The journal’s aim is to disseminate, communicate, disseminate and exchange housing and planning information. The focus of this edition is on tools, methods and processes which enable the various people and to help develop the necessary institutional frameworks which will support the local initiatives of people in the building process.

Open House International

The journal is an association of institutions and individuals concerned with housing, design and development in the built environment. Theories, tools and practice with special emphasis on the local scale.

BRAC University,
Department of Architecture, Dhaka, Bangladesh, (Fahd H Malik) fahd@bracu.ac.bd www.bracu.ac.bd

Universidad Del Rosario,
Calle 14 No. 6-25, Bogotá, Colombia, (Janneth Espitia) jespitia@urosario.edu.co www.urosario.edu.co

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Inha University, Department of Architecture, Inha University, Incheon, Korea. (Jin-Ho Park) jinhopark@inha.ac.kr

University of Technology, Department of Housing Quality and Process Innovation OTB Research Institute of Housing, Urban and Mobility Studies Jaffalaan 9, 2628 BX Delft, The Netherlands (Henk Vischer) H.vischer@tudelft.nl www.otb.tudelft.nl

McGill University
School of Architecture, Macdonald Harrington Building Centre for Minimum Cost Housing Studies, 815, Sherbrook Street West, Montreal, PQ, Canada H3A 2V6. (Ari Friedman) ari.friedman@mcgill.ca www.homcs.mcgill.ca

Ball State University
College of Architecture Planning, Muncie, Indiana, 47306, USA. (Stephen Kendall) skendall@bsu.edu www.bsud.edu/cap

HousingLab
Department of Architecture, Ateno Federale delle Scienze Urbaniste, Lombardia, Padova, Italy. (Esra Can, Emre Akbil, Eastern Mediterranean University Mersin 10 - Turkey. emreakbil@gmail.com

The Glasgow School of Art
Mackintosh School of Architecture MEARU, 176 Renfew Street Glasgow G3 8RJ, Great Britain. (Nasir Mughal) m.noguez@gae.ac.uk

Budapest University of Technology & Econ. (BME)
Faculty of Architecture Budapest, Muegyetem rkp. 3. 1111 Hungary. (Levente Malysz) lmalyusz@ekt.bme.hu

Universiti Teknologi Malaysia (UTM)
Resources Development Division, Perusahaan Sutapaan Zanarath, Universiti Teknologi Malaysia (UTM) 81310 Skudai Johor, Malaysia. (Anuar Talib) anuar@utmsz.utm.my http://portal.psz.utm.my/Uasa

Philadelphia University
Engineering & Architecture Department, Faculty of Engineering, P.O Box 1, Jordan. (Ahmed Abu Al-Haija) ahmed33@gmail.com www.philadelphia.edu/joincontent/View448590/

University of Malaya,
Faculty of Built Environment, 50603 Kuala Lumpur, Malaysia. (Mustaiz Daud) mustaizd@uhom.com.my

American University in Cairo (AUC)
Jacobs Center for amenities and Social Inquiry, New York, New York, USA. (Stephen Kendall) skendall@bsu.edu

University of Hong Kong
Department of Architecture, City University of Hong Kong, (Yuan Peng) ypa@cityu.edu.hk

Yonca Hurol, Department of Architecture, Istanbul Technical University, Istanbul, Turkey.

International Technical Editor
Yonca Hurol, Eastern Mediterranean University, Department of Architecture, Mersin 10, Turkey.

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For further information contact us at your nearest Open House International office.

International Technical Editor
Yonca Hurol, Eastern Mediterranean University, Department of Architecture, Mersin 10, Turkey, yoncahurol55@gmail.com

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The journal of an association of institutions concerned with the quality of built environment.
The publishing framework is shaped around the forces which act on built environment, which maintain, change and transform it. The content consists of articles which deal with these issues and in particular with responsive, self-sustaining and re-useable environments which have the capacity to respond to change, provide user choice and value for money.

Aims
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Inha University, Department of Architecture, Inha University, Incheon, Korea. (Jin-Ho Park) jinhopark@inha.ac.kr

University of Malaya,
Faculty of Built Environment, 50603 Kuala Lumpur, Malaysia. (Mustaiz Daud) mustaizd@uhom.com.my

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Jacobs Center for amenities and Social Inquiry, New York, New York, USA. (Stephen Kendall) skendall@bsu.edu

University of Hong Kong
Department of Architecture, City University of Hong Kong, (Yuan Peng) ypa@cityu.edu.hk

Yonca Hurol, Department of Architecture, Istanbul Technical University, Istanbul, Turkey.

International Technical Editor
Yonca Hurol, Eastern Mediterranean University, Department of Architecture, Mersin 10, Turkey, yoncahurol55@gmail.com

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International Technical Editor
Yonca Hurol, Eastern Mediterranean University, Department of Architecture, Mersin 10, Turkey, yoncahurol55@gmail.com

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Yonca Hurol, Eastern Mediterranean University, Department of Architecture, Mersin 10, Turkey, yoncahurol55@gmail.com

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E-Mail: nicholaz.wilkinson@emu.edu.tr

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Editorial

This is the last issue of Open House International, which was prepared by Nicholas Wilkinson, who was the chief editor of the journal for many years.

We have managed to bring together all the past volumes and issues of Open House International, after Nicholas Wilkinson passed away in September 2017. Since Wilkinson founded the journal in 1976, a single shelf of my bookshelves is not sufficient for the whole forty-three year collection. This makes a total of 168 issues gathered in 21 volumes. Maybe this is the only collection which contains all issues of the journal together.

Since Nicholas Wilkinson dedicated himself to this journal, called Open House International, these volumes also represent Wilkinson’s academic heritage. Of course, the journal is Wilkinson’s main heritage and it should continue to be active.

Wilkinson was 35 years old when he published the first issue of Open House International in 1976. This attempt was a result of Nicholas Wilkinson’s architectural and academic interest in John Habraken’s theory of architecture about the open building. Wilkinson was designing architectural projects in this direction and doing academic research on this subject. He visited various countries for his research. There were also political dimensions of this attempt, because the whole idea was giving power to people about the buildings that they owned/used. Since Wilkinson and his colleague, Nabeel Hamdi, appeared on British television channels, they were very popular in England. People liked them. Wilkinson explained to me that the main reason of his modesty was being successful when he was very young.

I am holding the first call for articles for Open House International, which was prepared in 1975, in my hands at the moment. In it, it is written that “the mailing list is international and starts of with 350 readers from 40 countries.” The article submissions were asked to be sent to Postbus 429, Eindhoven, Netherlands. This invitation ends with a list of publications available from the SAR and some other sources.

The first issue of 1976 starts with an editorial written by Wilkinson. In this editorial he wrote that: “The response to the introductory pamphlet has been good.” This issue starts with an article about “SAR 73” written by Joop Kapteijns. Then there is a summary of a talk about “10 years of SAR” given by Prof.Dr. N.J.Habraken. Habraken wrote that SAR is “Stichting Architecten Research” which means foundation of architectural research. The main research focus of SAR was housing. SAR was formed in 1964 and ended in 2000, and Open House International began its forty-two year journey with SAR in 1975. Wilkinson clearly stated in his editorial that:

“The function of OPEN HOUSE can therefore be stated under three headings. 1. To publish other people’s work which is based wholly or partially on SAR’s philosophy and methodology. 2. To publish other people’s work which is based on different concepts and methods but which pursue similar objectives. 3. To publish SAR’s own work and views in response to 1 and 2 above.”

The third article in the first issue of Open House International is by Seiji Sawada and is titled: A brief Outline of the Housing Processes in Japan. The forth short article is Marcello Mamoli’s and it is called Towards a broader Participation. The last text in this issue is a call for information, which was written by Hubert Froyen. This issue ends with photographs demonstrating “La Maison Medicale” in Brussels, “Rothausweg” in Switzerland, “Wohnmodel Steilshoop” in Hamburg and “Wohnen Morgen” in Austria.

The second issue of Open House 76(2) contains longer articles. It starts with a short editorial and introduces the three authors of this issue. These authors and their articles are as follows:

- A.G.Tipple- A Radical Approach to Low-cost Housing in Zambia,
- Edgardo Martinez- SAR Method as a Support in a 3rd World Housing Design Approach,

The logo of Open House was also different in the first issues. Studying the early logo allows us to understand the second logo. The following figure demonstrates the first and the last logos of Open House International. The human figure is clear in both of the logos. The first one contains abstract human bodies and the second one is a smiling human face which is an outcome of O, H and i. This last logo also is a reminder of the façades of some small vernacular buildings which contain effects of anthropomorphism.

The first and the last logos of Open House.

Yonca Hurol
Co-editor Openhouse International
MULTICRITERIA DECISION SUPPORT SYSTEM FOR GREEN COMMERCIAL SPACE DESIGN.

Hao-Cheng Huang, Yeng-Horng Perng

Abstract
Commercial space features essential characteristics of attracting clients and creating profits; thus, the exterior and interior designs of conventional commercial space were often made to look grandiose and overdecorated. Over time, according to commercial attributes, operator preferences, and style of the designer, commercial spaces have constantly undergone renovation into varied styles. However, the physical renovation process has caused multiple and composite types of environmental pollution, such as waste and noise pollution caused by breaking of walls or partitions, and decorative paint pollution, as well as the use of high-energy-consuming lighting equipment, air-conditioning systems, and decorative materials. Global pollution has caused climate change, endangering living organisms and human life. Furthermore, no effective method exists to control the problem of high greenhouse gas emissions. Therefore, this study used energy-saving design concerns of a garden-type commercial space to propose an energy-saving evaluation model. The study combined three methodologies, the Delphi method, analytic hierarchy process, and fuzzy logic theory, to construct a multi-criteria decision support system for designing green commercial spaces, and used the green spatial design of a garden café as an example to illustrate the high objectivity and adaptability of the proposed model in practical application. The study also used an international award-winning case to validate that the proposed model had practical value as a reference to support key design decisions.

Keywords: Energy-Saving Design, Environmental Protection, Delphi Method, Analytic Hierarchy Process, Fuzzy Logic Theory

RESEARCH BACKGROUND AND MOTIVATION
Because of competition and cost considerations, industries often neglect that production processes cause environmental pollution. Sources of pollution that have severe social consequences include the viciously competitive industrial production cycle, highly polluting thermal power plants, petrochemical industry, transport, and various household electronics used in daily life; these sources have caused high greenhouse gas emissions all over the world. Most notably, the United States, a major industrial nation, has backed out of the 2015 climate agreement, making countries achieving the agreed global greenhouse gas emission targets even more difficult. This may even cause increasingly severe industrial pollution, which could lead to high greenhouse gas emissions, resulting in environmental damage and environmental impacts (Jacob et al., 2016); severe pollution affecting the biodiversity of living organisms (Chen et al., 2017), increased energy consumption and the greenhouse gas effect (Hsueh et al., 2016), and climate change (Hand et al., 2016; De Souza et al., 2015; Wheeler et al., 2016), thereby worsening the situation. Therefore, personal and family social responsibility, corporate social responsibility, and national social responsibility are issues that demand alerting attention (Hsueh, 2012; Hsueh, 2015).

The United Nations Intergovernmental Panel on Climate Change (IPCC) published a special report that collated the research of 257 scientists, and named humans as “extremely likely” to be the culprits responsible for global warming (IPCC, 2013). Additionally, the United States National Aeronautics and Space Administration scientist, Walt Meier, said that the most worrisome matter was that phenomena caused by extreme weather conditions would become increasingly frequent, and that glaciers are already melting at an increasingly fast rate. If the Greenland ice sheet melts completely, the sea-level worldwide would likely rise by over 6 meters (New Lens, 2016). The disasters and crises resulting from global climate change would first affect poor countries in low-lying areas that depend on natural resources, and whose people live in low-carbon ecological environments; these countries would face flooding caused by the rising sea-level. If industrial nations do not take national social responsibility seriously, then no effective method will exist to stop climate change from progressing in a negative direction and effectively slow the speed at which land is being lost to the sea in low-carbon nations. Additionally, because businesses treat eco-
nomic interests as priorities, as well as the increasing human demand for material things (Hsueh, 2012), added pressure exists for industrial production and competition. Simultaneously, attitudes to personal, familial, and corporate social responsibility are affected. Huang and Peng (2017) explored the connection between environmental protection measures, environmental responsibility, and economic value; in their study, they cited Wood (2014) to emphasize that everyone is a part of living society, and should be responsible for others and nature, as well as for present and future generations, and respect and protect basic living rights. Furthermore, personal environmental responsibilities should include whether consumption attitudes, values, lifestyles, family structures, social hierarchies, cultures, and consumption behavior support environmental awareness (Wood, 2014).

Cultural innovation combined with industrial development trends enabled the wide reuse of free and abandoned spaces in multiple ways, giving rise to a variety of commercial space designs. These new designs not only instilled character but also attracted crowds and provided business opportunities. Common examples are cultural restaurants with local characteristics, garden cafés, green energy restaurants, and eco-restaurants, which all contribute to the development trend of thematic commercial spaces. The plans and designs of thematic commercial spaces must consider the competitive and collaborative relationships between investors, designers, and consumers, and attempt to reduce management risks. Traditional grand design and planning techniques are more easily accepted by each of the three parties. However, from the perspective of environmental responsibility and green energy design, whether new design styles, new construction methods, cost problems, and using green and nontoxic construction materials could earn the approval of all three parties depends on the professional experience and accomplishments of the architect and the environmental awareness and subjective values of the investor. Only then could a new innovative green energy design space be created, which concurrently conforms to the preferences of consumers in terms of characteristics and benefits (Poxanne and Mason, 1993; Mantel and Frank, 1999). Furthermore, the designer must also enable market segmentation (Lesser and Hughes, 1986) in the thematic commercial space, for it to become destination brand and destination image (Tasici and Kozak, 2006). Thus, green energy design will become life-changing events and marketing (Mathur et al., 2006). The aforementioned situations form a type of strict test of design practice for a designer; therefore, the experience, environmental awareness, consumer attitude, objectivity, and adaptability of the interior designer are the influencing factors for risks. Thus, building a thematic commercial space green energy design decision support model could enhance the effectiveness of practical designs.

LITERATURE REVIEW

Commercial space overview
Commercial space is a place for business, transactions, and profit-making. Its main purpose is to meet the daily needs of consumers regarding food and clothing. A commercial space not only provides consumers with a place to shop, but it is also an alternative place for recreation and entertainment, as well as for strolling, negotiating, and meeting. In developed and developing countries, economic growth and technological advances mean that the public on average have high purchasing power; additionally, widely available technology products and luxury goods have enabled the planning and design of commercial spaces to incorporate the attributes of business conduct, and exude various styles of design. Some designs are grand and royal, whereas others are simple and rustic; others even follow trendy designsthat integrate local cultural characteristics or use a brand as the theme.

Commercial space generally evolves with the overall economic growth of a country, and the rise in average income of the people and their subsequent rise in spending power often shows proportional growth, which simultaneously leads consumers to pursue demands such as new styles, brands, characteristics, quality, spirituality, and health and fitness. Consumer perceptions of factors such as price, quality, and value (Zeithaml, 1998) have gradually caused various types of commercial space to develop towards multi-level and multi-grade virtuous cycles. In the evolutionary and developmental processes of commercial space from standalone stores, retail stores (Baker et al., 1992), shopping streets, underground streets, intensive farming stores, chain stores, department stores, malls, and business districts to specialty and theme stores, consumers’ perceived value (Sweeney and Soutar, 2001) of commercial space is gradually becoming visible. Additionally, the developmental potential of a city and its economic development can be determined from the design, level, and grade of the urban commercial space; simultaneously, unique commercial spaces in the city often become tourist attractions, the city’s “business card,” landmarks, or regional identities (Shin, 2004). Commercial space and characteristic business conduct could even develop and evolve into the unique cultural practice of the region, forming a regional cultural festival, such as the tuna festival at Donggang seafood restaurants.

Café theme commercial space
Coffee is native to subtropical Africa and some islands in southern Asia. Presently, coffee is grown in over 70 countries, but mainly in the equatorial region (Wiki,
Commercial space is a public market place that attracts consumers. In addition to fire escapes and evacuation routes, other basic factors that should be taken into consideration during the planning and design of commercial places include ensuring customer loyalty and including features that attract consumers. Therefore, the design should exude style, character, and distinctiveness; it must also understand the influencing factors of planning, such as business attributes, business image and brand shaping, consumer level, product design and appearance, consumer attraction, and thematic design. By considering these factors, a trendy, sustainable, and innovative design can be created that exudes the design technique and ambience of the indoor space. Thus, the effectiveness of the business’s performance and investor operations can be enhanced, unifying the role of the consumers and reducing the risk of the investors, which in turn would ensure the steady growth of clientele as well as increases in competitiveness of the consumer market and sustainable operations.

In addition to having the advantage of attracting numerous consumers, a business conducted under an intensive business model could also easily become a place where people socialize and spend time; it could even become a business landmark of a city, and attract tourists to become a tourist destination. Although the business conduct of an intensive business model has the aforementioned advantages, it also increases the pressure from sales competition for companies selling the same product. Additionally, various types of commercial space often become a place of habitual consumption for people of varying consumer levels; thus, the interior design of the space must consider the consumption patterns and habits of people of various consumer levels to enable the characteristics of the indoor space to seemingly become the special “category” of the product. Because interior or environments have a destressing and relaxing effect (Scott, 1993), the business marketing strategy and features of the commercial space must offer market segmentation (Ziff, 1971; Blattberg and Subrata, 1974) to enhance the psychological reaction of consumers and protect the purpose of the base consumers. Because the ambience of thematic commercial space is gradually favored by various consumer bases, such as themes that emphasize green energy, low-carbon, and energy-saving designs, or styles that use dolls, special totems, nostalgic items, and particular colors (Bellizi et al., 1983), ambiance can enhance the quality of customer service and enhance consumer satisfaction, enabling customers to feel satisfied (Dube et al., 1994).

In the spatial planning and design of traditional cafés, most café’s designs emphasize and consider factors such as brand attributes, varied styles, and innovative business marketing models. In addi-

Preliminary influencing factors of green commercial space design

According to the 2013 statistics published by the National Coffee Association of the United States, 83% of the American population were coffee drinkers, and according to the International Coffee Organization, the total export volume of coffee exporting countries in 2012 increased by 113.1 million packs (each pack weighing 60 kilograms) in comparison to the previous year (MoneyDJ, 2013). Thus, coffee is not only a vital economic and agricultural product; it is also one of the most loved beverages worldwide. Therefore, the business conduct of coffee companies has driven the trend of coffee aesthetics and coffee culture, which in turn have driven the development of cafés worldwide to integrate personalized innovative design, such as brands, product packaging, and cups, into the commercial space design. Various types of café have already become an integral part of the food and drink industry.

The prevalence of virtual shops and virtual retail chain stores has directly affected the operation of various types of brick and mortar stores. This year, Jack Ma, the Chairman of the Alibaba Group, proposed a new retail store concept, in which virtual stores and brick and mortar stores co-exist. Additionally, in December 2017, the biggest Starbucks store (Starbucks Reserve Roastery) opened in Shanghai with a grand opening ceremony; the store highlighted the combination of new online operations with diversification strategies, and integrated a roastery that enables consumers to experience coffee culture. This in turn enables the coffee shop to start a new trend and business opportunities, as well as attract large crowds. The Starbucks flagship store used experience as its sales strategy, demonstrating marketing sensibility. Furthermore, thematic commercial space through design techniques could easily use brand image to drive brand equity (Biel, 1992), creating commercial spaces with distinctive style. Moreover, thematic commercial space through brands could easily create consumer brand loyalty (Chaudhuri and Holbrook, 2001). Because coffee is not just an essential beverage for leisure time, but also habitually consumed daily by numerous people, it is also frequently consumed at meetings and in restaurants. Coffee culture varies geographically, enabling multinational characteristics to become business opportunities for themed cafés and to have multiple applications in terms of design. Furthermore, the low investment threshold for cafés and a simple product category being the theme’s business practice, the industry has higher competitiveness. Therefore, the interior design of a café often becomes another selling point that attracts consumers; it is also the main influencing factor of a café’s operations.
tion, designers often must conform to the business owner’s idea of commercial success; therefore, designers must communicate with the owner before designing to gain the owner’s approval of their novel design concepts. Additionally, because corporate social responsibility and consumer markets are connected (Markus and Shimshack, 2012), this study expected the proposed low-carbon café to help change the alternative marketing role and function of the traditional commercial space of investors, which would in turn help to exhibit corporate social responsibility (Ardaiolet al., 2011); in addition, it would influence others to follow suit and raise consumer awareness regarding civic values and civic responsibility (Bryant et al., 2011). Thus, corporate social responsibility could be extended to personal social responsibility (Daugherty, 2016; O’Neill, 2011), and influence familial social responsibility, which would help to gradually foster low-carbon habits in society (Hsueh, 2012) and enable cities to implement green energy strategies for sustainable development (Midilli, 2006).

The low-carbon spatial design of the thematic garden café proposed by the study integrated energy-saving concepts into the commercial space design. The purpose was to create market segmentation and differentiation in the thematic commercial space; thus, we collated the factors for consideration from literature related to the spatial design of gardens. The summary of factors is as follows:

1. Design factors related to solar energy and the natural environment, such as solar energy (Hrastnik and Franković, 2011) and garden ecosystems, as well as increasing plantations being favorable for carbon sequestration (Benítez and Obersteiner, 2006), were incorporated into the design.

2. The interior design had to consider energy- and water-saving equipment (Hsueh, 2012), energy-saving lighting equipment (Zhao and Magoulès, 2012), energy-saving concerns related to the air-conditioning system, artificial ventilation systems (Pacheco, 2012), double glazing (Sun et al., 2016), roof photovoltaic systems (Cucchiella and D’Adamo, 2012), and green roofs (Silva et al., 2015).

Commercial spaces using low-carbon design components do not have to use a completely minimalistic design. The design factors considered for low-carbon designs have energy-saving as a precondition; outdoors construction material must comprise mainly green materials, and the construction techniques must be considered to avoid generating pollution. In other words, business conduct is a marketing model integrated with environmental awareness; the objectives of a low-carbon commercial space are to display the green energy design attributes of the space and eliminate the grand and complex design techniques of traditional designs. Use of non-green building materials must also be eliminated. Nevertheless, the style and characteristics of the commercial space could still be rendered, as shown in Fig. 1. Figure 1 shows an actual interior design example of a low-carbon themed café (2017 Chicago Design Awards – Silver Winner).

To summarize the literature in the aforementioned section, the following three main constructs and preliminary influencing factors are presented:
1. Interior design: must incorporate energy- and water-saving equipment, lighting and artificial ventilation systems, double glazing, roof photovoltaic systems, and green roofs.

2. Garden space design: must incorporate solar energy, garden ecosystems, and foster carbon sequestration.

3. Human and business factors: must incorporate corporate social responsibility and personal social responsibility.

RESEARCH METHODS AND DESIGNS

Research method overview

This study combined three methodologies, the Delphi method, analytic hierarchy process (AHP), and fuzzy logic theory, to construct a multi-criteria decision model. The features of the three methodologies are explained as follows:

1. Delphi method: Through the anonymous research support of an expert group, questionnaire surveys (mail, telephone, or direct) are repeatedly conducted to obtain the consensus of experts, and to confirm the influencing factors required for the research modelling. The Delphi method was first used in 1946 by the RAND Corporation in the United States as a prediction tool to explore future developments of the company. According to Zglio (1996), the expert group decision-making technique of the Delphi method was not only used to predict the future development of the company, it was also already used in practical experiments in various fields, such as its application to social policy (Zglio, 1996) and developing a sustainable building assessment scheme (Alyami et al., 2013).

2. AHP: AHPs used to construct the hierarchy framework, pairwise comparison, and matrix algorithm of each influencing factor; its objective is to solve the relative weighting value of each influencing factor. AHP is a type of multi-attribute decision analysis methodology that is widely used in various fields; it is one of the research analysis tools proposed by Professor T.L. Satty. Although Satty further proposed the Analytic Network Process (ANP) in 1996, with the purpose of improving AHP, the “improved” method did not consider the mutual influence between various decision hierarchies or the same hierarchies; however, listing the upper-lower left-right influencing relationship of each factor is difficult, and thus, the significance of ANP is lost.

This study integrated the expert group decision support of the Delphi method to improve the influencing relationship between hierarchies and the same hierarchy of AHP. Moreover, numerous studies still use the AHP technique, such as investigations into complex networks based on AHP (Bian et al., 2017), landuse change affecting subwatershed prioritization (Kundu et al., 2017), and identifying influential segments from word co-occurrence networks (Garg and Kumar, 2018).

3. Fuzzy logic theory: This is a quantitative method (Perng, 2005) proposed by Zadeh (1965), and it is a part of artificial intelligence. Fuzzy logic theory enabled the manner in which the machine in human–machine interfaces could further resemble humans; thus, the characteristics of fuzzy logic can process imprecise adjectives used in human speech, such as ambiguous semantics, as well as being able to process human preferences. Fuzzy logic theory can also be used in various types of quantitative research. For example, the automatic control of robots, wine quality classification (Petropoulos et al., 2017), a new metaheuristic optimization methodology (Díaz-Cortés et al., 2017), and students’ performance evaluation (Barlybayev et al., 2017).

The proposed integrated research framework that combined three methodologies is illustrated in Fig. 2. The framework of the assessment model and the development of the overall assessment model used an expert group knowledge environment. First, the Delphi method used the support of the expert group to confirm the influencing factors required for building the model. Subsequently, AHP was used to calculate the relative weighting values of each influencing factor. Finally, the quantization conversion technique of fuzzy logic was used to obtain the quantized value of each assessment.

Research designs

To effectively combine the Delphi method, AHP, and fuzzy logic theory to construct the assessment model, a research design technique was required to enable the complementary roles of the methodologies and accomplish a phase-wise modelling effect. Explanations of the research designs of the three methodologies are as follows:

1. Delphi method research design:

Thirteen people were hired to form the Delphi expert group, which comprised five industrial senior managers, five senior professors of construction and con-
construction management, and three governmental management specialists. A revised consensus regarding influencing factors was reached after three Delphi processes. Ten influencing factors remained after the revision, and these were divided into three main constructs. The influencing factors of each construct are as follows:

1. Interior design: Artificial ventilation systems, lamps (LED), double glazing/shading devices, and green building materials.
2. Garden space design: Green roofs, solar power system (roofs /lamps/motor), and ecosystem (water).
3. Environmental care: Corporate image, corporate social responsibility, and personal social responsibility.

2. AHP research design:

After confirming the three main constructs and 10 influencing factors for modelling using the Delphi process, AHP was used to calculate the method for relative weighting values of each influencing factor. First, the hierarchy framework of each influencing factor was constructed, as shown in Fig. 3. Subsequently, the valid pairwise comparison questionnaires of AHP and each influencing factor were checked to ensure that they conformed to the AHP consistency test; the conditions included the consistency index (C.I.) having to conform to C.I. < 0.1 and the consistency ratio (C.R.) having to satisfy C.R. ≤ 0.1. The study distributed 92 AHP questionnaires, and received 69 valid questionnaires. After eliminating eight questionnaires that had large variations, a total of 61 valid questionnaires (66%) were used. The study used the set average of the valid questionnaires; using Excel, and through the AHP calculation formula, the relative weighting values (\(W_i\)) and relative sequence of each influencing factor were obtained, as shown in Table 1 and Fig. 3.

Table 1 presents the sequence of the top six key influencing factors: green building materials, artificial ventilation systems, green roofs, double glazing/shading devices, lamps (LED), and corporate image. In the green space design consideration, these six key influencing factors had more significant levels of relative influence. Additionally, among the three main constructs, the environmental care factor had a lower relative weighting value, signifying that in commercial space design, environmental care was given relatively less attention by business owners, designers, and consumers. However, corporate image had a relatively high relative weighting value; thus, using corporate image as the marketing strategy could help build character and enhance the overall green energy design effect. Furthermore, this signified that the awareness of business owners, designers, and consumers regarding green energy commercial space was relatively lower than that for other design influencing factors.

3. Fuzzy logic theory research design:

In this phase, only after using the Delphi method for research support to obtain the definitions of relevant parameters of membership function, fuzzy set, fuzzy range of each factor, and establish an IF–THEN rule base, could a Fuzzy Logic Inference System (FLIS) work normally. The relevant parameters of each influencing construct are defined as follows:

1. Interior design influencing construct:

The interior design construct included four influencing factors: artificial ventilation systems, lamps (LED), double glazing/shading devices, and green building materials. In the definition of fuzzy set, if each influencing factor had three assessment statuses, such as semantics (high, mid, low; or good, average, bad), then four influencing factors would have 81 \((3^4)\)-types of assessment decisions. Additionally, the definitions of membership function and fuzzy range, and the optimal value, average value, and worst value outputted after quantization conversion of FLIS are presented in Table 2.
In the definition of the fuzzy set, each influencing factor had three statuses. Thus, 27 types (3*3*3) of decisions existed. Additionally, other parameter definitions and the optimal value, average value, and worst value of the quantization output are presented in Tables 3 and 4.

Table 4. Environmental care influencing factors

Professor Zadeh proposed fuzzy logic theory with quantization function in 1965, explained a computational approach to fuzzy quantifiers in natural languages in 1983, and further explained that fuzzy logic equals computing with words in 1996. He continued to emphasize and explain the quantization processing capacity of fuzzy logic theory. Fuzzy logic theory is a sub-tool with practical application; it can convert the complex semantics of human speech to quantitative values for assessing demand. Additionally, fuzzy logic is used to conduct relevant modelling research; its contribution lies in the establishment of a fuzzy inference system, fuzzy rules, membership function, and fuzzy operators and has no relevance to the application software (Hsueh et al., 2016). The assessment input status of FLIS regarding interior design and the three-dimensional output relationship diagram after quantization conversion are presented in Fig. 4.

MODEL INTEGRATION AND APPLICATION

Model integration

Combining three methodologies provided the model with complementary attributes. First, the Delphi method was used to confirm the influencing factors. Subsequently, AHP calculated the relative weighting...
values of each influencing factor. Finally, fuzzy logic theory was used to calculate the quantization conversion value of each construct under each assessment scenario. The multi-attribute decision support model constructed using a combination of three methodologies could compare the quantitative values during the assessment process; it also determined the relative weighting values of each influencing factor weighting function, enhancing the objectivity of the overall assessment. The assessment model and quantitative computation formula is presented in Fig. 5, which is a multi-attribute Delphi–AHP–Fuzzy (DAFuzzy) assessment model diagram.

**Model application**

The model post integration used “Optimal, Average, Worst” cases to explain the application function of the model. The quantization calculation procedure of the model application is as follows: (1) each assessment situation undergoes quantization conversion through FLIS; the quantitative value is expressed as $f(x)$; (2) Table 1 shows the weighted index of each influencing factor, and is represented by $W_i$; thus, the sum of the overall assessment is $\sum_{i=1}^{n} (f(x_i) \times W_i)$. The FLIS computed quantitative values of the three cases are: Optimal = 86.807, Average = 53.009, Worst = 25.261, which are shown in Table 5. The quantification computation of the three cases revealed that the proposed model has a quantitative assessment function.

**CONCLUSION**

Corporate social responsibility and consumer markets are connected, and commercial green energy space has a substantial positive effect on consumers; thus, the low-carbon operations attitude of investors and the awareness for creating low carbon consumer environmental space are the most basic methods of demonstrating corporate social responsibility. The designer should also have abundant experience in designing and planning green energy spaces to enable the idea, goodwill, and environmental protection purpose of business owners, in investing in low-carbon thematic commercial space to play its role; this could also create market segmentation and competitive advantage, which could directly impart to consumers the meaning and significance of low-carbon living. Thus, consumer awareness and dissemination of environmental protection could be enhanced through the popularity of low-carbon themed commercial spaces. Additionally, to reduce erroneous assessments of the multi-attribute influencing situation of the market by the subjective success factor of the investor and designer, the study developed a multi-attribute quantitative decision support model based on expert knowledge. The proposed model used a scientific quantitative computation process, and through comparison of the quantization output value of the assessment situation, provided objective decision-making parameter data that could enhance the objectivity of the decision-making, and reduce the risk of erroneous decisions.

The proposed research on thematic green energy commercial space revalidated that environmental care has a relatively weak influence on the design of green energy commercial space. Nevertheless, corporate image had a relatively strong influence on the design of thematic green energy commercial space. Thus, companies with a high corporate image investing in low-carbon commercial space could more easily create a low-carbon operation model. To summarize the aforementioned research, influencing factors like green building materials, artificial ventilation systems, green roofs, double glazing/shading devices, lamps (LED), and corporate image have more significant influence on the planning and design of low-carbon commercial space, and the proposed DAFuzzy multi-attribute decision support model has high objectivity and adaptability, making it convenient to apply and maintain.

**SUGGESTION**

People worldwide should be aware of environmental protection. The root of the worsening global environmental pollution problem is economic and industrial
competition in every country. Corporate, national, familial, and personal social responsibility should be effectively promoted. Derived from the aforementioned research results, this study proposed the following recommendations:

1. National economic development drives social advancements and enhances quality of life for the people; however, it also increases material desire and demand of the people, accelerating industrial development and internal commercial prosperity. However, increasingly severe pollution problems are also created. If the people could foster low-carbon daily living habits and reduce material desires, it would help to slow down the creation of regional environmental pollution problems.

2. Commercial spaces in the city are places where people shop and spend time daily. The green energy design concept of thematic commercial spaces could give commercial spaces distinctive characteristics, and create market segmentation and competitive advantage in commercial operations; it could also directly influence the environmental awareness of consumers. Additionally, they could also play a subtle role in environmental protection education, which could not only enable the company to effectively implement corporate social responsibility, but also subtly foster environmental awareness and personal social responsibility in consumers. Thematic green energy commercial space could enable consumers to experience things personally during the buying or recreation process, which could help influence consumers to generate environmentally caring behaviors.

3. Through counseling or rewarding the promotion of various types of thematic green energy commercial spaces, policies could use the counseled or award-winning green energy commercial spaces as an alternative education environment for promoting environmental protection. This could help environmental education and promotion to become a part of the daily lives of consumers.

Acknowledgements
The low-carbon café interior design example—Wandering and Pausing in Tasty Space—that was used in our study, was awarded the silver prize in the 2017 Chicago Design Awards.

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Authors(s):

Hao-Cheng Huang 1*, Yeng-Horng Perng 2
1 Department of Architecture, National Taiwan University of Science and Technology, Taiwan
1 Email (Correspondence): lifu168design@yahoo.com.tw
2 Email: perng@mail.ntust.edu.tw
Abstract
From past to present, Istanbul has witnessed many empires and historical events. This accumulation has made Istanbul one of the most important cities in Turkey. The architecture and historic potential of the city dates back to centuries ago. Palace architecture is the most important cultural inventories of the city. Over time, technological developments and the industrial revolution brought the “western influence” to Turkey. This effect is observed on planning character and on the planting design. The main material of the work is Topkapı Palace, Beylerbeyi Palace and Dolmabahçe Palace. In this context, this paper consist of three stages. Literature studies have been carried out in the first stage. “Western effect” on the palaces has been investigated after the second step consisting of the field study and mapping. As result of the examinations, western influence was studied in three stages as general planning character, structural material and plant material. As a result of the study, results were obtained for each title. Suggestions were made for rehabilitation and palace gardens planning.

Keywords: Ottoman Palace, Palace Garden Design, Western Influence, Planting Design.
plant order too (Tazebay and Akpınar, 2010). While trees chosen according to the functions such as shade, fragrance and color were often used in the garden border, those serving shade and visual purposes were used in the courtyard (Erdoğan, 2009). The species used for these purposes were plane, ash, linden, elm, hackberry, oak, laurel, judas, wild pear and fruit trees (Erdoğan, 1997, Artan, 1993). In addition to tall trees used, the colorful and sweet-smelling flowers had a place in Turkish garden layout. These plants were arranged without causing color and species complexity (Evyapan, 1972).

Anatolian geography’s unique climate, geographical topography, soil fertility and enable Anatolia to grow many different plants have made significant contributions to the formation of the Turkish garden style. But, the designed gardens were constantly differentiated during historical process due to the fact that a proper garden style did not adopt over time. The characteristics of apparent Turkish gardening had begun to disappear in the course of time because of the western effect too (Tarhan, 1998).

The westernization effects began to affect the Ottoman Empire by way of Tulip Period in the 18th century. This process was accelerated by Sultan Abdülmeid’s declaration of the Imperial Edict of Reorganization in 1839 and the spaces were designed with new designs whereby Industrial Revolution created. In the 19th century, it was collaborated with the western countries, especially England through trade agreements and westernization movements from social structure to architecture in the Ottoman Empire started to accelerate. Firstly, new designs of western origin were included in palace constructions and also became popular in other buildings over time (Fitöz, 2007). The “palace” constructions that had hosted this process only have the meaning for the sultan’s house when used alone in word meaning. This also has the meaning for government place, as well as the residence address of the sultans (Kuban, 1994).

This study deals with Dolmabahçe Palace, Topkapı Palace and Beylerbeyi Palace, which were the capital to many empires and were at the core of all the military, political and architectural developments during these periods. The “western effect” on these palace gardens has been examined in three main constructs such as general planning, plant material and structural material. As a result of this study, western effect was discussed using the current literature and field studies.

Material and Method

Material
The main material of the work constituted the working areas of Topkapı Palace affiliated to the ministry of Culture and Tourism and of Dolmabahçe Palace and Beylerbeyi Palace affiliated to Secretariat General for Grand National Assembly of Turkey (National palaces).

Dolmabahçe Palace
Located in Beşiktas (İstanbul), Dolmabahçe Palace is a place that covers an area of 250,000 m² between Istanbul Strait and Dolmabahçe Street extending from Kabataş to Beşiktas (URL-1). Until the early 17th century, it is a bay where the captain Pashas were resided and the navy was anchored. At the end of 17th century, Topkapı Palace was chosen as the summer residence (Esmerli, 2002) (Figure 1).

Topkapı Palace
After the conquest of Istanbul by Fatih Sultan Mehmet in 1453, its construction started in 1460 and finished in 1478. This palace covers an approximately area of 700,000 m2 which extends from Hagia Sophia Mosque to Sarayburnu. This triangle-shaped area is surrounded by sea walls on both sides in the direction of the sea, and a wall called Sur-i Sultan in the direction of the land (January, 2006) (Figure 2).

Beylerbeyi Palace
Located in Beylerbeyi district of Üsküdar (İstanbul), Beylerbeyi Palace was built by architect Sarkis Balyan by order of Sultan Abdulaziz in 1861-1865. The palace has a historical location, and the use of its premise dates back to the Byzantine period (URL-4) (Figure 3).
Method
After making a literature review, the palaces observed on site were examined visually. In the analysis, it was determined what the most important elements of the ‘change process’ resulting from the western effect could be considering the concepts found during the literature review. They were evaluated by performing analysis of general planning, plant material and structural material. The changes are shown on the tables and which of concepts has an impact on the 3 main constructs were investigated (Figure 4).

Results
Within the scope of this study, it was studied how the westernization effects exercising influence over Ottoman Empire by Tulip Period in the 18th century had an impact on the general planning, structural and plant characters. It has been examined for each palace how the traditional sense of aesthetics and space design changed through west admiration.

Findings about “Western Effect” on Dolmabahçe Palace
The western effect on Dolmabahçe Palace was evaluated on 3 main constructs and the results are given below. Observations were made for each construct and presented in Tables 1-2-3.

General Planning and “Western Effect”
The Dolmabahçe Palace was built by Karabet Balyan and Nikogos Balyan by the order of Sultan Abdülmecid in a way that would symbolize the westernization attempts and also show the splendour of the empire. The palace becoming the symbol of power over time became the symbol of change of the country over time (Fitöz, 2007, Konyali 2010). Because the
Industrial Revolution started to affect the palace in every sense (Konyalı, 2010). The palace is an architect built in a western manner with a profound Ampir ornament characterized by a baroque style inside and outside (Esmenli, 2002). It is the continuation of one-piece and monumental European palaces that are contrary to urban fabric (Konyalı, 2010). German Rococo was applied in combination with English Neoclassicism and Italian Renaissance in the palace plan (Gülersoy, 2001). The fact that it was built in the same years as the Industrial Revolution and the effects of interest showing to the European style in the Ottoman Empire can be observed during this period (Fitöz, 2007). The palace was built with the logic of ‘Gardens’ system, which is separated from each other with the high walls by its general layout. It consisted of four main space arrangements that had laid together (Konyalı, 2010, Esmenli, 2002). Arranging plants with geometric shapes and including objects such as lantern, vase, and sculpture in the palace indicate that the western effect had an influence on garden-planning in just the same way as the main structure (Figure 5). The symmetry effect adopted in the European palaces was tried to be used for the arrangement of these gardens during the reign of Sultan Abdülmecid. A rich and diverse plant collection was created in the palace using the plants that were brought by the Sultan from Europe, Asia and Africa, (Konyalı, 2010).

Structural Material and “Western Effect”
The western traces, which affected the palace in many ways, are also seen on the reinforcements used. Intensive animal objects, pools with animal head, cascading waters, structural elements far beyond human criteria, intensive embroidery and sense of baroque rococo ornamentation with ampir adornment were embroidered on every object used in the palace. The dominate flutings on the patterns, and the recessed, engraved patterns are among the objects to which the western style was embroidered literally (Figure 6-7). As Konyalı (2010) also stated in his/her work on the reinforcements in the palace, new materials and techniques that industrial revolution brought had a great effect (Figure 7). The fairly tall and embroidered clock tower, animal sculptures, metal cascading ornamental pools, grottos and intense engraved lighting elements present in the entrance of the palace are among luxurious reinforcements impressed by the western style of the palace. The palace entrances are among the splendid designs that open to the outside via the ‘Treasure Gate’ and the ‘Saltanat Gate’. These designs show that motifs in the Ottoman period started to change with Rococo and Ampir decorated ornamentations (Konyalı, 2010) (Figure 6).

Plant Material and “Western Effect”
The present plant analysis of Dolmabahçe Palace carried out according to Yaltırık (1997) and plant analysis in accordance with field works are presented in Table (1).

Table 1. Available plant species at Dolmabahçe Palace

Figure 5. Pool located in Has Garden in front of Mabeyin Circle.

Figure 6. Spectacular entrances of Dolmabahçe Palace (a: Treasure Gate, b: Saltanat Gate).

Figure 7. Spectacular reinforcement elements of Dolmabahçe Palace.
When we look at the plants used in Dolmabahçe Palace, Cedrus deodara (12.9%), Platanus x acerifolia (8.05%) and Magnolia grandiflora (11.6%) are among the most used plant species (Table 1). In addition, taxa such as Picea pungens ‘Glaucal’ (3.37%), Buxus sempervirens (1.25%), Taxus baccata (3.11%), Chamaerops excelsa (3.11%), Hydrangea macrophylla (3.11%) and Chamaerops excelsa (3.11%) are among the most used exotic taxa. 8 (2.07%) Cupressus sempervirens used in the palace show us that cypress is an important plant species that always needs to be used in the Turkish gardens (Table 1).

236 (61.2%) of the 385 plants used in Dolmabahçe Palace consist of evergreen taxa. The fact that palace appealed to the four seasons for Sultans had also affected the plant selection used in this palace and increased the use of evergreen plants. The fact that evergreen plants are suitable to prune and are flamboyant during every season in the Dolmabahçe Palace where the splendour is felt everywhere is considered among the reasons for their selection (Table 2).

339 (87.5%) of the 385 plants used in Dolmabahçe Palace consist of exotic taxa. Plant selection during design of the palace planting was also affected by the western effect (Table 2). The use of a symmetrical and formal order in addition to the high number of exotic plants used further emphasizes the western effect. However, informal order in some areas of the garden disturbed symmetry effect. Therefore, we can say that Dolmabahçe Palace was impressed by Baroque garden art and Neo-Classical style. The exotic plants used in the Dolmabahçe Palace where the Western effect appears most clearly underline this effect once more (Table 2).

When we look at their familial distributions, Pinaceae (26.49%), Magnoliaceae (12.7%) and Rosaceae (5.19%) are among the most used families. Pinaceae is the most used family with 102 (26.49%). They are able to use for shade and cool purposes in the Turkish gardens of the palace as many taxa of Pinacea family are evergreen. Calycanthaceae (0.25%) and Moraceae (0.25%) are among the least used families in the Dolmabahçe Palace (Table 3).

Findings about “Western Effect” on Topkapı Palace
The western effect on Topkapı Palace was evaluated on 3 main constructs and the results are presented below. Observations were made for each construct and given in Tables 4-5-6.

General Planning and “Western Effect”
The palace was planned and designed as a comprehensive castle to be defended from the sea and land (Konyalı, 2010). The outer wall surrounding the garden for defensive purposes separates the place where the Sultan resided in Topkapı Palace from the one where the people lived (Seçkin, 1998). The courtyard system in the hierarchical structure of the Topkapı Palace is also seen in the Abbasid palaces that had adopted the Iranian courtyard ceremonies and in the Chinese palaces in the Far East. The principle of natural arrangement in building layout of Topkapı is different from the Islamic palaces. Characteristic items such as courtyard, portico, crown gate in its general layout are based on very old traditions (Seçkin, 1998).

In the course of years, foreign observers who had studied the palace from various aspects said that it did not resemble other palace gardens, there was not any pavilion similar to them and they were devoid of splendour (Konyalı, 2010).

The palace has a structure consisting of orchards, flower beds, flower hothouses, large veg-
Table 3. Analysis of Dolmabahçe Palace according to plant families.

<table>
<thead>
<tr>
<th>Family</th>
<th>Frequency</th>
<th>Percentage</th>
<th>Family</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Araucaria</td>
<td>4</td>
<td>1.03</td>
<td>Lyrphanthus</td>
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<td>3.37</td>
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<td>Atramitopsis</td>
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<td>Loganiae</td>
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<td>Acantholilacae</td>
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<td>Malosaeae</td>
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<td>Magnolitae</td>
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<td>12.7</td>
</tr>
<tr>
<td>Acantholilaceae</td>
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<td>4.15</td>
<td>Morusaeae</td>
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<td>0.25</td>
</tr>
<tr>
<td>Berberis</td>
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<td>Palmae</td>
<td>12</td>
<td>3.11</td>
</tr>
<tr>
<td>Buxus</td>
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<td>Piceaeeae</td>
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<td>26.96</td>
</tr>
<tr>
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<td>Platanoeeae</td>
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<td>8.05</td>
</tr>
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<td>0.51</td>
<td>Poaceae</td>
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<tr>
<td>Cephalectus</td>
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<td>0.51</td>
<td>Pop诺nusaeae</td>
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<td>Rosaeae</td>
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<td>1.55</td>
<td>Sapindaceae</td>
<td>11</td>
<td>2.85</td>
</tr>
<tr>
<td>Hydrangea</td>
<td>12</td>
<td>3.11</td>
<td>Tamaricaceae</td>
<td>4</td>
<td>1.03</td>
</tr>
<tr>
<td>Juglandaceae</td>
<td>2</td>
<td>0.51</td>
<td>Tamaricaceae</td>
<td>6</td>
<td>1.55</td>
</tr>
<tr>
<td>Laurusae</td>
<td>3</td>
<td>0.77</td>
<td>Oleariaceae</td>
<td>12</td>
<td>3.11</td>
</tr>
</tbody>
</table>

The gardens, which consist of a number of courtyards that show very distinct differences functionally, have a modest planning feature suitable for their use (Akdoğan, 1995).

### Structural Material and “Western Effect”

A simpler reinforcement order was created within the palace compared to the other palaces. The western folds in the structural materials used are less and modest. The cascading pool, fountain, well, pot, parapet, lighting units and seating units are among the reinforcements used in the palace. The number of reinforcements was not highly large despite the magnificence of the palace in this use. Functionality was also included in the reinforcement system (Figure 8).

### Plant Material and “Western Effect”

The present plant analysis of Topkapı Palace carried out according to Yaltırık (1997) and plant analysis in accordance with field works are given in Table (4).

When we look at the plants used in Topkapı Palace, Cupressus sempervirens, Pinus pinea and Pyracantha coccinea are among the most used plants (Table 4).

Of the 464 taxa used, 325 (84.4%) are evergreen. The reason why evergreen plants selected is that these plants are flamboyant and often suitable to prune.

Canopies and areas able to be sit around water were formed using shade trees that consider important in the Turkish gardens of Topkapı Palace. Plant selection was performed accordingly (Table 5).

The use of exotic species is relatively small compared to other palaces since 245 (52.8%) of the 464 plants used in the Topkapı palace are natural taxa. 198 plants are of exotic origin and are fewer than natural number of taxa (Table 5).

Table 4. Current plant analysis of Topkapı Palace.

<table>
<thead>
<tr>
<th>Topkapı Palace</th>
<th>% P</th>
<th>Topkapı Palace</th>
<th>% P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Picea</td>
<td>49</td>
<td>273</td>
<td>4.75</td>
</tr>
<tr>
<td>Alnus</td>
<td>3</td>
<td>45</td>
<td>0.77</td>
</tr>
<tr>
<td>Acer</td>
<td>56</td>
<td>342</td>
<td>6.06</td>
</tr>
<tr>
<td>Acantholilacae</td>
<td>16</td>
<td>110</td>
<td>2.15</td>
</tr>
<tr>
<td>Acantholilacae</td>
<td>12</td>
<td>2.15</td>
<td>0.45</td>
</tr>
<tr>
<td>Acantholilacae</td>
<td>1</td>
<td>2.15</td>
<td>0.04</td>
</tr>
<tr>
<td>Acantholilacae</td>
<td>0.8</td>
<td>1.75</td>
<td>0.02</td>
</tr>
<tr>
<td>Acantholilacae</td>
<td>0.4</td>
<td>0.75</td>
<td>0.01</td>
</tr>
<tr>
<td>Acantholilacae</td>
<td>0.2</td>
<td>0.45</td>
<td>0.01</td>
</tr>
<tr>
<td>Acantholilacae</td>
<td>0.1</td>
<td>0.25</td>
<td>0.01</td>
</tr>
<tr>
<td>Acantholilacae</td>
<td>0.05</td>
<td>0.15</td>
<td>0.01</td>
</tr>
<tr>
<td>Acantholilacae</td>
<td>0.01</td>
<td>0.05</td>
<td>0.01</td>
</tr>
</tbody>
</table>

Table 5. Leafage state and natural exotic taxa status of Dolmabahçe Palace according to seasons.
When we look at their family analysis, Cupressaceae is among the most commonly used families with 111 (28%), as shown in Table (6). Cypresses have a particular importance for Turkish gardens. It is seen that they are commonly used in the Topkapı Palace.

Findings about “Western Effect” on Beylerbeyi Palace
The western effect on Beylerbeyi Palace was evaluated on 3 main constructs and the results are presented below. Observations were made for each construct and given in Tables 7-8-9.

General Planning and “Western Effect”
Beylerbeyi consists of palace complexes. It is surrounded by high walls on the land side and low walls on the sea side (Khabbazi and Erdoğan, 2013). It would appear that all the components of the palace were built independently and asymmetrically from each other. The main structure was built on the shore, and other structures were built back in the form of terraced gardens. The decorating details bear the impression of ‘Greco-Roman’. ‘Corinthian’ capitals were used in the columns. Beylerbeyi Palace has a unique design that clearly reflects the western impressions (Gülsün et al., 1997).

The sculptures, reinforcement elements and grotto pool found in the garden represent the symmetrical effect. There are some places that are used as the shade, as is the case with Ottoman-Turkish gardens (Khabbazi and Erdoğan, 2013). In innovative Sultan II. Mahmut period, Ampir style was dominant in a way that would be simultaneous with Europe (Üstünipek, 2003). Beylerbeyi Palace was among the favorite places loved by the Ottoman sultans. In addition, one of the most important features of the palace is the terraced gardens (Mutlu, 2006) (Figure 9).

Structural Material and “Western Effect”
The use of intense and flamboyant animal objects, structural elements far beyond the human criterion, the foil embroideries in the ornaments, the grotto pool and the intense Ampir adornment are found in Beylerbeyi Palace’s garden (Figure 9). Splendidness and exaggeration are dominant in almost all of reinforcements. The most favorite horse Ferhan statue of Sultan Abdülaziz found in the palace garden is among the splendid reinforcements of the garden (Figure 10).

Plant Material and “Western Effect”
The present plant analysis of Beylerbeyi Palace carried out according to Yaltırık (1997) are given in Table (7). The most commonly used species among 495 plants in the palace is Euonymus japonica with the number of 69 (13.93%). The least commonly used plant species are Aesculus x carnea, Aesculus glabra, Araucaria araucana, Castanea sativa, Fagus silvatica, Platanus orientalis, and Picea orientalis. Taxus baccata ‘Aurea’ used as the number of 29 is among pruned plants (Table 7). Color effect of the plants used did not much pay attention. Rough texture plants such as Picea orientalis, Cedrus deodora, and Quercus robur...
were used in the space border. The curved lines and symmetry feature of Baroque garden art are dominantly seen in the palace.

A total number of 495 taxa are used in Beylerbeyi palace is. Use rate of evergreen plants is 235 (%47.47) and deciduous plants were mostly used (52.52%). When we consider the Renaissance and other garden arts, the fact that the majority of the plant species used in Beylerbeyi Palace is made up of deciduous plant species actually reveals once more that Beylerbeyi Palace is a summer palace.

Of the 495 plants used in the palace, 385 (77.77%) are exotic taxa. A total of 110 natural taxa were used in the palace (22.22%). It is also evident from these rates that western plants had profoundly influenced the palace (Table 8).

When we look at the families used in Beylerbeyi palace, Celastracea is among the most used families, with the number of 69 (13.9%). The least used families are Araucariaceae, Platanaceae, and Rosaceae (Table 9).

Discussion and Conclusion

Istanbul Palace Gardens are a cultural bridge that extends from past to present. They are a component of the political, social, cultural, religious, traditional and economic indicators of the period at which they were built. In this context, they have the characteristics of treasure for designers, historians and sociologists. They are gardens where living and inanimate materials are used together during which cultural background shapes the living spaces. It is also certain that these spaces, which have important clues as to their environmental, ecological, aesthetic and historical dimensions as well as their social dimension, are a source of information for a wide range of disciplines related to this topic.

In this study, it has been revealed how the western effect reflected in the gardens of Dolmabahçe, Topkapı and Beylerbeyi Palace in Istanbul city center. The findings of this study on the palace gardens, which have great importance in many respects, have suggested how western effect has impressed us. This study was planned on three main constructs including general planning, structural material and plant material. In general planning, Topkapı Palace is an example of typical Turkish garden art which can tell the requests for planting of classical Turkish garden and gives importance to functionality. The unclipped, natural trees have been replaced with formed trees in Dolmabahçe and Beylerbey.

When we look at the most used plants in the palaces, the rate of Magnolia grandiflora in Dolmabahçe Palace is 11.6%, Cupressus sempervirens in Topkapı Palace is 8.62%, whereas Euonymus japonica in Beylerbeyi Palace is 13.93%. Comparing in terms of the use of exotic taxa, Dolmabahçe Palace has 87.5%, Beylerbeyi Palace 56.8% and Topkapı Palace 77.77%. It seems that western effect has affected more Dolmabahçe and Beylerbeyi than Topkapı Palace. These results support the studies of Seçkin 1998, Konyalı, 2010; Fitöz 2007. Comparing in terms of the number of evergreen taxa, Dolmabahçe is 61.2%, Topkapı 84.4%, and Beylerbeyi 47.47%. Esenli 2002 indicated that Beylerbeyi is a summer palace. It is thought that the palace is a summer one due to the high number of deciduous plants.

Among the most used plant families, Pinaceae is 26.49% in the Dolmabahçe Palace,

<table>
<thead>
<tr>
<th>Family</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aesculus</td>
<td>18</td>
<td>3.63</td>
</tr>
<tr>
<td>Acer</td>
<td>4</td>
<td>0.80</td>
</tr>
<tr>
<td>Aralia</td>
<td>1</td>
<td>0.20</td>
</tr>
<tr>
<td>Betula</td>
<td>3</td>
<td>0.60</td>
</tr>
<tr>
<td>Carpinus</td>
<td>19</td>
<td>3.80</td>
</tr>
<tr>
<td>Cupressus</td>
<td>60</td>
<td>12.20</td>
</tr>
<tr>
<td>Euonymus</td>
<td>23</td>
<td>4.60</td>
</tr>
<tr>
<td>Fagus</td>
<td>19</td>
<td>3.80</td>
</tr>
<tr>
<td>Fraxinus</td>
<td>54</td>
<td>10.80</td>
</tr>
<tr>
<td>Hydrangea</td>
<td>24</td>
<td>4.80</td>
</tr>
<tr>
<td>Ilex</td>
<td>33</td>
<td>6.60</td>
</tr>
<tr>
<td>Lonicera</td>
<td>36</td>
<td>7.20</td>
</tr>
<tr>
<td>Ostrya</td>
<td>16</td>
<td>3.20</td>
</tr>
<tr>
<td>Picea</td>
<td>31</td>
<td>6.20</td>
</tr>
<tr>
<td>Populus</td>
<td>30</td>
<td>6.00</td>
</tr>
<tr>
<td>Quercus</td>
<td>35</td>
<td>7.00</td>
</tr>
<tr>
<td>Robinia</td>
<td>29</td>
<td>5.80</td>
</tr>
<tr>
<td>Salix</td>
<td>27</td>
<td>5.40</td>
</tr>
<tr>
<td>Sorbus</td>
<td>21</td>
<td>4.20</td>
</tr>
<tr>
<td>Taxodium</td>
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<td>3.60</td>
</tr>
<tr>
<td>Tilia</td>
<td>24</td>
<td>4.80</td>
</tr>
<tr>
<td>Ulmus</td>
<td>23</td>
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</tr>
<tr>
<td>Vitis</td>
<td>19</td>
<td>3.80</td>
</tr>
<tr>
<td>Zelkova</td>
<td>26</td>
<td>5.20</td>
</tr>
</tbody>
</table>

**Table 8.** Leafage state and natural exotic taxa status of Dolmabahçe Palace according to seasons.

**Table 9.** Analysis of Beylerbey Palace according to plant families.
Cupressaceae (28.8%) in Topkapı Palace and Celastraceae (13.9%) in Beylerbeyi Palace. The palaces differ in this respect. Age determination to be made on the plant material can be a subject for different studies.

As can also be seen from the present results, Topkapı is a palace which is at least impressed by the western styles that reflect the features of the Turkish-Ottoman garden. The high rate of natural plant use, the characteristics of the general planning, and reinforcement functionality are some of these features. Taking into account splendidity rather than functionality, abundance of exotic taxa, intensive embroideries, geometric shaped plants, animal objects and symmetrical effect are among the most salient western effects seen in Topkapı and Dolmabahçe Palaces (Gülsün et al 1997, Üstünipek 2003, Konyalı 2010).

In conclusion, the key aspects that make a community the nation are actually historical background. The palace gardens, one of the important indicators of this background, should be handed down to future generations by preserving their identities and general characteristics during the historical process. This process is also of great importance in terms of social cohesion and politics. The transfer of these concrete examples to future generations in particular will play a key role in creating the consciousness of historical and cultural association. All of these will sustain the understanding of the Turkish garden and contribute to the continuity of the association from political, social and cultural aspects. In planning decisions to be made, it is very important to make applications that reflect the characters of the original Turkish garden, which is considered functionality rather than splendidity and is free from the western influence. The preservation and development of Turkish gardens being the original examples of this background, and the formation of new spaces should be performed within this understanding. The fact that thousands of years of Turkish culture should be kept alive and transported to the future will make significant contributions to continuity of social unity and solidarity values.

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Author(s):

BEKAR, M1*. – VAR, M2

1 Karadeniz Technical University, Department of Landscape Architecture, Trabzon, Turkey.
2 Yıldız Technical University, Department of Architecture, İstanbul, Turkey.
(phone: +90-539-9314725)
*Corresponding author
e-mail: mnurbekar@gmail.com;
A SPATIAL ANALYSIS OF THE URBAN PUBLIC SPACE: CASE STUDY THE MUSEUM OF ISLAMIC ART PARK, DOHA

Emine Malkoc True, Çigdem Kiliçaslan

Abstract
The starting point of this study is to examine the open space of the Museum of Islamic Art Park, located in Doha, through the design criteria to find out, qualitatively and quantitatively, its sufficiency for users. The park area, located by the sea, is one of the most modern open spaces in Qatar’s capital and was designed to complement the adjacent Museum of Islamic Art. Beyond a mere park, the design claims to bring together the public with the new urban space. In this context, the study is aimed at determining the use of the space by analysing its physical features, evaluating the sufficiency of the programme elements’ quality and quantity, determining the potential of the research area as a public open space by evaluating its visual life quality and attractiveness, guiding park designs with similar features, and providing a reference for other spatial analysis and evaluation research.

Firstly, literature on the research subject and area was studied. The evaluation criterias were determined by the findings from the literature and by visiting the area and these were used to create the analysis form to apply to the research area. Next, using the analysis forms in the field, the research area was evaluated under General information, Physical and Sensorial analysis. At the end of the study, the existing literature and fieldwork findings were evaluated with a holistic approach. It was found that the space brings together people from all ages and social groups; as well as providing an attractive social environment, the park hosts several urban spatial components in one place. Finally, recommendations were made for enhancing the visual/spatial quality and attractiveness of the area.

Keywords: Park, Museum of Islamic Art, Qatar

Introduction
Coastal areas, as a region where people meet up with water, have always maintained its importance throughout the history. In coastal cities, functions and different uses are densely found along the coastlines where the daily life passes and which means that the coastlines turn into focal / touristic attraction points.

Therefore, in coastal settlements, liveability and quality concepts gain importance in each passing day and spatial analysis studies come to the fore as an important factor for defining the negative factors and improving the space. These kind of studies which are carried out to reveal the physical properties of the built environment and to meet the expectations of the users in order to perform spatial improvement, have a leading effect on physical planning and design processes. In this context, examining the open spaces of the Museum of Islamic Art Park located on the coastline of Doha city, according to the design criteria and evaluating the space in terms of the quality and quantity adequacy is the starting point of the study.

The study was conducted with the aim of determining the spatial uses by analyzing the physical characteristics of the study area, examining the programme elements and the qualitative and quantitative aspects of the urban equipments in order to reveal their adequacy, determining its potential as a public space thereby its attractiveness by revealing the visual / life quality, leading the future designs of the similar places and being reference to the other spatial analysis.

Material and Methods
Material
The main material of the study is the Museum of Islamic Art Park, which is in the capital city of Qatar,
Doha. Situated on the Arabian Peninsula, Qatar with its petrol and natural gas reserves and the booming construction sector is an outstanding country in the Middle East. The capital Doha has the region’s largest international airport and is a favoured coastal settlement with a 7 km coastline (Figure 1).

Today, Doha, which has a population of 1.5 million, is becoming the centre of the region with its petrol and natural gas reserves as well as the new development strategies. The Museum of Islamic Art Park’s position next to the water strongly acts to bring the sea to visitors and creates an unequaled vantage point to contemplate the skyline of West Bay across the water. The reason for choosing the park as the study area is the strong physical relation of the park with the most important cultural place of the city, Museum of Islamic Art, and the dense use of the people (Figure 2 and 3).

Besides, literary sources, photos obtained from the observations and notes taken in the park, and analysis forms used in the field survey are the other materials of the study.

Methods
Examining the design criteria of the open spaces of the Museum of Islamic Art Park in Doha and evaluating the space in terms of the quality and quantity adequacy is the starting point of the study. Study area is also evaluated as a social space during its use (Figure 4). The park area which was opened in 2011 and its close environs are accepted as the study area and all the evaluations were made within these boundaries. The study was carried out in four stages including the conceptual framework, data collection, findings & analysis, evaluation & synthesis respectively (Figure 5).

• Conceptual Framework: This stage is composed of the literature review on the parks, public open spaces and spatial analysis etc. and pre-observations of the research area.
Data Collecting: In this stage, evaluation criteria were determined based on the pre-observations conducted in the study area and literature studies and analysis forms were developed. Key references, Küçükerbaş et al. (1999), Özkan et al. (2001), Malkoç Yiğit (2006), Özeren et al. (2011) were also consulted in the preparation of the analysis forms. Study area was studied in three main heading and seven sub-headings through analysing forms which are; General Information, Environmental Facilities, Physical Analysis, Accessibility and Linkage, Program Elements, Structural Equipment, Plant Material, Structural and Plant Material and Sensorial Analysis. In this context, analysis in Table 3, 4, 5 and 7 were graded between 1 to 3 and a numerical evaluation was made. According to this the negative feature has score “1”, partly positive has score “2” and positive has score “3” and average scores were calculated.

Findings and Analysis: At this stage, literature studies and the findings obtained from the field studies were evaluated holistically and qualitative and quantitative adequacy of the research area was revealed.

Findings
In this study, findings were discussed in 3 main sections in which the Museum of Islamic Art Park was evaluated as a social living space.

General Information
Firstly, general information about the study area was obtained and environmental facilities of the study area were determined from the results of the visual analysis (Table 1). Study area is easily accessible for the users. It is the...
part of the Corniche and the environmental facilities are centred mostly in 15 minutes walking distance. The study area, which is 280,000 m², is adjacent to Museum of Islamic Art.

**Physical Analysis**

In this section of the study, physical structure of the study area was analysed in terms of the accessibility and linkages, program elements, structural elements and plant materials (Table 2, 3, 4, 5, 6).

Firstly, accessibility and linkages of the study area were assessed, accessibility types were determined and their efficiency was questioned.

Pedestrian and vehicular accesses to the area are both possible. On the other hand, park is adjacent to the main road, which partly interrupts the secured access of the pedestrians. In addition, as the study area is far away from the city centre, the access of the users to the area is mostly by motor vehicles.

Public transport is insufficient. This is not a problem specific for the park; it is due to the lack of public transport of the city in general. For only important organizations and for certain routes, there is a free shuttle service bus. There is not any orientation – information board for easy access to the area.

Existing program elements in the study area were handled under two titles as “necessary program elements” and “optional program elements” (Table 3).

Site selection of the program elements was successful, their quality was sufficient and their usability level was successful. However, during the day, children’s playground is under sun exposure, which restricts its daily use and as there is only one bicycle - scooter renting point their usability level decreases.

Sufficiency (General average: Quantity: 2.93, Quality: 2.79 and usability level is sufficient in general (General average: 2.64)

Existing structural equipments in the study area were examined in two different subtitles, which are structural materials and plant materials. Structural materials were evaluated according to their sufficiency (quality and quantity aspects) and design features (form, size and colour). They were found sufficient and in high quality in general. On the other hand, kiosks and sculptures in the study area should be increased in number. Overall average of the structural materials was found to be between 2.56 and 3.

Appropriate plant materials were used in the study area due to design criteria. The quantity of the shrubs, bushes and cover plants was determined to be partly sufficient. On the other hand, climbing plants and colourful flowering plants were absent in the area. Besides, shadowing trees were not preferred in the area, which became a limiting factor for the day use. The overall average of the plant materials was found to be from 2.25 to 3.

Structural materials and plant materials were evaluat-
ed in general in Table 6. It was seen that the traditional Islamic architecture were accepted in general and the structural and plant materials were in harmony with the general design concept of the area. It has been observed that the structural materials are highly qualified, contribute to the identity of the area at a high level, and maintenance and repair works are satisfactory. However, it has been determined that the plant materials are moderate in quality and contribute moderately to the identity of the area, and that the maintenance work is still sufficient.

Sensorial Analysis
In this part of the visual analysis study, sensorial evaluation was performed in which 7 pairs of adjectives were included. In the evaluation of each pair of adjectives, ‘1 point’ was scored the most negative and ‘3 points’ was the most positive. At the end of the evaluation, it has been observed that the area is well maintained, safe, attractive, perceptible and original and generally leaves a positive sensorial influence on the user.

Evaluation and Result
The results of the visual analysis of the Museum of Islamic Art Park in Doha city shoreline are as follows:

• When dealt with in terms of general information and environmental facilities; the Museum of Islamic Art Park is a large green space that stands next to the museum in a beautiful location at Doha’s waterfront (Dohafamily, 2016). The research area is not only a mere park design, but also allows many activities such as eating, meeting and entertainment such as concerts and festivals, it is also a social life environment in which different age groups - children, young, elderly, women, men - come together.

• When accessibility and linkage are taken into consideration; research area is only 15 minutes drive from Hamad International Airport and within walking distance of Souq Wagif (MIA, 2016) which is famous with traditional garments, spices, handicrafts, and souvenirs (Wikipedia, 2016). The best way to get to the park is by car or taxi. This is related to the poor access to the area by public transport and the widespread use of private car-use cultures throughout the city.

• The ongoing 16 km. alignment of Doha Metro Gold Line will provide a new transport alternative for the study area (Kenyon, 2014). Access to the area by bicycle and pedestrian is only possible for those who live in the immediate vicinity. However, the fact that the main road adjacent to the area is very dense is a potential hazard especially for the pedestrians. There are also no orientation boards in terms of access to the research area. Car park space is located between the Museum of Islamic Art and the Al-Riwaq Exhibition Hall. Space is ample and covered (Dohafamily, 2016). There are no obstacles that restrict the access of the physically disabled and/or disadvantaged (elderly, pregnant and child) users to the area.

• When the research area is considered in the context of environmental relations, it is seen that the research area is designed as a neighbour to the Museum of Islamic Art and the Al-Riwaq Exhibition Hall. In this case, the park area turns into a centre of attraction point. However, the fact that the space has no spatial development opportunity for the future emerges as a limiting factor.

• Existing program elements are generally adequate and designed with a very modern approach. The presence of the multipurpose open spaces allows for more efficient use of the park. The presence of the children’s playground area is an important factor especially in the fact that the children’s families prefer the study area. The availability of bicycle - scooter rental, the possibility of using paddleboats and the bungee - trampoline affects the attractiveness and liveability of the study area positively. Park’s overall design concept creates the possibility of free seating to the users in many sub-spaces so that the numerical shortage of seating unit does not have a negative impact.

• The selection of the location of the structural equipments is successful, the number is sufficient, and the design and material selection are in accordance with the general concept and are rich. In line with these features, the ‘Museum of Islamic Art Park’ is a good example of future designs. However, it is essential to create solutions that will protect visitors against climatic conditions such as rain and wind in winter, sun and humidity in summer and provide bioclimatic comfort at optimum level. In this context, there is a need for shading elements that link existing subspaces together. This makes it a more comfortable walk for the user, especially at times when the sun is at impact, as well as the choice of materials and different design conception of the top cover will give a feeling of three-dimensional feeling to the space. The orientation of the water to the walking axes and emphasizing the existing axes, correct material selection and functional design were found positive. However, given the fact that the climatic conditions of the city are not suitable, the plants cannot meet the expected architectural and functional functions yet, there is a requirement that the sitting units should be integrated with the shading elements. The study area is a good example because of the diversity of flooring materials, their climatic suitability, colour and texture that are integrated with the design concept and used for the purpose of defining the spaces and applied successfully in the area.
According to Öztürk Kurtaslan (2005); sculptures emerging as plastic elements in urban spaces contribute to raising the quality of urban life. Sculptures, especially in the public spaces, contribute to the richness of visual sensation and enhance the aesthetic qualities of the space. For this reason, it is suggested to bring new plastic elements to the study area with the aim of ensuring a homogeneous distribution of the users in the whole area, highlighting some subspaces, creating a positive image in the users’ perceptions, supporting the artistic image of the area and directing users in the study area.

- When evaluated in terms of plant material; it was seen that the plants were successful in terms of planting design and rich in terms of species diversity and in accordance with the climate and concept of general design. However, supporting the overall design concept by improving the maintenance conditions, placing creeping plants in the baskets on the walls, and / or on the lighting elements will enhance the attractiveness of the area. The research area should also be enriched with shading elements or broad - crowned trees and shrubs to allow for use at different times of the year and in different weather conditions.

- When the research area is evaluated from the sensorial aspects; it seems to be designed with a holistic approach using different materials. It leaves a positive sensory effect on the visitors and is also inviting with an easily perceptible / readable design. The ‘7’ Sculpture, designed by Richard Serra, is also a symbolic element in enhancing the park’s perception from the outside and become a focal point..

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Author(s):
Emine MALKOÇ TRUE
Address: Ege University Faculty of Agriculture Landscape Architecture Department 35100 Bornova – Izmir, TURKEY
e-mail : eminemalkoc@hotmail.com

Çiğdem KILIÇASLAN
Address : Adnan Menderes University Faculty of Agriculture Landscape Architecture Department 09100 Aydın, TURKEY
e-mail : c.kilicaslan@hotmail.com
POST-DISASTER HOUSING: A COMPLEX SYSTEMS APPROACH TO SOCIAL RESILIENCE.

Ugochukwu K. Elinwa, Nothando Moyo

Abstract
Conflicts are a form of man-made disaster changing the economy of nations, influencing energy concerns, food, shelter and demographic distributions. The breakdown of global systems has become a huge concern that needs working mechanisms to develop resilient cities. The working mechanisms vary from one country to another, thus making the process a complex reality. Resilience is a word that was derived from the Latin word “resalire” which means “to spring back”. In this work, the housing environment was considered as a system constituting of several subsystems (Social, Environmental, Political, Economic subsystems). It argues that for resilience to occur within the post-conflict housing environment there is a need for an inclusive evaluation of users’ preferences and expectations. With a focus on the social subsystem, it tried to determine the level of significance of gender, age, income and level of exposure on the perceived social character of a post-conflict housing environment and the satisfaction derived thereof. The study showed the importance of inclusivity as it influences perception and satisfaction. Using regression analysis, the study revealed that Perception and satisfaction within a post-conflict housing environment were influenced by age (73%), gender (74%), income and level of exposure (54%).

Keywords: Housing Resilience, Complex System, Subsystems, Perception, Satisfaction

Introduction
The housing environment within the context of a post-disaster situation presents several complexities that impact upon the perception and satisfaction of the inhabitants. Therefore, viewing the post-conflict housing environment as a complex system with several interconnected subsystems allows us to carefully and critically analyze the level of functionality of the housing environment (Portugali, 2012; Haines 2000; Checkland, 1999; Senge 1994; Midgley, 2000). There are several factors that could affect users perception of a post-conflict housing environment. Different tools and methods have been applied in past research works to understand users reaction or perception of housing needs and provisions. A perfect competition model (PCM) model has been proposed by previous studies to understand the relationships between the users and the providers of housing. This takes into account economic considerations for choice of housing and the cost thereof (Meen 2002, Sinai and Souleles, 2005). The empirical values are deduced by considering different housing factors with direct and indirect effects on perception. It assumes that the perception of housing will be positively inclined when there are favorable conditions for users. Models of stability and instability suggest changes in preferred housing conditions will affect the housing environment negatively giving rise to inconsistencies in the usage, perception and demand within the housing environment (Peng & Potts 2007, Shiller, 2003). Thus the risk encountered by the users of the housing space and housing environment may grow into complex matters due to uncertainties and the absence of clarity for the users of the intentions of the different groups involved in the process of housing provision.

Econometric models developed by Garino and Sarno further point to the nature of complexities that could arise within the housing environment due to the perception of the users (Garino and Sarno, 2004). It points to how the perception of one individual can affect another’s perception due to uncertainties. This could result in what is known as herding and generally lead to social misconceptions. Baddeley (2005), proposed a model for behavioral analysis of housing. The model suggests perception of housing about their environment as being influenced by both objective and subjective factors and considerations. In applying the model, objectivity can be perceived in the process of analyzing the housing environment while the perception of the users may be subjective. A balanced approach to resilience will require a consideration of all aspects of the community or neighborhood in question; and should involve people of all age group, social and economic status. This will guide the resilience program towards being flexible to accommodate every human variable within that community or neighborhood (John and Duguid, 2000; Platt 1999; Bruneau et al., 2013; Godschalk, 2003;
Fraser, 2005; Binkley, 2000). Participation at this level is very important in determining what individuals, groups and the community are willing to accept (WTA) within the housing environment (Bruneau et al., 2001; Godschalk, 2003; Hegney et al, 2008; Barakath et al., 2004). Therefore, this paper adopts the complex system approach to understanding perception and satisfaction within the housing environment. This approach takes into consideration both the tangible and intangible aspects of space with respect to the post-conflict housing environment. It thus critically analyzes both objective and subjective behavioral patterns through a proposed model. A complex system within the context of the post-conflict housing environment may therefore be said to consist of “Multiple parts that are interdependent and produce outcomes that are not necessarily predictable based on any one part’s function, but by how the parts interact within the system” (USAID, 2014). Thus, the housing environment could be interpreted as a System with social, economic, political, environmental subsystems (Foster, 1997; Perin, 2009; Bujones et al., 2013; Wikström, 2013). Complexities arise within the subsystems as result of the interactions between human variables such as age, level of exposure, income and gender (Norris, 2008; Dennard et al., 2008; Mitchel, 2009).

**Complex Systems and Resilience**

Complex systems have been used in the past to develop frameworks for scientific studies in both physical and social dimensions (Watts & Strogatz, 1998; Wolfram, 2002). Combining this approach with technological advances enables in-depth studies of phenomena in real life cases with actions and often times multiple reactions (Jacobson and Wilensky, 2006). The insights and knowledge gained from complex systems studies or research are now being integrated by professionals into different fields of study. Unfortunately there is very little research that has been done in the past in the aspect of complex systems in housing, especially as it relates with conflict and resilience. The complex systems approach entails a collection of micro-parts whose activities affect the adaptive capacity of the macro-part. The post-conflict housing environment presents a complex laboratory of enquiry as a result of the different actors within such housing environments, their individuality and collectivity as a result of the nature of relationships (both formal and informal) existing between them (Figure. 1). The framework for resilience in this study involves three key steps for analyzing the resilience of a post-conflict housing environment, namely; contextual analysis, factor analysis and resilience analysis. The contextual analysis contained within this framework discusses the study area, its historical background and events leading up to its present day condition. As a post-conflict area, the contextual analysis presents a time frame of transformations within the study area. It further analyzes the different but very important actors within the study area, available structures and the nature of the communities within the post-conflict area under study. This is done in order to “determine their different exposures to various shocks and stressors and to identify the areas of research for the subsequent factor analysis” (USAID 2013). The next step within this process is the resilience analysis. It tries to determine the level of exposure of a community to stressors and the potency and legitimacy of available facilitators for adaptation. This framework will guide the research into identifying gaps within the housing environment which could diminish resilience and areas that could be potentially improved for better living conditions. Longstaff et al., (2010), depicts resilience as centering majorly on two
main pillars – resource robustness and adaptive facilitators. As mentioned earlier, resources are said to be robust when there is an adequate provision of a variety of options with high performance. This is also applicable to adaptive facilitators and institutions. Lastly, the study tries to determine the level of significance and existence or lack of certain elements for resilience within the study area. These elements include; Flexibility, Effectiveness of several levels of governance, Social Structure, Openness. The element of flexibility is determined based on the available varieties of options within the economic and environmental and social subsystems (diversity). Examples of such include alternative energy solutions and multiple income sources for the neighborhood and multiple spaces for public use. The effectiveness of the different levels of governance can be measured based on the legitimacy of the government bodies. That is if they are recognized and by whom they are recognized (Bujones et al., 2013). Governance could be defined as the “Establishment of policies, and continuous monitoring of their proper implementation, by the members of the governing body of an organization” (Business Dictionary.com). It refers to rules or systems of control or the way of governing a state or organization. Therefore governance can exist in form of the institutions/ regulatory bodies (formal and informal) responsible for ensuring proper functioning of the different subsystems (Bujones et al., 2013).

Social Subsystem
Resilience in the social subsystem is defined as the ability to constantly provide quality services and access to public spaces with limited interruption imposed by shocks and stressors. This entails planning for typical shocks and stressors in order to strengthen the subsystem and ideally improving the provision of public services in light of a shock or stressor (Bujones et al., 2013). The social subsystem can largely and greatly affect and influence all other subsystems because of its interconnectedness with them. Therefore, shocks and stressors on the social subsystem would have an effect on the other subsystems. This study considers resilience in the social subsystem with respect to the public spaces, their functions and their accessibility. The main elements of resilience considered within this subsystem include flexibility, openness and levels of governance. Openness refers to the accessibility of the public spaces and services, ensuring that they can be reached easily. The usage and provision of public spaces and services should not be restricted to any group of people but should be flexible enough in terms of user groups and usage (i.e the space can be used for multiple purposes). The levels of governance here refers to the different social institutions (both formal and informal) that are responsible for ensuring the effectiveness of public spaces.

One of the early literatures on social subsystems describes it as a complex entity which involves various levels of interactions of both active and passive parts (Parsons, 1966). A continuous relationship with the different parts eventually builds up into the dynamic character of the community or neighborhood. The social subsystem discusses the various services and public spaces that are available and within the reach of a neighborhood or community. These services and public spaces aid in the resilience process especially when there is no favoritism shown to any social group as was the case in Nepal (Rose, 2007). The social system is interwoven and relies on other subsystems, and a shock to the social subsystem can directly affect the political, economic, security, and environmental subsystems. For instance, a health or education system shock caused by the failure of service delivery due to corruption has the power to threaten the public’s trust in the government to properly and legally deliver services, which could culminate in conflict (Bujones, 2013).

Resilience in the social subsystem is defined as the ability to consistently provide quality services and access to public spaces with limited interruption imposed by shocks and stressors... Analyses should understand how gender awareness and responsive public services and resource allocation are in post-conflict settings (Bujones et al., 2013)

The consideration and inclusion of every individual and groups represented within a community is essential for the effectiveness of the system. Within the social subsystem, it is important to understand the level of gender awareness; are there any form of bias in terms of the public services and spaces as it relates to the women and men. If the women in the post-conflict housing setting are a disadvantaged group, the subsystem could be weakened (Brigulio et al., 2006). Such inequalities could lead to adverse conditions which form eventual stressors. An example is the case of India (Lebel et al., 2006) which showed a high female mortality rate of between 30 – 50% higher than males amongst children from ages one to five years. Although as stated earlier, the social subsystem could present complexities, Table 1 gives a sample guide to carrying out a resilience analysis of the social subsystem.

Economic Subsystem
The economy forms a very important aspect in the discussion of resilience. This involves every individual or group that is responsible for the provision, distribution and consumption of goods and services within the community (Rose et al., 2007). Several influences determine the resilience of an economic subsystem; however, the availability of resources is necessary for
a successful resilience (Brigulio et al., 2006). This includes assessing and rating the performance of the economic resources available (Longstaff et al., 2010; Bujones, 2013). The economic subsystem resources include small and medium businesses, restaurants, cafes, etc. that do not have or suggest social limitations or discriminations (Rose et al., 2007; Hobson, 2004; Dorward, 2001). Bujones et al., (2013) also argues that the economic environment is closely linked to all other subsystems as stressors within those subsystems tend to affect the economy at different levels. Table 2 shows a sample for a standard enquiry to test for elements of resilience in an economic subsystem. This enquiry can be broadened depending on the case under review. For this study, the economic subsystem is tested for the elements of flexibility and different levels of governance of the economy.

Environmental Subsystem

An environmental subsystem can be viewed in terms of the green spaces and activities geared towards reducing the adverse impacts or effects of man’s activities on the environment. The illustration in Fig.1 explains this point of view within the environmental subsystem. The environment considers the resources (considering climate, weather and other natural resources) that can be utilized in improving and sustaining the environment and livelihood, which portrays a level of sensitivity to the influence and activities of man (Adjer, 2000).

Conflict or fragility might also facilitate environmental destruction by inhibiting the enforcement of necessary regulation and monitoring mechanisms. (Bujones et al., 2013)

The physical infrastructure is closely linked to the environment and economic subsystems. It involves the provisions and facilities available for efficient provision and delivery of goods and services (U.S EPA, 2009). Within the environmental subsystem, flexibility presents a range of considerations. These considerations include but are not restricted to the following; alternative energy sources, multiple environmental

Methodology

A framework with two major parts was proposed for the study. The first part concerned the literature review and the second part guided the researcher into enquiries within the case study. The literature review is a gradual buildup from conflicts as a man-made disaster which influences or affects the housing environment in different ways. The post-conflict housing is discussed in terms of short term and long term conditions. Literature on resilience is also reviewed in order to understand what has been done in past research works on resilience. This guided the research into useful observations and understanding of the process of resilience in a complex situation (Fig. 2).

Data Collection and Analysis

A participatory approach was used in developing quantitative theories to simplify the complexity in adapting to the post-conflict housing environment and its resilience thereof. Workshops, meetings and seminars were eventually organized for the sensitization of the local community, the municipal government
agents, non-government organizations and scholars on perception and satisfaction as related to the resilience of the post-conflict housing environment. During these processes, quantitative data through interviews were collected and then used in developing a framework for resilience analysis through perception and satisfaction in post-conflict situations. In this work, a framework was designed for carrying out enquiries within the social subsystem (Figure 3). A total of 1000 completed questionnaires were retrieved during the survey. The respondents were high school teachers, parents, retired individuals, municipal authority, health workers, and business owners. The questionnaires were distributed randomly without any form of bias or preference for either male or female respondents. The total number of men and women who filled out the questionnaires was in the ratio 60:40, that is to say 60 male and 40 female respondents. In order to ensure credibility, the responders ranged from teenagers to elderly citizens. The data used for this study was collected over a two year period and verified to observe and check for discrepancies in the findings. Using SPSS, a regression analysis was carried to determine the significant impact level of age, gender, income and awareness on the perception of the post conflict housing environment. This was carried out to understand the relationship between perception of inclusiveness and the process of resilience within a post conflict housing environment. In this case, perception is line with the view that the process of resilience starts with enhancing an individual then a group and then a community. One of the core strategies used during the survey was to identify two major reference points within the study area. They are:

A - Created communities - social and economic inequalities
B - Bimodal demographic structure - ethnic, religious and racial diversity

Contextual Review
Famagusta, both in the past and present is home to many cultures and groups of people. From the past, we recount a transition in its multi-cultural dimensions as a result of the influence of different ruling governments such as the Roman, Byzantine, Lusignan, Venetian, Ottoman and the British rule (Doratli et al, 2003). The different conquest led to a continuous

Figure 2. Research Framework (source: author).
change in the identity and culture of Famagusta. Famagusta created an impressive dominance through the commercial activities that took place at its port. Although there is a gap in the history of Famagusta from the 3rd century to 12 AD, Famagusta began to rise to prominence by the 12th century. From 1191 – 1489 AD, it became a very important port and the center for trading activities for Europe and the East (UNHCR, 2014). In 1974, the Island of Cyprus was divided into two parts, with the Turkish Cypriots in the North and the Greek Cypriots in the South. This division was as a result of ongoing disputes between the Turkish and Greek Cypriots.

The area that was selected for this study is Asagi Maras, in Famagusta, the Northern part of Cyprus. Asagi Maras is an area that is surrounded by a buffer or cordoned off part known as Kapali Maras (Closed Maras) as a result of the Cyprus Conflict of 1974. Seven (7) quarters (Anadolu, Canbulat, Lala Mustafa Pasa, Namikkemal, PertevPasa, PiyalePasa, Zafer) make up the whole of Asagi Maras, but this work only focused on four quarters (Canbulat, Lala Mustafa Pasa, Namikkemal, PertevPasa) (Figure.4a and 4b). The selection was done considering the closeness of those four quarters to the cordoned off area. This choice was also based on the assumption that the areas in proximity to the buffer zone will be greatly affected by the restrictions resulting from the conflict (Onal et al., 1999, UNHCR, 2014).

Developments in Famagusta began from the walled city and eventually settlements began to grow outside the city walls to Maras (Varosh) (Fig. 18).

**Findings and Discussions**

Institutions are generally weakened by conflicts thus incapacitating them and making them less functional. In providing post-conflict housing solutions, there is a need to evaluate the preferences of the intended users as this tends to affect the perceived satisfaction of the users (Barakath et al., 2004). Resilience within the social subsystem can be understood through the nature of services and infrastructure, social and support networks within a community or neighborhood (Vinson, 2004). Such networks help in advancing the cohesiveness of the community of neighborhood (Van and Salet, 2012). This promotes the idea that a more cohesive and involved community or neighborhood, through its social networks (formal and informal) will have a higher chance of resisting the shocks within the community.
social subsystem (Bujones et al., 2013). In this work, resilience in the social subsystem is determined with a focus on public spaces, services and their accessibility; using the following elements of resilience: flexibility (spaces should be able to cater for different age groups and gender and without any form of segregation or discrimination), effective governance (both formal and informal organizations or institutions responsible for effective functioning of public spaces, facilities and infrastructure) and openness (easy accessibility to public spaces and other public provisions within the housing environment) (USAID, 2009; Cutter et al., 2008; Briggs et al., 2006; Lebel et al., 2006). “Resilience in the social subsystem is defined as the ability to consistently provide quality services and access to public spaces with limited interruption imposed by shocks and stressors... Analyses should understand how gender aware and responsive public services and resource allocation are in post-conflict settings” (Bujones et al., 2013).

Moody and White (2000) assert that the cohesiveness of a community can only be to the extent that the different players within the social subsystem hold it together. Thus adaptability within the context of the complex systems refers to how the people perceive the system as a whole as opposed to what is contained only in one subsystem. However, the adaptability of the community depends on the collective facilities within the system (Carpenter and Brock, 2008; Walker et al., 2009; UNDP, 2010). In order to create ease in the process of adaptation, there must a significant and sufficient level of resource provision (Longstaff et al., 2010). According to Ibem and Amole (2012), achieving residential satisfaction is a function of how people perceive the adequacy and the ability of the housing environment to satisfy their individual needs. Furthermore, Mohit et al., (2010) suggests that major features of the public housing environment, after being evaluated by the dwellers become subjective, thereby bringing about a degree of satisfaction.

Space perception when considering dependent variables such as age, level of exposure, gender and income forms a very strong basis for how people within post-conflict housing area respond to the housing environment. External factors such as the inclusiveness or non-inclusiveness of all the different groups represented within the housing environment, through a thoughtful process of planning, could influence the response of people to the housing environment. For instance, a situation that might appear to be a conducive housing environment for the 60+ old people may not be conducive for the teenagers. The data collected revealed a near balance in gender ratio with the selected quarters of which majority of the adults were between the age ranges of 31 – 60 years old. Most of them were family men/women with children, thus making the majority of the population children and teenagers (Figure 5). 1 A regression was run to determine the relationship between age and perception in a post-conflict housing situation. The result obtained had 73% significance.

By running a regression analysis, respondents’ choices had a 54% relationship with the gender of the respondent. The Durbin Watson standard was
in agreement with this result at significance of more than 2, thus revealing a very strong relationship between gender and perception. This expresses a strong level of relationship. With a mean of -5 and a standard deviation of 0.9 for gender an almost even curve as depicted in the histogram (Figure 6) further stresses the relationship between gender and choice/perception of space within the post-conflict housing environment. At 95% confidence, a strong correlation of 5% was found to exist, using gender as dependent variable to test for social integration, perception of space and the use of spaces. The regression further revealed a 74% relationship between income and respondents’ perception/choice.

According to the findings of the study, 63% of the respondents suggested that there were no adequate provision of social spaces within the study area, thus ruling out the resilient elements of flexibility and openness (Figure 7). Without adequate provision of social spaces or “comspaces” that are flexible and open, proper integration may not be possible in the post-conflict housing environment and this eventually affects the cohesiveness of the community.

As was stated earlier, this work reveals a strong relationship between age, gender, level of awareness, income and the perception or usage of public spaces and facilities. Therefore, inadequacies in the provision of spaces that cater effectively for the different groups of people represented in the post-conflict housing environment, could account for why people tend not to socialize in the public spaces. In this study, 62% of the respondents gave negative feedbacks about using public spaces such as parks within the study area, thus further questioning the level of openness and flexibility of the public spaces (Figure 8).

Inadequate provision of space infrastructure and accessibility are examples of structural restrictions in public spaces. Most of the socializing as revealed in this study happened on the streets (especially for the children).

Conclusion
Based on the findings, the study concludes that people in post-conflict situations can develop certain coping mechanisms, yet resilience may still not have been reached due to inefficiencies of the elements of resilience within the subsystems. This could lead to a collapse of the whole system if there is a major shock within the subsystems. Thus, in a resilience project, it is important to consider the different levels of interactions. It shows the uniqueness of one social setting from another. The suitability of the developments within the social subsystem can be reached by utilizing and involving the people living the study area in the decision making process. Involving them from the onset creates a sense of belonging and ownership of the plans. Such involvements enable flexibility within the subsystems. By improving the quality
of public spaces, cohesiveness can be achieved through continuous interaction (networking) of people within such spaces. The social subsystem should be able to combine both fixed and non-fixed spatial uses to foster social flexibility. Although this is not the situation currently in the study area, spaces can be adapted to new uses through proper designing of public spaces and facilities that will portray fluidity. This study reveals that gender plays a role on resilience as the needs of the male group may vary from the needs of the female groups. So also the needs of the younger groups or individuals could also vary from the needs of the older ones. For effectiveness of the system approach, the subsystems should be considered holistically as each subsystem is connected one way or the other. The process of planning should carefully consider the cost and effect of adopting or rejecting any plan or proposal aimed at achieving resilience of the system as a whole. Such plans should seek to support both short and long term recovery objectives. It should pay attention to structural, physical and nonphysical dimensions that will or could influence the effectiveness of the plans.

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Author(s):

Ugochukwu K. Elinwa
Final International University, department of Architecture.
ugoeelwina@yahoo.com

Notando Moyo
Business Administration Department, Cyprus International University
BUILT ENVIRONMENTAL VARIATIONS BETWEEN REGULAR AND IMAX THEATRES.

Chen Wang, Heng Li

Abstract
The movie substitutes such as home cinema, video on demand (VOD), and plasma televisions led to a declining attendance of patrons to movie theatres, which urged the invention of IMAX theatre to call movie lovers back to cinemas. Many cinemas plan to renovate their regular digital theatre auditoriums into IMAX theatre auditoriums, but there lacks of study for built environmental variations between regular and IMAX theatres. Through the combination of a questionnaire survey and a case study on a leading cinema company in Malaysia, the Tanjong Golden Village Cinemas (TGV), this paper aims to identify the structural and architectural differences between regular digital theatre auditorium and IMAX theatre auditorium in the perspectives of acoustic and visual experiences. The most significant factor influencing the satisfaction of visualization in IMAX is "immersive of picture" followed by "sharpness of colour" and "feels as part of the picture". The most significant indicators for audio experience in IMAX is "direction of object", which enable an audience to trace the direction and position of an object on the screen without looking at it. The built environmental variations between regular and IMAX theatres in terms of screen, camera and projection methods, seating, architectural layout, wall design, and sound system arrangement were thoroughly compared in the case study.

Keywords: IMAX, Cinema, Theatre, Built Environmental Variations.

Introduction
In the late 20th century and the early 21st century, the motion picture industry began transition from film-based cinemas to digital cinemas, which offers an enhanced viewing experience for audiences (Husak, 2004). However in recent years, many box offices faced a decrease in their revenue due to the declining attendance of patrons to movie theatre, which was mainly caused by the invention of movie substitutes such as home cinema, video on demand (VOD), large screen LCD, and plasma televisions, which enabled a movie lovers to enjoy the shows at home. This in turn urged the invention of IMAX theatre to call movie lovers back to cinemas. IMAX system was invented by the Canadian IMAX Corporation. In the beginning, the IMAX system was based on documentary that shows in museum. IMAX Corporation later detected a tendency of commercial market for the IMAX system to be used in the entertainment industry if cooperating with the Hollywood film. The "Matrix Revolution" was the first Hollywood film that released in the IMAX version in November 2003. IMAX theatre enables the viewers to experience a totally different environment by having a peripheral vision combined with the sound system which eventually makes the audiences feel as if they are a part of the on-screen action, thus although 3DTV was invented, it still could not achieve the level of experience in IMAX (Obrist et al., 2013. Tanjong Golden Village Cinemas (TGV) is the leading cinema company in Malaysia but it has only three cinemas with IMAX theatre auditoriums throughout the country, and other cinema companies hardly have IMAX theatres. The three cinemas are located in Sunway Pyramid, One Utama, and Tebrau shopping complexes. TGV has a plan to renovate as many as its regular digital cinema auditoriums into IMAX theatre auditoriums. This paper aims to identify the structural and architectural differences between regular digital theatre auditorium and IMAX theatre auditorium in terms of acoustic and visual experiences.

Cinemas and Different Projection Methods
The motion pictures technology was first invented by two early pioneers namely George Melies and Edwin S. Porter in the 19th century with magic lanterns, which is a slide projector able to project images in different scenes through lens using lights generated by kerosene lamp (Nowell-Smith, 1996). In 1832, a Viennese named Simon Ritter von Stampfer invented the Stroboscope, which was able to catch the moving object to be appeared into stationary or slow moving object through the slits by turning the disc-like shape instrument, then a simulated motion was generated. Whereas, in 1853, another Viennese named Franz von Uchatius combined the two technologies of magic
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It was the first large-screen project films in the world at the images on a large screen by using magic lantern, which able to capture motion pictures and projected. Louis Lumière successfully invented the first motion picture camera to capture motion in 1891 (Nowell-Smith, 1996). Nevertheless, the turning point in the movie industry occurred in 1889 with the invention of Celluloid film by George Eastman using his Kodak still camera. In order to allow light passing through the film, the film was cut into strips and its edges were perforated. Edison opened his very first Kinetoscope Parlor in his “Black Maria” studio in New York in 1894. These films only showed less than one minute with a low quality on screen in the parlor.

With the creation of a projector known as Bioscope by an England man, Robert W. Paul, a longer vision of film stayed in the screen, which was followed by the creation of Skladanowsky Bioscope by a pair of Germany brothers, Emil and MAZ Skladanowsky. However with the strong competition in the market especially in Europe and America, finally Skladanowsky’s Bioscope lost its market. In 1895, a France brothers Auguste and Louis Lumière successfully invented a camera known as Cinématographe which able to capture motion pictures and projected the images on a large screen by using magic lantern. It was the first large-screen project films in the world at that time. A technique has been invented using both splicing and editing to superimpose multiple shots and layering images overtone one another (Nowell-Smith, 1996). This technique acted as a stepping stone towards the movie industry in 20th century. In 1908, a very first theatre in the world was formed known as nickelodeon theatre with the formation of Motion Pictures Patents Company (MPCC). With the success of invention and innovation of all film-makers and scientist, the movie industry was able to survive until this 21st century with the creation of Hollywood, digital cinemas and the latest technology, IMAX cinemas.

After the initial low-cost theatre model in the early Nickelodeon Era, the movie theatre industry shifted into a Studio Era. In the Studio Era, classes of theatre existed, from the first-run films on exclusive road show releases at premium prices to the fourth and fifth-run theatres showing older releases at low prices. In 20th century, the movie theatres industry shifted into Modern Era, when a single screen cinema converted into cost-efficient multiplexes (Silver & McDonnell, 2007). In this Modern Era, celluloid-based film was shown in a film-based cinema. Theatrical entertainment has been film-based for over 100 years (Husak, 2004). With the invention of digital technologies, the primary medium for watching movies on large and wide screen was also in movie theatres (Silver & McDonnell, 2007). Digital cinema is the replacement of celluloid-based distribution and projection with digital technologies (Husak, 2004). The invention of digital cinema successfully improved the image quality. A 3D digital film was introduced in 1952 with an innovative wide-screen format called Cinerama. This type of film used three cameras that each of them shot the same scene from a different angle. When the film was showing in the digital cinema, there were three separate projectors projecting the film images onto three screens being joined to form a giant and curved screen providing the 3D illusion (Silver & McDonnell, 2007). Later, IMAX system was invented by the Canadian IMAX Corporation, which was able to give audiences not only a 3D vision illusion but also a 3D sound experience.

Digital Cinema

Digital cinema allows re-allocation of equipments to maximize the use of auditorium in the peak theatrical releases or during weekend and vice versa. This is because unlike in film-based cinemas, digital cinema does not have to duplicate new prints for each individual screens as it was computerized (Husak, 2004). One of the advantages of digital cinema is that it provides a better quality of images than celluloid-based film without having problems in washing out and scratching images. However, along with the advance in technologies, digital cinema faced its down when pirated DVDs were everywhere in street markets even before a public release. Moreover, the illumination on screen depends on the screen brightness and screen area. Typically, the image brightness was set to 12 ft. lm. Whereas in term of projectors, small projectors illuminate around 3000lm while a large projectors illuminate around 20,000 lm. The light of the projectors is filtered to reduce the level of infrared and ultraviolet radiation. There are currently two types of pro-
jectors used to display digital movies, namely: Digital Light Processor (DLP) and Digital Integrated Light Amplifier (D-ILA). DLP has mirrors that function to change the light intensity so that the film appears to be comfortable to audience’s eyes. D-ILA projector uses Liquid Crystal Display (LCD) based imager or Liquid Crystal on Silicon (LCoS) to display a digital movie. Compared to DLP, D-ILA has a light intensity that can be adjusted by applying a voltage to the pixel anode. However, D-ILA is not efficient for digital movies that require high brightness level. Audiences tend to experience a greater presence of himself in the movie when watching a 3D display as compared to 2D display (Cho & Lee, 2013). A higher involvement and immersion an audience will experience when watching 3D movies as compared to 2D movies (Obrist et al., 2013). A 3D display allows both monocular and binocular depth cues to coexist in a single display system with higher resolution colour imagery (McIntire et al., 2014). There are two methods for watching 3D display, namely: shuttered glasses and polarized glasses, and the latter is normally used (Kim et al., 2011). It is extremely expensive to show a 3D movie without the need of wearing glasses (Cho et al., 2014).

**IMAX Cinema**

The Canadian IMAX Corporation developed a technology known as Digital Re-Mastering Technology (DMR) that allows digital movies to be transformed into giant IMAX 15/70 format at an affordable cost (Silver & McDonnell, 2007). IMAX movies gave a similar experience to audience like what Cinemaroma gave but with a more affordable investment (Silver & McDonnell, 2007). Unlike the screens in digital cinema and film-based cinema as well as Cinerama theatre, the IMAX screen is as huge as around 8 stories high and hundred feet wide that makes it able to extend the edge of audience’s peripheral vision. IMAX system also provides a 3D sound effect with the 12,000 watt sound system surrounding the auditorium, which creates an intensive experience than any other types of theatre. In terms of cost of tickets, IMAX movies cost about 30%-40% more than a standard ticket prices for normal digital movies. The first Hollywood movie released in IMAX was “The Matrix Reloaded” produced by Warner Brothers. The film was 65mm with the images oriented horizontally rather than vertically (Husak, 2004). In 2010, the world’s first full-length IMAX 3D Hollywood feature film “Avatar” completed its initial run as the all-time highest grossing IMAX release. Apart from the Hollywood movies in IMAX format, the IMAX theatre is also able to show real-time events by broadcasting it through satellite like what a digital cinema does but with more advanced visual and acoustic experience. In terms of projection method, IMAX theatre uses MPX projecting system to deliver a higher level of clarity, detail and brightness compared to conventional movies and competing film and digital based projection systems (Silver & McDonnell, 2006). This projection system also known as IMAX MPX is able to display both 2D and 3D films by projecting 15/70-format film onto curved screens up to 70ft x 44ft (Silver & McDonnell, 2006). Compared to Cinerama, IMAX MPX is cheaper in its capital and operating costs.

**Acoustic Design in Theatre**

People hope to enjoy the environment in cinema. Indoor sound has a more complex nature compared to outdoors due to multiple reflections of sound incident on wall, floor and ceiling (Maekawa & Lord, 2004). A movie has loud and low frequency of explosions. Sound insulation deterioration is caused by the coincidence effect at high frequencies and mass-air-mass resonance at low frequencies in cinema (Matsumoto et al., 2006). Lightweight construction also causes poor sound insulation performance at low frequencies (Berglund et al., 1996). This problem becomes more serious when the rooms are equipped with hi-fi which produces high power at low frequency (Bengtsson et al., 2004). In order to avoid this kind of explosion from transmitting to other theatre auditoriums through the common wall, a single wood-frame construction wall is not enough. (Duarte et al., 2012). There is a standard known as ISO 15186-3 to measure the sound reduction index of a room at low frequency (Hopkins & Turner, 2005). The measurement is useful to calculate the sound insulation performance of a room where the sound fields could be diffuse at low frequencies such as between 50 and 80 Hz with a room volume greater than 300m$^3$. The range of sound reduction index at low frequency range of 50 to 125 Hz is approximately 15dB (Kropp et al., 1994). Lightweight partitions of single stud wall has been invented and encouraged to be used as internal partitions (Urías et al., 2002). A double stud wall with high sound insulation performance is particularly used between two adjacent cinema theatre’s auditoriums.

Various studies have been carried out to improve the sound insulation performance of the walls such as layering board materials (Novak, 1992). Experiments were conducted to investigate the differences in sound insulation performances of lightweight and heavyweight partitions at low frequencies (Maluski & Gibbs, 2000). A multilayered partitions with air spaces and staggered studs are used to increases the value of TL and in a meanwhile provide adequate acoustic separation. This multilayered partitions consist of two plasterboards made up of different physical characteristic (Matsumoto et al., 2006). This technique is also known as double drywalls govern by a rule known as mass low (Sharp, 1978). It is not only light in weight but also easy to install and to resist fire.
Nevertheless, the double drywalls have sound insulation defects at low frequencies due to the resonance between double-layered boards (Matsumoto et al., 2006). This can be improved by board layers made up of heavy materials with air spaces to adjust the resonance frequency to a sufficient low-frequency range. Apart from that, there is also an sound insulation defect at high frequencies due to the coincidence effect on each board (Matsumoto et al., 2006). The total thickness of these walls is at least 56 cm to effectively reduce low-frequency transmission between theatres. Besides, resilient channels or pads are required to seal all connections between the wall and the floor or ceiling.

In some shopping complexes, the cinema is located beneath the shopping levels, thus noise from the mall and foot-fall impact noise have to be considered. In some cases restrooms were designed below the stadium seating area of some theatres, the plumbing noise from flushing toilets needs to take into consideration as well. In order to avoid foot-fall impact noise and plumbing noise, isolation involving resilient hangers supporting the theatres ceiling is required. Seat location also affects the visualization experience in a movie theatre especially in watching a stereoscopic movie (Cho et al., 2014). An audience who choose to sit at the extreme sides of the theatre will experience discomfort when watching a stereoscopic movie due to distorted view (André, 2014). Audiences who sit on the left or right side of theatre will experience more dizziness as compared to those sit in the middle of the theatre and vice versa (Cho et al., 2014).

Research Methods and Procedures
A combination of qualitative and quantitative approach was applied in this study through a questionnaire survey and case studies. The questionnaire survey was mainly to compare movie audiences' watching experiences among different projection methods. Case studies assisted by interviews and direct observations during theatre construction provide better understanding on the built environmental requirements for a movie theatre auditorium in terms of both visual and acoustic aspects. The questionnaires were formally distributed to experienced movie goers in Malaysia. These movie goers were those experienced in watching regular 3D and IMAX movies in Malaysia’s leading cinemas. Their experiences lead to a better understanding on the perceived visual and acoustic differences between the auditoriums in a regular 3D theatre and an IMAX theatre. A total of 312 questionnaire forms were posted to samples who have been recorded frequently watching both IMAX and regular 3D movies in Malaysia and 104 valid forms were collected forming a responding rate at 33%. The sample list was acquired through the official websites of IMAX Malaysia and cinema’s database. The questionnaire form was divided into three sections with one open-ended question in the last section. Section A was to obtain the socio-demographic profile of respondents and Section B was to seek the reasons for choosing IMAX. Section C compared IMAX movie, standard digital (2D) movie, and regular (3D) movie in terms of visualization and audio experiences. Partial Least Squaring Structural Equation Modeling (PLS-SEM) was used to assist data interpretation especially in testing the correlation between variables. Cronbach Alpha was used to determine the reliability of the construct.

Table 2 shows the socio-demographic profile of respondents divided into six categories, namely gender, age group, education level, current working status, and current job stress level. The proportion of
male and female respondents participated in this study is quite balanced as 44.2% for male and 55.8% for female. There were 85.6% respondents from 21 to 30 years old while the proportions of others age groups were 11-20 years old (7.7%), 31-40 years old (3.8%), and 41-50 years old (2.9%). Overall 60.6% respondents hold a bachelor’s degree followed by certificate/diploma/advanced diploma holders at 21.2%, and postgraduate degree holders at 16.3%. Among the respondents 67.3% were still single, 26.9% were in a relationship, and 5.8% were married.

An explanatory case study was conducted to investigate how architectural and structural design impact on the visualization and audio experience in theatres’ auditoriums, with the following question:

a) How to make the soundtrack in IMAX auditorium rigid so that audients could identify the direction of the object without looking at the screen? b) How were the partition walls made in a regular theatre and in an IMAX theatre? c) How were the seats arranged to achieve better visual and audio experiences? and d) Any special requirements for projection methods in IMAX? Tanjong Golden Village (TGV) Cinemas were selected for this case study because it is the leading cinema company in Malaysia and it has three cinemas with IMAX theatre auditoriums throughout the country, while other cinema companies hardly have IMAX theatres. The three cinemas are located in Sunway Pyramid, One Utama, and Tebrau shopping complexes. TGV has a plan to renovate as many as its normal digital cinema auditoriums into IMAX theatre auditoriums throughout the country, while other cinema companies hardly have IMAX theatres. The three cinemas are located in Sunway Pyramid, One Utama, and Tebrau shopping complexes. TGV has a plan to renovate as many as its normal digital cinema auditoriums into IMAX theatre auditoriums throughout the country, while other cinema companies hardly have IMAX theatres.

Data Analysis and Interpretations

The internal consistency for the questionnaire result was tested via Cronbach’s Alpha. The reliability coefficient of 0.70 or higher is said to be reliable. The Cronbach’s Alpha was 0.879 demonstrating a high reliability in this study.
Table 3. Reliability and validity of structural model.

<table>
<thead>
<tr>
<th>Latent Variable</th>
<th>Indicators</th>
<th>Loadings</th>
<th>Reliability</th>
<th>Composite Reliability</th>
<th>AV/E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satisfaction on visualization</td>
<td>Better Brightness</td>
<td>0.857</td>
<td>0.741</td>
<td>0.911</td>
<td>0.60</td>
</tr>
<tr>
<td></td>
<td>Better feel as part of picture</td>
<td>0.854</td>
<td>0.729</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Close up</td>
<td>0.664</td>
<td>0.440</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Finish reading subtitles</td>
<td>0.622</td>
<td>0.387</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>More immersive</td>
<td>0.800</td>
<td>0.570</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Seating location on visualization</td>
<td>0.683</td>
<td>0.375</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sharpness of colour</td>
<td>0.757</td>
<td>0.530</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4. T-Statistics of Outer Loadings.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Satisfaction on visualization</th>
<th>Satisfaction on audio experience</th>
<th>Satisfaction on built environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Better brightness</td>
<td>1.254</td>
<td>0.065</td>
<td></td>
</tr>
<tr>
<td>Better feel as part of picture</td>
<td>0.259</td>
<td>0.452</td>
<td></td>
</tr>
<tr>
<td>Close up</td>
<td>4.860</td>
<td>0.854</td>
<td></td>
</tr>
<tr>
<td>Finish reading subtitles</td>
<td>5.060</td>
<td>0.683</td>
<td></td>
</tr>
<tr>
<td>More immersive</td>
<td>90.735</td>
<td>0.683</td>
<td></td>
</tr>
<tr>
<td>Sharpness of colour</td>
<td>0.932</td>
<td>0.683</td>
<td></td>
</tr>
<tr>
<td>Seating location on visualization</td>
<td>0.183</td>
<td>0.683</td>
<td></td>
</tr>
<tr>
<td>Shadows of the room</td>
<td>0.320</td>
<td>0.683</td>
<td></td>
</tr>
</tbody>
</table>

Case Study Findings

The cinemas in TGV normally consist of three levels. The first level is the main foyer of the cinema, which acts as the main door connecting the cinema with shopping complex. This area as shown in Figure 2 is where customers buy their movie tickets and watch movie clips on advertising screens. A candy bar selling food and beverage such as popcorn is beside the ticketing counter.

The second level is the access corridor as shown in Figure 3, which provides access to all auditoriums and washrooms. The theatre’s auditoriums take up of three levels height each. The corridor is also furnished with advertising screens. The utility rooms in this level only allow staff access. There is also a chill area selling food and beverages during a show. The kitchen for preparing food and beverage is also in this level as shown in Figure 3.

The third level consists of projection rooms. A corridor on this level connects all projection rooms and auditoriums. The projection room for regular digital movies (2D & 3D) has two windows, one of which is for projecting and another is for monitoring. However, an IMAX projection room has three windows as IMAX needs two projectors to achieve the best visualization effect. There are exhausts for projectors to release heat as every projector is operating non-stop for more than 16 hours per day. Figure 4 shows the corridor furnished with exhausts and projectors wrapped with blue plastics. Figure 5 shows the two windows of a projection room viewed from the theatre’s auditorium for regular digital movies. There is a Air Handling Unit (AHU) furnished in this level to provide both ventilation for the projection room and air-conditioning for the auditorium through the HVAC system. Figure 6 shows the cross sectional schematic of a typical digital cinema in TGV.

Visual Experience in IMAX and Regular Digital Movies

IMAX brings a better visual experience compared to regular digital movies. Audiences watching IMAX movies experience a better immersion. IMAX movie is
brighter and sharper in colour. The screen in IMAX spans from floor to ceiling which is around five stories high. The wall to wall width is around 72 to 76 ft. Audiences in IMAX are not able to see the black frame around the screen as in a regular digital movie. The IMAX screen is curved to help create a immersive experience for all audiences regardless of the location of seats. Figure 7 compares the screens of a regular theatre and an IMAX theatre.

Figure 7. Screens of an IMAX theatre (left) and a regular theatre (right) in TGV.
IMAX 3D uses two projectors but a regular digital 3D movie uses only a single projector. IMAX 3D projects two separated images on the screen, which are reflected into audiences’ left and right eyes separately with the aid of IMAX 3D glasses. The images are not separated but alternated forth and back on the screen which decreases the possibility of showing the whole images of forth and back towards an audience eyes. The separated images are then combined when they reach audiences’ brain which in turns create a more realistic 3D experiences. Besides, IMAX 3D projectors deliver brighter and more crystal-clear images than a regular 3D projection method. It provides images with about 40% greater contrast and 60% more brightness than the regular 3D images. In terms of the production of film, IMAX Digital Media Re-mastering (DMR) creates a high resolution of IMAX movie and makes the show more realistic. DMR also helps in sharpening the colour, improving soundtrack as well as enhancing details virtually in every frame to improve the image quality. The noise removal and image enhancement are during the production of IMAX movie by DMR. Figure 8 compares IMAX image (left) and regular digital 2D/3D image (right).

The seating arrangement and size of auditoriums also play important roles in delivering the best visualization. The seating arrangement in an IMAX auditorium in TGV is slightly curved as compared to a regular theatre. The arrangement of seating depends on the field of view on screen. IMAX in TGV provides a field of view at 70 degrees whereas a regular theatre only provides 54 degrees. To achieve this, IMAX seating is designed to be steeper than a regular theatre as shown in Figure 9. Figure 10 compares the architectural layouts of IMAX auditorium (left) and regular theatre auditorium (right). The first row of seats in IMAX theatre is further away from the screen as compared to regular theatre due to the degrees of field of view.

Audio Experience in IMAX and Regular Digital Theatres

IMAX 3D provides better audio experience than regular 3D movies. An audience in IMAX could trace the direction and position of an object on the screen without looking at it. The sound in an IMAX theatre is more evenly distributed than in a regular theatre. Wall design of the theatre plays a crucial role in sound isolation. There are totally four types of walls used in TGV as shown in Figure 11, determined by the rooms to be separated. Type 1 is used to separate two theatre auditoriums and Type 2 is used to separate the auditorium and access foyer or utilities rooms. The wall behind theatre’s screen is Type 3. Type 4 is not for sound insulation. The rockwool and fabric coating attached to the wall are for sound absorption. Only half height of the wall is coated to allow certain degree of sound reflection. The door of a theatre is sealed by rubber seal to ensure sound isolation.

Figure 12 compares the sound system arrangements in IMAX (left) and in regular theatre (right). There are normally 6 laser aligned loudspeakers distribute equal volume evenly throughout the IMAX theatre to create larger sweet spot. These laser aligned loudspeakers enable a pin-point accuracy of sound location to enable audiences to identify the direction and location of an object without looking at the screen. On the contrary, the loudspeakers in a regular theatre are placed on the left, right and rear of the theatre, which is not able to allow the identification of the direction of a moving object. Besides, the IMAX...
sound system is able to deliver a wider range of frequency so that audiences could hear both a high frequency sound such as pitch and a low frequency sound as deep as vibration, which cannot be achieved by a regular theatre. Table 5 summaries the similarities and differences between an IMAX theatre and a regular theatre.

Table 5. Similarities and differences between IMAX theatre and regular theatre.

Similarities: Wall design of both theaters are the same

Discussion on Findings
In Malaysia, a regular movie costs about RM10 and an IMAX movie costs around RM23 per ticket. IMAX movies cost about 50%-60% higher than regular movies. This gap is bigger than 30%-40% as suggested. The dizziness in watching IMAX movie is another
problem and the IMAX glasses may press down on the temples way too much and cause headache. This situation gets worse when audiences wear spectacles. In order to improve the comfortability in watching IMAX movie, this study found that wearing a polarized glasses is more comfortable than wearing a much more expensive and heavier shuttered glasses, as polarized glass does not create flickering effect as supported by Cho & Lee (2013). The IMAX screen in TGV is around 5 stories high providing immersive experience. However, it is smaller than the IMAX screen described by Silver & McDonnell (2006) as huge as around 8 stories high and hundred feet wide. This immersive experience is further related to human body system. Human eyes have two types of photoreceptor known as cones and rods. Cones are a receptor that sensitive to shapes and colours of the object we seen. Whereas, rods are a receptor that important to detect the peripheral vision which detect the motion of the object we seen. A human horizontal field of view is about 180 degrees. However, the central vision is about 10 degrees to see stationary objects. Human started to sense the peripheral vision at the 30 degrees from the centre of the horizontal field of view. A regular theatre has a field of view at about 54 degrees but an IMAX theatre provides a higher degree of field of view up to 70 degrees. Each increasing degree of field of view activates 20,000 rod cells thus creates a greater sense of motion. A regular camera only shoots one image through one lens but IMAX camera shoots two images from slightly different angles through two lenses. These two lenses are apart in a small distance same as the distance of human eyes which is about 3 inches apart. The IMAX images undergo a process known as Digital Re-Mastering Technology (DMR), which allows digital movies to be transformed into giant IMAX 15/70 format at an affordable cost. DMR also helps in sharpening the colour of the images by enhancing details virtually in every frame. It has been proved that compared to regular movies, IMAX movies have roughly 60% more brightness and 40% greater contrast.

In TGV, the sound-proof walls consist of 150mm thick air gap to separate two auditoriums and 170mm thick air gap to separate the access foyer and auditorium. The wall structure is coated by 12mm thick gypsum board with a density at 80kg/m$^3$ and 50mm thick rockwool with a density at 60kg/m$^3$ on each side of the wall. This type of multilayered partitions with air spaces and staggered studs have been proven to be able to increase the value of TL and to provide adequate acoustic separation. This type of technique is also recorded by Sharp (1978) as double drywalls govern by mass law. The air gaps in the wall design is able to adjust the resonance frequency to a sufficiently low-frequency range to encounter the sound insulation defects at low frequencies due to the resonance between double-layered boards as supported by Matsumoto et al. (2006). The total thickness of these walls should be at least 56cm to effectively reduce low-frequency transmission between theatres. In a meanwhile, the rockwool containing capillaries acts as an absorption material where the airway allows sound energy incident to be propagated into it and dissipated through viscous loss as well as frictional and vibration energy as supported by Maekawa & Lord (2004) and Cecchi et al. (2014). A human brain can identify the sound direction in 50 milliseconds, which is 100 times faster than human eyes, and males have higher sound localization ability than females (Sax, 2010). In order to renovate a regular theatre to an IMAX theatre, the height of each seat row needs to be increased, yet the height of each row in IMAX is about 300mm, which is too high for a person to climb the stairs to be seated, thus one seat row needs to ride on two stairs.

Conclusions and Recommendation
IMAX theatre enables the movie goers to experience a totally enhanced environment by having a peripheral vision combined with the sound system which eventually makes the audiences feel as if they are a part of the on-screen action. The most significant factor influencing the satisfaction of visualization in IMAX is "immersive of picture" followed by "sharpness of colour" and "feels as part of the picture". The most significant indicators for audio experience in IMAX is "direction of object", which enable an audience to trace the direction and position of an object on the screen without looking at it. The built environmental variations between regular and IMAX theatres in terms of screen, camera and projection methods, seating, architectural layout, wall design, and sound system arrangement were thoroughly compared in the case study. Currently many cinema companies plan to renovate their regular theatres into IMAX theatres, thus a structured renovation procedure derived from this research needs to be developed through further studies probably assisted by a standard to be developed as well.
REFERENCES


Syaidatul Azzreen Ishak, Hazreena Hussein, Adi Ainurzaman Jamaludin

Abstract
This paper probes into the relationship between Neighbourhood Parks and their efficiency as a potential stress reliever from the outdoor environment. It consists of the introduction to the relationship between stress and outdoor environment, background research on recent issues of Neighbourhood Park and it then continues with the context of perceiving Neighbourhood Park as a stress reliever. This paper looks into the previous studies that employed observations, survey, interviews and instruments as methods in proving Neighbourhood Parks as a potential stress reliever. Relevant findings were highlighted and recommendations for improving the design and planning were suggested to generate more quality living environment in the future.

Keywords: Neighbourhood Park, Wellbeing, Build Environment, Stress.

1. Introduction

This paper aims at the professionals, scholars, the government and community as well as those interested in the design of the Neighbourhood Park. This current study is effective in proving that Neighbourhood Parks can help cultivate stress, such as individuals in the rehabilitation for stress-related issues and in facilitating stress restoration (Tyrväinen et al., 2014; Pálsdóttir, 2014; Van den Berg et al., 2010). Most evidence verifies the outdoor environment as a great promoter to general and mental health that encourage one’s wellbeing in their lifestyle (Thompson et al., 2013; 2012; 2014; Abrahem et al., 2010; Alcock et al., 2014; de Jong et al., 2012; White et al., 2013). An increasing number of studies have also identified the fact that the greenspace provided in the neighbourhood shows that psychological distress was less common among adults in greener areas (Astell-Burt et al., 2013; Thompson & Aspinall, 2011; Grahn & Stigsdotter, 2010).

The main objective of this paper is to collect and present evidence in ways that can determine a good design of Neighbourhood Park for mental health especially in treating stress. To put in other words, the methods and research gaps in this topic encourage the future research on deliverables of knowledge of which design is best to be provided in endorsing and improving healthy lifestyle in one’s everyday life. Besides, the finding taken from the researchers’ point of view is considered for good practice. In addition, a recommendation that will be beneficial for the professionals as a reference in providing a better Neighbourhood Park in the future is also provided at the end of this paper.

2. Background

Stress is prevalent in everyday life as people can have and suffer from financial problems, complex family communications and other stressful and worrying situations. This has a superior influence on health and wellbeing for many people (Housley & Wolf, 2013). All sorts of situation can lead to stress and they can either be a good stress or a bad stress. However, it is a fact that stress is only healthy if it is short-lived. Excessive or prolonged stress can lead to illness, physical and emotional exhaustion. Taken to extreme, stress can even be a killer (Mental Health Foundation, 2016). Not only affecting one’s life, stress also creates such economic burden where it can contribute to disability worldwide (Mrazek et al., 2014; Ferrari et al., 2013). According to Jamaiyah (2000), stress can cause mental illness. She also added that in Malaysia, about 10.7% from 23 million of people had been diagnosed with mental illness based on hospital data.

Several studies have claimed that by being connected to nature, one can become more tranquil and improve his or her mental health (Sturm & Cohen, 2014; Kooshali et al., 2015; University of Sheffield, 2010; Sonntag-Oström, 2015). Also Kooshali et al. (2015) added that even though accessing this green area can be such a problem to the dwellers in the residential complexes, the higher amount of nature gives eventual satisfaction. Having a well located, designed and managed neighbourhood park, the most meaningful place influencing health and quality of life could
be particularly improved (Jim & Chen, 2006; Plane & Klodawsky, 2013). According to Healthy Spaces Places (2009), the size of the functional park usually measures one to eight acres for the park area requirement standard. It can cover about two acres per 1000 population which serves as a local gathering space within the walking distance of residents of approximately 10 minutes or 800m (Sunarja et al., 2008).

Parks can be seen as all-inclusive packages, a balance between economic, environmental and social amenities (Shi et al., 2006; Chiesura, 2004). People’s perceptions of the park and increased usage would improve if this stability is well maintained. Also, it improves the quality of life which is a key component of sustainable development and the creation of a sustainable city and lifestyle. Hartig et al. (2014) reviewed four of the most frequently suggested mechanisms from nature or green space where they can improve air quality, reduce stress, stimulate physical activity and facilitate social cohesion. According to the research carried by CABE Space by Heriot-Watt University, about nine out of ten people use green spaces and value this use for their health and well-being. However, even during this period of relative prosperity, not everyone benefits equally. A study in the Netherlands by Maas et al. (2006) found that residents who live in a neighbourhood with abundant green space tend to enjoy a better health. The positive link between green infrastructure and health is prevalent among the elderly, homemakers and people of lower socioeconomic groups. Physical disconnection from the environments in which we experience may be having an adverse impact on our emotional well-being as an acquaintance to nature is linked with improved happiness (Berman et al., 2012; MacKerron & Mourato, 2013; Zelenski & Nisbet, 2014; Cervinka et al., 2011).

Rarely spending time in an outdoor environment has been found to be an excuse to the present widely polluted environment (Laumbach et al., 2015; Blanco et al., 2009). This affects children too as the time spent playing in parks has shrivelled terribly due to the lack of green spaces. Instead, in the Western and European contexts, people tend to stay indoors and spend unhealthy lifestyle using mobile phones and watching television all the time and this can lead to many behavioural problems (Iulian-Dorua & Maria, 2013). Digital technology and a gigantic paradox of parents’ fears also become the reasons for people refusing to spend time outdoors. The impact on children’s health is caused by the shift away from outdoor activities (Sandercock et al., 2010). Unfortunately, not all serve to live in the good condition of the neighbourhood that provides proper green space for recreation. In some neighbourhood areas that have a low percentage of the green area, it causes more health problems and affects the quality of life (Thompson et al., 2012). The shortage of green spaces in urban areas not only gives an alarming rate of environmental issues such as Urban Heat Island (UHI) effect, but it also affects the productivity and psychological well-being at work (Taib & Abdullah, 2012).

People barely know about the importance of living in the green environment because of insufficient knowledge of the positive effect and mechanisms towards Neighbourhood Park (Barton et al., 2009). In Malaysia there are limited studies done on the green infrastructure (Mansor et al., 2015). The residents live in the urban areas are not aware of living in greenery and they tend to ignore the values of physical and leisure activities as regular habits in their daily lives. These can relate to the pandemics due to an unhealthy lifestyle like people tending to have work stress, sedentary or poor diet. Nevertheless, people tend to live in less green environments because of the increasing urbanisation and densification planning policy where particularly limited ability to greener area in the suburb will affect the people with less socio-economic privileges (Khoddee et al., 2012).

The scenario happens when the roles of a landscape architect only take place once the layout is approved, resulting in an unsuitable zoning for open space in neighbourhood areas (Hussain Said, 2014). It leads to the lack of landscape elements suitable or wisely designed in residential areas to reduce the stress in people living in the residential areas, for example, water feature, outdoor play area and scented plants (Othman & Fadzil, 2015). Hence, the open space is not fully utilised by the residents. Furthermore, the irony of having green space can cause the over pricing of houses and many people cannot afford this (Wolch et al., 2014). In decision making, public opinions were somewhat rarely considered during the era of centralised government control. This is related to measuring the value of recreational opportunities and amenities using a contingent valuation that determines peoples’ willingness-to-pay to use such services, and somehow this has seldom been a practice where their views are too little attention paid (Votsis, 2017; Jim & Chen, 2006).

3. Perceiving Neighbourhood Park as stress reliever context

3.1 Landscape and urban planning in outdoor space
Landscape planning concepts and thoughts can be interpreted and communicated to people to give an effective implementation of landscape demands. Social interaction, comfort and aesthetical value are the most considered by landscape architects (Hussain Said, 2015). Furthermore, they are likely to be engaged with the society and more concerned with the people or residents’ satisfaction in planning for open space. The involvement of this professional to meets residents’ needs is to create the residents’ sense of
Syedatul Azzreen Ishak, Hazreena Hussein, Adi Amranzaman Jamaludin

5 4

Neighbourhood Parks as a Potential stress reliever: community and attachment to their own identity. Thus, a good planning by both urban planning and landscape architecture contributes to a better open space that will encourage more people to spend time outdoors. Besides, this will automatically create relief to people who have urban stresses and it provides relaxation. Figure 1 shows how greenspace can potentially influence a wide range of factors in the society. Greenspace is beneficial covering the main four aspects: environment, economy, people and health. It brings broad positive effects to our daily lives, for example it can influence community health, mental health and physical health if a better planning takes place.

In America, environmental justice issues arise among predominantly White and more affluent communities where planning is dependent on who is wealthier (Byrne, 2012). It relates to the United States’ histories on property development which entangled with ethno-racial cruelties, philosophies of park design and land-use systems. This paradox has been overcome by increasing the supply of urban green space, especially in park-poor neighbourhoods implemented in many cities in the US. The strategies include making the remnant urban land, obsolete or underutilised transportation infrastructure green areas (Wolch et al., 2014). The reuse of remnant urban space as a green space for the poor community encourages their physical activity, psychological well-being and the general public health. The neighbourhood park can make residents worry less as they no longer have to live stressfully and they will lead a healthier lifestyle. In addition, people in Guangzhou city willing to pay for better greenspaces served as surrogate parks (Jim & Chen, 2006). It shows that planners play their role in evaluating and planning to make provision to improve people’s understanding of the value of the Neighbourhood Park.

3.2 Accessibility and safety in green space support physical activity

An easy access to public green space motivates people to exercise frequently, as a contribution to people’s health (Wolf & Wohlfart, 2014; Gladwell et al., 2013; Giles Corti et al., 2005; Roe et al., 2013). At the same time, stress levels can be reduced through vigorous exercises and improved people’s feelings of being balanced more effectively than a less strenuous exercise in public green spaces. Proven further by Feda et al. (2014), the risk of stress can be reduced through good access to the neighbourhood parks. An appropriate distance and space is crucial to get people to use the green spaces in their neighbourhood by easy access and walking. Supported by Reklaitiene et al. (2014), a negative association between residential proximity where living close to the park vs. >300 metre and depressive symptoms are very poor. In another mental health study, access to natural outdoor environments within 300 m was positively associated with mental health indicators (Triguero-Mas et al., 2015). Moreover, greater access barriers are present for women, lower-income, and peri-urban residents and this further limits park access (Wandel et al., 2012). Poorly planned desirable green spaces in neighbourhood create such issues on safety especially in the outer districts. Figure 2 shows the example of a neighbourhood park that is located to retain vegetation and links with the neighbourhood centre. The development at the front side of the park is to ensure good surveillance.

The study has found that park users are significantly healthier than non-park users. Walker (2004) also added that frequent engagement in physical activity can reduce the risk of coronary heart dis-

Figure 1. Relationship greenspace to other aspects of the natural and built environment (Source: Land Use Consultants, 2004).
ease, hypertension and weight loss. Physical activity can diminish severe stress reactivity (Roemmich et al., 2009) and have safeguarding effects of prolonged stress on adiposity and health among children (Newman et al., 2005; Holmes, 2008). Physical activity during leisure time has the ability to buffer stress effects on perceived stress, work strain, work stress, mental stress and life displeasure in an adult. In the extended time in green environments, it improves health as well as relieves and reduces stress (Bowler et al., 2010; Vella et al., 2013). The green areas such as a park that serves adults, young people and children can bring leisure, satisfaction and perceived freedom in leisure scores of the individuals participating in outdoor activities (Lapa, 2013).

3.3 Influence of landscape features in Neighbourhood Park

The neighbourhood environment could be a better influence on youth than on adults based on their vulnerability and reduced autonomy to travel outside their neighbourhood. It has a link with lower stress and higher mental wellbeing also increased physical activity levels or better overall health (Thompson et al., 2014). Ujang et al., (2015) added that the requirement on park quality should be based on the users’ experience of the place. It shows the strength of connection and inter-relation between people and places. Many positive understanding of the interaction with people and greenery is supposed to be a safe and useful field for recovery. Nature gives positive sensory experiences, physical and emotional well-being, also facilitate beneficial social interactions with the community (Adevi & Mårtensson, 2013). Toa Payoh Sensory Park in Singapore, for instance, has an abundant amount of plants with the installation of par course instrument. The addition of safety evident in the rubber map flooring, durability and material make people feel safe (see Figure 3).

Recent studies show that the high levels of green space in residential neighbourhoods and the lower perceived stress in urban population are inter-related (Thompson et al., 2012). It has been supported by Roe et al. (2013), where the higher levels of green space neighbourhood indicated healthier well-being. In this study it is found that cortisol levels in women are higher than cortisol levels in men. Also, this deprived urban population of middle-aged men and women not in work, is interrelated with lower perceived stress and a better diurnal cortisol decline. Better exposure of conducive Neighbourhood Park with natural sound from water features and birds chipping can relieve the pressure among the elderly. Meanwhile, the design of the green area has to be appropriate to encourage people to visit (Othman & Fadzil, 2015). Adults also gain health benefits from this kind of neighbourhood. Furthermore, children liv-
ing in a greater vegetation and nature neighbour-
hood, who were measured subjectively using survey
data, have lower psychological distress when going
through stressful life events (Van de Berg et al., 2010).
By viewing natural landscapes during a walk, viewing
from a window, looking at a picture or a video, or
experiencing vegetation around residential or work
environments it will give the individual a better health.
Contact to landscapes is associated with reduced
stress, improved attention capacity, enabling recovery
from illness, improving physical well-being in elderly
people, and behavioural deviations that increase
mood and general well-being (Velardea et al., 2007).
In Figure 4 it shows that the point of departure is
inferred from the information gathered from the con-
text of perceiving the Neighbourhood Park as stress
reliever through previous studies. From this establish-
ment of concept it could lead to the process of filling
the knowledge gap in creating quality and releasing
stress at the Neighbourhood Park. this structure con-
sists of landscape and urban planning in outdoor
space, accessibility and safety in green space which
support physical and landscape features that influence
the Neighbourhood Park.

4. Methods used in researching links of attributes of
Neighbourhood Park with stress
In finding the connections of Neighbourhood Park with
stress, the methods in previous studies focused on
observation, survey, interviews and instruments. Table
1 shows the list of methods used in researching links
of attributes of Neighbourhood Park with stress. The
different methods will specify those distinctive contribu-
tions to our understanding of the influence of green
outdoors such as park within health (McCormack et
al., 2010). Grahn & Stigsdotter’s (2010) quantitative
survey in the form of a postal questionnaire with pre-
coded questions, which looks into the different qual-
ties perceived in urban green spaces was conducted to
obtain information on town-dwellers in Sweden, respond-
ents’ demographics and habits of visiting urban green
spaces. The questionnaires also seek for preferences for certain qualities in urban open green
spaces; the prevalence of symptoms of stress, and to
determine whether or not there are any statistical rela-
tionships between the above-mentioned factors. Basically, experienced qualities in urban green spaces
should be able to meet the needs of individuals for
example philosophies, requirements and sentiments.
The respondents who perceive stress are difficult to be
considered as they are more sensitive to the environ-
ment. The analysis shows that the most stressful
respondents need more anthropocentric perspective
on green spaces.

Also, we refer to the interviews by Adevi &
Mårtensson (2013) with five participants who define
their involvements in the garden therapy and what they
noticed about when it comes to their recovery. The
participants had undergone rehabilitation at the time
of the interviews. In addition, the persons selected
were all willing to get involved in the study. The inter-
views had taken place in Alnarps Rehabilitation Garden
and the participants had described their emotions
being in the garden. They had described themselves
being in nature while they expressed their moods with-
out judgement. Also, they showed some positive out-
comes with different activities in the garden and that
the sensory experiences based on their needs can
sometimes create attractiveness and symbolism of
nature. Supported by Housley & Wolf (2013), surveys
and interviews of people while in the green settings
address self-perceived stress levels and feelings about
personal health, depending on the involvement. Typically reported outcomes delve more into the com-
bination of physical conditions and emotional moods or feelings. Survey questionnaire from Mansor et al. (2015) was distributed to several residents residing in low-cost flats and terraced house types of the residential neighbourhood to determine the Green Infrastructure (GI). This entire neighbourhood has the certain criteria that have neighbourhood green space in their residential areas. The level of “naturalness” quality of GI contributes to people’s psychological health. The quality of green outdoor in the neighbourhood does not meet the needs in the low-cost area to be compared with the higher cost of residential homes. In terms of cleanliness, maintenance and surrounding residents are hesitant about being outdoor as they concerned more with their own safety and prioritise on their physical and mental ease.

The final method highlighted here is saliva cortisol sampling via the diurnal pattern of salivary cortisol as an objective indicator of stress. This method is supported by Kirschbaum & Hellhammer in Salivary Cortisol (cited in Thompson, et al., 2012), over other body fluids for example blood and urine, saliva sampling to accurately represent the biologically active component of circulating cortisol in the blood. It allows for repeated measurement, for example Roe et al. (2013) who made a repeated salivary cortisol sampling for over two consecutive weekdays. Thompson et al. (2012) also added that compared to domestic and laboratory settings, this method also shows that reliable data can be collected from populations living in deprived neighbourhoods, across the day without supervision. Another research by Thompson et al. (2014), performed mixed method approaches with cross-sectional survey and interview-based questionnaires. To measure the stress level, Perceived Stress Scale and mental wellbeing, the Warwick-Edinburgh Mental Wellbeing Scale is being used in innovative approaches to research the links between the amount of green space and stress levels in residents (between men and women). From all these methods it is revealed that being in green environments is commonly related to reduce physiological meters, attitudes, and observations of stress. Result shows that diurnal cortisol levels among women get higher and healthier when dealing with more neighbourhood green space. In sum, all methods that have been used in the previous study have used all these vital criteria for example gender, neighbourhood setting, respondents’ physical and mental condition and physical activity. Correspondingly, the methods identify the users’ experience while in green space, the quality of the park and quantity of the green outdoor environment have a relation when it comes to combatting stress.

Table 1. Methods used in researching links of attributes of Neighbourhood Park with stress.

5. Planning and design guide for Neighbourhood Park

Despite the different methods used—either qualitatively, quantitatively or both, the different target groups appointed (organisations or individuals) and the different settings studied, the results are identical. The dimensions have been acknowledged and defined one by one, repeatedly in several periods before. Perhaps, such proof from the methods used still requires a better planning and design to emphasise to the neighbourhood park how different groups can benefit from the park.

5.1 Neighbourhood Park planning and accessibility

To create a quality park in the residential area, good planning from the landscape architect and urban planner is really important (Hussain & Said, 2015). This shows that important park characteristics are accessibility and distance between the residential and the parks (Giles-Corti et al., 2005; Wendel et al., 2012). In fact, the green environment should be appreciated as a noteworthy source of health and well-being for the residents to help achieve more satisfying and happier lives (Neuvenen et al., 2007). According to Malek (2010), it is important to emphasise of the use of the Neighbourhood Park in order to develop a quality Neighbourhood Park and promote its use. While studying the use pattern of the user in a park, it makes a better understanding the inclusive neighbourhood satisfaction level, gender, socio-economic status and the cultural contextual features in
neighbourhood park settings. Doick et al. (2009) pointed out that various criteria are needed to create different forms of open spaces. Designers and developers should take the opportunity to focus on their residential and community design selection and closely work on the related quality outdoor setting to fulfill the requirements of the users. Agreed by Tahir & Roe (2006), poor planning layout causes no access for the agency or local authority to park and keep up with the maintenance works. This automatically reduces the number of visitors coming to the parks because of the deficiency of maintenance. Another study by Tabassum et al., 2013, showed that an unplanned old Dhaka city in general linkages from the residents’ homes to the park is very poor. The residents suffer from consistent traffic congestion, poorly maintained roads and no pathway. Entrance to the park is also not very visible and occupied by the vendors, which lessen people’s accessibility. Even though old Dhaka faces this kind of problems, the development of the route, environment or surroundings and within the park area has taken place after all. Based on the GIS study on Cukurova district by Unal et al. (2016), Neighbourhood parks are significantly beneficial to the user as resting places and they promote community welfare among the residents in the neighbourhood. The evaluation of the distribution of neighbourhood parks according to the size of the park and the population density found that more than half of the inhabitants do not directly benefit from their Neighbourhood Park. Thus, a suitable size for the current population density should be made a priority.

A study was done on Helsinki’s residents in Finland and it was found that to increase the number of visits to any green environment a decent amount of green areas and easy access or a short distance to a natural environment is applicable (Neuvonen et al., 2007). According to Hussain Said (2015), people get stressed with their friends within the walking distance of their home, is very much preferred by children. This indicates that children can play in the parks without needing any adult supervision (Veitch et al., 2007).

5.2 Landscape features enhancing wellbeing in Neighbourhood Park
The use of Neighbourhood Park cannot be made similar to other parks. In an article Grand Parks vs. Neighbourhood Parks written by Price (2015), Neighbourhood Park is the kind of places you can find on the street where children can play there after school, people walk their dogs there or you can stroll and sit around with a book. Providing the landscape features in Neighbourhood Park, it may seem a key role in enhancing the physical activity where it can lead to an improved mental health as discussed earlier in this paper. Neighbourhood parks are proposed to function as the focal point within a neighbourhood and are designed to serve the needs of local neighbourhood residents by supporting either organised or casual activities. The features stereotypically include children’s play structures, pathway loops, seating areas, parking, par course and water features. All these hardscape elements have been provided to enhance the comfort and attractiveness of parks. An example of children’s play structure is the playground. It is proven that the children living nearest to parks and playgrounds are expected to be more active (Davison & Lawson, 2006). The greater proportion of parks in neighbourhoods is associated with greater physical activity in young children which contributes to better children’s health (Roemmich et al., 2009).

Gordon-Larsen et al. (2006) study on individuals who reported themselves as Blacks, Hispanics, Asians (people of colour) with lower income claimed to have less access to physical activities in facilities that are membership-based. Hence, the playground is the most important free facilities that should be provided to manage the equity problems to this population in the neighbourhood. Neighbourhood parks should be designed to reflect the local character and necessity to be welcoming and attractive to inspire people to linger and enjoy the space. Giles-Corti et al. (2005) stated that certain park features of the attractiveness score offer physical activity opportunities such as lighting, buildings and equipment or pathway for jogging, cycling and walking. In opposition, other features such as the barbeques pit, picnic tables at a picnic area and a high quantity of plantings might possibly lessen the physical activity by encouraging sedentary behaviour. Availability of social amenities like a restroom,
benches and trees for shade leads to high number of visits of adolescents. These make them stay in the park for long periods at same time extending their participation in physical activity. Besides, the existence of these amenities may inspire larger user from the community for a wide range of activities that can attract another user to join. In fact, providing the green area with lush plants can help to release the stress where the presence of trees has been shown to be associated with greater physical activity among children and adolescents (Hills, 2009). The best idea to transform one’s connection with the environment, and in turn become changed by the environment is to immerse oneself in natural sensory experiences (Hussein, 2009), for example, through the sensory garden. The continuous pathways that link to the site context and easy access to the features have the highest number of users especially among children with educational needs (Hussein, 2012).

Sensory immersion can help relieve stress for a few different reasons as it functions as an interference and non-verbal interruption in most of people’s thoughts. In general, it releases positive, happy sensations which can help balance several painful and anxiety feelings of a stressful person’s life. Moreover, exposing themselves to happy and content experiences will balance their lives in enjoyment (Mills et al., 2008). Their study has proven that the sense of achievement, satisfaction and aesthetic pleasure are those that the elderly can gain from their gardening activity. Activities based on space and gardening can release stress (Van Den Berg & Clusters, 2011) and at the same time this activity serves as a responsive partner, permitting them to be themselves and enabling them to talk freely (Adevi & Mårtensson, 2013). An expression of feeling while talking to plants directly improves the mood because people tend to be less judgmental. The Comprehensive Outdoor Recreation Plan 2013-2017 of Hartland, a growing number of communities provides public space for “community gardening” by way of the Municipal providing plots for residents to grow their own produce (Village of Hartland, 2012). The earlier planning which is to provide and reserve ample space to do gardening, to improve green volume and create physical activity, is a brilliant idea of having a healthy Neighbourhood Park.

Kaczynski et al. (2010) found that park amenities like drinking fountain, picnic area, and restroom are less important than park facilities, including paved trails, water area, and playground. Natural effect cannot be left behind as a study found that the sound from water features and birds chirping can well attract and encourage people to visit. Likewise, well-kept green areas, to the certain extent, have been proven to relieve the pressure among the elderly (Veitch et al., 2012; Othman & Fadzil, 2015). For children, although their use of neighbourhood parks was generally low compared to the elderly, when parks were closer to children’s homes and had greater vegetation density, it increased the amount of visiting (Dunton et al., 2014.)

5.3 Safety in Neighbourhood Park

According to Healthy Spaces & Places (2009), consistent maintenance of neighbourhood parks will guarantee that the spaces are used regularly and will prompt a sense of community pride. Investigation of the park from adjoining residences, streets or other activities will assist in making the space safer to ensure that parks are welcoming, attractive and well maintained. Studies from Napier et al. (2011) have revealed a positive relationship between safe environment and walking, specifically for children and senior citizens. A safer and more enticing environments for pedestrians and bicyclists can be created via the urban design strategies that create chances for pedestrian activity, such as ground-floor retail, daytime and night time uses, landmarks, and pedestrian-scaled lighting. Safety concerns mentioned in studies by McCormack et al. (2010) discovered that the majority of the residents were uncomfortable with the associated presence of unwelcome users of parks for example drug addicts, homeless people and loiterers. To overcome this, the Department of Town and Country Planning (2012) suggests that the implementation of the guide of crime preventable through environmental design (CPTED) that can influence human behaviour from getting involved in crime, as well as to reduce the fear of crime. Moreover, with the combination of physical layout, safety elements like garden furniture, spatial arrangement of social spaces, composition of vegetation, linkage and accessibility it might as well become a feasible idea (Thani et al., 2016). Besides, scheduled survey for homeless and drug users/dealers’ appearance and the presence of secluded paths and areas should also be considered. To avoid any injury to users, any sharp and dangerous objects in the park should be monitored and supervised. For young children and their caregivers, they would feel safer in the presence of older children and teenagers in the parks (Veitch et al., 2008).

6. Discussion

Taking all the reviewed evidence into account, the idea that interacting with Neighbourhood Park can treat stress and offer positive effects as well on health and well-being seems to be reasonably well verified. It sheds light on the guidance given by the landscape architect and urban planning in creating neighbourhood Park with its own identity. Besides, the equality issues surface in the Western country, the people with colour (referring to various ethnic groups) and low income are less prioritised as the park tends to be
dominantly used by wealthy people. Lack of justice in the neighbourhood is reported to prevail in most cities (Taylor, 2015). The accessibility in green space supports the increases of physical activity indirectly. There is evidence that individual physical activity levels increase when the number or density of accessible exercise amenities increases (Diez Roux et al., 2007). Perhaps, some studies argue that the distance of Neighbourhood Park to the resident’s home can affect the successfulness of treating stress, especially when a proper route to the park is available. In terms of landscape features, the influence of high green space contributes to lower perceived stress. The attraction of the parks lies in the landform, greenery, landscape, and scenic view (Ujang et al., 2015).

The main finding of this study is based on the analysis from the reported researchers especially the relationship between Neighbourhood Park and stress. That has been proven by many researchers as prominent linkages between this space and health. In Figure 5, it shows the summary of attributes of Neighbourhood Park in treating stress. The factor that contributes to the efficiency in treating stress in the residents is based on three major aspects: the satisfaction in planning for open space and accessibility; landscape features and safety. These three attributes depend on the type of user group and the requirement in one’s health. The characteristics of users including age, gender, and group income may also affect the use of Neighbourhood Park.

According to the methods which have been provided, most of the studies on the behaviour of user and the demography of the user adopt a survey method using a set of questionnaire. The result has been supported by the quantitative method such as salivary cortisol test, measure stress level (Perceived Stress Scale) and mental wellbeing (Warwick-Edinburgh Mental Wellbeing Scale). This review study also looks into the suitable planning to increase the quality of Neighbourhood Park to create a better accessibility and equality. The involvement of softscape and hardscape not only enhances the aesthetic value of the park but it also fulfils the requirement and needs of the residents. They prove that the sensory immersion has contributed a lot in people’s wellbeing. Maintenance and safety are the critical factors to look forward to as people proceed to have the activities in the park.

The current study on the effectiveness of Neighbourhood Park in dealing with stress should add to the extant literature that is in fact, quite limited. A previous study was selected based on the keyword of green outdoor space, nature, environment and parks and to control for potential confounding variables, those research that have not focused directly on stress in Neighbourhood Park were excluded. In addition, the previous study was limited to residents of socially advantaged and disadvantaged areas based on the

![Figure 5. Summary on attributes of Neighbourhood Park in treating stress (Graphic: Author, 2017).](image-url)
Western countries. Fewer studies on the Eastern countries have considered the physical environment such as the fact that the weather is very different from that of the Western. There is a scarcity of studies on the identification of Neighbourhood Park’s stress-relieving effectiveness among gender. Finally, people with disabilities are not highlighted even though this group of people may be facing trouble than able-bodied when they are in parks. This group of people wants to be treated equally in the mainstream life. For example, people with learning disabilities tend to go through a grieving process and their emotions usually follow these stages of grief, denial, anger, depression, working out a new way to live, and acceptance of the disability. These processes are similar to the grieving process for any other major life loss (Arthur, 2003).

7. Conclusion
Neighbourhood Park is important to green space in buffering stress. It offers a healthy lifestyle by providing opportunities for healing and social connections. The problems that occur include people being rarely connected with the outdoor environment, people lacking the knowledge of benefits being in the green area and the lack of good design to attract users to frequent the Neighbourhood Park can be overcome with the findings and evidence gathered from the previous study. Recent research proves that reactions to outdoor spaces and vegetation can be linked directly with health and in turn this is related to economic benefits of lower health costs and increased quality of life. The findings establish attributes for park planning, which can monitor future neighbourhood parks and management practices to improve population health in discussion. For substantially advanced understanding on the topic, more research needs to be done to prove the efficiency. The professionals have to collaborate with the government to provide the facilities that cater for the needs of community health. Amenity, well-maintained facilities, natural attractiveness and safety should be well considered in enhancing the quality of the Neighbourhood Park. Moreover, suggestion for further research to look into the effectiveness of Neighbourhood Park in Eastern countries and different requirement perceived by women and men in dealing with stress in the natural environment. There is another opportunity for future study, which is the action on the application of “Neighbourhood Park for all” by using the Universal Design theory, where this can give the Neighbourhood Park a better quality and give equal opportunity to persons with the disabilities. This offers fascinating evidence that the investment and promotion of urban green spaces for the health of our community is profoundly important and necessary (Green Cities: Good Health, 2012).

More studies in this field lends to a better understanding and a great contribution to this effort.

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Neighbourhood Parks as a Potential stress reliever:


Author(s):

Syaidatul Azzreen Ishak
Department of Architecture, Faculty of Built Environment, University of Malaya, 50603 Kuala Lumpur, Malaysia
email: azzreenishakDLI@yahoo.com

Hazreena Hussein
Centre for Sustainable Urban Planning and Real Estate, Faculty of Built Environment, University of Malaya
email: reenalambina@um.edu.my

Adi Ainurzaman Jamaludin
Institute of Biological Sciences, Faculty of Science, University of Malaya, 50603 Kuala Lumpur, Malaysia
email: adiainurzaman@um.edu.my
A DIFFERENT EXPERIENCE IN THE BUILD-SELL PROCESS: CASAE STUDY ANKARA.

Cilga Resuloglu

Abstract
During the post-World War II period, Turkey’s housing supply models were limited to individual housings. Three main trends in the construction industry helped overcome this limitation to a certain extent. These were cooperative societies, spontaneous squatter housing and the build-sell process. Build-sell process later became the most obvious reflection of urban transformation in the 1950s and 1960s. Within this context, this study examines the housing policy of the period and the build-sell process as well as the Rer-1 Apartment Block designed in line with the build-sell process. The Rer-1 Apartment Block was designed and implemented by architect Nejat Ersin between the years 1962-1964, and was constructed in Asağı Ayrancı District in Ankara. This specific apartment block was examined as an extraordinary example of the build-sell process - which rejects architectural concerns and prioritises profits - as it still incorporated such concerns despite being designed adhering to logic of the build-sell process. For the purpose of this study, an oral history study was conducted with Nejat Ersin. It was, therefore, possible to evaluate Nejat Ersin’s apartment block, presenting a new experience in the build-sell context, within the scope of era’s social, cultural, political and economic conjecture. The Rer-1 Apartment Block was scrutinized from the build-sell process aspect within the scope of the architect’s professional approach.

Keywords: Ankara, Build-Sell Supply Model, Housing, Rer-1 Apartment Block.

1. Introduction
In various aspects, the 1950s in Turkey were the beginning of a new era. Industrial cities were shaping and the migration from rural to urban areas was increasing. The growth due to liberal economy, the transition to the multi-part political system and industrialisation accelerated urbanisation. Booming population proved available housing to be insufficient, and therefore the capital Ankara experienced an intense urbanisation process. This growth rate soared to 6% in Ankara following World War II. (TEKELİ 2009a) One of the main drivers of the improvements in public housing in Ankara was this rapid population growth. Accommodation grew into a serious problem due to the population density, and soon, as a solution to the lack of sheltering, the immigrating population began building houses on lands they found available. These illegally constructed houses were named squat housing (called gecekondu in Turkish-built over night). The cooperative and build-sell (called yap-sat in Turkish) models accompanied squat housing in the process. These developments gave rise to legal regulations regarding housing. The subject of this study, Rer-1 Apartment Block in Ankara, Asağı Ayrancı district, was also designed as per the build-sell model of the time. The project of the building was drawn and implemented by master architect Nejat Ersin. This specific apartment block was selected as a subject to this study mainly due to its extraordinary characteristics as a build-sell design with architectural concerns during a period of alternative-seeking to the prevailing housing crisis.

2. Cooperative Societies, Squatter Housing and Build-Sell Supply Model
The process of political liberalism in Turkey gained acceleration between the years 1946 and 1950 (AHMAD 1993). This tendency can be explained through both İnönü’s belief in the success of the multi-party political system and the country’s relations with the western world. “People believing in competitive capitalism would shape Turkey’s future better than statist capitalism also believed that large scale foreign capital investments would serve the rapid economic growth as well.” vi (AHMAD 1993, p.131) The changing post-War world triggered significant transformations in Turkey, just as much as the 1950s in general. The true meaning of “despite people, for people” approach of the modernity project was now shifting. Settlement squatters multiplied and the need for infrastructural works rose. These happenings were met with new regulations. These developments, particularly those between the years 1945 and 1958, can
be examined under five main headings (TEKEL‹ 1998). The first one was establishment of the Bank of Provinces under the law numbered 4759, in 1945. This law provided municipalities with technical assistance in planning and infrastructure projects. However, this assistance was not sufficient. The second development was the adoption of the Law on Municipal Revenues numbered 5237, in 1948. Yet it did not lead to any significant developments in municipal structures in regards to democratisation; even though the single party system was replaced with multi-party system. The third regulation was the foundation of Chambers of Turkish Engineers and Architects under the law numbered 6235 in 1954. While not very effective in 1950s, it became active in the following years. The fourth development was the Law on Public Improvement numbered 6875, adopted in 1956. This law aimed to resolve the zoning issues of the cities by including the urban areas into the planning. The fifth development was the establishment of The Ministry of Development and Housing numbered 7116, in 1958. The main concern was to come up with solutions to the complications in planning, housing and construction materials. These events became the primary obstacles of the era; and none of the above-mentioned developments could provide sufficient affordable housing to the increasing population. Therefore, a search for alternative solutions was initiated. Following World War II, the prevailing “individual housing supply” proved insufficient in Turkey, particularly in Ankara, where cooperative societies emerged for the first time in addition to the squatter housing (barracks) due to Ankara’s character as a capital (TEKEL‹ 1998). Furthermore, another attempt to overcome the housing shortage during the same period was the introduction of build-sell supply model. In Turkey, as a developing country, and particularly in Ankara, the capital of the country, the housing shortage became an ever-growing problem. Insufficient attempts were made to tackle this problem, including increasing number of squatter housing, insufficient infrastructure formation, and inadequate mass housings. Moreover, it is the beginning of a period which witnessed the phenomenon of swiftly occurring social mobility. (KALAYCIOĞLU 2007) As a result, dull environments spread and the quality of the socio-spatial environment decreased.

Ankara, the capital city, is the most effective city which housing problem has occurred. The population has risen unexpectedly. (Saoğsöz et. al, 2014) Following the proclamation of the Republic of Turkey, efforts put into resolving the housing shortage accelerated. However, most of those attempts were not effective. A primary example is the Land (Real Estate) and Orphans Bank, which was established in 1926 (AYDIN et al. 2005, p. 535). Land (Real Estate) and Orphans Bank was established to offer loans to the public for housing and to support construction initiatives. However, instead of supporting low-cost housing, the bank encouraged housing for middle and upper income groups. On the other hand, due to the fact that the credit allocation levels of creditor organizations were under the desired targets, cooperative societies were perceived as more useful systems for building and purchasing houses. While cooperative societies inhabited more and more new districts, these new housing were quick to be included in city plans and in municipal services thanks to their pressurising power. (AYDIN et al. 2005) The cooperative housing system commenced with a Land Bank project for apartment blocks with central heating for 4000 officers. However, this project was never implemented (AYDIN et al. 2005, p. 441).

The cooperative society housing system was initiated as an alternative solution to the housing shortage in Ankara; particularly during the CHP’s (Republican People’s Party) statist policy period. The state adopted the cooperative society model beginning with the 1930s, as the main logic behind the cooperative housing system overlapped with Statism (Etatism). Thus, legal and institutional regulations were developed regarding cooperative building. Bahçeli Evler Cooperative Housing Society in Ankara was one of the first and significant examples of this system. (AYDIN et al. 2005) Bahçeli Evler Cooperative Housing Society was not only a first in the system, but it also contributed to the popularisation of the concept of “houses with gardens”. However, despite the efforts of the Turkish Cooperatives Institute, this concept did not spread. Although all the debts were paid by 1950, urbanisation led Bahçeli Evler to lose its original purpose. (AYDIN et al. 2005) Low-rise houses with gardens, designed generally for the middle-high income group in Güvenevler and Kavaklidere followed the Bahçeli Evler Cooperative Housing Society. In addition, the Cooperative Housing Society of Central Bank Members - similar to the Uczu Subay Houses- were single or two-storey houses in gardens, and they were offered to the residents in 1957. (CENG‹ZKAN 2002) Konservatüvar Cooperative Society Houses were located in Keçiören and were designed as high-rise buildings unlike others. (YÜCEL 2005) Another organisation varying housing types in the 1950s with its different building structure types was İkramiye Houses. They were built mainly by state banks in the 1940s. The number of these houses increased as new banks established within the concept of liberal state. These houses were located particularly in the Districts of Kavaklidere and Asağı Ayrancı. (ERS‹N 2007)

The increase in the number of cooperative housing societies can be based on two main reasons. The first one was the law on “Allocation of municipal-ity and state property lands in Ankara to housing construction” numbered 5218, dated 1948. This law
offered low-cost lands to individuals on the condition that they constructed on the said land. However, the complications in the implementation prevented this law from reaching wide populations. The second reason was the law on the Promotion of Building Construction numbered 5228, also dated 1948. This law offered ten years of building tax immunity, discount for building materials both in customs and transportation, and loans with a low interest rate. (YENİMAHALLE MUNICIPALITY, official web site, 2015) However, obstacles faced in land allocation meant that the law could not be implemented as planned. Besides, as Bayraktar (2002, p.14) stated the population density in the city centres led to a permission to “build penthouses or adding storeys on approved streets in accordance with the Cabinet Decree numbered 808 and dated 1951”. This permission caused an upsurge in land prices, left many lands vacant and increased infrastructure costs.

Following this process, which was forcing the property system in cities, the condominium system was pronounced. Therefore, new entrepreneurs bringing together a new mortgage mechanism allowing medium-income group to acquire houses and users of that mortgage system emerged. After 1955, this group called “property developer” conquered the market, and individual housing, which had been the main system in the previous term, stopped for good. (BAYRAKTAR 2002, p.14)

Permission to Constructing Attached Apartment Blocks in 1951 and Ankara Municipality Council, Commission of Public Works taking a decision to prepare a new Zoning Plan in 1952, indicate the efforts to set standards for housing and to improve the construction industry even in the early 1950s. In order to meet the dramatically increasing housing demand after 1950, two main attempts were made: squatter housing and the build-sell supply model. (TEKELİ 2005) Squatter housing, blooming after Ankara became the capital, took on a new meaning between 1940 and 1950. Turkey’s new economic policy, particularly in the middle of the 1940s, and the effect of Marshall Aid on agriculture were the leading factors affecting squatter housing. The squatter housing in Ankara was formed with the impetus of the moving countryside transformed through the mechanisation in agriculture. (AYDIN et al. 2005) In addition, Ankara was not equipped enough to receive the migrants which came from the rural sites of the country. So, the migrants should have to take care of themselves. They constructed their houses on the untapped lands of the city. (ZÜRCHER 2014) As a result, the improbable aspects of migration from rural to urban areas were culminated in squatter housing problem during the 1940s in Turkey. (DÜNDAR 2001) The law on “Promotion of Building Construction and Unlicensed Buildings” (legalizing the existing squatter housing) numbered 6188 and dated 1953 enacted “municipalities to use the lands in their possession for building low-cost and simple houses, and these houses to be sold for the building cost to the owners of the demolished squatter houses or to the individuals living in unhealthy conditions.” (AYDIN et al. 2005, p.541) However, the law did not work as planned: it could not restrain the increase in population density, the loss of green areas and the growth of the city akin to an oil stain. “Until the mid-1960s, governments had a negative attitude to squatter housing areas and their populations, seeing them as the sources of social ills in the urban system” (DÜNDAR 2001). Although the 1966 law on Squatter Housing aimed to provide the squat-ter house owners with some form of assurance, squat-ter houses nonetheless came to be a source of income rather than mere shelters (TEKELİ 1998). The policies on squatter housing were inconsistent until the mid-1960s. First, building new squatter housing were ile-galised, then housing built before the issue date of the law were legalised, then finally the municipal lands were granted to the low-income families in need. A long-term approach to housing taking the socio-economic conjuncture into account could not be de veloped.xiii

In order to overcome the housing shortage in the 1950s, the Land Register Law numbered 6217 was adopted in 1954 and the condominium concept was introduced. The Condominium Ownership Law numbered 634 was enacted in 1965. This law “encouraged the demolition of the urban texture, particularly in city centres where the small-scale and multiparty land ownership system was common, and the building of new multi-storey attached apartment blocks instead.” (YENİCE 2014) Even though the Land Register Law appeared to be an effective solution to reducing the building shortage, it obstructed the sense of quality in the newly formed urban texture as the population density, infrastructural issues and social needs led to a significant deficit. Thus, in 1956, Land Register Law numbered 6465 allowed for temporary constructions outside the housing areas.

In brief, cooperatives and squatter housing were attempts to overcome the housing shortage arising after World War II. Numerous laws regarding these two processes were enacted and implemented over time. However, a long-term, sustainable solution to the housing shortage could not be found. The immense housing shortage that the rapid urbanisation triggered led to the rise of build-sell supply model, as well as cooperatives and squatter housing. The build-sell model then was utilized as another attempt to decrease the housing supply. xiv

Turkey underwent various economic, political and social developments starting from the 1960s; the
two leading ones being the urbanisation concept, which accompanied the development of industry and trade, and the pluralistic world-view flourished with the multilateral relations with the western world. During the same period, more and more effort was put into city planning works. One of the main goals in city planning during this transformation phase was the rapid industrialisation of the city and hence, providing income equality when possible. However, mechanisation in agriculture created an enormous manpower deficit. For example, during the city planning in Ankara, the scale of the immigration from rural areas to the urban could not be foreseen. (YÜCEL 2005) Therefore, the housing shortage became evident in the drastically growing city. While this complication was tackled with squatter housing for the low-income group, other solutions were sought for the middle-income groups in the form of first the cooperatives, then the build-sell model. (SOZEN 1984) The build-sell model was one of the spontaneous solutions for middle-income group towards the housing shortage caused by rapid urbanisation. This particular income group lost the chance to be the property owner of a single housing on a single parcel as prices streaked with rapid urbanisation (TEKELİ 1998). The build-sell supply model, in return, was developed as an arrangement that allows for the middle-income groups to share the land costs. The micro entrepreneurs purchased lands with building authorisations in old parts of cities from their owners in exchange for flats, and then built multi-storey buildings to sell on these sites (TEKELİ 1998).

Besides these considerations, the build-sell supply model, which appeared in the 1950s and accelerated in the 1960s, excluded the architect almost entirely and began molding the urban environment. In the whole country, just as in Ankara, the single type building typology became widespread. Regional architectural differences disappeared. Two distinct factors promoted this process until the end of the 1960s. The first factor was the dominance of the build-sell model against the housing demand, while the other was the legalised condominium system.

In other words, the changes in the economic and social class structures of the society played an effective role in the development of the build-sell model and it became very efficient in the late 1950s as a result of the increase in housing demand in the urbanised social structure setting. In this conjuncture, the study examines the Rer-1 Apartment Block, the first project of the master architect Nejat Ersin that was designed in accordance with the principles of build-sell supply model, while still based on innovative and architectural approaches. As extended families in Ankara shrunk into nuclear families and wealthy families sought for new districts to move in, the green texture of Aşağı Ayancı and Kavaklıdere acted as a catalyst and these districts became the new attractions in the city. In Ankara, people sought to escape from city centre, and just like today, they searched for new

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**Figure 1. Cinnah 19 apartment block Source: Cengizkan (2002).**

**Figure 2. Rer-1 apartment block Source: Author’s photograph archive**

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neighbourhoods for themselves with the influence of
the surfacing social classification. The districts of Aşağı
Ayrancı and Kavaklıdere could meet these require-
ments in the late 1950s and in the 1960s. xv Rer-1
Apartment Block was also built in the Aşağı Ayrancı
district. The unconventional approach of Nejat Ersin to
the build-sell process renders the Rer-1 Apartment
Block he himself, as an architect, designed, imple-
mented and sold a unique experience; it is therefore
essential to examine the physical characteristics of the
building with a thorough understanding of the archi-
tect’s perspectives.

3. Nejat Ersin’s approach to the build-sell supply
model and the Rer-1 Apartment Block

Rer-1 Apartment Block was the second building xviii
Nejat Ersin designed in the Kavaklıdere District
between the years 1962 - 1964. (Figure 2) Although
this was his first project in the build-sell supply process,
the building still carried effects of architectural con-
cerns. It reflected the socio-economic transformation
of the period. Kavaklıdere was inhabited by foreigners
and bureaucrats as of late 1950s. Therefore, most
residents of the building consisted of ambassadors,
ministers and parliamentarians as the building was a
synthesis of locations addressing the needs of this
community. The appreciation and fame that Cinnah
19 evoked allowed Nejat Ersin to design his buildings
to address the demands of the community sharing the
same lifestyle as his. The Rer-2 and Rer-3 Apartment
Blocks that he designed in the following seven years
were two other significant build-sell constructions that
targeted the same community in the Kavaklıdere and
the Aşağı Ayrancı districts (Figure 3 & Figure 4).

Bilgin (2002) indicated that the majority of
the housing stock built between 1950 and 1985 were
either squatter housing or build-sell model buildings.

He further asserted that none of these concepts
allowed the architect to assert themselves within the
process as an individual. Moreover, Bilgin (2002)
emphasised that the build-sell model was a “small
scale production type on a mass scale which cannot
support the formation of the architect as an individual”
and he added that the architect’s signature on the
build-sell apartment blocks did not necessarily mean
that it was the architect’s own initiative. The difference
of the Rer-1 Apartment Block in Ankara, however, was
that it was designed and implemented by the architect
Nejat Ersin, keeping all initiatives regarding the
process to himself. Nejat Ersin was not only included
in the design phase of the project, but also in the
implementation phase of the every single detail. It was
also quite a rare occurrence in the build-sell process
that the architect sold many flats himself. The archi-
tect’s participation in all phases, from design to sales,
rendered the building distinctive from other build-sell
constructions. The construction process of Rer-1
Apartment Block differed from peers as well in the
sense that the architect assumed all responsibility,
unlike the standard procedure where the end product
is determined from the beginning and the whole con-
struction process is nothing but a formality. Even
though this building was constructed in compliance
with the build-sell process, the participation of the
architect in all the phases, from the implementation of
the architectural design to selling the apartments,
made this building unique and emphasised the role of
the architect. Moreover, the repetition of models in the
standard build-sell process did not apply in the case of
Rer-2 and the Rer-3 Apartment Blocks Ersin designed
after Rer-1. Although all three buildings were con-
structed based on the build-sell supply model, the
buildings differ from each other, apart from certain
planning decisions. Along with its other characteristics,
this difference contributed to Rer-1 Apartment Block’s
uniqueness for its era.

In 1960, Nejat Ersin resigned from his duty at
the Ministry of Public Works asserting that the charac-
ter of architecture was liberal, and he set up his own office in Ankara. In the meanwhile, a wealthy relative of Ersin suggested that he engage in build-sell business and he would provide the capital. Ersin accepted this offer. He explained his attraction to the idea as such: “In the late 1950s, the wealthy financed the renovation of old buildings in Istanbul in a qualified manner, and so the architects gained higher profits. That’s why I found this proposal quite intriguing.” (ERSİN 2007) Thus, Nejat Ersin both designed and implemented the plan for, and joined in the sales process of his very first construction since he settled his office, the Rer-1 Apartment Block on the Hüseyin Onat Street in Aşağı Ayrancı district, Ankara. He recounted that he was amongst few architects in Ankara in build-sell business when he first started working on the project for Rer-1. He explained how he earned a name through his previous design, Cinnah 19 Apartment Block, and that once people heard he was working on Rer-1 Apartment Block, they would show up in his office to inquire when the project would be completed:

Acquaintances of satisfied residents from Cinnah 19 Apartment Block, who heard that I began designing Rer-1 phoned or came by my office to inquire about the flats. I then immediately prepared brochures, and explained my plans for the new apartment block. Frankly, their excitement boosted my eagerness. Sales began already during designing phase (ERSİN 2007).

The brochures (information on the flats, plans and standards) that Nejat Ersin had printed helped him sell the flats in advance. This was not common in the 1960s. However, Ersin considered having sold all those flats to the already high demand before their values could increase as a business mistake. He explains that: “I never even considered negotiating. I only discussed the payment conditions of the price I had previously set. Yet I could not make profit as I received the payments in the long-term.” (ERSİN 2007) The innovative approach this building brought to the planning concept impressed the target market. The architect was offering a new, unusual lifestyle with the adjustments he made to the planning, and this was exciting to the future residents, which led to the flats to be sold out even before the completion of construction. Besides, it was prestigious to live in the Rer-1 Apartment Block, who heard that I began designing Rer-1 Ap...
Nejat Ersin claims that the limiting and degrading building regulations are among of the most significant causes of the overall distortion in architecture in Turkey. This degeneration mutated the architecture into a trading material. During his years in the Chamber of Architects, he struggled against these developments and always underlined the need for quality. Ersin believes that “one who needs builds the house, one who is in need sells it”. So in his opinion, this act should never be a trade. However, due to the lack of professional restrictions, the ineligible person began building and selling blocks, and in Ersin’s example: “Dimensions for each room in the house such as bathroom, kitchen and bedrooms are pre-determined, and it was considered a waste of space should the bedroom be designed wider than pre-determined dimension. So basically everything was pre-determined and the architect was not really allowed to actually design. This process transformed construction into a trade” (ERSİN 2007). The modern architecture in Ankara could have been quite different if only few more architects at that time could take initiatives, as did Ersin during the building phase of Rer-1 Apartment Block.

Nejat Ersin’s experience during the sale of Rer-1 Apartment Block sheds light on how the build-sell process changed face. On the client’s wish, he sold an apartment to a client who was not an architect in long-term installments. In no more than two months, this client got into build-sell business himself. Even though he was not an architect, he decided the business was profitable and started designing and selling buildings. Quite a lot of money was made out of these usually low quality buildings. And so, build-sell process became a commercial commodity without any architectural concerns. This transformation was evident not only in planning process but also in the materials used. Any person who is not an architect may all of a sudden make up their mind, buy a piece of land and erect a building the very next day. This person may not know the first thing about foundations or plumbing, but they try to impress people with colourful tiles and expensive paint. A friend of Nejat Ersin’s in the build-sell business advised him that he would not make money with his attitude and suggested that “(he) should keep two things in mind. First of all, you will not have a permanent office address so that they will not be able to find you if there are any problems once the construction is completed. Secondly, if you have built an apartment block in a neighbourhood one year, you will build in a further away neighbourhood the next” (ERSİN 2007). Ersin, however, had built both of his two build-sell buildings (Rer-1 and Rer-2 Apartment Blocks) in the same neighbourhood (Aşağı Ayrancı), and the third one (Rer-3 Apartment Block) in a nearby district (Kavaklıdere) all with a permanent office address. He believed this was the right way. Moreover, as great differences appeared between the projects on paper and the constructed buildings even when it is an architect who drew the project, Nejat Ersin felt alienated to build-sell system. He claims architecture in Turkey is corrupted in this sense.

4. The characteristics of Rer-1 Apartment Block
The apartments in Rer-1 Block were preferred by highly educated and high-income level individuals of their time. During the mid 1960s, the residents of Rer-1 Apartment Block were Pakistani and American ambassadors, doctors, ministers, and members of the parliament. In those years, parties and receptions were held in the block, particularly in ambassadors’ apartments. There was nothing but the two-storey building on the street. The last bus stop in Aşağı Ayrancı was on the Hüseyin Onat Street where Rer-1 Apartment Block was located. There used to be a stream with poplars on the side, parallel to Hüseyin Onat Street, at where is now called Kuzgun Street. Aşağı Ayrancı was just being founded then, and was a still developing and quite profitable district.

Nejat Ersin explains that Rer-1 Apartment Block was his breakthrough to professional life and he was excited at all stages, as it was his first build-sell project. He set up his own office for the first time in those years. He aimed to give the warmth of a home to his apartments rather than to fit them in strict limitations of blocks. He wished to offer pleasure, comfort, and their own corner for everyone in the house. He, therefore, enthusiastically made some research and put some thinking to come up with the best idea. In order to understand the innovations of the building and the new experience the build-sell process offers, it is essential to examine the planning decisions, façade design, and materials.

4.1. Planning decision
The project of Rer-1 Apartment Block on Hüseyin Onat Street in Güneşevler District, Çankaya was approved in 1964; the construction of the reinforced concrete carcass building began the same year and lasted two years. The street on the front side is about seven metres wide. There are two small gardens at the entrance on the eastern front and centre. There is wide hall at the entrance. In the drawings of the structure, the core circulation design system was used and four apartments on each storey, adding up to a total of twenty-two, were designed. The basement, ground floor, three storeys and the penthouse were built with
three-metre retractions (Figure 8). At the time, pent-houses were constructed as a result of building regulations. Later, as there were continuous leaks in the penthouses and as they caused difficulties in statics, and as almost every resident ended up covering them, permission to build apartments on these areas was granted by the then Housing Department. Thus, the penthouses were turned into apartments. The reason why there is not a lift in Rer-1 Apartment Block is that in the 1960s, lifts were only allowed after fourth floor.

Nejat Ersin thought his client profile would consist of families. He designed three rooms in each apartment on all three storeys other than the basement, the ground floor, and the penthouse. These three rooms were a master bedroom, a nursery, and a multi-purpose room the family could utilise in accordance with their life style. Besides the rooms, there is a living room (which had a dining room within, separated by a glass wall from the rest of the room), a kitchen, a bathroom, and a maid’s room with its own bathroom. There are two apartments on each storey, four apartments on the ground floor and penthouse; and two rooms, one living room, one bathroom and one kitchen in each apartment. Kitchen has a light shaft connection (Figure 5, Figure 6, and Figure 7). One of the most specific characteristics of living room planning in Rer-1 Apartment Block is that a twenty-centimetre elevation difference is used. Another such characteristic is that the living room is separated from the study with a glass wall.

Starting from the late 1950s, architectural planning focused more on squeezing more rooms into the same square measure by keeping room sizes at minimum. However, Rer-1 Apartment Block demonstrates quite a contrary approach. Nejat Ersin explains his approach as below:

Residents back in the 1960s, just as they do today, cared most about the floor space when buying residences. If the designer takes the square measure as basis, the result may not be right. My education and my designer instincts suggest otherwise. I believe, when planning a building, design should follow the lead of resident needs. First the needs are set, then the planning is completed accordingly, and then the square meter is told if asked. I consider a hundred-square-metre house description is inaccurate (ERSİN 2007).

Moreover, Nejat Ersin designated a centre point in Rer-1 Apartment Block’s drawings, and allowed circulation to service areas, rooms and the living room from that point. Therefore, the particular characteristic of each area was contained within. For example, only the central point and the corridors were used to get from one room to another. Unlike the traditional Turkish houses, the living room is not crossed to reach rooms and each room had its own purpose in Nejat Ersin’s designs. Therefore, through the square shaped hall at the apartment entrance, one can directly reach the living room, kitchen, and the “L” shaped corridor that leads to the rooms; thus separating the rooms completely from common areas.

4.2. The façade design
Nejat Ersin wished for all three of his build-sell apartment blocks to have different façade designs. However, he could accomplish this only in Rer-1 Apartment Block. The façade of Rer-1 Apartment Block differs from those of Rer-2 and Rer-3 Apartment Blocks in the way the windows are placed and in its comparison to the other parts of the structure. Besides, in Rer-1 Apartment Block, Ersin has not used the “sunglasses” as he called them, though he used them
excessively in Rer-2 and Rer-3 Apartment Blocks. (Figure 13)

Nejat Ersin employed the solid-void relationship when designing the façade of Rer-1 Apartment Block. He designed the three bedrooms and the living room as sequential windows on the same façade (Figure 9, Figure 10, Figure 11 and Figure 12). Moreover, he criticised the architectural trend of his time of using a lot of windows, and stated that: “I do not agree with the most predominant “whoever builds the largest window is the best architect” approach of 1960s. I have not used many windows in my designs, in fact; Rer-1 has the most windows” (ERSİN 2007). With this stand, he contested the prevailing approach with his designing principles and succeeded. The mass structure of the building and the solid-void balance on the façade are two of the striking characteristics of the building. Moreover, balcony railings are designed to be at the same level as windows, and a horizontal effect was created with the balcony tiles. The north and south façades of the building were designed symmetrically.

4.3. Materials
From 1960s to 1070s, a vast collection of low quality housings was built due to the use of wrong types of
systems and construction materials. A similar kind of negligence manifested itself in the material preference of the build-sell process in the same years. Luxurious, but unsuitable materials caused more problems in the long-term, resulting in unstable constructions. Among such a trend, Nejat Ersin emphasised that he specifically chose low-cost and simplest material, and avoided flamboyancy and ornaments. Therefore, whoever buys the apartment would be able to personalise it; or in his words:

I specifically chose the cheaper material thinking that the person who would buy the apartment could use a different or more expensive material according to their own taste. Those who were not architects but who were still dealing with build-sell business spent more money on the surface material. I, on contrary, spent on plumbing and infrastructure. (ERSİN 2007)

Nejat Ersin added that in 1960s bathtubs and sinks were hard to procure; one had to order, and then get a number. He explained his solution as such: There wasn’t any time to wait in build-sell process; time flew, so there I did not have time to line up for the materials. And therefore, I had them all built out of marble. I was not looking for a different material; it was simply out of necessity. It turned out pretty well though. We came up with quite impressive and favoured products. I then continued the production out of marble. (ERSİN 2007)

It is possible to find other marble designs in Nejat Ersin’s later buildings. It is extraordinary for an architect in build-sell process to design and to have built a product out of a material of his choice. The architect took initiative in material selection and application.

5. Conclusion
As a negative result of increasing use of machinery in agriculture - the most common vocation in 1950s Turkey - a vast volume of immigration towards cities took place. Ankara was one of the affected areas. The number of squatter housing increased, thereby resulting in insufficient infrastructure. To address this problem, cooperative societies were perceived as suitable housing construction systems. In Turkey, and particularly in Ankara, cooperative societies and squatter housing were offered as a solution to the housing shortage problem following the World War II. There are a number of laws issued to regulate these processes. Housing has been revealed much more than it is demanded in Turkey (TUREL and KOÇ 2014) however, no sufficient solutions were found to address the housing shortage. In a developing country such as Turkey, and in its capital Ankara, the housing shortage kept increasing.

The effects of politics in 1960s, the increasing population in existing structures, the accelerated building of apartment blocks, and cooperative societies and squatter housing led the city’s macroform to be reshaped. Build-sell process, which came up as an alternative solution at the time, was a new experience and an opportunity for both producers and consumers. Build-sell supply model in Turkey appeared as a result of increasing land prices due to urbanisation, and the initiatives on housing construction. Those who brought others in need of housing together built apartment blocks spending next to nothing based on condominium. These structures in build-sell process became highly populated apartment blocks, with middle-income group as their target market. The increasing housing shortage and the resulting build-sell process in Ankara in the late 1950s reinforced the importance of this study’s subject, the Rer-1 Apartment
Block. While the Rer-1 Apartment Block was built in build-sell process, Nejat Ersin traded with people of his own life style, and of high education levels; and thus the consumers of this profile preferred this building. The planning of Rer-1 Apartment Block, based on Nejat Ersin’s innovative approach in accordance with architectural principles, presented in build-sell style, flourished on the idea that our daily lives was being westernised. Nejat Ersin planned the structure with modern lifestyles in mind, and paid attention to give the warmth of a home to the apartments. He wanted the residents to find their house suitable to their life style, pleasurable, and comfortable. He, therefore, offered a new experience in build-sell process. The traditional build-sell supply model requires spontaneous solutions, aims middle class; and disregards the lifestyle of the residents, repeats the same types of units, and did not consider personalising the apartments.

Rer-1 Apartment Block is timeless in the way it opposes the trends of its time, and combines past and present. It has been possible to observe, through this structure, the importance of prioritising occupational ethics of architecture and the human factor in creating high quality structures, and thus, high quality environments despite the complicated and tough process. Rer-1 Apartment Block presents an outstanding example in the build-sell process not only for its unusual blueprint, but also for its stable mass composition and authentic details. Rer-1 Apartment Block with its strong planning decisions, expressive facade, and durable and aesthetic material selections offered a new experience in build-sell process earning its place among the most important structures of the era, and has kept its residential identity until today.

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\[\text{i} \] When land prices were rapidly increased, particularly middle classes faced a housing shortage. Furthermore, land prices were eliminated so that the opportunity of registering a single building on a single parcel of land in a single name, spontaneous housing movement was developed named as build-sell (yap-sat in Turkish).

\[\text{ii} \] The Rer-2 and the Rer-3 Apartment Blocks, which the project was drawn and designed after the Rer-1 Apartment Block between 1964 and 1971 during the build-sell process, are refered to in this paper only to take reference for Rer-1 Apartment Block. The Spatial-Typological analysis of the Rer-2 and the Rer-3 Apartment Blocks is a subject of another study.

\[\text{iii} \] The study is based on an oral history study, which was conducted with Nejat Ersin within the scope of a research process. The interview took place in Nejat Ersin’s own penthouse apartment, in Rer-2 Apartment Block, in 2007. Shopes (2003) mentions, “All interviews are shaped by the context within which they are conducted [the purpose of the interview, the extent to which both interviewer and interviewee have prepared for it, their states of mind and physical condition, etc.] as well as the particular interpersonal dynamic between narrator and interviewer: an interview can be a history lecture, a confessional, a verbal sparring match, an exercise in nostalgia, or any other of the dozens of ways people talk about their experiences.” For the aim of the study, the interview is constructed within the framework of build-sell supply model focusing on the Nejat Ersin’s Rer-1 Apartment block as well as the conjuncture of Turkey, Ankara of the period.

\[\text{iv} \] The population growth in Ankara between 1927 and 1980; “74553 people in 1927, 122720 people in 1935, 157242 people in 1940, 226712 people in 1945, 289197 people in 1950, 451241 people in
Moreover, in the following years, building densities were increased two to three by the Ministry of Development in Ankara in the 1950s, please see Bayraktar, N. ve Erol, Ö. (1993, p. 125-147)

vii “Individual Housing Supply can be defined as individuals, who intent to build a house, buying a land and then having a technical personnel to draw a project so as to implement the project on the land after taking permission from the municipality authorities, through sub-contractors or small businesses in construction.” (Tekeli, 1998, s. 118)

viii For more detailed information on housing development in Ankara in the 1950s, please see Bayraktar, N. ve Erol, Ö. (1993, p. 125-147)

	vi The mortgage system, which did not work efficiently because of the effects of the war, was to be boosted by transforming the Land (Real Estate) and Orphans Bank into Turkish Real Estate Loans Bank, in 1946, within the law numbered 4947.” (Aydın, et al., 2005, p. 535)

ix “The build-sell supply model appeared around the 1960s as a result of the increasing land prices due to urbanisation, and through the contractors’ persistence in maintaining constructions. Contractors began bringing the land owners and those in need of housing together with almost no initial capital, and constructed apartment blocks in exchange for flat ownerships. These apartment blocks are high-density buildings addressing the middle-income group. (Batur 2005: 52)

x The build-sell supply model seemed to be congruent with modernist legitimacy models compared to gecekondu (squatter housing) the government put forward a law allowing for the registration of a building in more than one name, including rules organising the management of apartment buildings. With new development plans increasing the number of stories in the three big cities, building densities were increased, so ‘build-andsell’ housing seemingly remained consonant with modernist legitimacy models.” (Tekeli 2009b: 2-3)

xi “[Build-sell supply model] leads to formation of residential areas with inadequate infrastructure and densities far higher than those foreseen in plans. As it was easier to present this spontaneous development as congruent with modernist legitimacy models compared to ‘squatter housing’ the government put forward a law allowing for the registration of a building in more than one name, including rules organising the management of apartment buildings. With new development plans increasing the number of stories in the three big cities, building densities increased, so ‘build-andsell’ housing seemingly remained consonant with modernist legitimacy models.” (Tekeli 2009b: 2-3)

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xx In 2007 when the oral history study was conducted with Nejat Ersin, there were still three of the original residents in the apartment block. In order to comprehend the general atmosphere of the block, an interview was conducted with a resident who’s been living in Rer-1 Apartment Block since 1964; he recounted that Nejat Ersin gave an apartment on the ground floor to his previous secretary and her husband, his draftsman, who still resides in the apartment; and gave another apartment in the basement to his accountant.

xx The streets on the front sides of Rer-2 and Rer-3 Apartment Blocks were also about seven metres wide. Both of them have two small gardens at their entrances.

xx Compared to the new provisions added in time, the solutions of the sixties on condominium proved insufficient against the new developments; under these circumstances, a comprehensive law amendment became essential. In 2011, Condominium Ownership Law was amended into today’s version through the law numbered 6111; which made certain adjustments to its provisions. For detailed information, please examine Condominium Ownership Law in Part 2 of this study.

xxv Nowadays, this part is combined into the living room and is being used as a dinner room. This planning was applied to Rer-2 and Rer-3 Apartment Blocks as well.

xx The same applies to Rer-2 and Rer-3 Apartment Blocks.

xx Nejat Ersin applied the core circulation logic in Rer-1 Apartment Block to Rer-2 and Rer-3 Apartment Blocks as well.

xx He used this type of green glass material (sunglasses) in control towers in Airfields to block the sun; Ersin figured this would be ideal for the eastern façade of the apartment blocks and used it in two of his structures.

xxx 43 years after the building’s construction, in 2007, the residents still stated no complaints related to the plumbing of Rer-1 Apartment Block.

xxx This selection of materials demonstrated itself in Rer-2 and Rer-3 Apartment Blocks as well.
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Author(s):

Cilga Resuloglu
Atılım University, Faculty of Art, Design and Architecture
Department of Interior Architecture and Environmental Design. 06836, İncek, Ankara, Turkey
Email: cilga.resuloglu@atilim.edu.tr
Abstract
The many speculative writings found in Finnish architect Alvar Aalto’s notes show an interesting array of information about the construction of a knowledge society, and the formation of networks, in which sharing and exchanging new knowledge among different bodies of architectural agencies become possible. These notes reveal insightful remarks, his personal accounts on the Internet and the growing Network Society that could be regarded as pioneering scholarly engagements, which still further stimulate new and profoundly articulated reflections in architectural theory. At the same time, these notes also encourage further scholarly studies on the possible relationships between time and space on philosophical grounds. With respect to his writings, one can summarize Aalto’s contribution under three major headings: the future is nestled in the past; often what is sought is located in the unthinkable; and of many, Alvar Aalto will never cease to be new, unexpected and innovative in his design thinking methods and procedures.

Keywords: Network Society, Alvar Aalto, Democracy, Transparency, Individual and Collective Action.

INTRODUCTION
History [Aalto A. 1987] and inside history, the stories, the labyrinths of the past, the deciphering of the future, environments in which research acts, ascending toward tapered tops or descending in lost darkness tunnels, these are the passages that prevent the contemporaneity of isolating itself and present the past as an extension of the present. Its physical accessibility is defeated by words and stones, echoes overlapping
between the present and the permanent, permanent as a commemoration of the impermanent through lines that do not change over time and challenge the evidence of its movement. The witnesses of the time, into the passage of time, are the facts generated by the teachings. He who teaches is the Master. The Master is the witness of Time in the times. In them, the unexpected and the improbable are hosted, waiting to be rediscovered in their role as prompters of directions, in a place to offer gazes and to interpret the syllables that the future distills. Historical factors are known to those who do research, as it is known by the wonder that, despite everything, they continue to generate. The evidence of this continuous occurring is part of the research, and it is itself research. It is evidence of the inscrutable laws that guide or condition the human path, the complexity of which cannot be chance. The profound and beneficial impact of tracks that gradually reveal themselves are often full of communicative values, capable of transformative impacts of perception on certain topics and those contiguous to them. The exploratory paths in this research are no exception. No comprehensive strategy is needed to be able to conclude a not forthcoming past or a past even related to the topic under investigation. In fact, the salient points of an interrogation have emerged and, while remaining within the orthodoxy of the theme, have caused, in an autonomous and involuntary manner, one gaze shift into a different scope from what is hypothesized. They are perhaps precisely these incongruous, non-compliant elements that capture an attention more accustomed to thinking of traditionally trained systems. Therefore, a theoretical plan that has been imagined and built according to the argumentative necessity of research to understand how technological innovation, produced in the communications field, had an influence on a specific social reality, the Finnish reality in this case, and the consequences on the professional lives of its architects, met with something else. This ‘something else,’ in its autonomy, has demanded a detour into past still able to excite, to allow to see, to allow to imagine and to affect the final outcome on the experience of research through an underground, but vivifying, conflict of intents.

At the beginning of this scholarly investigation, there was only one input for an Internet network that influenced the study in the architect’s work. Then, Finland is flanked to follow its current nature of society and the immersion in its architectural world looking for reflections. There, the presence of the past has surfaced, and with it, doubts, questions, searching for a comparison and choice of who to elect for this; as well as the attention to the consequences of an action that did not want to be labeled as a provocation, until to flow in the conclusions in which the passages of time, paradoxically, validate thoughts hypothetically linked to ended seasons. A circularity of thought where it is possible to add, but never to replace what already said, when it is well said, leads back to the starting point of this paper. However, the beginning of this paper is also the source that generated it, namely the study of the Internet phenomenon. From this point, it is convenient to break into the achieved path.

Since its inception, the Internet phenomenon has affected scholars in different spheres of knowledge. For the first time, since the decompartmentalization of knowledge has taken over human knowledge, there has been a common interest tending to unite what was previously divided. Examining, for example, studies of the sociologist Manuel Castells (Aalto A. 1997), the physicist Albert-László Barabási (Aalto A. 2004) and oncologists B. Vogelstein (Castells M. 2004), David Lane (Castells M., Himanen P. 2006) and Arnold J. Levine (Castells M. 2009), it is evident that, albeit from different paths, the analysis of the Internet leads to similar understandings about how synergistic these are among them in the advancement of every single branch of knowledge. Pasing among the paths faced by Castells, and especially among those concerning the Network Society, we turn out a study pointing to understanding the relationships among the immaterial sites created from the Internet and those materials, especially within the city, of another complexity of the human being from whom control is emerging. Understanding the Internet and its influence on human activity is an aid to interpreting the economic and social transformations that occur increasingly more quickly on this planet. The effects on architecture, on the profession of the architect, are consequential to this continuous subversion of human relations. To intercept the flows that affect the global dynamics, to handle them and not to tolerate them are new fundamental commitments for those who design and build urban and architectural spaces, or are delegated to do them.

One of the Castells’ studies, shared with Pekka Himmanen (Castells M. 2009), where the Network Societies are analyzed, highlights the Finnish reality as an interesting model for those societies. The reflections derived from that essay were guidance in the analysis of Finnish Architecture’s involvement in the phenomenon. Nevertheless, incidentally, that research has penetrated into the unthinkable. Addressing topics of an architectural nature, there is a great sun that still looms in those extreme lands. That sun that illuminates, but which could also blind, is Alvar Aalto. The risk that research in the field of architecture in Finland may incur is that: before a vast territory and a low population density, the presence of Aalto is perceptible even where it is not conceivable. It remains incredulous before some of his writings in which there are arguments that prefigure a society of knowledge and a tool like the Internet aimed at inten-
sifying, through communication, the development of a new awareness. The dread of being trapped in a web prepared by Aalto almost a century ago has made a push in the search for experts of his thought and architecture. These were identified in the figures of Eric Adlercreutz (Castells M. 2010), Maija Kairamo (Castells M. 2010), Vezio Nava (Charrington H., Nava V. editors, 2011) and Juhani Pallasmaa (Fleig K. co-editor, 1995). Their considerations allowed a different understanding of the architect Aalto, and consequently, a different interpretative measure of the Internet phenomenon in relation to architecture.

A BRIEF GLANCE OVER THE THEORIES OF THE NETWORK SOCIETY

At the end of the 1990s of the previous century, there were structural transformations of society, linked to the economic world, that led to what Castells calls ‘informationalism,’ (Fleig K. a cura di, 1986) which became the foundation upon which arose the Network Societies. The latter, described as an information society, immediately showed strident differences between them, in terms of institutional foundations and social consequences. Nevertheless, they achieved similar results in technological innovation, productivity growth and economic competitiveness. Not unlike what happens to the industrial society, the information society presented some common structural features in worldwide and which still characterize it, which is the fact that it is based on the generation of knowledge and information processing with the help of computer technology based on microelectronics. It is organized in networks and its fundamental activities are interconnected in a global scale network acting as a unit in real time thanks to the infrastructures of telecommunications and transport (Castell M., Himmanen P 2006:19). Nevertheless, the paths and the results towards the transformation into the information society display remarkable differences. Castells, although showing the non-existence of a single information society model which can act as a standard for the rest of the world, suggests three models to which greater attention can be focused: the Silicon Valley model: a market-driven information society; the Singapore (Lahti M. 2008) model: an authoritarian information society; and the Finnish model: an open information society, founded on Welfare (Castell M., Himmanen P 2006:20).

However, as any change in human society has not only innovative advantages but also weaknesses and risks associated with them, this epochal transformation is not immune to this condition. In fact, Castells (Castell M., Himmanen P 2006:22) points out that

“[t]he inability of the global information networks and wealth to respect the values of historically rooted iden-
tities has created great instability in the world, because the feeling of meaninglessness unleashes potentially fundamentalist reactions.”

This is a crucial concept whose devastating significance faithfully represents the scenario that now imposes itself. The same Finnish lesson highlighted in the study by Castells and Himmanen is, in large part, shattered precisely from that inability underlined by Castells.

The instability in the world has found an echo in the Internet that propagates through uncertain boundaries, constantly changing every hypothetical consistency. The Internet is a mirror; it shows and amplifies the strengths and weaknesses of human action. What appears in this second decade of the new millennium is still a society governed by subjective interest, not balanced by a careful vision from social relations and the common good, and marked from the privilege toward the means, and indifference toward any goal. The speed in communication, as currently regulated, should produce horizontality, changing the experts’ figures and modifying authoritativeness, but often it shows minds that cannot remain current with the spirit of the times, and brains in breathlessness in being in unity with their own minds. That speed, in which each instance of writing today becomes the face of the past, only favors the dialogue that takes place in the network, highlighting it as the value of updated knowledge, step by step. It is a disconcerting phenomenon, noting above all that which is produced and suffered by humanity. Is it possible to consider the transformation of the creation of knowledge? Not everything that is written on the Internet is knowledge. Moreover, it is also not easy to find. Search engines which exclude rampant superfluousness on the network are needed in order to avoid becoming lost in useless information devoid of any wisdom. Yet it is impossible to elude the network by its own action. In that chaotic flow, there are also our own paths that need to be covered, and there are many.

INTO THE FINNISH CASE: AN ARCHITECTURAL HISTORY AS IT WAS

The Finnish nation has suffered throughout its history two important dominations: the Swedish (1155-1809) and the Russian (1809-1917). During the Swedish period, the formation of a local nobility, who could make claims and oppose the dominant power, was deftly avoided (Castell M., Himmanen P 2006:145). The result was, in Finnish society, a homogeneity that has built a solid network whose benefits are some of the factors that allowed this nation to address and overcome serious moments of crisis. The physicality of this network is possibly seen in the dislocation of small
and very small settlements, distant from each other approximately 20 and 30 kilometers throughout the entire territory of the nation. This is the distance that, on average, a human being can cover in a day’s walk. In the Finnish winter weather, this means saving oneself. No one is abandoned in Finland because it is not possible or hardly could be possible despite the continuous prevalence in this world of a logic to produce homelessness easily. That is a great value for a nation where solitude and silence constitute a substantial part of its character.

In this human environment, it is not surprising that a society identified by Castells and Himmanen as a Network Society model has formed (Castell M., Himmanen P. 2006). Following their study, they linked the Finnish growth in telecommunications, and the consequential creation of the Network Society, to political issues in the period that Finland was dominated by Russia (Castell M., Himmanen P. 2006:72):

“Russia controlled the international telegraph lines, which attributed a decisive military importance. The Finns wanted to gain control of communications, considered strategic for independence, but Russia refused for a decade the demand to give up control of the Finnish Office Telegraphic. To avoid that, the experience of Russian control was repeated in the local telephone communications and the Finnish Senate decided in 1879 to leave the phone in the hands of private operators.”

This attracted international companies, and thanks to their presence (Castell M., Himmanen P. 2006:73):

“so that Finland gained a comprehensive knowledge in an area where foreign companies continued to be leaders until the end of the eighties. Just before the Second World War, in Finland there were 815 telephone companies. This historical process implied that Finnish telecommunications companies had to relate to a competitive market and demanding customers [...]”.

It is not inconceivable that demanding customers, indicated by Castells and Himmanen, arose precisely from that human environment, a constant presence in the evolution of Finnish identity, which upheld technological innovation, characterized by speed and spatial width in communication, generating networks that are synergetic to that already present in Finnish territory, a fundamental network, together with the Finnish language, of the firmness of its identity of national character during several centuries of foreign domination.

**ALVAR AALTO AND THE UNORTHODOXY OF THE INTERNET**

Between a human society and its space, it is desirable that the architect interposes the ferryman of one towards the other and vice versa. This does not mean that the architect is an external element to the process; he/she is in the process of being its interpreter. This leading thought towards the analysis of a society, of its value and that of its architects, is a limit confined to its contemporaneity. Why then to involve Alvar Aalto? What possible connection is there between Alvar Aalto and the Network Society, and more specifically, the Internet?

To compel this argument, an architect so permeated in orienting himself towards concrete building rather than towards abstract speculations, characterized by highly anti-theoretical traits, seems to be an excessive use of force. Nevertheless, who knows how to make good use of this thought and how to be able to transmit it, spread out the time in which he/she belongs, and become an inexhaustible source of knowledge, useful in every age to release thoughts that break the horizon limits? Only the idea to stand among his buildings, projects, to correct and to correct again his designs until they reach the desired result, made of apparent transparency of deceptive simplicity so as to evoke behind every one of his new works, different types of scenarios, several possible architectural memories, dreams of the relentless pursuit of a desire that arises in deceptive terms, that comes towards through a network of creations, which gives form to the loss of oneself, to take possession of his patience, transparency, and prudence. In his patience, there is the art of knowing how to wait, not in the sense in which the waiting is a result of research, and for this inexorable impatience, but in the sense in which it is a way to remain still in a state of availability. In his transparency, there is an opportunity to explore things, an experience often relegated to transient flashes of light, to the fragments that are not found anywhere else except in the infinite mirrors of the art of composition. In his prudence, following the direction given by its etymology (Makkonen L.2009), there is his excellence in the art to build bridges and to build relationships, taking decisions and evaluating their consequences.

Certainly, it is possible also to notice the membership of the unglamorous district of ‘Reason,’ a place that is indispensable to dwell. Usually, however, there is an architectural master who stops only the necessary time, keeping always alive in his/her heart the much more involving memory of the domain of the taste and harmony, even if imaginary and transitory, but essential to recover, to subtract the architecture from the posthumous status that this time seems to distinguish. To assimilate and to convey a sense of that harmony which struck the architectural masters would have the effect of large and powerful ocean waves breaking on a beach that was made mostly of the irresolution and the unrestrained display of visual
power, which hides behind the mask of technological redundancy, a demeaning intellectual anorexia. The energy absorbed by that impact is the tension needed in the search for balance, the size and the relationship with the context. This was, for Aalto, (Aalto, 1987:114) the flexible standardization or, as he preferred to call it, the humanized standardization, a very important time to stabilize the individual’s needs and those of mass society (Aalto, 1987:121):

“When we are able to get different and differentiated results with the same standardized units, adaptable to different tasks with the flexibility that is proper, then we will be passed between Scylla and Charybdis, between individualism and collectivism.” and (Aalto, 1987:119):

“Therefore, we must find the golden mean between the individual and the collective,"

This was a task that Aalto tackled in each of his intentions to project and thus described (Aalto, 1987:112):

“Dozens, often hundreds, sometimes thousands of contrasting elements emerge that only the will of man will force them to interact in harmony, harmony which can be achieved only through art. The individual elements of detail, technicians and mechanics, thus acquire their final value. A harmonious synthesis solution cannot be achieved only by calculation, nor with the experience of the static, nor through the probability game.”

The project doubts, the attempts to experiment with answers, were aimed at understanding the contemporary themes of his time, in order to place himself at the service of life (Aalto, 1987:130):

“What represents the mechanization for individuals: it is democracy. It is the only way to give more and more things in a growing number of people,”people who swim together or individually, according to Aalto, in the light (Aalto, 1987:43).

Aalto wondered how to share artistic ideas in order to make them a common intellectual patrimony so that every inheritance could be progressively improved. Reflecting on this issue in a paper Culture and Technology and referring to the New York Museum of Modern Art, he argued that this (Aalto, 1987:86):

“has as its goal to instill an intellectual attitude that increases the general interest […] towards the modern art such as to allow the formation of various currents of specialists that […] as in an “anthill,” they will spread their knowledge to others.”

But according to Aalto (Aalto, 1987:149):

“In order to evenly distribute throughout society that civilization, those conditions of life that were once the privilege of a minority, an apparatus of mechanical character of immense dimensions is needed.”

This idea had been present for a long time in his thinking. According to Juhani Pallasmaa (Reed, 1998:27):

“[…] at the end of thirty years he made several attempts to start a systematic architectural research. During the second trip to the USA, coinciding with the inauguration of the World’s Fair in New York in 1939, he proposed to a group of influential San Francisco architects gathered by William W. Wurster, to create a network of international research institutes (Mies van der Rohe L2010). Aalto was so taken by the idea of an architectural study, based on international collaboration that, just having returned from New York, published an article in which he suggested replacing the World Fairs with a system for lifelong education institutions in the participating countries, forming a kind of international schools network. With this solution, the universal exhibitions could regain their purpose of the evolution of mankind engines (Reed P. edited by 1998 Alvar Aalto 1898-1976).”

There is, in these writings of Aalto, an extraordinary advance of contemporary sensibility. Even for these reasons, his work and his thoughts belong more and more to the future than to the present. He is definitely one of those intellectual figures ready to establish changes in the events that regulate human life and create models for the future. Being able to grasp, by his thinking, suggestions that help build guidance models for this particular historical period drenched in the Internet phenomenon is an opportunity not to be missed. When the acceleration of life is such that the future is superimposed onto the present, it becomes necessary to intercept and understand the stresses undergone by the human being in the constant changes of scenarios due to complex sets of simultaneous information. If the change is characterized by more and more synthetic reactions, the constraints on the path of humanity are a source of considerable change. In fact, the use of thoughts was so far aimed at seizing individual ideas in the unity of existence. Now, in larger numbers, there is the propensity of mankind to become permeated with ideas coming from many different sources and to allow them to acquire a concrete expression into it. There is a place that can provide a physical representation of this phenomenon and perhaps become its symbolic connotation, namely the auditorium of the Viipuri library with
its undulating timber ceiling (fig.2,3,4). In this respect, Aalto writes \textit{(Schildt G. edited by 1978, Sketches: Alvar Aalto, tran. by S.Wrede)} (Schildt, 1994:114):

“The ceiling of the auditorium is formed by joint wood strips of... which spread the sound, in particular the spoken in the four directions, in an acoustically advantageous manner. Since the debate is as important as the conferences, the audibility is not in one direction, as in the concert halls. My acoustic arrangement aims to make anywhere in the auditorium equally efficient as transmitter and as receiver of words spoken at a normal volume on the entire surface. I consider that the acoustical problems are primarily of physiological and psychological order, and this is the reason why they cannot be solved through purely mechanical means.”

The acoustic of the hall objective reveals the aspiration of fairness and democracy through the possibility that everyone has to contribute to the debate, and this is also one of the potentially most interesting features attributable to the Internet.

**A NECESSARY METHODOLOGICAL CHECK: A KEY TO UNDERSTAND AND COMPHEL**

The exposed reflections required a condition capable of understanding the meaning and verifying the value. As the innovation development obtained through the industrious, “social” and symbolic swarming, of the ants that fill the art of making, is a tribute to the common growth of knowledge matrix and to the plurimillennial comparison and exchange among peoples and among minds, today also an immaterial scenario, that swarming is also the suggestion to lend support to the above mentioned thesis. In comparing and exchanging, it is possible to dispel the suspicion that the enthusiasm towards elements considered detectors, blurs the critical sense and thrust, with flippancy, in a drastic periodization that isolates phenomena in the today otherwise rooted in the past. Without evident constraints of legacy, the idealization of the “before” becomes a generalized condemnation of the “here” and “now.” Therefore, to hypothesize strategic deviations, within the logic of other historical contexts, causes a change of perspectives that modify institutionalized indicators. It is certainly a problem of measures, the progressive increments, regardless of factors established in the contemporary world, when one considers that none of those factors was unknown in the past century.

The comparison and exchange are such
insuppressible moments in a research path. The same identification of interlocutors is part of that path. Specifically, that operation has requested a selection among those who, in the Finnish architectural culture, in addition to having had direct knowledge of Aalto, continues to have roles of primary importance regarding the figure and the work of this Finnish Master. In consequence of this, the chosen people are those indicated in the introduction: Adlercreutz, Kairamo, Nava and Pallasmaa. The impossibility of being able to meet some of them personally, in the present case of Adlercreutz and Pallasmaa, has generated the need to prepare a questionnaire. In this questionnaire, the investigated main points were synthetically condensed. From that procedure, the four questions originated on whose basis the dialogue in the meetings held with Kairamo and Nava were also developed. The questions are as follows:

In one of his works, Culture and Technique, Alvar Aalto asserts that people’s knowledge should be spread like in an “anthill.” Could this metaphor of the “anthill” represent the Internet phenomenon?

In 1939, Alvar Aalto thought about creating a kind of international network of schools; through this solution, universal exhibitions could regain their purpose as engines of the evolution of humanity. This “view” of Alvar Aalto forestalled our contemporaneity. In light of all that, how could his thinking drive us in the understanding and acting of our times?

In the light of the previous questions, we could consider the works and thinking of Alvar Aalto as belonging more to the “tomorrow” than to the “today.” That puts him among those ready to settle for changes in
the events that rule the life of human beings and to create models for the future. How could it contribute to building the professional identity of every architect?

The acoustic aim of the ceiling of the auditorium of the library in Viipuri (now Vyborg) reveals an aspiration, as affirmed in an unpublished manuscript by Alvar Aalto, of equity and democracy through the possibility that everybody could contribute to the debate. Could we then assume that the ceiling of the auditorium of the library of Viipuri (now Vyborg) to be a symbol of the Internet?

ANSWERS BY ERIC ADLERCREUTZ

1. As we know, ants have a complex manner of communication, evidently very efficient. Aalto’s metaphor is, therefore, well chosen to express an ideal situation for human interaction: A common media (the Internet) and a common language (text and pictures). As everybody has the possibility to enter it, knowledge is easily attainable for everyone. In Aalto’s competition project for the Parliament House (fig.5,6,7,8) in the 1920s, he suggested a restaurant for the members of the Parliament situated close to the street and open also to the public. This would provide for an informal environment for the exchange of ideas and knowledge between MPs and the public. This was also an example of the democratic aspects in Aalto’s thinking.

2. Aalto’s notion was probably not to substitute the World Fairs with a network of institutes (as you could interpret the text you sent me on 15/11), but instead to complement them with an international network of such schools or research institutes. This has, to a certain extent, come true in the globalization process. What is obviously needed, though, is an international collaboration between participants at fairs to focus on the crucial problems of mankind in a true humanistic spirit. The network Aalto was talking about could take on this task.

3. The (future) professional identity of the architect would include:

- the “little man” in focus, which means a true humanistic approach;
- an international, open-minded attitude;
- the planet Earth as the work field;
- worldwide professional interaction; and
- interdisciplinary approaches;

4. At the library in Vyborg, Aalto’s idea was to provide such acoustics that everyone, regardless of position, may participate in the exchange of ideas and knowledge.

In Adlercreutz’s answers, there are all the elements that have suggested the idea of this research. It does not seem to be the logic of the inclusion or the exclusion to govern his answers. Rather, it is an appreciation in the expansion, non-injurious, of the gaze and the value of its references: the example of the project for the Parliament House is illuminating power. Each of his considerations seems to follow a parceling design, which together distinguishes and reconnects all usefully, without abdication before the urgings of the future: the indications included in the third answer are a manifesto of the purpose for all mankind, not only for architects.

The necessary distinctions notwithstanding, a harmony is detectable, underlying also in the valuations about the ceiling of Vyborg Library. Overall, these answers can only be accepted in order to be considered to be another step towards an idea for discussion and exchange among different social and cultural contexts. It is desirable that what Aalto thought, revamped with balance by Adlercreutz, can be gathered by those pursuing a growth of widespread awareness across the planet.

ANSWERS BY MAJA KAIRAMO (Schildt G. 2007)

We few think really of an anthill so they access everybody’s information […]. In a way it can be a metaphor, a modern intellectual attitude that increases interest towards modern art, so as to permit the making of various concepts of specialists. This is a very nice citation, really, it is very nice that you have found of position, may participate in the exchange of ideas and knowledge.

Figure 9. Review Arkkitehti n. 10/1935.
this and in a way, of course, Aalto knew Democratic progress and progressive literature. If we look at what sort of literature Alvar and Aino Aalto had in their library, we can find some of this progressive 1930s literature.

That was a meeting, creating a sort of network of schools. Of course, that is a very modern idea in those days if you think that there were letters, the telephone, and the telegraph. Then, all were used to travel and meet, so in a way, those days there were no technical means for this sort of network; but now we have internationalized this. That's very nice because here there are all the Arkkitehti reviews (fig. 9) in the library, so we can have a look because they have that. Sure, the idea is quite good even though this is a futuristic idea because, of course, there were no technical means to have this, but it is a very nice idea for your research.

Sure, in fact if you think about the 1930s psychological environment of architects, what they wanted was to solve habitation problems and how a city should be planned. In fact, I think that especially in the 1930s, architects thought about the future even though the technical means were not so advanced as the ideas of, for example, Le Corbusier, whose idea of houses like machines, and Aalto and the other guys thought about standardization and the production of building components. For example, Aalto already used every practice very early so that when they thought about some of the details, such as external scales or some handrail or whatever, they were archived in these drawings as standards and Aalto used the same things in several buildings, such as these handles, and the doors inside the Paimio sanatorium. He used the same handles at the Viipuri library; moreover, these lamps in the entrance are in many places in Paimio, and he used the same ones in the lobby at Viipuri Library and of course that quite famous Rautatalo handle, which was used in many houses. But these were typical 1930s ideas of very many architects because during the war, Aalto, together with his companies, funded the standardization office in SAFA, an architectural association, which even continues today.

In a way, the standardization system compares today’s architects and their designs. The latter simply do not have time to think about the future because of that flow of information, which is just putting informal information and in a way analysing the information we know. It is not easy to understand what it is; it is only propaganda for consumption because that is all that this capitalist system can do: consume, consume, consume. Therefore, it is a pity about the young people who are growing up in this propaganda.

To listen and speak, sure. The idea was very nice especially in those days of the 1930s when, I think, the general politics was not very democratic at all. In fact, when that ceiling was restored before we first dismantled it, that 1960s wooden ceiling which had the wrong profile, therefore, it didn’t function acoustically right. That ceiling didn’t spread the voice; therefore, it was taken down and there were only a concrete upper course and the concrete beams. Whoever deserves this form of the lecture hall said it is all the same whether or not it has this wooden ceiling. But since I have experienced it without this ceiling and when the ceiling was there, it was different to speak. However, Aalto also says, here or somewhere that a human being is, in a way, a psychological whole, so it may be that if you are standing in a concrete room or in a wooden thing, you psychologically hear more because it is so beautiful due mainly to wood. I was at a concert inside after the restoration and the acoustic was marvellous. So this is a very nice idea that you use this wooden ceiling as a metaphor for the Internet. The idea is the same, but of course, Aalto’s technical possibility to solve this sort of idea was only at small scales in one lecture hall instead of what we now have. If you are careful, you just write so that he didn’t foresee the Internet in that way. He could not imagine someday there would be this terrible Internet. He would not have touched any computer because he is writing and drawing by hand; he was drawing and assistants were drawing for him; but he was very good in, you know, drawing, in a beautiful hand and with a beautiful touch.

The possibility of dialogue in Aalto’s places
and spaces, in itself, gives a special value to that meeting. Thanks to Kairamo, it was possible to “breathe” the environments in which absolute masterpieces of architecture have been shaped. This has marked an exclusive uniqueness of that meeting. Kairamo, as did Adlercreutz, stressed the importance of democratic values for Aalto. In those dark years where dictatorial powers prevailed in much of Europe, Aino and Alvar Aalto, possessing a library full of literature addressed to a peaceful and democratic world, indicate a sign of confidence on the purer and positive essence of the human being that no ideology can annihilate, but only suspend for a specified period of time before it extinguished itself. And so it happened. The future in Aalto’s idea was a scenario to be rethought to resolve human needs, such as housing, through the sharing and development of knowledge. Both were carried out following a very specific intent that Kairamo highlights using recoveries taken in the experience and reaction compared to its contemporaneity.

A contemporaneity not worse than the current one, certainly not even better, where the commodification of ethics and values was, and is, the main disease that afflicts human life. Kairamo also highlights an important point: the difficulty of this era where everything happens and passes quickly, to find the mental space in which to imagine the future. That phenomenon, more than any other, tied to the current speed with which things happen, is a measure of a perspective impoverishment crushing the future into the present, causing lack of interest in the latter and in the attempt to plan it. The lack of interest as a disease spreads and attacks the “here” and “now,” zeroing the will and, consequently, folding human society in on itself in a limbo full of apathy. The difficulties and risks of destruction that the Vyborg library has risked in the Soviet period are no different from those that humanity often risks. As Kairamo, supervisor of the restorations of that library, bringing it back to its original splendor, indicates: it has lost only what no one wants to save. The same applies to all mankind at all times subject to the tests that it imposes on itself. Even in this, that library and its story rise to a symbolic multiplicity of hope in a desperate world, such as the present.

ANSWERS BY VEZIO NAVA
The current system of the network is not in contradiction to Aalto’s way of thinking and it fits perfectly. The Internet, like the anthill, has a spontaneous structure, elastic, democratic, and above all, anti-dogmatic, which gives the user an infinite number of alternative routes in search of information. It is possible to admit that Aalto’s idea of the anthill has somehow materialized with the Internet.

Aalto went through as a young man the years when there was a strong innovative push in technology and society, where there was much talk about the future and the advent of radio, television and electronic equipment. In this context, Aalto considered ideas, common heritage (“The world is full of ideas and is not always necessary to invent new, it is enough to develop existing ones”) and for that, he considered crucial a comprehensive system for the exchange of information and to increase the development of ideas. This is one of the most important messages handed down by Alvar Aalto and we find confirmation in his works.

Aalto looked to the future, to tomorrow, as men of his time. In his works, there is, however, a strong link with tradition. It is demonstrated, for example, by the use of certain materials: brick, stone, copper, bronze and wood, traditional materials with which the human being feels more comfortable, being accustomed to them for thousands of years. As an architect of the Renaissance, he was looking for inspiration from history, but not limited to classical antiquity.
ty. In his architecture, there is also the reworking of ideas and elements ranging from Japanese houses to medieval Italian architecture. Therefore, it must know how to use the tradition to project itself into the future.

The line of the undulating ceiling of the auditorium at the Viipuri library is an icon of architectural history. Its characteristics of equity and democracy are well suited to be taken as a symbol of the Internet.

The meeting with Nava has been run by the memories of his long-term collaboration in the study of Aalto over the death of the Master, and culminated with the management of the entire church project in Riola di Vergato, in the province of Bologna, Italy. Many of those memories that one can read in the book Alvar Aalto – The Mark of the Hand (Charrington H., Nava V. 2011), led the dialogue toward infinite paths and shades. Referring to the comparison between the Internet and the anthill, Nava speaks not only about democracy but also especially of an antodogmatic structure that allows endless alternative possibilities in the search for information. Nava, during the meeting, highlights this aspect and puts it in confrontation with Aalto’s buildings. In fact, he pointed out how many of Aalto’s buildings had more entrances (fig. 11,12). According to Nava, Aalto used this strategy because he foreshadowed, in time, the possibility of modifications to his buildings that the different openings would have facilitated. Nava, stressing the parallelism among the different possibilities of access, has a website and Aalto’s buildings, an example of which is the Vyborg library with entrances on each side that do not escape, amplifies the acquisition of the library as a symbol of the Internet. Overall, the underlying node that can be inferred from Nava’s reflections is the ability of Aalto to strengthen a tradition, innovating from within and adapting it to new circumstances and needs.

ANSWERS BY JUHANI PALLASMAA

We find the suggestion that some of Alvar Aalto’s ideas anticipate our Internet age somewhat disturbing. Pointing out and analyzing the open structure of his thoughts is fine, but connecting his thinking retrospectively with the Internet should be conducted with caution. It would be preferable to speak of his evolutionary thinking. Moreover, making assumptions that are too strong on the basis of Aalto’s acoustic designs should be carried out with caution. Recent studies have shown that Aalto’s acoustical designs were based on the visual analogy of light reflection, which is, in fact, a wrong acoustical assumption. His verbally expressed ideas of “democratic space” are something different and are valid as an explicit intention.

Pallasmaa was very busy at the time of this research. He was preparing for a five-month stay in Frank Lloyd Wright’s Taliesin West Studio in Arizona. In addition, he was flooded with countless emails from students around the world. For this reason, his answer is very brief. Despite this, it is unthinkable to exclude it both for the importance of the person in contemporary Finnish architectural history, and because his warnings are required for the survival of this research. The absence of a general harmony and perhaps even as compared with the assessments made in the research, are not the most striking aspect in Pallasmaa’s answer. The average content, maybe not concerted, in referring to the acoustic value of the auditorium of the library can be interpreted as having low or no regret with regard to the legendary aura that enveloped the glories of the Modern Movement, and to that enthusiastic and tasteless spontaneity prefiguring a prepackaged and anesthetized hastiness that, around his story, would continually emerge. This is the main risk with which this research deals. However, the constant referral to the idea of Aalto’s democracy, to which none of the interlocutors has escaped, points out the meaning of some values, whose scroll through time could make them rise to negative values, has not changed and this new turbulent millennium, instead of coming off the trunk of the recent past, traces the prevailing track of the Modern’s legacy.

FINAL CRITICAL READINGS: IS THE FINNISH CASE A UNIQUE ANSWER?

The resulting reflections, seeking alchemy between the thoughts of Aalto and the contemporary, highlight an interesting manner in which the architecture talks about the mind that creates it and, at the same time, how the mind becomes, in turn, an operating field on which to shape ideas through its shades and gradations. The exploration specificity has created a synthesis that suggests every architect, researcher of instruments and values culturally appropriate for the era in which he/she acted, a reference for every age. This is especially possible when the studied person is dehumanized and his/her reality is depersonalized. In the case of Aalto, his inquisitive action proved to be a useful instrument in the observation of contemporary life. This also excludes the fact that Aalto is completely a contemporary of this era. Too many are the cultural assumptions, the foundations of social life, the same categories of perception and construction of real differences in the time frame that separates this historical period from his. In the work of that master, it can be recalled that the relationship with the architectural culture will never be fully understood, and also how it is important and necessary to translate, for interpreting, the deployment and calibration of conceptual instruments, in an extremely complex and unremitting study, but necessary for the growth of knowledge and awareness.

However, this should not lead one to suppose that there is an intention in pointing to the historical dimension in order to aspire to integrate the world of
the modern movement in the pioneering investigation the Internet age. No one would wish to model that period of history and the figure of one of its principal teachers on that era changing it in facts until links and justifications are found. Nevertheless, in the endless ferrying, among the ages of knowledge, modes of action, a sense of movement and transfer are reflected, linked to the care with which it attempts to express the originality of a time, and this leaves space and infinite reflections and comparisons. Architecture is an expression of mind, not one of its dross, rather it is a distillate of selective processes which, understood and absorbed, fall in an action that sees the architect increasingly mobilized in the categories of sensory perception, sensitivity, intellect, memory, and reactivity. For that, as for all the works of the mind, architecture is also a machine that can work or not work if it can instill a functional and aesthetic infinite in the user, a real mental short circuit, in which those who fall are pushed alone to benefit and wanting to benefit more and more. In this perspective, it is legitimate to ask oneself about the observations and considerations about what it means to do architecture today, and consequently, about the products of this doing. If an indisputable fact is linked to an ever greater spatial dispersion of works produced by an architect, to define this architect, and its location is less certain. If minds, spread and interconnected over the entire planet, want to establish themselves as a new kind of architect, their potentialities, possibilities and usefulness towards society must be understood in time. The latter is changing fast, and for this reason, it is ridiculous to believe that the architect is not involved in these changes. On the functioning of the combinatorial potentiality of the new communication systems and exchange of information and knowledge and the relative interaction that may be held, today an architectural firm can be conceived as an interconnected network. Something that does not have a precise physical location, but it is the sum of several places where the architect’s mind and consequently its cultural identity, are constantly revised, deformed, by the speed of access and interrelation to information and exchange, such that they are considered creations consistently supported and renewed by this huge network.

What is important, in the performed operation of interpretation, is the construction of a thought being used as a model of an authoritative reference, of which it preserves its memory, but simultaneously re-written, leaving traces of the past and still pointing to the expressive completeness of that thought.

To recall the original creative shaping that Aalto’s architecture has imposed on the matter is not an attempt to metamorphose him to suit oneself, giving rise to a new body in which the unfortunate intercepted protagonists appear as living traces, witnesses of an earlier state that has been irretrievably lost. What has been obtained from the Finnish master’s work is his own thinking, his own way of translating and interpreting a different world distant in time. The reflection that can be deduced about him is that of an author who worked in a delicate balance between tradition and innovation, between anxiety about the project and the emancipation from the models, but not from an echo and originality. He is an architect in relation to any architectural construction of any previous era to his own, beyond his likes and preferences.

Yet the biggest surprise is that which is represented by certain thoughts expressed by Aalto through speeches as well as through his works, including the signs which he inserted into his first library. There, and not only there, Aalto was shown as a lord of thoughts, a being overwhelming and eager towards his thinking the architecture, a secure identity of his doubts as the answers he does not know. However, regardless of so much mystery surrounding the art of design, he was always ready to dialogue with nature in accordance with procedures ranging from the mystical to the imaginative, and not be engulfed by the city. Nevertheless, it is misleading, in respect of an era and the entire Modern Movement, to consider Aalto an isolated hero in a nation so extreme in terms of location and climate. Aalto communicates a common feeling that can also be tracked down in other great masters with whom he shared the temporal space as well as often the space of ideas. From those great architects, there is much to gather, to learn a more correct orientation in the ways of a profession that is changing faster than it is possible to understand, but which will always have an unchanging base that will tie them all to a single indivisible unit.

Aalto, as many of the masters of the twentieth century, is a reference of his time and his space. This, without building altars for anyone but only looking within the limits of possibility, gave the guidelines towards which human society could move. However, like every intention, today to speak of definitive statements is misleading; time always has denied them, and today, mobility provides no opportunity to stabilize a framework enclosed by clear boundaries. The landscape is always a moved, if not a blurred, frame in which the profiles are in a moment perceived and immediately lost. It should identify the trajectory, and today it is definitely the most important parameter and an elusive one also for that. There are the instruments to locate it. Or must they be constructed? One suggestion is inside the funeral oration that Ludwig Mies van der Rohe uttered when Walter Gropius died (Mies van der Rohe, 2010: 303):

“It has been a favourable fortuity to permit Walter Gropius, near the end of his life, to be in Stuttgart, at the inauguration of the exhibition for the fiftieth anniversary of the Bauhaus, the school he founded that represented one of the most vital educa-
tional views in our epoch. Looking back the sixty years when I knew him as one of the most important architects in our time and as the greatest teacher, I’m impressed from the generosity of his spirit. The deviant forces of this century have been very powerful: disorder, competition, specialization and materialism. This situation never discouraged Gropius from finding unity in the multiplicity, it has never undermined his conviction that people can work more profitably collaborating rather than competing. The courage to pursue a course of collaboration and integration among efforts of many people was never lacking to him. He had the rare talent to join people.

As I said about him years ago, he has always been a brave fighter in the eternal struggle for new ideas. His participation in this struggle continued till the end of his long and productive life. These, for me, are the noblest inheritances that Gropius leaves to all of us.”

From that inheritance, specific questions and a consequent search for adequate answers can be extracted to plot future paths. If they have quality and if there are going to be good uses for them, they may also even be handed down. Therefore, the best that those masters have wanted to convey will not be betrayed, this time and even the architecture will not be betrayed.

ENDNOTES

1. From Greek ἱστορία (istoría) “a learning or knowing by inquiry”.

2. Manuel Castells is a Spanish sociologist especially associated with research on the information society, communication and globalization.

3. Albert-László Barabási is a Romanian-born Hungarian-American physicist, best known for his work and research on network theory.

4. Bert Vogelstein is a pioneer in the field of cancer genomics. His studies on colorectal cancers revealed that they result from the sequential accumulation of mutations in oncogenes and tumor suppressor genes. These studies now form the paradigm for much of modern cancer research.

5. Sir David Philip Lane is a British immunologist, molecular biologist and cancer researcher. He is best known for the discovery of p53, with Arnold J. Levine, one of the most important tumor suppressor genes.

6. Arnold J. Levine is an American Molecular biologist. He is best known for the discovery of p53, with Sir David Philip Lane. one of the most important tumor suppressor genes.

7. Pekka Himmanen is a Finnish philosopher.

8. Responsible for the office of architecture A-Konsultit Helsinki, established in 1962 along with his wife Gunnel Adlercreutz; already a collaborator of the architect Alvar Aalto. He was the foreign examiner in evaluating candidates for the position of Professor of Architecture at the Royal Swedish Academy of Arts in Stockholm in 1995. He has been Chairman of the Finnish Committee for the Restoration of Viipuri Library since 1994.

9. Secretary General and member of the Planning Committee of the Finnish group for the restoration of Viipuri Library since 1998.


11. He was Professor of Architecture at the Helsinki University of Technology (1991-1997), Dean of the Faculty of Architecture (1993-1996) and has taught at several universities in Europe, North and South America and Africa.

12. Term used by Castells in his trilogy The Information Age: Economy, Society and Culture (2009-10), which identifies the fact that the decisive activities in all areas of human practices are based on information technology, organized (globally) in informational networks whose center is information processing.

13. “Singapore is one of the most dynamic economies with double-digit growth for about ten years. There have been perhaps fewer people informed about that since 1989. The Republic developed an intense program of cultural investment, culminating in a 2002 report, Investing in Singapore’s Cultural Capital. It draws on culture as a function not merely of consumption, but to support creativity, innovation and quality of life. (http://portal.unesco.org/culture/en/files/40790/12705587795Cls_dev_strat_Annex1.1.pdf/CIs_dev_strat_Annex1.1.pdf).

In 2008, Singapore was published in the world as the Global City of the Arts with explicit references to the Italian Renaissance. Its spectacular art museums, history, and science, as well as the intense cultural production and investment in education and research make this city-state one of the liveliest cultural pres-
ences not only in the Asian world, but on an international scale.” Gilberto Corbellini, La conoscenza ci libera dal pizzo, Sole 24 Ore Domenica, 26 February 2012:25.

14. from Old French prudence (13c.) and directly from Latin prudential “a foreseeing, foresight, sagacity, practical judgment,” contraction of providential "foresight".
15. Reminder of the meeting of June 1, 1939, preserved in the William W. Wurster Archive, Berkeley, California, USA.
18. The answers were extrapolated from a dialogue held with the architect Kairamo in the office of Alvar Aalto in Tiilimäki 20, Munkkiniemi, 00330 Helsinki, on 2012.10.9.

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Author(s):

Marco Bruno
Department of Architecture | Faculty of Architecture
Middle East Technical University
Dumlupınar Bulvarı, No: 1, 06800 Ankara, Turkey
E-mail: mbruno@metu.edu.tr
marca.bruno@tiscali.it
1.0 INTRODUCTION

Throughout history, humankind’s interaction with nature had disruptive impacts on nature due to energy production, creating artificial landscapes, constructing buildings, mining, etc. The pressure on natural environments and disrupting ecosystems have been increased recently. Our consumption has exceeded the natural environments’ ability to rebuild themselves and their resources. Each organism is dependent on the environment for meeting their needs. The secret of life and lasting of every creature depends on harmony and conformity between its temperament and the temperament of the natural environment.

In addition, architecture has an important responsibility to the city ecosystem. Since part of the problem is related to architectural issues, so the solution can be addressed through designs based on sustainable and ecological principles; using advanced green technologies and materials; and investigating high performance buildings (ATTMAN 2010) or even high-rise buildings which the need for such buildings increases by the time. As population grows, societies have to choose constructing high-rise buildings as a solution. The important fact in ecosystem is energy and energy usage (YEANG AND LLEWELYN 2008).

High-rise buildings consume high amounts of energy. Because of the scale, purpose and height of these buildings, they are dominant elements in cities. So many architects believe that this type of buildings are more threatening to the environment than air pollution, so they noticed that green architecture is a solution to address such kinds of problems (NAVAEI 2015). In environmental perspective, the main subject in high-rise buildings is ecological design or design with nature. In this perspective, designers should put nature as their preference and consider that built environment depends on it. This relationship is called continuity. The main principle of ecological design is to understand the relationship between live and non-lived elements in nature. More precisely, ecological design is a beneficial integration between human and nature. While such kinds of activities have effects not only on natural environments, but also on next generations by reaching maintenance of environment and
1.1 State the Problem
By increasing population and its consequences, vertically development of cities seems the best solution for this problem which will change the urban design methods. Due to the importance of environmental issues, ecological architecture affects our present and future designs. It should be mentioned that in sustainable designs, this vertical development will be effective (Navaei 2015). Today there would be no worries about environment, if the inner structure of a building and its exterior interactions act like a natural organism. The power of nature in reconstruction and rehabilitation is the most important feature that can be used in ecological design. So we can reach an ecosystem in scale of a building which imitates nature in all its aspects. The necessity of this subject should not be neglected, but must be paid attention to it to be solved by proposing such kinds of strategies for designing ecological buildings.

1.2 Research Goals
In architecture there are many trends and approaches aimed at solving environmental problems and make a balance between built and natural environment. It is obvious that each building should be able to communicate with its surrounding environment. According to the most considerable subjects and to reach these sub subjects, the basic goals of this research can be:

What are the ecological design principles in architecture?

How can ecological high-rise buildings increase the ecological capacity of a region?

1.3 Research Method
Ecological high-rise buildings belong to an emerging area of design research in which the environmental impacts of the building and issues of sustainability influence all parts of a high-rise building (Howeler 2003).

In order to reach and design ecological high-rise buildings, the structure of this research is basically formed on two terms: ecological design and high-rise buildings. Mainly, the role of ecological design is to demonstrate how ecological properties affect buildings, residents and environment. But before these terms being matched together, the term ecological design should be expanded and defined by ecosystem and the effects of human and building on it and natural environment. Ecological architecture consider architecture as a live organism that builds an appropriate environment for human living which is another live organism and gives identification to the built environment, although it uses the most advanced design and implementation techniques, but it is completely related to the traditional architecture principles.

By considering these two terms we achieve ecological design principles and by getting these principles into design process of high-rise buildings we can achieve ecological high-rise buildings (see Figure 1).

1.4 Research Structure
Research structure consists of four main subjects including: ecology, ecosystem, high-rise buildings, ecological design and its principles of ecological high-rise buildings. After defining these concepts, architectural ecology and ecological architecture are introduced to reach the term ecological design and its principles.

Next step is introducing ecological high-rise buildings all around the world and the analysis of their design concepts and strategies. After analysis and introducing constructed or even future case studies, the results are released (see Figure 2).

2.0 ECOLOGICAL LITERACY
2.1 Ecology
Ecology by itself is clear enough to be understood, as it is the science of the relationship between all living organisms and their surroundings, but things get vague when the term is applied to buildings. Nevertheless it implies a connection to the global environmental movement that began to coalesce in the late 1960s as part of the social upheavals associated with that period (Steele 2005).

A basic definition of ecology is “the study of the relationships and interactions between living organisms and their natural or developed environment.” Ecology is about relationships, but not all of them, just those which are between organisms or organisms and their environment. Environment may
be “natural” or “developed.” Ecology includes the whole environment and its various systems (ANTHONY 2004).

2.2 Ecosystem and Natural Environment
Ecosystem is a kind of natural unit, which includes plants, animals, and micro-organisms in as a complex which work together, along with the nonliving factors in that complex. This term was first published by Sir ARTHUR GEORGE TANSLEY (1871-1955) and then extended by EUGENE P ODUM (1913-2002). An ecosystem is not a single unified entity, with an exact size. A single lake, a neighborhood, a region, etc. can be ecosystems (see Figure 3) (MILLENNIUM ECOSYSTEM ASSESSMENT 2005). Therefore, an ecosystem can be as large as the entire globe, or as small as a city or a building (see Figure 4). Most ecosystems are autotrophic, which means that they capture sufficient energy to support their own requirements (ATTMAN 2010).

Through a self-regulating cycle and feedback loops, the different parts of an ecosystem are related to each other. If one part of an ecosystem is removed or disrupted, there are ripple effects throughout the system (CHAPIN ET AL. 2004, PONTING 2007, KRAPIVIN AND VAROTSOS 2008, OSTFELD, KEESEING AND EVINER 2008).

2.3 Human and Building Effects on Ecosystems and Natural Environment
Today the disruption of ecosystems is much greater and more harmful than the past due to our effects on natural environment. According to the 2005 Millennium Ecosystem Assessment (MEA) study, the health of the world’s ecosystems is in significant decline (MILLENNIUM ECOSYSTEM ASSESSMENT 2005). The Ecological Footprint, a conservative measure of natural resource consumption, calculates the total amount of land the world’s countries need to produce the resources they use to absorb the waste generated from energy used, and to provide space for infrastructure (WWF 2008). According to this source, man has exceeded the earth’s ecological capacity,
and we have been living beyond our means since 1987 (see Figure 5).

3.0 ECOLOGICAL DESIGN
3.1 Design with Nature
When human chose caves to live and built his house from trees, woods and foliage, the relationship between nature and architecture began (PROTOGHEZI 2006). The different architect’s view at the nature is different from others, and also getting inspiration from nature is different (FEIZABADI et al. 2015). JOAN TORRAS says: “the next generations of architects are going to create buildings by getting inspiration from nature, since it is more rational, durable and efficient” (SENOSIAN 2003).

Designing with nature is a solution to decrease harmful effects by attending to the preconditions of health. It indicates that the best ecological solutions make the best life’s own patterns of health (RYN AND COWAN, 2007).

Nature proposes many solutions leading to the architectural creation and is the best source of inspiration. So one of the approaches in design is to get inspiration from nature or designing with nature (FEIZABADI ET AL. 2015).

Designing with nature proposes an interaction with nature which is beneficial to both people and ecosystems. Our existence comes from nature and nature continues in human. We face an interesting ambiguity of “multiple perspectives, of design as pattern, of ourselves as nature’s designer and nature’s designs.” (OYAMA 2000). This indicates that ecological design is our engagement with nature which indicates nature’s main integrities and that can find a new context for design with them (RYN AND COWAN 2007).

3.2 Ecological Architecture
“Ecological architecture” is about relationships between buildings, surrounding environment, occupants, cities, and the global ecosystem. The term is used generally as a framework to describe multilevel ecological building design and its balance with nature which is established by three components (see Table 1) (ATTMAN 2010).

<table>
<thead>
<tr>
<th>Elements</th>
<th>Resources</th>
<th>Environment</th>
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<tbody>
<tr>
<td>Durable</td>
<td>On-site energy</td>
<td>Healthy</td>
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<td>Economical</td>
<td>Cost-effective</td>
<td>Habitable</td>
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<td>Low maintenance</td>
<td>Accessibility</td>
<td>Social/institutional capacity</td>
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<tr>
<td>Recyclable</td>
<td>Natural forces</td>
<td>Safety and security</td>
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Table 1. Components for Ecological Architecture (ATTMAN 2010).

1. Ecological elements (technological and material)
2. Resource ecology
3. Environmental ecology

3.3 Ecological Design
Ecological design is related to an ecosystem or bioregion, it is the relationship with nature’s cycles and also it adapts to them. It proceeds from considerations of health and wholeness, and tests its solutions with a careful accounting of their full environmental impacts. The ecological design goal is to regenerate the world which is wounded by intensive design (RYN AND COWAN 2007).

Ecological design is the best solution to integrate human and nature’s elements, components and cycles. First of all, it finds the richest possibilities of the context and then gives solutions and strategies which are fully matched with the cultural context. Ecological design proposes natural solutions by taking the background of the site as an initial factor and it celebrates the flow of water on the landscape, the rushing wind, the fertility of the earth, the plurality of species, and the rhythms of the sun, moon, and tides.

4.1 Principles of Ecological Design
In order to build the best relationship between ecology and design, we should exactly imitate nature’s deep interconnections in our design. We remain in mechanical life and mechanical styles. Now it is the time to stop mechanical designing and to start to design by getting inspiration from nature.

Ecological design integrates built environmental systems and natural systems. So ecological design uses a set of principles for environmental design in order to maintain a coordination between nature and buildings (FEIZI ET AL. 2014). Figure 6 is
Increasing ecological capacity by designing ecological high-rise buildings.

The ecological design is a study of relationships and interactions between human and built environment to reach the integration of our current life and natural environment. It should be used in the fields of environment including: land use planning, building design, oriented production, energy systems, transportation, conservation, agriculture and forestry. Pay attention that ecological design and its principles are not regular and permanent and they are dependent on site and its use which is related to the architect or designer’s view (FEIZI ET AL. 2014).

DAVID ORR describes ecological design as:

“... Ecological problems are in many ways design problems: our cities, cars, houses, and technologies often do not fit in the biosphere. Ecological design requires the ability to comprehend patterns that connect, which means looking beyond the boxes we call disciplines to see things in their larger context. Ecological design is the careful meshing of human purposes with the larger patterns and flows of the natural world …” (ORR 1992).

Ecological design is an integration of new science of complex systems like self-organization and fractal geometry. It must be based on the term “ecosystem” which is completely described above. Table 2 describes characteristics of ecological design.

4.0 FINDINGS
4.1 High-Rise Buildings

Before introducing the ecological high-rise buildings and the concepts and strategies which are used in designing process, we should describe high-rise building as a term in different perspectives.

<table>
<thead>
<tr>
<th>Ecological Principles</th>
<th>Issue</th>
<th>Ecological Design</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Sensitivity to ecological context</td>
<td>The design is related to ecological factors of the place. the strategies come from this.</td>
<td></td>
</tr>
<tr>
<td>2. Sensitivity to cultural context</td>
<td>The design relates to historical knowledge of the place and local materials. it gives continuity.</td>
<td></td>
</tr>
<tr>
<td>3. Adaptation</td>
<td>The design adapts to changes in the environment and culture.</td>
<td></td>
</tr>
<tr>
<td>4. Nest of reference</td>
<td>Using commonly applicable in very optimal times.</td>
<td></td>
</tr>
<tr>
<td>5. Ecological accounting</td>
<td>Covering all the life cycle of the designed project. it gives a variety of materials.</td>
<td></td>
</tr>
<tr>
<td>6. Design criteria</td>
<td>Ecosystem and human need. ecological</td>
<td></td>
</tr>
<tr>
<td>7. Ecology and resilience</td>
<td>Make it compatible.</td>
<td></td>
</tr>
<tr>
<td>8. Energy supply</td>
<td>Using renewable energy source, waste, small-scale hydro, geothermal,</td>
<td></td>
</tr>
<tr>
<td>9. Materials use</td>
<td>Using recycled, reusable, renewable, durable and flexible materials which are in a system for years or used for the next.</td>
<td></td>
</tr>
<tr>
<td>10. Biographical and cultural identity</td>
<td>Maintaining the local culture and biodiversity and ecosystems that support them.</td>
<td></td>
</tr>
<tr>
<td>11. Relationship</td>
<td>Nature as an essential natural intelligence in designing buildings which is market when is needed and possible.</td>
<td></td>
</tr>
<tr>
<td>12. Response to sustainability crisis</td>
<td>Regenerating human and ecological health by seeking for practices that potentially make them sustainable.</td>
<td></td>
</tr>
<tr>
<td>13. Whole spaces</td>
<td>Act with whole systems. designing to reach the physical, cultural, and social relevance.</td>
<td></td>
</tr>
<tr>
<td>14. Knowledge base</td>
<td>Integration expanded and collaborative change of knowledge.</td>
<td></td>
</tr>
<tr>
<td>15. Level of participation</td>
<td>A query for curiosity, discussion, and reflection.</td>
<td></td>
</tr>
<tr>
<td>16. Spatial scale</td>
<td>Integrate multiple scales in designs.</td>
<td></td>
</tr>
<tr>
<td>17. Unchanging properties</td>
<td>Change, change, participation.</td>
<td></td>
</tr>
<tr>
<td>18. Types of housing</td>
<td>The integration of technology and nature is visible. The design helps to be in systems which integrate.</td>
<td></td>
</tr>
</tbody>
</table>

Table 2. Characteristics of Ecological Design (Authors)

MOUSAVI (2015) quoted from council on tall buildings and urban habitat America (CTBUH) says:

“There is no absolute definition of what constitutes a "tall building.” It is a building that exhibits some element of “tallness” in one or more of the following categories: a) Height Relative to Context b) Proportion c) Tall Building Technologies” (MOUSAVI 2015).

These days, “Buildings are the main destination for the nation’s power supplies and hence the main sources of carbon dioxide emissions” (PANK ET AL. 2002). High-rise buildings are inevitable types of our city buildings. On the other hand, because of the effective use of high-rise buildings in limitation of land, the necessity of this type of buildings is more than ever (YEANG 1999).
We can also mention that from both financial and professional aspects, developing high-rise buildings give a chance for sustainable designs and sustainable technologies to be used widely, which can also lead in the higher use of this design approach for other types of building (WOOD 2015).

### 4.2 Ecological High-Rise Buildings

Because of the scale and the extreme amount of material and energy usage, constructing ecological design and sustainable high-rise buildings are in fact more serious than other common buildings (YEANG 1999; FRACASTORO AND SERRANO 2010). In addition,

<table>
<thead>
<tr>
<th>Location</th>
<th>Architects</th>
<th>Function</th>
<th>Completed</th>
<th>Height</th>
<th>Stories</th>
<th>Information</th>
<th>Concepts</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>West End</td>
<td>Boeri Studio</td>
<td>Residential</td>
<td>2014</td>
<td>111 m &amp; 76 m</td>
<td>18 &amp; 22</td>
<td>Creating biodiversity in the city,</td>
<td>Creating new ecosystems by using vegetation,</td>
<td>Replacing traditional materials with complex of forms and plants with different colors which changes each season.</td>
</tr>
<tr>
<td>Boston</td>
<td>Foster &amp; Partners</td>
<td>Office &amp; Apartments</td>
<td>2016</td>
<td>182 m</td>
<td>48</td>
<td>Bringing garden in city.</td>
<td>Creating natural life and developing natural regions in high density in an urban context,</td>
<td>Plants acts like a filter by absorbing dust, reducing pollution, producing BODC, Carbon Sequestration, heat and increasing humidity which get balanced by transpiration of plants.</td>
</tr>
<tr>
<td>Beach Road Towers</td>
<td>Jean Nouvel</td>
<td>Mixed Use Tower</td>
<td>2014</td>
<td>117 m</td>
<td>34</td>
<td>A best integration of architecture and nature.</td>
<td>Be a symbol of green life,</td>
<td>A best combination of environmental strategies.</td>
</tr>
<tr>
<td>On Cesar Pelli</td>
<td>Pelli Clarke Pelli</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>An integration of natural world with city.</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 3/1: Constructed Ecological High-Rise Buildings Around the World (Authors).
high-rise buildings are a good choice for recycling and maintaining resources. Therefore, designing high-rise buildings is a difficult and complicated work and needs more experience.

Recent researches about environmental issues, have prompted high-rise buildings that use some strategies to save energy, decrease buildings’ effects on their surrounding environment, and make sure that all the materials which are used in the buildings are recyclable. Obviously the future of architecture will be involved with unification of architectural design and environmental concerns. Ecological high-rise buildings refer to an appearing area of design research in which the environmental effect of the buildings and sustainable issues affect every scale and system of a high-rise building (HOWELER 2003).
According to these topics and issues, and the right description of the subject literacy, this paper wants to introduce some of the ecological high-rise buildings around the world in detail, by defining each of their concepts and strategies to act as an ecological high-rise building. What is obvious in each project, is that they used at least one or more than one principles of ecological design in their concepts by utilizing characteristics and design strategies, and all important issues of ecological design are taken into account, as mentioned above in Table 2.

<table>
<thead>
<tr>
<th>Project No.</th>
<th>Information</th>
<th>Concepts</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 Jung Le</td>
<td>Architects: Vincent Callebaut + Arnaud Martinez + Maguy Delhouso + Location: Master Plan for the Central Waterfront, Hong Kong</td>
<td>To re-tame the nature and to widen the territory of the ultra-modern city. Rehabilitation of the urban landscape and its development on Central Waterfront. Improve the real estate availability by using ecological design. and more energies.</td>
<td>Using irregular cells as a mesh which enables the water to infiltrate in the deepest of the existing urban fabric and its hollow teeth to the Tamara Site overriding the Tum Wo Lane. It is a new ecosystem matched to the networks that will progressively set up embracing from East to West.</td>
</tr>
<tr>
<td>2.0 Les Etoiles</td>
<td>Architects: Vincent Callebaut + RESCUBIAK (Benoit Partner and Marco Conti Silva) + Aurelie Cottin</td>
<td>Adding spaces like exposures in an ecological high-rise building. Make an interface and relationships between future and past by creating a new view to architectural landscape and the city.</td>
<td>This ecological tower is part of the environment movement, using renewable energies in all parts of the project.</td>
</tr>
<tr>
<td>3.0 Forest</td>
<td>Architects: MAD Ltd</td>
<td>The incorporation of nature into the extreme density of the city in future to extract the sympathy for nature once lost in the oriental ancient world and to bring it to the new city dwellers. Inspring from nature and the man-made in Eastern Philosophy, with nature. Inspiring from mountain chain by shifting in a dynamic and yet holistic rhythm, and becomes a continuation of nature.</td>
<td>It is made up of curved, abstracted shaped floors which have been layered slightly off-center from one another to give the facade seem organic as it rises up into the sky. Protecting each level's interior by full length glass windows with a see-through, wrap around terraces which makes the building transparent and the floors almost look like they are floating on top of one another. Providing expansive views to the city by the full length glass windows.</td>
</tr>
</tbody>
</table>

Table 3 is about some projects which are constructed until now or those which are under construction and Table 4 is introducing the projects which are just designed and not have been constructed but can have an important role to increase and expand ecological high-rise building design in future.

5.0 CONCLUSIONS
As time passes, our pressure on nature and ecosystems is getting more and more. Man has exceeded the capacity of the natural environment and has con-
Table 4/2. Future Ecological High-Rise Buildings (Authors).

| Tower | Architects | Locations | Function | Date/Design | Height | Stories | Increasing biodiversity and rehabilitate the local ecosystem in Singapore’s ‘zeroculture’ metropolis. | Revitalize the site where the natural ecosystem was completely disrupted. | Using photovoltaic panels that meet about 39.7% of the building’s energy needs. | Using natural ventilation. | Using biogas generation plant all wrapped within an insulating living wall that covers half of its surface area. | Estimating 55% self-sufficiency by collecting rainwater and using a grey-water system for both plant irrigation and toilet flushing. | Using recyclable materials, and a centralized recycling system which is accessible from each floor. | Designing well-planted facades and vegetated-terraces which have green areas that approximate the gross useable-areas. |
|-------|------------|-----------|----------|-------------|--------|---------|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|
| EDIT T Tower | T.R. Hamzah & Ken Yeang | Singapore | Exhibition Tower | 1998 (Competition design) | 112 m | 26 | - An organic order which can be interpreted as chaotic according to people. | - Inspired by nature and sustainability and mental health. | - Vertical gardens and yards. | - Use plants and vegetation in traces. | - A system of voronoi pattern is used to shape the glass cube as a symbol, indicating growth and evolve. |
| Chaotic Tower | Mahmoud Feizabadi, Marjam Moradi, Farnaz Gohabadi | Mashhad, Iran | Residential | 2015 | 140 m | 33 | - A figure of the human body. | - A green view to the city. | - Specify green yards for each office story. | - Using a shell for the core of tower by inspiration of the Islamic geometry. | - Using turbines at the gravity center of the tower for optimization of the wind energy and energy usage. |
| X Tower | Mahmoud Feizabadi, Maryam Ardakani | Mashhad, Iran | Residential | 2015 | 150 m | 33 | - making city live by designing such a river valley in center of the city. | - Passing nature through the building. | - Vertical gardens. | - Use plants and vegetation in traces. | - Having waterfall form the last story to the ground level. | - Different size of traces for making public spaces. | - Stories shaped layer by layer. |
| Stream Tower | Mahmoud Feizabadi, Mina Moayedl, Reyhane Shahabadi | Mashhad, Iran | Residential | 2015 | 146 m | 40 | - Using photovoltaic panels that meet about 39.7% of the building’s energy needs. | Using natural ventilation. | Using biogas generation plant all wrapped within an insulating living wall that covers half of its surface area. | Estimating 55% self-sufficiency by collecting rainwater and using a grey-water system for both plant irrigation and toilet flushing. | Using recyclable materials, and a centralized recycling system which is accessible from each floor. | Designing well-planted facades and vegetated-terraces which have green areas that approximate the gross useable-areas. |

sumed much more than its ability. According to population growth and lack of land in order to colonize more people in a region, the need to build high-rise buildings is undeniable.

On the other hand, a view at ecological capacity of a region can comprehensively identify the condition of that region. By colonizing too many people in a region, ecological capacity for each person decreases, and should be compensated for each person, while the secret of lasting of each ecosystem and organism is dependent on its relation with natural
Throughout this matter, architecture has a significant responsibility to protect and maintain all ecosystems or even city ecosystems, so the solution maybe the ecological design. Ecological design is the best solution in designing for meeting the occupant’s needs. It is unification of built environment with natural environment. It should be used in fields of environment including: land use planning, building design, oriented production, energy systems, transportation, conservation, agriculture, forestry and urban design. Ecological design is using principles for built environmental design and life style. There are five principles that help us to think about the integration of ecology and design.

High-rise buildings which are the best solution for colonizing more people in limited lands can change the city skyline effectively in order to compensate the lack of land and space for living. In environmental perspective, designers should consider nature as an active system which built environment is dependent on it. By choosing this type of building as the solution of the issues of population and using ecological principles and design strategies we can vertically increase the ecological capacity in a region, which not only disrupt the natural ecosystem, but also act like a sustainable ecosystem. This can be achieved by the name: ecological high-rise buildings (see Figure 7).

**Figure 7. Increasing Ecological Capacity of a Region by Designing Ecological High-Rise Buildings (Authors).**
Increasing ecological capacity by designing ecological high rise buildings.

Author(s):

Talie Tohidi Moghadam,
Master Student Faculty of Architecture,
Urbanism and Islamic Art, Ferdowsi University of Mashhad, Iran
E-mail: talie.tohidi@stu.um.ac.ir

Mahmoud Feizabadi,
Faculty of Architecture, Urbanism and Islamic Art, Ferdowsi University of Mashhad, Iran
E-mail: feizabadi@um.ac.ir


Author(s):

Talie Tohidi Moghadam,
Master Student Faculty of Architecture,
Urbanism and Islamic Art, Ferdowsi University of Mashhad, Iran
E-mail: talie.tohidi@stu.um.ac.ir

Mahmoud Feizabadi,
Faculty of Architecture, Urbanism and Islamic Art, Ferdowsi University of Mashhad, Iran
E-mail: feizabadi@um.ac.ir


FLASh CARD SET AS REHEARSE TOOL FOR ARCHITECTURE STUDENTS.

Badiossadat Hassanpour, Adi Irfan Che-Ani, Nil Paşaoğluları Şahin, Alireza Tabrizi

Abstract
The main goal of architectural education is to increase the independency level of students in finding design solutions throughout their academic years. Despite numerous educational attempts, the lack of supplementary educational methods or tools is still acknowledged by scholars. The present study aims to help students undergo a smooth transition from being highly dependent to minimally dependent on instructors by developing an auxiliary tool that may be used together with critique sessions in design studios. In this study, the critical stages in the design process adopted by students are identified through interviews with instructors and questionnaires for architecture students at Eastern Mediterranean University (EMU) in Cyprus and Universiti Kebangsaan Malaysia (UKM). Basic theories are aligned with the needs and expectations of the chosen case studies to develop a user-friendly model in flash card format. The data analyses show that students and tutors all agree on the two main critical stages of design, namely data analysis and data development (synthesis) which ends with idea simulation. The developed model and the proposed flash cards attempt to connect these critical stages, which are usually skipped by students. Results show that students need to adopt and be equipped with sequences, priorities and creativity techniques in each step of the design process, and the proposed flash cards can help address this concern.

Keywords: Architectural Education; Students’ Design Pattern; Independent Learning; Design Auxiliary Model; Flash Card

Introduction
The salient feature of an architectural design studio lies in the employed learning methods, which are rooted in experiential learning or learning by doing approach in solving design problems (Biggs 1999). As it was described by Donald Schön (1987) “...design studio teaching in architecture as a ‘practicum’—a setting designed for the task of learning a practice”. Furthermore, the problem solving activity as an activity in education and practice was used by Schön (1987) as an exemplar of how reflection-in-action operates. Cowan (1998) identified three types of reflections that can contribute to learning and development:

- Students can reflect before an activity starts
- Students can reflect whilst an activity is ongoing
- Students can reflect after an activity and before proceeding to the next activity.

Design actions can be perceived as the reasoning derived from a set of needs, requirements and purposes meant to be realised and involve physical configuration and intended use (Dorst 1997). This reasoning process is non-deductive; no ‘closed pattern’ of reasoning associates needs, requirements and purposes with a certain product form. Open design problems were considered by Rittel and Webber (1973) as ill-posed problems, in which information is unclear or the number of variables is indeterminate. Alexander suggested that designers should categorise the various aspects of the problem, identify incompatible variables and place problems in a discipline to overcome the complexity of problems. He introduced the concepts of self-conscious and unself-conscious design skill. In the unself-conscious design skill, a similar form is repeatedly used to master the creation of such form; thus, people only need to learn how to repeat a physical pattern by duplication and modification. By contrast, new ideas and subjects play an important role in the self-conscious design skill (Alexander 1964).

In architecture, which is a teachable discipline, the self-conscious design skill is an opportunity to depart from traditions and demonstrate individualism in controlling the design process (Elsheshawy 2001; Lapadula & Cquiroga 2012).

Developing a personal understanding from experience requires students to reflect on their experiences resulting from action consciously and systematically (Brockbank & Mc Gill 1998). Succeeding studies on higher education learning towards the development of a desired consciousness amongst architecture students show that what a student does is actually
more important in determining what the student has learned than what the teacher does (Shuell 1986). The project review is a form of teaching for decades at schools of architecture and the continuity of this historical teaching form seems that in the past it has been a successful mode of transmitting the knowledge and skills of the architect to the next generation of the profession (Wilkin 2005). Reflective practice indicated as one of the most helpful methods students could utilize to strengthen their understandings and should be an integral part of the students’ design process (Coorey 2012). However, in some instances a tutor’s critiques, which aim to develop and improve self-conscious design skills, may result in overreliance on tutors. In the long run, such overreliance turns architecture students into draftsmen. The development of autonomy in architecture students requires learning not only how to judge one’s personal product but also how to evaluate and improve on one’s personal learning process. During their education students must also learn how to learn and take responsibility for their own learning throughout their life; identifying the existence of new information, accessing it and judging whether it is good and useful should also be known. When students work independently in a studio environment in relative freedom seem to be an ideal situation to develop lifelong learning skills. It is not easy to fully realise the development of self-reliance; but the studio programmes could be structured consciously to lead students from dependence to independence in learning. As Hammett & Hersrud (2012) pointed out, student should not be the recipient of knowledge from an authority in the case of developing self-responsibility (Hammett & Hersrus 2012). They should be encouraged to experiment, not taught how to do things in the conventional way (Wood 2005).

The primary objective of design education needs to be the development of process related skills as highlighted by Tschimmel (2011). Therefore, the decision making process is the main educational platform, and tutors are currently attempting to monitor this process by providing critiques and helping students learn the correct manner of designing by seeking alternative ways to achieve goals explicitly. McKeachie (1992) states that, “it is important to make learning understandable in order to facilitate learning. Accordingly, the teacher should help ‘to bridge the gap between the structures of the discipline and structure in the students’ minds’. Thus, engaging students in active dialogue around learning with necessary learning materials is essential. A repertoire of tasks and strategies are needed that will facilitate and involve students in active processing (for example discussion, debate, questioning, explaining) so that they transform, translate and own the learning as personal knowledge” (McKaechie 1992). Nevertheless, one could see that management of learning is students’ own responsibility. Regular opportunities could be provided students to reflect on their own learning such as to monitor and evaluate their own processes of working – regular reflection, self-monitoring or self-evaluation - that are crucial to the development of self-responsibility. Furthermore, as Nelson & Stolterman (2012) points out, the more a designer understands the nature of design, he or she can deal with the responsibility of design. Good understanding of design is stated as the first step towards developing a mature design character; reflecting on responsibility is one way of better understanding design (Nelson & Stolterman 2012). Since design problems are ill-defined, unspecific or unknown; it is difficult for students to forecast what issues would emerge and what knowledge is required for the design process since they typically do not have an adequate body of design knowledge when they start designing (Goel & Pirolli 1992). However, most architecture students are still impressed by unique ideas, believing that the starting point of any architectural product is solely creativity and ideas come by revelation. Thus, whatever the function is and wherever the site is, this method is adopted for creating unique products. This prevailing misconception shows the serious need for students to step back from design project activities to realise how to start a design project and advance thereafter.

Several theoretical studies on design approaches are all based on the two well-known design methods presented by Alexander (1964) and Schön (1987); however, the presented theories has rarely been aligned to the real expectations, needs and concerns of architectural design studios (Wilkin 2005).

Alexander and Schön are the two most cited scholars in the architectural education field. They attempted to determine how steps can be taken and how to control these steps to produce the final product. Their proposed methods have been accepted and used as the most adaptable and supportive design theories and methods. These methods can be aligned to design studio critiques and enable easy and better acquisition of high-level designing skills (Wilkin 2005).

Alexander’s theory (1964) asserts that form is a significant part of design and needs to fit the design context. In his proposed design pattern, the misfit variables are regrouped, solution to each of these groups is developed, and these solution groups are combined into a new whole.

Schön introduced 12 normative domains, namely programme/use, siting, building elements, organisation of the space, form, structure and technology, scale, cost, building character, precedent, presentation and explanation Schön (1987).

Instructors do know and employ these methods, whereas students simply over-rely on the comments and suggestions of their design tutors on what
students to help them better control and manage their flash cards that may be used in second-year design development. A more reliable and user-friendly model in this study also aims to evaluate the exigencies in the design process and complement the strengths of the theories (models of Schön and Fakhra). This study also aims to develop a more reliable and user-friendly model in flash cards that may be used from second-year design students to help them better control and manage their

2 Methods and Material

A common design process that students need to follow should be set to design an auxiliary supportive tool that is efficient and adapted to the real situation in architectural design studios.

Department of Architecture at EMU was selected as case study area to identify the most skipped decision making parameters by students in the architectural design studios. EMU is an institute aiming for high-quality education and is an accredited institution by NAAB (National Architectural Accrediting Board). Department of Architecture at Faculty of Engineering and Built environment at UKM was selected as the second case. The National University of Malaysia (UKM) is among recognized architecture school in Malaysia by the Board of Architect, Malaysia. The uniqueness of UKM Architecture, among others is the teaching and learning approach, which is not rigid and always open to experiment any new invention in teaching methodologies; and flash card for studio learning is one of it.

In the first phase of this study semi structured interviews were conducted with 32 design studio instructors (20 from EMU & 12 from UKM) who had experience in teaching design studios more than 5 years from named cases, in order to understand the

Figure 1. Structure of Study phases
concerns, attitudes, experiences and approaches in relation to the design approach followed in the architectural design studios (Figure 1). The interviews took the form of a conversation, creating a participant-led interview process. Questions were around followed design strategies in their studio, how operationally that model is adapted to their semester calendars, students’ performances and results in general and particular submissions, critical sessions or either stages they faced with. All responses to questions were tape recorded and transcribed at a later date. The results are based primarily on the content analysis and the interpretations by authors to find common categories of answers, and a brief summation of the range of answers.

In addition, questionnaires were distributed amongst third and fourth year students in architectural design studios (Spring 2015) and 67 questionnaires were returned out of 97. This selection was based on aforementioned level of dependency students’ of these studio levels have. To understand how students are starting, controlling and revising their design decisions, a questionnaire contained three questions distributed.

A consensus was found amongst all the interviewed instructors about the implemented design approach which comprises the following sequential steps: (1) site analysis (2); synthesis; (3) First proposal; and revisiting and revising the determined product could be limited to the submission time. Studying project spatial requirement, earlier similar projects, review site information including building survey would be carried out in tandem. They added that the compatibility between context and form is one of the main elements in the first two years of education. The form extraction from the ground and other issues side relation in the proposed form, cantilever use, face to face, pull-ups, tension position, inside and outside relation in the proposed form, cantilever use, form extraction from the ground and other issues learned during the first two years of education.

One of the instructors asserted that students at EMU are asked to prepare a SWOT analysis table immediately after a site analysis; however, the analysis results of the students are erroneous most of the time. A majority of the instructors suggested that conducting the analysis and creating a SWOT analysis table with teachers was a better option for students, and that students might even be forced to record information in one sheet. According to one of the interviewees, this approach ‘provides an opportunity for students to collect all the information and be more aware of the analysis and synthesis’ (Interview). The instructors mentioned that, beyond creativity, functional organisation and layout orientation are important in conceptual design, and both elements may be derived from the prepared SWOT analysis table and research. The orientation of the buildings should be analysed based on various factors, such as climatic condition, sun direction, wind and main pedestrian access (Interview).

The vital role of basic design principles is repeatedly mentioned by instructors. However, according to them, students tend to dismiss the importance of these principles and apply these basics to form making; as a result, students fail to design according to these principles (Interview).

Reminding students the basic design principles and tools can help students integrate geometries and produce creative forms based on the previously conducted logical analysis. These principles and tools are as follows: order, solid and void relation, alignment (how lines follow each other), similarity, grouping the forms, balance (symmetric, asymmetric and radial), proportion and scale, unity (establishing common language), dominance (focal point and emphasis), hierarchy, transformation, subtractive and additive forms and exaggeration.

As regards form organization, students should remember grid, radial, cluster, urban and linear forms, as well as the relation between these forms, including face to face, pull-ups, tension position, inside and outside relation in the proposed form, cantilever use, form extraction from the ground and other issues learned during the first two years of education.

One of the instructors mentioned that these tools are employed in the upper design levels wherein data analysis is integrated with form making; however, students forget these design tools in upper design levels. Consequently, they are unable to design properly. Thus, developing a tool to force students to remember these tools in every step of their decision making can be helpful’ (Interview).
Questionnaires were distributed amongst senior architecture students of EMU in the spring semester of 2014–2015. Out of the 97 distributed questionnaires, 67 were returned. Responses to the question “How you are asked to start designing the given project?” are indicated in Figure 2, 46 people out of 67 pointed to site analysis & case study as first actions toward the design. 4 people only referred to conceptual design and 7 people selected only case study and 10 people only site analysis.

As shown in Figure 3, forty nine percentages of students implied that they are using only case studies as main factor before first proposal, while twenty one percent of them mentioned about revelation, ten percent synthesis and twenty percent site analysis information.

Students were asked to respond “How are you re-visiting your proposal before studio critique of coming session?” Sixty three students believed they only rely on tutor comment, 24 percent peer review, and 10 percent referring to synthesis and site analysis and 3 percent revelation or studying similar cases (Figure 4).

These findings from instructors and students reveals providing the necessary supportive method to guide students in their designing would be helpful. Theoretical development is necessary to develop an applicable and user-friendly flash card set. Alexander (1964) emphasized that logic enables a designer to create a picture of reality, harness their creativity in creating these pictures and generate a new part of reality. However, he mentioned that no physical form could be established unless the designer creates a readable programme in his mind. Programming the design based on studies and conducted interviews begins with the context, which is represented by (C1) in Figure 4.

Step C1 is the raw information from the existing context of a given site with its realities. This raw context needs to be surveyed and reinterpreted to fit the initial proposal properly (C2). As revealed by interviews with EMU instructors, students need to study the context carefully, define the information about this context and improve on site and context knowledge in step C2; such improvement is possible through site analysis. Considering that the obtained and structured picture from the context is remains insufficient and unclear, the designer is still unable to make design decisions and has to mature his decisions by synthesis.

In Step C3, the designer creates initial ideas with maximum compatibility with and adaptability to the context. Schön (1987) named this stage as ‘siting’. Interviews with the EMU instructors indicated that the same strategy is called site analysis and synthesis (C group stages).

Synthesis is the logical combination of components or elements to form a connected whole. For better time management and control, the next step that students should take is the conceptual design for a given site. In the 12 proposed domains of Schön, this stage is called ‘general layout.’ In the Z group stages, the appropriate organisation and orientation of spaces and their interrelations are determined. The conceptual picture of the form is then structured. Finally, the initial proposed form is further developed and matured in the form-making stage. In the F group

Figure 2. Students response to the question “How you are asked to start designing the given project?”

Figure 3. Student responses to: “Which one do you use the most while you are preparing your design proposal?”

Figure 4. Student responses to: “How are you re-visiting your proposal before studio critique of coming session?”
stages, which are called by EMU instructors as ‘development of detailed design,’ dozens of alternatives might be produced, and creativity plays an important role. As shown in Figure 5, the Z and F group stages have a special bilateral feature that allows the alternatives and proposals to be revisited in any stage.

The proposed flash cards system by Fakhra (2012) merely supports the F group stages, running counter to the explicit goal of providing process-oriented education by architectural design studios, as acknowledged by many scholars. The need to assist students and novice designers to remember the critical points in every stage of the decision making and establish a flexible and adaptable method to any size, scale and project type has become the motivation of the development of the proposed flash cards based on the aforementioned three domains: C, Z and F. As indicated in Figure 6, the first domain is site(ing), under which are the following subdomains: site analysis and report development (synthesis).

3 Proposed Flash Cards

Based on the results obtained from the interviews with architecture instructors at EMU and UKM and the literature review, natural and man-made environment analyses are considered important in architectural decision making. Studying these components enables a designer to align decisions with the characteristics of the site and establish a strong relationship between the proposed form and context. Such a relationship is the most desirable result in terms of functional organization. Accordingly, two flash cards covering all key issues discussed in Figure 6 have been designed, as shown in Figure 7.

As shown in Figure 7, the flash cards are printed on both sides. On the front, the method is introduced and a brief definition is provided. On the back, details on the components are introduced, and guidelines are presented. As shown in Figure 7(a), sun direction, wind direction (prevailing wind and summer breeze), topography (level differences, degree of slope and pattern of the land), vegetation (existing trees and plants) and water should be studied by the student.
Based on the EMU case study and the literature, students need to conduct a SWOT analysis after site analysis. SWOT analysis is a prerequisite for strategic planning. As shown in Figure 8, students are asked in this stage to make a SWOT analysis table based on the analysis conducted.

Collected data about the site and report development (synthesis) require preparing a robust foundation for designer to define strategies towards form making. This stage has been confirmed by the aforementioned models in the literature. It is one of the most critical stages identified by EMU students and instructors.

In this stage, the designer has to combine and merge the data gathered in site(ing) and synthesis to find a suitable organisation of the form and best functional placement in the site. Two subgroups are introduced under the zoning stage to determine the optimal flash card structure based on the strategy introduced by Alexander and the 12 domains proposed by Donald Schön, as shown in Figure 9. These subgroups are layout orientation and organisation, and each of them covers the most relevant and influential characteristic of the site determined in the previous steps to facilitate decision making for students.

Building orientation enables the designer to determine the standards for thermal comfort and ventilation inside the building.

According to interviews and references on layout organisation, figure ground (solid void) analysis, land-use analysis, publicity/privacy and accessibility are factors influencing decision making. Studying these items enables the designer to find the logical organisations between buildings and between buildings and its surrounding area in the site (Figure 11).

After matching the layouts with the site (zoning), students are requested to develop their forms based on the initial proposed layout. According to observations and studies, geometry and internal space organisation are the foremost concerns. As previously mentioned, students are asked to start creating geometry based on the main idea. Without basic ideas underlying their buildings, architects are simply space planners. To develop this main idea, students need to use principles, patterns and techniques, which they have learned in their basic design classes. These prin-
principles have important functions in producing creative forms. Several researchers have explored about the categorisation of these principles (Ching 1979; Pottman et al. 2007); however, according to the interviews conducted, the need for educational auxiliary tools that can aid students remain dire. According to the literature, (1) design strategies, (2) spatial organisational patterns and (3) formal distortion need to be considered. Thus, four cards are prepared for this stage in the present study (one card for components (1) and (2) and two cards for component (3)).

As shown in Figure 12, seven applicable and useful factors are included in the design strategy flash card. These factors are unity, balance, rhythm, contrast, proportion and dominance based on the interviews and the literature.

The way in which these principles are applied affects the expressive content or the message of the work. Spatial organization can be regarded as the compositional patterns of several forms and spaces that are gathered and organized into an interrelated ‘whole’ by logical and ordered relation (Ching 1979).

In creating the geometry of forms, certain techniques allow for the incorporation of creativity into the development of proposals and alternatives and improvement of forms to be more functional and aesthetic. To recognise the tools that are frequently disregarded or forgotten by students in their form-making process, the authors attended EMU jury sessions in the fall of 2014–2015 for three levels of design programs and recorded the critiques from jury members, particularly on geometry, layout development and form quality. The generated list and the information obtained from personal interviews with instructors are summarised in two cards, named formal distortion (1) and (2).

In these two flash cards, twelve techniques, namely combine, transform, replace, extrude, move, break apart, add parts, subtract, shell and exaggerate, are presented to the users (i.e. architecture students). These techniques enable students to employ their creativity to create various forms and logically solve their geometrical and functional problems. Formal distortion (1) includes five specified techniques, namely combine, transform, replace, extrude and move (Figure 14).

As shown in Figure 15, these techniques are break apart, add parts, subtract parts, shell and exaggerate.

Break apart is a technique that helps students break geometry into smaller components and elements and create better forms.
Designing is a procedure and its stages are interconnected; thus, solving problems in one step can provide a good basis for starting the next. The pin-up feature of designed flash cards allows students to confront new and developed ideas in each step and smoothly move between different stages of design.

4 Evaluation of the Proposed Model
Nineteen design instructors responded to general call from different architecture design levels (excluding first year students) from Malaysia and Cyprus. In order to evaluate the usability of proposed flash card set and reach to more reliable results, firstly conventional and
then summative content analysis method used to find common themes in instructors answers and frequently used codes. This result was used as reference in student’s main questionnaire preparation. The instructors were asked to review the flash cards in terms of its usability and alignment to studio teaching approach.

Extracted keywords after summative content analysis of the received comments are: Reminding all needed information and factors also to be architecture students to overcome challenges in the decision making. Reminding priorities and inter-relationship of information, Possibility of reviewing stages, fault finding, better time management, possibility of creating more alternatives, sparking creativity, enabling the designer to become a good self-controller, providing possibility of reviewing, providing easy movement between stages, helping in taking backward steps while making decisions.

5 Conclusion

This research mainly aims to design a flash card set and aid architecture students to overcome challenges in the decision making. The flash card set is designed to help students make mature decisions by reminding them about the issues that they have learned before and that they need to consider in and apply to their current work. This tool also provides architecture students with a variety of possible choices that may increase their creativity level, especially in the form-making stage. The obtained results from users reveal that the proposed flash cards can help students manage their own design pattern when used together with routine critique sessions. Therefore, the designed flash cards meet the initial expectations. This study attempts to avoid the tendency of students to bypass necessary stages of design (proceeding from analysis to form making and ignoring the synthesis part) and only rely on intuitions, creativity and comments from tutors. This study can help students manage their own design pattern and undergo a smooth transition from being dependent to being independent designers under the supervision of their tutors. However, this study still has few limitations, especially in the form-making stages, such as taking into account the internal space organisation and structural considerations. These issues need to be studied and developed in the future. Nevertheless, the present study could serve as a jumping-off point for future studies and has the potential of positively influencing learning in higher education.

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Author(s):

Badiossadat Hassanpour
Department of Architecture, Faculty of Architecture, Eastern Mediterranean University, Famagusta, T.R. North Cyprus via Mersin 10, Turkey.
E-mail: badieh.hassanpour@gmail.com

Adi Irfan Che-Ani
Department of Architecture, Faculty of Engineering and Built Environment, University Kebangsaan Malaysia, Bangi, Selangor, Malaysia.
E-mail: adiirfan@gmail.com

Nil Paşaoğlulan Şahin
Department of Interior Architecture, Faculty of Architecture, Eastern Mediterranean University, Famagusta, T.R North Cyprus via Mersin 10, Turkey.
E-mail: nil.pasaogullari@emu.edu.tr

Alireza Tabrizi
Department of Architecture, Faculty of Architecture, Eastern Mediterranean University, Famagusta, T.R North
War has become an integral part of the political agenda. Electoral programmes are based on it, and national budgets are often framed to finance it. In the past politicians used to promise their constituencies “no more war”. Today that slogan has been replaced with “war for ever”.

A similar change of attitude also reflects the way in which those concerned with the built environment deal with the subject. War seems no longer to be something abnormal or alien to the urbanized world. Indeed, the various combinations possible between the two terms this issue of OHI is dedicated to – war against the city, cities at war with other cities, the city at war with itself (shuffled according to whether the focus is on the city as a victim of conflict or responsible for it) – are at risk of becoming mere academic disciplines, fields of specialization.

In 2002, an issue of Open House International already addressed the topic. Scholars with different backgrounds and experiences reported on a number of cities. They analysed and reflected on the situation before the armed hostilities, both in physical terms and in terms of the conflicts of ethnic and civilian character, and the role of external forces and actors; the war in its different manifestations: a never ending conflict, a succession of battles and precarious truces, bombing, the threat of bombing; the prospects (if any) of reconstruction, with particular reference to the different effects for the various groups and interest.

Today, 16 years later, the ambition of this issue is not only to provide further empirical investigation but to contribute to the broadening of the discussion going beyond the case study logic.

The call welcomes papers that consider problems whose relevance is not confined to a specific situation and which are interwoven one with the other. Contributions on the following themes are especially encouraged:

- the war as means to accelerate the introduction of a market economy and the ancillary privatisation of land, housing and public services as well as the relaxation of land use planning rules;
- the armed conflicts driven by both internal and external forces expressing complex rivalries for appropriation and control of natural resources;
- the intentional exacerbation of hostility between groups of different ethnic and/or religious composition;
- the role of the international community that simultaneously participates in the destruction and proclaims itself anxious to provide humanitarian aid and help with reconstruction;
- the war’s profiteers (i.e. global corporate interests, financial institutions, construction companies and architectural firms);
- the forced relocation of displaced people into “special” settlements which brings to an increasing fragmentation of post-war landscape;
- the incorporation of war into the planning discourse that has perverse effects on all our cities and not only on those directly devastated by armed operations.

The papers about unarmed conflicts which also destroy environments and people in other ways than the physical wars are also welcome.
University References:

"One major contribution of Open House International is its ongoing emphasis on open-ended design as an important attribute of environmental quality of built environments. Through this, Open House International has ensured that this topic has not been forgotten and has continued to develop. Prof. Amos Rapoport, University of Milwaukee, Wisconsin, USA.

The high academic level of the journal is an example to be followed. We are privileged by our affiliation with you and the journal. I think that our disciplines are hungry for the level of academic rigor that OHI demonstrates on a sustained basis."Guillermo Vasquez de Velasco, Dean, College of Architecture and Planning, Ball State University.

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