry, and bio-medicinal science. Coumarins, with the structure of thiazole, have many advantages including high fluorescence quantum yield, large Stokes shift, excellent light stability, and less toxicity. Therefore coumarin derivatives have served as good chemosensors of anions including cyanide, fluoride, acetate [1]. In our study, the new multi-functional Schiff base based chemosensor and its Pt(II) and Pd(II) complexes were synthesized by using general complexation procedure [2] as shown in Fig1.

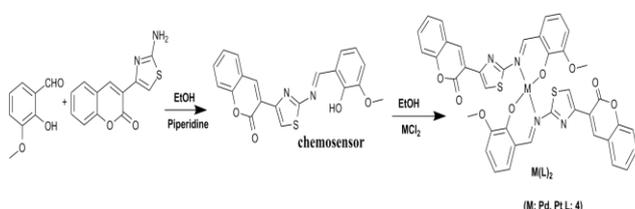


Fig.1. Synthetic pathway of sensor and its Pd (II)/Pt (II) complexes.

All compounds and complexes were characterized using general spectroscopic methods (FT-IR, ¹H/¹³C-NMR and LCMS). In this study, we report a simple Schiff base chemosensor which can selectively detect cyanide besides interfering anions like AcO⁻ and F⁻ in aqueous medium via UV-vis and fluorimetric spectroscopic methods. Interaction mechanism between

CN⁻, F⁻ and AcO⁻ and sensor could be possibly explained by the hydrogen bonding ability and the nucleophilic addition of the anions as shown in Fig2.

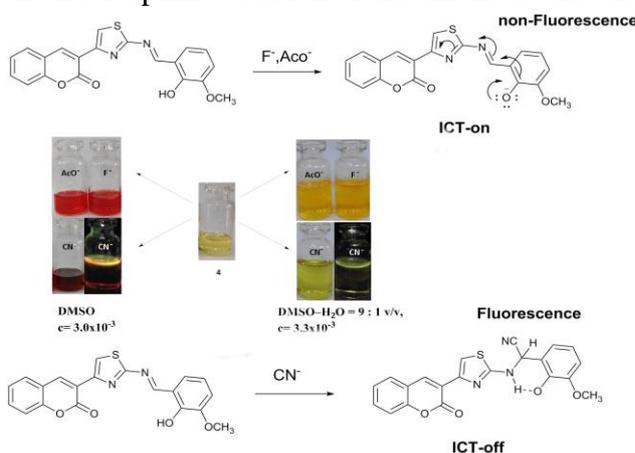


Fig.2. Interaction mechanism between CN⁻, F⁻ and AcO⁻ anions and chemosensor

In our study, in case of Schiff base chemosensor with CN⁻ deprotonation of phenolic proton and addition in imine carbon were observed. The deprotonation process and the nucleophilic addition mechanism of CN⁻ were supported by the ¹H NMR titration study. In conclusion we have developed coumarin thiazole-based highly selective CN⁻ chemosensor in DMSO solvent (10⁻⁵M). Also we synthesized Pt(II) and Pd(II) complexes of chemosensor. From the spectroscopic characterization, it is concluded that

Schiff base act as a bidentate ligands coordinating through CN and phenolic-O in square-planer geometry.

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Key Word: Coumarin-thiazole, Schiff base, Chemosensor, CN⁻, AcO⁻, F⁻ ion, Metal complexes

This work is supported by TUBITAK 214Z152

COUMARIN- THIAZOLE DERIVED FLUORESCENT CHEMOSENSOR AND ITS Pd (II)/Pt (II) COMPLEXES

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The development of sensitive chemosensors is an active field of research in recent years because of their potential application in clinical biochemistry as well as analytical chemistry and environmental science [1]. As a result of studies for years on the coumarin compound it was found to have very good photophysical properties of various derivatives. Even in daylight, it was found that the fluorescence intensity is quite high [2]. Also coumarin derivatives are well known biological active compounds. This type class of compounds with biological activity, such as analgesics, anticoagulant, human leukocyte elastase, diuretics, anticancer and antibacterial pharmacological properties [3].

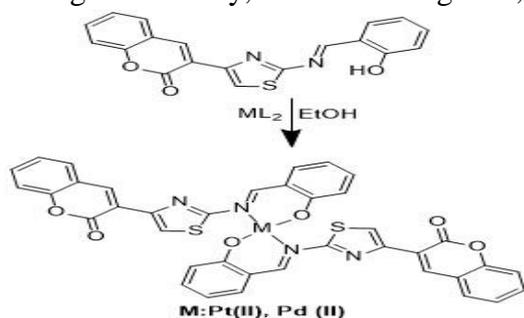


Fig 1. Schiff base and metal complexes

In this study, coumarin-based fluorescence Schiff base and its Pd(II), Pt(II) complexes have been synthesized and characterized by using elemental analysis, spectrophotometric methods (¹H/¹³C-NMR, FT-IR, LCMS) as shown in Fig2.

UV-visible absorption and emission spectra were obtained for analyzing the Schiff base photo-physical properties.

In this work, the cyanide anion sensitivity against Schiff base was investigated (Fig2). For the CN⁻ anion titration study it was obtained optimum absorption spectrum in DMSO solvent (10⁻⁵M). The same method was used in fluorescence studies. Fluorescence was determined against rising cyanide ions. Schiff base behaves highly selectivity and sensitivity toward cyanide anion in DMSO solvent (10⁻⁵M). From the spectroscopic characterization, it is concluded that coumarin-thiazole based Schiff base act as a bidentate ligands, coordinating through CN and phenolic-OH via deprotonation. Pd(II), Pt(II) complexes have square-planer geometry. Square planer the common geometry for the following d⁸ metal ions.

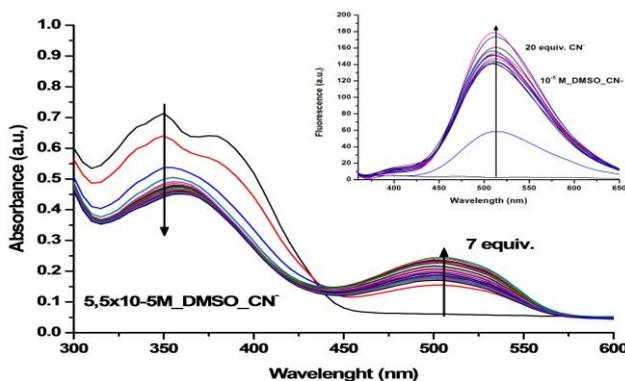


Fig 2. Fluorescence and absorbance spectra changes of Schiff base upon addition of TBACN salt in DMSO

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Key Words: Chemosensor, Coumarin Schiff-base, Fluorescence, CN⁻ ion, Metal complexes

This work is supported by TUBITAK 214Z152

CONFORMATIONAL EFFECT ON DS- AND G-QUADRUPLEX DNA BINDING ABILITY OF PERYLENE DIIMIDE CONJUGATE SYSTEM

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The perylene diimides (PDI), have been reported to be selective for G-quadruplex structures with little affinity for either single- or double-stranded DNA (ds-DNA) [1]. Phthalocyanine (Pc) derivatives also have substantial potential as high-affinity G-quadruplex-ligands because these planar chromophores are similar in size and shape to the G-quadruplex. Previously we reported the synthesis, electrochemical and in situ spectro-electrochemical properties of PDI and cage-like covalently linked donor-acceptor PDI-Pc system [2].

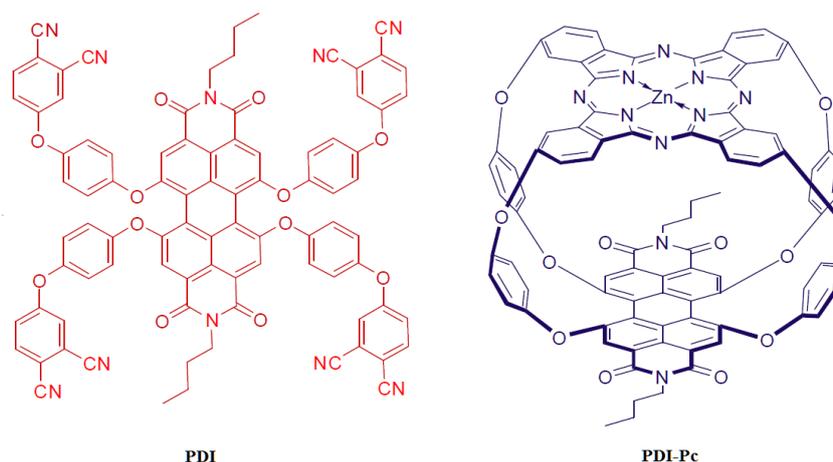


Fig.1 PDI and PDI-Pc

In this study, G-quadruplex DNA binding abilities of these two supermolecules are studied under an identical condition to shed light on the conformational effect on ds-DNA and G-quadruplex DNA binding.

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Key Words: (Perylene diimide, Phthalocyanine, G-Quadruplex DNA, ds- DNA, DNA binding)

Synthesis of Poly (ϵ -Caprolactone)-g-Poly (Ethylene Glycol) Comb Type Amphiphilic Graft Copolymers via Click Reaction

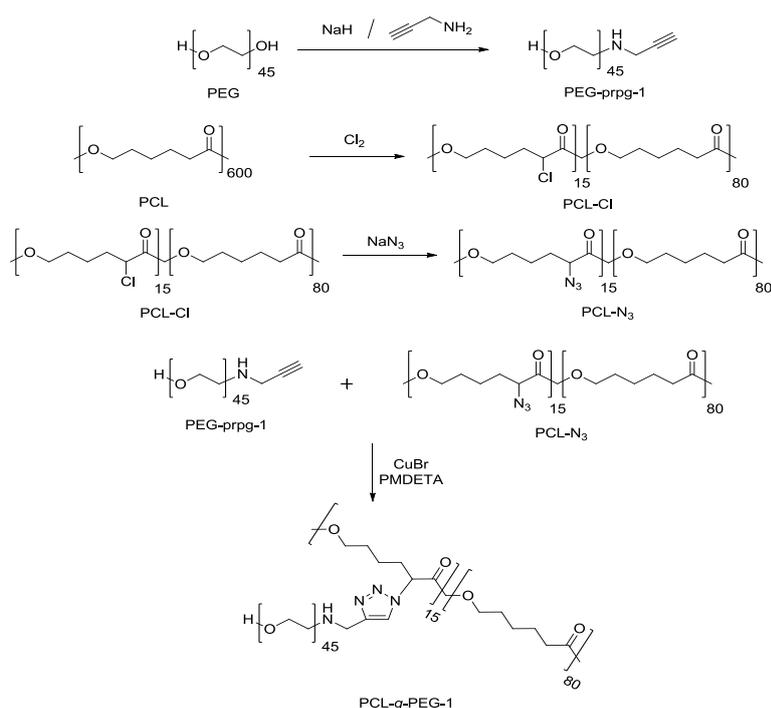
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The Cu (I)-catalyzed alkyne-azide cycloaddition (CuAAC) reactions were used as a new strategy for the synthesis of well-defined copolymers. It has widely been used in the synthesis of the various types of block and graft copolymers, functionalized polymers, telechelics and new macromonomer [1,2]. This work describes the synthesis of a novel polycaprolactone-g-poly(ethylene glycol), (PCL-g-PEG) comb type amphiphilic graft copolymers via click reaction. Chlorine gas was passed through the chloroform solution to obtain chlorinated polycaprolactone. Pendant chloride groups of PCL were reacted with sodium azide to prepare PCL with pendant azide groups (PCL-N₃). Poly(ethylene glycol) methyl ether (mPEG) was then reacted with propargyl chloride to achieve alkynyl mPEG (mPEG-alkyne) followed by click reaction carried out by the reaction between PCL-N₃ and mPEG-alkyne to give PCL-g-PEG comb type amphiphilic graft copolymer. The introduction of hydrophilic blocks into PCL chains enhances hydrophilicity and biodegradability. PEG can thus be used as a promising material for biomedical applications due to its low toxicity, good hydrophilicity, excellent biocompatibility and biodegradability [3,4].

The resulting products were characterized by ¹H NMR, FTIR, gel-permeation chromatography (GPC), SEM, surface tension, contact angle and water uptake measurements, DSC and TGA techniques. Interestingly, SEM images of the PCL-g-PEG comb type amphiphilic graft copolymers illustrated the highly microporous structure.



Scheme 1. The reaction mechanism of the synthesis of PCL-g-PEG-1 amphiphilic graft copolymer.

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Key Words: Polycaprolactone-comb-polyethylene glycol, Click reaction, Amphiphilic copolymer, Surface tension

HETEROCYCLIC COMPOUNDS FROM (THIO)SUBSTITUTED NITRODIENES

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The aim of this work is to investigate the reaction of the very reactive mono(thio)substituted 2-nitroperchlorobutadienes with some piperazines. In this study, N,S-substituted butadiene compounds have been obtained from these reactions. A number of mono(thio)substituted compounds of 2-nitroperchlorobutadienes were also prepared previously [1].

It is known that some heterocyclic compounds have got biologic activities such as herbicides, insecticides, fungicides etc. from US-patent [2]. From the spectroscopic data and related literature it can be concluded that these new compounds are formed by substitution of chlorine atoms bound to the first carbon of nitrodiene with N-nucleophiles.

The new compounds are purified by chromatography on silicagel. These compounds are characterized by micro analysis and spectroscopic methods (IR, NMR etc.).

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Key Words: NitroButadienes, Sulfur Compounds

SYNTHESIS AND INVESTIGATION OF NOVEL QUINONE COMPOUNDS

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Quinones are useful compounds for preparation of superconducting materials. They also exhibit high biological activity as antimalarial, antifungal, antitumor and antibacterial agents.

The *p*-chloranil containing chlorine atoms and a pair of carbonyl groups is a quite reactive compound. Therefore a large number of *p*-benzoquinone derivatives are synthesized from *p*-chloranil. *p*-Chloranil and its derivatives behave as electron acceptors in the reaction of charge-transfer complexes. Thioethers which are synthesized from the reactions of thiols with quinones are known as thioquinones [1]. Tetrakis(thio)-substituted-1,4-benzoquinone compounds are used in the dye industry. Certain thioquinone dye molecules are known to have characteristics such as organic nonlinear optical materials, organic photoconductors, and emitters for electroluminescence. According to an US patent, mercapto quinones are valuable compounds for using oil-soluble fungicidal sprays on plants as fungicides. It has been reported before that from the reactions of *p*-chloranil with difunctional thiols have been obtained the cyclic thioquinones, their solid state spectrum and crystal structure have been investigated.

The main purpose of this study is to synthesize novel thiosubstituted *p*-benzoquinones and identify of their structures by micro analysis and spectroscopic methods(IR, NMR etc).

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Key Words: *Quinones, Sulfur Compounds*

Novel synthesis of SNS pincer type thioether ligand (2,6-[[bis(2,6-dimethylphenyl)sulfanyl] methyl]pyridine) and its Cu(II), Co(II), Fe(II) metal complexes: Spectroscopic (NMR, Mass, FTIR, UV-Vis) characterization studies

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Thioether ligands containing pyridine group and their metal complexes have received considerable attention because of their various crystal conformation properties and applications. Thioether compounds have also found application in medicinal chemistry, biological and catalytic activities [1-3]. Thioether-pyridine compounds containing N and S donor atoms have found applications in medicinal chemistry, antimicrobial properties and homogenous catalysis [3]. Thioether compounds play a key role in many catalytic processes [4].

Thioether ligand was synthesized from reaction of 2,6-dimethylbenzenethiol with 2,6-bis(chloromethyl)pyridine. Metal complexes were synthesized from reaction thioether ligand and metal chloride. Thioether ligand and its metal complexes were characterized by elemental analysis, UV-Vis, ¹H-NMR, ¹³C-NMR, FT-IR spectral analysis.

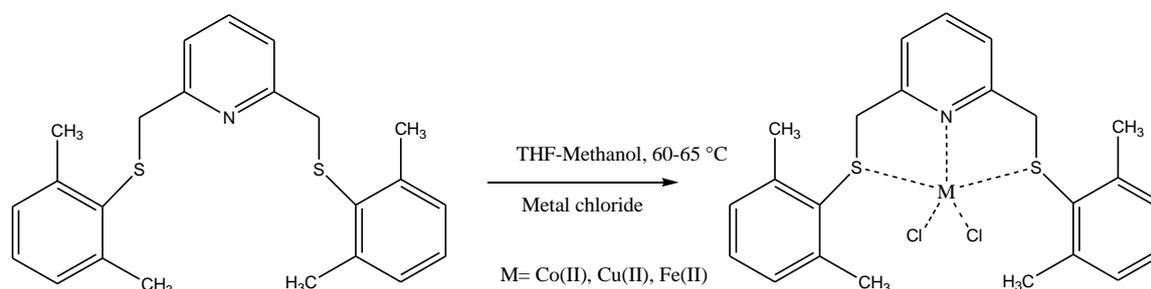


Figure1. Synthesis of thioether ligand metal complexes

*This study is supported by a grant (Project number: FEF.13.06) from Presidency of Scientific Research Projects of Gaziantep University.

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Key Words: SNS pincer type thioether ligand, characterization, metal complex

Synthesis of a new ONNO donor Tetradentate Schiff base Ligand and binuclear Cu(II) Complex: Spectroscopic and photoluminescence investigations

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β -diketones benzene derivatives which usually exist in enol and keto forms. Generally the enol form is observed in solution for β -diketones [1,2]. The enol tautomer of these forms absorbs strongly in the UVA region whilst the keto forms generally absorb in the UVB region. To block UV light of avobenzene is one of the fundamental compound in sunscreen. Therefore, a number of β -diketones have received regulatory approval for use in sunscreens worldwide. However, they are prone to photodegradation, causing substantial loss of protection [3]. So, organic luminescent metal complexes have attracted great interest. β -diketone and derived Schiff base metal complexes have great interest by many researcher because of their dioxygen uptake [4], oxidative catalysis [5], magnetic and biological properties [6].

The aim of this study is to synthesize new Schiff bases formed β -diketone benzene derivatives had structure with *p*-phenylenediamine and molecular structure of the Schiff bases are to clarify by UV, FT-IR, ¹H-NMR, ¹³C-NMR, TGA, elemental analysis methods and determine photoluminescence properties. The likely composition of synthesised Cu(II) complexes were confirmed by its analytical data and structure was suggested by spectroscopic investigations.

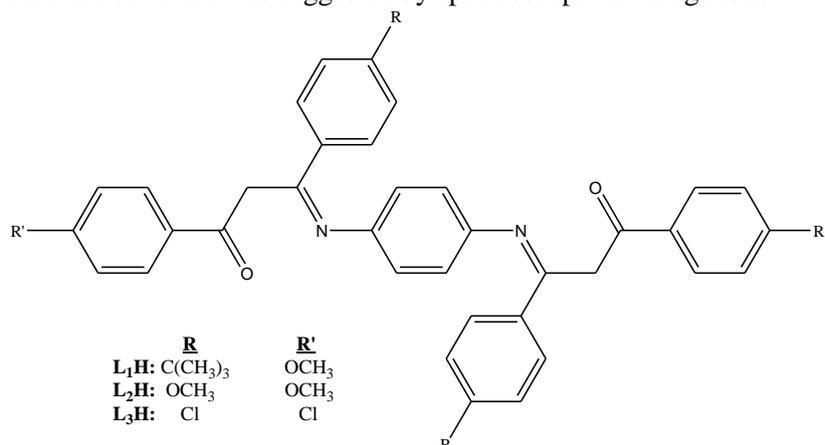


Fig.1. Structure of synthesized Schiff bases

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Key Words: Schiff base Cu(II) complex, β -diketone, photoluminescence properties

Carbazole derivative synthesis and their Electropolymerization

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In this study, a research at the latest advances in carbazole derivative synthesis and their electropolymerization processes were investigated in detail. Conjugated monomers of carbazole derivatives and their polymers attract interest due to their suitability in a broad range of applications, such as photovoltaics, electroluminescent devices, field-effect transistors and supercapacitors etc. The carbazole-based compounds are particularly attractive due to their important photochemical and thermal stability [1].

Carbazole compounds have drawn attention because of their versatility in functionalization, good chemical and environmental stability, excellent charge transport ability etc. Lav et al [2] have considered the synthesis and characterization of carbazole-based π -conjugated system with fullerene as electron accepting an ambipolar conjugated polymer.

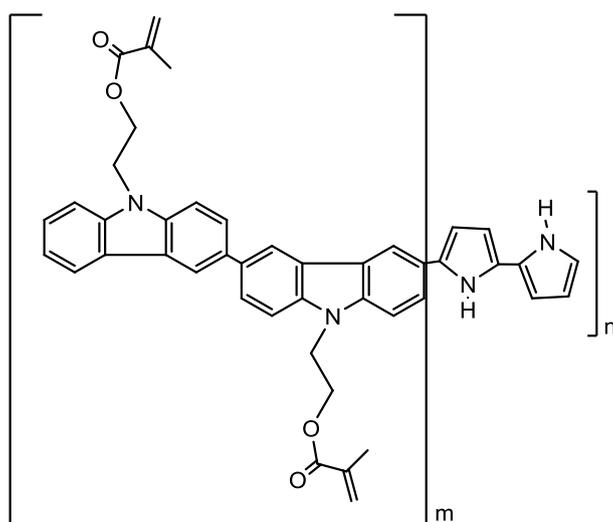


Figure 1. The Electrosynthesis of methylpyrrole and 2-(9H-carbazole-9-yl) ethylmethacrylate (CzEMA).

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Key Words: Carbazole derivatives, Comonomer, Electropolymerization, Corrosion, Fuel cell.

Synthesis of (9*H*-Carbazole-9-yl)-Carbothioic Dithioperoxyanhydride, Poly(9*H*-Carbazole-9-yl)-Carbothioic Dithioperoxyanhydride) Formation and Capacitor Study

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In this study, 9*H*-Carbazole-9-carbothioic dithioperoxyanhydride (2CS₂Cz) was chemically synthesized in our previous studies [1, 2]. Specific (C_{sp}) and double layer capacitances (C_{dl}) of the electrocoated poly(9*H*-carbazole-9-carbothioic dithioperoxyanhydride) P(2CS₂Cz) films were obtained on glassy carbon electrode (GCE). The polymers were characterized by cyclic voltammetry (CV), Fourier transform infrared reflectance-attenuated total reflection spectroscopy (FTIR-ATR), scanning electron microscopy (SEM), energy dispersive X-ray analysis (EDX), and electrochemical impedance spectroscopy (EIS). Polymer characterizations of FTIR-ATR, and SEM-EDX analysis were taken on carbon fiber microelectrodes (CFMEs). The initial monomer concentration of 2CS₂Cz was taken as 0.25, 0.5 and 1.0 mM in 0.1 M sodium perchlorate (NaClO₄/acetonitrile (CH₃CN)). The capacitance behaviour of 2CS₂Cz / GCE is shown by Nyquist, Bode-magnitude, Bode-phase and Admittance plots relationship. The low frequency capacitance ($C_{LF}= 0.52 \text{ mFcm}^{-2}$) and double layer capacitance ($C_{dl}= 571 \text{ } \mu\text{F}$) were obtained for $[2\text{CS}_2\text{Cz}]_0= 0.25 \text{ mM}$ and 1 mM, respectively.

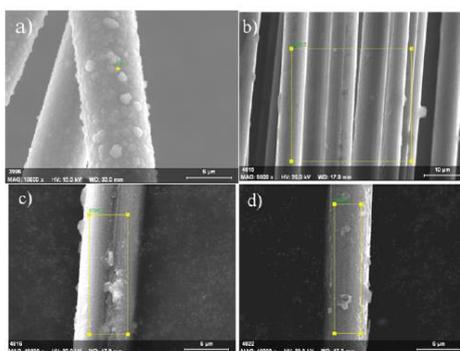


Figure 1. SEM images of **a)** PCz/CFME, **b)** P(2CS₂Cz)/CFME, $[2\text{CS}_2\text{Cz}]_0= 0.25 \text{ mM}$, **c)** $[2\text{CS}_2\text{Cz}]_0= 0.5 \text{ mM}$, **d)** $[2\text{CS}_2\text{Cz}]_0= 1.0 \text{ mM}$. Polymerization was obtained by chronoamperometric method at constant potential of 0.8 V in 0.1 M NaClO₄/CH₃CN.

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Key Words: Capacitance, Conducting polymer, Electrochemical impedance spectroscopy, Electropolymerization, Poly(2CS₂Cz).

ANTIRADICAL AND ANTIOXIDANT POTENTIAL OF *Curcuma longa* EXTRACTS

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It has been suggested that natural antioxidants are more safe and healthy than synthetic antioxidants which used in food. Turmeric is primarily consumed in the form of powdered rhizomes mainly for coloring because of its yellow color and its associated medicinal properties. It imparts characteristic flavor and preserves the freshness of the product prepared. The curcuminoid pigments and volatile oils, which are the major secondary metabolites of turmeric, have been shown to be largely responsible for the pharmacological activities of turmeric powder, extracts and oleoresins (1,2).

Turmeric (*Curcuma longa* L.) is one of the most popular spices containing natural antioxidants and is reported to possess numerous medicinal properties including antioxidant antiprotozoal, antitumour, antiinflammatory and antivenom activities. The major biologically active components of turmeric are curcuminoids which include curcumin, demethoxycurcumin and *bis*-demethoxy curcumin. Curcumin is a yellow-coloured phenolic pigment and is an effective antioxidant that can scavenges superoxide radicals, hydrogen peroxide and nitric oxide from activated macrophages (3).

The objective of our work was to determine the antioxidant potency and total phenolic and flavonoid contents of turmeric *in vitro* by analysing the radical scavenging activity of extracts for different antioxidant tests. Total phenolic and flavonoid contents were determined as gallic acid (GAE) and pyrocatechol equivalents (PE). The methanolic extract exhibited the higher total phenolics content (502.6 ± 11.3 mg GAE/g extract), whereas the contents obtained with ethanolic extract were smaller (421.8 ± 10.1 mg GAE/g extract). The content of total flavonoids expressed as pyrocatechol equivalents, varied from 281.1 ± 5.3 to 303.2 ± 4.1 mg as PE/g extract. The results obtained in this study clearly indicate that turmeric has a significant potential to use as a natural antioxidant agent.

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A COMPARATIVE DNA BINDING STUDY FOR HETEROLEPTIC PLATINUM(II) COMPLEXES OF PIP AND HPIP

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Since the demonstration of G-quadruplexes telomeric DNA [1], their conformations and functions have gained considerable research interest [2]. In most cancer cells, telomere cannot be shortened because of high telomerase enzyme activity [3]. The formation of stable G-quadruplex from G-rich strands of telomere inhibits catalytic functions of the telomerase enzyme. Therefore, molecules those can stabilize G-rich strands to form G-quadruplexes have gained considerable research interest because quadruplex stabilizers could serve as antitumor agents [4-5].

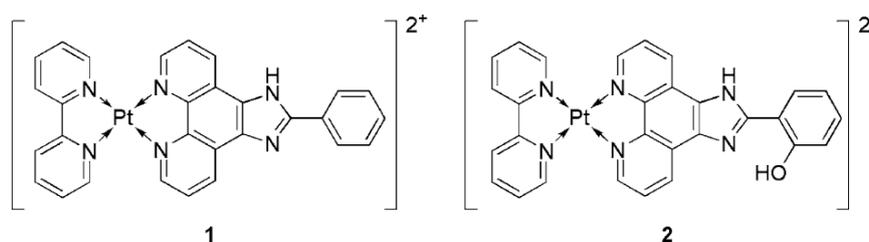


Fig.1 Platinum complexes

In this study, G-quadruplex binding abilities of two platinum complexes (fig.1) those previously reported [6] were compared with ds-DNA binding abilities.

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Key Words: (*Pt(II)*, *G-Quadruplex DNA*, *ds- DNA*, *DNA binding*)

Selective Carbonic Anhydrase I Inhibitors: Electrochemical Characterization of Aromatic Substitue Sulfonamide and Its Copper (II) Complex

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Abstract

Enzyme inhibition studies have fundamental importance for toxicity and drug screening in the process of drug discovery [1]. It is thus of critical importance to synthesize and assay carbonic anhydrase I (hCAI) inhibitors from diverse classes of substances, in order to detect compounds with specificity towards certain isozymes [2]. Studies demonstrated important roles of CAs in a variety of physiological procedures and showed that extraordinary levels or activities of these enzymes have been often related with different human diseases such as the glaucoma, kidney, gastric mucosa, salivary glands, brain, nerve myelin sheath, pancreas, prostate and uterus. A large number of aromatic/heterocyclic sulfonamides containing imine (C=N) group have been prepared in this regard and also investigated by electrochemical methods (cyclic, differential pulse etc). Electrochemical techniques have been useful tools to investigate information on the interactions of imine compounds with the metal ions. Many transition metal ions in living systems work as enzymes or carriers in a macrocyclic ligand environments. Meaningful research in this direction might generate simple models for biologically occurring metalloenzymes [3].

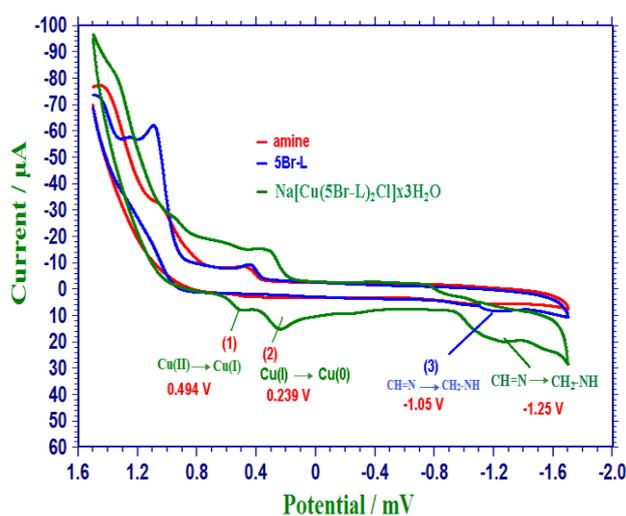


Figure 1. Cyclic voltammograms (CVs) of amine, 5Br-L and Na[Cu(5Br-L)₂Cl]x3H₂O complex

In this study, cyclic voltammograms (CVs) of 5Br-salicylaldehydemethanesulfonylhydrazone (5Br-L) and Na[Cu(5Br-L)₂Cl]x3H₂O complex were recorded in acetonitrile containing 0.1 M tetrabutylammonium tetrafluoroborate using glassy carbon (GC) electrode. The reduction peaks of CH=N→CH₂-NH belong to imine group were observed for L and Cu(II) complex at -1.05 V and -1.25 V, respectively. And also the inhibition efficiencies of ligand and its copper(II) complex were evaluated by using differential pulse voltammetry (DPV) method and it was found that Cu(II) complex has higher activity than parent ligand against hCA I

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Enzyme Inhibition Studies of Furan Sulfonylhydrazone Cu(II) Complexes by Using Differential Pulse Voltammetry (DPV) Method

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Abstract

The carbonic anhydrase isoenzymes (CAs:CAI, CAII, CAIII, CAIV....) are the metalloenzymes containing zinc center which classically participate in the maintenance of pH homeostasis. Inhibitors of the CAs have clinical usage of major diseases such as glaucoma, epilepsy, gastroduodenal ulcers, acid-base disequilibria and neurological disorders. Sulfonamides (sulfonylhydrazone, sulfonic acid hydrazide, sulfonyl urea) constitute an important group of carbonic anhydrase inhibitors and their metal complexes have massive impact on medicine, especially in biochemical properties of the sulfonamides based drugs. CA I inhibitors block the active site of CA I isoenzyme and the actual metabolism of the substrate is inhibited and so the body functions remain normal [1].

In this study, redox behaviors of Cu(II) complexes of 2-acetylfuranmethanesulfonylhydrazone (**L1**) and 5-nitro-2-furaldehydemethanesulfonylhydrazone (**L2**) and acetazolamide as standard inhibitor were investigated by cyclic voltammetry (CV) technique in acetonitrile with a sweep rate of 0.1 V s⁻¹ between 1.5 V and -1.7 V potential range. Inhibition effects of different concentrations of sulfonylhydrazone Cu(II) complexes (0.1–100 µM) on CAI were studied by differential pulse voltammetry (DPV). The inhibition effects of the copper(II) complexes are concluded by measuring the reduction peaks of the product p-nitrophenol (PNF) produced from the enzymatic hydrolysis of substrate p-nitrophenylacetate (PNFA) by hCA I. In the presence of sulfonylhydrazones, the enzymatic function is inhibited resulting in a decrease in PNF formation. The inhibition degree of hCA I is therefore correlated by the decrease in PNF reductive current which depends on the increasing concentration of the sulfonylhydrazones. Time effect on interaction of the enzyme with the substrate was also studied by CV. With the increasing time of reaction, the redox current of PNFA decreases and peak of product appears and increases with the increase of reaction time [2,3].

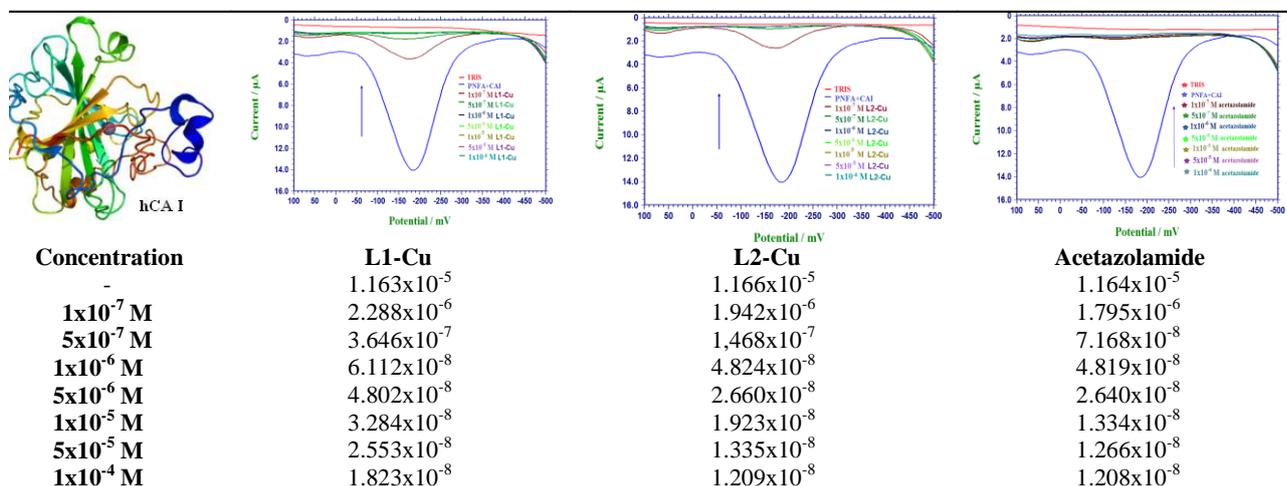


Fig.1. DPVs with peak currents of PNF against increasing concentration of L1-Cu, L2-Cu and Acetazolamide

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Immobilization of Salophen derivative Schiff base Co(II) complex on a copolymer coated platinum electrode and electrocatalytic investigations

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Electrode materials can be improved by modifying of electrode surfaces with organic-inorganic compounds and conducting polymers [1]. Thus, their properties of selectivity, sensitivity and catalytic activity can be made better [2]. Recently, inorganic metal complexes that have active metal center and functional groups are becoming attractive materials as alternatively in this area because of their catalytic activity and stability [3]. Prepared modified electrodes have been used as a biosensor for determination of biochemical species.

In this study, o-amino-benzylalcohol-co-o-anisidine was synthesized on the platinum electrode in 0,5 M H₂SO₄ supporting electrolyte medium by electrochemical methods. Then Co(II) complex of salophen type Schiff base was immobilized on this copolymer coated modified electrode surfaces. Modified surfaces were characterized by Cyclic Voltammetry, UV-Vis, SEM-EDAX and ICP-MS techniques. The electrocatalytic activity of modified electrodes was investigated on electrooxidation of Dopamine for biosensor applications.

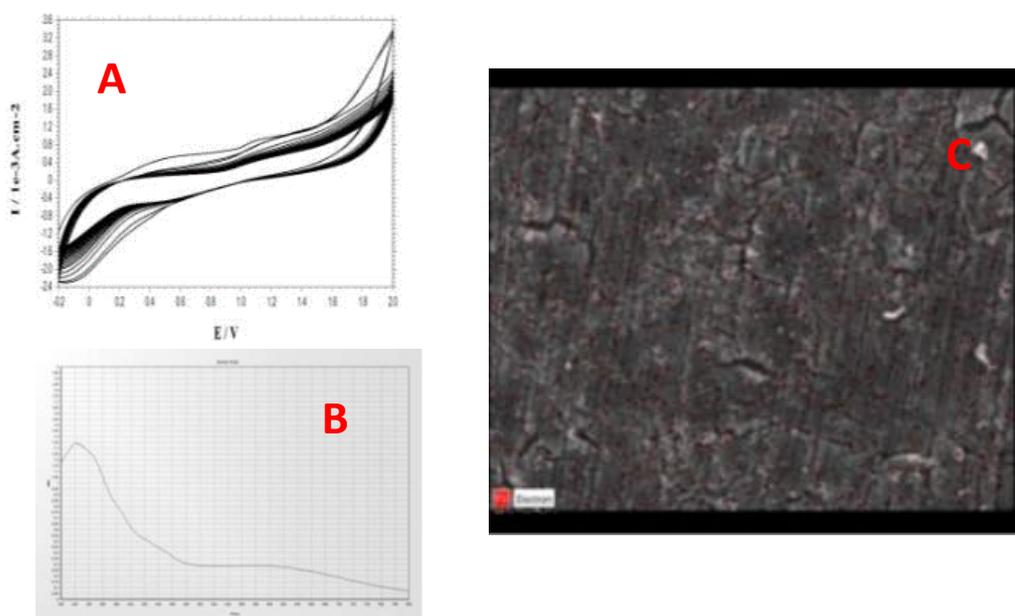


Figure.1. A. The multi-cycle CVs of immobilization of Schiff base Co(II) complex on copolymer coated Platinum electrode vs. Ag/AgCl, supporting electrolyte is 0.15 M LiClO₄ in acetonitrile, sweep rate is 100 mVs⁻¹ B. UV-Vis spectrum of modified surface. C. EDAX mapping analysis of Co element for modified electrode.

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Acknowledgments

This study was supported by TÜBİTAK (The Scientific and Technical Research Council of Turkey) (Project Numbers: 114Z691)

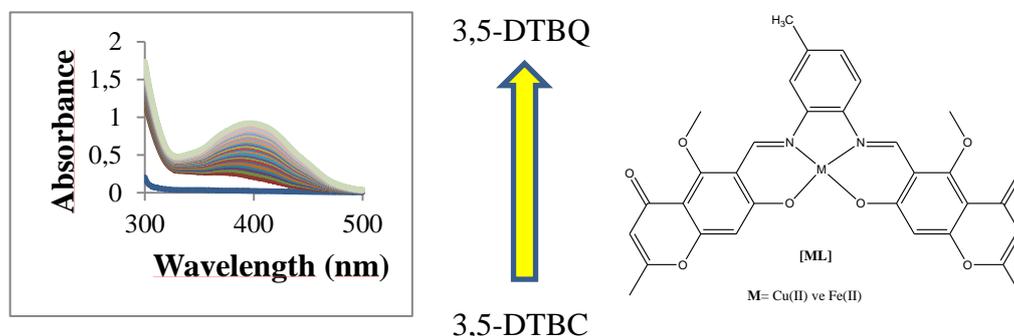
Synthesis, Characterization and Catalytic Activity of Mononuclear Copper(II) and Iron(II) Complexes with New Schiff Base Ligands Derived from Visnagin

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Ammi visnaga L., a plant indigenous to the Mediterranean regions, has been used in Egypt for centuries as a home remedy and spasmolytic. Pharmacological studies confirmed that the furanochromone derivatives mainly khellin and **visnagin** are responsible for the biological activities of the plant [1]. **Visnagin** can be easily oxidized to an *o*-hydroxy aldehyde compound according to the reported method by Schönberg et al. [2]. It is known that *o*-hydroxy aldehyde derivatives are valuable starting material for the synthesis of tetradentate bis-Schiff bases. The tetradentate Schiff base ligands with oxygen and nitrogen donor atoms in their structures act as good chelating agents for the transition metal ions [3]. The corresponding metal complexes have been of significant interest in recent years that may be attributed to their stability, biological activity [4,5] and potential applications in many fields especially in catalysis [6].

In this study, visnagin, a natural furanochromone, was isolated from *Ammi visnaga* L. and oxidized to *o*-hydroxy aldehyde compound in good yield. Two new Schiff-bases and their Fe(II) and Cu(II) complexes were synthesized by condensation of two diamine compounds with 6-formyl-7-hydroxy-5-methoxy-2-methylbenzopyran-4-one and by using appropriate metal salts, respectively. The prepared compounds were characterized by elemental analysis, FT-IR, and NMR. Catecholase-like activity of prepared Schiff-base metal complexes was investigated by using 3,5-di-*tert*-butylcatechol (3,5-DTBC) as substrate.



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Acknowledgments

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THEORETICAL STUDIES ON THIOPHENE CARBOXAMIDE AND ITS Cu(II), Zn(II) COMPLEXES

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Carboxamides, containing amide linkage (-CO-NH-) which is an essential building unit proteins, act as a multidentate chelator towards transition metals [1]. The increasing interest in the study of the carboxamide complexes provides better understanding of physicochemical properties of such metal complexes, especially the stereochemistry of the metallic centers [2].

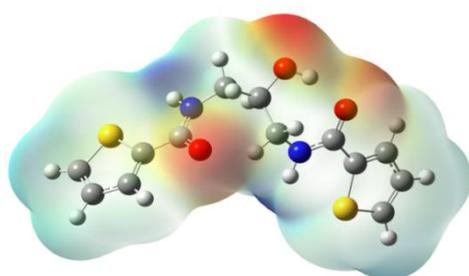


Fig.1. MEP shape of thiophene carboxamide

The molecular electrostatic potential (MEP) is a plot of electrostatic potential mapped onto the constant electron density surfaces which provides information about charge density distributions, chemically reactive sites, and electrophilic interactions in living systems [3]. In the molecular electrostatic potential (MEP), the positive regions (blue) may be regarded as electrophilic centers, whereas the negative regions (red) as nucleophilic sites.

In this study, the molecular geometry of N,N'-bis(thiophene-2-carboxamido)-1,2-diaminopropanol was optimized using density functional theory using (DFT/B3LYP) method with the 6-311G(d,p) basis set. Chemical shifts, geometrical parameters (bond lengths, bond angles, torsion angles), frontier molecular orbitals (HOMO and LUMO) and molecular electrostatic potential (MEP) were evaluated by DFT method with Gaussian 09 program.

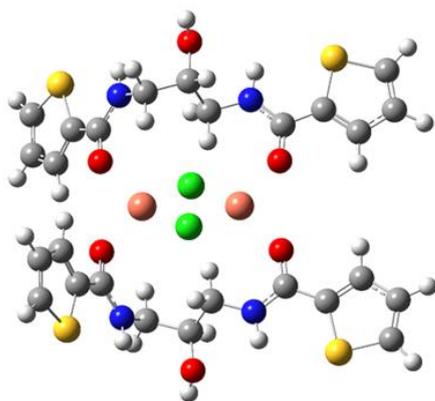


Fig.2. Optimized geometry of Cu(II) complex

The geometrical and electronic parameters of Cu(II) and Zn(II) complexes were also obtained using LanL2 basis set with DFT/B3LYP method, too. As seen in the MEP shape of carboxamide (Fig.1), the regions having negative potential (red) are over the oxygen atoms, so coordination is expected to be formed through the carbonyl oxygen (red sites) and also two chlorine atoms as bridging in distorted tetragonal geometry (Fig.2).

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Key Words: Carboxamides, dinuclear Cu(II)-Zn(II) complexes, DFT

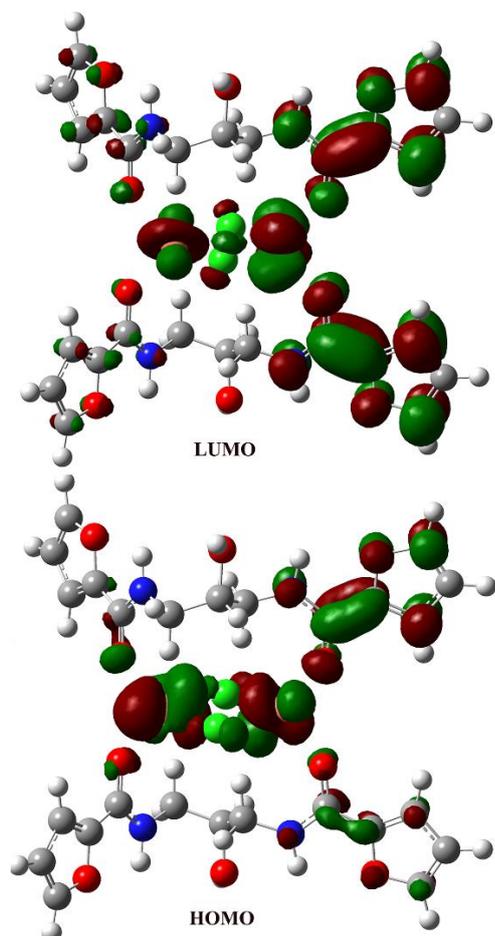
THEORETICAL INVESTIGATION ON STRUCTURAL AND ELECTRONIC PROPERTIES OF FURAN CARBOXAMIDE AND ITS METAL COMPLEXES

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The carboxamide complexes are also used in asymmetric catalysis, molecular receptors and synthetic model of metalloproteins [1]. Binuclear metal complexes of benzamides which have various chelation behavior by coordinating through carbonyl oxygen, bridging donors etc. are reported to have widely uses in biological processes [2]. Recently, frontier molecular orbitals (FMO's) are also used to prove the bioactivities of the molecules relating with intramolecular charge transfer (ICT) [3].



Frontier molecular orbital (FMO) surfaces represent the various stable electronic distributions of molecules and play an important role in electronic and optical properties. According to FMO theory, the highest occupied molecular orbital (HOMO) and lowest unoccupied molecular orbital (LUMO) are crucial in predicting the chemical reactivities of the species.

In this study, B3LYP/6-311G(d,p) basis set for carboxamide ligand and LanL2DZ basis set for its metal complexes were performed to get an insight to molecular geometries (such as optimized structures and geometrical parameters) and electronic properties (such as frontier molecular orbitals (HOMO and LUMO) energies and molecular electrostatic potential (MEP) mapped shapes) by using DFT method with Gaussian software program. In optimized geometries of metal complex, donor sites (carbonyl-O atoms) of ligand and bridging chlorides are coordinated to metal centers in tetragonal system.

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Key Words: Carboxamides, dinuclear Cu(II)-Zn(II) complexes, DFT

REVIEW OF SYNTHESIS AND CHARACTERIZATION OF GRAFT COPOLYMERS USING RENEWABLE SOURCES WITH VARIOUS POLYMERIZATION METHODS

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Renewable oils and fatty acids applied auto-oxidation has been used for the synthesis of the novel graft copolymers since 2004. Different polymerization methods have been improved and tried to be understood. Developed and implemented polymerization methods have been free radical polymerization, ring opening polymerization, one-pot polymerization (free radical and ring-opening polymerization), aqueous free radical polymerization (redox) and nitroxide-mediated polymerization methods respectively [1-4]. These obtained graft copolymers' biomedical and industrial applications have been investigated. Poly(linoleic acid)-g-poly(ϵ -caprolactone) (PLina-g-PCL) and poly(linoleic acid)-g-poly(styrene)-g-poly(ϵ -caprolactone) (PLina-g-PSt-g-PCL) were synthesized by ring-opening polymerization of ϵ -caprolactone initiated by PLina and one-pot synthesis of graft copolymers, and by ring-opening polymerization and free radical polymerization by using PLina, respectively. PLina-g-PCL, PLina-g-PSt-g-PCL3, and PLina-g-PSt-g-PCL4 copolymers containing 96.97, 75.04 and 80.34 mol% CL, respectively, have been investigated regarding their enzymatic degradation properties in the presence of *Pseudomonas lipase* [1,2]. Polymeric linoleic acid graft copolymers have been synthesized via nitroxide mediated radical polymerization (NMRP) method in the presence of 2,2,6,6-tetramethylpiperidinyl-1-oxy (TEMPO). For this purpose, PLina-ox exposed to polymerization with styrene (Sty) or Sty and pentafluorostyrene (F₅Sty) in the presence of TEMPO by NMRP method in order to obtain PLina-g-PSty and PLina-g-PF₅Sty-g-PSty graft copolymers with controlled structure and low polydispersity [3]. Water soluble hydroxylated soya oil polymer has been used in the redox polymerization of N-isopropylacrylamide (NIPAM) in order to obtain water-based hydroxylated-soya oil polymer-g-PNIPAM graft copolymer. For this purpose, soya oil was exposed to air under sunlight to obtain autoxidized soya oil polymer (PSy-ox). PSy-ox was allowed to react with diethanol amine to obtain hydroxylated soya oil polymer (hydroxylated-PSy). An ammonium persulfate with hydroxylated-PSy redox initiating system was used in the polymerization of NIPAM in order to obtain thermo- responsive hydroxylated-PSy-g-PNIPAM water-based graft copolymers [4].

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Key Words: *Auto-oxidation, polymeric linoleic acid, graft copolymers, one-pot, NMRP*

CONTROL OF DIABATIC CONTINUOUS STIRRED TANK REACTOR AT AN UNSTABLE OPERATING POINT

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All industrial chemical reactions which are either exothermic or endothermic require energy manipulation to maintain a constant temperature or a predetermined temperature profile in various types of processes [1]. Exothermic reactions in many industrial reactors which have the similar characteristic may have very interesting behaviour to investigate because of potential safety problems. A mean conversion of a reactant can be realized at a single unstable equilibrium point that can be obtained by determining the eigenvalues of this system Jacobian matrix [2]. The chemical processes such as polymerization reactors are exposed to various disturbances [3]. To maintain a certain set point in face of load disturbances, conventional or advance controller must be applied to a process with well-tuned control parameters [4-5].

In the present work, a non-adiabatic continuous stirred tank reactor simulation program was run in Matlab at a predetermined unstable operating point to attain closed loop performances. Jacket temperature was chosen as a manipulated variable. It is assumed that the jacket is well-mixed at a lower temperature than the reacting mixture. Energy transfer direction is from the reactor walls to the jacket. The simulated program having mass and energy balances for reactor inlet and cooling system was used to apply proportional control and to design the tuning parameters of conventional and advance control systems. A sinusoidal set point change for a small time interval was introduced to the simulated process, the reactor temperature oscillation with a constant amplitude was monitored for proportional only control. The numerical value of the proportional controller coefficient that produces oscillatory system response was varied to rich the well-suited ultimate reactor temperature changes versus time. With the best ultimate gain chosen as 0.5 the value of the ultimate period (0.6 min/cycle) has the greatest effect on the control performance. Ziegler-Nichols [2] and Tyreus-Luyben [6] evaluation technique was utilized to evaluate Proportional Integral Derivative controller parameters. Whilst retaining the computational simplicity of Matlab and the conventional control parameter evaluation techniques, the proposed method was made temperature response to follow an unstable operation set-point successfully. It is significant to note that integral action in the controller provides saddle point steady-state following without offset even if the values of the parameters of the system or of the controller change. Self-tuning Proportional Integral Derivative controller initial tuning parameters were also evaluated by using the proportional, integral and derivative constants and the second order parametric system model. The success of the various control actions were compared by using the integral square of the error and the integral of absolute value of error criterions.

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Key Words: Control, tuning parameter of controller, unstable operation point

Symmetric device performances of carbon based nanostructures for supercapacitors

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In this study, activated carbon (ACs) are successfully synthesized from *Elaeagnus* grain by a simple chemical synthesis methodology and demonstrated as novel, suitable supercapacitor electrode materials for graphene hydrogel (GH)/AC nanocomposites. GH/AC nanocomposites are synthesized via hydrothermal process at temperature of 180 °C. The low temperature thermal exfoliation approach is convenient for mass production of graphene hydrogel (GH) at low cost and it can be used as electrode material for energy storage applications. A remarkable specific capacitance of 602.36 Fg⁻¹ (based on GH/AC nanocomposites for 0.4 g AC) is obtained at a scan rate of 1 mVs⁻¹ in 1 M H₂SO₄ solution and 155.78 Fg⁻¹ for GH.

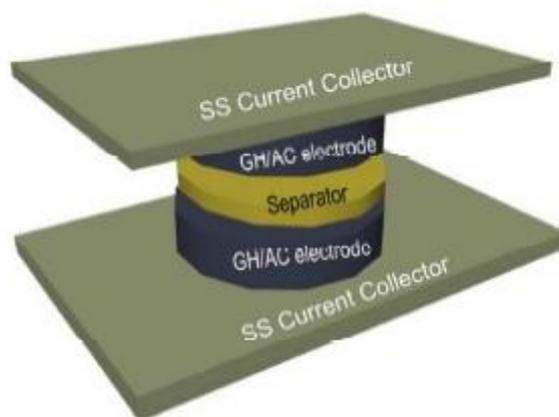


Figure 1. Schematic illustration of 3D view of GH/AC nanocomposite supercapacitor device.

In addition, polyaniline (PANI)/copper oxide (CuO), poly(3,4-ethylenedioxythiophene) (PEDOT)/CuO and polypyrrole (PPy)/CuO have been synthesized electrochemically on glassy carbon electrode (GCE) in sodium dodecyl sulphate in sulphuric acid solution as an electroactive material. The highest C_{sp} was obtained as C_{sp}= 286.35 Fg⁻¹ at the scan rate of 20 mVs⁻¹ for PANI/CuO amongst the PEDOT/CuO (C_{sp}= 198.89 Fg⁻¹ at 5 mVs⁻¹) and PPy/CuO (C_{sp}= 20.78 Fg⁻¹ at 5 mVs⁻¹) by CV method [1].

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Key Words: Thermal exfoliation, symmetric supercapacitor, energy density, graphene hydrogel, active carbon, power density.

The application of conducting polymers and their nanocomposites as a corrosion protection

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In this study, many conducting polymers and their nanocomposites such as polycarbazoles (PCz), polycarbazoles/nanoclay and polycarbazoles/Zn-nanocomposites were chemically and electrochemically synthesized on a stainless steel (SS304) electrode [1]. Polyaniline (PANI), polypyrrole (PPy) nanofilms, PANI/TiO₂ and PPy/TiO₂ nanocomposites were synthesized electrochemically on Al1050 electrode [2]. Strong adherent electroactive polymer films of poly(vinylcarbazole) (PVCz) and its nanocomposites with P(VCz)/nanoclay and P(VCz)/Zn nanoparticle have been electrodeposited on stainless steel (SS304) by chronoamperometric method using 0.3 M oxalic acid / butanol solution [3]. Polyaniline (PANI) and its nanocomposites containing TiO₂, Ag and Zn were electrocoated on an Al1050 electrode by cyclic voltammetry [4]. Thiophene, 3-hexylthiophene and its nanocomposites with TiO₂ were electropolymerized on Al1050 electrode by chronoamperometric technique [5].

The modified electrodes were characterized by electrochemical methods (CV, chronoamperometry), Fourier-transform infrared spectroscopy (FTIR)-attenuated transmission reflectance (ATR), scanning electron microscopy (SEM)-energy dispersive X-ray analysis (EDX), four point probe, electrochemical impedance spectroscopy (EIS), and equivalent circuit model of $R_s(Q_c(R_c(Q_p R_{ct})))$. Modified films on different substrates were assessed by open circuit potential monitoring, potentiodynamic polarization and EIS measurements to test the corrosion protection efficiency against 3.5% NaCl solution.

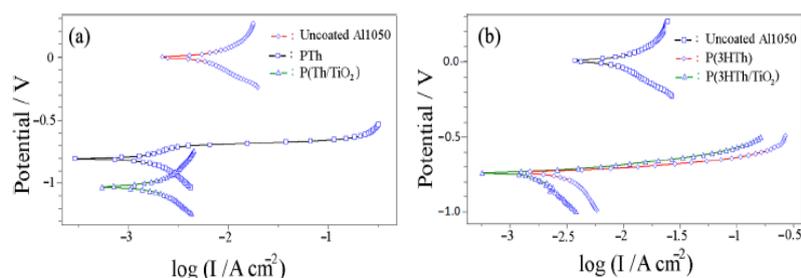


Figure 1. Tafel plots of a) uncoated Al1050, PTh and PTh/TiO₂, b) uncoated Al1050, P(3HT), P(3HT)/TiO₂.

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Key Words: Corrosion, nanocomposites, EIS, Ag nanoparticles, Zn nanoparticle.

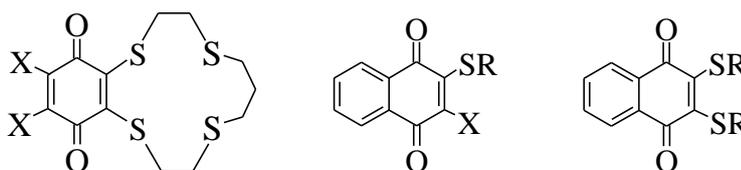
SYNTHESIS OF SOME NEW S-SUBSTITUTED QUINONE DERIVATIVES

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Napthoquinones and benzoquinones have special interest due to chemical characteristics in organic chemistry as versatile starting materials e.g., cycloaddition, photochemistry and pulse radiolysis, as well as prominent pharmacological applications such as cytotoxic, antiviral, antifungal, antiallergic, anticoagulant, anti-tumor and antibacterial, etc. Polyhalogenated benzo- and naphthoquinones were found to be potent inhibitors of plant and bacterial ureases and can be used for treatment of infections caused by urease producing bacteria [1]. Napthoquinone and benzoquinone derivatives containing nitrogen and sulfur recently have received considerable attention due to increasing numbers of substituent nitrogen or sulfur atoms enforce the biological activity [2,3]. Quinones play pivotal role in biological functions including oxidative phosphorylation and electron transfer and they are good electron acceptors and are known to be efficiency dependent on the redox potentials of the corresponding quinone-hydroquinone system. Some thiosubstituted quinone derivatives were directly prepared from substitution reactions of halobenzo- and halonapthoquinones with some thiols as nucleophiles. The synthesized compounds were purified by chromatographic methods. The structures of compounds were determined by using micro analysis and spectroscopic methods (¹H-NMR, ¹³C-NMR, UV-Vis, FT-IR and MS).



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Key Words: *Quinones; Organic synthesis; Spectroscopy, Thiols, Biological activity*

SERDAR GÖKŞİN AYDINLI

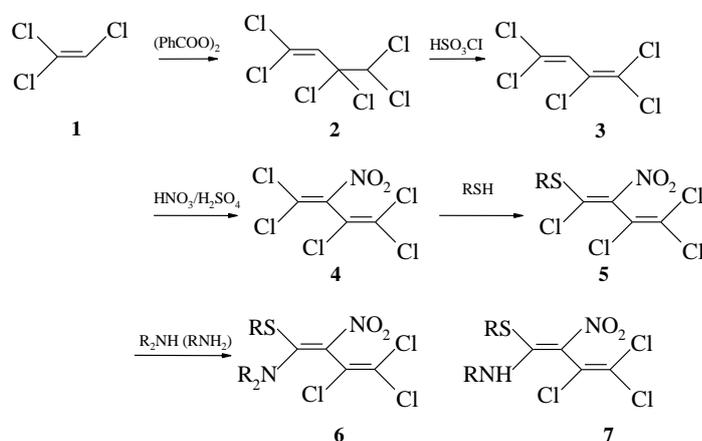
NITROPOLYHALOBUTADIENES AS BUILDING BLOCKS FOR THE NOVEL SYNTHESIS OF HETEROCYCLES

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Halogen containing nitrodienes have been the object of long lasting interest because of their direct involvement in the chemistry of various bioactive compounds. They are versatile building blocks in the synthesis of various important carbo- and heterocycles [1]. The most important one “2-Nitroperchlorobuta-1,3-diene (**4**)” which was obtained in three steps from trichloroethylene, serves as a valuable precursor for the click synthesis of per-substituted heterocycles as well as a cycles and so has significant importance due to its potential use in many areas of organic chemistry applications. Nitrodiene **4** which has stepped reactivity, proceeding mainly according to nucleophilic vinylic substitution. From a mechanistic point of view, initial regiospecific reaction of nitrodiene **4** always starts with the attack of an appropriate nucleophile to the dihalogeno-nitrovinyl fragment [2,3]. In the course of our studies, some perhaloaminothioethers were prepared from the reactions of nitrodiene **4** with some S- and N-nucleophiles. The structures of the prepared compounds were proved by elemental analysis, ¹H-NMR, ¹³C-NMR, FT-IR, MS and Single Crystal X-ray Diffraction spectrometry.



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Key Words: 2-Nitroperchloro-1,3-butadiene, S- and N-nucleophiles, Heterocycles, Nitro polyhalobutadienes, Nitrodiene, Trichloroethylene

SYNTHESIS AND SPECTRAL CHARACTERIZATIONS OF 5-METHOXY-2-(5-H/Me/Cl-1H-BENZIMIDAZOL-2-YL)-PHENOLS AND THEIR ZnCl₂ COMPLEXES

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Various benzimidazole derivatives display a wide range of biological activity. For instance, vitamin B12 has 5,6-dimethylbenzimidazole moiety as coordinated to the Co(II) ion. On the other hand, various drugs and pharmaceutical compositions contain benzimidazole derivatives. Some of benzimidazole derivatives are used as drugs such as omeprazole, thiabendazole, albendazole, mebendazole, flubendazole, astemizole and fenbendazole [1-3].

In this study, 5-methoxy-2-(5-H/Me/Cl-1H-benzimidazol-2-yl)-phenols (HL_X, X = 1 – 3, Fig. 1) and their complexes with ZnCl₂ were synthesized and characterized by using analytical data, FT-IR, NMR, ESI-MS and fluorescence spectra. The compounds HL₁, HL₂ and HL₃ show triple fluorescence in ethanol and the complexes give single band only. According to the analytical and spectral data, HL₁ gives 1:1, HL₂ and HL₃ give 1:2 M:L complexes with ZnCl₂: [Zn(L₁)Cl(H₂O)], [Zn(HL₂)₂Cl₂]·2H₂O, [Zn(HL₃)₂Cl₂]·2H₂O (Fig. 1). Molar conductivity measurements support that all of the complexes are non-ionic.

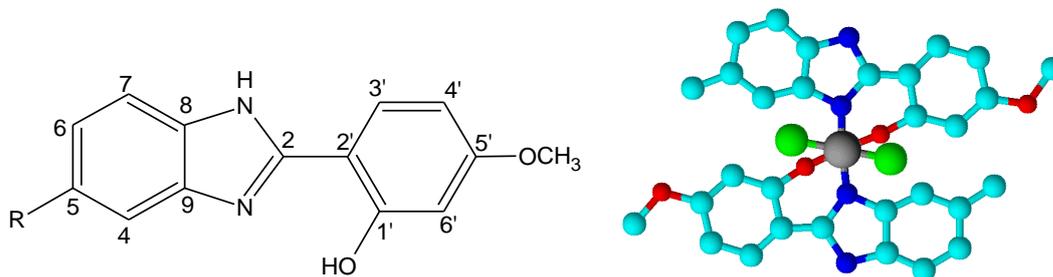


Fig. 1. Schematic view of the compounds in the study: R = H, HL₁; R = CH₃, HL₂; R = Cl, HL₃ (left) and the structure of HL₂ complex with ZnCl₂ (right).

Acknowledgement: This work was supported by the Scientific Research Projects Coordination Unit of Istanbul University.

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Key Words: Benzimidazole, phenol, zinc, complexes, characterization

SYNTHESIS AND SPECTRAL CHARACTERIZATION OF A NEW RED DISPERSE MONOAZO DYE: 3-[[4-(DIETHYLAMINO)PHENYL]DIAZENYL]-5-NITROBENZONITRILE

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Azo dyes are a large class of synthetic organic dyes that contain nitrogen as the azo group –N=N– as part of their molecular structures; more than half the commercial dyes belong to this class. Azo dyes account for the majority of all dyestuffs, produced because they are extensively used in the textile, paper, food, leather, cosmetics and pharmaceutical industries [1].

There are various disperse dyes that resistant to alkaline media for dyeing recycled polyester fibers, however their light and sublimation fastness are low [2]. Aim of this study is to obtain a new, low cost disperse azo dye that provides high sublimation fastness and suitable dyeing in alkali medium for polyester. For this purpose, we synthesized 3-[[4-(diethylamino)phenyl]diazenyl]-5-nitrobenzonitrile (C₁₇H₁₇N₅O₂, MA: 323.35 g/mol, Fig. 1), is a red disperse azo dye, by using N,N-diethylaniline as coupling component and diazo component of 3-cyano-5-nitroaniline. The compound obtained was characterized by using analytical data, FT-IR, NMR, UV and LC-MS/MS spectroscopic techniques. It is observed that the new red dye has good dyeing properties after the basic tests such as particle size distribution and the washing fastness. The dyeing studies are continuing.

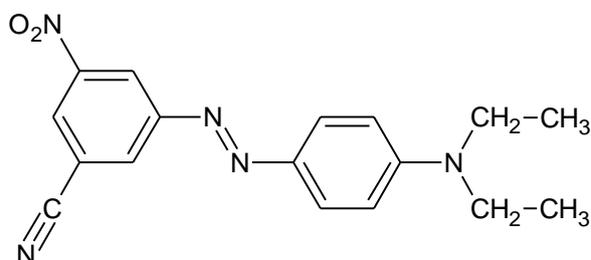


Fig. 1. Chemical structure of the title compound (red dye)

Acknowledgement: This work was supported by Republic of Turkey Ministry of Science, Industry and Technology. Project number: 0280.STZ.2013-2.

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Key Words: Diazo, disperse dyes, synthesis, spectral characterization

SYNTHESIS OF SOME BENZOXAZOLE COMPOUNDS

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Benzoxazoles have been reported to exhibit a broad spectrum of biological activities. Notable among these are antihistaminic, antifungal, cyclooxygenase inhibiting, antitumor, antiulcer, anticonvulsant, hypoglycemic, anti-inflammatory and antitubercular activity [1-2].

In this study, various benzoxazole derivatives were synthesized via cyclization reaction between an aminophenol and a carboxylic acid. New compounds were synthesized by reaction of 2-amino-4-methylphenol with 2-bromo-4-chloro benzoic acid, 2-bromo-5-chloro benzoic acid in PPA.

Structures of the synthesized compounds were characterized by IR, ¹H-NMR, ¹³C-NMR, fluorescence and mass spectrometric techniques.

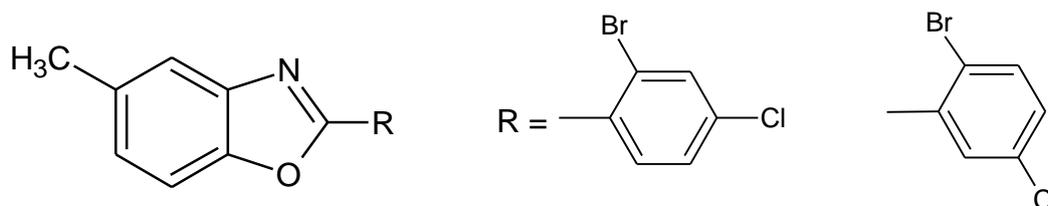


Fig. 1. Chemical structure of the synthesized compounds.

Acknowledgement: This work was supported by the Scientific Research Projects Coordination Unit of Istanbul University.

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Key Words: *Synthesis, spectral characterization, benzoxazole.*

SYNTHESIS AND SPECTRAL CHARACTERIZATION OF A NEW ORANGE MONOAZO DISPERSE DYE: 3-(BENZYL{4-[(2,6-DICHLORO-4-NITRO-PHENYL)DIAZENYL]PHENYL}AMINO)PROPANENITRILE

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Disperse dyes are organic coloring compounds having low molecular weight (approx, 300-700), virtually water insoluble dyes suitable for coloring hydrophobic fibers, like cellulose triacetate, nylon, polyester and some extent polypropylene, acrylic and modacrylic fibers from an aqueous dispersion. Monoazo dyes represent the largest group of disperse dyes [1].

There are various disperse dyes that resistant to alkaline media for dyeing recycled polyester fibers, however their light and sublimation fastness are low [2]. Aim of this study is to obtain a new, low cost disperse azo dye that provides high sublimation fastness and suitable dyeing in alkali medium for polyester. For this purpose, we synthesized 3-(benzyl{4-[(2,6-dichloro-4-nitro-phenyl)diazenyl]phenyl}amino)propanenitrile (C₂₂H₁₇Cl₂N₅O₇, MA: 454.31 g/mol, Fig. 1), is an orange disperse azo dye, by using 3-[benzyl(phenyl)amino]propanenitrile as coupling component and diazo component of 2,6-dichloro-4-nitroaniline. The compound obtained was characterized by using analytical data, FT-IR, UV, NMR and LC-MS/MS spectroscopic techniques. It is observed that the new red dye has good dyeing properties after the basic tests such as particle size distribution and the washing fastness. The dyeing studies are continuing.

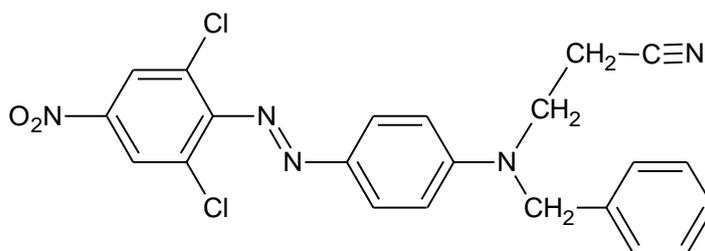


Fig. 1. Chemical structure of the title compound (orange dye)

Acknowledgement: This work was supported by Republic of Turkey Ministry of Science, Industry and Technology. Project number: 0280.STZ.2013-2.

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Key Words: Diazo, disperse dyes, synthesis, spectral characterization

THE SYNTHESIS OF SCHIFF BASE; METHYL 2-((5-CHLORO-2-HYDROXYBENZYLIDENE)AMINO)-6-METHYL-4,5,6,7-TETRAHYDROTHIENO[2,3-C]PYRIDINE-3-CARBOXYLATE AND INVESTIGATION OF ITS ELECTROCHEMICAL PROPERTIES

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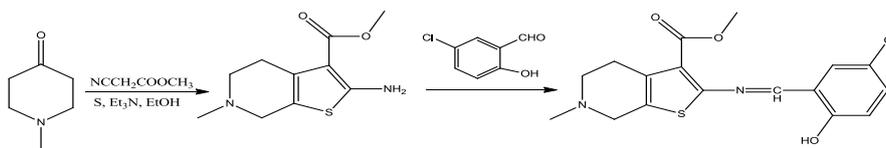
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Abstract

S-heterocyclic ring systems are present in many products, several of which show antibacterial, antifungal, antiamoebic, antioxidant, antitumor, anticoagulant and antithrombotic activities [1]. The electrochemical characteristics of molecules may be of use in future research on their action mechanism as well as pharmacokinetic and pharmacodynamic purposes in biological media, if they find use as drugs [2].

In this study, we have synthesized Schiff base derived from substituted 2-aminothiophene by using Gewald method. The Gewald reaction consists of a one-pot procedure that is very extensively used method for this synthesis. This convenient technique includes the condensation of ketones with ethylcyanoacetat and a sulfur element in a solvent such as ethanol, in the presence of triethyl amine at room temperature. Schiff base was also synthesized by the reaction of aminothiophene with 5-chloro-salicylaldehyde and characterized using ¹H-¹³C NMR, LC-MS and FT-IR methods.



The electrochemical behavior of Schiff base was evaluated by cyclic voltammetry (CV), controlled potential electrolysis and chronoamperometry (CA) techniques. Electrochemical study is proposed that Schiff base follows electrochemical reduction (EC) mechanism by semireversible electron transfer steps and Epc – Ep/2c values are found in the range of 40–160 mV which is in good agreement with those given in literature EC mechanism [3].

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Key Words: Schiff base, Gewald reaction, electrochemical behavior, cyclic voltammetry

SYNTHESIS, CHARACTERIZATION OF METHYL 2-AMINO-6-METHYL-4,5,6,7-TETRAHYDROBENZO[b]THIOPHENE-3-CARBOXYLATE AND ITS ELECTROCHEMICAL BEHAVIORS

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Abstract

Aminothiophenes are versatile building blocks for the synthesis of agrochemicals, dyes and pharmacologically active compounds. There are several methods in the literature for the preparation of these compounds [1-3].

The aim of the present research was to synthesize methyl 2-amino-6-methyl-4,5,6,7-tetrahydrobenzo[b]thiophene-3-carboxylate by Gewald reaction with excellent yield and characterize by nuclear magnetic resonance (¹H and ¹³C NMR), LC-MS and FT-IR methods. In electrochemical studies, the number of electrons transferred (n), diffusion coefficients (D) were determined by using an ultramicro electrode (UME) and the standard heterogeneous rate constants (ks) was calculated by Klingler-Kochi technique (Table 1). Electrochemical reduction mechanism of compound is proposed that our molecule follows electrochemical reduction (EC) mechanism by semireversible electron transfer steps [4].

Table 1. Electrochemical parameters of titled molecule in nonaqueous media

Cottrell Slope(S)x10 ⁵ of (-C=O-) peak	5.16 ± 0.02
Diffusion coefficient (D, cm ² /s) x 10 ⁷ D ± ts/√N	0.68 ± 0.05
UME Limit current (i. A)x10 ¹⁰	3.20 ± 0.04
Transferred electron number(n) (Baranski method)	1.01 ± 0.03
Bulk electrolysis calculated by the number of electrons (n)	0.98 ± 0.03
Heterogeneous rate constant ks(cm/s)x10 ⁴ ks ± ts/√N	0.020 ± 0.003

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Key Words: *Gewald reaction, aminothiophenes, diffusion coefficient, electrochemical reduction (EC)*

Novel Azo-azomethine Based Dinuclear Metal(II) Complexes: Synthesis, Definitions, DFT Calculations and Biochemical Applications

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Azo-azomethines are organic dyes and contain the characteristic chromophore groups -N=N- and -CH=N-. Azo dyes are used in industry as dyes for many different textile products including polyester, silk, leather, wool and cotton which are namely intended for clothing and decoration. Azo colours come in different forms which include amido-azo, oxy-azo, diazo, tetrazo and other polyazo compounds. It has long been known that the azo group has some ability to form a coordinate link with the different metal ions and addition compounds of azobenzene with metal salts have been described [1].

For decades, coordination chemistry of Schiff base ligands has been the subject of great interest. Schiff bases derived from aromatic amines and aromatic aldehydes and their metal complexes have a wide variety of applications in the fields of biology, catalysis, materials and inorganic and analytical chemistry. These compounds have been found to possess a wide range of biological activities such as antibacterial, antifungal, antimalarial, anticancer, antitubercular, anti-inflammatory, and antiviral. On the other hand, Schiff bases derived from azo chromophore group containing aromatic aldehydes and their metal complexes have been extensively studied because of their interesting physical and chemical properties and potentially useful biological activities. Azo-azomethine ligands contain both azo and azomethine groups. Azo groups possess excellent donor properties and play an important role in coordination chemistry [2,3,4].

The aim of the present work is to synthesize a new symmetric azo-azomethine based (Schiff base) ligand, H₂L, and its metal complexes with copper(II), cobalt(II), nickel(II), and palladium(II) ions. The structures of the ligand and its metal complexes were characterized by elemental and thermal analyses, FT-IR, ¹H and ¹³C-NMR, electronic, and mass spectra as well as conductivity and magnetic susceptibility measurements at room temperature. The antimicrobial activity of the ligand and its complexes was screened against selected kinds of bacteria and fungi. Moreover, the free radical scavenging (DPPH), ferrous chelating, reducing power, and DNA cleavage abilities all of the compounds were tested. It was determined that all compounds showed good ferrous chelating activity. The highest chelating activity (78.3%) was obtained with Cu(II) complex. Cu(II) complex also exhibited the maximum antibacterial activity (12 mm) against to *Pseudomonas aeruginosa* (ATCC 9027). In addition to these, all tested compounds was possessed of two strand DNA cleavage active. Additionally, the ground state geometries of the ligand and its metal complexes were optimized using density functional theory methods at B3LYP/6-31G (d, p) level in order to obtain information about the 3D geometries and electronic structure.

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Key Words: Azo-azomethine, Schiff base, metal complex, DFT calculations, antioxidant activity, DNA cleavage

SYNTHESIS AND SPECTRAL CHARACTERIZATION OF A NEW BLUE MONOAZO DISPERSE DYE: *N,N*-DIETHYL-4-[(4-NITRO-2,5-DIHYDRO-1,3-THIAZOL-2-YL)DIAZENYL]ANILINE

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Azo compounds are derivatives of diazene (diimide), HN=NH, wherein both hydrogens are substituted by unsaturated hydrocarbon groups, e.g. PhN=NPh azobenzene or diphenyldiazene. Diazo compounds have two linked nitrogen atoms (azo) as a terminal functional group. Azo compounds are good oxidizing agents and can be readily reduced back to hydrazine or primary amine. Additionally, azo compounds have been utilized in various biological assays, as coupling agents, and in synthetic dyes [1].

There are various disperse dyes that resistant to alkaline media for dyeing recycled polyester fibers, however their light and sublimation fastness are low [2]. Aim of our study is to obtain a new, low cost disperse azo dye that provides high sublimation fastness and suitable dyeing in alkali medium for polyester. For this purpose, we synthesized *N,N*-diethyl-4-[(*E*)-(4-nitro-2,5-dihydro-1,3-thiazol-2-yl)diazenyl]aniline (C₁₃H₁₇N₅O₂S, MA: 307.37 g/mol, Fig. 1), is a blue disperse azo dye, by using *N,N*-diethylaniline as coupling component and diazo component of 2-amino-5-nitrothiazol. The compound obtained was characterized by using analytical data, FT-IR, NMR, UV and LC-MS/MS spectroscopic techniques. It is observed that the new red dye has good dyeing properties after the basic tests such as particle size distribution and the washing fastness. The dyeing studies are continuing.

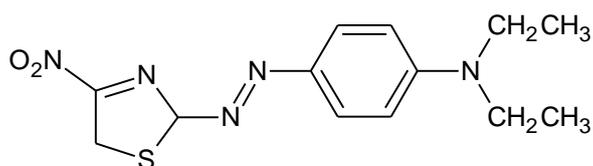


Fig. 1. Chemical structure of the title compound (blue dye)

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Key Words: Diazo, disperse dyes, synthesis, spectral characterization, dyeing

SYNTHESIS AND SPECTRAL CHARACTERIZATION OF 7-[(4-BROMO/FLOROPHENOXY)METHYL]-4H-[1,3,4]THIADIAZOLO [2,3-C][1,2,4]TRIAZIN-4-ONES

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1,2,4-Triazines and its derivatives have been found to exhibit the variety of biological applications such as antitumor, anti-HIV, antiviral, antimalarial, antibacterial, antifungal and antioxidant activities.

In this study, the synthesis of 7-[(4-bromo/lorophenoxy)methyl]-4H-[1,3,4]thiadiazolo [2,3-c][1,2,4]triazin-4-ones (Fig. 1) by condensation of 4-amino-3-mercapto-1,2,4-triazin-5(4H)-one with corresponding phenoxy acetic acids is described. The structures of the compounds were determined by FT-IR, NMR (¹H- and ¹³C), ESI-MS spectroscopic techniques and analytical methods.

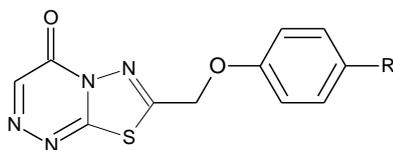


Fig. 1. Chemical structure of the title compounds (R = Br, F)

Acknowledgement: This work was supported by the Scientific Research Projects Coordination Unit of Istanbul University.

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Key Words: Triazin, phenoxy acetic acids, cyclization reactions, spectral characterization

Novel 1,4-Naphthoquinone Structures Containing Amino Groups

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Abstract:

1,4-Naphthoquinones being one of the most prominent members of quinone compounds are versatile reagents in organic synthesis [1-3]. Their unique properties make them attractive for highly successful applications in many important fields [3]. A wide variety of methods and reagent systems have been developed to affect their synthesis [4]. Our approach aims to synthesize 1,4-aminonaphthoquinones by combining different substituents. This study presents the synthesis and characterization of novel derivatives of substituted 1,4-naphthoquinones obtained from the reactions of 2,3-dichloro-1,4-naphthoquinones with some amine compounds. The structures of these compounds were characterized by spectroscopic methods.

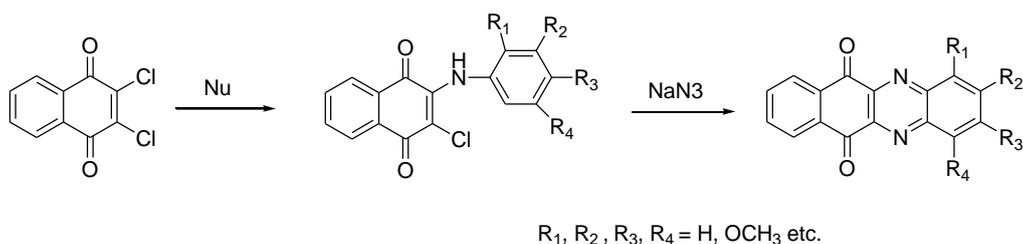


Figure 1. Synthesized Aminonaphthoquinones and Benzo[b]phenazine-6,11-dione Derivatives

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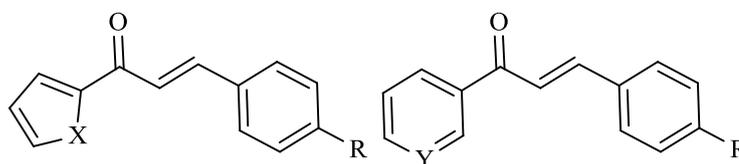
SYNTHESIS and CHARACTERIZATION of NOVEL 3-[(4-SUBSTITUTED-1-YL)PHENYL]-1-ARYL/HETEROARYL-2-PROPEN-1-ONES

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Chalcones are α,β -unsaturated ketone compounds which belong to the flavonoid family[1]. Also, chalcones are important building blocks used to synthesis of various heterocyclic compounds such as pyrimidines, pyrazolines, oxazolines, benzothiapines, etc [2]. Chalcones and their heterocyclic derivatives have been known to possess many pharmacological activity such as anti-inflammatory, antimicrobial, antioxidant, anticancer, antileishmanial, antimalarial and antiviral [3-5]. In the present work, we synthesized some novel 3-[(4-substituted-1-yl)phenyl]-1-aryl/heteroaryl-2-propen-1-one derivatives starting from 4-substituted-benzaldehydes and aromatic/heteroaromatic methyl ketones by Claisen-Schmidt condensation reaction. The chemical structures of chalcone derivatives were elucidated by IR, ¹H NMR, ¹³C NMR and EI-MS spectral data. In future studies, the cytotoxic activities of these compounds will be evaluated.



X: O, S, NH

Y: CH₂, N

R: morpholino, piperidine, pyrrolidine, imidazolyl, pyrimidine

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Key Words: synthesis, chalcone, heterocyclic.

SYNTHESIS and CHARACTERIZATION of NOVEL 1,3,4- OXADIAZOLE-2-THIONE MANNICH BASES CONTAINING L-PHENYLALANINE MOIETY

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Five membered heterocyclic compounds like oxadiazole ring have attracted considerable interest owing to their broad spectrum pharmacological effects in the field of medicinal chemistry and organic chemistry [1]. Especially, it was reported that 1,3,4-oxadiazole-2-thiones have various biological activity such as anti-inflammatory, analgesic, antibacterial, anticancer and antioxidant activities [1-3]. Also, their Mannich bases were prepared due to biological activities including antitubercular, antimalarial, anticancer, and analgesic properties in recent years [2-4].

In this study, some novel Mannich bases of 1,3,4-oxadiazole derivatives were synthesized from *L*-phenylalanine ethyl ester hydrochloride. Their chemical structures were characterized by IR, ¹H NMR, ¹³C NMR, EI-MS and elemental analysis.

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Key Words: Mannich bases, 1,3,4-oxadiazole, *L*-phenylalanine

SYNTHESIS OF 1,4-DIHYDROPYRIDINE DERIVATIVES USING HIGHLY EFFECTIVE PdNiRu@GO NANOPARTICLES:

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1,4-Dihydropyridine derivatives act as potential antimicrobial, antioxidant, antiatherosclerotic, antitumor, antihypertensive agents which possess pharmacological importance due to the blood flow-regulating activity.[1-4] For example, Nifedipine, calcium channel blocker is used to treat hypertension (high blood pressure) and angina (chest pain). Therefore, novel practical and facile synthetic methodology is very important for Hantzsch dihydropyridines. For this purpose, graphene oxide-supported trimetallic Pd-Ni-Ru nanocatalyzed biologically active 1,4-dihydropyridine synthesis via multicomponent condensation reactions of various aldehydes with dimedone, ammonium acetate and ethyl acetoacetate at high temperature in aprotic polar solvent will be described as a new methodology of Hantzsch synthesis. The catalyst is recoverable and reusable. Although the catalyst could be used many times, there is not a significant in their activity loss and the process is efficient, eco-friendly and industry-oriented.

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Key Words: *1,4-dihydropyridine, nanocatalyst, multicomponent reaction*

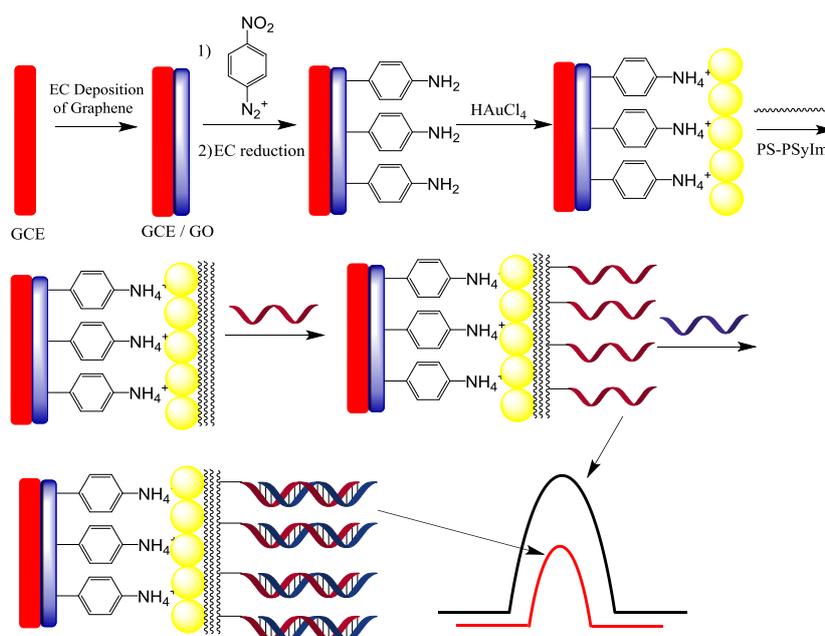
LABEL FREE DETECTION OF DNA USING POLYSTYRENE-g-SOYA OIL-g-IMIDAZOLE GRAFT COPOLYMER

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An electrochemical DNA biosensor, which is capable of directly detecting hybridization of DNA, is developed through the attachment of polystyrene-g-soya oil-g-imidazole graft copolymer (PS-PSyIm) onto gold nanoparticles electrodeposited on NH₂ modified graphene oxide [1]. Interaction of PS-PSyIm polymer with DNA at the bare glassy carbon electrode by cyclic voltammetry technique was studied and it was found that interaction predominantly takes place via intercalation mode. The selectivity of developed DNA biosensor was also investigated through DPV on the basis of considering hybridization event with non-complementary, one base miss-matched DNA and complementary target DNA sequence. It was demonstrated that a large decrease in the peak current occurs upon the addition of complementary target DNA [2]. The sensitivity of the manufactured biosensor was also found to be remarkably good as detection limit is found to be 1.8 nM.



Scheme: General procedure for the construction of electrochemical DNA biosensor

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Key Words: Label free DNA detection, Hybridization, Soya oil.

The Functionalization of Highly Oriented Pyrolytic Graphite Electrodes and a DFT Study.

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The functionalization of highly oriented pyrolytic graphite (HOPG) electrodes with edge and basal plane orientation was performed. Computational study onto the modified basal plane of graphene layer using first principal density functional theory was also reported. The electrochemical attachment of different types of Boc-protected-diamines linkers and diazonium tetrafluoroborate salt to carbon electrodes was successfully carried out by electrochemical oxidation and reduction of corresponding diamines and diazonium salt, respectively, followed by coupling of anthraquinone (AQ)-2-carboxylic acid through using solid phase synthesis methodology [1-2]. The type of carbon electrode and linker was found to have significant effect on surface coverage of AQ. The blocking properties, effect of scan rate pH and the kinetic parameters for the AQ-modified electrodes for each linker were examined by CV. Density Functional Theory (DFT) was employed to shed light on the changes in the structural properties of the modified basal plane of graphene after the functionalization with diamines, why edge site exhibits higher reactivity to the attachment of linkers than basal site and type of linker has an effect on the surface coverage. This DFT study was fulfilled on the basis of considering relationship between binding energy and charge transfer in order to ascertain the root of the effect whether it is steric or electronic

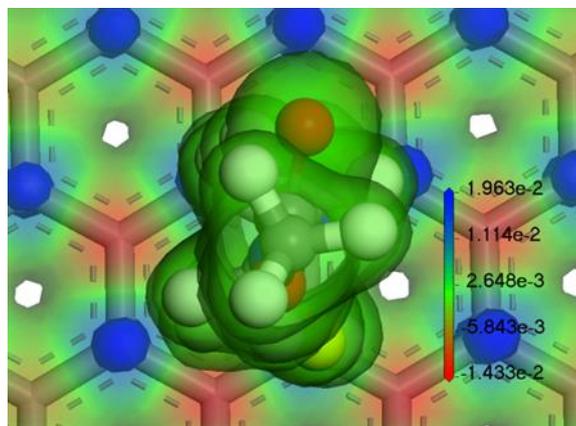


Figure: Total electron density representation for an EDDA linker anchored onto basal plane. Regions coloured with yellow and red display accumulation and depletion of electrons, respectively.

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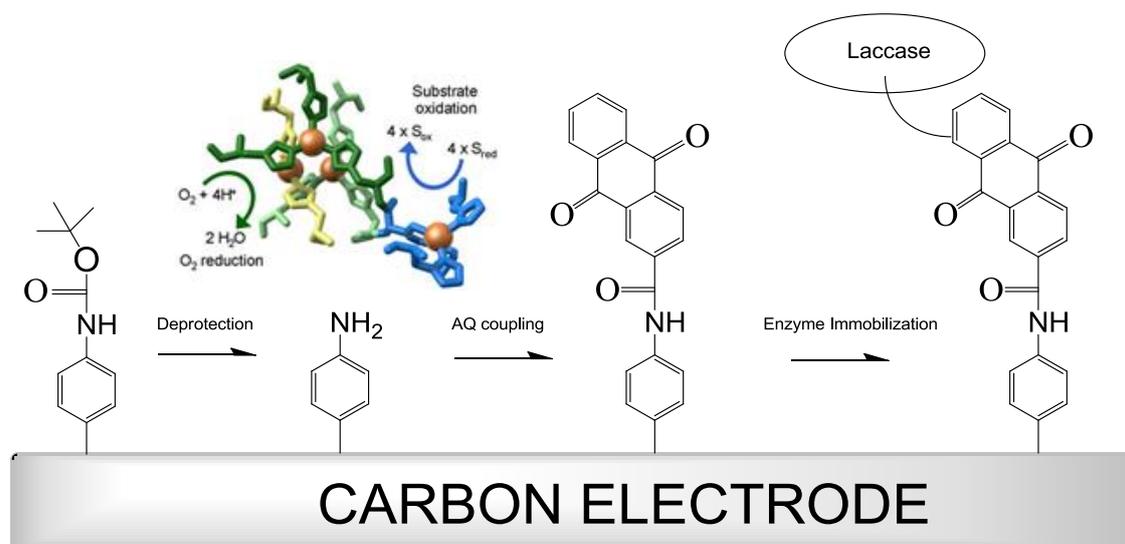
Laccase Immobilization onto Anthraquinone and Anthracene Modified GC Electrodes and High-throughput Screening of O₂ reduction

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Laccase is a glycoprotein and an enzyme that contains different copper sites (T1, T2 and T3 regarded as binding sites as well), which carries out four electron reduction of dissolved molecular oxygen to water [1]. In this work, electrografting of Boc-protected ethylenediamine and C₆H₄CH₂NH– linkers to GC surface and subsequently coupling of anthraquinone (AQ) and anthracene (AC) (head groups) after removal of Boc group were carried out to build a platform for the further attachment of laccase (*Trametes hirsuta*). This experiment was designed to perform with 3 replicates for each linker and head group, which designates a library of 12 electrodes after all functionalization and immobilization procedures are completed. We used high-throughput screening for the O₂ reduction with the aid of a multichannel potentiostat, which is capable of simultaneously running CV for the 128 electrodes. After having established homogeneous distribution of O₂ across the electrochemical cell O₂ reduction at laccase-immobilized GC electrodes was performed. All electrodes were found to exhibit electrocatalytic activity towards oxygen reduction. This indicates successful binding of laccase to functionalized carbon surface and decent electrical contact between substrate and enzyme active site.



Scheme Representation of immobilization of laccase to modified GC electrode with AQ through C₆H₄CH₂NH– linker. Inset shows oxygen reduction mechanism on laccase enzyme.

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Key Words : Laccase, high-throughput screening, Oxygen Reduction

INVESTIGATION OF SOME AZO DYES BY USING POLAROGRAPHIC AND VOLTAMMETRIC TECHNIQUES

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Aromatic azo compounds constitute a very important class of organic compounds because of their widespread applications in many areas of technology and medicine. Azo dyes, which are characterized by one or more azo groups, are a major group of colorants used in textiles, plastics, pharmaceuticals, cosmetics and food products. Many synthetic azo dyes can be converted to colourless aromatic amines, some of which are carcinogenic. The studies, were mainly concerned with aromatic azo compounds because of (i) the importance of this group in the dyestuff industry (ii) the interest in carcinogenic properties and (iii) the use of azo compound for indirect determination of metal ions[1-4].

The polarographic and voltammetric experiments were performed using a computer controlled electroanalysis system (Metrohm 757 VA Computrace Electrochemical Analyser). A three electrode combination system was used. This consisted of a Multi Mode Electrode (DME, SMDE and HMDE), an Ag/AgCl reference electrode and a Pt wire auxiliary electrode. All measurements were carried out at room temperature.

Azo compounds with reducible or oxidizable moieties are electrochemically active. These substances yield faradaic current as a result of redox process and they can be determined by direct polarographic and voltammetric methods. Electroinactive azo compounds can be determined in the same way after derivatization. The detailed elucidation of the reduction mechanism of the azo compounds in a variety of experimental condition can be explained by using different voltammetric and polarographic techniques. Electrochemical and physicochemical properties of some azo, have been explained by different voltammetric and polarographic techniques.

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Key Words: *Voltammetry, Polarography, Reaction Mechanism, Azo Dyes*

Synthesis, Characterization, Crystal Structure and Biological Applications of the New Thiosemicarbazone Derivatives

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Thiosemicarbazones are an important class of compounds having general structure $R^1R^2-C=N-NH-CS-NH_2$ and can be synthesized by condensation reaction of semicarbazide with a suitable aldehyde or ketone. [1,2]. The chemistry of thiosemicarbazones has been receiving considerable attention in the area of medicinal chemistry because of their promising biological implications and remarkable pharmacological properties. Various thiosemicarbazones and their heterocyclic thiadiazoline derivatives have been used in an array of drug categories such as antimicrobial, anti-HIV-1, anticancer and central nervous system inhibitor activities and the literature concerning these subjects is steadily increasing [3]. Thiosemicarbazones are popular because of their metal chelating properties in order to generate metal-complexes having interesting geometries. Metal–thiosemicarbazone complexes have been found to have interesting catalytic as well as biological applications. However, it has been also reported that by suitable structural variations thiosemicarbazone ligands could also become potential anticarcinogenic agents [4,5].

In this study; (2-(2-(2-methoxyphenyl)hydrazono)cyclohexane-1,3-diylidene) bis(hydrazine carbothioamide) (L_1), 4-(2-(2,6-bis(2-carbamothioylhydrazono)cyclohexylidene) hydrazinyl)benzoic acid (L_2), and (2-(2-(4-bromophenyl) hydrazono)cyclohexane-1,3-diylidene) bis(hydrazinecarbothioamide) (L_3) bis(thiosemicarbazone) derivative compounds were synthesized by the condensation reaction of thiosemicarbazide and various ketone compounds. The structures of synthesized compounds were characterized by using FT-IR, 1H -NMR and ^{13}C -NMR spectra, elemental analysis, mass spectra. Also, the structure of the L_1 has been determined by X-ray crystallographic analysis (Figure 1). Additionally, the antioxidant activities such as free radical (DPPH) scavenging ability, iron chelating ability and reducing power of compounds were evaluated. Especially, L_3 displayed good DPPH activity (84.13%) at 100 mg/L. In addition to these, pBR322 plasmid DNA cleavage activity was examined and all of the compounds were able to cleavage the plasmid DNA.

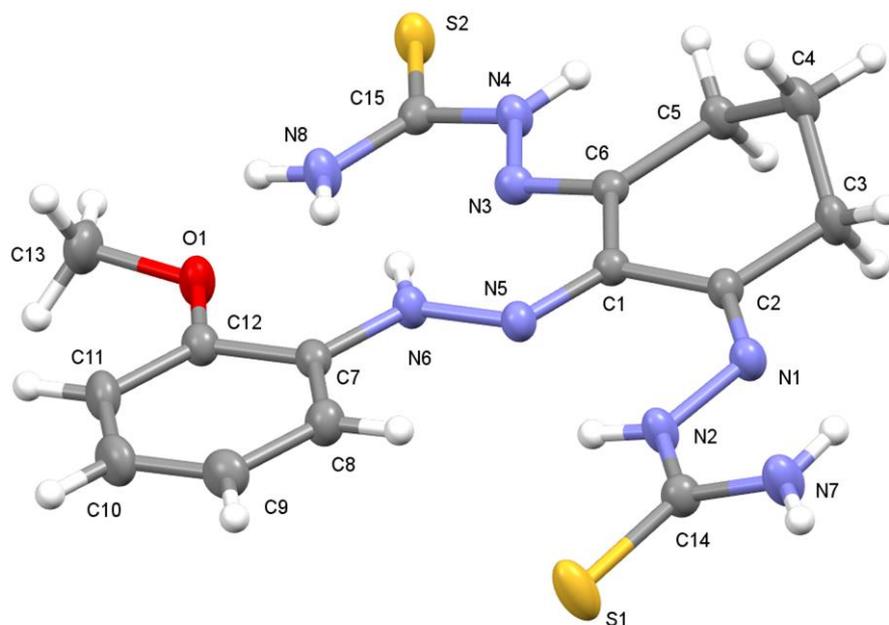


Figure 1. ORTEP view of the L₁ showing the atom numbering scheme

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Key Words: Thiosemicarbazone, crystal structure, antioxidant activity, DNA cleavage

ZETA POTENTIAL, MOBILITY AND PARTICLE SIZE MEASUREMENTS OF POLY ETHYLENE-BLOCK-POLY(ETHYLENE GLYCOL)

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Polyethylene (PE)-based materials are widely used in many fields due to the combination of excellent physical and chemical properties along with low cost. However, the lack of chemical functionality and structural diversity is the common barrier for broadening their applications. Hence, it is urgent to develop the PE-based materials functionalized by polar groups or polymer segments with some improved or modified properties [1]. One of them is polyethylene-block-poly(ethylene glycol). It is nonionic surfactant, emulsifier for coatings, ceramics, metalworking fluids and inks and is used as lubricant, mold release agent and thickening agent [2]. Intercalates of kaolinite/Polyethylene-block-poly (ethylene glycol) were successfully prepared by melt intercalation of the polymer with a kaolinite: dimethyl sulfoxide pre-intercalate [3].

In this study, polyethylene-block-poly(ethylene glycol) with different molecular weights have been examined by Zeta Potential Analyzer. Zeta potential, mobility, conductivity and particle size of PE-b-PEG system were determined by using the Zeta Potential Analyzer in water with different pHs.

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Key Words: *copolymer-drug delivery system, zeta potential, particle size, mobility*

Acknowledgements: *This work has been supported by Yildiz Technical University, Turkey.*

INVESTIGATION OF pH EFFECT ON ZETASIZER MEASUREMENTS OF POLY (MALEIC ANHYDRITE-CO-VINYL ACETATE) - ACRIFLAVINE CONJUGATE

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Synthetic polymers are biomaterials useful for controlled drug delivery systems, applied in the medical and biotechnologies, as well as in the food and cosmetics industries. These applications also include surgical devices, implants and supporting materials (e.g., artificial organs, prostheses and sutures), controlled drug delivery systems (different routes of administration and rational drug design), carriers of immobilized enzymes and cells, biosensors, components of diagnostic assays, bio-adhesives, ocular devices and materials for orthopedic applications [1]. Surface properties of drug carrier systems are responsible for their interactions with plasma proteins. Zetasizer measurements which are zeta potential, particle size and mobility provide valuable properties of particles or molecules in liquid medium. Zeta potential measurements will give information about the overall surface charge of the particles and how this is affected by changes in the environment (e.g. pH, presence of counter-ions, adsorption of proteins). Zeta potential can also be used to determine the type of interaction between the active substance and the carrier; i.e. whether the drug is encapsulated within the body of the particle or simply adsorbed on the surface. This is important because adsorbed drug may not be protected from enzymatic degradation, or may be released very rapidly after administration. Particle size (PS) and width of particle size distribution called polydispersity index (PI) of nanosuspensions are responsible for saturation solubility, dissolution velocity, physical stability and biological performance of nanosuspensions. Change in particle size affects saturated solubility and dissolution velocity [2,3].

In the present study, copolymeric drug delivery system, poly (maleic anhydrite-co-vinyl acetate) copolymer carrying acriflavine drug, has been examined by Zeta Potential Analyzer. Zeta potential, mobility, conductivity and particle size of prepared copolymer-drug system were determined by using the Zeta Potential Analyzer in water with different pHs.

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Key Words: *copolymeric drug delivery system, zeta potential, particle size, mobility*

Acknowledgements: This work has been supported by Scientific Research Project Coordination Center of Yildiz Technical University, Turkey (2014-01-02-YL09) and Sciences Research Projects Foundation of Cumhuriyet University (Project No: F258).

ZETASIZER MEASUREMENTS OF POLY (ETHYLENE OXIDE)

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Polyethylene oxide is a polyether and has strongly hydrogen bonds with water. Poly (ethylene oxide) (PEO) is one of the most intensely studied polymers in current materials science and biotechnology because of not only its unique behaviors in solution but also its wide applications [1]. It is chemical stability, solubility both in water and many organic solvents, non-toxicity, rapid clearance from the body, lack of immunogenicity and a Food and Drug Administration (FDA) approval for internal consumption. Films of high molecular weight PEO are tough, ductile, heat-sealable, and because of their high degree of crystallization, resist well to atmospheric moisture [2]. Additionally, architectures based on nonlinear PEO have recently become a focus of scientific interest, due to their branched structures and unique rheological property [3], and their intriguing potential for biomedical and pharmaceutical applications, for instance as multivalent PEGylation reagents.

In the current work, polyethylene oxides with different molecular weights have been examined by Zeta Potential Analyzer. Zeta potential, mobility, conductivity and particle size of PEO system were determined by using the Zeta Potential Analyzer in water with different pHs.

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Key Words: *polyethylene oxide, zeta potential, particle size, mobility*

Acknowledgements: *This work has been supported by Yildiz Technical University, Turkey.*

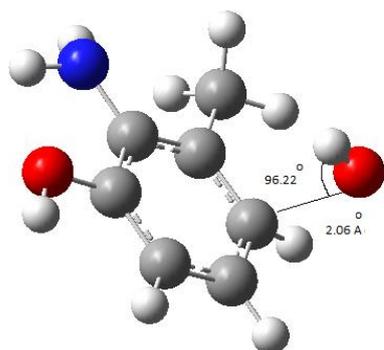
THE ANALYSIS OF REACTION KINETICS OF AMINOTOLUENE MOLECUL THROUGH CALCULATIONAL METHODS

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The most probable reaction paths of aminotoluene (o-toluidine) molecule with OH radical have been analyzed. The optimized geometry was calculated via Gauss View 5. Subsequently, the lowest energy status was found out through geometric optimization via Gaussian 09 programme. The geometrical structure analysis and bond lengths were also calculated. This study aims to determine the most probable path for the product distribution of aminotoluene and OH radical interaction in gas phase and aqueous media. Quantum mechanical methods were used to indicate the impact of reaction rate over primary intermediate, hydroxylated intermediate, and finally the impact of water solvent.



With the aim to determine the intermediates occurring at the reaction of aminotoluene degradation, geometric optimization of the reactant and transition status complexes were realized through Density Functional Theory (DFT) method. Based on the Quantum mechanical calculation, all probable rate constants of reaction paths were calculated by using Transition Status Theory (TS). For the determination of the transition status of the reaction, C-O bonds were taken as reference. Activation energy for probable reaction paths of all transition status complexes was calculated,

and their most stable state from the thermodynamic perspective for the gas phase and aqueous media. The impact of water solvent was investigated by using COSMO as the solvation model. The COSMO method describes the solvent reaction field by means of apparent polarization charges distributed on the cavity surface, which are determined by imposing that the total electrostatic potential cancels out at the surface. This condition can describe the solvation in polar liquids. Hence, it is the method of choice in this study.

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Key Words: DFT, OH radical, Aminotoluene

Investigation on Elastic and mechanical properties of intermetallic compounds Mg-TM (TM=Cu, Ag)

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Abstract. Magnesium (Mg) alloys are among the lightest structural materials known and they are used in a variety of applications, particularly in the automotive industry and aerospace manufacturing. In this work, the structural, elastic and mechanical properties of the intermetallic compounds MgCu and MgAg are systematically studied using the density functional theory plane-wave pseudo potential method, within local density approximation (LDA) and generalized gradient approximation (GGA). The first-principles quantum mechanics calculations are carried out to report a quantitative study. The elastic constants were determined from a linear fit of the calculated stress-strain function according to Hooke's law. From the elastic constants, the bulk modulus B , shear modulus G , Young's modulus E , Poisson's ratio σ and anisotropy factor A for MgCu and MgAg compounds are obtained. Comparison of the calculated equilibrium lattice constants and experimental data shows good agreement. The calculated elastic constants indicate that the MgCu and MgAg compounds are mechanically stable and anisotropic at ambient conditions. Ductility for these compounds is analyzed by calculating the ratio B/G and Cauchy pressure ($C_{12} - C_{44}$). The intermetallic compounds MgCu and MgAg are found to be ductile.

Keywords: *Intermetallics, Elastic properties, Mechanical properties, Computer Simulations*

Elastic and mechanical properties of MgX (X=Ru, Rh) intermetallic compounds

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Abstract

In the last years, Magnesium alloys are known to be of great technological importance and high scientific interest, due to their applications in the automobile industry, aeronautical and space industry. In this work, density functional theory plane-wave pseudo potential method, with local density approximation (LDA) and generalized gradient approximation (GGA) are used to perform first-principles quantum mechanics calculations in order to investigate the structural, elastic and mechanical properties of the intermetallic compounds MgRu and MgRh with a CsCl-type structure. Comparison of the calculated equilibrium lattice constants and experimental data shows good agreement. The elastic constants were determined from a linear fit of the calculated stress-strain function according to Hooke's law. From the elastic constants, the bulk modulus B , shear modulus G , Young's modulus E , Poisson's ratio σ and anisotropy factor A for MgRu and MgRh compounds are obtained. Ductility for these compounds is analyzed by calculating the ratio B/G and Cauchy pressure ($C_{12} - C_{44}$). This is the first quantitative theoretical prediction of these properties.

Keywords: *Intermetallics; Elastic properties; Mechanical properties; Computer Simulations*

Synthetic Studies on Quinones by Means of Nucleophilic Substitution

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Abstract:

The preparation of new organic compounds is a prime focus of the researches in the field of current organic, bioorganic, and medicinal chemistry [1]. In recent years, there has been considerable interest in the synthesis of 1,4-benzo- and 1,4-naphthoquinones which are the core structures in various lead molecules displaying antifungal, antibacterial, antiviral, and anticancer activities [1-3]. The presence of heteroatoms such as sulfur or nitrogen atoms in quinone moiety enhances the interesting biological profile [4]. Our investigation was to synthesize of 1,4-benzo- and 1,4-naphthoquinones combined as substituents such as ethoxy, thio or amino groups. In this presentation, a detailed overview about spectroscopic and structural aspects of the synthetic reactions of 1,4-benzo- and 1,4-naphthoquinone compounds with different nucleophiles will be given.

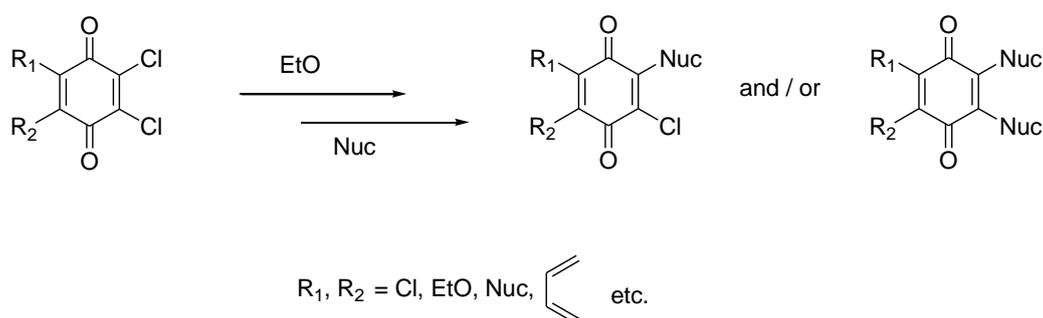


Figure 1. Synthesized Substituted 1,4- Benzo- and 1,4-Naphthoquinone Derivatives

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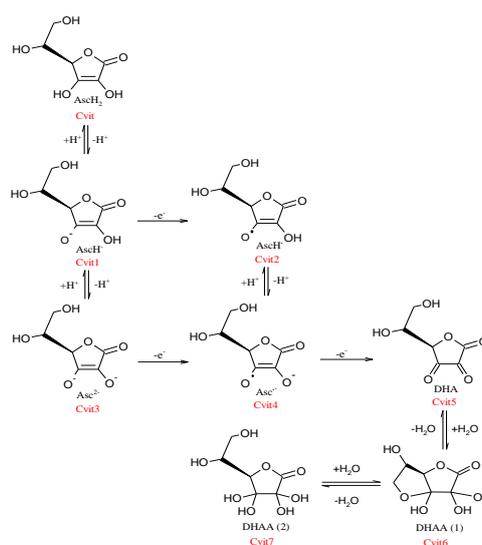
DFT ANALYSIS OF INTERCONNECTION OF Fe⁺² IONS WITH VITAMIN C IN THE FOOD

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Vitamin C (Ascorbic Acid) is known as both for being reducing agent and creating acid, which increases the absorption of non-heme iron from the iron source in food. Ferric iron Fe⁺³, ferrous iron Fe⁺² reductions by ascorbic acid as a result of non-heme iron absorption is known to increase. In this paper, relation between ascorbic acid with ferric iron (Fe⁺³) and its effect is analysed by Density Functional Theory (DFT) method. In order to understand this effect better, at first molecular structures have been examined by the DFT method, using the B3LYP hybrid functional with the 6-31g(d) and 6-311g(d, p) basis set implemented in the Gaussian 09W software package, the structural and optical properties are calculated in Figure. UV graphics of the wavelength and strengths belongs the lowest 20 electronic passes of molecules in gas and water phases are illustrated. At Second, the reaction mechanism energies are calculated.

It has been observed from the results that the reaction mechanism energy is 102,80 kcal/mol without iron. When Fe⁺³ has been introduced the energy increases to -1312,41 kcal/mol. Depending on the hydroxyl groups and double bounds in the molecules, shifts in the UV graphics are observed. Then the NBO charges of molecules in each step have been calculated. Atoms that supplied the electron reaction steps required for reaction Fe⁺³ + e⁻ → Fe⁺² are observed [1].

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Key Words: DFT, Vitamin C, Iron ions, UV

NEW TRENDS IN GC-FID TECHNIQUE FOR DETERMINATION AND CONTROL OF NICOTINE IN CIGARETTE SMOKE AND INDOOR AIR

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One of the most significant sources of environmental exposure to many toxic compounds is environmental tobacco smoke. In addition to ordinary tobacco cigarettes relentlessly are growing popularity of electronic cigarettes. To date, the majority of cigarette research has focused on characterizing the tobacco, which is ultimately vaporized for the end smoker to inhale. There is no report of simultaneous determination of nicotine-related alkaloids in cigarette smoke and indoor air, especially for electronic cigarettes.

The primary objective of this study was to compare and possibly differentiate various tobacco brands for original and electronic cigarettes. Different cigarette smokes and tobaccos were analyzed for levels of nicotine as alkaloids. The additional aim of this work was to develop analytical method of chromatographic determination of nicotine in cigarette smoke of one single cigarette and in indoor air using direct solid phase extraction combined with improved GC-FID method. The following solid adsorbents were examined: polyfractional silica gel, activated carbon; spherical activated carbon and membrane filter based on perchlorvinyl.

Nicotine was extracted from indoor air polluted with tobacco smoke from cartridge packed with selected sorbent or membrane filter, flowmeter and vacuum pump. The analytes were determined in laboratory as well as in real-time conditions (public pub). To extract nicotine from adsorbents more effectively, two different extraction steps were tested in our experiment: liquid extraction and thermodesorption. Because it extracted more amount of nicotine, the first rout was chosen for extraction of alkaloid from surface of solids. The extraction solvent was chosen for maximum extraction efficiency. To avoid thermal degradation and adsorption inside the liner, a suitable injector temperature and pulse injection mode were chosen.

Both materials filter based on PVS and spherical activated carbon have a great potential for use as materials for control nicotine in indoor air. These materials offer not only high adsorption capacity, respectively, 40,8 mol/g and 30 mol/g, but also many times regenerated. Our results of nicotine in indoor air confirm that the compounds of interest occur at significant levels in location where people smoke cigarettes, and using selective adsorbent can be significantly decreased their level.

Key Words: Tobacco smoke, Electronic cigarettes, Nicotine, Ordinary tobacco cigarettes, GC-FID, Extraction.

MOLECULARLY IMPRINTED POLYMERS FOR PROTEINS

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To mimic the active sites of antibodies the target analyte is interacted with chemically active moieties of polymerizable monomers and this arrangement is fixed in the following polymerization. After removal of the template binding sites partially complementary in size and shape are formed thus the template preferential rebinds to these cavities. For the reparation of MIPs for proteins so-called surface imprinting techniques have been developed, where the template is imprinted in ultra-thin polymer films in order to allow effective removal of the target. From the beginning of the 2000's electrochemical synthesis of MIPs by polymerizing electroactive functional monomers gained acceptance in molecular imprinting of proteins. Preparation of MIPs by electropolymerization allows optimizing the film thickness in order to generate binding sites accessible for the target. Most of the electropolymerizable monomers can be deposited from aqueous solutions where protein molecules preserve their natural conformation.

In this talk electrochemically prepared MIPs for the following proteins will be presented the redox carrier cytochrome c, the iron storage protein ferritin, and the enzyme acetylcholine esterase. For this spectrum of proteins different approaches of oriented immobilization of the target during the electropolymerization, methods of template removal and of read-out after rebinding are discussed.

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Key Words: *Molecularly Imprinted Polymers, Biomimetic Sensors, Proteins, Enzymes*

Biodegradation of a BTEX compound (Toluene) under varying soil water content and Temperature

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BTEX (Benzene, Toluene, Ethyl benzene Xylene) are monoaromatic petroleum derived hydrocarbons which create a major pollution problem in the subsurface. They are classified as Light Non Aqueous Phase Liquids having densities less than water. Such spills can occur in various habitats. The accidental spills and leakages of underground tanks and transporting pipelines have been the major sources of these hydrocarbons. There are many disadvantages of using chemical and physical methods for the removal of BTEX from soil-water systems. The most suited environmentally benign option is through bioremediation. These contaminants get biodegraded with time by indigenous microorganisms but the process of natural attenuation is quite slow. Many studies have shown success with enhanced or engineered bioremediation which accelerates the natural process. The rate of this remediation depends on some crucial environmental factors like oxygen supply, nutrients, temperature, and soil water content. Toluene is chosen as the representative component of BTEX in this study. This study highlights the combined impact of soil-water content and temperature on the biodegradation of Toluene. Batch experiments were performed under controlled laboratory conditions with oven dried soil and contaminated groundwater spiked with toluene stock with sufficient headspace to maintain aerobic conditions. Two different soil water contents were investigated at two different temperatures. Each set had a live and sterile batch. It was found that for both the oversaturated and 100% saturated cases, the overall biodegradation time increased more than two fold when the temperature changed from 30 °C to 10 °C. Whereas under different soil water contents, toluene degraders were found to be more efficient for the oversaturated case than the 100% saturated case. A comparative account of these four different techniques is presented for their respective rates of biodegradation and the total time of degradation. The results of these experiments can be beneficial in framing the engineered bioremediation plan for BTEX contaminated soil and groundwater systems.

Keywords: BTEX, soil-water content, temperature, enhanced bioremediation

**A CASE STUDY: ANALYSIS AND PERFORMANCE OF AN ANCHORED
PILE WALL IN WEAK SATURATED SILT**

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An excavation of 7.5m depth from ground surface is set forth for a public parking garage to be underlain by weak saturated silt. Saturated weak silt prevailing the soil profile makes it inevitable to excavate the soil considering stability of the pit. In Turkey, secant pile wall is one of the commonly preferred solutions for the sites where the seepage due to difference between ground water levels of the pit and free field should be taken into consideration. Having proven the stability problem in such an excavation, the case has been analyzed analytically and numerically. Since the excavation depth is higher than level over which the wall might not be safe and economic without anchorage, performance of secant pile wall anchored at just one level has been evaluated. The results of the analytical and numerical analyses have been discussed in a comparative manner. The results have been found to be soil parameter sensitive for both type of analyses. The relationships between pile embedment depth, anchorage force and soil parameters have been shown.

Key Words: *Secant pile wall, Case study, Saturated silt*

EXPERIMENTAL TESTS OF OPTIMALLY DESIGNED STEEL CORRUGATED BEAMS

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Abstract

Over the past few years there has been sustainable development in the steel construction technology. One of the recent additions to such developments is the steel I-girders with corrugated web beams. The use of these beams results in a range of benefits, including flexible, free internal spaces and reduced foundation costs. Corrugated web beams are built-up girders with a thin-walled, corrugated web and wide plate flanges. The thin corrugated web affords a significant weight reduction of these beams, compared with hot-rolled or welded ones. In this paper, experimental tests of optimally designed corrugated steel beams are presented. For this purpose, six corrugated steel beams are tested in a self-reacting frame to determine the ultimate load carrying capacities of mentioned beams. The tested corrugated beam specimens are designed by using one of the recent stochastic search techniques called firefly algorithm. The design constraints are respectively implemented from BS EN1993-1:2005 (Annex-D, Eurocode 3) ve DIN 18-800 Teil-1.

Keywords: Steel structures; corrugated beams; load carrying capacity; structural optimization; failure modes of beams.

**THE YOUNG CUSTOMERS' PERCEPTIONS OF TOMATOES OF DIFFERENT
GEOGRAPHICAL AREAS: EXPERIMENTAL STUDY**

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Abstract

This paper presents the experimental study among young consumers of tomatoes, regarding the organoleptic characteristics of tomatoes from three different geographical areas and results regarding their perceived price of tomatoes. In this study differences/similarities of Slovenian tomatoes with altered organoleptic characteristics, (a brand new variety to other types of tomatoes that are available on the Slovenian market) are compared to Dutch and Spanish tomatoes. In this experimental study the organoleptic characteristics of the tomatoes affecting the perceived price for each tomato variety by young consumer, were analyzed. This experimental study examines four hypotheses using different quantitative methods: one-way ANOVA, chi-square, multiple regression and logistic regression. In first stage of the study it was found that all organoleptic characteristics (colour, texture, firmness, ratio of acid to sugar, and aroma) have statistically significant effect on overall impression regarding tomatoes; the most important are ratio of acid to sugar and colour of tomatoes. It was also found that there are statistically significant correlations between the organoleptic characteristics and the perceived price, except for the firmness of tomatoes. Our study also revealed that there is no statistically significant relationship between the perceived price and the choice of tomatoes. In the next stage of the study it was found that there were statistically significant differences between the three different tomato varieties grown at three different locations. Young consumers assessed the organoleptic characteristics of the Slovenian varieties as the best, followed by the Dutch and Spanish tomatoes. The scientific contribution of this study is reflected in the evaluation and comparison of tomato varieties from three different geographical regions, in linking the organoleptic characteristics of tomatoes with the price, and in results regarding the relationship between the price and the final selection of tomato variety.

Key words: *tomatoes, customer behavior, experimental study, organoleptic characteristics*

UNCERTAINTIES IN FLOOD EVENTS ESTIMATION

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Flood event probability is of great interest, both in estimating flood risk and in decision making about design of structures for flood protection. Basic uncertainties classification is on natural and epistemic uncertainties. Concretely, hydrological, hydraulic, statistical and geotechnical uncertainties play role in real value of flood event probability, each of these having two basic concepts of uncertainties involved in it. Climate change and global warming could play significant role in future floods, bringing more uncertainty in statistical description and hydrological processes of water protection systems. Review, classification and description of those uncertainties are given in the paper.

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Key Words: *flood event, probability, uncertainties*

LONG TERM RESERVOIR OPTIMIZATION DUE TO THE CRITERIA OF ENERGY PRODUCTION

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Operation of water reservoirs can be considered in the manner of real-time, short term, mid term and long term planning. In this paper, the long term operation is emphasized, due to the criteria of satisfying the needs of electric power system. Usual method for analysing the operation of reservoir includes maximization or minimization of criteria function due to the given technical constraints of the system. Those technical constraints can include satisfying water supply demand, irrigation demand, securing the space for flood wave etc. In the paper review of criteria functions and constraints is given, including discussion of possible hydrological uncertainties influencing the reservoir operation.

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Key Words: *reservoir, long term planning, optimization, technical constraints, uncertainties*

**ENVIRONMENTAL EFFECTS OF THE ENERGY CONSUMPTION IN
URBAN AREAS**

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Urban areas are places where a large majority of citizens live. Urban areas are dominant in the economy and energy use. People in these areas can affect balance of nature. Gradual increase in the earth's surface temperature is mostly caused by human activity. Human causes carbon dioxide, e.g. exhaust from cars and power plants. In case of the continuation of this negative effect, climate changes due to global warming will be inevitable. In this study, air quality parameters in some countries compared with each other and with threshold values. While CO₂ concentration was around 250-280 parts per million (ppm) in the late 1800s according to the National Oceanic Atmospheric Administration, CO₂ concentration reached 380ppm in the 2000s and 400ppm in the 2015. If we does not act and if emissions continue to increase, global mean temperature may increase over 3⁰C by 2030. Therefore energy consumption in urban area is very important. Energy circulation plan's items against further temperature rise can be the planting trees in school gardens and on roofs and walls and around public institutions and religious places, the expansion and reformation of green areas in children's parks, and the improving green areas around the buildings and roadsides. Reducing energy consumption in the city can be possible by increasing the density (increasing the number of people per square meter in the city), the use of public transportation such as subways, buses, trams, light rails, and the use of energy derived from waste in the city.

Key Words: *Urban, Global warming, Energy consumption, Air quality*

PROBABILISTIC APPROACH TO THE SCHOENBERG SPLINE OPERATOR AND UNIMODAL DENSITY ESTIMATOR

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Using Chebyshev's inequality, we provide a probabilistic proof of the uniform convergence for continuous functions on a closed interval by Schoenberg's variation diminishing spline operator. Furthermore we introduce a unimodal density estimator based on this spline operator and thus generalize that of Bernstein polynomials and beta density. The advantage of this method is the local property. That is, refining the knots while keeping the degree fixed of B-splines yields better estimates. We also give numerical example to verify our results.

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Key Words: *Schoenberg spline operator, B-spline, uniform convergence, Jensen's inequality, unimodal density, Beta density*

**A HYDROLOGICAL APPLICATION OF THE RANK OF BIVARIATE
EXTREME ORDER STATISTICS**

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Hydrological events can be described as a multivariate event whose main characteristics can be summarized by dependent random variables. In the paper of Yue et al (2001), a few bivariate Gamma distribution models which are Izawa, Moran, Smith-Adelfang-Tubbs (SAT) and Farlie-Gumbel-Morgenstern (FGM) constructed from specified Gamma marginals are summarized and the applicability of these models have been showed with actual flood data. In this study, the joint distribution of rank of bivariate extreme order statistics has been applied in analyzing and investigating the joint probabilistic behaviour of environmental events such as floods and storms. By using the same data obtained from the paper Yue et al (2001), we represent the joint probabilistic behaviour of largest flood peak and largest flood volume using the obtained joint distribution of rank of bivariate extreme order statistics in a new sample.

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Key Words: *Bivariate order statistics, Extreme value, Hydrology, Risk*

**BAYESIAN APPROACH TO DEMAND ESTIMATION WITH
JEFFREYS' PRIOR**

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Demand estimation is a process that comes up with an estimate of the amount of demand for a product or service. The estimate of demand is typically confined to a particular period of time. One of the reasons that companies use demand estimation is to assist with pricing. Another reason that demand estimation is commonly used is so that it can help with production amount and controlling the serviceable inventory level. Demand estimation derived from a parametric distribution requires statistical estimation of its mean and variance or other parameters. In the case of unobserved lost sales, the parameter estimates must be adjusted appropriately to account for the unobserved component of demand. The focus of this paper is to cope with the observable lost sales in the textile sector we utilize the Bayesian approach. In Bayesian analysis the new information is combined with the previously available information. At this point the prior information (distribution) corresponds to the historical data or the subjective thought of the decision maker about the random parameter of the involved process. The consequential decision or inferential statement (posterior distribution) pooled all available information about the uncertain parameter of the interest. The proposed Bayesian approach is applied to women clothing monthly sales data between the years 1997 to 2013. To obtain the posterior distribution parameters we used Jeffreys' priors where the lack of information about the priors.

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Key Words: *Jeffreys's Prior, Bayesian Information Update, Demand Estimation.*

Nonparametric Kernel Density Estimation under Shape Constraint

ABSTRACT

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We will discuss nonparametric density estimation methods under shape constraints. Most of talk focus on discussing a robust data sharpening method (Choi and Hall, 1999) for rendering a standard kernel estimator, with a given bandwidth, unimodal. Basic concepts of kernel density estimation will be introduced with a graphical motivation. Our approach involves modifying the sample so as to ensure the standard estimator, applied to the altered rather than the original sample, satisfies the shape constraint such as unimodality. In particular, for a given bandwidth and kernel the data are moved the least amount subject to the kernel estimator having the unimodal property. It has theoretical and numerical properties of the type that one would like such a technique to enjoy. With probability converging to 1 as sample size diverges, our technique alters the kernel estimator only in places where the latter has spurious bumps, and is identical to the kernel estimator in places where that estimator is monotone in the correct direction. Provided the true density is unimodal our estimator generally reduces mean integrated squared error of the standard kernel estimator. Multivariate applications of our method are also possible. Indeed, in the setting of two or more dimensions there are relatively few alternative approaches. Again, the distance through which the data have to be moved could be used as the basis for a test of unimodality. Methods for estimating density functions under qualitative constraints include those suggested by Braun and Hall (2001), Hall and Huang (2002), Turnbull and Ghosh (2014), etc.

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Key Words: Bandwidth, data sharpening, data tilting, unimodality.

**CREDIT CARD FRAUD DETECTION OF AN E-COMMERCE SITE
USING DATA MINING TECHNIQUES: A CASE STUDY**

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Fraudulent transactions are one of the main concerns regarding online shopping. Fraud transactions cause financial losses for not only to customers and E-Commerce merchants but also to the banks. Therefore, it is crucial for E-commerce sites to have capabilities to detect and to classify product orders that can be attributed as fraud. These kinds of fraud detections are easier when there is available abundant information about clients as in Banking but it becomes challenging to find proper attributes in commercial web sites. In this study real transaction data of an E-Commerce site are used to analyse for illegitimate use of credit card transactions. Firstly all raw data analysed and filtered from missing values. Appropriate attributes are selected using gainratio algorithms, after then Fraudulent transactions have been detected and classified and a true positive rate more than %92 is obtained using data mining techniques namely, Naïve Bayesian, Artificial Neural Network, Decision trees (J48)

Key Words: Fraud, Fraud detection, Naïve Bayesian, Machine Learning, E-commerce Fraud Detection, E-commerce fraud detection

**THE FACTORS AFFECTING STATISTICAL POWER OF
APPROXIMATE F-TESTS IN LINEAR MIXED EFFECTS MODELS
WITH LONGITUDINAL DATA**

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Statistical power analysis is an important technique in designing of any longitudinal study that helps researchers to determine how large a sample size of subjects and number of time points should be considered for the study. The power of a statistical test gives the likelihood of rejecting correctly the null hypothesis when it is false. In this study, via a simulation-based approach, statistical power for F-test statistics with Containment, Kenward-Roger and Satterthwaite degrees of freedom approximation methods is calculated to determine sample size in the context of linear mixed effects models (LMMs) [1] used to evaluate the change in responses from two treatment groups in longitudinal studies. The effect of the variance-covariance structures of random effects [unstructured UN or FA0(2)][2] in LMMs is examined on the statistical power calculations. Errors in the LMM are considered to be uncorrelated, autocorrelated in first-order autoregressive AR1 and first-order moving average MA1 structures. Furthermore, whether restricted maximum likelihood (REML) and maximum likelihood (ML) parameter estimation methods differ in statistical power calculations for approximate F-tests in the LMM with uncorrelated, AR1 and MA1 errors. It is found that parameter estimation methods, the structures of autocorrelated errors and random effects variance-covariance affect power calculations. However, the greatest factor affecting the statistical power of approximate F-tests is the variance-covariance structure of random effects in the LMM. The required sample size and number of time points for desired power in the longitudinal study differ noticeably according to the autocorrelated errors and F-tests.

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Key Words: *linear mixed effects models, statistical power, approximate F-tests, autocorrelated errors, parameter estimation methods*

CLASSIFICATION OF THE STOCK INDEX DIRECTION WITH LOGIT MODEL

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In supervised learning, the classification problem is predicting the categorical class labels of new observations based on the training set of data including observations whose category membership is known. Classification is one of the most extensively used data mining technique. In financial data mining, stock index direction prediction is a challenging task. In this study, we aim to predict the direction in the Borsa Istanbul 100 (BIST100) Index over the period from January 2005 to March 2016. To predict the direction of stock market, a logistic regression model is fitted using five previous trading days' returns which are called Lag1 through Lag5 and volume. The model also have been trained and tested on two separate data sets. Finally, we compare the out-of sample predictions to the actual movements of the stock market over the given time period.

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Key Words: *Classification, Multiple logistic regression, Stock index prediction.*

FORECASTING TOURIST ARRIVALS TO TURKEY WITH GENETIC PROGRAMMING

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Time-series models have most frequently used for forecasting to tourism demand. Alternatively we have used a Genetic Program (GP) to predict the number of tourists coming to Turkey from abroad on a monthly basis is studied. In this paper, the performance of the proposed method in tourism forecasting and the adequacy of GP to predict was studied. The GP technique shows different advantages regarding to other forecasting methods. It is more robust, easy to use and it allows a n elementary ad hoc interpretation of the analysis results. The period of monthly tourists arrivals to Turkey from January 1970 to December 2014 was determined for forecasting. The sample was divided into different sub-samples for verifying the validity of the model. The results have indicated that GP could be a beneficial tool to predict the tourist arrivals.

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Key Words: *Genetic Programming, Tourism Forecasting*

**ON THE IMPROVEMENT FOR MEAN ESTIMATION BASED ON
BALANCED GROUPS RANKED SET SAMPLING**

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The ranked set sampling (RSS) is an efficient and advantageous method for estimating the mean of the population especially when the exact measurement of an observation is difficult and/or expensive and visual ordering can be done easily. This method come into prominence recently due to the efficiency and cost effectiveness. The basic RSS method has been modified by various researchers. One of them is Balanced Groups RSS (BGRSS) which takes into account the measurements of the lowest, the median, and the largest ranked units. Balanced Groups RSS is more efficient than commonly used simple random sampling for estimating the population mean and it gives unbiased results when the underlying distribution is symmetric. In this study, we propose an improvement on the sampling procedure of Balanced Groups RSS. It offers a more flexible sampling plan ensuring the independence of the set size and sample size. We give a Monte Carlo simulation study comparing the performance of the mean estimators for the methods of Improved BGRSS, BGRSS, Median RSS, Percentile RSS and Extreme RSS according to their mean squared errors and sampling costs in various type distributions of populations. Also, we suggest a weighted estimator for an efficient estimation of the population mean and we compare the characteristics of the estimators in different type of asymmetric probability distribution with different sets and various sample sizes.

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Key Words: *Balanced Groups Ranked Set Sampling, mean estimation, weighted mean*

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Pólya-Aeppli of order k risk model

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Abstract

In this study we define the Pólya-Aeppli process of order k as a compound Poisson process with truncated geometric compounding distribution with success probability $1 - \rho > 0$ and investigate some of its basic properties. Using simulation we provide a comparison between the sample paths of the Pólya-Aeppli process and the Poisson process. Also, we consider a risk model in which the claim counting process $\{N(t)\}$ is Pólya-Aeppli process of order k , and call it a Pólya-Aeppli of order k risk model. For the Pólya-Aeppli of order k risk model we derive the joint distribution of the time to ruin and the deficit at ruin as well as the ruin probability. We discuss in detail the particular case of exponentially distributed claims and provide simulation results for more general cases.

INVESTIGATING CUSTOMER SATISFACTION USING IMPACT SCORE TECHNIQUE

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Customer satisfaction is very important to develop the retail strategies. Especially in the supermarkets, where competition intense each day, it is very important for the markets to meet the needs and wants of the customers and satisfying them. In order to attract customers to their own supermarkets, managers conduct intensive marketing campaigns and expect that these campaigns really help in attracting customers to their own supermarkets. In this study, using impact score technique for analyzing the customer satisfaction. The Impact Score technique determines the relative impact of attributes on overall satisfaction by measuring customers' relative decreases in overall satisfaction, when a recent problem with an attribute is reported. Therefore, the attributes have the most impact on supermarket customer satisfaction are determined. The data used in this study consists of 1530 customers shopping from 102 stores belonging to four Turkish supermarket chains in Istanbul.

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Key Words: *Customer Satisfaction, Impact Score Technique*