CONTEMPORARY ISSUES IN ARCHITECTURE

ECOLOGY, URBAN ENVIRONMENT, EXPERIENCE

EDITED BY
YILDIZ AKSOY
EFE DUYAN

DAKAM
DOĞU AKDENİZ AKADEMİK ARAŞTIRMALAR MERKEZİ

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EDITOR'S NOTE

Contemporary Issues in Architecture Ecology, Urban Environment, and Experience is an edited (multi-authored) book focusing on the new trends and frontiers in architecture. Architecture renews itself in terms of structural, aesthetical, and functional aspects that correspond to the needs of every age. Unlike artistic creativity, innovation in an architectural sense has to be evaluated differently as an object of use in social life. The innovation might include technical, design, manufacturing, management, and commercial aspects related to presenting a new (or improved) product. In other words, innovation, as a novel idea bringing an added-value, is an enterprise tool, in which change is used as an opportunity. Originality, on the other hand, the quality of being special and not the same as anything else, opens up a a discussion of how an original architectural move relates to the context, history, and cultural background. Original and/or innovative, new social demands and new technological apparatus challenges architecture every moment by calling out the creativity of the designer.

Within that scope, the concepts of innovation, originality, and creativity had been brought into focus.

YILDIZ AKSOY AND EFE DUYAN

URBAN ISSUES AND TECHNICAL CHALLENGES

ANALYSIS OF GREEN AREAS IN URBAN NEIGHBORHOODS BETWEEN 1990 AND 2020: THE CASE OF KÜÇÜKÇEKMECE

YILDIZ AKSOY

ABSTRACT

Green areas are classified into two main groups which are active green areas and passive green areas. In this study, active green area sizes were calculated throughout the district by periods and m2 area per person was presented accordingly the population of the same periods. The green area situation calculated across the district was compared with the green area norms so that the green area deficit was revealed. The goal of the research is to determine the spatial adequacy level of active green areas in terms of population, density, planning criteria according to current regulations and standards, and to examine the situation in Istanbul City Küçükçekmece District sample and reveal the conceptual framework. The results of the research can provide a comprehensive background to the planning and green system and can guide the determination of the places where new green areas should be made.

Keywords: Green areas, active green areas, Küçükçekmece, spatial size, planning.

1. INTRODUCTION

Küçükçekmece district, which is selected as a research area, is located on the west side of Istanbul Province; It has a location on the Catalca peninsula (Figure 1).

Figure 1. The Location of Study Area

Küçükçekmece is one of the most crowded districts of Istanbul with its historical, cultural and natural values. The using of urban green areas with various functions and spatial sized in the Küçükçekmece district of Istanbul forms the topic of this research.

In this research, as quantitative, just size of the green areas and the increasing size considered. In this context, the district Küçükçekmece of Istanbul, in terms of green area use, density of the population use and activity opportunities, includes active green areas. The presence of green areas in cities presents many advantages to citizens.

Chiesura (2004) writes that 'green areas in a city play an important role in helping residents and visitors to escape temporarily from the crowded streets and buildings: it provides a place to relax'.

Green areas have a important part in forming a more liveable environment for speedily developing cities. Urban green areas offer recreative possibilities that may at the least rest repressions that an urban environment causes, making a more habitable environment with the sociable, economical and ecological functions that these areas propound (Bishop et al., 2001). Green areas provide recreational areas for habitants and help to improve the visual and peripheral feature of neighborhoods. As one of the best significant factors of urban texture, open-green areas are social interaction points where people with different socioeconomic characteristics (Thompson, 2002).

Urban green areas take part in a major part in maintaining the balance between natural and built environment (Haq, 2011; Kabisch and Haase, 2013). Green areas have varied functionalities lending to develop the quality of the city living by exchanging weather standard, support bodily activities and sociable relationship, decreasing stress, noise and controlling heat and temperature (Zhang et al., 2017).

Although the contribution to the lives of urban green areas in Turkey, is planned primarily to supply the necessity of houses in urban planning. The green areas planned in urban areas regardless of the needs of the city residents are mostly insufficient in terms of quality and quantity. For this reason, green areas often fail to provide the expected benefits with their weak functions (Altunkasa and Uslu, 2004).

Despite the important functions of green areas on urban life quality in Istanbul, there are practices that negatively affect the protection and sustainability of green areas. For example, modern sites are being built within the forest areas surrounding the city (Aksoy, 2017). Balanced spatial distribution of green areas is of public importance as it has a quality affecting many factors, especially the population. Spatial analysis is the beginning dot for the evaluating of the dispersion of green areas that are formed according to the needs of the society.

It is observed that any planning and design criteria are not leave out of account in the spatial dispersion of the green areas of Küçükçekmece district. In this study, it has been revealed that the green areas of Küçükçekmece district are inadequate in terms of area and numerically. There is no homogeneous distribution in the spatial distribution of active green areas.

Urban green areas should meet the needs of the population, and their balanced distribution in spatial and functional staging should be ensured throughout the urban area. Giving the amount of green area per square meter is rely on the guess that the green areas are distributed homogeneously in the whole settlement texture. However, the distribution of green areas of Küçükçekmece district is random and there is an imbalance in terms of its effect areas. The aim of this study is to examine, in detail, the spatial sufficiency and temporal changes active green areas facitilities of Küçükçekmece.

This study aims to draw attention to the necessity of planning systematic green areas for municipalities preparing the development plans that shape the cities, so that high quality and healthy cities can be formed. In this research, the spatial sufficiency of the active green areas in Küçükçekmece District, Istanbul was evaluated using GIS technology. The results of the research can supply a wide back plan to the planning and green system and can guide the determination of the places where new green areas should be made.

2. METHOD

A literature study was conducted to create the theoretical part of the research. In the study, satellite images of 21 neighborhood of Küçükçekmece district were obtained from the Geogle Earth Program (Figure 2).

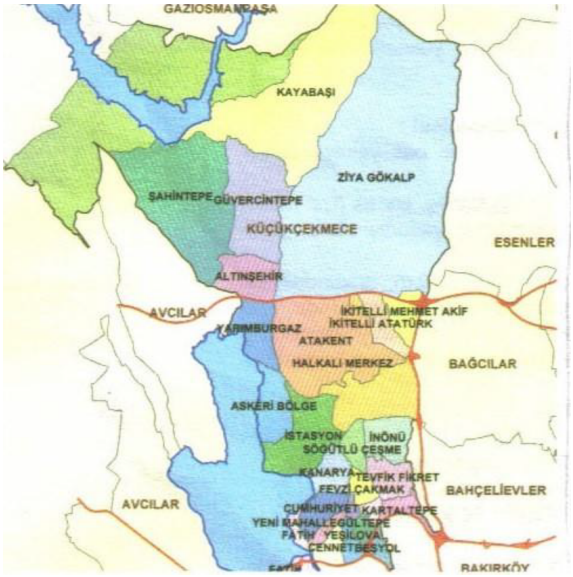

Figure 2. Neighborhood boundaries of Küçükçekmece district

1/1000 scaled base maps, 1/5000 scaled master plan and 1/5000 scaled topografic maps of Kucukcekmece Municipality were used. The data of the research area between 1990 and 2000 were obtained from the Ph.D. Thesis titled 'Investigation of the Area Status of Istanbul City' by Aksoy in 2001.

The data showing the distribution of active green areas belonging to the research area and the population data of Küçükçekmece district on the basis of neighborhoods were determined as non-graphic data in order to determine the green areas per person. Data of Küçükçekmece Municipality were used. Since the data of green areas could not be obtained from Istanbul Metropolitan Municipality, the web page of Istanbul Metropolitan Municipality Park Garden and Green Areas Directorate was used. The main materials of the research consist of quantitative data. When we look the functional dispersion of the green areas of

Küçükçekmece District; all of active green areas are constituted from Park areas. Parks in Kuçukcekmece District are classified as mobile, small, neighborhood, district, and city parks with according to their size (Aksoy, 2001).

The methodology of the study is based on examining the quantitative data obtained for the active green areas of Küçükçekmece District within the scope of spatial adequacy in terms of spatial size and per person values.

Data for the research was provided by satelite maps analysed controlled of wide area investigate systematically and applied on the GIS Maps by checked by the main scheme.

As a result of the research; it has been showed up that active green areas indicate an unstable distribution at the district level in terms of spatial adequacy possibilities and are unsatisfactory in terms of spatial norms.

3. RESULTS AND DISCUSSION

3. 1. Spatial Distribution of Green Areas

Factors affecting the use of urban areas are divided into five groups: natural, social, cultural, economic and urban factors (Mc Bride, 1999).

Green areas are divided into two groups as active and passive green areas and are in the group of urban factors. The standard of green areas is defined as square meters of active green areas per person. Active green areas include playgrounds, sports fields and mobile, small, neighborhood, district and city parks. Besides, there are passive green areas as afforested areas, meadow, nursery and forests, visual green areas, refuge and squares, grove areas and cemeteries. But these are not considered to determine the green area standards (Byrne and Sipe, 2010).

The description of urban green areas that is accepted by ecologists, economizers, sociable scholars and planners is public and private open areas in city, mainly coated by herb. Urban green areas contain some advantages for human.

Ecolocigal utilities of green areas might be cover pollution control, biodiversity and nature protection. In addition economical and aesthetical advantages are power-saving and economic worth; latest advantages will be in sociable and mental like recreation and and people welfare (Shah and Haq, 2011).

3.2. Spatial Analysis of Green Area Status in Küçükçekmece District of Istanbul.

Spatial analysis is the beginning dot for the asessment of the dispersion of green areas that are formed according to the needs of the society. Jim (2004) argues that the use of area and urban development patterns create different geometry, distribution and composition in green areas. Accordingly, the amount of green area tissue is a required as a prior condition to sense the spatial dispersion and time dependent change of green areas.

Urban green area is obligatory for develop the standard of living as it gives different advantages in conditions of sociable, ecological, economical and esthetic ways of city living (Givoni, 1991; Heidt and Neef, 2008).

Urban green areas offer a lot utilities to people by playing as urban lungs – absorbenting polluters and let outing oxygen (Hough, 1984; Haughton and Hunter, 1994), supply clean air, water and soil, and balances city's natural urban surroundings (Nijkamp and Leventa, 2004).

3.3. Existing Green Area Situation of Kucukcekmece

Küçükçekmece, which was a district on 01.03.1956, left the Bakırköy District with the Law No. 3392 published in the Official Gazette dated 04.07.1987 and went into service as a district on 15.07.1988 (http: /www.Kucukcekmece.bel.tr).

In this research, the existence of green areas in Küçükçekmece was evaluated and per person values were

calculated. Considering the date of 1988, when it was put into service as Küçükçekmece district, the start date of the evaluation of Küçükçekmece district within the population-green area relationship was taken as 1990 and the green area situation of last 30 years of the district was examined within the population-green area relationship (Table 1). When the green area situation of Küçükçekmece district in the last 30 years is analyzed within the relationship between population and green area. The active green area per person in Küçükçekmece district in 1990 is 0, 3 m^2 (Table 1).

When the population growth between 1990 and 2000 was examined, there was an increase of 61545 m^2 in the active green area and also ncrease of 124089 people. In terms of population green area relationship, there is an increase of 0,1 m^2 of active green area. Between 2000 and 2007 years; there was increase 191872 person in the population and increase 3471778 m^2 in the active green area. In terms of population green area relationship, there is an increase of 4,3 m^2 of active green area. The increase in active green areas between and 2007 years is due to Atatürk Olympic Stadium and Başakşehir Şamlar Nature Park in Başakşehir Ziya Gökalp neighborhood.

In terms of population green area relationship, there is 0,1 m^2/ per person active green area in 2007. When the population growth between 2007 and 2020 years was examined, there was an decrease of 61545 m^2 in the active green area and also decrease of 124089 people.

The main reason for the decrease is due to the fact that Atatürk Olympic Stadium and Başakşehir Şamlar Nature Park, which is present in Küçükçekmece district, remained within the borders of Başakşehir District, which was formed by the merging of the neighborhoods separated from Küçükçekmece and Esenler districts and Bahçeşehir Municipality in 2008.

The population of Küçükçekmece district is 593520 people in 2000. In 18 years, by increasing 176796 person population was 770316 person in 2020. It was necessary to construct a 1767960 m^2 green area within 18 years from the norm of 10 m^2 of active green area for a person.

However, during this period, a green area of 1144275 m^2 was realized and this constitutes 64% of the value to be realized. Table 1 shows the population and the green area occupied by a given Küçükçkemece District. Based on the above data, the largest district in Istanbul, which has a population of 770316 people, covering green areas of 1.252.581 m^2. The sum of active green areas was about 1252581 m^2.

Years	**Population**	**Active Green Areas Surface (**m^2**)**	**Per Person Area (**m^2**)**
1990*	469431	107105***	0,2
2000*	593520	168650***	0,3
2007**	785392	3640428****	4,6
2020**	**770316**	**1252581**	**1,6**

Table 1. Population-Green Area Ratios of Küçükçekmece District in Different Years

* State Institute of Statistics

** Turkish Statistical Institute (TUİK) Adress Based Population Registration System Results

*** (Aksoy, 2001)

**** (Aksoy et al., 2007)

3.3. Determination of Active Green Areas and Decisions of Existing Area Usage in the Neighborhood Unit in Küçükçekmece District

Neighborhood (NH) is described qua an space of of the same kind or similar distinctive features whether in terms of ethnicity, residence, sort of development, etc. (http://www.merriamwebster.com/dictionary/neighborhood).

Significance of green areas is recognized to protect the ecological quality and sustainability. (Gupta et al., 2012). Also, the presence of green areas affects human beings. Cities with more nature give support people to exert more time outsides and be more physically active. In fact, green areas in closeness to the neighborhoods, rise recreational activities, alert the relevance for the nature, and create ecological awareness (Thaiutsa, et al., 2008). Active green areas were examined at the neighborhood level. Küçükçekmece district should not only look at the green area situation as a population-area relationship. It is necessary to look at the locations and distribution of these areas within the neighborhood settlement texture.

In the Küçükçekmece district the locations having larger green areas are Fatih (42,3 m^2 /per person), Atakent (4,1 m^2/per person), and Halkalı Merkez (2,2 m^2/per person) quarters; and those with smallest number of green areas are Kanarya (0,05 m^2/per person), Mehmet Akif (0,07 m^2/per person), Kemal Paşa (0,08 m^2/per person) quarters. On the other hand, Sultan Murat quarters have no active green areas (Table 2).

Neighborhood	**Area (m^2)**	**Population**	**m^2/ person**
Atakent	390291	95636	4,1
Atatürk	5777	42171	0,1
Beşyol	3992	3890	1,0
Cennet	10559	29892	0,4
Cumhuriyet	44208	50786	0,9
Fatih	450051	10643	42,3
Fevzi Çakmak	4680	25124	0,2
Gültepe	5097	30160	0,2
Halkalı Merkez	170306	77648	2,2
İnönü	37722	72454	0,5
İstasyon	51111	39092	1,3

Kanarya	3239	67914	0,05
Kartaltepe	8276	12426	0,7
Kemalpaşa	1111	14256	0,08
Mehmet Akif	3621	52258	0,07
Söğütlü Çeşme	31525	32744	1,0
Sultan Murat	0	14052	0
Tevfik Bey	15776	36408	0,4
Yarımburgaz	1800	9867	0,2
Yeni Mahalle	8248	19831	0,4
Yeşilova	5191	33064	0,2
TOTAL	**1.252.581**	**770316**	**1,6**

Table 2. Existing Green Area Ratio (m^2/person) Values According to Neighborhood

Parks are classified as pocket, small, neighborhood, district, and city parks with according to their size (Table 3).

Parks	**Size**
Pocket parks	(0-5000)
Small parks	(5001-20000)
Neighborhood parks	(20001-50000)
District parks	(50001-250000)
City parks	>250000

Tablo 3. Classification of Parking Areas According to Their Size (Aksoy, 2001)

Park areas of Küçükçekmece District are classified as pocket, small, neighborhood and district parks according to their area sizes. (Table 4).

Neighborhood	Type of park	Number	Sum Area (m^2)
Atakent	Pocket park	5	12077
	Small park	9	108059
	Neighborhood park	2	57500
	District park	2	212655
	City park	-	-
	Total	**18**	**390291**
Beşyol	Pocket park	2	3992
	Small park	-	-
	Neighborhood park	-	-
	District park	-	-
	City park	-	-
	Total	**2**	**3992**
Cennet	Pocket park	4	10559
	Small park	-	-
	Neighborhood park	-	-
	District park	-	-
	City park	-	-
	Total	**4**	**10559**
Cumhuriyet	Pocket park	2	5145
	Small park	1	15350
	Neighborhood park	1	23713
	District park	-	-
	City park	-	-
	Total	**4**	**44208**
Fatih	Pocket park	2	5171
	Small park	1	5646
	Neighborhood park	-	-
	District park	3	439234
	City park	-	-
	Total	**6**	**450051**

Fevzi Çakmak	Pocket park	2	4680
	Small park	-	-
	Neighborhood park	-	-
	District park	-	-
	City park	-	-
	Total	**2**	**4680**
Gültepe	Pocket park	4	5097
	Small park	-	-
	Neighborhood park	-	-
	District park	-	-
	City park	-	-
	Total	**4**	**5097**
Halkalı Merkez	Pocket park	12	22297
	Small park	3	27733
	Neighborhood park	2	67110
	District park	1	53166
	City park	-	-
	Total	**18**	**170306**
Atatürk	Pocket park	4	5777
	Small park	-	-
	Neighborhood park	-	-
	District park	-	-
	City park	-	-
	Total	**4**	**5777**
Mehmet Akif	Pocket park	3	3621
	Small park	-	-
	Neighborhood park	-	-
	District park	-	-
	City park	-	-
	Total	**3**	**3621**

İnönü	Pocket park	16	31884
	Small park	1	5838
	Neighborhood park	-	-
	District park	-	-
	City park	-	-
	Total	**17**	**37722**
İstasyon	Pocket park	4	12249
	Small park	3	38862
	Neighborhood park	-	-
	District park	-	-
	City park	-	-
	Total	**7**	**51111**
Kanarya	Pocket park	2	3239
	Small park	-	-
	Neighborhood park	-	-
	District park	-	-
	City park	-	-
	Total	**2**	**3239**
Kartaltepe	Pocket park	1	210
	Small park	1	8066
	Neighborhood park	-	-
	District park	-	-
	City park	-	-
	Total	**2**	**8276**
Kemalpaşa	Pocket park	1	1111
	Small park	-	-
	Neighborhood park	-	-
	District park	-	-
	City park	-	-
	Total	**1**	**1111**

Söğütlü Çeşme	Pocket park	2	6174
	Small park	2	25351
	Neighborhood park	-	-
	District park	-	-
	City park	-	-
	Total	**4**	**31525**
Sultan Murat	Pocket park	**-**	**-**
	Small park	**-**	**-**
	Neighborhood park	**-**	**-**
	District park	**-**	**--**
	City park	**-**	**-**
	Total	**0**	**0**
Tevfik Bey	Pocket park	12	15776
	Small park	-	-
	Neighborhood park	-	-
	District park	-	-
	City park	-	-
	Total	**12**	**15776**
Yarımburgaz	Pocket park	1	1800
	Small park	-	-
	Neighborhood park	-	-
	District park	-	-
	City park	-	-
	Total	**1**	**1800**
Yeni Mahalle	Pocket park	6	8248
	Small park	-	-
	Neighborhood park	-	-
	District park	-	-
	City park	-	-
	Total	**6**	**8248**

Yeşilova	Pocket park	2	5191
	Small park	-	-
	Neighborhood park	-	-
	District park	-	-
	City park	-	-
	Total	**2**	**5191**
TOTAL		**119**	**1252581**

Table 4. Classification of Parking Areas at Neighborhood Level According to Area Size

87 of the parks of existing parks in Küçükçekmece district are pocket parks, 21 of the parks of existing parks are small parks, 5 of the parks of existing parks are neighborhood parks and 6 of the parks of existing parks are district parks (Table 5).

Parks	**Size**	**Number**
Pocket Parks	(0-5000)	87
Small Parks	(5001-20000)	21
Neighborhood Parks	(20001-50000)	5
District Parks	(50001-250000)	6
City Parks	>250000	-

Table 5. Classification of Park Areas

All of active green areas in Küçükçekmece District are park areas. There are also playgrounds and sports areas within the park areas. Children's playground and sports fields are not available in Küçükçekmece District (Figure 3).

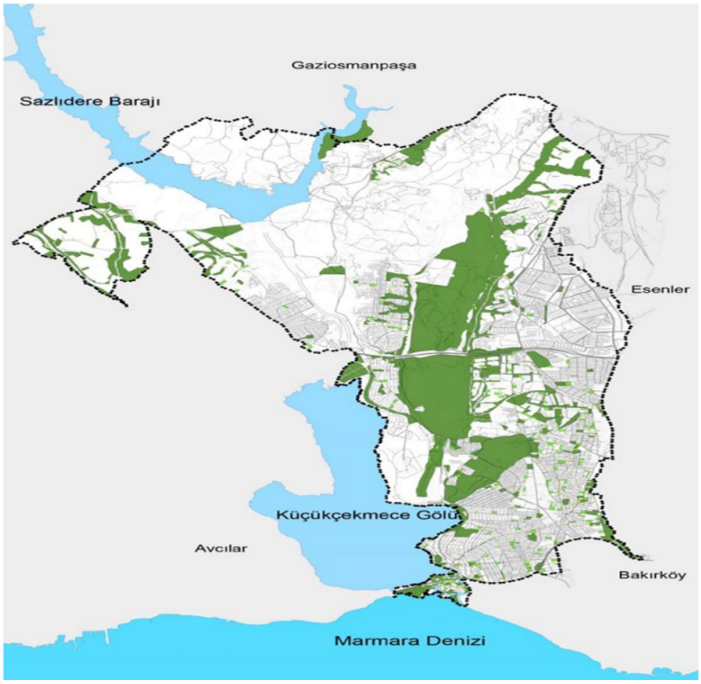

Figure 3. Active Green Area Map of Küçükçekmece District

There are 119 parks in the Küçükçkemece district and of these 87 are pocket parks, 21 are small parks, 5 is a neighborhood park, 6 is a district park. An inventory has been put forward to evaluate the adequacy of the green areas of Küçükçekmece district. Total amount of green areas of Küçükçekmece is 1.252.581 m² in 2020. When the distribution of active green area types in Küçükçekmece at the neighborhood level, it is seen that the most active green area is in Fatih district (450051 m²) and Atakent district (390291 m²) (Table 2). When we approach the subject in terms of the amount of green area per person, it is seen that 1,6 m² of active green area per person has fallen in the entire district.

One of the most important components of sustainable urban planning is that urban green areas show a homogeneous distribution in urban plansTherefore, studies on the distribution of urban green areas in cities have been carried out by many researchers in different cities of the world as well as in our country. Tabassum and Sharmin (2013) and Reyes et al. (2014) in their studies on the distribution of urban green areas, concluded that green areas do not show a homogeneous distribution in cities and that green areas do not serve the entire city. Similar results in studies conducted in our country it has been reached. In this context, as a result of the researches conducted by Yenice (2012), Gökyer and Bilgili (2014), Manavoğlu and Ortaçeşme (2015) it has been observed that green areas show a heterogeneous distribution in the whole of the urban form.

Since there is no regulation defining quantitative and qualitative standards for green areas in our country except for the one defining the active green area per person, different interpretations both in planning and in practice and consequently various decisions might occur. When compared to international per person value standards, these standards are significantly higher than the values in Küçükçekmece.

There are some standard by the goal of explain the environmental sustainability of towns, described by different company.

Similar practice is establishing the per person green area size of a town (Laghai and Bahmanpour, 2012). This worth symbolizes the scope of green area in square meters (m2) for a one person. Developed countries

have their own per person green area values, for example, 50 m2 in USA, 30 to 60 m2 in Germany and 50 to 60 m2 in Switzerland (Hosseini et al., 2015). Big towns, too, in improved countries have described individualistic values, for instance, 154 m2 by Los Angeles and 47 m2 by New York (Hosseini et al., 2015). The World Health Organization (WHO) has described that an area of 9 m2 of green area should be protected for every individual in an urban area to supply a bettering quality living (Khalil, 2014). UN has described that the per person green arae should be more than 30 m2, and such cities are called as sustainable cities, while the European Union (EU) stated the minimum value as 26 m2. (Morar et al., 2014)

By rules of the Ministry of Public Works and Settlement dated 1985, and included of the amendment made later which was published in the official gazette number 23804 on September 2, 1999, a total of 10 m2 of green area should be shared amongst each individual. The most amount of active green area per person is in Fatih neighborhood (42,3 m^2 / person). (Table 2). It was revealed that 10 m^2 / person active green area norm was caught in Küçükçekmece district and there was no norm deficiency. In Küçükçekmece district, neighborhood level analyzes were carried out to ensure balanced distribution of green areas at the neighborhood level.

The existing active green areas in Küçükçekmece district do not meet the specified standards in terms of per person area. By using findings, some proposal relating to urban green areas for the future are described in terms of e sustainable urban development.

The functional dispersion of green areas by needs of people of varied age groups is significant. According to numbers given above, the functional dispersion of available green areas in Küçükçekmece district does not supply the standard recreational wants of people in varied age groups. Urban green areas have a important role in forming a more worth living environment for quickly growing cities. Urban green areas should meet the needs of the population, and their balanced distribution in spatial and functional staging should be ensured throughout the urban area.

At the end of the study, it was determined that active green areas of Küçükçkmece decrease below spatial standards in terms of size, per person area, and show inequality distribution in Küçükçkemece district. This study for Küçükçekmece district should be done for other districts and green alan strategies should be evaluated with national and international standards and legislation arrangements should be made within the city planning system for this.

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POST-IT EFFECT: RE-PRODUCTION OF URBAN FACADES THROUGH THE MULTIPLE "INTERFACES" IN ISTANBUL

TUBA SARI, AYLİN ARAS, MARYAM GOLABİ, İMRAN GÜMÜŞ

ABSTRACT

Multi-experiential activities created by architectural design studios, accepts the architecture as a research tool, and supports a multidisciplinary approach in design process. This research aims to create a new interface through inductive design approach eliminating complexity and chaos resulted from the arbitrary façade organization in urban space. The research adopted a manifest based on such concepts as temporality, transformability, reproducibility, articulation, flexibility, and it built structural frame through considering whole-part relation. The units attached to the structure behaved as the parts of 'post-it effect' through unfinished form image. The case area focused on the dynamic and chaotic structure of façade organizations on Mumcu Bakkal and Hasfırın streets in Beşiktaş district. The facades are evaluated as one of the elements of urban vitality and they are adopted as the first meeting intervals of passerby and users in the relation with urban space. The design proposals intend to question how the eclectic façade organizations can be turned into an integrated whole. In the first phase, the street silhouette of the case area shared with workshop participants. After the environmental observations, the students produced a collage of design idea and developed 3D models of spatial interfaces. These models structured dynamic units through the elements such as form, function, experience, variety of user activity, etc., creating a 'post-it effect' through multiple interfaces in urban space. These interfaces between indoor and outdoor spaces restructure the façade through as flexible and transformable contrary to the insight of the facade as a shell or a physical border. The proposals of façade design act consistent with the surrounding facades. However, the various aspects of facade organizations are influenced by users and passer-by. The solid-void proportion, the importance of skyline and street-line should be considered in the design process due to the changing nature of building perception, keeping the relationship with the surrounding buildings.

Keywords: Articulation, flexibility, interface, post-it effect, reproduction, urban vitality.

INTRODUCTION

The buildings were compressed in the big cities being isolated from the surrounding. Looking at the whole structure, the interior and exterior have to be interrelated and the facades should behave as the interface of this relationship. The perception of the city and the environment is not two dimensional, therefore all urban elements should be considered in the designs. The facade, which creates a link between the interior and the exterior, is important in terms of function and perception of space. The connection between the indoor-outdoor is interpreted differently regarding the form-function relationship between in distinct periods (Özer, 2018). The new physical and structural additions throughout the time, which are not consistent with previous façade organization, cause the lack of harmony in the continuity of street silhouette. Accordingly, the aim is to prevent the chaotic structure of different façade organization in street silhouettes where different interfaces, functions and structures are developed over time.

The user experience, building heights and façade character are important both functionally and spatially considering the interaction between interior and exterior (Holl, 2009). As the physical or sensory interaction between the indoor-outdoor space characterizes the area, a sense of consistency and integrity is created between them. Sometimes an interval space is created between the interior-exterior, which is called "intermediate, transitional, liminal or in-between spaces" (Shahlaei & Mohajeri, 2015). In this research, in-between space is adopted as a conceptual tool to define the interaction between interior and exterior.

The research concentrated on the reasons of the chaos resulted from different facade organizations in Beşiktaş district of Istanbul. Building facades, which provide interaction between the outdoor and indoor space, were considered as interfaces with various physical and structural features. These interfaces contributed to experience of urban area as supported with functional qualities and social interaction possibilities. Through a holistic approach, it was assumed that the distinct facade organizations were to be re-interpreted through new interfaces in respect to the indoor-outdoor relation. The study examines the façade organization by Mumcu Bakkal and Hasfırın Street silhouette, which extends from Sinanpaşa Bazaar entrance to Eagle Statue in the square (Figure 1).

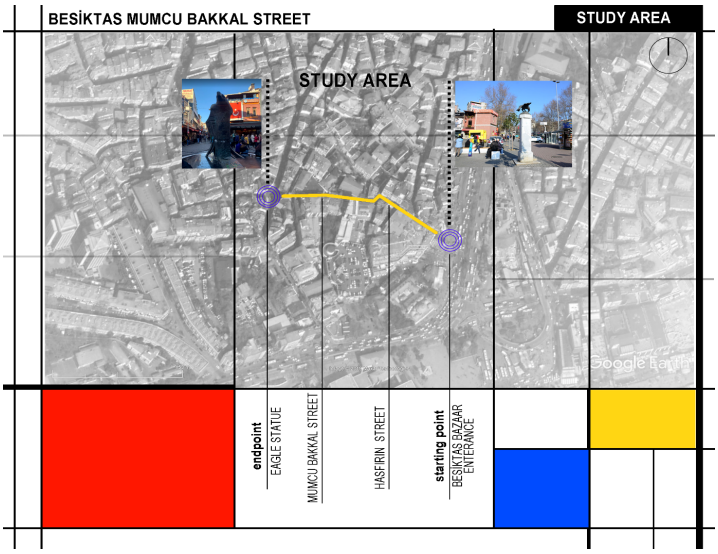

Figure 1. The map showing the limits of the study area in urban context of Beşiktaş.

The aim of the research was to propose design solutions to the solid boundaries created by the facades, questioning the indoor-outdoor relationship between the building facades and the street through the designed interfaces. In this context, experience spaces were created for users between indoor-outdoor relations beyond the perception of the facade as a shell. In addition, the multiple interfaces which were created between the indoor-outdoor, form -function were questioned regarding the part-whole relationship; the intention was to transform street silhouette through 'Post-it Effect' approach. Post it effect was defined through such terms as "precariously, impermanence, reversible, and temporary" in the metapolis dictionary of advanced architecture by F Seguret, WB Muller (2002).

Considering the changing aspect of urban silhouette throughout the time, the buildings in the case area reflect different facade characteristics through the construction of new buildings or destruction of buildings for different reasons. The new physical and structural additions throughout the time, which are not consistent with previous façade organization, cause the lack of harmony in the continuity of street silhouette. The facade design that connects the interior and exterior space is not a shell, rather it is an interaction medium of the design in urban space.

1. MATERIALS AND METHODS

The building facades were adopted as the first encounter intervals with passerby keeping the relation with urban area, which contributed to the livability of street. The main attempt was to explore how the eclectic order on the street axis could be transformed into the multiple interfaces in harmony. The design proposals were expected to create a 'Post-it Effect' through the multiple interfaces in the urban space creating the dynamic structures, which were integrated with the form, function, user experience, etc. (Figure 2).

Figure 2. The urban silhouette of study area between Mumcu Bakkal and Hasfırın streets.

The case study emphasized on maintaining the consistency of street silhouette and creating the multi-functional in-between spaces. In this situation, the part-whole relationship was examined through considering such concepts as transition, changeability, reproducibility, articulation and flexibility. The proposed designs reflecting part-whole integrity led to the 'post-it effect' in urban space. The process of this research consists of three different phases; environmental analysis, conceptual studies and end-design process. The data which was gathered from observations, photographing and sketching interrogated the social and physical problems of the field. Discussing the concepts such as permeability, fluidity, transition, changeability, reproducibility, articulation, flexibility, the main goal of the proposals was to keep functional continuity by user-centered approach.

2. THEORETICAL APPROACHES: THE CONCEPT OF INTERFACE

Interface are defined as encountering area, which intersects building facade and urban space, and it creates a new space which provides connection between interior experiences and flow of urban space. It is defined as "the point where two subjects, systems, etc. meet and affect each other" (Oxford dictionary). Interfaces constitute the interaction among people and define transition spaces that regulate the relationship between nature-urban, private-public, interior-exterior, solid-void (positive-negative), urbanism-architecture. These spaces are the boundary of the artificial environment and the surfaces of urban spaces. Building facades, which are the interfaces providing functional and visual continuity in transition between urban and architectural space, create flexible and fluid environments (Bala, 2006).

Facades define a border which is an intersection of buildings and open spaces and emerge as the vertical component of the concept of "interface" between buildings. The facade is not built as a mask covering interior, but simultaneously built with the interior. Many borders are established through the tension between indoor and outdoor, which lies on the walls separating them (Colomina, 2017). In- between spaces are defined as the street and building interface and display a different rhythm than the flow of the street and the interior of buildings (Goffman, 2017). Schumacher (2010) states that the relations among the building requirement, structure and facade design should be questioned. Within the scope of the study, building facades are considered as spatial interfaces; their characteristics and functions are classified according to conceptual tools. This classification determines the type of the intervention to be employed during the case study in Beşiktaş district in Istanbul.

3. CASE STUDY: DESIGNING MULTIPLE INTERFACES ON URBAN FACADES

3.1. Symbolic Meaning

The buildings in the urban space might have various symbolic meanings such as landmarks of cities, as well as they are of importance defining identity of the cities. Venturi (1977) stated that the building form might have a symbolic meaning (defining as a duck) within the integrity of the facade and skeleton completely, on the other hand, the buildings might reflect symbolic meanings with some components, independent of the building structure (decorated shed). Apart from these two categorizes, spatial interfaces might be reflected as symbolic meanings of some places generating the third space that created by spatial experience. Furthermore, spatial interfaces, created by in-between spaces that strengthen the relationship between interior and exterior, have the potential to organize surrounding spaces, in case of becoming the dominant space (Ching, 2014). Urban buildings have distinct meanings such as signs, symbols, irony and metaphors defined with facade boundaries, instead of interpreting abstract forms of interior orders experienced by passerby in the cities and streets (Lefebvre 1991; Özer 2018)**.**

Considering Case 1, the two masses at the entrance of the street constitute an important reference point since it creates the first interaction between passerby and the street. The entrance of Sinanpaşa Bazaar was not perceived due to the sudden increase of the user density at the beginning of the street, thus the crowd caused complexity and chaos. As a solution to this problem, the entrance of the passage was recessed and through creating transparent layer in façade, the circulation space was displayed to passer-by. Accordingly, the indoor and outdoor spaces between the street and the building was integrated (Figure 3).

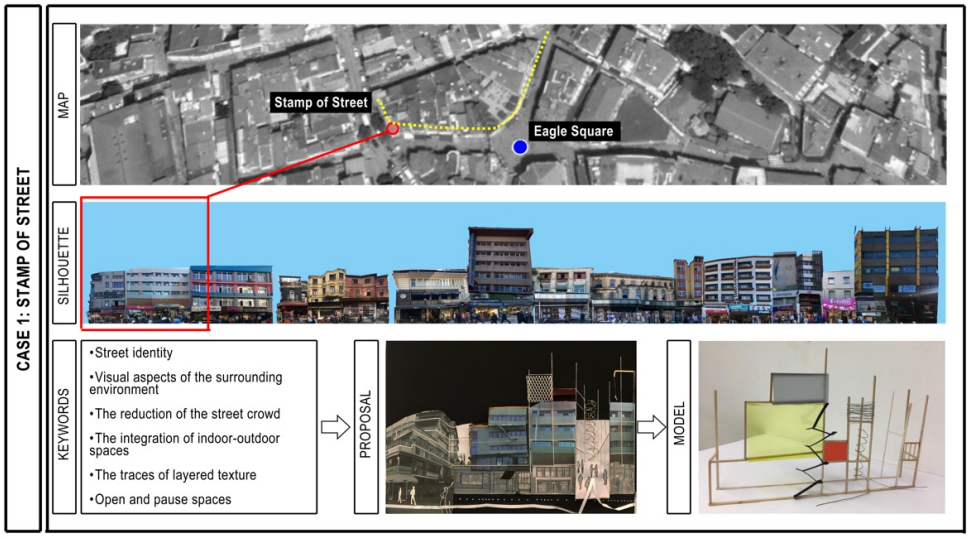

Figure 3. Stamp of Street/ design proposal by Ramazan Çankaya, Şeymanur Erdoğan, Şevval Bayır

The new surface of the facades covered with commercial and advertising signs concealed the real function of the buildings, causing a complexity and chaos. Although Sinanpaşa Bazaar is a structure used as an intense density within the building group, its relationship with the public space and the street decreased because of the façade's complexity. The initial design proposal was to reflect the traces of all façades on the street considering that the building's public behavior as a reference point that opens to the street and square.

The layered texture of the back elevation of the building had broadened the open space in the street and enriched the physical / visual relationship with the surroundings. In order to reflect the same effect to the Hasfırın Street, the traces of layered texture in back elevation were integrated into the all facades of the two buildings. The vertical circulation of the mass was restructured in order to integrate with the public area. This situation allowed users to experience all the functional units in the building.

3.2. Flexibility

Some contradictions in architecture such as duality of exterior and interior space was interpreted by many architects. Loos (2014) pointed out that the interior spaces of the buildings should be designed according to the taste and preferences of the users and organized as a theater scene. However, the facade of the buildings should be simple and designed as free of decorative elements. As well as the point of view clarifying the exterior space is a result of the interior space, Van Eyck (1962) states that in-between spaces create common areas that bring the different poles together. It is likely to infer from these interpretations that building facades define in-between spaces at the intersection of the building boundaries and the urban space, create multiple interfaces. The interfaces enable to provide spatial flexibility creating changeable spaces and preventing distinct separations between interior and exterior. Flexible designs refer to the use of the same volumes for different functions according to user requirements without changing the building organization (Forty, 2000).

The research of the case 2 revealed that both public and cultural spaces had come together in one building. Some functional units inside the building were as follows: cultural center (ground floor), stage and rehearsal space (first floor), restaurant (second floor), and offices (third floor). The elimination of functional complexity, and at the same time, making of the relationship between indoor and outdoor space were proposed as the primary design ideas. In design process, the first step was to separate the public space from the cultural spaces. The spaces, which were serving the cultural activities and events were considered to be transparent. The next step was to provide the legibility of the staircase from the outside as it was intended to display the continuity of the user movement inside the building to the outside. Therefore, the vertical circulation area was transformed into the transparent spatial interface in the building. (Figure 4).

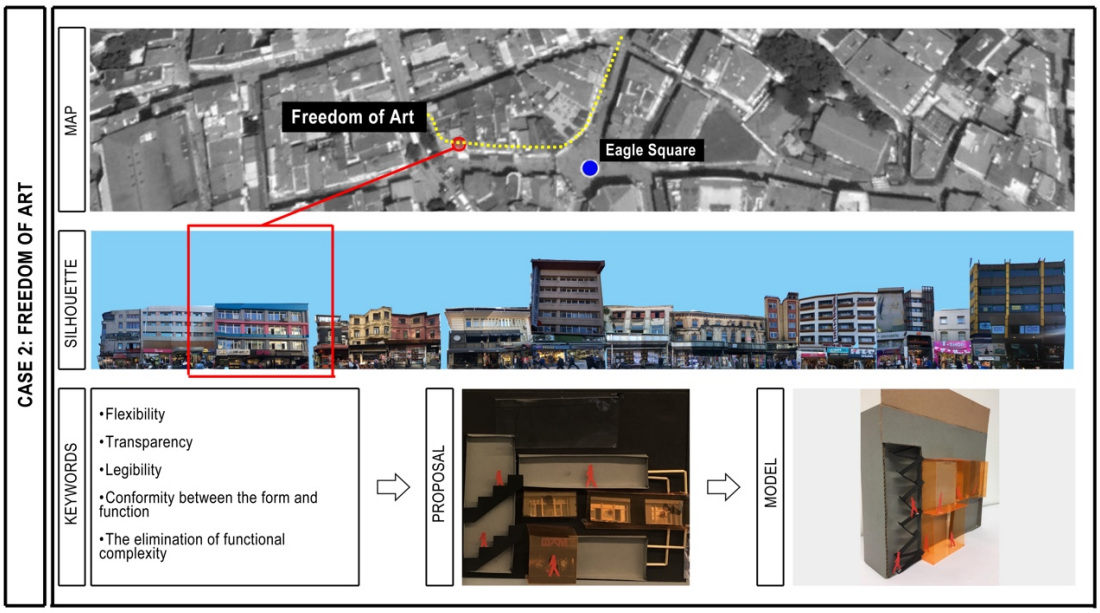

Figure 4. Freedom of Art/ design proposal by Afra Çambel.

3.3. Visual and Perceptual Experience

Urban interfaces are examined as the part of the in-between spaces and offer different spatial experiences. Besides the tension stemmed from building's skin and interior use, third spaces defined by the building skin, displaying functional usage and opening to the streets, are important in terms of spatial experience (Zizek, 2011). Holl (2000) described the concept of parallax as changing movement, perception and redefinition of space. It was a dynamic spatial order defined by the moving body within the space and formed by overlapping space sequences.

Considering Case 3, one of the design problems was that the upper and the lower parts of the building's facade were visually independent and irrelevant. While the upper part of the building had a historical and

modest pattern, the lower part had a very compact and undefined facade due to its commercial function. Although the dense human flow on the ground floor were an influential factor in the dynamism of urban texture, this density can cause unperceived of the building. The design proposal mainly focuses on the elimination of the visual and physical disintegration of the facades. The intention was to design a balanced and cohesive interface in terms of the density and visual aspect. Therefore, in order to make the whole building perceptible, the undefined density which provides dynamism on the street level was proposed to be transferred into the upper levels. The distribution of usage density to the upper floors provided continuity and fluidity in the design (Figure 5).

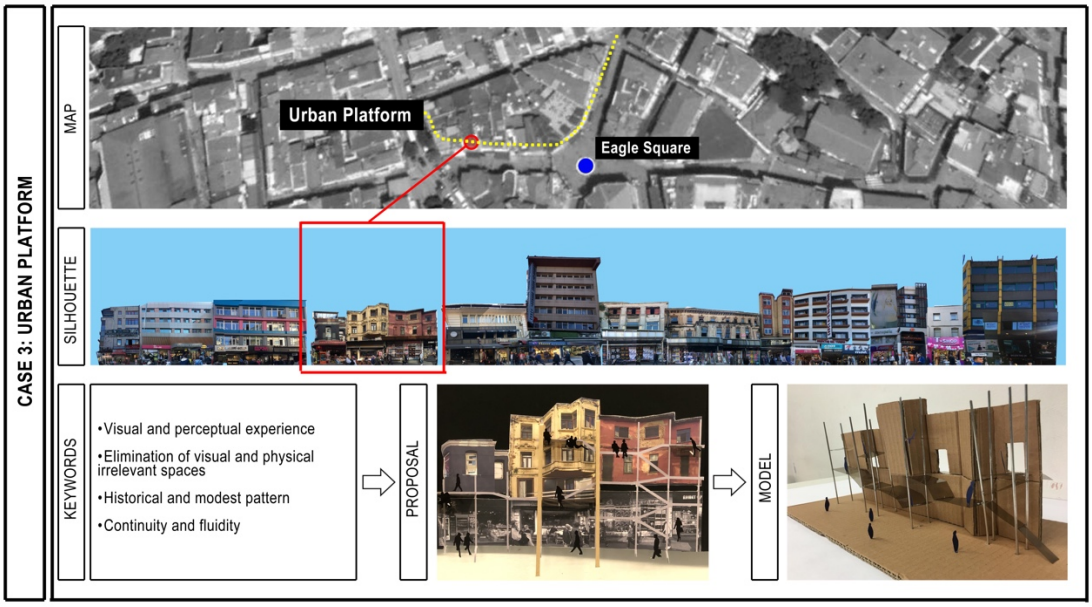

Figure 5. Urban Platform/ design proposal by Gülay Gültekin, Zeynep Hayırsever.

The building façade and its function reconfigured with the proposal of new structure designed as an urban platform. With these flexible platforms, which could be attached to the structure and were also removable from it, new spaces such as open spaces and terraces were created. Through different spatial interventions including openings and slits in the façade, the indoor and outdoor spaces were integrated. Accordingly, 'post-it effect' was created through multiple interfaces including the new structural system. These interfaces contributed to the urban space and were influential in the creation of the part-whole relationship.

3.4. Buffer Zone between Natural and Artificial Environment

Some of the spatial interfaces serve as loose spaces. Franck (2007) defines the loose space as "the space that has been appropriated by citizens to pursue activities not set by a predetermined program." People create 'loose space' through their own activities and these spaces serve the city life as a threshold – in between spaces. 'Loose spaces' are often associated with the natural environment in urban space, unlike solid spaces surrounded by walls. These spaces located between the masses and nature establish a relationship between people and environment (Lozano, 1990). Unstructured negative spaces which are the extension of natural environments create space for unexpected activities.

The buildings studied in Case 4, were two old structures between two high-rise buildings. While one of these buildings was identified by its remarkable historical identity, the other one had been deteriorated due to the physical additions made over the years. The analysis of the buildings and their surroundings revealed that in contrast to the compact texture of the Beşiktaş district, a green texture was existed at the back elevation (Figure 6).

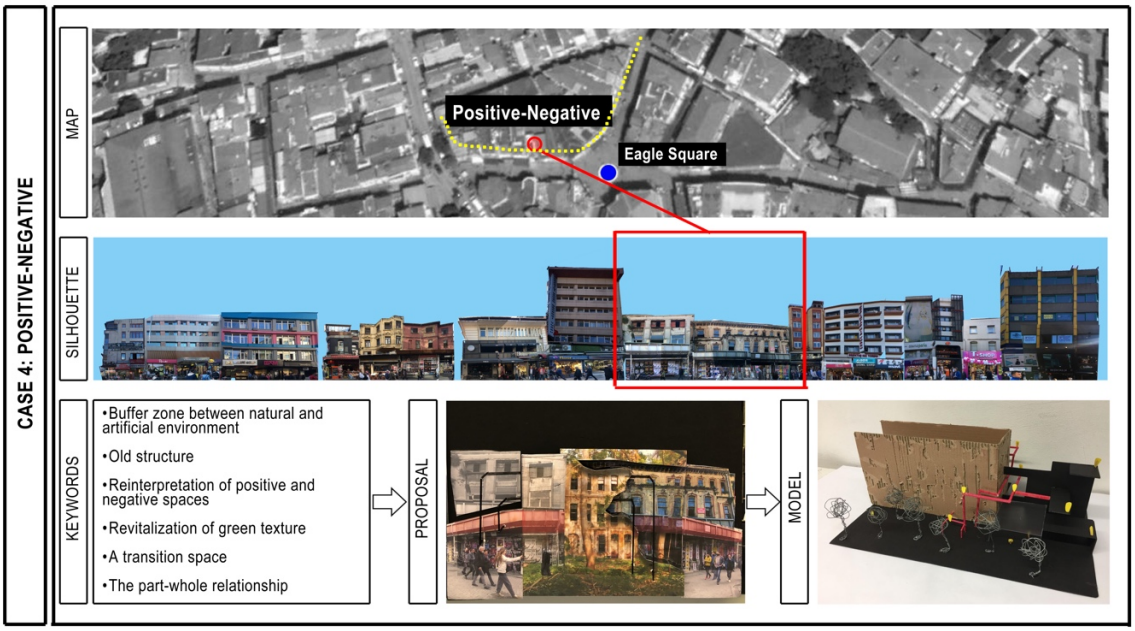

Figure 6. Positive-Negative/ design proposal by Rümeysa Öztürk, Tuba Kaya, Büşra Şevgin

The design proposal was threefold. Firstly, the aim was to examine the relationship between the buildings and the street in order to intervene that relationship into the design. Secondly, it was intended to be a part of the historical buildings without destroying them. Thirdly, the negative and positive spaces were to be reinterpreted in these historical buildings. In other words, the purpose was to extend the green texture in the back elevation, as a negative space, into the positive space in order to rebuild a public space.

This non-functional building was intended to be a transition space between the green texture and the street. Through recession of the building, the creation of an inviting transition space was proposed. Moreover, the attempt was to create a passage effect along the axis through taking the bazaars in the street silhouette as a reference point. The new units, which were jointed and articulated to the structure through the distribution of the different level in the upper floors were transformed into the new functional spaces.

Furthermore, the part-whole relationship was examined and reinterpreted in the context of design purpose. Instead of intervening the historical building, the goal was to elevate the structure from the ground and to create a circulation route around the building, and then to draw an axis into the transition space. In this situation, the steel constructions in the ground floor were used as a part of the main structure. These constructions, which were seen as a communal space on the street, created multiple interfaces, which included the back elevation.

3.5. Transition Space

The transition spaces are of great importance in terms of providing continuity between interior-exterior and public-private space. The notion of interstitial space, which has been firstly defined by Kahn as a "small opening or space between objects" and synonym of these terms as “residual, leftover, in-between, threshold, liminal” (Steen, 2015), is a type of in-between space that offers different experiences intensively.

The areas located especially in front of facades have functionalized as a transition area, present various information about functional and visual qualifications of both interior and exterior (Curran, 1983); they also create a neutral space balancing between these two poles (Kurokawa, 1991). The facades of buildings which affect the public and private functions of buildings and urban spaces are a kind of in-between space and have a dominant character forming public usage (Lang, 1987). The steps, ramps and entrances are the example of urban transition spaces (Ashihara, 1983) and these spaces are beyond physical and visual borders.

Furthermore, thresholds have functionalized as the main element of transition spaces. Steven (2007) emphasizes the boundary between inside and outside that can be opened; a threshold is defined as where a lot of "perceptions, movements and social encounters" occurs. Norberg Schulz defines the opening as "the element that makes the place come alive, because the basis of any life is interaction" (Schulz, 1971). Urban interfaces might be stemmed from mobilities and events of urban spaces and also may be basis of dynamics of in-between spaces.

Considering Case 5, the field research revealed that the building and its adjacent buildings were functionally restricted. Moreover, buildings' elevations represented lack of identity as they did not reflect any context about the physical and functional aspects of the buildings (Figure 7). In line with this problem, four design proposal were planned and presented. The first proposal was to alter the function of the building and add new function to it in order to serve the two adjacent buildings, which were dormitories. Therefore, as a space of interaction, a new social space was proposed between the two buildings. The second proposal was that one of adjacent dormitories was replaced with the studio spaces. In addition to that, the new designed social space between the dormitory and the studio was defined and determined as a transition space. The third proposal was to elevate the street level, in order to provide a relationship among the different levels in the building. The fourth proposal was to create open and semi-open spaces, which were integrated with the street and public space. These new proposed open and semi-open spaces were very influential in providing a relationship between the inside and outside of the building.

As a result, the functional flexibility and creation of a balance between the solid and void parts of the building were very influential in the formation of the design idea. They provided a relationship between indoor and outdoor spaces, the legibility and the experience of the building from the outside. The interventions in solid and void parts of the building created a dynamic façade effect.

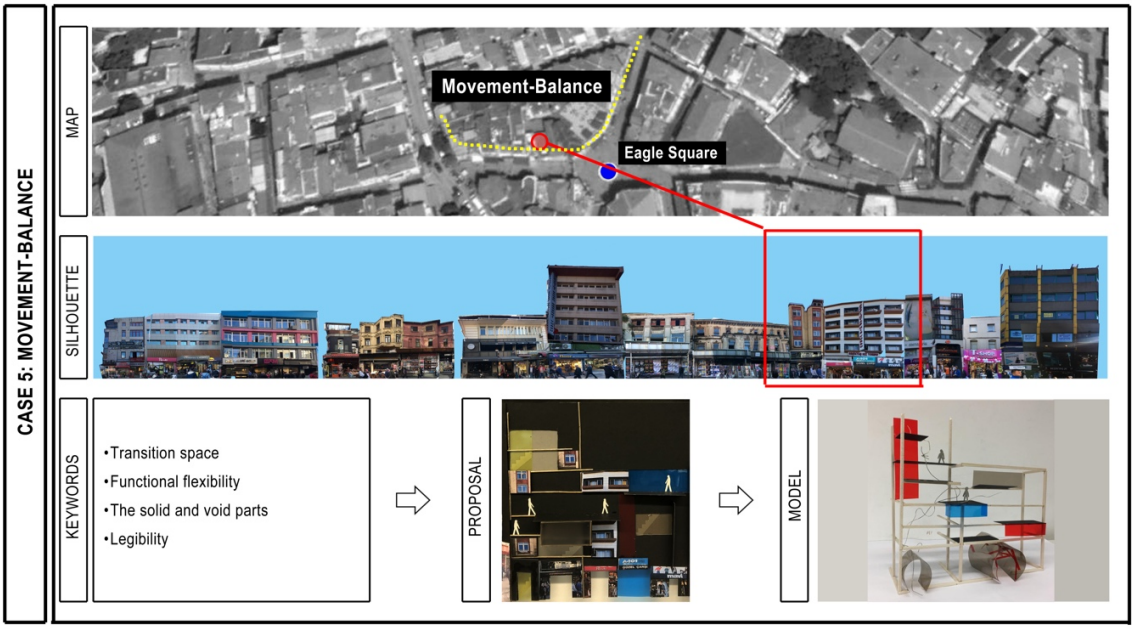

Figure 7. Movement-Balance/ design proposal by Dilaver Bakay, Beyza Hacıhasanoğlu.

3.6. Moving Space

Architecture consists of two distinct phenomena as space and spatial experience. The relation of the body acting in the space indicates that architecture could not be defined without program, activity and event rather than cause-effect relationship (Tschumi, 1996). Architecture, which includes everyday life and movement, is reconstructed with dynamic and temporary activities with the development of cross-programming, dis-programming and trans-programming techniques. Cross-programming aims to adapt a

different program from the current program to the structure, dis-programming aims to keep different programs together, trans-programming intent to bring together different programs (Güleç 2012).

Considering Case 6, the functional order of the buildings in the study area varies. In this framework, the first building includes cosmetics store and a beauty center on the upper floors. Next to the building, there are fast food restaurant and dressing room and accounting office on the upper floors serving this restaurant. The second building includes a cosmetics store and a warehouse function on the upper floors (Figure 8).

Figure 8. Moving Space/ design proposal by Başak Oto, İrem Bıçaklar.

In the new interface proposal added to the structure, some functional and spatial changes are envisaged in the ground level of the buildings in order to facilitate the commercial axis and human density at the lower levels. It was aimed to complement the functions through recessing the ground floors from the street. The front extension in the middle of the building group was recessed, and it was intended to establish a physical and functional connection between two similar functions of cosmetics stores. The entrance door of the beauty center with cosmetics stores and restaurants, which divided the whole commercial function, were moved to the starting point of the building group, so the physical, functional and visual continuity problem was solved.

The front articulation on the upper floors was associated with the functional units inside, and the public / private spaces were attached to the facade with opaque / transparent areas. Utilitarian solutions for some functional units with the concept of privacy of the aesthetic center have been provided with re-additions to the facade. Based on the concepts of change and privacy, opaque / transparent spatial extensions, which vary according to the usage density of the building during the day, were created. These units, which are extensions of different functions, have been interpreted as a spatial setup where the pieces can be intertwined while joining the facade.

The metal facade additions applied in the middle of the building group were removed and the windows which were hidden under the shell was completely opened to the street. In this context, the functional and physical difference of the buildings in the middle were represented by a neutral façade order. The façade order was reinterpreted through transparent units and adding platforms opening to the street, secondary functions such as warehouse are concealed by the spatial interface which included public functions.

3.7. Questioning the Borders / Articulation of Boundary

The fact that public spaces to be transformed performance areas by means of some symbolic meanings and events have great contribution for societies to develop their social structure. Therefore, creating social spaces that enable the interaction among people are of great importance regarding balance of boundaries between interior-exterior and public-private space (Madanipour, 2008).

Common spaces where the place, social experiences are shared, provide re-definition of spatial and social boundaries as well as empowering the sense of belonging of space and society. In these spaces the social production of space through various activities redefines people's relations and questions spatial boundaries. Brookes (2012) defines the in-between space as "a connection, transition, border, differentiation, threshold or line of tension. The design of space which is neither internal nor external – may best be described as a third type of space: inside-outside space". The building facades contribute to the formation of common spaces including inclusive or disjunctive functions and appearing exclusionary or inviting.

Considering Case 7, the building of was located at a corner of the area that defined the square overlooking the Eagle Statue at the end of Mumcu Bakkal Street. Located at the intersection of human density coming from Barbaros Boulevard and Akaretler, Mumcu Bakkal street was a place where human circulation was dense throughout the day. According to the observations at the surroundings, the building included some commercial units such as sports store, restaurant, pharmacy, IT store, dentist office. Some units in the commercial structure were no longer used. These dysfunctional units are empty spaces on the upper floors (Figure 9).

Figure 9. Transform Space/ design proposal by Yunus Emre Tancuay, Hümeyra Alemdar.

The observation made over the surrounding buildings displayed the existence of a terrace opening to the urban landscape on top of the building. Due to its commercial functions on the ground floor, the building created complexity in the square which were defined by the landmark of Eagle Statue. In line with the design proposal, the aim was to direct people in the area by the proposed red surface on the urban floor approaching the building.

The design goal was to publicize the building by spreading the usage density on the ground level to the whole building and opening the terrace to the public use. To make a continuous livable building, various functions were preserved, and new functions were added to the unused spaces. Due to the lack of open public space, there was a need to create an inviting space in the extension of the Square. By opening public spaces on the ground floor of the building and continuing this idea to the upper floors, it is aimed to sprawl the use of open spaces to the whole building.

To eliminate the indoor and outdoor separation and redefine boundaries between the street and the building, the use of public spaces was opened on the upper floors. The public spaces defined by the different colored circulation elements, formed a circulation route extending from the part to the whole. The circulation network was designed as interconnected, reproducible elements. The formed public spaces could also be used in different public functions as flexible spaces.

CONCLUSION

The paper discusses the proposals of a design workshop which aims to reduce the complexity and chaos effect caused by the random façade organization through multiple interfaces in urban space. The research deals with the discourse of 'Post-it Effect' and the concepts such as temporality, transformability, reproducibility, flexibility, permeability, fluidity, transition and articulation. In addition, the multiple interfaces which were created between the interior-exterior, public-private, form-function relationship were questioned regarding the part-whole relationship beyond the perception of the facade as a shell or a physical border. Moreover, 'in-between space' is adopted as a conceptual tool to define the interaction between interior and exterior.

The main objective of case studies was to transform the dynamic and chaotic structure of street silhouette between Mumcu Bakkal and Hasfırın Street in Beşiktaş, through 'Post-it Effect' approach. In addition, the design proposals implemented user-centered approach to question how the eclectic façade organizations could be transformed into an integrated whole of multiple interfaces (Figure 10). Building facades, which provide interaction between the interior and exterior, were considered as interfaces with various physical and structural features. These interfaces contributed to experience of urban space in terms of functional qualities and social interaction possibilities.

Figure 10. The proposal of reproduced urban silhouette through new spatial interventions

In Case 1, the physical/visual relationship with the surroundings are developed in respect to the building's public behavior as a reference point that opens to the street and square. Open and pause spaces were created considering user movement. The proposal of Case 2 deals with the concept of flexibility and emphasizes the relationship between indoor and outdoor space as well as the elimination of functional complexity. Likewise, the proposal of Case 5, underlines the relationship between indoor and outdoor spaces through the concept of 'transition spaces' to provide a functional flexibility and a balance between the solid and void parts of the building. In Case 3, the building façade and its function reconfigured through an urban platform as a balanced and cohesive interface in terms of the density and visual aspect. Similarly, the proposal of Case 6 uses some platforms opening to the street as multi-functional spaces. Additionally, the proposal of Case 4 focuses on the integration of positive/negative spaces through defining a buffer zone between natural and artificial environment. In another proposal, Case 7 concentrated on to remove the indoor and outdoor separation and redefine boundaries between the street and the building and the use of public spaces was opened on the upper floors.

To sum up, every design idea struggles re-production of urban silhouette through multiple interfaces as parts of "Post-it Effect". These multi-functional interfaces contribute to the user-centered experience of urban space through the relationship between façade and street. Furthermore, the multiple interfaces articulated between indoor and outdoor spaces restructure façade movement on the contrary to the perception of the facade as a shell or a physical border.

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BOLD PLANNING

LEVENT ŞENTÜRK

ABSTRACT

The discovery of playful, joyous yet mathematical constraints in architecture is one of *Pomi*'s (*Studio for Potential Architectur*e, founded in 2002) fundamental concerns. Bold planning, a procedure invented among others in the studio can even be contemplated as a counterattack against the cult of thinness of our age. We live in an age where architectural sections hardly ever thicken. Is the progressive thickening of the cross section or of the plan in bold planning then, an equivalent to vulgarisation in language? A stylistic vulgarity (slang) in language does not correlate a building with a thick section. In this article I initially seek to touch on the background of carving out architectural procedures and link this tendency with *Oulipo*. I survey the prospective equivalents of bold planning in fields like comics, literature and 'pataphysics. I outline a framework for *Pomi* by introducing "perversive" procedures; I then discuss some cases in architectural and urban scale in which the procedure is tested, accompanied by drawings. Basic design must be for architecture what the figures in rhetoric are to the *Oulipo*. Oulipians invented constraints releasing language and breaking the yoke of conventional writing; an *Oulipo* procedure hardly prioritizes meaning or grammar. Likewise, this is inventing a playful procedure in architectural design not necessarily conforming to functionality and *Pomi* procedures perform systematic, mathematical operations that do not correspond to the consistent codes in architecture. In bold planning, every constituent in the plan is gradually and evenly thickened: Any plan can turn into a mass without a void, though such a mechanics leads nowhere just as a literary technique implemented blindly will not suffice for a piece of literature to come into being. The plan is then carved, to end up with thinner walls. The final step is "translating" the shell into an architectural layout, remaining as faithful as possible to the former plan's programmatic distribution. *Pomi* procedures can be grouped into ten categories: Algorithms, uncertainties, translations, aggrandizements, inventories, exclusions, metamorphosis, measural constraints, perversions and finally, inversions. Bold planning is grouped under the last one. *Oulipo* constraints can be used only when they are not necessary. This applies to *Pomi* procedures as well. *Pomi* procedures are criticism in action, which open up a fertile and intimate experimental space stemming from Queneau, Jarry, Durand, Genette, Perec, Calvino, Bök, Madden and the like. *Pomi*'s desire is to respond to the canonical with a humor inspired by *Oulipo* and 'pataphysics; to put forth poetic consequences with a sarcastic gesture, as opposed to the deadly positivism of the royal sciences.

Keywords: Studio for potential architecture (*Pomi*), *Oulipo*, *'Pataphysics*, procedural architecture, architectural education.

1. INTRODUCTION: THE CULT OF THINNESS

Thinness is one of the modern cults, possibly the fundamental one –considering that we live in an age that has vowed itself not only to transform the human body *itself* into a monument of delicacy, also refining everything that humans utilise, from body politics to technology. Modern architecture had its share of this archetype of purification by the pioneering architects throughout the twentieth century; in the twenty-first century though, an entirely contrastive technological propensity can be sighted, in which constructional surfaces and sections become growingly thinner and immaterial. Thanks to the novel non-Euclidean fluent software plus a futurology that supplies porous rather than massive materials to achieve more robust and more economical sections, thinness has been launched into the market, hitherto in a democratic enough way to be printed on a 3D printer and a suitable enough way for a neo-baroque aesthetic form. In recent years, when the frontier of thinning the cross-section had been achieved, it had become possible to discern in every field, starting with industrial design, that a dramatic, ultra-structural micro-formalism had been inaugurated. In this essay, instead of bringing water to the mill of the myth of thinness, I intend to undermine it. As the supervisor of an architecture atelier that has kept topics such as experimentalism, *Oulipo*, *'pataphysics* on the agenda in architectural education since 2002, I am trying to cultivate an "antidote" with bold planning among many others: Studio for Potential Architecture (*Pomi*) put forward a series of architectural constraints in 2019, tested them on a building and catalogued the outcomes in a bilingual book (Şentürk, 2020). *Oulipo* (*Ouvroir de Litterature Potentielle*), or workshop of potential literature, one of the longest-standing experimentalist art movements in the history of modern literature was initiated in Paris in 1960 by François Le Lionnais (1901-1984) and Raymond Queneau (1903-1976) and has survived to this day. It is dedicated to the exploration of the creative possibilities of writing under constraint. Some of its members are Jacques Roubaud (1932), Claude Berge (1926-2002), Jacques Jouet (1947) and Georges Perec (1936-1982). 'Pataphysics is written with the apostrophe in front of the first letter. "The science of imaginary solutions" invented by Alfred Jarry (1873-1907) means "beyond metaphysics". 'Pataphysics is equally distanced to physics. Four years after Jarry's death at the age of 34, in his "Exploits and Opinions of the Pataphysician Dr. Faustroll" (2003: 177-267) published in 1911 where 'pataphysics is baptized as the science devoted to exploring the laws of exceptions has influenced numerous thinkers and artists, from Jean Baudrillard to Gilles Deleuze, yet little is known about that science. The concept of "writing under constraint" is an innovation introduced in French literature in 1960 so as to employ deliberate and precise methods to get rid of chance and inspiration. In the text, it entails handling purposefully specified playful rules –unlike conventional constraints– imperceptible to the reader. Likewise, finding and testing playful constraints in architecture is *Pomi*'s principal concern. Bold planning is one of them and holds true that it is a parody, still there's more to it: Increasingly, bold planning can even be counted as an attack —in a way— against modern architecture's ideal of designing thin sections, elegant details, and thinned, weight-reduced buildings. Bold planning, on the other hand, gives one the freedom to convert any designed and finished plan of any kind and scale (through a simple algorithm of a few steps) into something utterly distinct by questioning, warping, satirizing and parodying, without the need for an imaginative capacity for humor at length. This article first touches on the background of carving out architectural procedures and links the concept to *Oulipo*. The article then surveys the prospective equivalents of bold planning in fields such as comics, literature and 'pataphysics. The part introducing *Pomi* procedures under the caption of diversion outlines a framework for bold planning. It discusses a few cases in which the procedure was tested in the atelier and briefly accompanied by drawings. In the conclusion, it points out the exigency for such experiments to find a place in the architectural design studio.

2. PROCEDURE AND HYPERTEXTUALITY

For bold planning —as is the case with almost any *Pomi* procedure— a ready-made material is indispensable; in other words, an architectural project. It does not matter whether this is manufactured by the designer herself or someone else. To make this point clear, I will refer to the linguist and semiologist Gérard Genette (1930-2018) and his book, *Palimpsests* (1997). The thinker highlights the distinction between *hypotext* and *hypertext*. Hypotext is the source or primary text. We can term a literary work a hypotext. Hypertext is a "second degree" text that came out of this welding text. Genette highlights that

since no text can be pursued to its origin, it is compulsory to acknowledge that every text is ultimately a hypertext: There are myriad hypotexts behind every text. For Genette (1997), hypertextuality is a bricolage process; the way to create something fresh handling a preceding material (p. 398). Genette also refers to the oulipians: He reminds that Georges Perec acknowledged hypotext as root text (p. 44). Genette cites *Oulipo'*s pioneer Raymond Queneau's *Exercises in Style* (URL-2) as a blueprint of "trans-stylization", changing style or going beyond style: Writing variations that create parody and pastiche on a theme (Genette, 1997, 124). *Exercises in Style* is based on a short anecdote: A awkwardly garmented juvenile getting on a bus, the scuffle with a passenger; later seen elsewhere with a friend. Genette includes a striking depiction from Marcel Proust (1871-1922) earlier in the book on pastiche as "criticism in action" (Genette, 1997, 8). From Genette's standpoint, it wouldn't be erroneous to regard *Pomi* procedures as hypertexts written using architectural tools; the author declares at the end of the book that all forms of hypertextuality bring about a kind of playfulness in the practice of re-use of existing structures (p. 398). Genette also often employs utterances such as "playful transformation", "playful form of source mode" (p. 48). *Pomi* constraints correspond to what Genette labels "pseudoscientific precision" (p. 141); they are solemn, technical and scientific exercises on the one hand, and absurd and sarcastic on the other hand; they can be assumed to be assailant and defeating for any canon. Literature professor and oulipian Warren Motte (2015) refers to the "three levels of constraint" identified by François Le Lionnais (1901-1984) when speaking of formal constraint: At the rock-bottom there are constraints in the language in which the text is written, at the interim level there are rules of genre and literature, at the third and last level, there are trick and dexterity systems that the author exerts deliberately and voluntarily (p. 11). Plans are created by the contemporaneous utensils (planning tools) in architecture, which can be called the first level of the constraint. At the second level, there are insights and reasonings into what the architect is planning and in the field of architecture (about the housing plan). It can be said that the *Pomi* procedures belong to the third level –conscious and voluntary– parallel to *Oulipo*'s experiments that carry the game forms such as anagrams and lipograms to a superlative grade of scourge. According to mathematician and oulipian Claude Berge (1926-2002), *oulipo*'s three chief inclinations are as follows: The first is to search for new structures for authors to use in the way they see fit. The second is the "automatic" transformation of texts, as in Jean Lescure's (1912-2005) "W+7" technique. This dictionary technique of Lescure is the substitution of the pronouns (verbs, etc.) chosen in the text, regardless of its meaning, the seventh (or n^{th}) next in the dictionary. The third and final is the transposition of concepts from variegated fields of mathematics, such as geometry, Boolean algebra or matrix algebra, into the realm of words. The tangential geometric poems of Le Lionnais, the intersecting novels of Jacques Duchateau (1929-2107) and the multiplicative texts of Raymond Queneau, are exemplification of this last tendency (Berge, 2015, 116). Bold planning is adjacent to the second of the oulipian tendency inasmuch it is, to a large extent implemented as an "automated" process. It is analogous to an algorithm of thickening, carving and re-architecting respectively.

Some of the concepts and specifications of classical rhetoric must be the basic design principles for architecture and what they are to *Oulipo*. Oulipians tended to invent constraints that would release the language and the author by breaking the yoke of classical text generating practices. An *Oulipo* constraint is equivalent to operating on language without prioritizing meaning, common rules or grammar. For architecture, this is to invent a playful and precise process in planning that does not conform to functionality. In other words, to perform systematic, non-architectural, mathematical operations that do not correspond to eloquent / beneficial / consistent codes in architecture. Bold planning is an instance: Every constituent in the plan is gradually and systematically thickened. The thickening process is applied evenly to the elements selected in the plan. This is a process with a definite end: Any plan can turn into a mass without a void, into a black stain. However, such mechanical thickening blindly leads nowhere; just as a literary technique implemented blindly will not be adequate to fabricate a piece of literature. Architectural constraints, which are *Pomi*'s inventions, turn to design tools; they aim to question and transform them. As a constraint is tested, other rational architectural tools begin to revolve around that constraint; the designer can test both the possibilities of other instruments through constraint and the boundaries of her own design capacity as a designer. Bold planning, as opposed to one-way constraints on the outcome, is a twin process involving the reciprocal; it works forward and backward: In the plan, the structure is initially thickened, then thinned; both are "borderline" transactions. How the chosen plan will be thickened in advance cannot be

predicted. As the plan thickens, it must be pushed to the logical limit of the reason for existence: While the lines of the plan come too close to touch each other, gaps remain between them that do not affect spatial signification. In the second phase, the plan is carved and the carved walls are thinned. The final procedure is the translation of the thinned latest shell into the conventional layout language, while remaining as faithful as possible to the former plan: Rooms reassigned, openings determined, and even the furnishing is completed.

3. CONSIDERATIONS ON GRADUAL ENHANCEMENT

Figure 1. Matt Madden (2005), Template (p. 3) (left) and Plus One (p. 65) (right).

In *99 Ways to Tell A Story* (2005), Matt Madden (1968) bases the framework of the comic book story divided into eight frames on a simple event (Figure 1). This book is an homage to Raymond Queneau's *Exercises in Style* (URL-2) from the comic book domain. Madden attempts to make variations of it by establishing an almost "blank" notational story –just like Queneau's: Waking up from his computer, Matt calls out to his wife Jessica who works upstairs and asks for the time, and standing in front of the refrigerator he grumbles: "What the hell was I looking for, anyway?" In "Plus One" (p. 65) it is seen that Matt proliferates in every frame and makes the story inextricable. This treatment could have been tried by duplicating not the narrator but other agents in the comic –the computer, the door, the staircase, or the refrigerator; or –on the contrary– an element that starts congested could dilute and disappear as the story unfolds across the frames. Madden's reproduction of the illustrator parallels the phenomenon of the author's dissolution, which Italo Calvino refers in "Cybernetics and Ghosts" (1997: 15):

> "…the person 'I', whether explicit or implicit, splits into a number of different figures: Into an 'I' who is writing and an 'I' who is written, into an empirical 'I' who looks over the shoulder of the 'I' who is writing and into a mythical 'I' who serves as a model for the 'I' who is written. The 'I' of the author is dissolved in the writing."

Madden's playful and uncanny multiplication phenomenon is chaotic enough even when taken in its purely quantitative dimension. On the other hand, Madden's tactic in "Plus One" contributes to the intellectual dimension of bold planning: Tautology ascends, where it makes the plan absurd, the plan reverses and

initiates the metamorphosis. It is hollowed out, re-functionalized: It is almost inconceivable to comprehend that it originates from the former plan.

4. THICKENING: VULGARIZATION, INFLATING AND BEYOND

At the beginning of the article I addressed the myth of thinning inherent in modernism: We live in a time when architectural sections cannot be expected to thicken for any reason other than war or hurricane. So, is progressive thickening of the cross section or plan an equivalent to vulgarisation in language? It is not trouble-free to find a remedy. Below is the last paragraph from the notational text in Raymond Queneau's *Exercises in Style* (URL-2) and its vulgar version:

“Two hours later, I meet him in the Cour de Rome, in front of the gare Saint-Lazare. He's with a friend who's saying: "You ought to get an extra button put on your overcoat." He shows him where (at the lapels) and why.”

“Cup lowers la'r, guess wo'? A sees ve fust young bleeder agin walkin' up'n deahn ahtsoider ve Garsn Lazzer, arkin' to anuvver young Froggy a-jorein' 'im abeaht a bleedin' bu'en.”

It is true that here is a stylistic vulgarity (slang); however, it would not seem right to presume that a building with a thick section would be greeted with a common expression. Instead, it may be more meaningful to watch examples of quantitative growth. Gérard Genette (1997) calls doubling or tripling the length of each sentence in the hypotext as expansion (p. 260). Amplification or inflation is manifested as a form of text writing, staffing the narrative with tedious details and descriptions, augmenting the identical episodes and secondary characters, and maximizing dramatization of an adventure that cannot be considered dramatic. Non-narrative ingredients are placed in the text with historical and religious references, while scenes from real life are revived by a sequence of scenes (p. 289). All these inflations do not contribute to the quality of the text. Bold planning does not rely on an invasion of off-plan elements; extension is narrowed to the quantitative enhancement of substantial plan elements.

5. TAUTOLOGICAL EXPANSION AND EQUALITY PRINCIPLE

French poet, mathematician and *oulipo* member Jacques Roubaud (1932-) suggests a rather striking method in a renowned essay in which he dealt with mathematics in Raymond Queneau's texts. Words that separate one phrase from another will dissolve and expand, eventually this expansion will reach the extent to include all the words of that language, and the distinctions will lose their meaning (Roubaud, 2015, 89):

“25. Method: One chooses two utterances that are as different as possible. In each of these two utterances, one replaces the significant words with their definition to obtain a quotation ‘a la maniére de…” After a series of transformations, the two original utterances result in a single text.”

These statements are determined as: “The presbytery has lost none of its charm, nor the garden its brilliance” and “Workers of the world, unite”. Suppose, according to the method proposed by Roubaud, take the words “presbytery” and “garden” from the first sentence, and “world” and “worker” from the second sentence. The first expansion is obtained by writing the dictionary equivalents (all taken from *Google*) in place of each. The first sentence will expand as: “The the house of the Roman Catholic parish priest has lost none of its charm, nor the piece of ground adjoining the house, in which grass, flowers, and shrubs grow its brilliance ” while the second will become as dense as: “People of the earth, who do a specified type of work or who work in a specified way, together with all of its countries and peoples, unite.” Select more words from the expanded sentence and write their definitions in the dictionary. Thus, broader texts are obtained. If this process is amply repeated, the number of common words expands. In the end, all the words in that language –two sentences that were initially unrelated– are swallowed to stabilize the situation. Roubaud concludes from this extension method he proposes (2015, 89):

“It has been conjectured that, according to this method, any two utterances in a language are always equivalent, that is, that according to this mode of deduction, language is tautological.”

The meticulous logic that facilitated Roubaud to grasp this perplexing but irrefutable conclusion is the echo of the equivalence principle in the language of ’pataphysics. ’Pataphysics baptized as the science of exceptions by Alfred Jarry (1873-1907), one of the avant-garde figures of the early twentieth century, profoundly extinguishes all types of hierarchies with the principle of absolute indifference. According to the equivalence principle of ’pataphysics, anything is neither superior nor privileged over another; a piece of paper and the Mona Lisa are equal in the pataphysical universe. In science, as in language, axioms are wholly arbitrary, and the royal sciences cannot “know” their axioms: The mathematician does not know what three is, but cannot change it. On the other hand, the principle of equivalence can also be interpreted with optimism, such as equalization before history: If it is taken into account that many philosophers and artists whose names were not recognized in their lifespan reached their merited place after years (sometimes centuries).

6. OTHER PROCEDURES OF THE “PERVERSIONS” CATEGORY

199+: Architecture After Pomi (Şentürk, 2020) is a book of architectural experiments written as a parallel on Queneau's *Exercises in Style* (URL-2). The book is constructed on the principle of diversifying an architectural structure, just like Queneau's variations on a modest framework. This is the building known as the “Convercey House” built in France in 2001, designed by architects B. Quirot and O. Vichard, standing on pilotis, as a simple and modernist structure with wooden construction. Twelve members of *Pomi* in the book pertained twenty procedures each to this structure. These approximately two hundred procedures can be sorted under ten categories: “Algorithms” comprising a series of mathematical steps, “uncertainties” based on ambiguity, blurring and euphemism, “translations” stemming from variations and bringing another perspective, “Aggrandizations/diminutions” deriving from reduction or exaggeration. “Inventories” springing from listings and checklists, “exclusions” that can be called dogmatic, “metamorphosis”, “measural” constraints based on pataphysical or mathematical constraints, “perversions” originating from disruptive interventions, and finally, “inversions” as inverting interventions working as negations.

To explain roughly the titles of “perversions”, namely program/design distortions and disruptive interventions, including bold planning (Şentürk, 2020): Plan distortions get titles such as transcendental, ivory tower, plateauing, violation, exclusion, exoteric, lobography, switchblade, but there are many more. The Transcendental (p. 59) procedure begins when a column (or wall) selected from the three-dimensional model of the building is amplified five or ten times, and the spaces in the plan are independently attached to this transcendental element. If the operation is established on the size of the space, the spaces can be lined up around the column, rising from the floor, from small to large. In the next stage, the spaces are recombined with stairs and ramps. A comparable process is the Ivory Tower (p. 105); each room becomes another floor plan, recombined with vertical circulation elements. Plateau (p. 216) is akin to the preceding ones; however, the plan is detached from them by assigning different levels to each room. The rooms/spaces turn into plateaus. The plan is reorganized in sections. Room continuity is re-established by adding vertical connectors. Another plan disrupting operation is Violation (p. 141): Each room tries to violate the others by overflowing its boundaries. While the mezzanine insists on itself (trying to transform other areas into mezzanine floors), the plan is the remnant of this struggle. In Exclusion (p. 169), with the repositioning of each inner wall of the plan to the outside, there is no inner wall left in the plan and all of them spring from the façades.

Exoteric (p. 91) is among the most playful procedures of the overall: Each volume in the plan is opened with an outer door and corridor when necessary. With a process comparable to tracheal/tubular breathing in insects, the corridors are kept very narrow, with minimal intervention in the existing volumes. In Lobography (p. 175), the plan is drained like a corpse with a brain removed; it is a planar lobotomy procedure. All kinds of information, from legend to detail, from scale to diagram, are scattered around the evacuated plan, which consists of a contour. The final plan distortion procedure of the perversion category

is Switchblade (p. 252): Elements (interior walls, façade protrusions, etc.) project outward from the structure on an axis (right/left, up/down).

Regional distortions manifest themselves in Cpr and Fabulist; a fragment of the plan is affected by the procedure while the rest remains the same. Cpr (p. 73) gets its name from the heart graph. Continuous or partial loss of information in the plan is a type of glitch (digital disorder). Like the scanner error, it is the extension of the lines of the plan, horizontally or vertically, as a part of it creeps: Straightening the line when the heart stops for a while. In Fabulist (p. 269), a part of the plan is covered and the missing part is completed from imagination. Completion can also be done by uninformed people.

Programmatic diversions are manifest in procedures such as Extensions, Twin House, Pomi Housing, Slaughterhousing and Parking. In the three-dimensional model in Extensions (p. 99), unpredicted annexes (terraces, rooms) come to the spaces in the building and the structure becomes rhizomatic. In the Twin House (p. 135), a wall of the building is left blank with no openings, shared and reorganized in a twin house layout. Four different symmetrical twin plans can be created for each façade. Pomi Housing (p. 218) becomes the satire of the lazy and invasive urbanism grounded on its production that consists of row houses, star blocks, etc. from a single house. Slaughterhousing (p. 182) is the replication of the building's program as a slaughterhouse and is an exemplar of warping a prevailing building by an irrelevant program. In Car Parking (p. 200), while the building is converted into a multi-storey car park, it is readjusted with supplementary circulation features so that the maximal quantity of cars can drive in. The Park (p. 205) is the transformation of the building into a park: The bearing components of the plan leave their place to elements such as trees and hedge plants, while the furnishing is replaced by playground equipment.

Unit-level distortions target individual units and not the whole in the plan or three-dimensional model, and occur with procedures such as explosion, implosion, precision, small but fatal, optical flaw, cento, triptych and w+7. Explosion (p. 102) is the scattering of all the elements of the building model by the outburst with isometric logic in the exploded perspective, and with an inversely proportional algorithm, the elements close to the centre of the plan are scattered farther and those farther to the centre, avoiding a utilitarian representation. In Implosion (or inplosion) (p. 137), plan elements are scattered inward without disturbing the contours. In Precision (p. 149), each element in the model is individualized, distorting its articulation, so that it does not touch any other. In Small But Fatal (p. 166), the stairs, built-in elements or the level difference in the three-dimensional model are deliberately broken by minor errors, but fatal to the user. In Optical Flaw (p. 192), some kind of deception is created by deliberately drawing elements (%10-30) bigger or smaller in the plan. Shoving (p. 241) is also called +7 or Cento. It is the insertion of seven different transmissions from another building (e.g. Le Corbusier, Villa Savoie, 1929). In Triptych (p. 268), the building model –in the same floor plan– is handled in three levels in the section (e.g. referring to the Doric, Ionic, Corinthian trilogy) and the materials and details are determined again. W+n (p. 261) is a dictionary procedure. Each building element replaces the item seven after it in the Dictionary of Architecture. This process is applied to as many building elements as desired.

Another diversion is on the stylistic level. It diversifies under titles such as fortification, junkyard, flooding, negativities, autopsy report, prehistoriology, palacing, pilotisms, biased, Walter Benjamin. Fortification (p. 108) is a medievalization parody, obtained by raising the length of each structural element and expanding its cross section conically at the base. Prehistoriology (p. 219) is the prehistoric version of the building, as in Çatalhöyük. All walls are blank, wall thicknesses are maximized, openings are minimal, and entrances are through the roof. The Junkyard (p. 126) is a model of the edifice constructed with second-hand, leftover supplies. Flooding (p. 106) is the process in which the structure is submerged to some extent. It is a sectional exercise referring to Peter Zumthor's Therme Vals (Switzerland, 1996). Once the spaces are submerged, new connections become inevitable for access. In Negativities (p. 191), the gaps of the building are massif. Also known as "Architecture After Rachel Whiteread". Whiteread (1963) produces sculptures that become negative structures by filling the inside of buildings with concrete and then removing the building itself so as to materialize the void. In *Exercises in Style* (URL-2), Queneau defines every element in Negativities of what it is not; comparable to fullness manifested as emptiness in architecture. Autopsy Report (p. 258) is kept after the model of the building was destroyed by a preferred manner. It documents the damage as if it were a constructional damage. Palacing (p. 227) is the occupation of a land hundreds of times the size of

the building itself, surrounded by lavish landscapes and outbuildings. In Pilotism (p. 209), the construction is elevated on pilotis pillars; the overall structure, fragment or subcomponents can be elevated on pilotis. In Shapology (p. 256), all species of figures that constitute the structure are grabbed from the drawing, and reproduced in a loose fashion, sufficiently procreating a fictitious microcosm (a homage to Daniel Libeskind's Micromegas (1979)). In Biased (p. 264), in the narration, while too much emphasis is placed on some areas of the plan in terms of visual representation and detailing, other areas are not given even a minimum level of attention. Walter Benjamin (p. 272) is a parody of the philosopher's project of passages: A passage is overrun through the middle of the building's model and the project is reconstructed.

Pomi procedures are based on *Oulipo* in one way or another; explaining the correlations of each goes beyond the limits of this article. Some are named the same as in Queneau's *Exercises in Style* (URL-2), some have the same titles as Matt Madden's *99 Ways to Tell a Story* (2005). For these matches, see the notes of the relevant chapters in *199+* (Şentürk, 2020). The titles can be found with ease for the book is in alphabetical order. The reader can enjoy these games more through benchmarks. In *Oulipo* constraints can be used "only when they are not necessary" –with deep irony. This tenet, which prescribes the utilization of *oulipian* procedures in beneficiary ways, also applies to *Pomi*'s procedures.

7. BOLD PLANNING APPLICATIONS: ARCHITECTURAL STUDIO EXPERIMENTS

It would not be erroneous to portray bold planning as a "transposition" following Genette: Transfer, interchange, displacement; the process of passing the equation to the opposite side. The first specimen is a wooden teahouse by Japanese architect Watanabe built on Mount Fuji in the 1960s on pilotis (Autocad drawings by Özlem Gök). When we take this structure as a hypotext or a root-text –in Genette's words– we can reach the subsequent conclusion:

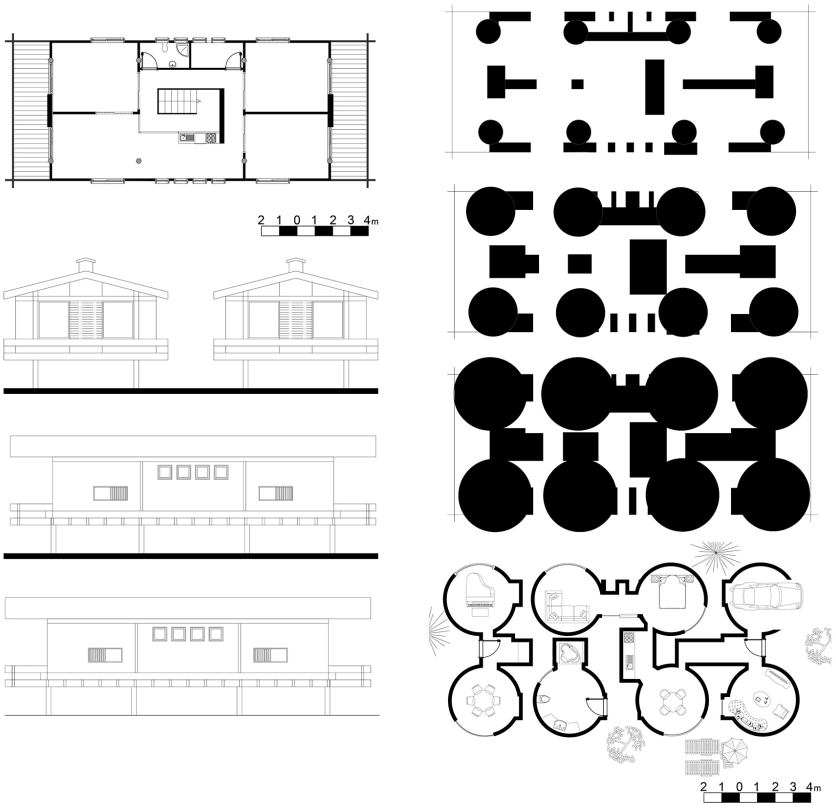

Figure 2. Left column: Watanabe, Tea House, 1960s. Right column: Watanabe bold planned. Drawings: Özlem Gök.

Watanabe's design is an elegant, monumental wooden structure that rises on almost indistinguishable pilotis (Figure 2). While these pilotis pillars were gradually thickened until they reached the size of the silo, we achieved the initial stage of bold planning by transforming the thin dividing elements in the plan into thick bands that disorganized the continuity and austerity of the space. We exerted the thickening evenly until a physical impermeability occurred. The second stage is the planned maximization of the interior space by carving the plan to the maximum. Bold planning is concluded with conventional architectural processes such as novel program distribution and the openings layout.

When bold planning is made devoid of discerning between the elements and amplifying at the same proportion, it gives a sequel like Ayşenur Telli's, one of the members of *Pomi*: It is a version of the plan where the silos are not distinct and the plan has inner courtyards (Figure 3).

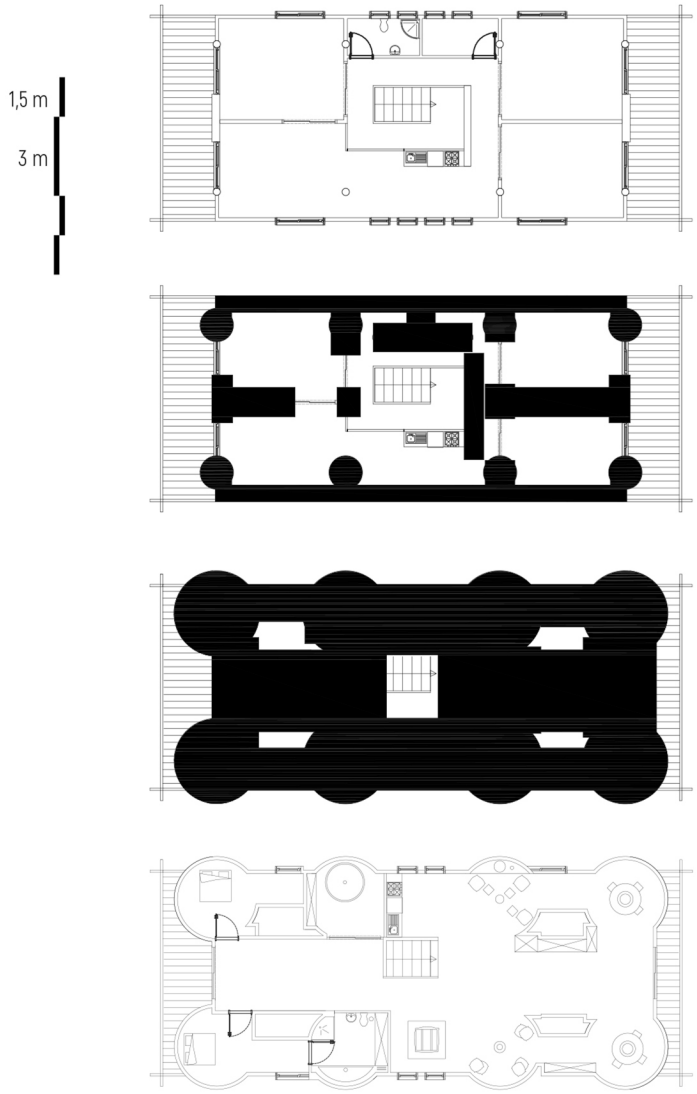

Figure 3. Watanabe original plan on top. Plan becoming thicker, reaching a limit, then carved and re-configured. Drawing by: Ayşenur Telli, 2019.

The design of Aybüke Kara (another member of *Pomi*) who practiced bold planning to the plan of the Convercey House (a wooden twenty-first century residence in *199+*), makes it lose the singularity of the

original plan, which resembles a largely linear container volume, causing it to undergo longitudinal corridors and divide into interior rooms (Figure 4). She has difficulty in exercising conventional dimensioning and space dimensioning and creating an eloquent architectural integrity from the labyrinth-like plan. The accomplishment of assessments in *Pomi* procedures cannot be predicted. The outputs of experiments have always been fruitful for *Pomi*, with their contingencies that make it possible to think about architectural reality, the phenomenon of design, and the knowledge of design generation: Even when the result is a complete failure in architectural terms.

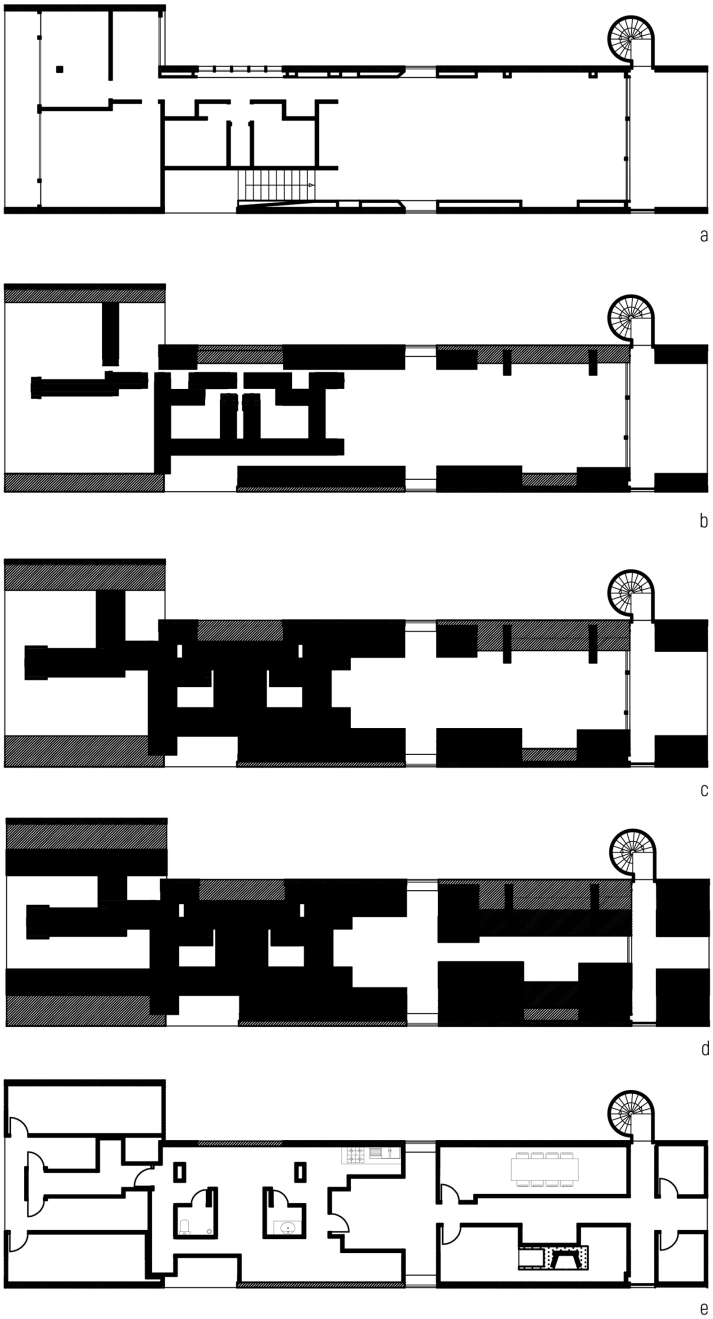

Figure 4: Convercey house (2001) on top. Phases of bold planning, gradual thickening and a final carving. Drawings by: Aybüke Kara, 2019

Ezgi Yardımcı, another member of *Pomi*, took bold planning a step further by putting it together as an issue in her graduation project that she researched in depth in urban scale, and she conducted a sequence of experiments on the section instead of the plan (Figure 5). Ezgi Yardımcı's cross-sectional research in *Pourat* (*Atelier for Potential Urbanism*) in 2020 launched with the museum structure she designed in the city center; it then turned into an experiment that dispersed the volumetric relationships of the structure by performing disruptive thickening operations on a series of cross and long sections of the edifice. The algorithm she used in thickening the section of the museum building is rooted in the application of a thickening coefficient, which is inversely proportional to the length of the element in the section. Thus, regardless of its functional significance, a short element in the cross section becomes thicker while a longer part becomes less. The virtual models that Yardımcı has produced by overlapping these sections, create spatially chaotic three-dimensional situations, which brings about opportunities for the designer to invent "clinamens" for these inconsistencies to turn them in favor. "Clinamen" is a term expressing the anomalous interventions made by oulipians voluntarily within a text. It was first coined by Lucretius in *De Rerum Natura* (2000), over twenty one centuries ago.

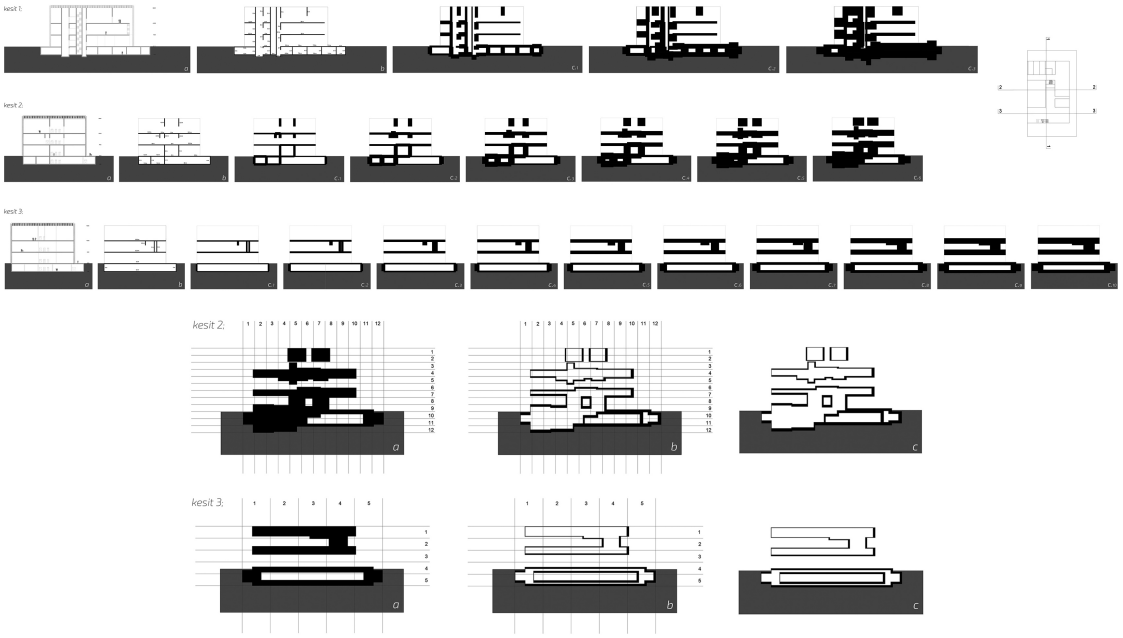

Figure 5: A museum project in sections. Project by: Ezgi Yardımcı, 2020.

8. CONCLUSION: THE RESPONSE TO THE INFORMATION BOMBARDMENT, WITH A SARCASTIC BOMBARDMENT

Oulipo's former president Noël Arnaud (Motte, 1986, 289-306) had an interview with oulipian Warren Motte in 1985 on the occasion of the twenty fifth anniversary of *Oulipo*'s founding; that aforementioned interview is inclusive of plenty of argumentations that give the opportunity to question the significance of *Pomi* experiments in terms of architectural pedagogy and experimentation. Arnaud emphasizes that *Oulipo* should not usurp the field of education, underlining that pedagogy was detrimental to *Oulipo* the most. *Oulipo* has endured as a minor and closed science and literature laboratory for a considerable time since its emergence in 1960 as a group under the College of Pataphysics. It cannot be disowned that for this closeness, it effectuated an enigma that renowned authors of the era were enthusiastic in exposing what was taking place there. Nevertheless, currently the state is unalike and *Oulipo*'s traditional gatherings are lucidly continuing. Arnaud's main concern for "pedagogism" is that *Oulipo*'s procedures are not made reachable without being sufficiently and high-grade tested; considering Arnaud's use of the metaphor of

“drug released only after enough experimentation”, it can be thought that he sees it as an ethical issue. On the other hand, most of *Oulipo*’s first generation nucleus insiders are no longer alive; thus, the group’s authority over inventions outside the group lost its significance. According to Arnaud, *Oulipo* as a literary workshop fancied to hold meetings with experts from fields like mathematics and the like, and not with writers, contrary to the expansionist movements of the epoch.

Pomi procedures in the architectural studio disclose Proust’s effort to get an imminent specification of “criticism in action” by opening up a laborious, sophisticated, fertile and knowledgeable experimental space that has both intimate and collective extents. Stemming from philosophers, authors and artists such as Queneau, Jarry, Durand, Genette, Perec, Calvino, Bök, Madden and the like, the experiments draw on a wide range of references. Architectural experiments are originating from conventional architectural experience and the blending of this knowledge with black humor rather than monotony and uniformity; not to the superior designer ego, but to make reflections collectively; it is based not on making the game superficial and easily consumable, but on intensifying it with intimate labour. *Pomi* procedures are yet in their early stages, theoretically and practically, but even as such they are promising to yield a safe medium for inventing novel conceptions and procedures.

The fundamental task of *Pomi* in terms of architectural pedagogy can be assigned as follows: A systematic and methodical opposition to the reduction of design to utilitarian processes, a rejection to the elimination of game by pragmatism with the armor of science, and the increasingly mechanical design activities. *Pomi*’s desire is to respond to all this with acumen, an unparalleled and fertile humor inspired by *Oulipo* and ’pataphysics; to put forth poetic consequences with a sarcastic gesture, as opposed to the deadly positivism of the royal sciences.

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ACADEMIC REPRODUCTION OF DISCRIMINATORY DISCOURSES ON HUMAN-ENVIRONMENT RELATIONS: THE NEIGHBOURHOOD STIGMATISATION IN ISTANBUL

ESER YAĞCI

ABSTRACT

Individual or collective meanings and values accumulate in our natural habitat as much as the built environment in the cities. Alongside constituting the common aspects of determinations on the natural and built environment, these accumulations widen the tendency of examining and conceiving the urban environment primarily with respect to the human being producing these meanings. The activity of the human recognition of its environment, to generate and transform values, is related not only with the norms, human developments and spread of standards but also with the continuity of non-human lives. Studies focusing on Human-Environment-Space relations are, as per the problem of reaching scientific inferences, mostly related to those which are non-ambiguous, concrete and dependent to its own analytical repertoire, in terms of ontology. However, with respect to transformations in norms as well as changes in spatial determinations, the concepts used in the discourses and narratives affecting, triggering, spreading, or legitimizing such performances matter as much as the certain productions of the human being. Rhetoric discursive uses may also mediate subjective relations between sciences and the areas of implementation that they contribute. With these presumptions, recent adoptions and exclusions affecting living beings' habitats unsettle lives, and effective forms of intervention are primarily based on these discourses. Istanbul is deemed a metropolis with continuously changing population characteristics from a historical perspective. Istanbul's old neighbourhoods, which are rapidly transforming, and which have been transformed already, as new tourism centres, have become the subject of urban and architectural studies, as the environments where lasting commonalities of city environment have visibly been destructed. Making a contribution to these studies, emphasizing environmental justice and widening its scope with concepts, are the primary ethical responsibility of not only the relevant scientific fields, but also of every subject charting the emancipatory spaces of academic knowledge production in relation to urban developments. Hence, when the social, environmental, and spatial problems of each city are considered in an integrated manner under the main theme of discrimination, it would be clear which discourses pave the way for discrimination. The problems on the agenda of the new millennium, such as climate crisis, excessive individualization or materialization of life in an urban environment, will continue to be the subjects of future research putting forward especially which forms of awareness are incorporated by the new "protection" or "re-functioning" approaches. Upon these reasons, the premise of this article is such usage of the concepts in spatial studies overlap with the concepts used in the structuring of gender-related discriminatory spaces as well as the ones that concern the ecological and class-based vulnerability. As per this premise, the positions adopted by academic knowledge production in addressing the urban environment are as important as the attitudes of the decision-makers and executive actors. The effects of the discourses used on lifestyle habits and reinterpretation of the environment and space have already exceeded the conventional epistemological frames structuring the scientific studies about the cities. Fields of architecture and planning are flourished by these meanings and values provided that they focus on different scales and facts, as long as they are

directly and indirectly effective in the determination or obligatory adoption of new spatial norms. This study, which is a theoretical convergence proposal, intends to analyse the impact of discourse re/production and re/interpretation of concepts on urban developments in association with its environment, without making distinctions in relation to the medium of existence, type, kind, race, gender, and camp of thought. It aims to pave the way for new research questions and conceptual extractions within the framework stated above. Its frame was defined with the relationality of favoured concepts and discourses such as "rehabilitation" justifying environmental deterioration, through urban interventions in Istanbul's inner-city neighbourhoods. Its purpose is to bring the dialectic between the concept and the patriarchal practices it results into question, rather than presenting a critique of architecture or planning. Its method relies on its extraction of the prominent concepts that will remind the taxonomy of the implications, mostly in the empirical studies which will address the transformation of new/old neighbourhood environments of Istanbul within its distinctive environmental dynamics. Upon the interpretations of readings, one may question the embedded discriminatory elements in a discourse and what conceptual convergence discloses these elements.

Keywords: Environmental inclusion, city, patriarchal space, discrimination, academic discourse.

INTRODUCTION: PROBLEMATIZING THE CONCEPTS AND THE CONSTRUCTIONS REGARDING DISCRIMINATION IN SPATIAL STUDIES

Having blended with various cultures, distinctive environments, the forms, and values of every city, which have their influence for a certain time and then disappear, are transferred between generations. They are interpreted and transformed as accumulations adopted and continued by its inhabitants. In this way, continuity of values and spatial characteristics regarding the environment is ensured despite their inner inconsistencies. Values regarding nature and objective world which have been subjects of many fields of science and their dialectic can be analysed through related expressions and type of discourse as well as related spaces. The discourse1 reflecting the perspective of the humanity and nature also determines the established relations with nature, life, and space.

While the human being, who tries to locate itself within the objective world, widens its priorities according to practices of life and requirements, in other words, while establishing its subjectivity, re-determines self-attitude toward nature, other human beings, and spaces that it interacts with. However, these priorities may disrupt also other life forms when they change into destructive mass tendencies due to interactions with different subjectivities and cultural variables. Whensoever the natural and built environment are addressed separately, a certain environmental discrimination is produced from the very beginning. Other discrimination forms are added to this as well. For these reasons, it is essential to eliminate potential discriminatory elements in an established discourse on a certain space, to re-locate the perspectives, and to extract the problems on the basis of discrimination, then to determine the concepts that will be useful for the method to be adopted for this elimination.

All environmental and social divisions may be grounded on the human reproduction of nature as patriarchal act. Regardless of diverse identification, the male domination on knowledge production can be assumed as one of the consequences of this act. In human history, the domination in the written transfer of the knowledge in diversified fields of science quotas were still being imposed on women during and after major cultural enlightenment periods. Therefore, whilst the sources and discourses referred to in the applicable and written culture are mostly expressed by the male thinkers who gained a place in the world of science and ideas, the attitudes emerged in the societies based on oral culture which were excluded in the

[1] Studies of Bahtin on literary philosophy (2016, 2017) not only support the viewpoint presented hereby by conceptualizing the relations between discourse and environmental conditions changing by time and space; but also provide methodological frameworks. These studies pave the way for points of view which enable extraction of clues for time-space transformation factors and which engages the positions in regional, social and political relations in Bahtin's narratives categorized as discourse types -especially in qualitative studies-.

periphery of this world were under-rated. The development of knowledge production, which is subject to recording thereof, caused the domination of written culture over the accumulations emerged in the oral culture2. On the other hand, while conceptualizations taking attention to the production of inequality and discriminations in knowledge production has a certain potential of critical evaluation as long as they take both discourse transfer forms into account. The interest of hybrid disciplines such as environmental sociology and environmental psychology to cultural history today is based on this potential and the purpose of deepening their contributions with their cross-disciplinary or polyphonic approaches towards development of inclusive approaches. Accordingly, through these developments, the interest in empirical studies related to the cities increases as well. Environmental and social consequences of the implementations made without making the benefit of these studies and theories in the fields of planning and architecture, which structure the environment, constitute the most important subjects of the new millennium that we live in. This makes the implementations having experts from different disciplines progressive, in both environmental and social terms.

Economic, political, and biological sources of collective tendencies which emerge and spread in the course of daily life, take more space in the urban and architectural studies. Accordingly, the fact that evolutionary psychology gained ground concerning the continuous relations of social bonds with environmental perceptions. It provided multidisciplinary research subjects from environmental psychology and sociology, thus enriched design and planning practices, within participatory frames. Nevertheless, some of the discourses and narratives established on transformations in urban studies, may be found insufficient in covering new environmental and social fragmentations which are more prevalent from the perspective of social sciences or environmental sciences – especially due to the obligation of architecture and planning fields to practically comply with the norms. Some of these may pave the way for the preparation of subjective reports falling out of the scientific frameworks of environmental impact assessment and consequently disrupt socio-ecological unity.

Theoretical studies problematize the gaps between scientific data and area of implementation related to urban environment, and socio-spatial fragmentation as well. However, in Turkey, the area of implementation may put the findings prevalent in theoretical investigations into its own agenda in limited environments as it will be explained in the following subtitles. The inconsistencies between theory and practice are maintained in social and spatial terms. In addition, the ecology of civil society which aim to protect and preserve their certain intersectionality and commons to the extent of their capacity of compliance may continue to be disrupted by being externalized to make contributions. If this relationship is read in reverse, the fact that implementations transform the society's environmental awareness and usage of habits, then stretches the acceptances in a professional environment, and indirectly makes knowledge production subject to this flexibility, is one of the most important problems today. Neoliberal co-optation operates today mostly over knowledge production and undergirds the decisions in favour of a certain privileged structure, despite the usage of concepts such as "improvement", "corruption", "prestige", "sustainability", "green" and "smart" within pragmatic attitudes.

In relation to the problems identified in the above-mentioned context, the role of urban narratives in the normalization of discrimination in relation to environmental, social, and spatial transformations and in the pre-production of discrimination in the field of theory, cannot be denied. The discourses on the protection of natural assets independently from the tangible and intangible cultural assets as a precondition of human sustainability may be given as an example in this respect. On the other hand, the environmental and social effects of discriminations regarding human life and the relation of environmental discrimination with the gender-based discriminations took place in both eastern and western intellectual history. As one the most known philosophical approach, Platon (1995) developed in the 5th Book the State and the discussions taking place in the 2nd Book, and while bringing up the equality of women and men in the social division of labour to discussion, expressed with dialogues coming against the slavery system that administrators of the state need to have an accumulation of philosophical knowledge. In this work, which reflects the contentious

[2] Ong (2013), discusses the functionality of literacy in technologizing the world as well as the spread of collectively-produced meanings and values through encoding, and compares them through the narrative differences in oral cultures.

thoughts of Socrates vis-à-vis Gloukon, one may trace much earlier effects of Confucius on Platon, questioning the consubstantiality of nature and human as well as the moral and philosophical positions of administrators. Improving the qualities of discussion and investigation produced in the field of philosophy comes to the surface in such written source. On recent issues, most related to urban environment where the social caste occurred, the class-based analyses mostly make reference to Engels's study titled "Dialectics of Nature" (2014). In this compilation of texts, Engels emphasizes the dialectic of the natural and social world, and thus becomes effective in rendering firstly moral and then political positions determined by human on the nature. Similar dialectics were developed in subsequent prevalent studies (Harvey 1996, Smith 2017, Katznelson 2019) and taken up as subjects of sciences, reminding determination of multidisciplinary methods. The degeneration in human and environment relations, more dramatically after the two world wars and in the post-industrialization period scaled up, since fundamental sources of non-human and human life were consumed more rapidly. All these have been problematized in various mediating spaces from student strikes to grassroots movements and artistic expressions other than the international organizations.

In more recent discourses, blessing the continuity of the human being and the technology as a saviour in a way -concealing the inequalities and related precariousness for the poor and the women-, is criticized in the sense of normalizing and spreading the anthropocentric point of view. By reversing this acceptance and making an eco-centric reading, one may find other examples serving as a source for discourse constructions which reproduce or normalize green washed, environmentally racist, elitist, class-based discriminatory, ethnocentric or sexist basis, which cannot be found comprehensive. Presently, each narrative formed abstractly or concretely on urban and environmental transformations, affecting lives from the urban myths to the cinema, from gossips to news, from fears to dreams, are rendered eligible for revival, and thus for commoditization, by re/productions in digital media. As what those produced in such media represent in terms of semantics becomes transitive3, the same meaning transformation is applicable for physical spaces as well.

Discourse construction can be discussed in the education phase as a matter of ethics within the fields of science, rather than being a form of political performance. However, for problematizing pragmatic positions, the role of narratives transferred from verbal to written culture also worth attention. The transmissivity and subjugating role of narratives in human-environment-space relations does not lose its effect in any environment. As a matter of fact, to the extent that it is possible to find numerous examples that prove how effective urban myths are on city transformation and maintenance, environmental and spatial constructions made in digital media today have a role in value re-de/generation as well, despite their transient nature. Since each spatial definition finds reflections on norms and economic relations, - which became more associated with industrialization-, considering them as an environmental dynamic would not be found a degradation.

Handling the causes of environmental and urban conflicts beyond the dominant views, and beyond the geographical, political, epistemological boundaries, can be possible by converging related academic positions. Besides, today, data collection and processing related to historical, political, cultural narratives have generated, and still generate, new boundaries and relationships in the field of ontology, by being transferred to digital medium from the end of the second millennium C.E. of human history and paved the way for the emergence of more fluid and open mass culture. This new process, where lasting spatial perceptions may be reviewed by new facilities of measurement and analysis, is continued by analyses of penetrative and dominant elements of cultural codes. Stating that the processing side of the mentioned transformation is carried out by machines, and the spreading and manipulation or direction function by only media is questioned by theorists today. The practicality of these investigations, on the other hand,

[3] Derrida (2001), in this transitivity which he conceptualizes as *hauntology*, provided an approach beyond modern and post-modern camps of thought, for the purpose of analyzing the relations between value exchange and commoditization, by questioning the commitment of changing boundaries in discourse to the environment that it emerged from.

becomes possible in the inclusion of models where theory and knowledge production are taken into consideration by policy makers, designers and planners.

WHICH CONCEPTS TO DECONSTRUCT WHICH DISCRIMINATORY DISCOURSE

Being diversified so far as spatial manifestoes from environmental and urban utopias, narratives give information about the recognitions and space-time dynamics of the period in which they emerged, while affecting the moral values, behaviours, and habits regarding the environment in terms of psychology. From a favourable reading, for instance, when evaluated as per the dynamics of reproduction, refusal, and recognition, they provide applicable data about the spatial evolution of social and cultural fragmentation causing conflicts. This fragmentation was witnessed more visibly while associated with the symbolic dissolution of socialism and collective conscious towards equality, in the new era following the dissolution of the Soviet Union and the fall of the Berlin Wall, during which capitalist thought structures would be made fashionable while "hollow copies" of its opponents would be produced as neo-liberalism. In the study where the latest evolution capitalism was conceptualized as "capitalist realism", media theorist Fisher (2011, p.22) defined the capital as "zombie manufacturer" and questioned the values as well as the ontological dilemma that blur the critical sub-contexts such as political capital, academic capital, and mediating capital. In this context, Axiotou (2018, pp.72-96) redefines the pedagogic and cultural symptoms of neoliberalism and argues that turning theoretical investigations' perspective about "post-humanisation" toward a critical theoretical frame which has the potential to eliminate this ontological dilemma. Upon this perspective, decentred investigations can define their new notions. As she explains (p.75): "These notions range from an emphasis on a 'zoe-centered system of species egalitarianism' (Braidotti 2013; 2016) to futuristic accounts of progressive merging of human organisms with technological prosthesis (Haraway 1985; 2006); or to the very possibility of disembodied future consciousness heralded by the post-corporal experience of the cyberspace." With the context suggested by Axiotou (2018, pp.75-76), this evolutionary perspective requires a certain political conscious for the establishment of new epistemological and ontological relations as well as widen the epistemic boundaries. Considering the evolutionary state of variables at the intersectionality of these views might also have a certain practicality in mitigation potential disruptions between life and knowledge from viewpoints taking into consideration the genealogy of newly emerged hegemonic structures.

Decolonization of the Concepts in Spatial Analysis

New forms of discrimination, violence, and precariousness are redefined by thinkers who intend to de/re-construct longstanding structural points of view. Decolonization comes to the fore as a concept targeting the emerging exploitation mechanisms and patriarchal convergences that reveal themselves mainly in the natural environment, city, and reconstruction of the urban self. As a base of this concept, the post-colonial critical thought having its references from Said's queries (2008) on orientalism directs its attention to emergent forms of colonialism which are built over privileges by formal and biased analytical structures and cultural spaces.

At this point, decolonization of academia may be ensured via deconstructing "regulatory or subjugating power" forms on which Butler and Athanasiou (2017, p.71) tried to take attention, and thus adopting scientific, ethical, political, and psychological attitudes that will reveal "dispossessions" defined by them as making devoid of existential position of the self in dominant culture. Post-colonial critical thought can be considered a lens for focusing on the new organizational structures of exploitation and consumption in today's global capitalism. Particularly, as the performances of establishing a spatiality and transforming the environment become norms toward the determination of standards throughout the processes, their relationship with a certain environment or spatial policy more than any other period, were problematized in Foucault's studies before (2008). Mass monitoring and the operations of hegemonic and patriarchal structures through neoliberal re-subjectivities and population management were initially problematized under the concept of biopolitics by Foucault. Then this concept started to be used in diverse spaces of inquiry on the norms of alignment with environmental and gender policies as well (Shiva & Moser 1995,

pp.193-213). Feminist and queer theorists such as Hooks (1990), Lorde (2007), and Ahmad (2018) who remind Fanon's voice4 (1965, 2008), take attention to the patriarchal re/construction of white privileges in the global North by the norms or hegemonic templates, and on the changing class relations in relation thereto. These Feminist thinkers widened this intersection with a view to covering those who are devoid of white and new middle-class privileges over the ecology policies, feminist and queer discussions which came to the fore all the more as from the 60s on. In this regard, environmentally destructive positions which were discriminatory against women were brought into question over eco-feminism and included in the queries via the post-industrial society's whiteness, privileges, and colonialist standards in the field of culture. Similarly, Alexander and Mohanty (1997, pp.3-29) locate themselves against the post-modern approaches. In their critical positioning, they argue legibility of white-supremacist discrimination that is embedded in dominant discourses and then propose the ways of analytical deconstruction of structural discriminations, rather than locating themselves against the Western culture-centric feminist discussions. This approach avoiding possible "whataboutism", also tends toward the purpose of inclusion which gives voice to pro-BIPOC5 discourses in comparative studies. These are regarded as new class-conscious approaches and have paved the way for intersective discussion spaces for critical views not only on racism and sexism but also on other forms of discriminations such as ageism and techno-centrism.

In more recent spatial studies, environmental justice, urbanization, class divisions and gender inequalities are conceived interdependently 6 with regard to the spatial reflections of the social discriminations. Furthermore, new relations are defined between collective trends and transforming fashion driven production and consumption habits. Besides these, the loss, reproduction, or corrosion of moral values that have been effective in the emergence and spread of moral degeneration of views on environment, were also situated within today's neoliberal urban discourses.

In the fields of academic knowledge production, -as new environments, relations, commitments, and fragmentation emerged together with the digitalization which spread in the new millennium-, a new process has begun in terms of following the environmental analysis, data collection, assessment, receiving information, and converging processes which situate the human being, whose performances affect the nature and all living species, differently. For instance, in ontological evaluations, reproduction and dissimulation processes or re-materialization of values and spaces with ambiguous characteristics along with their commoditization are addressed more intensely since the 90s, by thinkers who were mostly committed to post-structuralism's methods. On the other side, alongside the developments in digital media and temporariness of relationships in the 2000s, another fact emerged such as the derivation of new discrimination and oppressive forms such as the cyber-bully, accompanied to developments of monitoring technologies as well as rise of techno-centrism. Hence, relations between the environment and the human being started to erode more rapidly as human activities were simulated in cyberspace and caused disconnection with the real environment. These side effects of neo-liberalism which are associated with digitalization, and which appeared and are then concealed, but whose sources may be grounded on the attitudes surfaced much before.

While these conceptualizations are merged in monitoring policies and the discrimination and bullying forms connected thereto, they are used in the analysis of their diffusion and spatial forms. Monitoring bodies on

[4] Fanon (1965, 2008) relocates the phenomenon of slavery and discusses the restructuring of colonialism oppressing people of colour who are exposed to White suppression.

[5] Black, indigenous and people of colour.

[6] According to these new facts, colonialism of labor in space continues to be addressed as exchange of values, and then commoditization, in the field of culture with class-based differences, within the current alienation approaches taking such values into consideration. These are continued mostly by thinkers who are committed to the Marxist interpretations (Katznelson, 2019). However, in the new discrimination and inequality forms emerged along with the transfer to digital media of activities in a built environment, contact, and interaction with the natural environment and the new interventions of social gender, brings the discourses emphasizing the intersectionality in seeing vulnerable lives and environmental problems into attention. In these, new spaces of precariousness are defined beyond the structural and post-structural camps as longstanding feminisms come to the fore within the dialectics of environmental injustice (Jarvis, Kantor, Cloke, 2012).

one hand that are invisible in digital media may identify today the spaces of an emancipatory organization via tools providing relatively free communication and data sharing, but on the other hand also audit, bully and control spaces. At this point, a probe of techno-centric view, which is based on technological developments' controlling or empowering capability at instances of ecologic deterioration, can be questioned through the concept of digital colonialism along with eco-imperialism which can be regarded as the causes of most sneaky destructions.

2.2. The Questions on Methodization of Environmental Inclusion in Spatial Studies

It can be said over the concepts extracted above that, each discourse and intervention regarding a certain environment, city, or space exceeds pre-defined boundaries of the designed scope and form of life. With the related informal productions or the productions representing critical-thought as well as numerous approaches altering political correctness may be found functional in dissolving oppressive structures and status-quo in their own discourse. Moreover, even if they are not connected to a camp of thought, they potentially inspire a mass movement or may be brought to the agenda. Due to their assertion to take anti-normative or pre-normative positions, they are problematized through social sciences usually in the field of knowledge production as a political otherness or as marginal positions within the longstanding system and standards. The effect or praxis of utopias and dystopias on urbanism implementations constitute examples in this context7.

Consumption of non-/human life resources that was started with sharing of resources across the boundaries of nation-states which were aligning themselves with capitalism, led to a visible human resource crisis when coupled with the potential effects of climate change as from the post-war conditions of the 1960s, and organizations leading to multinational agreements that would be studied and discussed under international frameworks in this field, diversified. Destructive effects of two world wars, coincided within the same process with the formation of reconstruction and erecting after destruction through post-modern or analytically limited approaches which were concealing the network and frames of privileges. Following the categorization of developed or developing geographies under the effect of the Cold War in the 1970s as Western Block, Eastern Block, and Third World countries, flexibilities emerged also in relation to capitalist industrial, military, cultural, and commercial affinities of the aforementioned international organizations in terms of criteria and sanctions. Studies questioning these privileges could find free research and publication media where they would reveal necessary data on a limited scale or get "pushed toward the field of civil society" as Freudenburg, Gramling, Davidson (2008, p. 4) argues "the uses of 'science' as a rhetorical or/and legitimation device".

Epistemic boundaries are seen as the most questioned causes of fragmented academic spaces. In this context, contributions of Piaget to the philosophy of science supports the development of comparative methods to evade scientific uncertainty and monophonies. According to Piaget (1980, pp. 70-71), identifying the examined variables of "empirical" qualities are progressive methods complementing quantitative data and object structures that are linked to measurement. On the issue of concepts' comprehensiveness, Piaget expresses that the concept of space corresponds to a limited area for sensory information although it provides their common aspects and that however, it has an unlimited scope in comparison with the perception to which it exists. Hence, it is essential to establish relations between the concepts by grounding pre-/assumptions on rational hypotheses, as well as to take the psychological roots and evolution of concepts into account. It is mentioned in following hybrid approaches that under the classical epistemological frames, rational inferences of only quantitative or qualitative findings are insufficient in eliminating scientific uncertainties.

Scientists' participation in public policies is found contentious. According to Campbell Keller (2009, pp.27-45), in terms of participation in decision mechanisms, there are studies that maintain protective and analytical approaches which cover diversities. Among these studies, there might be contributions to

[7] The impact of utopias and dystopias were addressed mostly in Jameson's studies (2005). In addition, Benhabib (2005) visits affirmative thinkers to rethink the impact of utopian understanding of modernism on the global spread of its norms.

multinational frameworks such as scientific and technological assessments regarding "the ozone layer which triggered climate change, such as the Montreal Protocol". However, in the same study, examples where the environment to which scientific support is provided, or participation is ensured, aimed profit, and those which are used to undergird implementations with toxic or destructive socio-economic consequences in absence of relevant expertise, are also addressed. Today, in environmental and spatial studies where various fields of science intersect in line with their relevance, many studies emphasize the objectivity condition and normative commitment of scientific identity. As also addressed by Campbell Keller, in participation in implementation processes of policy formation, there is a risk of rhetoric inclusion of science by political or material power mechanisms interfering the decision-making processes for their own purposes. In such analyses and in assessing the potential socio-ecological effects of the aforementioned, competence becomes important as much as considering the risk of co-optations in participatory practices. In this view, to which phase and in which media was included in spatial and social policies and undergirding the discourses toward a certain group in such media, determines also the boundaries between scientific and unscientific.

As Campbell Keller (2009, p:42) indicates:

"Technocratic outcomes arise when scientists dominate decision making to the exclusion of other legitimate participants in democratic processes; politicization occurs when individual or group interests in policy outcomes introduce bias into scientists' actual work or their representation of their work in policy settings. For a number of scholars, setting the boundary between science and non-science correctly can lead to better decision making."

In some cases, the structural norms representing the majority, covers the stereotypical or global hegemonic approaches which do not comprise those on the margins, or outside of, the longstanding conceptions in scientific analyses. Shiva (2018, pp. 155-200) focuses on the rhetoric uses of universalism which corresponds to "cultural violence" and spreads under the discourse of "civilizing the marginalized". She discusses the relations of multinational corporations' processes of commoditization of nature with the anti-democratic practices still dominant on the marginalized geographies. In the same study, Shiva brings the differences of application of Universal Rights among the living and consuming cultures into attention, more specifically over the harmonization policies of the World Bank with examples. In this inquiry, over the examples, she mentions that by the spread of fundamentalist spaces, the patriarchal structure of the order affects the women and girls at the most. At this point, it might be stated that neoliberal globalization caused a value degradation in terms of universal values as well, more specifically through patriarchal structures. Lordoğlu (2018)'s work supports this argument with examples from Turkey. According to her analysis, daily life experiences of a person within the context of being a single woman in Istanbul and the vulnerability dynamics generated by the family and culture patterns affecting the person, and certain local patterns may be effective in the construction of various symbolic boundaries and distances independently from the urban condition. (2018, pp.138-139) As it has been exemplified particularly with the experiences of single women in Istanbul, although the "marginalization" of interviewed women is not based on spatial causes but rather related to cultural backgrounds in social circles in their own built environment. Yet, this behavioural situation may be handled as the source of spatial distancing. This study demonstrates that analysing only the unique qualities of the space on the issues of study established based on the space and a specified related group is not enough and that ethnological and psychological assessments are also crucial in going beyond the social and spatial stigmatization.

In context of gender-based discriminations, shifts in values or un/intended discriminatory frames in spatial studies analysing environment may also be related to an excessive adoption to certain disciplinary and theoretical boundaries likewise cultural boundaries. Wilson E. (1991) puts forward a finding similar to this shift, over the fact that continuing colonial and patriarchal connections in the field of culture and in urban discourses take a changing form with a commitment to modern and post-modern schools of thought. She adds the following statement (p.123): "Researchers and planners have extended their formal concern for the moral, physical and eugenic well-being of the inhabitants of their own cities and have often treated third-world population centres as caricatures of the 'parent' cities of the West as reproducing their worst problems in a grotesquely exaggerated form." Here Wilson states that, the cities labelled as belonging to

the ‘third world’ are in fact globalizing the ‘irregular’ neighbourhoods which are not harmonized with the West’s nuclear family norms, particularly the free existence of women in the construction of the house and in public space, with an approach trying to re-organize or bring an order to them according to these norms. On the other hand, romanticizations relenting the power relations and inequalities in these irregular neighbourhoods coincide with the liberal understanding of post-modern city planning approaches and legitimize leaving these spaces devoid of fundamental urban services.

The above given examples show that knowledge about spatial facts is not static, and that convergence of facts is as important as diversifying the perspectives within the specified frame and context of each study. More specifically in spatial studies, juxtaposition and extraction of the concepts -for the purpose of unsettling the equalizing rationale of analogy- in a converging manner deconstructs biased or nomothetic conceptions. Cross-disciplinary ones are produced in light of the conceptual considerations synthesized above. Longstanding scientific methods might also be converged in this respect. Studying a certain socio-ecological space requires establishing logical and meaningful relations between the dynamics that shape our physical environment with experience, observation, and anticipation, not over examination subjects and objects of presumptions selected for a certain process. As long as these studies continue to undergird implementations, their expertise on plan and projects are also included in the research phase with the analyses on their expertise areas to which their participation is ensured. Diversification of scientific knowledge production techniques and the deepening of the study might be conducted by multidisciplinary research teams. Environmental, democratic, and inclusive models intend not to reiterate the templates and standards, but to continue the quantitative and qualitative characteristics of the natural and social ecology they are related to. A “rational treatment” for a certain place may turn into a deconstruction of relations, disintegration, and dislocation of lives. For such possibilities, addressing unpredictable or under-estimated environmental impacts and both biological and social reactions without uncoupling them require each study’s original concept, scope, and method. Hence, having non-static study teams paves the way for contingent and inclusive solutions by forming the analytical framework of the study with its scope and assessments from the viewpoints of specialties required by the pre-defined discursive problem.

ISTANBUL NEIGHBORHOODS AS CASE OF EXAMINATION FOR ENVIRONMENTAL AND SOCIAL DISCRIMINATION

Shared values and spaces related to the natural and structured environment are examined more widely in a neighbourhood scale which render the common accumulations emerging through socio-spatial conflicts and negotiations identifiable. These values as socio-spatial commons, imply the changes in moral values on protection of the environment as a whole. Despite globalization, neighbourhoods are considered one of the most identifiable urban spaces in Turkey as they continue to develop upon their own unique network relations, cultural patterns as well as the local formal and informal structures. Effects of global neoliberal policies transform recognitions on urban commons, especially in metropolises such as Istanbul with constantly changing population structure. However, these policies, as Işık and Pınarcıoğllu (2005, p.59) mentions, cannot change the “overt and covert power relations” everywhere as a whole. As Erder (2002, p.39) also states, although there are many studies regarding informal networks and solidarist relations in Turkey, intense inquiries on these relations reflecting recent urban struggle are limited. While relations and local networks operate for protecting and maintaining the disadvantaged or those under threat within the natural environment and social stratification where they are situated, some may maintain environmentally devastating, patriarchal, discriminatory, or oppressive practices benefitting a certain power structure. As it is mentioned under the sub-titles above, researches addressing the effects of social and spatial conflicts and compromises that occur in the same urban environment, are co-conducted with the contribution of fields such as environmental and social psychology, environmental sociology, and conservation theory more intensely as from the 1980s. This disciplinary diversification and hybridization emerge on the basis of research projects in Turkey as well.

The environmental inquiries that aimed to understand these above-mentioned relations have been produced particularly regarding Turkey’s cities and with the participation of civil society. Some of the studies analysed environment-human relations whereas some more focused on the planning approaches

within the context of indicators of urban and social stratification and the rest on the environmental considerations in spatial developments. Such notions according to implied contexts where problems aggregate, on the other hand, demonstrate the inter-relationality and traceability of environmental inequality through spatial developments. In the studies in which digital findings are presented together with surveys, observations, and related transformations in legal frameworks, opinions of urban dwellers who are at the centre of the identified problem are also incorporated.

Some of them include the examinations identifying applicability conditions of collective values and patterns that have become norms by time and related to the planetary issues. In new research environments in Turkey, the ecological dimension of inequality is addressed with social inequalities. In these, one of the most important problems in knowledge production is addressed with the lack of a comprehensive environmental policy and the restrictions in the acquisition, documentation, reliability, and accessibility of data for inclusive protection approaches. As Avrami (2019) problematizes these approaches in context of global preservation policies, the challenges such as reliability of the mediums authorized to verify the required data, is deemed a valid dilemma not only in Turkey but also in an international level. From this perspective, one could confront the environmental narratives which might be used to replace some places that have heritage value with new "green" constructions which corresponds to a type of co-optation. And as Avrami expresses (p.15), "climate change has given new voice to a preservation narrative dating back to the oil crisis of the 1970's, which asserts that old buildings are inherently more energy efficient." On the other hand, limitations bound by economic and social agenda in changing governmental policies also restrict or determine data collection facilities and processes. As Tekeli (2008, p. 110) questions in the context of regional inequality in Turkey, there are crucial problems in accessibility to information in the forms framed by the system such as national acceptances, or dominant culture. Tekeli (2008, p.123) expresses an uneasiness that "despite all developments in our manner of thinking poverty, although some questioning is made about the system in several studies conducted in good faith about the solutions, there is a difference between the discourses and done, -in other words an insincerity among those discussing poverty-, on negotiations that are in the agenda of international organizations."

In handling the urban environment, ecological sustainability and socio-cultural inclusiveness intersect under the concept of environmental justice. Aligning with this concept, particularly in planning and architecture jargon, the natural environment of the city corresponds to more comprehensive meanings than identifying the land use of the resources and reserves necessary for the humankind. Within the context of popularization of protection culture, the establishment and dissolution settings and conditions of protection of the environmental and social commons become concrete over neighbourhood transformations. In Turkey, especially in the metropolis of Istanbul, capital driven interventions at the neighbourhood scale, demonstrates where and into which forms do the social-environmental awareness and inequality evolve.

The Theoretical Sources of Alienation and Fragmentation in Urban Environment: The Functionality of Stigmatization in Zombified Neighbourhoods of Istanbul

As expressed under the subtitles above, the relation of environmental justice with place making is not about anthropologic continuity only, but the environmental deterioration is directly associated and thus interrelated with social inequalities related to spatial organisation. For this and the aforementioned reasons, in Istanbul which is one of the vibrant spaces for post-industrial financial capital in Turkey, it becomes possible to understand firstly the transformation of the social fabric, and then the transformation of moral values of the urban self to protect environmental unity, over the spatial transformations. The shifts in structural life cycles by the tendencies in design and motivations behind the decisions at an architectural scale, which constitutes the culture of place making, renders the dominant discourses of sustainability in the current built environment as contradictory. Even in mainstream architectural discourses using terms such as re-use, regeneration, revitalization as adaptive approaches using pre-existing structures according to contemporary requirements and taking modern developments into account in design and implementation phases, there is are certain risks for social fragmentation and segregation.

While any location at an urban or architectural scale is perceived as a common living environment, those pushed toward the periphery in terms of life culture or those kept outside thereof, are marginalized. Consumerist lifestyles triggering environmental deterioration are re/organized socially and ecologically over the spatial planning. For these reasons, Istanbul can be considered a unique international field for inquiries, as inequality and excessive consumption, displacement of humans and non-human lives as well as the gender inequalities converge more intensely in Turkey. Every spatial finding in the academic field regarding this area of the experiment are used, although they do not intend such purposes, by actors. However, some of the decisions and changes in legal frames enable labelling, acculturation and control of the collective understanding on ecological and social integrity. In this context, studying on Philosophy of Law, Gölbaşı (2008, pp. 71-83), alongside emphasizing the relationship between "urban ecology and social disintegration", mentions the risk of the usage of the defined problems specific to a certain place with its own dynamics generated by social norms for explaining another place in theoretical approaches. Such uses might lead to stigmatization as "corrupted zone" without examining the actual reasons and dynamics. Although the analogy is not in question, within the context mentioned by Gölbaşı (pp.88-90), under-estimating the limiting, isolating, or devastating consequences of imposing values or environmental recognitions of a certain dominant group with stigmatizing definitions over those stigmatized, constitute partial or fragmenting approaches.

In a publication of Ministry of Public Works and Housing of Turkey, General Directorate of Residence, Department of Social Research from the series of translation studies titled "Cooperation during Redevelopment and Renovation of Cities" (1969), Twichell (pp. 6-15) explains the use of the definition of "Corrupted Zone". According to this study, in early diagnosis for a planning and development purpose, the usage of corruption primarily started among the constructors, real estate agents and the developers in exchange of mortgage. Rather than analysing the causes of corruption in relation to recession and stagnation in environmental and spatial standards, this study shows how such an identification pave the way for the spread of misleading views provided that it is handled as a generalizing view. Particularly, the old residential areas in the city are addressed as "corrupted", through marginalisation and segregation due to the population change trauma by being reflected as an economic burden for urban services. Neighbourhoods, where disadvantaged groups can find shelter within the dominant economic and social structure, are addressed mostly under corruption due to their stagnation as poor and mostly under-class neighbourhoods. In this regard, the environmental, social, and cultural causes of the aforementioned corruption and accessibility of the collected data as well as the transparency of decisions by official authorities as well as archiving them openly with participation of primarily academic community and civil society, are the preconditions of inclusive/ discriminative approaches.

While the studies concentrated on gecekondu 'shanty house' as the spatial phenomenon of underdevelopment in Turkey are diversified, some of these areas which were defined as corrupted became full of apartments and "entered the capital accumulation area of the urban development sector" as Öktem interprets in her study(2005, p. 20). Then, others kept their characteristic of being poverty neighbourhoods embodying the housing problem triggered by domestic migration generated by cheap labour move as of 1980. On the other side, with the given prominence of global city discourse in the same period, recent spatial categories started to intertwine. As Öktem states (2005, p.25), "the 'Global City' discourse, which was generated and which brought about a distancing from critical theories in academia together with favoured topics such as postmodernism and information society", was "generated and spread in order to legitimize a certain political and economic program favoured by a dominant class". Starting along the Büyükdere-Maslak axis and increasing its density of construction gradually in Istanbul, capital concentration continued to spread so far from neighbourhoods located in the city centre such as Şişli-Bomonti and Istanbul's south-western periphery to north-western periphery and diversified the project-focused plan changes. Within this context, the concept of "global city" expresses an approach facilitating the importation of urban interventions designed according to other environmental and social conditions highlighted as land developers' priorities and as examples with specific privileges. Addressing the evolution of suburb in Istanbul from 1980 onwards over the practices of "Bahçekent", Kurtuluş's study (2005, pp.77-123) examines not only the transformation in shanty neighbourhoods in Istanbul but also the dynamics behind the emergence of new settlement areas that appeared towards the periphery and most of which were planned

according to the demands of the middle class. This study demonstrates -by converging qualitative and quantitative data- the demands of the new labour and urbanized middle class transformed during the global evolution of capitalism which became effective in the spatial relocation in urban environment, as well as the land use, ownership, and land developer relations specific to Istanbul. The intensification of construction investments is mentioned in this study with reference to the urban agricultural land as private property, in the periphery of Istanbul. As Kurtuluş framed her research over "Critical Realist Theory", also Şen (2005, p.128) emphasizes the importance of critical theories whereby gentrification becomes an important area of study for understanding spatial transformations in the city; Moreover, for revealing and monitoring the spatial traces of class-based transformation. With examples presented by Şen over Ortaköy, Cihangir, Galata, Fener-Balat which became subject to gentrification in Istanbul as well as Kuzguncuk and Arnavutköy neighbourhoods as old Bosphorus villages. She supports the view that alongside the supply-demand relations, also the employment factors, the participation of women in the workforce, transportation facilities for the distance between workplace and home, and the architectural heritage which regained value in relation to increased access to cultural production and services in the city, should be added to the scope of class-based analyses. According to Şen (146), "while these studies emphasize the significance of the neighbourhood dynamics and intertwining dynamics between classes, they demonstrate a deficiency of the studies for discussing spatial transformation through the limits of physical transformation." Among the given examples, Bosphorus Villages gradually lost their intensity of the middle class and multi-cultural character, due to the flexed frame of Bosphorus Protection Law (1983) with the articles added since 1985 and the exemptions in the zoning frames appeared in the same years during the local government elections. Gradually these neighbourhoods face invasion of public spaces with retail functions, mainly as cafes and restaurants which can be explained as "trendification" and gentrification. According to Smith (2005, pp.30-31), in such cases, "it is often also true that very vital working-class communities are culturally devitalized or culturally moribund prior to gentrification". Here, Smith underlines the class character of such processes by referring Glass (1964) who first conceptualised "gentrification". In Istanbul case, the invasion of these neighbourhoods is related to the loss of neighbourhood culture as well. Besides, the transformation of neighbourhoods in the city centre related to the domestic migration flows are triggered with the plan changes. Evictions and displacements which were partly formalized by Law No. 5366 (2005) "Law on the Protection and Use by Renewal of Damaged Historical and Cultural Tangible Assets" in specific neighbourhoods have affected the precarious dwellers. In these multi-ethnic neighbourhoods where the pro-diversity groups and grassroots settled, the solidarity and the protective commons were dissolved by the massive projects.

Concerning these neighbourhoods, another problem to be considered in the diagnosis of problems is that neighbourhoods are venues where environmental recognitions are restructured with intertwining relations beyond representing an administrative border. Yet, under which scopes the current protective, solidarity network participation, and environmental vulnerabilities are defined. Similarly, it is also important which values are reproduced beyond the spatial transformation and to reveal the information that will bring the political ground and dynamics of value erosion special to the urban environment to light. Unless conceptual clarity and scientific methodology established in a non-discriminative manner are ensured, there is an increased risk that rhetoric use of concepts in projects arguing to be "progressive" or "in favour of development" spreads. Consequently, while various conceptual labels are effective in the increase of neighbourhood zombies, yet, spreading a façadomy based design and planning culture. In such circumstance, the terms and concepts might not be prevented from their mis-/use as marketing labels by developers and investors. Moreover, the whole city might lose its moral pre-shaped understanding of environmental and social justice as common values. Such consequences have been intensely examined in the field environmental sociology, but the social scientist have more limited space in decisions. (Yearley, 2005, Cudworth 2005) In Istanbul case, the discourse of urban development has started to dominate decision making processes as well as the spaces of knowledge production producing theoretical frames to evaluate urban ecological and social unity.

The study in which Türkün and Kurtuluş (2005) examine the phases of urban transformation in Istanbul, is a pioneering study putting forward such inquiries. Their work brings attention to the effectiveness of the

general theoretical framework presented by the economy-focused "Theory of Urban Development", which emerged in the 1950s and leads city-wide transformations. Türkün and Kurtuluş state (2005, p.17):

"With its generalizations that underestimate the historical and local specifications of countries, this economy-based theory, which has become effective on all disciplines of social sciences and has been a primary analytical tool in the literature on Sociology and Urbanism of the 1960s and 1970s."

In the case of Istanbul, with the theoretical approaches and methodological frameworks mentioned above, the following conflicts come into prominence:

As urban sprawl pressure brings large transportation and investment projects in the northern areas into the urban agenda, it threatens forest areas which were once restricted as natural reserves. Their protection of these areas has previously been a priority according to the 1/100,000 scale Environmental Plan of the city before the revisions related to the approval of mega projects.

Increasing the attractiveness of Istanbul for investors with global city discourse, cultural activities and entitlements such as 2010 European Capital of Culture, environmental and urban policies are deprived of its relationship with architectural as well as the social culture. Tourism-based investments and gentrification stratified since the city became more attractive for transnational urban self which emerged due to the increase in the operations of cheap ticket aviation companies and the spread of information technologies as of 2010. In October 2010, the construction of a third airport brought into agendas through the reason that the two airports in Istanbul could not meet the demand. In 2011, when State Planning Institution, which has produced five-year state development plans based on regional equality since 1960, was abolished. In the recent reports such as the 9th Five-Year Development Plan that covered the years between 2007 and 2013 became invalid (Üstün 2009, p. 36). In this plan, principles such as empowering the principle of participation and protection of cultural assets for the next generations had been determined as a future vision. These developments demonstrate that environmental and urban policies have been detached from a comprehensive approach with numerous amendments shaping the society's perception of city and environment since 2010.

From a wider perspective, it may be argued that in the same period, environmental rights were developed towards uncertainties over the cities in international economic conjuncture whereby financially and socially privileged groups gained the flexibility in urban decisions. The relevant Ministry could prepare in 1993 the Environmental Impact Assessment Report Regulation in addition to the 2872 Law on Environment (1983), based on the European Union Environmental Impact Directive formed in 1985 (Directive 85/337/EEC) in the European Union harmonization process in line with the technical reports and opinions of professional organizations in a participatory manner has later been revised according to the demands of financial capital providers. Furthermore, the local impact of economic recession was felt on a global scale at the end of 2007 and effected the financial growth trends prioritizing the construction industry. While European Union Environmental Impact Assessment criteria held only public supervision of countries responsible in 1985 for preparation of reports –other than exceptions for national defence projects-, it became the case for many other states that after 2011 the private institutions gained authority to prepare these reports. Despite the guiding measures by Aarhus Convention, flexibility was ensured in many countries over the (Directive 2011/92/EU) 2011 in an Article with their preparation by the organs to be defined by national regulations based on the developmental consent of "public and private parties". Simultaneously, in Turkey, Environmental Impact Assessment (EIA) reports were started to be prepared by the private bodies that are authorized by the Ministry, with the regulation amendments on Environmental Impact Assessment (2014) by Ministry of Environment and Urban Planning. This situation caused a legal gap where investors can interfere in the EIA process for their projects, and the condition of participation defined in the relevant legislation was started to be realized under the initiative of these private EIA offices.

Even if the EIA reports include project-related information such as waste control, analyses on energy efficiency and the life cycle of the materials to be used, and despite the use of simulation technologies, these reports involve many inconsistencies with respect to realistically foreseeing and reflecting the emissions that may emerge during and after the construction implementation. Yet, operation process as well as forming the knowledge production processes by opening them to the public and independent expert organizations' opinions remain as other aspect of ambiguity. Hence, it may be said that an environmentally

and socially discriminative system is being reshaped according to the special requests of global capital as long as civil society's engagement is excluded in almost all levels.

When these facts are considered in a taxonomy, it becomes apparent that the most fundamental equality principles of the right to the city intersect with the right to live in a healthy environment aligned with rights of all human and non-human lives that are under serious risk of extinction. The violation of rights as highlighted in the Handbook on the United Nations Basic Principles and Guidelines on Development-based Evictions and Displacement (2010, pp.3-5):

"Universal Declaration of Human Rights, International Convention on Economic, Social and Cultural Rights (art.11, par.1), Rights of Children (art.27, par.3), Convention on the Elimination of All Forms of Discrimination against Women (art.14, par.2h), International Convention on the Elimination of All Forms of Racial Discrimination (art.5 (e))" lies firstly in discourses, then is normalized collectively.

It may be stated even upon these findings that the violation of social rights is a patriarchal act and can be read through the discourses on spatial displacements in Istanbul, thus, are based not only on the violation of the right to the city but also of the environmental rights. Hence, it should be noted that readings made independently from environmental policies would remain segmental or limited -when environmental justice is intersected with gender equality under the same context-, whereas the studies intending to make comprehensive readings may be detached from addressing the discriminatory dynamics specific to the urban interventions. In the context defined hereby, the transformations realized in neighbourhood scale in Istanbul would be able to provide only a cross-section of a part of the discrimination as well.

CONCLUSION

Problematizing the concepts behind the political, economic, cultural, and behavioural foundations of neoliberal implementations has a certain discursiveness. In definitions of socio-spatial inequalities, within the environments where they are addressed, may result in easy importation or exportation of concepts as long as the scope of inclusion is centred around a specific view. Presently, revealing vulnerabilities is more intensely related with de-centring and dissolving overly adopted patriarchal positions. Such patriarchal positions are initially maintained by normative boundaries defined by epistemic boundaries. As a consequence of the fact that scientific or academic knowledge production puts forward new probes questioning altered conditions and spaces of ethics through the evolution of technology as well as the evolution of capitalism.

The efforts toward paving the way for solutions seeking the answers to these questions continue inevitably. However, the inclusion of academia in the decision processes by being accepted as an actor is still regarded as a vulnerable relationship that might also be problematic in terms of boundaries of sciences and political ethics. In addition to this inter-relationality, the developments mentioned above and the neoliberal establishments that are subject to their own norms may also sneak in the knowledge production processes overtly or covertly, provided that they quiz the ethical tolerance of the scientific environment. As a new phenomenon, the neoliberal organization of academia and dependence of institutes to public and private funds are emphasized in exceptional economic-political conditions.

Assumptions, definitions, findings presented here provide a limited cross-section through cases, as each case could produce counter-discourses that may render a reading to be made a pragmatic view, the priority in the method determined is to pave the way for determination of questions that will be the source of deeper argument in subsequent potential research and readings, through the discursive focus of this text. Hence, the discursive extraction of -potential- affirmative and negational uses of concepts and narratives that are approving or legitimizing discriminatory practices in natural, built and social environments, primarily in the area of knowledge production, is a problem of research methodology. Empirical studies partially tend towards such extractions, however, as one of the favoured theorists interpreting capitalism's behavioural side effects, Deleuze makes the following warning (2016, p.38): "The fact that nature and society constitute an insoluble mixture should not make us forget that society cannot be reduced to nature". Similarly, one might make another as nature cannot be reduced to society.

In the studies intending to eliminate the risks mentioned above, a certain analytical method or formulation is not found applicable everywhere in academic knowledge production with respect to the transforming and converging epistemic boundaries and emerging tools and techniques for analysis. Especially in spatial studies, the generation of a methodological frame in the defined environmental problem spaces -on the basis of concepts that are appropriate with the scope of the environment- where discrimination becomes objective would reach certain inclusiveness. As Morton (2013) aimed to explain with the concept of "hyperobjects", one of the theoretical approaches leaning toward such a purpose, the need for new theoretical constructions that will reveal the invisible cognition of climate change (fact) for human by the general usage of climate transformation (concept), increases. In light of these conceptual constructions, one may pave the way for disciplinary cooperation in the extraction of experiment subjects together with experiment objects, free from primarily human-centred and then subjective judgments. Morton's philosophical approach puts this into words as (2013, p. 81): "what is called inter-subjectivity -a shared space in which human meaning resonates- is a small region of a much larger interobjective configuration space. Hyperobjects disclose interobjectivity. The phenomenon we call intersubjectivity is just a local, anthropocentric instance of a much more widespread phenomenon, namely interobjectivity."

With this and similar de/re-/positioning, the sciences constituting the theoretical basis as well as their spaces of knowledge would clarify the meaning of sustainability regardless of exploitative, discriminative, patriarchal assemblages. Accordingly, the accessibility and usage of the new monitoring and extraction tools provided by brand-new technology might be re-considered and pave the way for the emergence of knowledge clusters that may assess environmental and social damage also for the disadvantaged. Then, academia might pave the way for the concepts with a capacity of adaptation that can be accessed by even the economically most disadvantaged societies. As a simple sampling, the concept of retrofitting denoting the continuation by adaptation of those currently held as opposed to destroying and then remaking, arises among conceptual trends and be implemented widely.

The use of technologies utilized in short-term and low-budget solutions developed with the concept of tactical solutions do not go beyond the authority and scope of interest of privileged academic institutions unless being accessible. In this context, Shiva mentions (1995, p. 193), "In periods of rapid technological transformation, it is assumed that society and people must adjust to change, instead of technological change adjusting to the social values of equity, sustainability, and participation." In this perspective, the use of information regarding the reality in association with the use of technologies utilized in knowledge production and design processes without questioning them may undergird the implementations that are in fact environmentally or socially disruptive over the data manipulated by generic simulations. At this point, although the context of data's democratization puts pressure on different axes within the framework of identified rights regarding intellectual rights by being misinterpreted, the development of suggestions that commoditize labour processes in knowledge production, that makes invisible which resources are used from which geographies, and that will not affect the vulnerable (human-nonhuman) lives which are more widely used as the test subjects of the new technical approaches, unless the concerns are intersected under concept of environmental justice.

Socio-spatial discriminatory and oppressive structures may be analysed first of align with the academic field. Decision-making actors also interpret these analyses. Academia starts to become inclusive with its provision of these intersections not on the basis of network relations but of specialties, as long as knowledge production's capacity of adaptation to practice redefines and locates its own universality. Therefore, the academic knowledge productions on spatial developments are in need of critical positions that would increase the number of studies looking for or designing in intersectionality, as well as decolonizing the environmental concepts and then mainstreaming the handling in such studies of the socio-spatial problems under a more comprehensive framework in relation to environmental problems.

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TRADITIONAL ARCHITECTURE IN RIJAL AL-MAA' VILLAGE, SAUDI ARABIA

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ABSTRACT

Urban heritage in the Kingdom of Saudi Arabia is diverse in its style, function, and architectural and aesthetic elements. As a result of the Kingdom's expansion and various climates, the architectural styles were diverse. Each region had its environmental properties and its own culture. This was reflected in the architectural properties for each region, whether in the urban fabric of the region, the building methods or the aesthetic and decorative elements. Despite this diversity, there is still correspondence and harmony within the urban heritage throughout all regions of the Kingdom. This harmony stems from national unity and submission to the same social, cultural, and religious conditions, the difference is caused by the difference in climate and natural environment from one place to another. Urban heritage within the Kingdom of Saudi Arabia can be divided according to the different geographical regions within it, into five regions as follows: Urban heritage in the Middle region, Western region, Eastern region, Northern region, and Southern region of the Kingdom. We will discuss one of the most important urban heritage sites in the Kingdom, which is the special and distinct location of *Rijal Al-Maa* in the southern region of the Kingdom. Some sources state that the village was the capital of the *Hala* Emirate, under reign of its Prince- *Musa Al-Kinany*- in the year 732 Hijri (1331 AD). The Emirate gained its strength through its peoples' specialization in trade. The Emirate was made into a center of trade and received trade from the red sea through the ports of *Al Qunfoza, Al Qamha*, and *Jazan.* It also traded with India through the ports of *Adn* and *Hudeeda*. It had a Customs duty office for the goods transported into it, as well as an energetic scientific center which scholars flocked to from the southern region, and which many scientists and writers are native to. The village is also a tourist attraction which tourists visit from all around the Kingdom and the World. This research aims to showcase the most important features of the village of *Rijal Al-Maa'*, and to nominate it as one of the top tourist villages in the Kingdom and the World altogether. Its location, distinct urban fabric; and what it contains distinct traditional buildings, as well as structural, aesthetic, and decorative elements that make it deserving of such a spot.

Keywords: Traditional architecture, Architectural construction, Urban fabric, Building methods, Architectural composition.

1. GEOGRAPHICAL REGION

The village of *Rijal Al-Maa'* lies in the south of the kingdom in the *Tihamah* area of the *Asir* region, approximately 45 kilometers west of the tourist city of *Abha*. It is about 500 meters off the general road which ties between the cities *Muhayil* and *Al Darb*, meaning that its location is close to the tourist areas in *Abha* and the surrounding areas. The unique location of *Rijal Al-Maa'* between the mountains as well as the vibrant and rich nature gives you a sense of isolation from the rest of the world. (AlShakh, A., 2010 p.185.)

The buildings of the village are characterized by having a unique architectural style, which consists of many forts, each fort representing a rare artistic composition; made up of many repeated floors which keep all their intricate interior and outer exterior details. This is a sign of achieving a great degree of richness and urbanization. Buildings of this size and elegant design are a sign of the luxurious lifestyles and the fine tastes and social attitudes of the people who lived there, as well as great architectural richness within that period. (Fig 1)

Figure1. The unique location of Rijal al-Maa` *among the arms of the mountains*

Figure2. Heritage and historical buildings in the village of Rijal al-Maa`

2. TRADITIONAL AND HISTORICAL BUILDINGS WITHIN THE VILLAGE

There are many historical and heritage buildings within the village of Al-Maa' which can be visited in order to learn about its architectural and cultural history: (Figure 2)

2.1. The Old Mosque:

One of the largest historical mosques in the Asir region, which has an intricate architectural design (Fig 3). It is one of the most important buildings when it comes to architecture for the cultural and civilizational commune, as the families of residents congregate in it to perform prayer and discuss matters. The mosque also holds religious celebrations, and it consists of the following (Maghawi, A. 2010 p.42-45) :

A- Prayer House: The ceiling of the mosque is made of long straight Juniper wood- which are solid and upright trees brought from Al Sarah, so it is rare in the regions of *Rijal Al-Maa'*. The walls have triangle-shaped cavities called Niche (*Mishkat*), or lamp (*Siraj*)–in which oil containers are placed and used for lighting through igniting the oil within them. As for the gate of the large mosque, they call it "*Al Jame'*" and it consists of carved wood.

B- *Matahir:* Basins for ablution which water runs through and fills the first tub, and then the next one until all of them are filled up with water consecutively. Next to them, there is a *"Mastar"* which is a place for ablution that has been built with a beautiful and intricate architectural style that they also call *"Al Mathar"*

C- *Al Sooh:* An additional external prayer area mostly used in summer for the Maghrib and 'Isha prayers- facing west. It is connected through a stairway to the place where the caller to prayer stands. In the two holy mosques, this place is called *"Al Mak.bariyah"*

D- *Al Manzalah:* A place connected the mosque consisting of a partially roofed area, which people can enter from the main gate of the mosque. It is covered with poles that extend a distance of two meters next to the walls, to make a shaded area where people meet to discuss their affairs, or for travellers to rest. - *Al Manzalah* had large millstone to grind grains used in old times by travellers.

Figure 3. The Old Mosque of the heritage village Rijal al-Maa`

Figure 4. Matahir: *Basins for ablution*

E- Mosque Exit: Opens towards the west and flows into the market.

F- Mosque pond: Lies on the right when entering the mosque through the main gate, following the beginning of the *Matahir*, which are deep. The village's residents tell that its depth is a result of the Backfill factors in the valley and its growing height, and that they keep increasing its height as the height of the valley increases due to floods. They infer this through the cavities that they are familiar with. The water is an endowment for the worshippers. Some say that there is a prayer niche (Mihrab) in the northern walls, which may indicate that there was a mosque that existed - before the old mosque which we have discussed.

2.2. The Museum

Consists of an old fort "The fort of *Aal-'Ilwan"* which has been renovated with contributions from the women of the village, as they engraved the palace under the supervision of the mother: *Fatima Ali Abu-*

Qihas, they also donated their traditional silver earrings, old clothes, as well as parts of their furniture and decorative savings.

Following this, the museum was organized and divided into twenty sections according to its contents, and the neighboring courtyards were prepared (Figure 5).

Figure 5. The Museum -the old fort of "Aal-'Ilwan" which has been renovated

2.3. Open Theatre

An open theatre which was constructed next to the museum and was used to hold general celebrations. Despite it not suiting the general architectural heritage character, it helped accommodate cultural lectures and literary afternoons. In addition, the folk groups of the province contributed towards holding many artistic and theatrical activities and events, utilizing artistic assets and rich folk heritage (Fig 6).

Figure 6. the open theatre next to the museum which was used to hold general celebrations

2.4. Heritage Library

The fort of *Mo'gab,* which dates back in ownership to the family of Faye' Bin Ibrahim, who transformed it into a heritage library which contained some old manuscripts and books. He also documented some

social documents related to the village and its people, their correspondences and agreements, and collected educational tools such as writing ink pads and plates.

2.5. Al Dakkaat and *Rewayat* (Yards for Congregation and Seating)

The *dakkaat* is placed next to the trading shops and at the entrances of neighborhoods. They are populated by the elderly and people in general, talking about their community, and their history of struggles. Stories which are overwhelmed by talks of heroism and legendary tales which have been memorized. *The dakkaat* is one of the most important areas of cultural civilizational commune in *Rijal Al-Maa'*, which became famous for their great poets as a part of the peoples' culture and civilization (Figure 7).

Figure 7. Al dakkaat populated by the elderly and people in general

Figure 8. The urban fabric within the village of Rijal Al-Maa' is famous for its cohesive style of buildings

3. URBAN AND ARCHITECTURAL FABRIC OF THE VILLAGE OF RIJAL AL _MAA'

The urban fabric within the village of *Rijal Al-Maa'* is famous for its cohesive (connected together) style of buildings (Figure 8), as buildings are seen without large spaces between them but with narrow and winding passageways. This village was built such that some of the buildings were constructed on the mountains and some on the foothills of the mountains. From a distance, it seems to be a military castle. This style shows the influence of security and climatic factors on the urban fabric planning of the buildings. As despite the fact that the climate is moderate in the *Asir* area, it is still hot in the village of *Rijal Al-Maa'* due to its location being in a valley below the mountains.

4. ARCHITECTURAL BUILDINGS OF THE VILLAGE OF RIJAL AL_MAA'

The buildings in the village were affected by many factors when being designed, such as climatic, structural, decorative, as well as cultural and social factors as follows:

4.1 Climatic Factor

The climatic factor affected the architectural design of the buildings, and this is shown through the village's residents making sure to determine the wind direction. This leads to the orientation of the windows and entrances on the southern and western facades. This is because the desirable winds usually come from the south and west, and as such the openings are oriented towards the wind as it is required to receive cool winds, especially in areas of high temperatures. The chief mason makes sure that the windows are oriented

east and west to receive light and to make up for the facades which are stuck to the mountainside or other buildings. Mason might seek to increase the areas of the windows to receive the greatest degree of light possible as is seen in the house of Aal-'Amir, the Riyad fort, and other places (Talib, K., 1984, p. 93).

4.2. Constructive Factor and Construction Methods and the Materials used: (Figure 9)

Construction method: Building with load-bearing walls constructed of rocks cut from the mountains. The builders construct on a stone-ground (usually on a stone in the mountain) to guarantee its stability and make sure that the building will not be subject to danger of collapse, as is possible if it were built on a ground of dirt. They begin construction directly on the stone without the mud *"Khalab",* as it can leak water through it without damaging the foundations. The foundation, in this case, is called *"Al Saas".*

A. Construction process: Through using stones with a flat regular side (typically stone bricks) and they are placed connected without one overlapping the other, except in the case of constructing larger lower segments of the building, and smaller sized segments above them. Construction must be built that way or it will be considered a flaw in the fabric of the buildings, which are connected to each other.
B. When constructing the corners of the buildings, the stone which is built upon is called the *"Hidad",* as the construction is done in reverse from the two sides, and no two "*Hidads"* are placed above one another from one direction.
C. A thin type of stone is used to fill the spaces between stone bricks to guarantee and maintain their stability, these stones are called the *"Wataya".*
D. The spaces between the exterior and interior facades of the building are filled, and it is instilled in mud, and it is called "*al-kars*"
E. To protect the buildings from erosion, the *"kohl"* is regularly crammed vertically between the building blocks at the façade, in order to protect the inner mud from the erosion agents "air and rainwater". the *"kohl"* is a soft, thin "not thick" rocks which color is closer to the grey color.

Figure 9. Construction method and building materials

4.3. The Architectural Design of the Residence:

the internal distribution of the residence is very similar to the residencies of large cities today with their repeated housing units and floors. The definitions we know today were not included in the patterns of old buildings; as society was not split into men and women, which is considered privacy today. There was no area meant for males and no male or female entrances as social life was balanced. Women were not veiled from men and speaking to or working with women was not considered wrong or a misdemeanor; it did not violate the Islamic teachings from the perspective of society. Instead, it was considered a sharing and partnership in life which did not induce stress, and as such the building's internal distribution was – generally- as follows: (Maghawi., A ,2010. p86-87)

Al Soffah: The entrance of the house and the passageway for all the residents of the building, as well as an entrance to the housings and a place for the millstone and water containers. It also acted as a living space and dining area (Figure 10).

Al 'Olyah: A room for sleeping, sitting, and entertaining guests. Women would care for the furniture and decoration of this room with local patterns and inscriptions, as well as pick luxurious seats and couches (Figure 11).

Al Maglis: The guest area and reception. It has everything that the 'Olya has of attention and care, but unlike the '*Olyah*'s usually square area, this area is generally rectangular. The 'Olya was usually augmented with a washing area (bathroom), and the concept of bedrooms being placed next to bathrooms appearing hundreds of years ago brings interest and attention in a village community such as this one.

Al Mashquqah: A small side room or isolated room specifically for the master of the residence, or is used as a workspace isolated from the residence.

A. *Al Roba'eyah:* An opening in the wall considered as a small room used as a warehouse or storage area. An area in the walls of rooms might be removed and used as a large inner storage area which is also referred to as a *Roba'eyah.* It may be present on two floors to be used as storage.
B. *Al Zalgah:* A small room, used as storage connected to rooms, especially the *Majalis* and *'Olyah.*

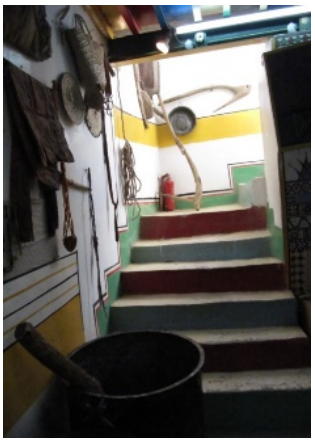

Figure 10. The staircase at the entrance of the residence

Figure 11. Al 'Olyah: A room for sleeping, sitting, and entertaining guests

Figure 12. Al Maglis: The guest area and reception

4.4. Decorative and Aesthetic Elements of the Buildings:

Forming the exterior facades of the building:

Builders paid attention to the exterior shaping and design of the building while leaving the interior to the females.

They used quartz *"Marw"* (A white solid rock) in the architectural shaping of the windows, where they would be shaped as triangles (Figure 13). They were also used in shaping the facades as in the forts of *Amsha'ba* and *Amsiba'.* Marw was also placed in walls to measure the movement of the sun, and these types of astronomical positions were used to determine the different seasons of planting and harvesting, as well as rain and others. These were called *Manazil,* and worked through determining the beginning and end of seasons through the sun reaching this marw in the wall of the building. This is seen the forts of *Hakim, Al Riyadh*, and *AmSiba*'. The doorframes and window frames are defined with niches of small rocks *(kohl)* and *marw.*

Windows are placed on a horizontal and vertical grid such that they overlap each other and are proportionate in size. Some of the windows are sunken but they are generally at the same plane with facades. The window frames are painted white (Figure 14).

The entrances are mostly at the same plane with the wall and not especially unique, except in the use of *marw* to create decorative patterns in the shapes of triangles as is shown in the attached images (Figure 15).

Figure 13. Using marw *stone in the architectural composition of windows*

Figure 14. Windows are proportionate in size and painted in white

Figure 15. The entrances are at the same plane with the wall and decorated with marw *stone*

Shaping the interior walls:

It is the inscribing of the homes from the interior executed by women. The women of the village are considered to be creative and stunning in their artistic work. They possess unique skills when it comes to inscribing and interior design, which is an art that carries a symbolic significance. The woman is usually assisted in this role by her neighbors when it comes to artistic tasks, and they work in accordance with their roots and specific traditions. The Decorator *(Al Mozienah)* - who is a capable and skilled craftswoman - places a framework for the artistic endeavor, while the assistants add the color. Some of these women attained widespread fame in the art of inscribing, and the art is still alive, with some training courses still taking place in the traditional heritage village (Figure 16).

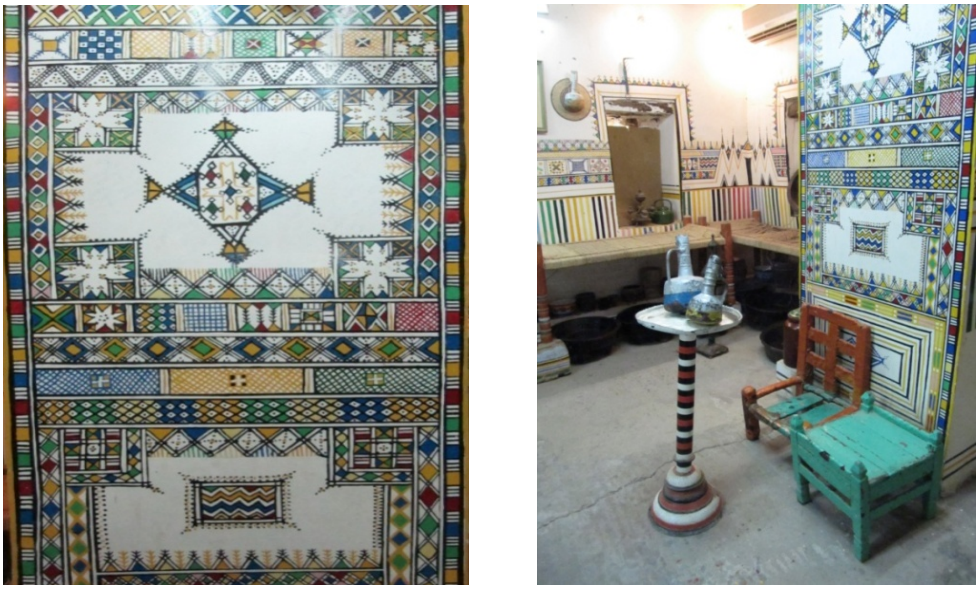

Figure 16. Colorful inscription work in interior spaces of the residents of Rijal Al-Maa'

CONCLUSION

Due to the importance of the village *of Rijal Al-Maa'* from a hereditary side, and its uniqueness for having these types of stone buildings non-existing anywhere else in the kingdom, the citizens of the area carried out a unique heritage project which the descendants of the village itself partook in. The project aimed to turn the remains of the village into what we see today as a heritage village full of movement and tourism, and an attractive spot for foreigners. This is through renovating some heritage buildings and turning them into a museum and an open theatre, as well as transforming some of the houses into shops which serve the area from the touristic side. The importance of this geographical location has been showcased along with the most important buildings of tradition, how they were constructed, and the aesthetic and decorative elements which make it distinct and attract tourists.

Despite the village of *Rijal Al-Maa'* being in the *Asir* region, which is warm in the summer and cold in the winter, yet the village's temperatures are high in the winter compared to other tourist spots in the *Asir* region, such as *Abha* and *Al-Soda*. This is due to it being in a low altitude spot and being surrounded by mountains. It can be used in the winter as a tourist attraction spot since it possesses a different type of architectural heritage.

Even with the importance of this heritage, there has been no documentation or presentation of these buildings. Despite constant research, we could not find any blueprints, horizontal plans, or Architectural documentation of these buildings. As such, we recommend that these buildings be well documented, architectural and urban documentation.

The traditional architecture was a true reflection of the environmental conditions of the societies in which they originated in all their natural and social dimensions.

RECOMMENDATIONS

The architectural movement in the Arab countries is undergoing a real crisis, embodied in the disappearance of the personality and identity of Arab Saudi architecture. This architectural confusion is evident in the new Arab Saudi cities. We need to study the reasons that led to the disappearance of the Arab Saudi identity and work to resolve them and convert reasons to viable practical solutions to restore the personality of Arab Saudi architecture.

Providing the scientific disciplines which are required to develop the process of preserving the character of the Arab architecture, disciplines which are related to the economic and social dimensions at the national, regional and local levels.

Involving qualified specialities; who have studied economic, social, geographical and architectural disciplines through their undergraduate and postgraduate studies, in the development process at the national, regional and local levels.

Teaching students of architecture and history the processes of restoration and re-employment of buildings. Students should learn scientific assets of archaeological architecture through academic education, scientific research and community service.

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AN OVERALL EVALUATION OF CLIMATE CHANGE ADAPTATION AND MITIGATION SMART CITY IMPLEMENTATIONS IN MEGA CITIES

ALİYE CEREN ONUR

Abstract

As of 2019, around half of the world population lives in urban areas, and this figure is expected to increase especially in megacities that have the pull factors including abundant employment opportunities and urban facilities. Climate change is a recent challenge that began to change the land cover and land use around the globe, and it proves to be a rather new push effect from rural areas toward mega cities. However, the infrastructural and governmental capacity in cities are not yet well-adapted to overcome such a challenge. Floods, droughts, extreme weather events, and heat waves have already began to create pressure on urban welfare. Along with the developments in technology, investments in smart city practices gained importance. These technologies can be perfectly adapted and used for combatting climate change. They can serve towards the adaptation to climate change (such as early warning systems and flood control) and the mitigation of climate change (such as smart buildings, settlements and transport). Mega cities seem to need such practices given that their population, the urbanization trends and the challenges continue hiking simultaneously as a result of both rapid urbanization and climate change. This study provides an analysis of the mega cities worldwide with more than 10 million inhabitants in order to reveal the importance attached to climate change adapted smart city implementations evaluated together with their GDP's, to determine their need for investments of this type, and to demonstrate the need to incorporate such an issue in cities' agendas.

Keywords: Climate change, smart city, megacities, infrastructure.

AIMS AND SCOPE

After the 1950s, the urban population worldwide begun to increase. According to the UN World Urbanization Prospects Report (2014), 54% of the world's population lives in urban areas, and this figure is anticipated to reach up to 66% in the 2050s. While around half of the world's urban population lives in urban areas with less than 500,000 inhabitants, the rest lives in mega cities with a population of over 10 million (UN, 2014). Mega cities function as economic engines not only for their own hinterlands but also for the countries they are located in.

The majority of the mega cities in developing countries suffer from an influx of rural-to-urban migrants who are in quest for better employment opportunities and improved living conditions given the poor conditions in rural areas including the degradation of agricultural areas due to droughts or floods, the lack of sanitation and infrastructure or other social issues. As a consequence, the rapid and uncontrollable increase in the urban population in mega cities leads to challenges in terms of cities' adaptation capacities. Particularly, when it comes to mega cities in developing countries, vulnerabilities to natural disasters and economic loss are extremely high because of the lack of adaptation capacity to fast urban expansion (Kumar and Bhaduri, 2018). Housing, transportation, infrastructure, sanitation, social, economic problems are inevitable in those cities with high social, physical and economical vulnerabilities (Taubenbrök et al, 2012) (Figure 1, 2, 3, 4). It is expected that these challenges will intensify together with the impacts of climate change such as increase in temperature, droughts, floods, extreme weather events, and the rise in the sea level.

Figure 1. Karachi flood (Relief Web, 2018)

Figure 2. Flood in Lagos (Pulse 2017)

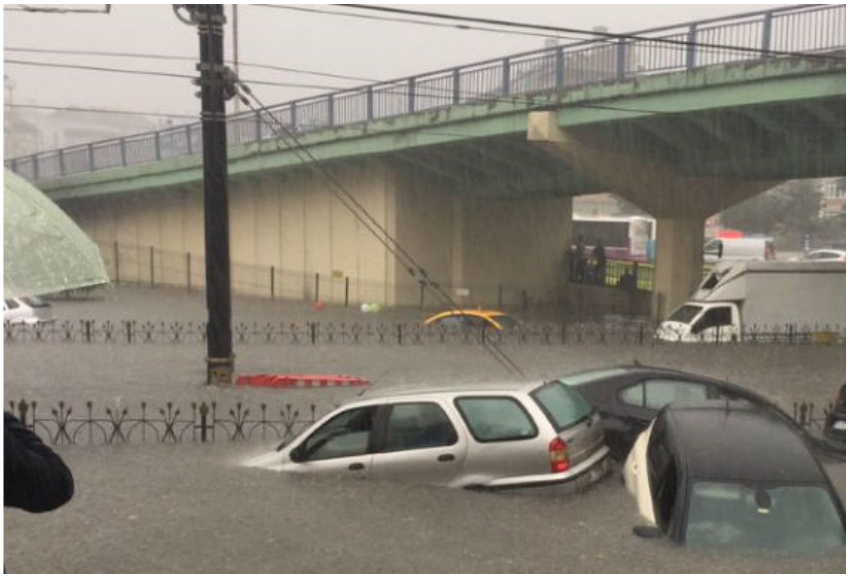

Figure 3. Flood in Istanbul (“İstanbul'daki sel,” 2017)

Figure 4. Heat Wave in Delhi (Kim S.,2015)

CLIMATE CHANGE ADAPTED SMART CITY PRACTICES

Climate change, which is both a current and future challenge for cities, has already took on a new significance in the agendas of many cities. The widely known impacts of climate change (such as temperature rise, droughts, floods, extreme weather events, rise in the sea level) have hard-predictable risks particularly on developing and fast-growing cities (Onur & Tezer, 2014). According to the IPCC sectoral distribution of greenhouse gas (GHG) emissions' productions, 20% is produced by transportation, about 30% from energy supply and 11% from residential and commercial sectors (EEA, 2014). This piece of information indicates that more than 60% of greenhouse gas emissions are produced in cities (Figure 5). Although cities in developed countries are the main contributors to climate change by producing more GHG than the cities in developing countries (Satterthwaite, 2008), developing cities suffer more from the impacts of climate change due to the fact that their adaptation capacity is quite low and insufficient. Nowadays, the impacts of climate change also affect the cities near oceans and water basins like New York, Tokyo, İstanbul.

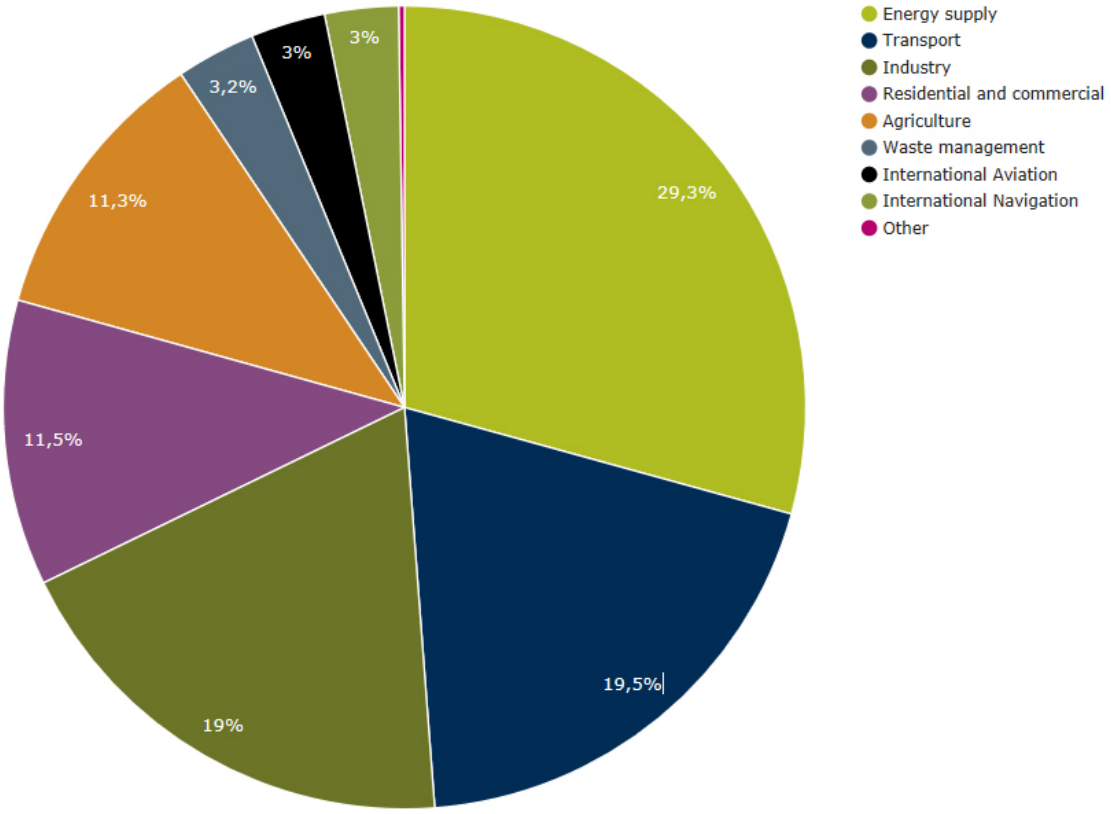

Figure 5. IPCC Sectoral distribution of greenhouse gas emissions (EEA, 2014)

Particularly mega cities in developing countries have social, environmental, economic and institutional vulnerabilities as a result of the risks that originate from fast urbanization and climate change. Nowadays, many mega cities have to face facts related to climate change like river floods in Delhi (Kumar and Bhaduri, 2018), hurricanes related sea level rise in New York (Yin et al., 2017), Hong Kong and Singapore (Chan et al., 2018).

Together with urbanization and climate change, achieving sustainable development goals becomes more difficult and new strategies are needed. Smart city approach is accepted as one of the solutions not only to urbanization related challenges like infrastructure, energy, pollution, social issues etc. but also to current and future challenges of climate change like floods, extreme weather events as well as their threats on cities (Ahvenniemi et al., 2017; Silva et al., 2018).

Smart city approach is defined as creating connection between citizens and urban infrastructure, environment, social and economic capital using ICT technologies in order to ensure better urban management, achieve sustainable development and increase quality of life (Harrison et. al, 2010; Kondepudi, 2014; Silva et. al., 2018, Mohanty, 2016). Considering the same aims; a smart development model is a combination of technological, human and institutional factors like local governments, NGOs, citizens, public and private institutions (Silva et al, 2018). Smart cities aim at protecting the environment, natural resources and fighting with environmental degradation by ensuring efficient consumption and decreasing carbon footprint by means of green buildings, smart energy and transportation systems, green and smart urban planning (Silva et al, 2018). It is important to enlarge the scope of smart city practices from single applications to city-wide implementations (Albino et al., 2015).

As a result of rapid and unexpected impacts of climate change, mega cities that are particularly located close to coastal areas, watersheds or sloping areas are under high risk of floods caused by disasters, and

their capacity to adapt to these risks are not sufficient even in developed mega cities like New York (Yin et al., 2017). Coastal cities in Asia like Hong Kong and Singapore with abundant economic opportunities and high population growth rates, are quite vulnerable to climate change induced storms, floods and sea level rise (Chan et al, 2018). Under these circumstances, risk management including climate change adaptation strategies have further importance for cities.

Smart city approach can be used as a risk management tool for climate change induced impacts by warning citizens and both public and private institutions by using ICT technologies to take vital precautions against disasters. In a similar fashion to the mega cities, developing cities with high populations are vulnerable to the impacts of climate change as their physical and socio-economic adaptation capacity is low in comparison to the cities in developed countries (UNFCCC, 2019). Human life can be saved and quality of life can be altered with climate change adapted smart infrastructures, waste management, increasing green areas, using less energy and efficient public transport systems, producing less GHG emissions (UNFCCC, 2019).

Climate change adapted smart city practices can be grouped as practices for mitigation and practices for adaptation. The term 'mitigation' is used for any strategy, action or practice that is used to reduce greenhouse gas emissions while the term 'adaptation' refers to adjusting to climate change (IPCC, 2007). Consequently, any practice or application, which helps reducing energy consumption and greenhouse gas emissions, such as using renewable energy, adoption of new technologies for producing less energy and GHG emissions, building energy efficient buildings etc. can be accepted as mitigation. On the other hand, however, other practices or applications that facilitate living with the impacts of climate change can be considered as adaptation. Early warning and smart flood control systems are categorized as adaptation to climate change, while smart transportation, buildings, infrastructure and settlements that aim to reduce energy consumption and greenhouse gas emissions can be effective tools for the mitigation of climate change. In this context, smart urban practices can be grouped as follows:

- Climate change adaptation smart implementations; early warning systems (meteorological or for flood alarms) and smart flood control systems.
- Climate change mitigation implementations; smart buildings, smart settlements and smart transportation.

EARLY WARNING SYSTEMS

Worldwide smart technologies, which are adapted to climate change induced disasters, are generally early weather warning systems for expected rain falls, floods, heat waves, storms etc. These systems are based on obtaining environmental data and variables, analyzing risks and vulnerabilities. It is important to disseminate the warning information to users and understanding their social, economic, cultural and environmental needs (Horita et al., 2016).

Data that is collected from national or local meteorology departments is used to inform people generally by text messages to have them get prepared for disasters. In the Shanghai Metropolitan Area, a smart early weather warning system is built for disasters and unexpected weather events by using meteorology forecast data.

These kind of systems can also be adapted in agriculture, tourism etc. Another smart early warning technology is used for river or coastal floods. A system that measures the level of water is located to the select places of the flood resource and when there is a limit access, the system sends a warning message to the operation center, then the data is analyzed by the institutions and text messages are sent to the mobile phones and internet devices. These systems are effectively used in many mega cities including Tokyo, Shanghai, New York City, İstanbul, Cairo, Sao Paolo, Karachi (Esteban et al.,2014, Tan-Mullins et.al. 2017, NYS Mesonet, 2019, AKOM, 2019, Jaffery R., 2018, Shaikh S. and Tunio S.,2017, Mashaly and Ghoneim, 2018).

Smart Flood Control

Sea level rise in coastal cities proves to be another important challenge. According to the climate change scenarios (IPCC,2007), the rate of global sea level rise is projected between 26-82 cm by 2100. Low lying coastal mega cities with rapid urbanization like Tokyo, Singapore, Shanghai together with increased intensity of tropical cyclones due to rise in temperature and worldwide sea level rise, multiplies the social, economic and environmental vulnerabilities, risks and damages even in developed mega cities like Tokyo, London and Singapore. In these cities, storm surge barriers that help protect the city from a potential flood seems essential for disaster management (Esteban et.al., 2014). In London, Thames Flood Barrier aims to protect over a million of citizens from the risk of flood. The system works in case of a risk of flood caused by storms in order to protect London (Figure 6).

Figure 6. Thames Flood Barrier- London (Brooke, 2015).

In Tokyo, an underground flood water storage and control tunnel was built in 2006. This smart flood control tunnel helps to discharge the flood water from the city to the rivers. These tunnels have a diameter of 10 m, and they are 6,3 km long with a huge capacity of discharging flood water from the city (Figure 7).

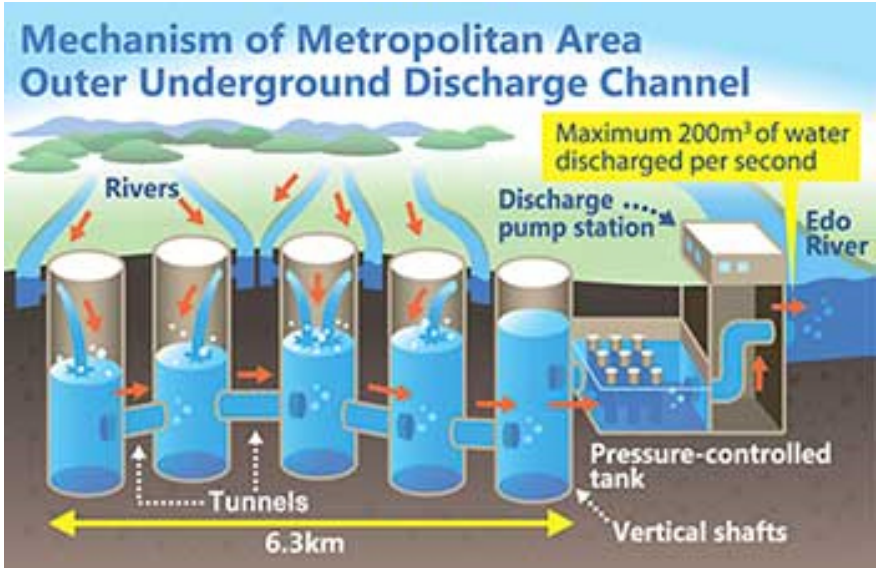

Figure 7. Tokyo Metropolitan Area flood control and discharge model (Trends in Japan, 2013).

Surge barriers, water discharge control tunnels are developed with sophisticated technologies, and they are totally smart and effective solutions for mega cities. These kind of technologies can increase the adaptation capacity of cities to climate change impacts. Even though the cost of these technologies are extremely high, the long lasting effectiveness and safety of citizens and urban life makes them extremely important and crucial.

Smart settlements and smart buildings for energy efficiency

The aim of energy efficient smart settlements and buildings is to reduce energy demand, decrease the GHG emissions and consumption by taking some precautions towards saving energy and water, using adequate materials or smart systems to control and reduce energy flow, and using energy renewable resources (Kyili and Fokaides, 2015). Worldwide initiatives on zero-emission cities aims for the reduction of greenhouse gas emissions and encouraging sustainable energy use by promoting renewable energy resources like solar, wind, biogas, geothermic, hydro etc. (Mohanty et al, 2016). Thus, smart technologies are promoted and supported by most of the local governments and nations like EU countries as an effort to reduce their carbon footprints.

Smart transportation

The increase in population, rapid growth of cities and new roads lead to an excessive traffic flow in cities. Transportation induced GHG emissions contributes about 20% of global GHG emissions (EEA, 2014). Smart transportation systems together with zero emission and public transportation systems helps the urban transportation systems to become more effective, time and cost saving and environmentally friendly (Mohanty et al, 2016). Therefore, not only using renewable energy resources but also utilizing ICT technologies for route advices, scheduling etc. for time saving and cost effectiveness are useful for the reduction of GHG emissions.

EXPERIMENTAL

In this study, the existence of climate change adaptation and mitigation adapted smart practices (such as early warning systems, smart flood control, energy efficient and renewable energy smart buildings, smart transportation) are examined in mega cities with a population over 10 million according to the United Nations World Urbanization Prospects Report (2014). UN's report is particularly chosen because it has published numerous studies and reports on cities worldwide, and it is one of the best known organizations that addresses a high variety of topics and have sub-organizations like UNDP, UNEP, UN-Habitat, UNESCO, UNFPA, UNICEF etc.

Smart city-scale practices are classified as mitigation-aimed and adaptation-aimed practices. For each city, municipal reports, online news, scientific articles were used to identify whether any of these practices existed in a city. Any future projects were not taken into consideration. When conducting the analyses, finding resources in English and identifying the current smart practices from the resources available was a challenge. Afterwards, the GDP values of each city was considered in order to reveal the relation between the existence of such implementations with economic development rates. The GDP values were intentionally chosen from years as close as possible to 2014 given that the mega cities with more than 10 million inhabitants were selected according to the UN World Urbanization Prospects Report 2014. The overall findings were evaluated altogether to understand the importance of the economic level of the city which is important to understand the capacity of investing in climate change adapted smart city implementations.

RESULTS AND DISCUSSION

Evaluation of Climate Change adapted Smart Mega Cities

Mega cities with high urbanization and population rates are the main contributors of GHG emissions with high consumption of energy in transport, heating/cooling, industry, etc. and most of them have already been under pressure of climate change impacts like floods, droughts, sea level rise and heat waves. Mega cities, and especially the developing ones, are more under risk of these impacts than rural areas due to the fact that the adaptation capacity of these cities are quite low because of their high population rates and urbanization challenges like infrastructure, housing, sanitary and poverty. Unfortunately, the local governments in most of the mega cities like Istanbul, Delhi, Buenos Aires are far from making any investments in climate change adaptation and mitigation, and their primary aim is to make investments that would ensure economic welfare. But the truth is that the impacts of climate change threatens economy, life safety, food and water security and quality of life even in developed cities.

In the table blow (Table 1), the existence of smart city applications and implementations, their main focus and implementations considering climate change in mega cities over 10 million inhabitants (UN, 2014), are analyzed to address the existing situation in mega cities in terms of climate change adapted smart technologies. By defining that, another question can be asked: Do mega cities integrate smart technologies efficiently to their system?

Table 1. Analyses of mega cities in terms of being a climate smart city (Mega cities are chosen according to the UN (2014) World Urbanization Prospects Report)

Mega-Cities over 10 million [1]	Climate Change Smart city implementation (YES-N/A)	Topics	Implementations	Adaptation /Mitigation	Formal Resources Scientific articles, institutional reports, city government web pages, projects etc.	Informal Resources (Informal) Internet news and NGO news and report
Tokyo	YES	Rise in sea level, flood,	Early warning systems, Flood control and measure (canalization water level measures) systems	Adaptation	Esteban et al. (2014) , Takemoto (2011)	
		Emission, Energy Efficiency	Smart buildings and settlements (smart energy systems, low carbon buildings) Smart Transportation (smart vehicles, bike, public transportation)	Mitigation	Pham (2015)	
Delhi	N/A	N/A	N/A	N/A		
Shanghai	YES	Flood	Early warning systems	Adaptation	Tan-Mullins et.al. (2017), Tang et.al. (2012)	
		Emission, Energy Efficiency	Smart Transportation (smart vehicles, bike, public transportation), Smart settlements	Mitigation		
Mexico City	YES	Emission, Energy Efficiency	Smart Transportation (smart vehicles, bike, public transportation)	Mitigation	Ibarraran M. E. (2011), Climate Reality Project (2015)	
Sao Paolo	YES	Emission, Energy Efficiency	Smart Buildings and settlements Smart Transportation (smart vehicles, bike, public transportation)	Mitigation		
		Flood	Early warning systems	Adaptation	Horita et al. (2016)	
New York	YES	Emission, Energy Efficiency	Smart Buildings and settlements Smart Transportation (smart vehicles, bike, public transportation)	Mitigation		smart and resilient cities (2018)
		Flood	Early warning systems	Adaptation		Nysmesonet (2019)
Cairo	YES	Flood	Early warning systems (according to the level of water text messages are sent to the citizens)	Adaptation	Mashaly and Ghoneim (2018)	
Dhaka	YES	Flood	Early warning systems	Adaptation		Cuminskey L., Hakvoort H., Altamirano M. (2015)
Karachi	YES	Heatwave, extreme weather	Early warning systems Text massage on mobile phones for early warning of heatwaves, floods and extreme weather events	Adaptation		Jaffery R. 2018, Shaikh S. and Tunio S. (2017)
Buenos Aires	N/A	N/A	N/A	N/A		
İstanbul	YES	Extreme weather events, flood	Smart early weather warning and flood systems on mobiles (measuring level of rivers)	Adaptation	AKOM (2019)	
Manila	YES	Extreme weather events, flood	Early warning flood systems	Adaptation	Institude for International Urban Government (2012), Fabito et al. (2016)	
Lagos	N/A	N/A	N/A	N/A		
Moscow	YES	Emission, Energy Efficiency	Energy Efficiency in industry	Mitigation	UNFCC (2003), Davydova A. (2017)	
Kinshasa	N/A	N/A	N/A	N/A		
Paris	YES	Emission, Energy Efficiency	Smart Transportation (bikes, energy efficient transport, parking, metro, pollution measures), energy, smart buildings, smart grid and networks	Mitigation	City of Paris (2018), Agence Parissienne du Climat (2017)	
		Drought	Water efficiency reduction,	Adaptation		
London	YES	Emission, Energy Efficiency	Smart Transportation (intelligent transport network, Heathrow pod), smart infrastructure for reuse of waste heat of city,	Mitigation	Mayor of London (2019)	Smartcity Press (2017)
		Flood	Flood warning and control systems	Adaptation		
Jakarta	YES	Extreme weather events, flood	Early warning flood systems	Adaptation	Fabito et al (2016)	

Table 2. Evaluation of smart implementations considering climate adaptation and mitigation together with GDPs (Shanghai, 2016, Trujillo J.L. and Parilla J. (2016), PWC, 2015)

City		**Adaptation**			**Mitigation**	
	GDP per capita $	**Early warning-Flood**	**Flood control**	**Early warning-Drought-Heatwave**	**Smart buildings-settlements**	**Smart transportation**
Tokyo	41,636 (2012)	Yes	Yes	N/A	Yes	Yes
Delhi	3,580 (2013)	N/A	N/A	N/A	N/A	N/A
Shanghai	15,300 (2016)	Yes	N/A	N/A	N/A	Yes
Mexico City	20,960 (2013)	N/A	N/A	N/A	N/A	Yes
Sao Paolo	23,704 (2012)	Yes	N/A	N/A	Yes	Yes
New York	73,327 (2013)	Yes	N/A	N/A	Yes	Yes
Cairo	2,980 (2013)	Yes	N/A	N/A	N/A	N/A
Dhaka	3100 (2013)	Yes	N/A	N/A	N/A	N/A
Karachi	N/A	Yes		Yes	N/A	N/A
Buenos Aires	25,388	N/A	N/A	N/A	N/A	N/A
İstanbul	11,979	Yes	N/A	N/A	N/A	N/A
Manila	6,160 (2013)	N/A	N/A	N/A	N/A	N/A
Moscow	21,340	N/A	N/A	N/A	Yes	N/A
Kinshasa	N/A	N/A	N/A	N/A	N/A	N/A
Paris	59,611 (2013)	N/A	N/A	N/A	Yes	Yes
London	54,383 (2013)	N/A	N/A	N/A	Yes	Yes
Jakarta	5,020 (2013)	Yes	N/A	N/A		

In each mega city, the existence of smart implementations in accordance with climate change impacts were searched without considering future projects. Adaptive implementations are accepted as any

implementation considering flood, extreme weather events like storms and heat waves, while implementations used for energy reduction, zero emission are considered under mitigation. According to the UN (2014), 19 of the mega cities had a population of more than 10 million. Among these 19 cities ,15 of them had at least one smart implementation adapted to climate change. Tokyo, Shanghai, New York City, Sao Paolo, Paris and London had smart implementations in both climate change adaptation and mitigation. Adaptive smart implementations are designed for flood risk except Paris because the city is under risk of more heatwaves than floods. In flood control early warning systems had the majority while flood control systems in rivers and dams are few. Flood control infrastructure have high costs and most of the cities like Cairo, Dhaka Karachi invest more on early warning of flood, storm or drought by mobile phones rather to invest on flood control infrastructures. Even though early warning text messages are effective to ensure life security, they may not be as effective as early warning infrastructures like flood control for food, life security, maintaining quality of life and economic welfare. Among these mega cities, Istanbul has also smart early warning systems for meteorological events and flood control as a result of increase in flood and extreme weather events in recent years. In Istanbul case increase in population, urbanization and impermeable surfaces are the main causes of threats. Therefore, not only early warning systems but also flood control infrastructure together with smart buildings, transport and settlements should be invested and supported.

Summary of smart implementations in relation with climate change adaptation and mitigation, together with GDP per capita ($) of each mega city in the list are evaluated to address the relation between smart investments and economic welfare. Cities with a higher GDP per capita (more than 10,000 $) seems that they have invested in smart implementations in accordance with climate change mitigation. Smart mitigation strategies focus on emission reduction end energy efficiency at the building and city scale. These implementations generally include smart energy efficient buildings, smart settlements that reuse waste heat of a city like in London, smart city lighting with LEDs, smart zero emission buildings solar, photovoltaic usage or usage of other renewable energy resources together with water efficient systems. Smart transportation and grid systems like mobile applications for route selection, smart park & ride bike and car usage systems, public transportation etc. are needed to be invested. Developed mega cities like Tokyo, London, Paris, New York seem to have invested more on these technologies than other mega cities.

These implementations are costly and for cities with lower GDP, the priority is to give importance to climate adaptive smart implementations. These adaptive implementations (like early warning systems) are easy and more affordable as an investment and crucial for cities that are particularly vulnerable to the risk of flood. Considering that cities with higher economic levels are more resilient to climate change impacts as they can invest in climate change adaptation and/or mitigation aimed smart implementations. But it can also be seen from Table 2 that not each and every city with a high GDP is interested in investing in these implementations.

CONCLUSION

Considering challenges along with rapid and unplanned urbanization as well as climate change, smart city implementations like early warning systems for floods, droughts, extreme whether events, adaptation of renewable energy and energy efficient technologies in cities and efficient public transportation are gaining increased importance. However, these systems are not only costly but they are also not easily adaptable in mega cities as, especially the developing ones, already have major socio-economic problems that require resolution. On the other hand, investing in these practices may actually support the wellbeing of the city and help to save money at the same time.

Again, the answer can be asked again: Do mega cities integrate smart technologies to their system efficiently? The answer seems to be “No, not yet”. Climate change is quite real, and its impacts are hard for cities, the local governments and citizens to adapt. Therefore, in the future, it seems like mega cities will not have another choice but using and investing climate change smart technologies for both mitigation and adaptation to climate change.

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EVALUATION OF PASSIVE FIRE SAFETY PRECAUTIONS IN SUSTAINABLE ARCHITECTURE: TURKEY'S REGULATION ON FIRE PROTECTION ANALYSIS

MUAMMER YAMAN

ABSTRACT

The energy crises that have been experienced due to the rapid increase in consumption in the process from the past to the present have prioritized sustainability. The fact that most of human life is carried out in buildings has made it necessary to question the theme of sustainability in architecture. Excessive energy consumption has increased the tendency to use renewable energy, and buildings that are self-sufficient and provide optimum comfort conditions have emerged, especially in line with passive principles. Sustainable building components have been created in line with different principles in building materials, building elements and building and are constantly being developed. In the creation of sustainable building components, it is necessary to ensure the safety of life and property for the building occupant, and to create optimum comfort conditions depending on the building physics. In ensuring the safety of life and property in buildings, fire, which may be a threat throughout the life cycle of the building, has been addressed, and the necessity of providing fire safety precautions in sustainable buildings has been emphasized. For this purpose, within the scope of the study, building components used in buildings within the scope of sustainable architecture were discussed and examined within the scope of fire safety precautions. Within the scope of building components, thermal insulation materials and recyclable materials in context of building materials; double skin facades, vegetative roof and facade systems, skylights and solar tubes, photovoltaic systems and wind turbines in context of building elements; building geometry and facade form and atrium in context of building are discussed. Within the scope of the investigations, a comprehensive literature review has been made and fire risk analysis has been presented in sustainable building components. In the study, passive fire safety precautions are emphasized to those affecting the architectural design and providing input to the project design process. From the regulation that sets out the requirements for passive fire safety precautions, the Turkey's Regulation on Fire Protection (TRFP) was considered and analysed through sustainable architecture building systems. In order to contribute to the intelligibility of the subject in the Turkey's Regulation on Fire Protection, visualizations were made in the relevant requirements and the evaluation of the regulation was made. As a result of the study, assessments were made to prevent the emergence and spread of fire caused by material use. It was focused on eliminating the risks that may cause fire and on the need to create design systems that can limit the spread of fire. It has been determined that there are no detailed explanations within the scope of sustainable architecture under the Turkey's Regulation on Fire Protection. Deficiencies in fire regulation have been identified in the areas of vegetative roof and facade systems, photovoltaic systems and wind turbines, building form and facade geometry. Within the framework of sustainable architecture, the need for the development and elaboration of Turkey's Regulation on Fire Protection has been clearly stated. The importance of informing and raising awareness of architects and engineers for fire safety precautions within the framework of sustainable architecture have been explained.

Keywords: Sustainability, Sustainable Architecture, Fire Safety, Fire Regulations, TRFP.

1. INTRODUCTION

Environmental problems, which have become a global problem starting from the regional level in the process from the past to the present, have reached a problem level that can threaten humanity today. Depletion of limited resources, starvation, environmental pollution, climate changes and frequent natural disasters are major indicators of this problem. It is necessary to fundamental precautions and develop solutions within the scope of the issue in order to solve the problems, especially to leave a liveable and clean world for future generations (Bekem Kara et al., 2015). For this purpose, sustainability, which has emerged and developed recently and can manifest itself in all functional phases of life, is an important concept. Sustainability, as an architectural approach, should be considered and evaluated at the building where human life takes place. Sustainability has an important theme in buildings, common living areas and urban uses.

Sustainable architecture is an architectural approach that includes flexible and renewable space productions designed on the basis of the use of renewable resources without harming the natural environment of the building integrated systems in the building life cycle. Within the scope of architectural design; ecological, socio-cultural and economic sustainability approaches should be evaluated and transferred to the architectural project:

Ecological sustainability is based on the consideration of renewable resource use, with the protection of resources and ecosystems at the forefront.

Socio-cultural sustainability is based on the use of social and cultural values in occupant comfort conditions.

Economic sustainability is based on long-term availability of resources and keeping costs within the optimal value range (Özmehmet, 2012).

Unlike sustainability as a trend, preference and orientation, it is deemed necessary to consider it as a part of architectural design process. It should be included in the design decisions that should be considered and implemented in new buildings and existing buildings within the framework of developing and advancing building materials and systems. For this purpose, in the buildings we use today, we encounter a number of applied system approaches for energy production and consumption in terms of sustainability. The establishment of valid and rational solutions in the designed systems increases the efficiency taken within the scope of sustainability.

The basic requirement in sustainability is to create optimum comfort conditions in designs that are considered occupant based by addressing the building life cycle. However, one of the main requirements is to ensure the safety of life and property of building occupants. It is important that the components used in building systems evaluated within the scope of sustainable architecture are constructed according to fire safety precautions. It should be considered that the whole of the systems that are designed and considered with a sustainable approach in buildings can cause fire to occur and spread within the enclosed space. In this context, different uses of sustainable architecture should be addressed and assessments should be made within the scope of active and passive fire safety precautions (Figure 1).

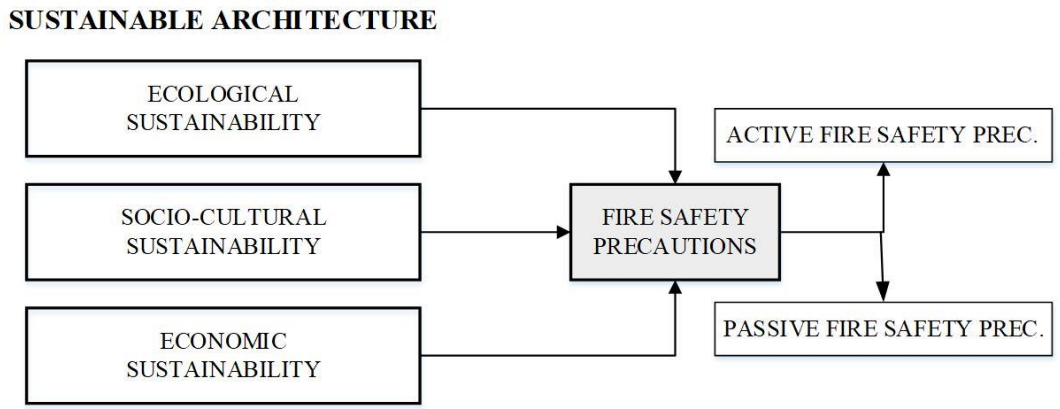


Figure 1. Relation of sustainable architecture and fire safety

Fire safety precautions in buildings are carried out by the common field of different discipline. It is generally formed with active and passive fire safety precautions. Active precautions; it constitutes the whole of mechanical systems that can be applied to the building during the design process and later, perform its function in case of fire and support passive fire safety precautions. It includes fire safety precautions such as fire detection and warning systems, fire detectors, mechanical smoke control systems etc. Passive precautions; it covers the fire safety precautions involved in the emergence, spreading of the fire and the construction of evacuation systems integrated into the architectural project during the design process. It includes fire safety precautions such as planning of horizontal and vertical fire escape routes, creating compartment zones, selecting and applying building materials and elements in accordance with the fire dynamics requirements. Active and passive fire safety precautions should be evaluated in a holistic manner and should be designed in architectural projects to support each other (Demirel et al., 2017; Rahardjo and Prihanton, 2020).

Within the scope of the study, the systems designed and applied in sustainability practices in architecture were examined within the framework of fire safety precautions. Within the scope of the investigation, relevant sustainable architectural systems have been identified in order to make evaluations especially for passive fire safety precautions:

Thermal insulation materials and recyclable materials in context of building materials,

Double skin facades, vegetative roof and facade systems, skylights and solar tubes, photovoltaic systems and wind turbines in context of building elements,

Building geometry and facade form, atrium in context of building

Risk assessments have been made for passive fire safety precautions for the systems being considered. Precautions and safety mechanisms that can be taken with risk assessments have been focused. In the study, Turkey fire regulation (Turkey's Regulation on Fire Protection, TRFP) was discussed in detail within the scope of the study, and assessments were made in terms of fire safety in sustainable architecture. In order to contribute to the intelligibility of the regulation, visualizations were made and proposals for the development of Turkey fire regulation were presented.

2. RELATION OF SUSTAINABLE ARCHITECTURE AND FIRE SAFETY

Combustion occurs through the fire triangle elements (flammable material, oxygen and heat) in the environment. The fire that occurs in an enclosed space grows and spreads when these three elements are present in the environment. The emergence and spread of the fire in an enclosed space occurs as ignition, growth, flashover, full development, structure fire and collapse phases. The resulting fire spreads rapidly in enclosed space as direct, radiative and thermal plume (Champneys et al., 2013). Structural components are an important factor in the emergence and spread of fire. For this purpose, structural components should be designed to reduce possible fire risks and be arranged in a way to minimize fire and smoke spread. Unit and building-based assessments should be made as an enclosed space, and fire spread should be evaluated by determining the source location and should be transferred as input to the design process (Table 1).

Unit-based	*Building-based*
Dimensions, Proportions	Dimensions, Proportions
Fire Load *MJ/m^2 (Amount of Flammable Materials)	Fire Load *MJ/m^2 (Amount of Flammable Materials)
Heat Source Position and Energy	Geometry
Number of Heat Sources	Building Class, Interior Arrangements
	Facade Openings
	Fire Barrier

Table 1. Fires risk assessment criteria in enclosed space

The use of natural, unlimited and renewable materials in buildings within the framework of sustainable architecture is the main approach. This approach covers the preference of light weight structural systems, the use of natural light for the necessary lighting, periodic regulation of heat losses and gains, and natural ventilation strategies. The main effects of materials and systems used for this purpose in the emergence and spread of fire should be studied and transferred to building systems as a component of design:

The fire reaction of materials

The effect of toxic gases coming out of materials during combustion

Automatic pressurization systems and air circulation routes

Fire resistance of building elements during fire

Firefighting and extinguishing approaches should be evaluated (Krause et al., 2012).

3. FIRE SAFETY OF ARCHITECTURAL COMPONENTS IN SUSTAINABLE ARCHITECTURE

The determination of fire risks within the framework of sustainable architecture makes clear the fire safety precautions that can be developed in buildings. For this purpose, risk assessment of architectural components established within the framework of sustainable architecture should be carried out. As a result of risk assessments, alternative solutions that can be developed should be presented and transferred to the architectural project. Architectural components include systems that are effective in the occurrence and spread of fire within the buildings systematics. Within the scope of sustainable architecture, architectural components should be explained in context of building materials, building elements and building (Figure 2). It is important to create and classify passive fire safety precautions that can be taken with explanations.

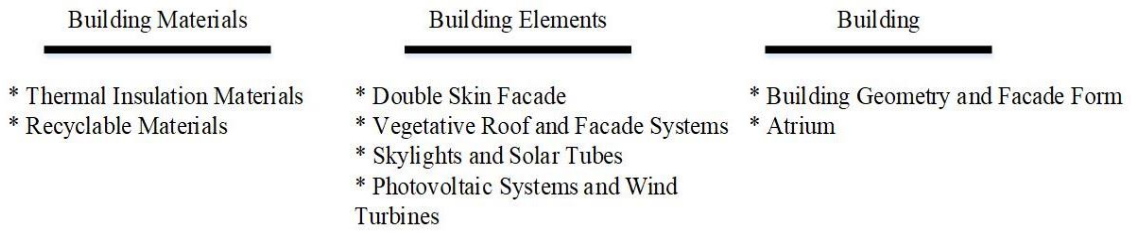


Figure 2. Classification of architectural components within the framework of fire risks

3.1. Fire Safety for Building Materials

Building materials throughout the building are architectural components that pose a risk in the emergence and spread of fire. The fire reaction classes of the materials to be used in buildings must be known. Along with the fire reaction class are important to know the droplets, smoke and toxic gas release properties during combustion. It should be required to know the ease of ignition of the materials used, their internal combustion conditions, their flammability properties, and these properties should be determined by test results obtained from accredited laboratories (Wade and Clampett, 2000). Increasing the fuel load according to the fire reaction class of materials to fire increases the safety risks (Equation 3.1). In a possible fire scenario, the spread of the fire accelerates and the loss of life/property increases. Thermal insulation materials and recyclable materials were examined in the risk assessment of building materials within the scope of sustainable architecture.

$$qc = \sum mvHv / Af \qquad (3.1)$$

qc = fire load (MJ/m2), Af= floor area (m^2), mv= total mass of the combustible material (kg) and Hv= calorific value of the combustible material (MJ /kg)

3.1.1. Thermal insulation materials

Thermal insulation materials include materials that are effective in providing indoor and outdoor heat control, and regulating heat losses and gains throughout the building, ensuring indoor comfort conditions. Thermal insulation materials are used in roofs, facades and underground building envelopes in buildings. There are herbal and animal origin (natural) thermal insulation materials, mineral origin thermal insulation materials and synthetic origin thermal insulation materials used for building thermal insulation (Karadayı and Yüksek, 2016). According to the climatic data of the region, the thickness and layer order of the thermal insulation materials change. It is recommended to use fire-resistant thermal insulation materials especially in building envelope (facades and roofs) that are in contact with air (O_2), which is necessary for combustion to occur. It is recommended to use non-combustible thermal insulation materials in high-rise buildings and buildings with a high risk of fire.

Fire risk assessment of the materials generally used for thermal insulation purposes has been made in Table 2. Layer, thickness and air contact of the materials in the building systems are effective on possible fire risks. Thermal insulation materials appear as building components that should be considered in facade fires and later in roof fires. Sandwich panels (structural insulated panels, SIP) used for thermal insulation are building materials that should be considered, especially since they are positioned in connection with indoor and outdoor spaces. The reaction of the material providing thermal insulation properties in the core part of sandwich panels to fire should be known and it should be recommended to choose from non-combustible materials.

Thermal Insulation Materials	*Thermal Conductivity (W/m K)*	*Fire Risk Assessment*
Mineral Wool	0.04	Rock wool, glass wool and ceramic wool are included in this group. It shows fireproof material feature.
Expanded Polystyrene (EPS)	0.03-0.04	It is a petroleum-derived material. It is a flammable material. It has the properties to release toxic gas and droplet.
Extruded Polystyrene (XPS)	0.03-0.04	It is a petroleum-derived material. It is a flammable material. It has the properties to release toxic gas and droplet.
Cellulose	0.03-0.05	It is obtained from paper and wood fibers as recyclable materials. It is a flammable material.
Cork	0.03-0.05	It is obtained from cork and is a flammable material.
Polyurethane (PUR)	0.02-0.03	It is a rigid foam material. Its compression strength is high. It is a flammable material.
Polyisocyanurate (PIR)	0.023-0.025	It is a rigid foam material. Its compression strength is high. It is a flammable material. Its performance is higher than PUR.
Vacuum Insulating Panels (VIPS)	0.004-0.008	It is an insulation material obtained with core, protector and barrier. While the core can be formed with flammable and non-flammable material options, the barrier is produced from flammable materials.
Gas-Filled Panels	0.04 (at lower values in theory)	It is similar to VIP. However, gas filling is done instead of vacuum.
Aerogel	0.013-0.014	Fire reactions should be determined with test standards.
Nano Insulation Materials		Fire reactions should be determined with test standards.

Table 2. Fire risk assessment on thermal insulation materials (Jelle, 2011; Lyons, 2006)

3.1.2. Recyclable materials

The recyclable use of building materials within the scope of sustainability ensures efficient planning of resource use. The reuse of materials taken from the building that has completed its life and the recyclable use of materials such as the use of materials that are not obtained for construction production in building systems is an important assessment within the framework of sustainable architecture. If recyclable materials are used throughout the building, their reaction to fire should be known depending on the location where they are used. The application of chemical fire retardants into the materials created provides the required fire reaction from the material. Phase change materials, which are widely used in thermal insulation, should be used carefully in buildings because of the structural components they contain, as they are mostly flammable materials (Al-Janabi et al., 2014). In addition, it is important to know the fire resistance of recyclable materials designed as a structural system.

The fire reaction classes of building materials must be determined according to the EN 13501-1 test standard. The fire reaction classes of the materials to be used on roofs are subject to different test standard. Roof materials must be tested according to EN 13501-5. Within the scope of the test standards, the burning rates, flame emission, heat release, smoke and droplet properties of materials exposed to fire are tested (EN 13501-1, 2018; EN 13501-5, 2016). As a result of the test, classification (A1, A2, B, C, D, E and F) and smoke properties (s1, s2 and s3) and droplet properties (d0, d1 and d2) are determined for building materials. Different classes (B_{ROOF}, C_{ROOF}, D_{ROOF}, E_{ROOF}, F_{ROOF}) are used for roof materials. The selection of

building materials from non-combustible materials, the absence of smoke and droplet properties are important factor in preventing the emergence and spread of structural fire.

3.2. Fire Safety for Building Elements

In the fire risk assessment of the building elements, their effect on fire resistance and fire spread should be investigated. Building elements must limit the spread of flame and smoke during a fire, do not perform the burning reaction and maintain its integrity for a certain period of time. Within the scope of sustainable architecture, double-skin facades, vegetative roofs and facade systems, skylights and solar tubes, photovoltaic panels and wind turbines were examined within this scope.

3.2.1. Double skin facade

Double skin facades are designed systems that build a secondary facade by adding them to the first facade of the building. The inner layer generally consists of low-e glass or solar controlled glass to provide heat control. The outer layer, on the other hand, can be made of glass or can be constructed from alternative materials. The gap between the inner layer and the outer layer is between 20-200 cm (Chan et al., 2009). Air circulation is provided in the gap inside the facade. Double skin facades are made in different types according to partitioning of the façade, type of ventilation and type of air flow (Figure 3). According to the designer's decision, it is important to select and apply the double skin facade type with various requirements.

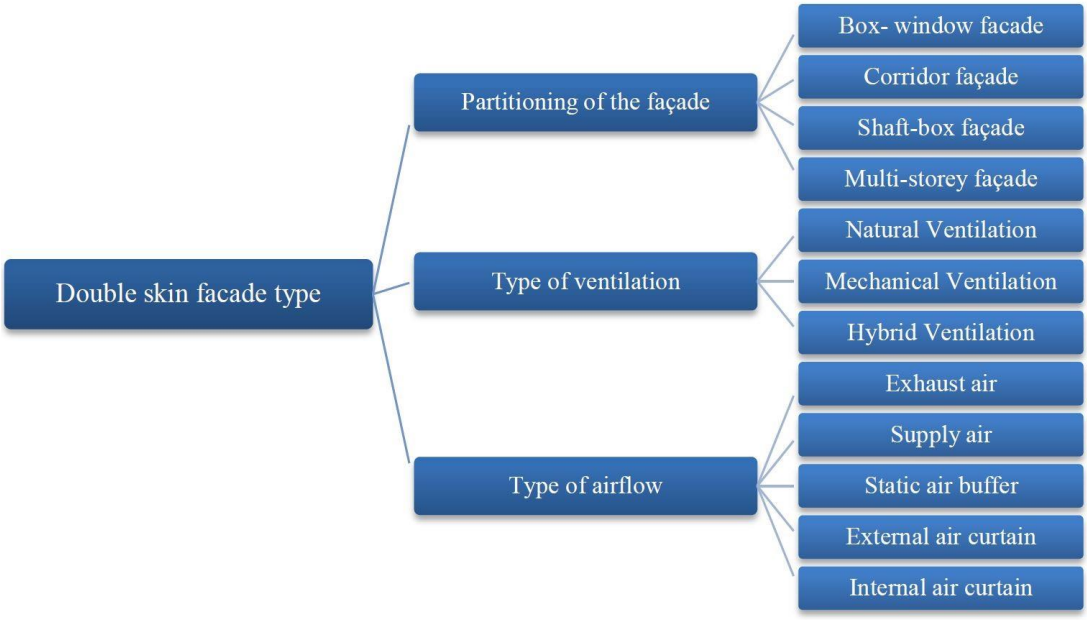


Figure 3. Types of double skin facades (Motevalian, 2014)

As a result of the fire that occurs in the interior of the double skin facades, the glass in the inner layer is broken by the effect of radiation. With the breaking of the glass, the flame and smoke in the room fill the gap inside the facade. The flame and smoke reaching the gap quickly spread to the upper floors and affect the other floors. The hollow space of the facade creates a chimney effect and accelerates the spread of flame and smoke (Chow and Hung, 2006; Chow, 2013) (Figure 4).

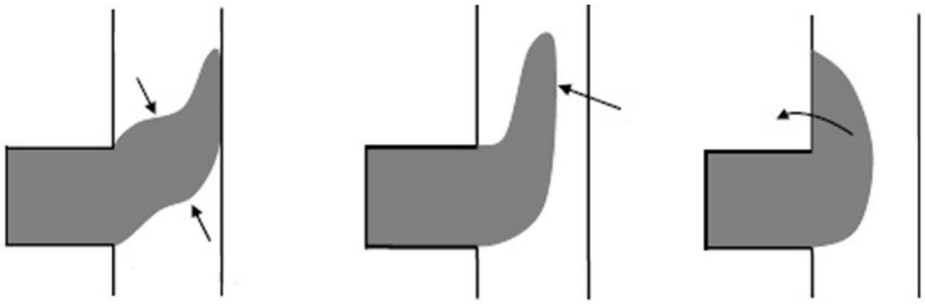


Figure 4. Fire dynamics in double skin facades (Chow, 2013)

For double skin facades, interrupting the interior gap is important within the scope of fire safety precautions. According to the facade partitioning types, it should be preferred as box-window type, corridor type, shaft-box type and multi-storey type respectively. At the same time, in double skin facade systems, especially the profiles and glass materials used in the outer layer must be resistant and not falling during fire (Civelek and Beyhan, 2019). In the case of a possible fire, interrupting the ventilation in double skin facades prevents the rapid spread of the fire. If natural ventilation is used, closing the ventilation system; if mechanical ventilation is used, it is important to make the active ventilation system passive. In double skin facades, in air flow types, the interruption of air in the interior prevents the fire from continuing. If the oxygen in the fire triangle does not present in the environment, it will ensure that the fire is taken under control and extinguished. However, attention should be paid because the oxygen released into the environment with the sudden air intake will cause flashes called backdraft.

3.2.2. Vegetative roof and facade systems

PVC elements, foam layers and polystyrene foam used in vegetative roof and facade systems increase the risk of fire as flammable materials. In addition to its flammability property, oil-derived materials, the presence of toxic gas releases and droplet properties leads to an increase in problems during fire. Instead of using such materials, it is recommended to use prefabricated and metal materials, soil and stone origin materials, gypsum products and mineral wool as fireproof materials (Tidwell and Murphy, 2010). It should be known that if the plants used in the facade and roof systems dry up, they create an extra fire load on the building. In order to reduce the risks, it is recommended to grow herbaceous plants instead of wrapped and climbing plants. During a possible fire, the burning of dry plants and their spread to the environment causes the fire to spread quickly. Cleaning and removing dried and spilled plants, especially from roof and facade systems, is important within the scope of fire safety precautions.

It should be noted that if the soil layer is present in the system of building elements in vegetative roof and facade systems, the fire department can absorb the soil's extinguishing water during the extinguishing process. In these cases, especially when interfering with buildings that do not have an automatic extinguishing system, the extinguishing water should be increased too much (Özgünler et al., 2018). At the same time, vegetative roof systems should ensure that plants do not prevent fire intervention.

3.2.3. Skylights ve solar tubes

Within the scope of sustainable architecture, there is a great need for skylights and solar tubes for optimum design of daylight in line with building and space requirements. Skylights are often preferred for the lighting of interior and long and deep enclosed space on the roof of the building. However, designing with fire-resistant materials is the main issue to be considered within the framework of fire safety precautions. As the plastic material that is frequently used in architecture, the fire reaction class of polycarbonates is low, they melt during fire and form droplets. In addition, smoke and toxic gases are released into the environment during a fire in such materials. Within the scope of fire safety precautions, it is recommended

to use products approved within the framework of fire safety by making relevant fire test standards, and to apply fire resistant glass solutions in transparent designs.

Solar tubes are used to transport daylight from the outside to the depths of the indoor space. Especially in the connection of different compartment regions, solar tubes are problem in the spread of flame and smoke (Tidwell and Murphy, 2010). Similarly, the connection of the solar tubes with the external environment prevents the decrease of the oxygen level in the indoor space, making it difficult to extinguish the fire and indirectly interfere with the fire. In order to prevent this situation, it is necessary to use dampers in solar tubes in various regions depending on the automation.

3.3.4. Photovoltaic systems and wind turbines

Photovoltaic systems are designed to produce all or part of the energy used in buildings by the building through the sun. Photovoltaic systems are constructed in two different ways as building-integrated and building-adapted systems (Figure 5). Building integrated systems are integrated into the building shell, which covers the systems decided at the building design process. Building integrated systems, the building should be detailed within the framework of physical environmental conditions. Building adapted systems cover systems that operate independently of the building, transferring only carrier loads to the building (Heinstein et al., 2013). The presence of electrical equipment in photovoltaic panels poses a great risk to fire safety. In addition, the fire reaction of materials used in building integrated and adapted systems should be known. They should be evaluated according to their use of the building. As part of the study, the focus was especially on building integrated photovoltaic systems.

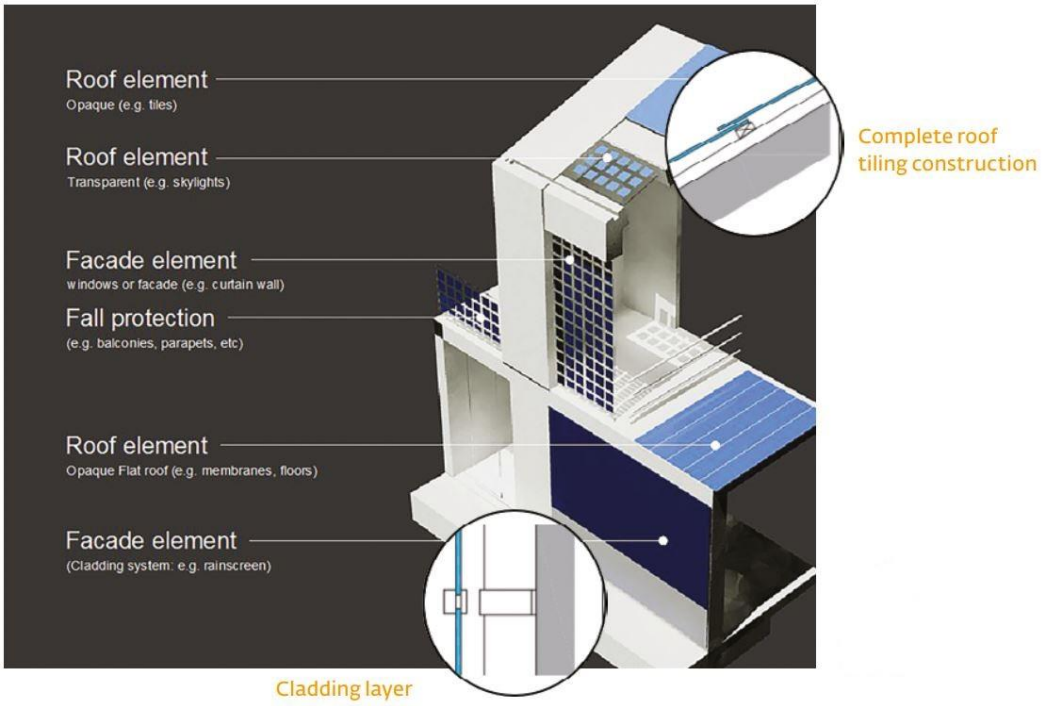


Figure 5. Roof and facade photovoltaic panels in architecture (Zanetti et al., 2017)

In roof photovoltaic use, roof-mounted model constructions and connection equipment should be preferred to be made of fireproof materials. Flammable material should not be positioned in the ventilation gap located at the bottom of the panel. Firefighters should be easily accessible on the roof in case of a possible intervention, and attention should be paid to the positioning of photovoltaic panels. Flammable

materials should not be used in electrical cable transits and passive firestop precautions should be taken. Considering the relationship between the roof and the building, the use of compartments or fire walls should be continued on the roof (Yaman and Kurtay, 2019).

There are different alternatives for design in facade photovoltaic uses. Exterior wall systems, facade cladding and curtain wall systems, their use as an additional element in the facade are left to the designer decisions. Particular attention should be paid to facade and floor joints in photovoltaic systems constructed as external wall systems. Connection parts of different floors must be insulated in a way that prevents the transmission of flame and smoke. In photovoltaic systems designed as facade cladding and curtain wall, it is necessary to use fireproof materials in interior spaces. Similar to double skin facade systems, it is recommended to interrupt the interior gap of the facade or to close the gap between the floors with intumescent elements. In photovoltaic systems used as an additional element in the facade, it is used for sunshade, spandrel, parapet or railing. It is important that the flammability class of the panel elements used and that the flame and smoke are designed to be removed from the facade in case of a possible fire (Yaman, 2018).

Like photovoltaic systems for generating all or part of the energy used in buildings, wind turbines are also used. But the design of wind turbines, which are built on a building, is quite difficult. It can be used within the designer's suggestions and environmental data, including on roofs and facades. Dynamic nature of wind direction and speed determination in environmental control complicates design decisions and affects the efficiency of the wind turbine (Park et al., 2015). Wind turbines negatively affect the acoustic comfort of the building and city user as noise and vibration sources, they should be evaluated and constructed with noise control details in the design process. As part of the fire safety precautions, it is possible that fires will occur as a result of the force of movement of the rotating arms along with the wind and the heating of the device (Figure 6). In these cases, it is important to disconnect the electrical equipment and disable the system and perform periodic maintenance of wind turbines.

Figure 6. Wind turbine combustion in the urban area (Uadiale et al., 2014)

3.3. Fire Safety for Building

The spread of flame and smoke to different parts and floors during a fire in buildings causes important problems. For this purpose, limiting the spread of fire is an important criterion in fire risk assessment for building. Building form, facade geometry and atriums should be considered and evaluated within the scope of sustainable architecture.

3.3.1. Building form and facade geometry

Positioning and geometry of the building are among the parameters that should be evaluated within the scope of fire safety in sustainable architecture. The location of the building in an open area, its relationship with the surrounding buildings and wind should be evaluated within the scope of fire safety precautions. Urban equipment (lighting, garbage, transformer etc.) and landscape areas around the building should be investigated within the scope of fire risks. In the design of the building, the relationship between topography/wind and fire should be evaluated and used as a parameter in the design process.

Building form is of crucial in the sustainable architectural design process. While making building form decisions, attention should be paid to fire safety risks, especially when designing concave surfaces (for example; U-shaped). The fire that occurs in the lower floors on concave surfaces tends to spread rapidly to the upper floors. It is important to construct the factors that cause the emergence and spread of fire in both indoor and outdoor design in this context. Not designing spaces with high fire risk (kitchen, tank, fuel room etc.) in interior space design on concave surfaces; there should be no factors (garbage, vehicles, electrical equipment etc.) that cause fire in the outdoor environment. Flammable materials should not be used in exterior wall finishing systems on concave surfaces. Likewise, the fact that the materials used in exterior wall finishing systems do not have the properties of droplet during fire reduces the spread of fire (Yan et al., 2017).

The facade geometry is an important component in the construction of the building within the scope of physical environmental analysis. Facade geometry should be considered as the requirements of facade materials and building systems. Building materials and construction systems that accelerate the spread of fire on facades should be avoided. It is suggested that the ledge used on the facade are evaluated regarding the its material, angle, mobility and continuous/dashed fire spread (O'connor, 2008) (Figure 7). Especially the presence of vertical ledge to the facade that can remove fire and smoke in facade systems, fireproof materials and spandrel designs in facade slab joints have been put forward within the framework of fire regulations (Yaman and Demirel, 2020). As the facade geometry, it is important to consider the facade openings within the scope of fire safety precautions together with the effect of the movements on the facade on the spread of fire. During a fire in wide facade openings, the tongue of flame spreads close to the facade and accelerates the spread of the fire. In narrow and long windows, the tongue of flame moves away from the facade and limits the risk of fire during a fire. Within the scope of the subject, it is important to produce solutions within the framework of computational fluid dynamics (Saunders, 2018).

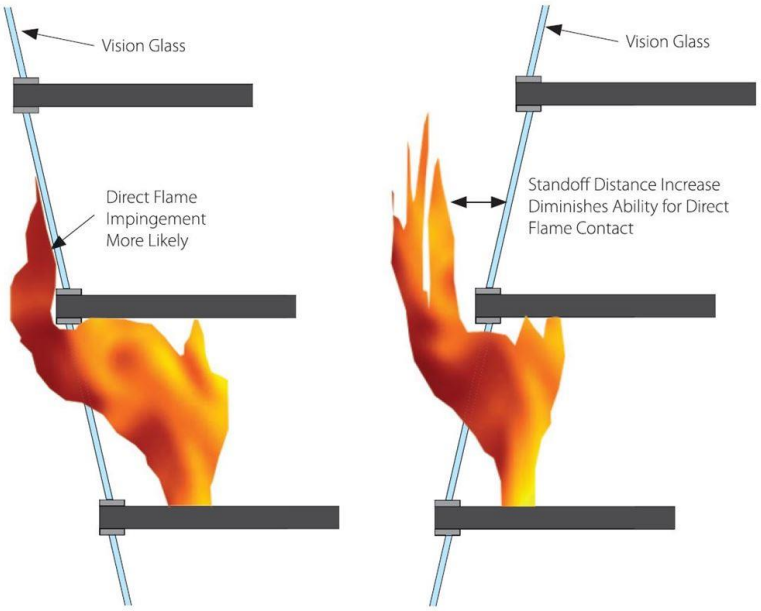


Figure 7. Relation of facade geometry and fire dynamic (O'connor, 2008)

3.3.2. Atrium

Sustainability as a spatial requirement within architecture, atriums have been designed to improve indoor air quality and optimum use indoor daylight pose fire safety risks in buildings. Smoke generated during the fire in buildings with atrium is spreading rapidly to the upper floors. Spread affects occupants on different floors, and also affects occupants during evacuation (Xu et al., 2018). It is important to try to reduce the fire load in buildings with atrium and to have automatic extinguishing systems. In addition, it is necessary to have effective smoke evacuation systems, smoke curtains under the floor and mechanical pressurization systems to control smoke in the atrium. Smoke evacuation strategies should be established depending on where the fire occurs. In buildings with atrium, it is recommended to develop a total simultaneous evacuation strategy, especially for occupant evacuation, and to investigate smoke analyses according to possible fire positions (Ölmez Gültek, 2005).

The presence of atrium in buildings especially complicates compartment approaches. It is important to prevent horizontal and vertical compartment leaks in order to control the fire regionally and to establish proper occupant evacuation. The dimensions (width-height), location, geometry of the atrium to be designed, the position of the pressurization systems located in the atrium, and the state of the atrium being closed during a fire must be determined and fire safety precautions must be taken within the framework of building performance requirements. If atriums work as a chimney effect during a fire, the safety risk for building occupants and firefighting teams will increase more (Al-Janabi, 2013). For atrium, it is especially important to investigate performance solutions and resolve the fire and smoke properties in atrium models within the framework of computational fluid dynamics (Sinclair, 2004).

4. FIRE RISK ANALYSIS AND FIRE REGULATIONS IN SUSTAINABLE ARCHITECTURE

In the determination of fire risks in sustainable architecture, it is important to determine the dangers for the emergence, spread, control and extinguish of fire and to reveal the relationships with architectural components (Table 3).

In the emergence of fire; being as a heat source and/or flammable product, causing explosions, releasing toxic substances, creating an ignition source, causing continuous burning after starting to burn, accelerating the combustion of the flammable substance and affecting the flammable substance carry great risks.

In the spread of the fire; causing fire to grow, causing smoke, disrupting the chemistry of the material in a short time, changing the flammability, static state, smoke and flame spread of the material, causing flaming burning in the material, changing smoke and heat transitions cause the emergence of danger scenarios.

The creation of occupant evacuation scenarios and the impact of sustainable architecture components on evacuation scenarios should be examined. Establishing the evacuation time in the shortest time and establishing safe evacuation and escape plans should be evaluated within the scope of sustainable architecture and transferred to the project.

In controlling and extinguishing the fire; it should be ensured that firefighting teams have access to extinguishing components, ensuring suppression effectiveness, having access to extinguishing equipment, and making all kinds of access and intervention of firemen easy.

Especially, the role of the country's fire regulation is great in identifying fire risks and creating safety precautions. Recent fires make it necessary to revision the country's fire regulation. Two basic approaches come to the fore in the control mechanisms of national and international fire regulation. These approaches constitute prescriptive-based regulation and performance-based regulation on systems. Prescriptive-based regulation is created by a set of values and rules given in such a way that certain requirements are at minimum or maximum. But today, advanced construction techniques require performance-based solutions thanks to computer technology systems and Building Information Modelling (BIM). For this purpose, in the field of fire safety in developed countries, the transition from prescriptive-based systems to performance-based systems in fire regulation is gaining speed and project-specific solutions are produced within the framework of building fire risk assessments. Some of the prominent countries in this area, such as the United States of America, Canada, Sweden, New Zealand, Australia and the United Kingdom, are at an

advanced phase in the development and implementation of performance-based regulation on fire safety (Meacham, 2010; Tavares and Galea, 2009).

Sustainable Architecture Properties and Fires Safety Precautions	***Hazardous Dangers***																					
	Poses potential ignition hazard	Poses potential shock hazard	Potential explosion hazard	Poses potential toxicity hazard	Readily ignitable	Burns readily once ignited	Contributes more fuel / Increased	Material affects burning	Fast(er) fire growth rate	Significant smoke production /	Danger of short time deterioration	Deterioration affects burning	Deterioration may create stability	Deterioration may create smoke	Deterioration may create flame	Material may flame spread	May impact smoke/heat venting	May impact occupant evacuation	May impact FF water ability	May impact suppression	May impact fire apparatus access	May impact FF access and	Relative Risk Level
Building Materials																							
Heat Insulation Systems																							
Mineral wools																							
Structural integrated panel, SIP																							
Exterior insulation-finish, EIFS																							
Rigid foam insulation																							
Spray-applied foam insulation																							
Foil insulation systems																							
Phase-changed materials																							
Recyclable Materials																							
FRP (interior)																							
Wood (interior)																							
Bamboo (interior)																							
Bio-polymers (interior)																							
Building Elements																							
Double Skin Facades																							
Cavity, Stack effect																							
Box-window facade																							
Corridor facade																							
Shaft-box facade																							
Multi-storey facade																							
Vegetative Roof-Facade Systems																							
Vegetative roof systems																							

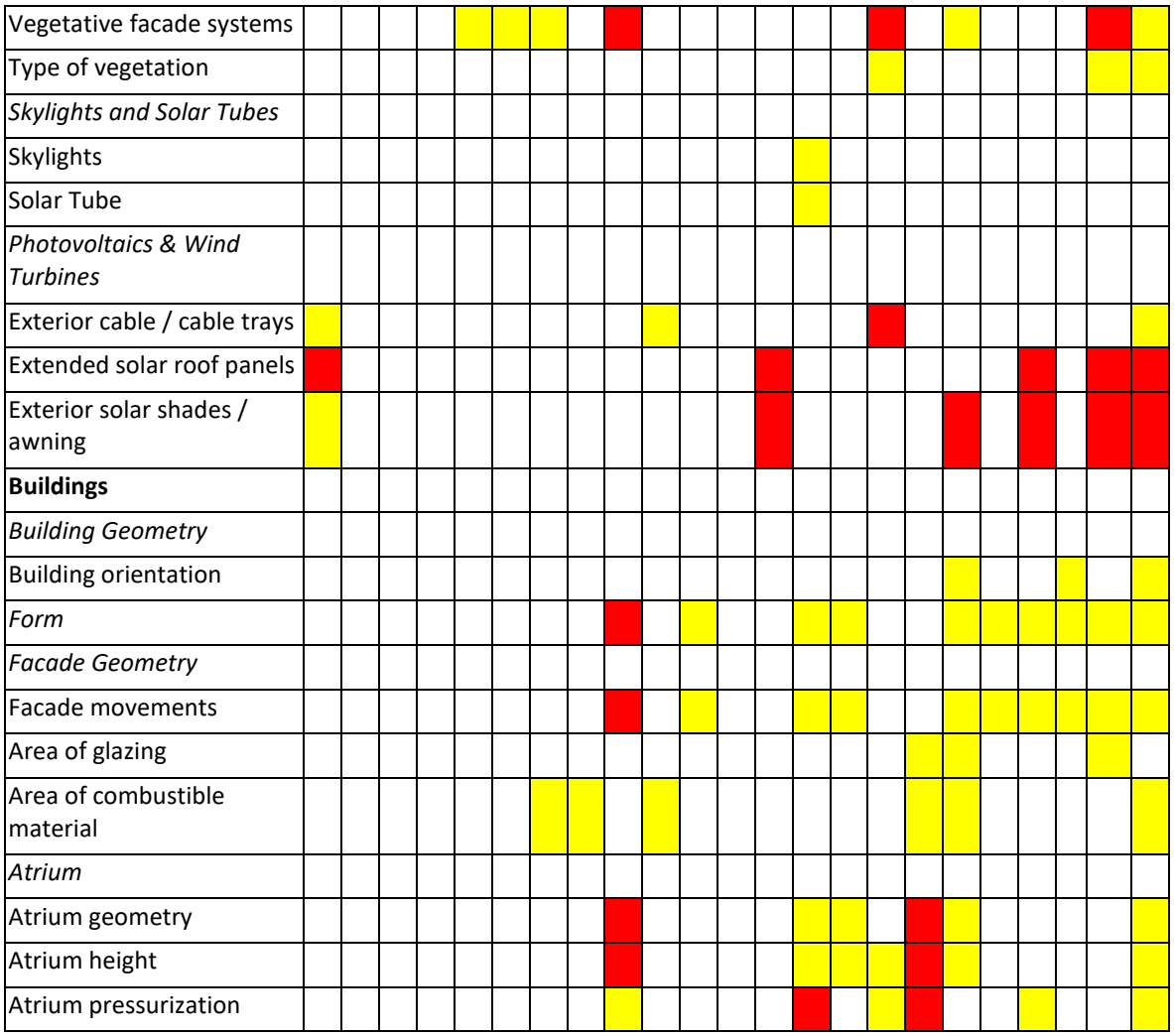


Table 3. Sustainable architecture fire risk analysis (Meacham et al., 2012)[1]

As part of sustainable architecture, a lot of buildings have been built in the world recently and are still being built today. Sustainable building production has gained momentum to have green building certification systems; BREEAM (Building Research Establishment Environmental Assessment Method), LEED (Leadership in Energy and Environmental Design), DGNB (Deutshe Gesellschaft für nachhaltiges Bauen e.V.), Greenstar (Enviromental Rating System for Buildings), CASBEE (Comprehensive Assessment System for Built Environment Efficiency). Ecological and sustainable design in buildings developed by the Turkish Green Building Council (ÇEDBİK) within the borders of our country national certification system (B.E.S.T-Residential Certificate) has been developed. In light of all these developments, it is thought that sustainable

[1] Within the scope of fire safety precautions risk assessments, properties of double skin facade detailing, building form, facade movements and atrium were made by the author.

building designs will increase much more in future periods. In this context, the application of fire safety precautions to be taken in the projects will be at the forefront.

Considering the national and international fire regulations, it has been determined that there are basic requirements under two topics as passive and active fire safety precautions (Table 4). Passive fire safety precautions are mostly taken at the project design process and include architectural and structural design decisions. Passive fire safety precautions are taken at building materials, building elements, building and settlement scale. Passive fire safety precautions include architectural and design applications. Active fire safety precautions, as another safety precaution, include the whole of the mechanical systems that contribute to passive fire safety precautions in the project. Active fire safety precautions include applications of more engineering disciplines (Altındaş, 2020).

Passive Fire Safety Precautions	***Active Fire Safety Precautions***
It covers the architectural and structural principles integrated with the architectural project during the design process.	It includes the whole of mechanical systems that contribute to passive fire safety precautions.
Architectural design decisions	Smoke detection and warning systems
Structural design decisions	Emergency lighting and routing systems
	Smoke control systems
	Automatic extinguishing systems

Table 4. *Passive and active fire safety precautions*

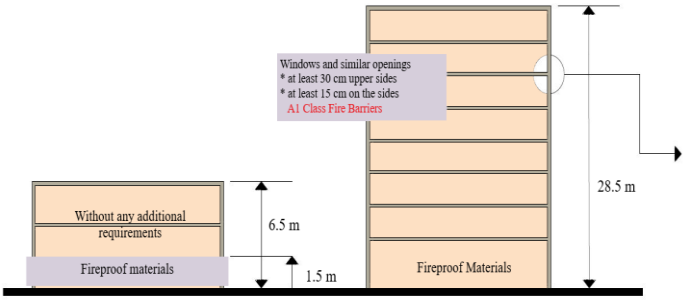
5. FIRE SAFETY PRECAUTIONS ON TURKEY FIRE REGULATION IN SUSTAINABLE ARCHITECTURE

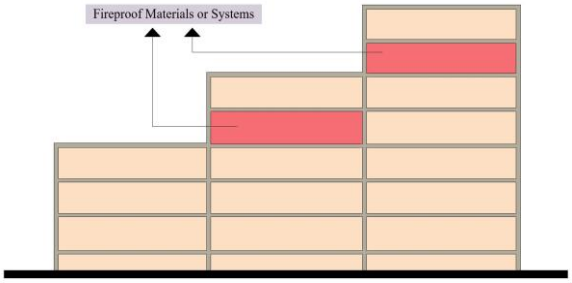
Turkey's Regulation on Fire Protection (TRFP), as part of the structural fire safety precautions within Turkey's borders, entered into force in 2002 and has undergone various revisions to its current use (TRFP, 2015). The current Turkey's Regulation on Fire Protection is established as a prescriptive-based regulation. The regulation requirements of passive fire safety precautions considered within the scope of sustainable architecture were investigated and architectural design based solution proposals were prepared within the scope of this issue.

In accordance with the Turkey fire regulation, there are a number of requirements in cases of use on facades and roofs for thermal insulation materials on the building materials. Similarly, there are requirements for fire resistance, especially when recyclable materials are a structural system, used indoors and used in a building shell (Table 5).

Related Provisions	***Explanations***
Heat Insulation Materials for Facades 2.3.27 Annex 2/A Annex 2/C Annex 2/Ç Annex 3/A TS EN 13501-1	

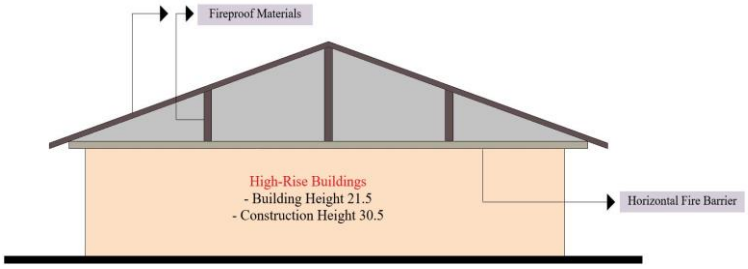
All of Building Class	
Building Height	*Requirements*
> 28,50	Fireproof materials (A2-s1,d0) must be used.
< 28,50	It is necessary to use the least difficult flammable materials (C-s3,d2). If difficult flammable materials (c-s1,d2) are used, the course or levelled floor should be covered with non-flammable material (A1) at a distance of 150 cm.





Related Provisions	***Explanations***
Heat Insulation Materials for Roofs 2.3.28 Annex 2/A Annex 2/C Annex 2/Ç Annex 3/A TS EN 13501-1 TS EN 13501-5	

Roof Construction	*Alternative 1*	*Alternative 2*
Coverings	BROOF	Fireproof (A1)
Surface or Insulation Under Roof Coverings	Least hardly flammable (Min C-s3,d2)	Least normal flammable (Min E - d2)
Structure Systems		Fireproof (A1)*
* Only in High-rise and Adjacent Buildings		



Heat Insulation Materials & Recycle Materials 2.3.29 TS EN 13501-1 TS EN 13501-5	It is expected that the materials to be used within the scope of sustainability will be tested by the relevant standards. In accordance with 2.3.29, it is expected that the building materials will be used appropriately. The relevant provisions and annexes of the regulation are explanatory. (Annex 2/A, 2/B, 2/C, 2/Ç, 3/A, 3/B, 3/C)

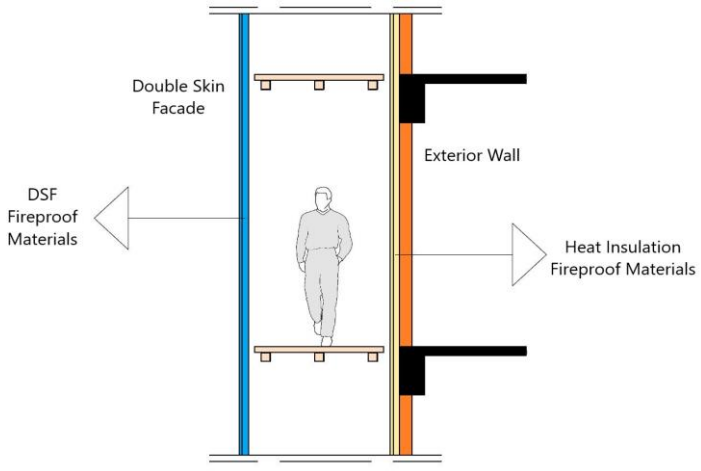
Table 5. Turkey fire regulation for building materials in sustainable architecture

In accordance with the Turkey's Regulation on Fire Protection, there are a number of requirements for double skin facades on the building elements. The necessity of selecting heat insulation materials from fireproof materials used to limit the spread of flame and smoke during a fire has been emphasized. Turkey's Regulation on Fire Protection does not include the necessary regulations on double skin facades, vegetative roof and facade systems, skylights and solar tubes within the scope of sustainable architecture. However, as general approaches, solar tubes can be examined within the framework of roof and facade requirements, compartment requirements that will be built horizontally and vertically (Table 6).

<table>
<tr><th>Related Provision</th><th>Explanations</th></tr>
<tr><td>Double Skin Facade

2.3.27
Annex 2/A
Annex 2/C
Annex 2/Ç
Annex 3/A
TS EN 13501-1

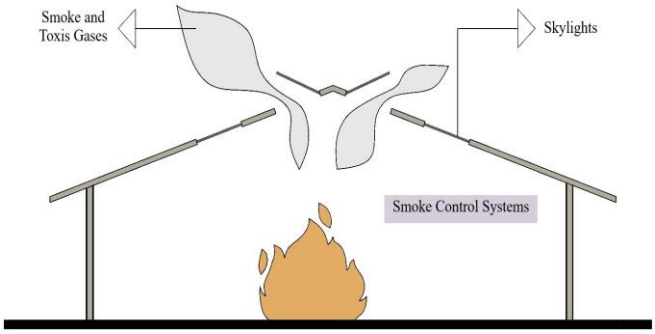
2.3.29
TS EN 13501-1
TS EN 13501-5

2.3.24 (Indirect)</td><td>
<table>
<tr><td colspan="2">All of Building Class</td></tr>
<tr><td>Building Height</td><td>Requirements</td></tr>
<tr><td>> 28,50</td><td>Fireproof materials (A2-s1,d0) must be used.</td></tr>
<tr><td>< 28,50</td><td>It is necessary to use the least difficult flammable materials (C-s3,d2). If difficult flammable materials (c-s1,d2) are used, the course or levelled floor should be covered with non-flammable material (A1) at a distance of 150 cm.</td></tr>
</table>


</td></tr>
</table>

<table>
<tr><td rowspan="2">Vegetation Roofs and Facade Systems</td><td>2.3.28
Annex 2/A
Annex 2/C
Annex 2/Ç
Annex 3/A
TS EN 13501-1
TS EN 13501-5</td><td>2.3.27
Annex 2/A
Annex 2/C
Annex 2/Ç
Annex 3/A
TS EN 13501-1</td><td>2.3.29
TS EN 13501-1
TS EN 13501-5</td></tr>
<tr><td colspan="3">There are no specific requirements under Turkey Fire Regulation. As general principled decisions, investigations should be carried out in accordance with the requirements of roof, facade and building materials.</td></tr>
<tr><td>Skylights and Solar Tube

2.3.29
TS EN 13501-1
TS EN 13501-5

2.3.24
(Solar Tube)
(Vertical and Horizontal Compartment)</td><td colspan="3">Skylights can be used for smoke evacuation in roof systems. For a detailed analysis, Chapter 6 of the Turkey's Regulation on Fire Protection should be examined.
 

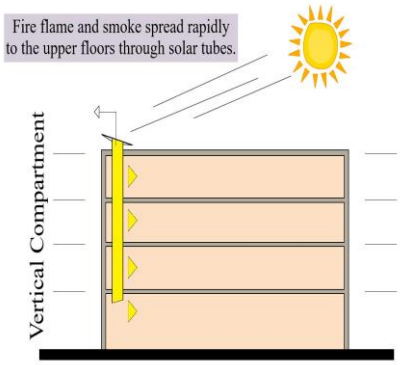

</td></tr>
<tr><td rowspan="2">Photovoltaic Systems anr Wind Turbines</td><td>2.3.28
Annex 2/A
Annex 2/C
Annex 2/Ç
Annex 3/A
TS EN 13501-1
TS EN 13501-5</td><td>2.3.27
Annex 2/A
Annex 2/C
Annex 2/Ç
Annex 3/A
TS EN 13501-1</td><td>2.3.29
TS EN 13501-1
TS EN 13501-5</td></tr>
<tr><td colspan="3">There are no specific requirements under Turkey Fire Regulation. As general principled decisions, investigations should be carried out in accordance with the requirements of roof, facade and building materials.</td></tr>
</table>

Table 6. Turkey fire regulation for building elements in sustainable architecture

In accordance with the Turkey's Regulation on Fire Protection, there are a number of requirements on the building, especially for the use of atrium. Although there are some requirements for building form and facade geometry only on facade openings, regulations are generally required in building and facade design decisions within the scope of fire regulation (Table 7).

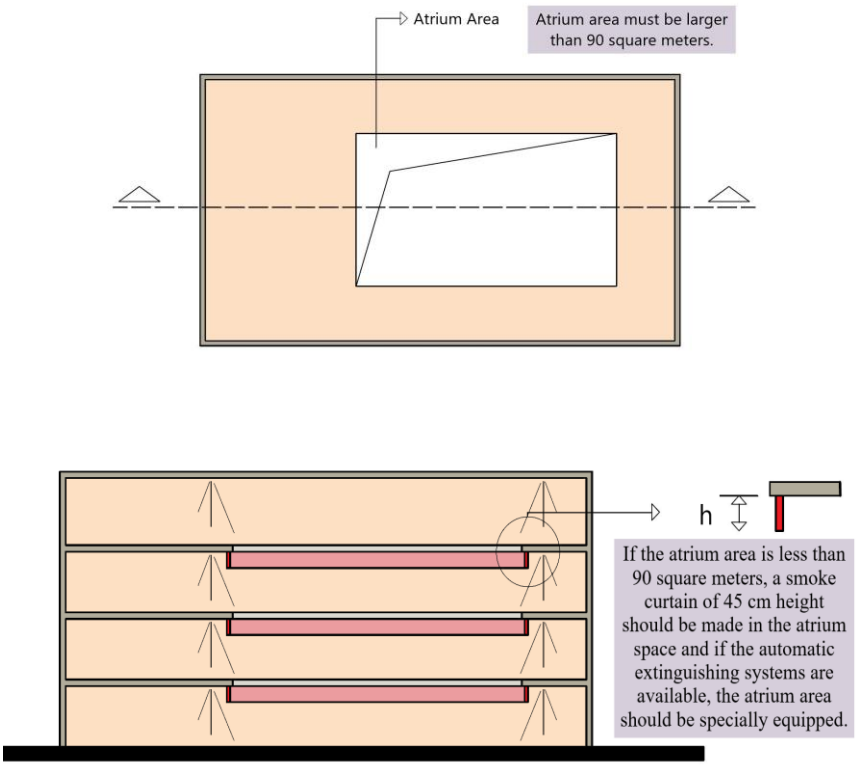
Related Provision	***Explanations***
Building Form and Facade Geometry	There are no specific requirements under Turkey Fire Regulation. As general principled decisions, investigations should be carried out in accordance with the requirements of roof, facade and building materials.
Atrium 2.3.24 Annex-4	
	Suggestion for atrium design (Url-1)  

Table 7. Turkey fire regulation for building in sustainable architecture

6. CONCLUSION

Sustainable architecture components should move forward by transferring on today's architectural knowledge. The necessity of using the principle of sustainability within the scope of architectural design and application processes is increasing day by day. For this purpose, the role of architects especially as designers, is important. Sustainability should be built on the use of natural resources and passive design strategies in architecture. However, with sustainable architecture, it is essential to ensure the safety of life and property of occupants as basic requirements. For this purpose, architects should be informed about passive fire safety precautions.

Within the scope of sustainable architecture, various strategies should be developed at building materials, building elements and building in the creation of passive fire safety precautions. Fire risk assessments should be made within the scope of the strategies developed. Within the scope of the study, evaluations of fire risk analysis in sustainable architecture were made. With these evaluations, it has been determined that especially the use of materials has a great effect on the emergence and spread of fire. The reactions of thermal insulation materials and recyclable materials to fire should be evaluated and building uses should be allowed accordingly. In the risk assessment of building elements within the scope of sustainable architecture, different building systems have been examined. In double skin facades, attention should be paid to the spread of fire and smoke. In vegetation roof and facade systems, attention should be paid not to increase the fire load, especially in buildings, and roofs and facades should be cleared of falling plants. Care should be taken not to choose the materials used from petroleum-derived materials. It is important not to use particularly flammable materials in the skylights and solar tubes, and also to evaluate smoke evacuation possibilities. Compartment integrity should be created based on the protection of indoor compartment systems in solar tubes. Attention should be paid to the electrical equipment of photovoltaic systems and their integrity in the building element system used should be evaluated. Different fire safety precautions should be considered according to roof and facade systems and should be transferred to the project. In wind turbines, the heating of the device should be checked and the reaction of electrical equipment to fire should be known. Periodic device maintenance is required, especially in photovoltaic systems and wind turbines. In the building form and facade geometry, the interior and exterior formations that may cause fire should be evaluated. Facade formations that will accelerate the spread of fire should be avoided. Aspect ratios of facade openings and facade geometry should also be considered in this context; fire-resistant spandrels or facade ledges should be created. In atrium designs, indoor fire spread should be kept under control and smoke evacuation strategies should be developed. Compartment configurations, especially those created horizontally and vertically, should be evaluated comprehensively in buildings with atrium and recommendations should be developed.

Within the scope of sustainable architecture, Turkey's Regulation on Fire Protection (TRFP) for passive fire safety precautions has been investigated and examined by visualization. As a result of the investigations, it has been determined that there are no detailed explanations within the scope of sustainable architecture

in the TRFP. Deficiencies in TRFP must be identified, especially in vegetation roof and facade systems, photovoltaic panels and wind turbines, building form and facade geometry. Requirements for various building systems are not sufficiently established and open to improvement. Considering that there are many different system configurations in building materials, building elements and building within the scope of sustainable architecture today, the necessity of developing fire regulations of countries arises. Turkey's Regulation on Fire Protection (TRFP) regulation should be developed within this framework and a different approach to fire safety precautions in sustainable architecture should be created. It is of great importance to analyse passive fire safety precautions for systems to be used in buildings and to transfer them to the architectural project. It is necessary to spread the use of performance-based fire regulations and develop project-based solution proposals. It is recommended to take steps towards the establishment and application of passive fire safety precautions as an important topic in national and international green building certification systems.

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EXPERIENCE, PERCEPTION, THEORY

NEUROSCIENCE AND ARCHITECTURE: BASES FOR AN INTERFACE

ANA LUISA ROLIM

ABSTRACT

This chapter focuses on an emergent topic in contemporary architecture theory and practice, the connection between architecture and neuroscience, a field with potential to help understanding the biological and sensory effects of the built environment on human beings. This relationship mirrors a larger context, where architecture, in order to cope with increasingly complex issues approaches other areas of knowledge, such as biology and physiology. Neuroscience is particularly relevant in this scenario considering that there have been many more discoveries in the past 25 years than ever before, such as the genetic sequence of the DNA in the human brain, completed only in 2003. Different than behavior sciences in 1960s, neuroscience offers more precise tools to measure the impact of spatial experiences upon man. Neural images and functional magnetic resonance imaging (fMRI), for instance, have enabled the visualization of the inside of the brain when it engages a spatial experience, and have been used in the past 10 years in multidisciplinary studies by several research and educational institutions, a knowledge that starts to be translated to the Human Sciences. Tracking the origns of the interface in question, some if its precedents from the 19th century until the mid-1980s will be revisited in order to establish a relationship with contemporary neuroscientific notions applied to architecture, including: Initiatives related to the empathy theory in the 19th century and its continuity in the Gestalt, as well as more sporadic efforts throughout the following century, mainly the phenomenological and multisensory experience on which several current studies focus on.

Keywords: Neuroscience, embodiment, sensory architecture, empathy theory.

1. THE BLURRED LIMITS BETWEEN ARCHITECTURE AND SCIENCE

The limits between art, technique and science in architecture were once very blurred and difficult to distinguish. The terms chief artisan or master builder gave meaning to *architekton*, a term coined by the Greek, who divided the arts into two categories. The higher arts were associated to celebration (music, drama, poetry and dance) and represented by gods like Apollo and Dionysus. The technical or lesser arts (painting, sculpture, and architecture) were the lower group, known more for cultivating skills than for exercising the imagination. In other words, architecture, by definition, was born as an art clearly associated with technique (Mallgrave, 2015).

This influence extended until at least the 18th century, an interval during which architects continued to seek philosophical or theoretical bases in the sciences, and architecture was considered both a science and an art. Still in the Ancient Times, Marcus Vitruvius (1st century BC) argued that the architect, in addition to geometry, optics, arithmetic, acoustics, musical harmony, medicine and law, should master mechanics and hydraulics, among others.

In the Renaissance, Leon Batista Alberti (1404-1472), in turn, believed in a more universal system, in which beauty would be accessible only through the initiation of dogmas and scientific methods. The anatomist Claude Perrault (1613-1688), a member of the Académie des Sciences (1672) and author of the pioneering French translation of Vitruvius (1673), who had been trained in mathematics and medicine, already expressed himself similarly to the way contemporary neuroscience does by arguing that the eye and ear processed their stimuli physiologically in different ways (Mallgrave, 2010).

Although starting from the 18th century architecture gradually moved towards becoming an autonomous discipline, it is still possible consider a continuity of its attraction to science, particularly to the biological sciences. Mallgrave (2015) points out that, in 1757 the Irish philosopher Edmund Burke published the treatise “A Philosophical Enquiry into the Origin of Our Ideas of the Sublime and Beautiful”, establishing a new course for aesthetic theory by proposing that emotions stimulated by beauty and the sublime had nothing to do with numerical proportions or harmonic relations, but with relaxation and tension of the optic nerve.

The approach to the biological sciences continued in the 19th century. Schopenhauer, for instance, following Imannuel Kant, argued that perception was not a passive process, but something built by the brain through a complex series of neurological operations. The philosopher translated his idea into architecture by considering the shape of a building a conflict between gravity and rigidity.

The approximation with the biological sciences can be strongly witnessed in the German movements in aesthetic psychology and art research in this period, especially those linked to theory of empathy, which fostered the theoretical basis of modern artistic practice. Some of these initiatives will be addressed more specifically later, as they carry notions considered exceptional for their time, especially in relation to the current context of scientific discoveries. In the field of neuroscience, this prolific period coincides with the incipient days of the modern tradition of observing, manipulating and measuring, therefore marking the beginning of the path that would lead scientists to start determining how the brain actually worked (Gazzaniga, Ivry, Mangun, 2014).

In architecture, the ideals in aesthetic psychology launched in the past century extended to the next, when some efforts on cognitive and perceptual experiments continued, such as the garden city of Hellerau, founded in 1906, in Germany; the Russian constructivism; the De Stijl movement; the teachings of the Bauhaus (mainly through the work of Johannes Itten, Oskar Schlemer, Wasilly Kandinsky, László Moholy-Nagy), and the Gestalt psychology. Although all these initiatives supported many of the cognitive and perceptual experiments of the previous century, with the exception of the Gestalt, they all collapsed before World War II.

More strongly towards the second half of the 20th century, the belief that architects could generate social improvements through technology coincided with the increasing autonomy of the discipline, corroborating a certain weakening of the approximation between the theory of architecture, itself, and biological sciences. This would lead to a period, increasingly after the war, where architects were divided between the modernist promise of social change and “the cynical winds of a post-structuralist storm” (Mallgrave, 2015, p. 15).

There were exceptions to these two main approaches, such as: Richard Neutra’s book Survival Through Design (1954); the phenomenology of philosopher Merleau-Ponty; the book Experiencing Architecture (1959) by Dannish architect Steen Eiler Rasmussen; the various studies by Norberg-Schulz; Kevin Lynch's urbanism; Christopher Alexander's sociological standards; Rudolf Arnheim's Gestalt thinking; Kenneth Frampton's phenomenology, and Juhani Pallasmaa's experience of perceptual senses. As much as these efforts conform an interesting scope of work - some of which will be discussed in the subsequent sections - with the exception of studies by Frampton and Pallasmaa, they did not end up having much force in the bridging of architectural theory and the biological sciences.

Markedly from the 1990s onwards, growing demands linked to sustainability, digital media, and various types of information that neded to integrated in the design process (thermal distribution models, energy consumption diagrams, maps of transport networks, neuroimages, etc) increased the complexity of the problems that architecture had to deal with, making it difficult to address and solve such issues within the sole scope of the discipline. This scenario led architecture to cross paths with other fields of knowledge, ultimately leading to improving its performance, moving towards an expanded condition (Alexander, 2014).

Thus, in a reality guided by energy efficiency, highly technological construction materials, parametric software and Building Information Modeling (BIM), it seemed plausible that architecture had to leave its sole area of activity, seeking for what Vidler (2004) called the "expanded field", a interdisciplinarity-driven condition, where the aim would be to learn from other areas of knowledge.

This period coincided with important advances in biological sciences and neuroscience, which, according to Mallgrave (2010) led to more discoveries about the human mind than in the entire history of mankind. Examples of these advances are the genetic sequence of the DNA of the human brain (2003) and technologies in neuroimaging, such as fMRI, which allowed the internal visualization of the human brain in activity. Together, these developments paved the way for revolutionary studies in microbiology and neurology in the last two decades of the twentieth century, that amidst other innovations, have offered more conducive conditions in assessing human responses to environmental stimuli.

These continuously evolving advances have also helped to foster an important transformation of the traditional dichotomous notion of body and mind. Originating from the theory of empathy in the 19th century, evolving studies and discoveries helped establish today’s embodied biological model of the body, according to which our bodies and minds are interconnected, thus making us relate to environments in a holistic way.

In the following sections we will first address some issues surrounding the emergence of the association of architecture and neuroscience in contemporary times. Exploring this interface implies revisiting some of its precedents, especially the fertile context of the 19th century and some of the ideas regarding the theory of empathy, which will be discussed in section 2. Afterwards we will center on the continuity of these ideas through the Gestalt psychology and more sporadic initiatives throughout the twentieth century, especially those involving the phenomenological and multisensory experience, themes still present in current studies. Finally, we wil present a brief conclusion on the directions and expectations surrounding the interface between architecture and neuroscience.

2. WHY NEUROSCIENCE AND ARCHITECTURE?

Considering the unprecedented level of advancements currently facilitating the application of neuroscientific knowledge into different fields, it is also important to remember that the affinity with biological aspects is intrinsically connected to architecture: The most primary function of a building is to shelter its dwellers and belongings in a warm and dry environment, in which they can sleep protected

against the attack of predators and diseases, basic physical requirements that reflect the fact that we are biological beings. As the Academy of Neuroscience for Architecture (ANFA) former president and neuroscientist, Dr. Thomas Albright explains:

“In addition to building constraints dictated by site, materials and budget, an architect must respond to the the nonnegotiable facts of human biology. Indeed, architecture has always bowed to biology: the countertop heights in kitchens, the rise: run ration of stairs, lighting, water sources, heat and airflow through a building, are all patent solutions to salient biological needs and contraints” (Albright, 2015, p.197).

Besides our physical demands, a building must also seek to satisfy our psychological needs, as we expect buildings “to inspire and excite us, to promote mental states that lead us to discover, understand and create, to heal and find our way [...] We expect them to be beautiful” (Albright, 2015, p.198). Contemporary neuroscience emerges as a potential interdisciplinary application precisely in the cross between architecture, the understanding of the biological needs and the behavior of its users.

If we spend most of our time in built environments - according to Eberhard (2009), the proportion reaches 90% of our time -, how would it be possible to get a better understanding of the human response to stimuli in these environments, since they seem change our behavior and, consequently, our brain?

Other subsequent questions arise: Considering a building and its spaces the material component and human behavior and emotions, the immaterial aspect, how could we clarify about sensory-perceptual and emotional responses of individuals in these environments strictly through an architectural perspective? If contemporary architectural practice transforms itself by seeking to partner with the natural sciences, entering an expanded field, wouldn’t it make more sense to leave its sole scope, opting for an interdisciplinarian approach?

Neuroscience points to a possible way of studying how the behavior of animals, including man, is caused, modified or prohibited by the brain, allowing for a better understanding of how it controls our bodily activities, affecting how we think, move, perceive, learn and learn, as well as we remember. Broadly speaking, neuroscience is the umbrella for several empirical disciplines, such as biology, experimental psychology, cognitive science, chemistry, anatomy, physiology, and computer science. These disciplines investigate the relationship between brain and behavior through multiple internal processes that mark this relationship, including sensation, perception, cognition, memory and emotion (Albright, 2015).

There are similarities between the field of neuroscience and the behavioral sciences of the 1960s. According to Eric R. Kandel, winner of the Nobel Prize in Physiology or Medicine, in 2000, before the emergence of systematic brain science in the second half of the 20th century, scientists “relied on psychology and on the emerging understanding of visual perception to investigate the workings of the human mind.” (Kandel, 2016, p.17)

Albright (2015) argues that the current moment is different because, even though the basic psychological needs of men in buildings have remained almost the same since ancient times, we now have the modern field of neuroscience, a remarkable instrument that promises a new perspective on how buildings influence mental states. For Mallgrave (2010) the crucial difference is that today there are different tools, greater biological knowledge and more accurate results on human engagement in environments.

To operate in the so-called "expanded field" (Vidler, 2004), properly addressing broader issues such as sustainability, contemporary architecture needs to embrace interdisciplinarity and adopt more comprehensive concepts. Facing its growing multiplicity and plurality, architectural practice is significantly transformed by seeking bridges with the natural sciences, making use of quantitative data that can inform human responses to the built environment. Thus, the emergence of neuroscience potentially fits this expansion, as research and discoveries in the last 25 years promise a deeper understanding of the implications and impacts of architecture, that according to Pallasmaa (2013) needs to be seen not only as an artifact, but also in its biological and ecological context.

Mallgrave (2013b) ratifies the importance of the relationship between these two fields by warning about the lack of biological understanding of who we are and who the people we are designing for, especially when the amount of discoveries on the functioning of human organisms in the last 25 years is greater than throughout human history, reinforcing the potential of applying new sciences, such as neuroscience, in

architecture. For the author, the new understanding of our neurological map, our chemical and synaptic system, our molecules and their sequence, transcends the strict sciences and their implications are already beginning to be translated into the human sciences.

Currently, there is a particular interest in research that integrates these two fields. The Academy of Neuroscience for Architecture (ANFA), founded in San Diego in 2003, with the support of the Salk Institute, an advanced biological research center in California, has been developing research and hosting biennial conferences. ANFA also has a close relationship as one of the best technology centers in educational institutions in the U.S., the California Institute for Telecommunications and Information (Calit2) which has several *Cave Automatic Virtual Environment* (CAVE) for experiments in augmented virtual reality, in addition to a series of neurometric tools. Some North American universities already have curricula with disciplines focused on neuroscience, such as the New School of Architecture + Design (NSAD), in San Diego, which has the newly created specialization in neuroscience, Certificate for NeuroScience in Architecture.

Other architecture schools involved with neuroscience include the University of Arizona, in Tucson; Kansas State University, with research carried out by Professor Robert Condia, and the Catholic University of America, Washington DC, where Professor Julio Bermudez investigates the human experience in cultural and sacred spaces based on the the interface between phenomenology and neuroscience.

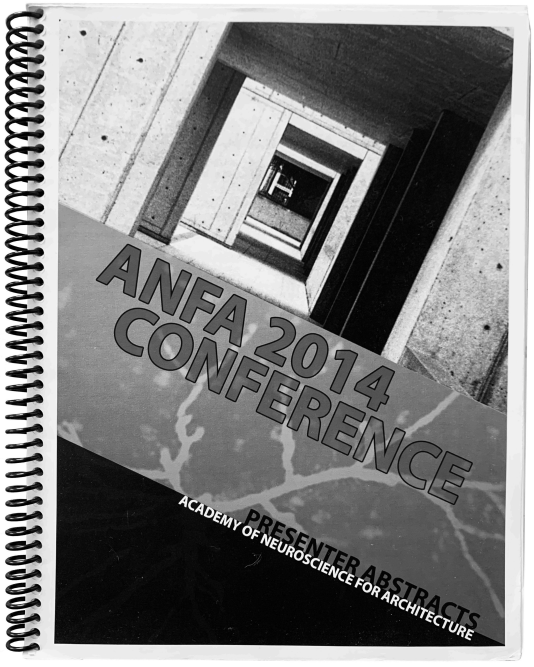
Regarding scholars, the pioneering work of Harry Mallgrave, professor emeritus at the Illinois Institute of Technology in Chicago is noteworthy. Mallgrave has an extensive production in architecture theory that includes seminal publications on architecture and neuroscience. In addition, Professors John Peponis and Sonit Bafna, from the School of Architecture of the Georgia Institute of Technology, in Atlanta, have carried innovative studies exploring the interface between the theory of space syntax and neuroscientic procedures.

In Europe, Finnish architect and scholar Juhani Pallasmaa has published an extensive body of work devoted to the human engagement in spaces according to a phenomenological perspective. In London, the Spatial Cognition Lab at University College London, directed by neuroscientist Hugo Spiers, with focus on neural representations of space, has developed experimental research aimed at understanding the psychological and biological bases of behavior, covering from the physiology of neuronal computing to the cognitive structure, with a strong emphasis on ecological and social interactions. Experiments carried out in the laboratory involve a variety of equipment and technology, such as fMRI, electroencephalography (EEG), virtual reality, and eye tracking (Spiers Lab, 2010?).

Speaking of neuroscientific applications seems to be tightly connected to the fact that we initially perceive the environment in an emotional way, before capturing its details. Although there are several types of emotions in neuroscience, the key point is that they always imply a multimodal and multisensory experience, of someone moving in an environmental field. If we engage in the world at all sensory levels, then architecture involves multisensory experience (Pallasmaa, 2005). Neuroscience can help to understand this experience.

The connection between neuroscience and architecture is also expanding beyond the academic circuit, gaining strength in professional publications, such as the renowned North American magazine, Architectural Record, whose issue number 05, in 2016, was almost entirely dedicated to discussing the brain capabilities to corroborate the development of creativity (Figures 1, 2 and 3).

Figure 1. Extract from Architectural Record magazine, issue number 05, 2016, which almost entirely dedicated the brain capabilities to corroborate the development of creativity (own photo).



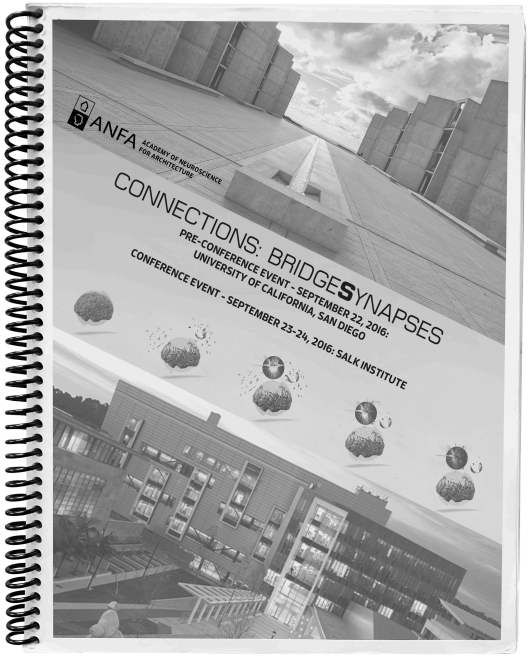


Figure 2. Cover of booklet of abstracts from the 2014 Academy of Neuroscience for Architecture (ANFA) conference (own photo).

Figure 3. Cover of booklet of abstracts from the 2016 Academy of Neuroscience for Architecture (ANFA) conference (own photo).

Perhaps the fact that most experiments in architecture occur in built environments it makes sense to consider that such environments affect how users respond to them, or, neurologically speaking, how human stimuli are produced while navigating these spaces. Lisa Barrett (2008), a neuroscientist from Northeastern University, established that when an organism engages in an environmental stimulus, the body first produces a central effect, an initial state of pleasure and displeasure, arising from how the sensory properties of the stimulus (the environment) affect the vital condition of the organism. This central effect is either directed or happens in conjunction with two correlated neurological pathways, based on the orbitofrontal cortex, the part of the new cortex of the brain (gray matter), fitted just behind the eyes (Mallgrave, 2013a).

The sensory path establishes a preliminary value for the stimulus, while the visceral-motor circuit modulates the autonomic, chemical and behavioral response to the stimulus. Collectively, they produce a state willing to be affected, linked to a particular situational meaning, giving us the willingness to act in a certain way (Figure 4). With the technology available today, such as neuroimaging, it is already possible to analyze some responses to specific environmental stimuli, proving what many of the theorists from the 19th century and early 20th century had pre-announced.

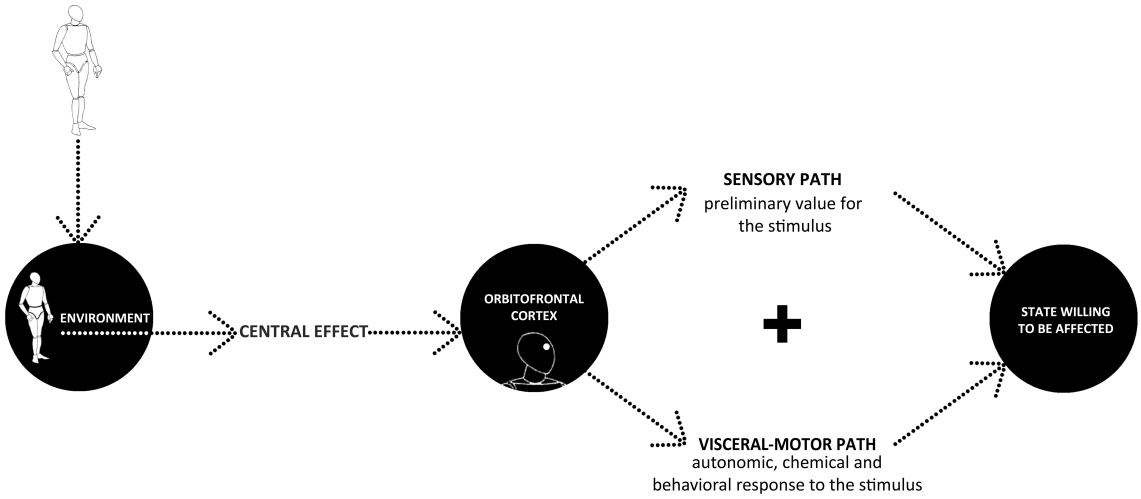


Figure 4. Diagram of the human response to an environmental stimulus based on Barrett (2008) suggesting that the brain produces a central effect that happens in conjunction with the sensory and the visceral-motor pathways, leading to a state willing to be affected.

Extending what the theories and studies of the empathy in the 19th century precociously announced, it is important to point out that the various models derived from recent research, both in the biological and human sciences, reinforce the obsolescence of the older notions in the social sciences that divided things into the categories of mind, body and world. According to the new ideas:

"The body and its emotions can no longer be distinguished from an insubstantial and spaceless mind which was presumed to operate rationally upon our corporeal or sensory events. We are not purely 'thinking' that we once presumed ourselves to be" (Mallgrave, 2013a, p.8).

The breakdown of the old mind and body dualism - shared by the philosophers Martin Heidegger and Maurice Merleau-Ponty, which we will discuss in the next section - is consolidated by the revolutionary studies in the last two decades of the 21st century in microbiology and neurology that have made it easier to construct an embodied biological model of man. Examples of these discoveries are the genetic sequence of human brain DNA, completed only in 2003, and advanced neuroimaging technologies, such as fMRI, which allowed the internal visualization of an active human brain. The important thing for architecture and design is that this vision implies that we are embodied beings whose bodies, minds, environment and culture are interconnected at different levels:

" [...] we are continually evolving and self-organizing organisms-within-environments, and that this dynamic mind/body/social field of relationships, rather than some static abstraction of our presumed human natures, shapes our precognitive and cognitive understanding of the world. Such a perspective strongly opposes any reductionist way of thinking, which is a specter inevitably, and seemingly gratuitously raised whenever the words 'science' and 'art' are mentioned in the same sentence" (Mallgrave, 2013a, p.10).

The expectation of scholars and organizations that support the interface between neuroscience and architecture is that it might help having the focus of architectural design return to where it was originally, that is, to the human being inhabiting our built environments. To ignore the potential of neuroscientific studies is to miss an opportunity because this knowledge can help the architect to better understand the subjects for which he designs. Furthermore, on a broader perspective, Robinson (2015) reflects on what could surface from such interdiscplinarity:

"What emerge here are design criteria that have been forged over eons of evolution on this planet – whose imperatives are neither arbitrary nor negotiable. Attention is not narrowed in algorithms, signifiers, and particles, but directed toward the emergent; the affective, the sensual, the gestural and kinesthetic factors that pattern human perception and experience. Here you will find and increasingly complex, subutilized understanding of human drives, longings, and desires, and arguments that detail the unequivocal agency of the buildings we create" (Robinson, 2015, p. 6).

Amongst the notions that have come out from recent research in neuroscience, perhaps we can argue that the embodied view (whose origns will be addressed in the next section) has specific impact on building design and analysis because it clearly reinforces an approach that sees architecture as a multisensory environmental field, not only a physical, sustainable, technological and efficient artifact. In order words, it helps placing the understanding of how users experience the built environment at the core of the architectural discussion.

3. PRECEDENTS OF THE INTERFACE BETWEEN NEUROSCIENCE AND ARCHITECTURE IN THE NINETEENTH CENTURY

In this section we will revisit some of the important precedents for applying scientific knowledge to the theoretical and practical spheres of architecture, focusing on the cases in which there is a clear relationship between the views of 19th century scholars and contemporary neuroscience.

German movements in the 19th century, in one way or another, became the theoretical basis of modern artistic practice. The scholars of the period considered the question of how we see and think about built environments. These ideas, if seen in the current context, stand out as extraordinary for their time. In fact, it is quite interesting to notice how old some of the new contemporary notions really are, and how these "old" ideas still continue to be so fresh in the current stages of neurobiological research.

For this segment, the book *The Architect's Brain: Neuroscience, Creativity, and Architecture* (Mallgrave, 2010) is a key reference. The author provides a lenghty historical overview in an attempt to start tracing back the precedents of the connection between architecture and biological research. Mallgrave addresses what he calls the types of brain that would have sought this approach, breaking it in nine categories: Humanist, Enlightened, Sensational, Transcendental, Animate, Empathetic, Gestalt, Neurological and Phenomenal. As far as possible, we will complement this analysis, as in addition to an overall increasing academic interest in the subject the author himself has produced other works after his benchmark 2010 publication.

Our focus relies on the studies that most closely surround the concept of empathy, translation for the term *Einfühlung*, coined by the German philosopher, Robert Vischer, in his 1846 doctoral thesis *On the Optical Sense of Form*. The first parallel with the current embodied and experiential notion in contemporary neuroscience is in the term *Einfühlung*, as it goes beyond the emotional transposition of our feelings into objects of visual or artistic contemplation. It is, in itself, a reading of these objects through our collective and personal experiences, the unconscious projection of our own corporeal form (and of our soul) in the form of the object. Mallgrave establishes that the key concept for Vischer is the idea of similarity in the sense of harmony between the object and the subject, not that inherent in an object. This means that not

only do we tend to relate objects to our bodily form, but also that they, in turn, relate at various levels to the functioning of our nerves, muscles and neural changes. (Mallgrave, 2010)

In this sense, a horizontal line is pleasant because it accommodates the structure or the visual apparatus (Figure 5). A diagonal line would be less pleasant because it requires more uncomfortable movement of the eye (Figure 6). The philosopher also refers to psychological responses as 'contractive feeling' and 'expansive feeling' (Figures 7 and 8). These ideas echo in modern physiology, which indicates that certain sensations have an inhibiting effect on nerves and muscles, while others enhance our vital sense of wellbeing.

Figure 5. National Galeriee, Mies van der Rohe, 1965-68 (own photo).

Figure 6. Royal Ontario Museum, Daniel Libeskind, 2002-07 (own photo).

Figure 7. Salk Institute, Louis Kahn, 1959-65 (own photo).

Figure 8. World Trade Center One, Skidmore, Owings & Merrill and Daniel Libeskind, 2003-2015 (own photo)

In her Doctoral thesis Alexander (2007) examines three episodes in aesthetic experience, bodily knowledge and pedagogical practices in Germany between 1871 and 1918. Describing the intellectuals of that period, she states that they were:

"Concerned that an attentive and contemplative perception could not be afforded by the masses, these

liberal-minded members of the educated middle classes theorized a new kind of aesthetic experience that was based on corporeal pleasure rather than intellectual judgment. According to this model, an aesthetic encounter with an artwork was primarily kinaesthetic: an artwork elicited an unconscious and immediate effect on the musculature of its beholder" (Alexander, 2007, p. 5).

Vischer's embodied vision approaches two problems in contemporary neuroscience: Perception of certain proportions relates to the way in which the visual cortex breaks down and processes visual images and that all forms of perception and thinking, including our emotional life, are associative as to their nature. This implies that our artistic satisfaction is largely conditioned by the interest we see in the work of art, that is, how much it changes our sensory, emotional and intellectual (neural) patterns (Mallgrave, 2010). Agreeing with this thought, the neuroscientist Allbright (2015) exposed that the information converted by our senses, in a symbolic and functional context, can be a source of strong aesthetic and emotional responses, including the perception of beauty.

Swiss art historian Heinrich Wölfflin is another important scholar from the 19th century. In a more straight forward approach than Robert Vischer's, Wölfflin asks in his doctoral thesis, *Prolegomena to a Psychology of Architecture* (1886): "How is it possible that architectural forms are able to express an emotion or a mood?" (Mallgrave, 2010, p.76). For the author, the condition of embodiment is a central theme in architecture, referring to the vital feelings or moods, as we apprehend everything that is physical through our corporeal entity.

Wölfflin's idea echoes on the work of Professor Mark L. Johnson, a contemporary expert in the study of embodiment in philosophy and cognitive science. The main premise of Johnson's studies highlights what Wölfflin had already exposed in the 19th century:

"Human beings are creatures of the flesh who arrange spaces and physical structures fitted to their bodies. We live in and through our ongoing interactions with environments that are both physical and cultural."(Johnson, 2015, p. 33)

For Wölfflin, Vischer's view of empathy was a type of projection of the "I" in the artistic entity, which would lead us to emotional responses or to feel our own experience. For the Swiss art historian, the idea was simpler and more direct: We animate architectural events because we have a body. Rudolph Arnheim, an important theorist of the 20th century, recalls that, when basing his theory of perceptual expression, Wölfflin "proposes to show that the fundamental elements of architecture, namely matter and form, gravitational weight and force, depend on experiences we have had within ourselves." (Arnheim, 1977, p.212)

Wölfflin's view is closely associated with recent studies on mirrored neurons by art historian David Freedberg and neuroscientist Vittorio Gallese (University of Parma, 2007), who argue that art and architecture work through the pre-cognitive activation of the mechanisms of bodily mirroring involved in the simulation of actions, emotions and corporeal sensations. The research, in fact, goes further and points out that we can also read the marks of the artist's gestures, in the sense that would perhaps feel a great emotional and empathic attachment while looking at a sculpture depicting a tragic scene (as somebody being murdered), which would be different than the tension felt while looking at certain twisted inanimate forms. (Mallgrave, 2015, p. 25)

Similar to Wölfflin, Adolf Göller (1846-1902), professor of architectural history and aesthetics at the University of Stuttgart, was influenced by the psychophysiological research of the time, but unlike his German colleague, he criticized the focus on the body base for these emotions. As published in his 1887 article, *What is the Cause of the Perpetual Change of Style in Architecture?* Göller's main idea was that architecture could be reduced to the art of pure visible form, a pioneering definition of non-historicist architecture: "an inherently pleasurable, meaningless play of lines or of light and shade." (Mallgrave, 2010, p. 82)

Göller also established the notion of image from memory, as the one that unconsciously and mentally caused the pleasure that we derive in a way. For Mallgrave (2010) the more clearly the image of memory becomes recorded in the memory patterns of individuals, the more clarity it gains, the more pleasurable the experienced forms become. Göller said that when the architect (and the viewer) no longer enjoyed

seeing or reproducing old forms, there was an exhaustion of style, summarizing his options to seek out new combinations of conventional decorations or to intensify what is left of saturated forms. This reasoning illustrates the scholar's great concern with the stylistic issues of the time, culminating in the publication of the impressive study *The Origin of Architectural Style-Forms* in 1888.

A number of scholars, including Göller, were influenced by the school of formalist psychology started in the first half of the 19th century by Johann Friedrich Herbart, a German philosopher and psychologist who created pedagogy as an academic discipline. Two of his disciples, Wilhelm Wundt and Carl Stumpf would influence the formation of an important field of studies of the mind: Gestalt psychology.

Wundt published *Principles of Physiological Psychology* (1874) in which he argued that psychological activities would be analogous to the mechanical laws of physical bodies. Its key point was the distinction between sensation, emotion and feeling that became a landmark in psychological studies entering the 20th century. Wundt founded a laboratory at the University of Leipzig, dedicated to psychological research strictly linked to scientific methods.

In this study *On the Psychological Origin of Spatial Imagination* (1873), Carl Stumpf opposed to Wundt's assumptions about spatial perception by saying that space was immediately given to consciousness, which supported the notion of the direct experience of phenomena in themselves, a subject that Edmund Husserl, one of his students, would later dedicate himself to studying. Other disciples of Stumpf would eventually give rise to Gestalt psychology, which we will discuss next.

4. THE GESTALT AND SOME EXCEPTIONAL EFFORTS IN THE TWENTIETH CENTURY

Max Wertheimer, Kurt Koffka and Wolfgang Köhler, three disciples of Carl Stumpf, conceived Gestalt school, one of the predominant strands in psychology in the 20th century. Because it is a well-known chapter in psychology we will focus on some notions that suggest associations between Gelstalt and the neuroscience-architecture connection we are trying to establish.

Perhaps the most important aspect behind Gestalt was the fact that its core idea differed from the prevailing views on the brain at the time that limited the human perceptual field to the activities of conscious life. Instead, Gestalt theory focused on the unconscious, an approach that would gain strength in the years to come, as some later studies would argue that 95% of all thought occurs below the threshold of conscious awareness (Lakoff and Johnson, 1999). In his famous 1928 paper, *On the Structure of the Unconscious*, Koffka had already established that “true creations of the imagination do occur as the result of processes which take place in the unconscious” (Koffka, 1928, as cited in Mallgrave, 2010, p.89).

Max Wertheimer, one of Gestalt’s founders, carried out an experiment in 1912 with light alternately displayed behind two slits cut into a panel, and realized that the human subjects perceived it not as alternating, but moving from one side to the other. Dealing with the issue of “apparent motion”, he demonstrated that a perception was more than an atomic sensation, leading to the conclusion that there was a relation between behavioural and physiological fields.

“Wertheimer in fact hypothesized that the connection between the two stimuli took place in the cerebral cortex of the brain. If the second light appeared before the neural processing of the first stimuli was completed, then the brain connects the two events and the perception becomes constructed as one of movement” (Mallgrave, 2010,p.87).

This experiment originated the basic Gelstaltic concept of *Prägnanz* according to which the brain imposes a psychological organization of the phenomenon of experience, such as creating forms that are regular, simple and symmetrical, in addition to the principles of closure, similarity, proximity and continuity. While “closure” refers to completing what is missing in an image, “similarity” means grouping similar items. “Proximity” relates to grouping according to location, and “continuity” applies to continuing lines and forms when these are interrupted (Figure 9).

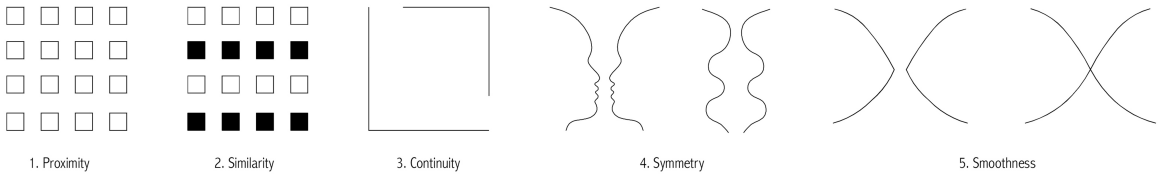


Figure 9. Synthesis of some of Gestalt principles.

Following Wertheimer's steps, in *The Principles of Gelstalt Psychology* (1935) Koffka, who had previously published *The Structure of the Unconscious*, argued that the brain produced many memory errors and that the legitimate creations of the imagination were the result of processes that took place in the unconscious. He formulated the concept of the environmental field as the perceptual medium that discerns events through which we build things, such as visual organization, figure and background, constants of form and color and tridimensional space.

Köhler would go even further regarding the causal connection between behaviour and the "psycho-physical field" by defining the key concept of *Isomorphism* as a direct correlation between a perceptual event and the cortical or neurological activities of the brain. This approach is very close to the contemporary neurobiological understanding that patterns of neurological activity, rather than patterns of the retina, correspond to sensory processes, as ratified by Johnson (2015):

"We now know from neural imaging studies that seeing a cup is not just a *visual* experience, but it also activates some some of the neurons in the motor and premotor cortical areas of the brain that would be activated if we actually picked up the cup, manipulated it or drank from it." (Johnson, 2015, p. 37)

After being in contact with Wertheimer and Köhler, the German-born perceptual psychologist Rudolph Arnheim, was attracted to the concept of Isomorphism, but in a different way from the creators of Gestalt, introducing the idea in the U.S. with his book *Art and Visual Perception* (1954). Arnheim's focus was on the visual perception of events through metaphors: "the structural kinship between the stimulus pattern and the expression it conveys" (Arnheim, 1969, as cited in Mallgrave, 2010, p. 92).

In the later study *Visual Thinking* (1969), the theme of metaphors became central to Arnheim. Anchored at rejecting the notion of the mind as an entity with dual functions (collecting and processing information), he argued that cognitive operations called "thinking", rather than a privilege of mental processes, were essential components of perception itself. Mallgrave (2010) argues that Arnheim's efforts were valuable due to their metaphorical power and the ability to evoke visual images as a means by which the mind categorizes and thinks about things.

Arnheim was also the author of the first architecture-specific Gestalt-based study, *The Dynamics of Architectural Form* (1977). Opposing to the concerns emerging in the architecture theory of the time, such as, linguistics, information theory, structuralism and experimental psychology), Arnheim went back to the origins of psychology in the 19th century. In chapter 7, entitled *Symbols through Dynamics*, he revisited the notion of embodiment, aligning the metaphoric question with the issue of senses, in a perspective that was quite close to recent discussions:

"All genuine metaphors derive from expressive shapes and actions in the physical world. We speak of 'high' hopes and 'deep' thoughts, and it is only by analogy to such elementary qualities of the perceivable world that we can understand and describe non-physical properties. A work of architecture, as a whole or in its parts, acts as a symbolic statement, which conveys, through our senses, humanly relevant qualities and situations" (Arnheim, 1977, p. 208).

4.1 A Brief Detour: The Unique Case of Hellerau

Before continuing on with other important theoretical foundations launched in the years following the Second World War, we will go back in time to briefly address the singular case of the town of Hellerau, in

Germany. The experiment that took place in the outskirts of the city of Dresden was an attempt to apply aesthetic reasoning similar to Wölfflin's questioning of architectural forms as possible evocators of emotion and state of spirit.

The construction of Hellerau began in 1906. It was inspired by the businessman and ecologist Karl Schmidt, the creation of the German Werkbund in 1907, and its first executive director, the biologist Wolf Dohrn, perhaps the strongest of these influences. Dohrn had studied with the famous empathy theorist, Theodor Lipps, and his idea was to make Hellerau a new 'German Olympus', a center for social well being and personal growth.

Dohrn's most revolutionary proposal was perhaps to place musical training as the centerpiece of Hellerau's educational system. In order to achieve this, he convinced the renowned musicologist Émile Jaques-Dalcroze, to relocate his conservatory to Hellerau. Dohrn's thought was that, even if the purpose of the institute to be created was not the musical competence itself, it should be used as a means to develop happiness and personal creativity, a belief shared by Dalcroze (Mallgrave, 2015).

Dohrn was a biologist himself, but Dalcroze was also fascinated by the discipline, which led him to develop a system of rhythmic gymnastics called *eurhythmics*, which had an emphasis on the body and its movements, a method applied in Hellerau indiscriminately, from children to young men and women.

A new theater and institute, designed by the German architect, Heinrich Tessenow, was built to house the activities to take place in Hellerau. The architectural composition was classic and based on the simple shapes of the square, rectangle and circle, with a Yin / Yang symbol placed at the center of the façade as the only ornament on the building. When completed, the complex served 495 students from around the world and its festival attracted around five thousand people (Mallgrave, 2013a).

Although highly interesting and cultural, the Hellerau experiment was interrupted by a number of factors: The beginning of the First World War, in 1914; Dalcroze's return to Switzerland and Dohrn's death in a skiing accident. But in its short life, many leading intellectuals interested in learning about the program visited Hellerau, such as: Ebenezer Howard, George Bernard Shaw, Thomas Mann, Heinrich Wölfflin, and the architects Peter Behrens, Henry van de Velde, and Hans Poelzig. Alma Mahler, Walter Gropius' future wife, always visited it, as well as, Mies van der Rohe's fiancee, Ada Bruhn, who studied with Dalcroze. Le Corbusier's brother Albert Jeanneret was an assistant instructor to the musicologist.

It is likely that these modernist masters also visited Hellerau several times, therefore one could argue that the importance of this initiative lay in the fact that it was "an attempt to put into practice what was then the current state of psychological and physiological knowledge" (Mallgrave, 2013a, p.7-8), which is tightly related to the contemporary neuroscientific belief that we are embodied beings whose minds, bodies, environment and culture are interconnected at deep levels.

4.2. The Second Post-War Period

Returning to the Second Post-War period, similar to what had happened so far in twentieth century, the initiatives that could point towards a connection between architecture and the functioning of the human brain are more punctual, neither conforming a movement nor even a group of cohesive theorists, as it had happened with the theory of empathy, notably in Germany, in the previous century.

The notions we have discussed so far are relevant in order to understand where the current state of the interface between architecture and neuroscience stands. Following the second post-war period, although Richard Neutra's book, Survival Through Design (1954) may be considered a benchmark achievement within the field of architecture, it is very likely that the most advanced ideas regarding contemporary neuroscience came from the economist and philosopher, Friedrich Hayek, and his *work The Sensory Order: An Inquiry into the Foundations of Theoretical Psychology* (1952). The field of Phenomenology also revealed an active group of philosophers - mainly through the work of Maurice Merleau-Ponty – that helped establishing the current notion of the body-and-mind as a whole entity, having a relevant repercussion in architecture, represented by the workd of Steen-Eiler Rasmussen, Norberg-Schulz, Kenneth Frampton and Juhani Pallasmaa.

Starting with Hayek, the philosopher argued that the neurological process of sensory perceptions was an

act of classification and, therefore, of interpretation, which appeared on multiple levels and unfolded in successive stages, following specific physical laws. For him the brain was a classifying organ formed by neurons whose operations have evolved over time, aiming to improve the chances of their own biological survival. Despite remaining on the theoretical plane, Hayek's work proposed a dynamic system for brain operations, constituting an important reference for current research in memory, perception and consciousness (Mallgrave, 2010).

Hayek's legacy continued on the work of his contemporaries, such as the Canadian psychologist Donald Hebb, who argued that learning arised from synaptic growth that connected neurons, revealing two questions: First, if one neuron triggered another, the link between them would be strengthened, increasing the possibility of firing again in response to similar stimuli. Successive shots eventually would cause circuits or associative memories. Secondly, the final result of the connection between neurons could be altered by experience through *neuroplasticity*, understood as the brain's ability to modify in response to the stimulus. Conversely, if neural circuits were not reinforced by repeated firing growth would deteriorate and the connection would cease to exist.

Before examining Neutra's seminal book, it is worth to mention Frank Lloyd Wright's influence on the Austrian-born architect, who had emigrated to the U.S. from Vienna, in 1923, hoping he would find work with the American master. Neutra would end up achieving his goal and working at Wright's Taliesin studio, in Wisconsin, from 1924 through 1925, when the firm went through harsh times, and the Austrian architect decided to move to Southern California.

Some years later, in 1931, Wright would open his own architecture school, *The Taliesin Fellowship* under the mission to have students learning by doing, rather than studying theories. For Robinson (2015), Wright's hands-on approach and the educational philosophy of the psychologist, educational reformer and philosopher John Dewey - a member of the Friends of Taliesin group in the original school prospectus of 1932 - are part of the restricted group of thinkers of the 20th century who understood the complexity and philosophy of embodied experience: "In this context learning occurred not through the study of texts so much as it was directly transferred from the embodied knowledge of the master to the receptive, experiential ground of the student" (Robinson, 2015, p.2).

As Richard Neutra integrated the first generation at the Taliesin studio, when *The Taliesin Fellowship* was being formed, it is likely that he was influenced by Wright's ideas. Neutra's book *Survival Through Design*, written during the Second World War and only published in 1954, was dedicated to Frank Lloyd Wright and would become an early attempt in trying to apply neuroscientific knowledge in architecture. The extreme accent of the book title referred exactly to the potential of modernist architecture:

" [...] to liberate us from the bondage of cramped thinking undertaken in dark quarters: it would increase our efficiency, expand our mental and physical horizons, and guarantee a brighter future" (Robinson, 2015, p.4).

The book results from Neutra's experience with building design and his personal research in psychology and physiology. Like Wright, Neutra understood the individual as a whole in the context of a broader ecology that included the biological, social, cultural and linguistic spheres, agreeing with the vision and advances to be unfolded decades later, in the field of neuroscience. Another aspect of the work was the critical content of architecture as a commercial enterprise and its approach towards design focusing exclusively on aesthetics. Neutra argued that emotions not only colored each experience, but "Our neuromental performance is acted out on a multiple level stage, like a medieval mysterious play. Emotion is near to all the levels and never exits" (Neutra, 1954, p. 132).

The French philosopher, Maurice Merleau-Ponty, another important scholar of the second half of the twentieth century, published his first book, *Phenomenology of Perception*, in 1945. The psychological and physiological basis of his later works were then planted: The critique of behavioral psychology; the attempt to break with the Cartesian dualism of mind and body; the establishment of the supremacy of perceptual awareness and the principle that for all of us there is an autochthonous significance of the world, which is accessible through our bodily negotiations (material existence) with the universe (Mallgrave, 2010).

In Merleau-Ponty's notion, perception merged with phenomenological awareness and the senses, with the

body acting as the general instrument of our understanding. For Mallgrave (2010), the Cartesian dualism between mind and body still remained in the work of French philosopher, who would confirm such hypothesis in his manuscript *The Visible and the Invisible*, found out after his death, in 1961.

Merleau-Ponty's strongest goal in the manuscript was perhaps to break with the mind/ body duality – he used the terms "sensed body" (one that conjectures, that imagines) and "sentient body" (one that is able to suffer and feel pleasure), considering these two moments of the same body, or, as expressed in one of the terms often used by the philosopher, the same "flesh". By implementing this idea, he recalled Vischer and the theory of empathy: "my body is made of the same flesh as the world (its is a perceived), and moreover that this flesh of my body is hared by the world, the world reflects it" (Merleau-Ponty, 1968, as cited in Mallgrave, 2010, p. 113).

When Phenomenology is applied to architecture, which took place increasingly in 1960s, it indicates that the latter should be guided by authentic human experiences. The Phenomenological studies in the architectural field are relevant in the context of establishing connections between architecture and neuroscience when they associate sensoriality and experience with design. In addition to the written contributions, the representation of experience through drawings, collages, photographs or three-dimensional models are also important, as they indicate that technology worked as an enabling element between matters of intellect and experience (Otero-Pailos, 2010).

Although here we will focus on some writings that are more central to phenomenological notions applied to architecture, in *Know Thyself: Or what designers can learn from the contemporary biological sciences* (Mallgrave, 2015), the author explains that the efforts of Steen-Eiler Rasmussen and Christian Norberg-Schulz obtained little traction in the context of the application of the discoveries and research of contemporary neuroscience if compared to the much more interesting episodes of the Frankfurt School, the semiotics approach or the initiatives of French philosopher Michel Foucault. However, Mallgrave himself dedicates part of the chapter entitled *The Phenomenological Brain* of his book *The Architect's Brain* (2010) to Rasmussen. Still we will briefly discuss some of their ideas, as we believe that both scholars are important due to the vivid association they make between the sensory issue and architecture.

The Danish architect and urban planner Steen-Eiler Rasmussen published *Experiencing Architecture* in 1959. Although time wise it was close to Merleau-Ponty's studies, from a philosophical point of view, it was a less rigorous work, as it did not offer any specific concern about the mechanisms of the brain. But, similar to the French philosopher and others that preceded him, Rasmussen considered architecture as a diverse experience particular to the senses. Mallgrave (2010) argues that, despite not referring to his bibliographical references, Rasmussen's book demonstrated a psychological and biological bias, with a large number of observations on details that emphasized the sense of touch.

Rasmussen's intention was to engage architecture as a multisensory experience by using the city of Rome to demonstrate this. The author described some situations he observed from personal experience on the different sites throughout the city, and, even if not using the term "phenomenological" to speak of architecture, the idea of generating engagement was clear in the way Rome was presented to the reader, which, unlike historians, offered "the prospect that architects might employ their unique experiential and aesthetic means to investigate the intellectual content of history." (Otero-Pailos, 2010, p. xiii)

If Rasmussen did not use the term "phenomenological" explicitly, the Norwegian architect, Christian Norberg-Schulz, in his 1971 book, *Existence, Space and Architecture* was the first one to do so in the realm of architecture. Turning to the philosophers Merleau-Ponty and Martin Heidegger, Norberg-Schulz was concerned with how existential space could be materialized in architectural space through symbolic means, such as place / nodes, route / axes, domain / district. In two later studies, *Meaning in Western Architecture* (1975) and *Genius Loci*: *Towards a Phenomenology of Architecture* (1979), Schulz focused on understanding architecture in sensory and emotional terms, proposing, in the latter, the examination of psychic implications in architecture in situating nature as the place of origin of all experiences.

As for representation, the connection with empathy was very close. Norberg-Schulz - a student of Siegfried Giedion, who had adopted the technique of image comparison introduced by Wölfflin - considered the use of images not as a formal analysis, but as a way of thinking through the simultaneous perception of multiple

photographs to access a deeper experience of architecture, describing and illustrating several of his archetypal experiences. According to Otero-Pailos (2010), Wölfflin used these comparisons of images as arguments to explain the transformation of styles throughout history.

According the argument on *Genius Loci* (1979), the visual experience would have to emerge from a direct experience with the landscape, instead of maps. If Giedion emphasized the connection between experience, form and space, Norberg-Schulz focused on the triad of experience, history and theory, reflecting the postmodern context of the student in relation to the modernist generation of the interwar period when his master was active (Otero-Pailos, 2010).

The other contributions of the period in question come from two authors, both architects: Kenneth Frampton, and Juhani Pallasmaa. Since Pallasmaa is one of the contemporary exponents of the theory of architecture supporting the interface between architecture and neuroscience, we will examine briefly only a few of his seminal works, as we understand that his studies do not represent a precedence per se, having evolved concomitantly with the current approaches surrounding the connection between the two fields of knowledge.

The Architect and critic Kenneth Frampton graduated from the influential Architectural Association School of Architecture (AA) in 1950, in London, immigrating to the U.S. in the following decade, where, according to Mallgrave (2010), he gave credence to the notion of phenomenology in architecture. Frampton has an extensive body of work that permeates other segments of architectural theory not restricted to the scope of phenomenology - notably postmodernism and its trends, tectonics and regionalism -, but our interest here lies in his contribution in a broader perspective plan of the phenomenological approach.

For Frampton the phenomenological notion of the place endorsed the practice of designing (and building) on a more topological and tectonic basis, while recognizing, at the same time, a public sphere that good architecture needed to accommodate. From this idea emerged his notion of “place, production and nature”, which would be taken up in the 1980s in his renowned study on critical regionalism, in which he would address, among more theoretical aspects, design strategies that took into account local variations in topography, context, climate, the use of natural light and tectonic form.

Frampton’s book *Towards a Critical Regionalism: Six Points for an Architecture of Resistance* (1984) was based on a series of articles he had written previously, including *On Reading Heidegger* (1974) and *The Status of Man and the Status of His Objects: A Reading of Human Condition* (1978), which sought inspiration in the phenomenology of the philosopher Hannah Arendt, according to Jorge Otero-Pailos:

“The existence of architecture, he thought, was ethically necessary as a common experiential foundation for the individual development of fully human lives, that is, lives capable of experiencing a shared social reality.” (Otero-Pailos, 2010, p. xxxi).

The influential contemporary theorist Juhani Pallasmaa considers architecture to be an experience of perceptual senses. Early in his career, he was influenced by phenomenological studies by Norberg-Schulz, Martin Heidegger and, above all, Gaston Bachelard and Merleau-Ponty. In *Architecture and the Obsessions of Our Time* (1983), relating to the thepry of empathy in the nineteenth century, Pallasmaa talked about the loss of sensuality and plasticity in architecture. Phenomenology itself would become more evident in *Geometry of Feeling* (1985), where, recalling Robert Vischer, Pallasmaa addressed questions regarding why very few buildings seemed to actually appeal to our emotions.

The core of Pallasmaa’s thesis is architecture as a metaphorical and multisensory experience, which persists in his most recent publications, *The Thinking Hand: Existential and Embodied Wisdom in Architecture* (2009) and *The Embodied Image* (2011). In his text *Six Themes for the Next Millennium* (1994), Pallasmaa listed the six points for the reenchantment of architecture: slowness, plasticity, sensuousness, authenticity, idealization, and silence. Like Rasmussen, he discussed the sensory sphere of acoustic intimacy, silence, smell, and taste, but the new aspect of his argument was the high value it associated with haptic sense, unfolding in three spheres: “Shape of Touch”, “Images of Muscle and Bone”, and “Bodily Identification” (Mallgrave, 2010, p.120).

5. CONCLUSION

The ideas exposed so far tried to establish a path of the various theoretical efforts from the 19th century until the mid-1980s focusing on bridging the new investigations on contemporary architecture and their association with scientific knowledge related to neuroscience.

As it is not yet possible to speak of a neuroscience theory for architecture itself, knowing its origins is an initial step. Perhaps the next stage would be to focus solely on studies from the past two to three decades, systematizing and analyzing the latest initiatives, which timewise coincide with what Harry Mallgrave has pointed as a very fertile period in the history of neuroscience that witnesses more discoveries about the human brain than at any other time. These findings have been leading to an increasing amount of fresh studies and new publications by various authors, including some of the ones we discussed here, such as Juhani Pallasmaa.

The Finnish architect and architectural theorist was the keynote speaker at the 2014 ANFA conference, with a lecture entitled "Empathic and Embodied Imagination: Intuiting Life and Experience in Architecture". Anchored in the notion that man live in resonance with the world and that such reverberance should be mediated by architecture, Pallasmaa argued that the true architectural qualities "are not formal or geometric, intellectual or even aesthetic properties; they are existential, poetic, and emotional experiences, and they arise from our embodied encounter with the work" (Pallasmaa, 2014).

The architecture-neuroscience interface should be seen, as a constantly maturing field of knowledge that (depending upon such a complex task as understanding the human brain) is subject to producing non-linear developments. Just as the contemporary concept of neuroplasticity involves the brain's ability to regenerate itself, making it possible to exchange the activation of a certain area of the brain to replace the one initially active, the path we tried to establish here is similarly dependent upon evolving dynamics.

However, some ideas that started to take shape almost 100 years ago with the theory of empathy should stand the test of time and remain active, such as our neurons that constantly fire through synapses, in response to environmental stimuli. This is the case with the holistic understanding of the human organism and its embodied nature or the discoveries in mirrored neurons associated to empathy towards objects that have no life. No matter how new they are, these findings reveal an important aspect, as argued by Mallgrave (2015):

"We may not generate an empathic accord with every aspect of our inanimate environment, this simulation of features of the inanimate world – which of course encompasses the built environment – returns us to the empathy theories of Semper, Theodor and Robert Voscher, and Wölfflin." (Mallgrave, 2015, p. 23)

Perhaps it is also important to state that the connection between neuroscience and architecture should not limit itself to professional, scientific or graduate school levels. Agreeing with Mallgrave (2013), it seems that, to some extent, reflection has been been forced out of architecture schools by the realities of the workplace, leading to a growing trend in design studios to privilege dealing with programmatic, functional and technical issues.

In previously published work (Rolim & Canuto, 2016) we have argued that an interesting diverging strategy would be to introduce the two areas of knowledge together, even at the undergraduate level in architecture schools. Although not the focus of this current study, it is worth noting that by applying a neuroscience and phenomenology-based methodology (Figure 10) in a studio focusing on the design of a spiritual space, the main goal was to enable the understanding and use of the natural agent to conceive buildings "that would help stimulate sight and, consequently, improve the multisensory potential of architecture" (Rolim & Canuto, 2016, p. 142). Neuroscience-wise, we departed from Dr. Thomas Albright's notion that patterns of light are mostly originated by reflectance from physical surfaces indicating that light becomes visible only by interacting with matter (Figure 11).

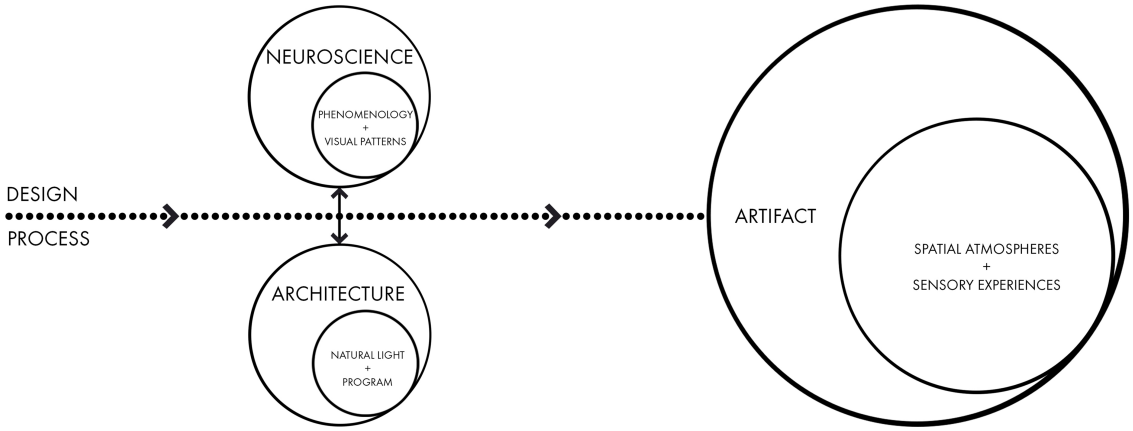


Figure 10. Example of neuroscience and phenomenology-based design methodology applied in an architecture school design studio.

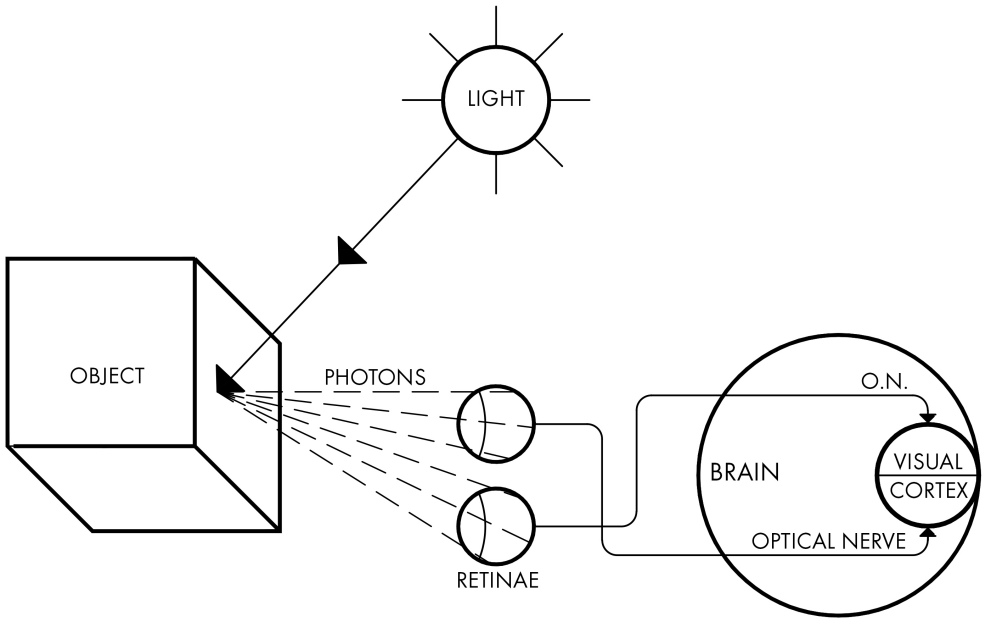


Figure 11. Diagram showing that light becomes visible only by interacting with matter based on Albright (2005)

Although more than a century separates this academic experiment from the studies we discussed earlier, we believe that it was precisely some of the 19th century theorists who launched the precedents that have been leading to today's initiatives in design and research. Now, aiming towards new achievements in the years to come, we share the thought that the information to be learned from the interface between neuroscience and architecture, its new research and discoveries should be regarded as an opportunity to offer architects the means to rethink their tasks and design with a more solid theoretical basis, after all, as the philosopher Socrates would agree, knowing ourselves can help us to better understand the people for whom we should be designing for.

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VIRTUAL EXHIBITION AND VISITOR EXPERIENCE: HOW DIGITAL STORYTELLING ENHANCES ONLINE EXHIBITION SPACES

EVRİM KARACAN, GIUSEPPE RESTA

ABSTRACT

This paper explores the relationship between interactive technology and visitor experience, focusing on how digital storytelling in online virtual exhibition environments enhances the visit of a virtual show. COVID19 spurred the creation of new online exhibition platforms, accelerating an ongoing process in which galleries and art-related institutions were experimenting new ways to address a potential audience remotely. The environment of an online art exhibition is a complex blending of artistic content, appropriateness and quality of the architecture of the platform, human-machine interaction mechanism. In order to explore this chain of problem, we will pose the following questions: how are online art and exhibitions platforms evaluated by their audience? Are they engaging when used regularly? What is the actual role of the visitor and how active is his/her agency in respect to a pre-designed exhibition? Do these interactions and digital storytelling create a personalized experience? The participants of the study, which are digital natives, have been tested on one online virtual exhibition tour of the National Gallery of Victoria. For the investigation of this relationship in the light of past studies, a multiphase study was developed and conducted online. The online interview was performed to obtain participant subjective opinions on digitization, and digital storytelling applications data, then online virtual exhibition tour and questionnaire to obtain participant interaction, personalization and engagement data. Although there were sceptical feedbacks about the possibility to have an experience of the virtual exhibition that would replace that of the physical venue, the overall findings showed that digital storytelling had a positive relationship on enhancing the online visitor experience. Better visitor experience, high interaction, and long-term engagement are the intended achievements of these art and exhibition spaces in order to attract new and different types of audience.

Keywords: Digital storytelling, interaction design, virtual museum, visitor experience, online exhibition.

INTRODUCTION

COVID-19 spurred the creation of new online exhibition platforms, accelerating an ongoing process in which galleries and art-related institutions were experimenting new ways to address a potential audience remotely. The wide spectrum of practices ranged from participatory initiatives by self-organized groups via social media, having inevitably a political impact on the freedom of expression (Feng, 2020), to more institutional forms of online interaction with visitors. The importance to keep a contact with their audience led many galleries and museum to develop novel communication strategies, based on social media and talks with curators, artist, and special guests. As demonstrated in a survey conducted by the Network of European Museum Organisation (NEMO) in April 2020, museums were forced to change tasks towards online presence for 30% of their staff.

The unexpected condition of a pandemic functioned as a catalyst to start a reaction of virtualisation of art and its fruition. It is not surprising that one of the first examples of virtual museums was developed by the Guggenheim foundation in 1999, in an effort to both expand their institution globally and to align the virtual nature of cyberart with that of the virtual space of the venue. Nowadays, this assonance between the medium and the content is not anymore decisive when a certain institution decides to host the event on a platform, but is rather considered a new outlet to be explored and adapted to any type of art. In this paper, we will try to address this topic, questioning whether the virtual is specific for virtual art, or just another means of expression for any type of creative expression, physical or not. In this last case, it might be accepted as a “decision” or “desire”, an option, which facilities would be able to choose at will. In general, those online platforms that are based on a template to be customised will not look too much different from each other in terms of user experience. Even if the content might be very different, the device and its interface will inevitably flatten the interaction with the object on behalf of a virtual visitor. When looking at a screen, platforms use basic features of human-computer interaction, usually unnatural ones. Mouse clicking, controlling the point of view with a pointer, keyboard typing, panning to move the visual, and so on, are the main interaction action we are familiar with using an online exhibition platform. Furthermore, this interaction is provided and enriched by immersive and virtual environments that are associated with different kinds of digital storytelling techniques. In these spaces, the audience encounters with videos, audios, voice-overs, and texts that should increase the level of a multi-sensory experience. The whole experience differentiates itself from physical spaces with digital storytelling techniques and playfulness.

Hence the environment of an online art exhibition is a complex blending of artistic content, appropriateness and quality of the architecture of the platform, human-machine interaction mechanism. In order to explore this chain of problem, we will pose the following questions: how are online art and exhibitions platforms evaluated by their audience? Are they engaging when used regularly? What is the actual role of the visitor and how active is his agency in respect to a pre-designed exhibition? Do these interactions and digital storytelling create a personalized experience? As already mentioned, while platforms are spreading rapidly, their popular appeal for a large audience is quite a recent issue. This paper focuses on answering these questions by conducting an online multi-level study. The participants of the study, which are digital natives, have been tested on the online virtual exhibition tour of “Keith Haring | Jean-Michel Basquiat: Crossing Lines” (Accessible online via https://www.ngv.vic.gov.au/virtual-tours/haring-basquiat/) and shared their experience during the online virtual exhibition tour. The overall process of this study can be described as in the following figure (Figure 1).

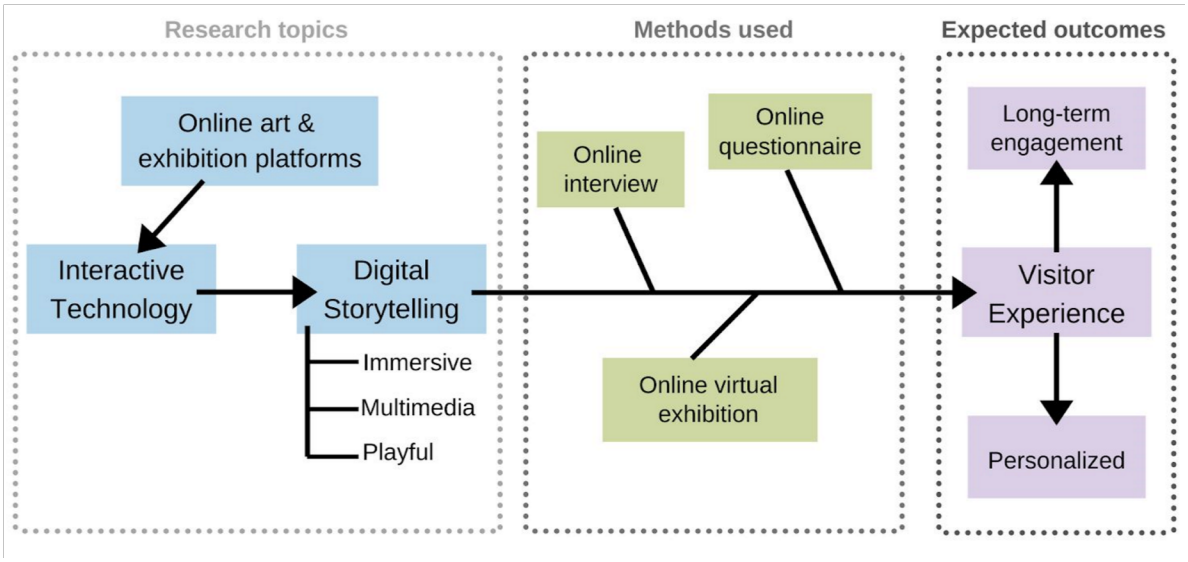


Figure 1. Graphic abstract

LITERATURE REVIEW

Interaction Design in Exhibition Spaces

Willem Sandberg, who was the director of the Stedelijk Museum (1945-1962), is credited for being a pioneer for the first audio tours in museums. He is also recognized for intending the museum experience as a dialogue between the visitors and exhibits, in contrast to a one-sided narrative controlled by the exhibitors and curators (Tallon & Walker, 2008).

This two-way dialogue is primarily enhanced with audio tours that add an additional layer to the visitor's experience. Hence is accepted as the transformation of the museum experience from one-way communication to a multi-sensorial experience and, also, as a complimentary narration that expands the involvement of an interested subject fostering the level of intellectual bond with the objects on show. Shannon Mattern (2014) mentioned this experience as a challenge for exhibition design: "The challenge is to develop exhibition practices that provide appropriate contexts and experiences for art and design that emphasize multi-sensorial experience, the activity in context, over product" (p. 136). The term "over product" explains the challenge very clearly. The challenge in this field is to consider all artworks as products to be located within a context, in a milieu that might be real or virtual, and in any case more than just painting walls and arrange the artworks in a space. The new expanded field of experiential shift toward a more subjective engagement of the visit of an exhibition is stated by Vermeeren et al.:

The concept of 'museum experience' is the turning point of this historical shift, as it implies a focus on the visitor and connections between visitor and objects rather than a focus on collections. In the course of time, new types of museum experiences gradually emerged (Vermeeren et al., 2018).

Such new types of experiences started by challenging in the first instance the space of museums. Museum design used to be focused only on the sole spatial features, thus creating the shell for possible interactions by the visitors. The idea of interaction started then to be associated with a museum experience, to be designed as integral part of the architectural project, when new software and hardware allowed a control of the visitor interaction and its simulation with behavioural models as well (Muñoz, 2016, p. 365). Running a stimulation, museum experience can be tested to check what is the degree of engagement with users under different conditions and for different types of media. The stimulation is then becoming a powerful

tool to include interaction as a challenge for museum design. Muñoz (2016) described what interaction is in a museum or exhibition space as “an interactive exhibition is the one that reacts to the visitors' acts, and at the time, motivates an answer from them, establishing a dependence between the visitors and the exhibition itself” (Muñoz, 2016). This explanation by Muñoz (2016) is a simple statement to explain that interaction between the visitor and space goes both ways. In general, as in the case of the audio tour aforementioned, this interaction involves media and its features. To increase the enhancement and creating multi-sensorial museum experience, it could be formed by digital media and technology in a very brief manner: “The degree of sophistication and immersion increased exponentially when experiences started to be enhanced by the integration of interactive and digital media” (Vermeeren et al., 2018).

Furthermore, all these new possibilities of interaction and experience design consider the museum visit as an act of exchange. The design itself has to enhance a common ground for sharing rather than envisioning it only as an act of looking. In brief, this layered experience engages three different agents, namely the visitor, the spatial setting, and art pieces, thus creating an emotional response on the subject:

The interaction appears when visitors react with emotional basic acts to that physical environment that the exhibition is, the aesthetics interaction is a result of the visceral emotional reaction that the visitor has, face to the phenomenon or reality that catches his/her attention (Muñoz, 2016, p. 365).

Hence, the overall design of an architectural space or the features presented in that space are not the only relevant characteristic for an exhibition, because the interaction will be also linked with a subjective realm that curators might want to explore. Even if the system or the path that is designed to make the exhibition interact with the visitor is very well laid out, individuals should be willing to interact, follow, and being attracted in unpredictable ways. Or at least it should be given a range of options that would tailor the experience on time allocation, level of interest, and cultural diversity. Visitors' feelings and thoughts are significant factors to follow and calculate the success of such interaction (Muñoz, 2016). But generally, the success of interaction in spaces is proved by many cases: “Studies show increased visitor interest in interacting with the artefacts in an original and participatory manner (Solima, 2012), notably by exploiting the functions offered by new digital media” (Falco & Vassos, 2017). All these functions, which are offered by digital media and technology, change the museum spaces into hybrid and complex fields. These spaces with interaction outlets create stories that are narrated with characters, adding then another layer to artworks and exhibition spaces (Falco & Vassos, 2017).

DIGITAL STORYTELLING

Stories are the most important foundation of human communications. According to Cesário (2019), a story is also a work of art, and storytelling is an art of entertainment and besides, it helps to exercise our emotions, opens new windows to the imagination, and enlarges and enriches our life experience. Storytelling is a method already used in museum environments to deliver the artefacts and the historical background of that specific artefacts or event, in a linear sequence of scenes, such as in a book or a movie (Danks et al., 2007). Behrens, Espinoza, Siscoe and Palilonis (2019) also found that storytelling is a beneficial form that makes personal connections between the artefacts and visitors for a museum since it offers multiple perspectives and supports interpretation.

Digital technologies allow more sophisticated nonlinear stories; allowing visitors to interact with the story at different points in time (Danks et al., 2007). Digital storytelling is one of the digital forms that offers a multimedia, playful and immersive experience in a museum space. A research conducted by Cesário (2019) found out that the use of digital storytelling in a museum environment is appreciated in terms of interactivity by most visitors.

There are several applications of digital storytelling in museum environments for enhancing the visitor experience, such as learning, aesthetic experience, storytelling games for participatory social interpretation, and immersive storytelling for making the visit more memorable as it has been presented by Maia Sirnes (n.d.). Firstly, storytelling is embedded in human learning because it presents information in a structured, organized and entertaining way. It engages the artefacts emotionally and intellectually with visitors. Therefore, Cesario (2019) mentioned that educational experiences in museums are achieved by using interactive technologies to attract and engage more audiences. Amelia Wong (2015), also, underlined the importance to include forms of storytelling in museums, as it will make the visitors connect with the context, then motivate the visitors to wanting to see what will happen next, and lastly make the learning experience more entertaining for a wider audience. Secondly, narrations encourage people to use their imagination.

While visitors experience artworks with storytelling, they tend to produce and generate new thoughts, stories and therefore this process becomes an aesthetic experience. Next application of storytelling is games, whose process is generally know as gamification, which drives participation and social involvement, as well as a sense of achievement intending the visit, or part of it, as an adventure with different stages. According to Ioannidis and Vayanou (2017), storytelling games are highly participatory. Visitors make up stories with their imagination and share the story with other visitors who participated as well. Lastly, immersive storytelling offers a visiting experience in a way that can be even more memorable and engaging. Virtual Reality is the most common technological tool that is employed in museums for this purpose.

ONLINE ART AND EXHIBITION PLATFORMS

In recent years, museums and other art spaces gradually embraced the digitalization process of their collections, and exhibitions. As already mentioned in the introduction of the text, many museums recently established their online presence within websites and social media feeds, and offered the users the chance to visit and search through their collection via online content. A website of a museum is a beneficial tool to inform online visitors about art collection, special exhibitions, work in progress with behind the scenes insights (Arends, Goldfarb, Merkl, & Weingartner, 2009, p. 117). In this way, while website usage increases with online visitors, the image of a museum gets more attention by potential visitors, usually distant from the physical location of the venue, and as a result it may interact and attract new visitors with a global reach. What is important is not merely the information about museum history and exhibits provided in the website, but also to consider the overall design that can attract online visitors as a digital environment. According to Marty (2011), perception of online visitors of the quality of a museum can be influenced by some elements such as content of the website, its presentation, offered media, its format and appearance, usability of the website, interaction with the content. Among these elements, the option of creating personal digital collections is particularly important as it serves to facilitate personalized visitor experience.

Online platforms are beyond just being infographic sources about museums or art spaces. These institutions have been curating their collections online with specific editorial contents, mirroring a physical exhibition or launching exhibitions to be held exclusively online. Having this new dissemination outlet, museum websites are transformed, in terms of their format, from a 2D showcase to a 3D environment, which is designed to interact as much as possible with online visitors. All these website-based technologies are enhanced with 3D visualization tools and 3D interaction interfaces through Virtual Reality (VR), Augmented Reality (AR) and Web3D in conjunction with an advanced database that may facilitate the preservation, dissemination and virtual exhibitions of artworks owned by the museum (Jones & Cristal, 2002, p. 2).

An online virtual exhibition offers various features besides exhibits or artworks, such as plan of the exhibition space where online visitors can reach easily to see the map and the configuration of the exhibits,

audio guides corresponding to the specific exhibits, narratives, additional videos, and finally guiding signs for circulating appropriately inside the online virtual exhibition space. Therefore, online and virtual technology offers a complete experience where visitors can move freely, and zoom into details in a way that they could not do it in a physical space (Lohr, 2014, p. 6). This new kind of exhibition experience, characterized by being online, virtual, and multimedia centred, has different challenges if compared to the physical visitor experience according to Hartig (2019). Can we simply apply the same concept of a physical exhibition to an online platform, or rather we need a new and separate curatorial concept that is applicable to one of the two realms? Causing disembodiment in the passage from one to the other, do visitors have common expectations that virtual exhibitions would replace the physical visit? Therefore, while developing online platforms for exhibition, it should be considered that part of the experience of the physical space couldn't be transferred to the online platforms, and the two will be complimentary rather than alternatives.

METHODOLOGY

Research Questions And Hypotheses

The objective of the study is to explore the influence of interactive technology expanded with digital storytelling as it is offered in online virtual exhibition spaces such as museums, galleries, etc., and thereby generate more personalized and engaging online visitor experience and long-term engagement. In that matter, the following research questions are formulated and the corresponding hypothesis is tested. Q1: Does digital storytelling techniques enhance engaging visitor experiences in online virtual exhibition spaces?

Q1a: Does the digital storytelling techniques influence long-term engagement of online virtual museum visitors?

Q1b: Does the digital storytelling techniques influence personalized engagement of online virtual museum visitors?

H1: Digital storytelling techniques that are developed for online exhibition spaces offer more long-term engaged visitor experiences.

H2: Digital storytelling techniques that are developed for online exhibition spaces offer more personalized visitor experiences.

Participants of the Study

To conduct the research study, one of the requirements is to have participants who are specified under the term of "digital natives". This term is firstly used by an education consultant Marc Prensky in 2001 and is used for the people who are raised in a digital, media-saturated world (Moran, 2016). Digital natives constitute the people born after 1980, and they are raised in an environment where they have access to computers, video games but most importantly the Internet. Digital natives make up the largest segment of the population demographic. The reason for choosing this specific group is that they have the most intimate relationship with computer technology compared to other groups, and then the participants will provide ideally more effective results. The second requirement is to have participants that had previous experience of visiting museums, art galleries, and other art-related spaces. Finally, the third requirement is to have advanced knowledge of the English language, because both the language of the study and that of the online exhibition tour is English.

Participants are selected by the non-probability purposive sampling method. A total of 18 people are selected based on the requirements above mentioned and their age group falling between 23 to 30-year age interval, with practical knowledge of technology and experience with virtual environments. The same

interview, the online virtual exhibition tour and the survey are presented to the participant group. The selected participants are informed about the content of the study by the researcher and are not compensated for their participation in this study.

Instruments of the Study

In this study, one virtual environment was used to study the behaviour of the selected group of participants, experiencing an online virtual exhibition tour by the National Gallery of Victoria, in Australia. Participants visit the online exhibition tour using their personal computers and a private Internet connection. Also, there are three different instruments used to assess the responses of participants before and after the online virtual experience: the demographic questionnaire, the online interview, and the survey questionnaire.

Online Virtual Exhibition Tour

In this study, participants are invited to experience an online virtual exhibition tour that is open to public access by the National Gallery of Victoria in Australia. Founded in 1861, the National Gallery of Victoria is one of the most visited art museum in Melbourne, Victoria. Its collection ranges from Asian art to photographs, prints and drawings from both modern and classical art.

Due to the pandemic situation, the National Gallery of Victoria (NGV) has decided to move one of the most popular exhibitions, *Keith Haring | Jean-Michel Basquiat: Crossing Lines*, to their online platforms and create a virtual curator's tour for the visitors (Accessible online via https://www.ngv.vic.gov.au/virtualtours/haring-basquiat/). During the online virtual tour, visitors can explore the space in 3D, and shift to the floor plan (Figure 2) when they need to navigate somewhere else, and finally orbit the 3D venue as a dollhouse (Figure 3). The exhibition presents the work of two of the most significant and influential artists of the late 20th century, Keith Haring and Jean-Michel Basquiat, (NGV International, 2020). Both artists' works were created in public spaces, paintings, sculptures, photographs and many more. Therefore, the medium of exhibits is not homogeneous.

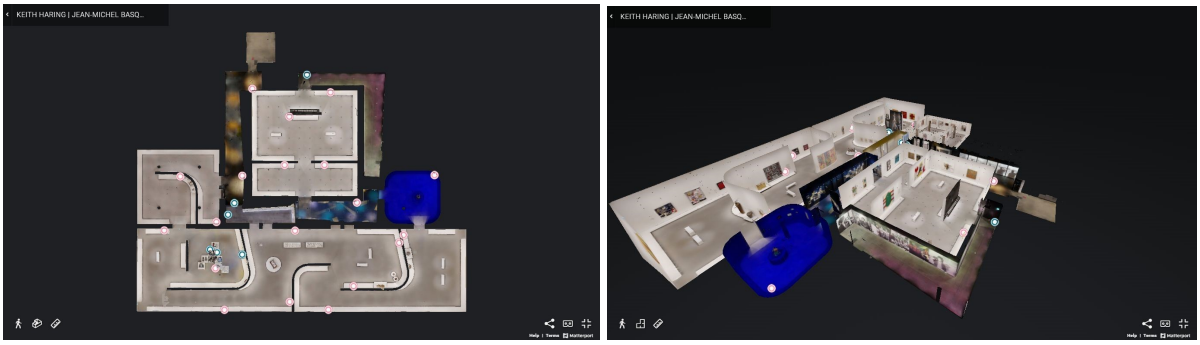
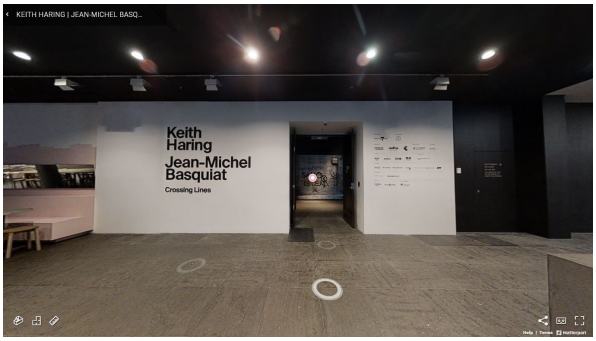


Figure 2 & 3. Floor plan and dollhouse view of online virtual exhibition tour

The online virtual exhibition tour starts with a colophon providing the title, sponsorships, and institutional support, re-creating in a virtual environment the same welcome scene of a traditional exhibition set in a physical space (Figure 4). A number of white guiding circle tags on the ground are placed for visitors to follow along, and different coloured circle tags can be clicked to access audios (pink) and videos (blue) (Figure 5). Descriptions on exhibit labels and the curatorial statement is kept as it is in the physical exhibition.

During their visits, participants are required to calculate the duration of their online virtual tour by using a stopwatch and then report the duration to the researcher.



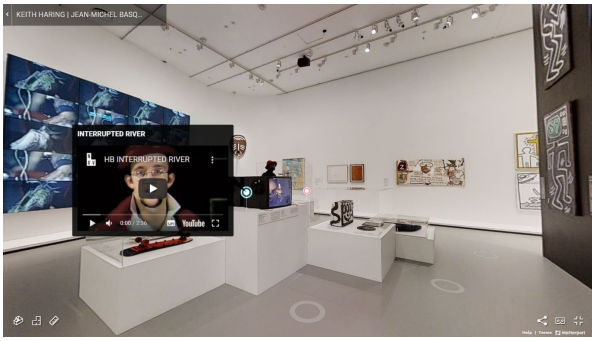


Figure 4 & 5. Entrance view of the online virtual exhibition tour and a view during the online virtual exhibition tour

Besides the virtual tour, NGV online platform provides a transcript that visitors can read about the exhibition, split and shown at different stops of the exhibition. The same applies for exhibition labels that visitors can read, the descriptions of the exhibit, multimedia guide as digital storytelling, again divided into different stops (there are 18 stops) of the exhibition, defined by the curator Dr. Dieter Buchhart, narrated by Patti Astor, and written by Phip Murray. NGV also provides the themes of the exhibition online, for the visitors who do not want to spend time on the virtual tour but rather gather the exhibition story as a summary. Additionally, there is a map of downtown New York City, created by Dr. Dieter Buchhart and Anna Karina Hofbauer, for exploring the important locations for both artists along their careers. All the written material provided by the NGV are also downloadable, therefore online visitors can read exhibition contents offline at any moment.

Demographic Questionnaire

The demographic questionnaire is the first part of the instruments that include information about the participants' demographic factors such as age, gender, profession, and one question regarding whether they had an experience of virtual environments or not. The demographic questionnaire could be found in Appendix A. Demographic questionnaire is made with Google Forms and then e-mailed to the participants.

Online Interview

After demographic questionnaire, an online interview is conducted as a qualitative study. It includes three different questions prepared for the participants that are open-ended and semi-structured. Questions allow subjective responses on the topics of digitization in exhibition spaces and its adaptation to the architectural space, integration between the exhibits and their descriptions and the visitor experience, based on digital storytelling technique (which is the narrative *fil rouge* that takes the visitors from the beginning till the end, along a complete visit) and lastly, thoughts on art and museums shifting to online platforms. This also prevents research from directing the participants. These three questions are designed to elicit a surplus of information from the participants, and since the professional/educational background of all the participants is highly related to the research topic, the cultural involvement in the exhibition is significant.

All questions in the form are specific to the research topic. The first question in the online interview asks to express participants' opinions on the digitization that is gradually getting diffused worldwide. It is used to convey information, guide the visitors, and evaluate their adaptation to the architectural space of the museum. Although digital approaches are beneficial for increasing visitor interest in interaction with the exhibits, its adaptation to the virtual architectural space should be questioned. What follows is the second question that is about exploring the application of digital storytelling in exhibitions from the participants' point of view. Digital storytelling is the key component in the research, because from the beginning each exhibition tells a story to the visitors, and shifts the experience from a linear visit to a complete journey where the visitors are at the centre, with an interactive and personalized experience. The last question, the third one, is more general if compared to the other two and is an attempt to reveal the participants' general thoughts, responses, and/or perceptions about art and museums shifting to the online platforms by offering games, online seminars, online virtual tours and other types of experience.

The online interview questions could be found in Appendix B. Zoom online platform was used to record and answer the questions by the participants. After the recording, the video was sent to the researcher.

Survey Questionnaire

As a final step of the study, the same participants responded to the survey questionnaire as a feedback of their experience, which is a quantitative study (see Appendix C). Likert Scale with five-point, beginning with 1 that refers to strongly disagree and 5 to strongly agree, is used in order to explore the visitors' interaction within the online virtual exhibition experience. The survey is conducted by using Google Forms and shared with participants directly online.

The questions in the survey are divided into three different categories, namely experience and interaction, engagement, and finally perceived issues. Each category has different questions regarding the specific subject, and a total of 12 questions are asked. Experience and interaction related questions are asked to explore the feedbacks of visitors in terms of their understanding of the experience of the overall exhibition. Following the guided path during the experience, are examined the series of audios and videos, the clarity of visual scenes of the online virtual exhibition tour, interactivity of the online virtual exhibition having multi-sensorial aspects. Engagement related questions cover the opinions about the personalization, feeling presence in the space and the connection with the storytelling from the beginning till the end having the narratives on the wall, audio, and videos. Final category is perceived issues, which questioned the issues of perception when comparing a physical exhibition experience with a virtual one. Therefore, on one hand it can be seen as a comparison, on the other hand it can discover perceived issues and problems encountered with a virtual experience.

Setting and Procedure of the Study

This study took place in an online virtual museum environment as stated above. Although there are different kinds of museums such as archaeology, art, history, military and war, science etc. and as such it should be specified, "modern art museums" have been chosen for this research. It should be noted that art museums are one of the most articulated form of museums in terms of their collection and exhibitions, and require knowledge and longer time to discover the displayed objects. In brief, most of the technological approaches are presented in modern art museums in comparison to the classical art museums. This is due, in most cases, to their architectural setting. Digitization requires technical equipment and a context of the displayed objects that are more appropriate in modern art museums to such digital applications.

In this study, the data is collected from participants through Internet because of the pandemic situation. Each participant is required to complete the tasks in sequence by connecting with their computers. The online interview is conducted asynchronously, meaning that the researcher and the participants were not online at the same time. Because of the limitations regarding the pandemic situation, participants were not all available in the same period. During the study, no physical meeting happened between the participants of the study and/or with the researcher. Therefore, all stages of study were conducted online properly and in a short period.

The online interview was conducted in order to obtain subjective responses on the topics of digitization in exhibition spaces and its adaptation to the architectural space, integration between the exhibits and their descriptions and the visitor experience based on digital storytelling technique, and thoughts on art and museums shifting to the online platforms. For the online virtual exhibition tour, the website link was shared with all participants after their interviews. Since NGV opened the virtual exhibition tour online to the public access, there were no restrictions while reaching it by the participants. Online virtual exhibition tour was introduced to the test users in comparison to the physical exhibition. All participants had different personal experiences with exhibitions. After participants completed their online virtual exhibition tour by recording their duration of experience, they received the survey questionnaire via e-mail. The survey was conducted as a feedback of the visitors after their experience of online virtual exhibition tour. The survey is divided into three different categories in order to create boundaries between investigated components of the visitor experiences which is expected to achieve personalized and long-term engagement of visitors as stated in the hypotheses (Figure 6).

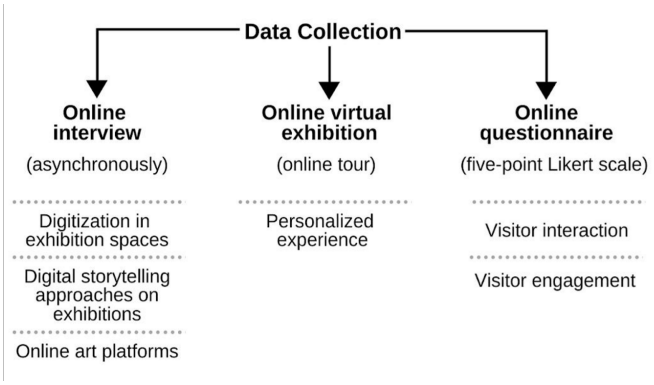


Figure 6. Diagram of data collection methods

RESULTS

This chapter presents research findings related to the influence of interactive technology, expanded with a component of digital storytelling, offered in NGV's online virtual exhibition space, and as a consequence, generates more personalized online visitor experience and long-term engagement. Statistical Package for Social Sciences (SPSS) software version 21 (IBM Corp, 2012) is used to process and analyse the collected data.

Statistical analysis were made by using the SPSS software for all quantitative data. As a first step in the study, the demographic characteristics of the participants was obtained and analysed with descriptive analysis. For the next step of the study, online interview, since it gave a subjective open-ended answers, major themes were developed based on the participants' answers and then were evaluated. Lastly, for the Likertscale questionnaire, combination of these different existing variables into one variable was made by using Compute Variable in SPSS. Then, their means were calculated, analyzed and evaluated accordingly.

Demographic Characteristics

The demographic questionnaire was developed using Google Forms and distributed to the participants as the first part of the study that covers information about participants' age, gender, profession, one question regarding whether they had an experience of virtual environments or not, and lastly, one question regarding whether they had participated to any kinds of online art activities in the past. All the information related to the demographic characteristics of the participants is gathered from this questionnaire.

The study is conducted with 18 participants who were selected by the non-probability purposive sampling method. Eight of the participants are females subjects and 10 of the participants are male subjects (Table 1) with a mean age of 25.72 (SD= 2.492) as it is included under the term of digital natives which explained in the previous chapter. The age range of the participants is between 22 and 30 years. Overall, the profession of participants is another characteristic in the demographic data which could be seen in the Table 1. Although the profession was not a criterion of selection, almost all participants are involved in the field of art, design and architecture. Results regarding the time spent on computer showed that, 61.1% of the participants are spending five hours or more time using a computer per day, while only 16.7% of them are spending one to three hours (Table 1).

Characteristic	**Category**	**Total**
Gender	Female	8
	Male	10
Profession	Academic in art,design, architecture fields	3
	Designer	3
	Artist	3

	Architect	7
	Other	2
Time spent on computer per day	1 - 3 hours	3
	3 - 5 hours	4
	5 hours or more	11
Experience with virtual environments	Experienced	16
	Inexperienced	2
Participation to the online art activities in the past	Participated	14
	Not participated	4

Table 1. Demographic characteristics of the participants

At the end of the demographic questionnaire, participants were also asked two questions about their experience in the past with any kinds of virtual environments and in participation to other online art activities. According to the results, 16 of the participants were experienced in virtual environments and therefore, they were familiar with this environment as could be seen in Table 1. Lastly, while looking at the participation in the online art activities, only 4 of them stated that they never participated in online art activities in the past (Table 1). Given the fact that some requirements were fixed while choosing the participant group, the results regarding the demographic characteristics were expected by the researcher.

Findings of Interview

This part covers the analysis of the online interviews, which consists of three open-ended questions in semi-structured interviews, about the application of digitization, contribution of digital storytelling to the exhibition, and lastly thoughts on online art platforms. These questions were developed to obtain subjective responses of the participants. After gathering the data of open-ended questions, major themes were developed based on participants' answers. Each question and their answers were analysed and evaluated according to these themes.

Application of Digitization

The application of digitization to the exhibition spaces was the first topic asked in the online interview. Application of digitization means using interactive maps, audio guides, video guides, VR applications, or AR applications in exhibition spaces. Since digital storytelling is also one of the digital tools used in exhibition spaces, it is beneficial to gather participants' data firstly about the digitalization, in general. Participants' answers were focused on these two different themes: informative tool and interactivity tool. According to the answers, 38.9% of the total participants stated that digitization in exhibition spaces is seen as a tool to visualise and understand the artwork in a better sense. Since this digitization could be used in various ways, one of the participants describes the experience with digitization tools in exhibition spaces as:

"With digitization I can get information about exhibition much more easily. In exhibition spaces, I really like audio guide because with audio guide I can use my different senses at the same time. Also, with digital maps, I can find my way in interior easily."

There are some answers regarding to the appropriate use of these informative digital tools, because there might be some problems in terms of understanding how to use that digital technology or related to ergonomic issues. One of the participants mentioned the problem of one of the digital technologies as:

"For example, VR applications are enjoyable although it might be hard to use while experiencing it in any kind of art space. Since it is a device that you have to carry on your head, it turns into a prosthesis and it takes time to use it. This time and effort to learn and understand the technology of VR makes the visiting and learning experience difficult."

On the other hand, as a second theme interactivity of these digital technologies were emphasized among the participants. Since 44.4% of the total participants expressed that digitization offers new kinds of experiences, it also increases interactivity between the visitors and exhibits, besides having other positive aspects. As one of the participants' opinion about this theme is stated as:

"It adds lots of flexibility and utility it allows visits to be designed and enhanced by the designers of the exhibitions, and no doubt it changes the perception of visitors besides increasing the interaction."

Mostly participants shared their opinions on this topic as having positive feelings assuming that these digital applications are designed in a proper way. In case of a proper design, they feel engaged in the architectural space from a visitors' point of view. Even if these digital applications appear as devices in the space, they have a significant importance, because visitors are the ones that use and interacts with them as one participant states as:

“If they're designed the right way, I think they add a lot of value to the experience. I'm not a fan of audio/video guides, but interactivity of any kinds of digital technology is very enhancing and can really make you appreciate the space the exhibition is being hosted in.”

Conversely, 16.7% of the total participants have negative opinions about this digitization and they believe that digitization mostly causes disembodiment and visitors should not stick to it firmly just because we live in the digital world. They stated that, even if they are designed according to the architectural space, most of the time they become useless in practice.

Contribution of Digital Storytelling

Second question in the online interview was about the contribution of digital storytelling (which includes all digital media and narratives to create a complete journey about the exhibition in general, and exhibits) to visitor experience in exhibition spaces. The answers gathered from the participants were divided into two major themes as: connection with the exhibition and engagement of the online visitors. According to the answers, participants mostly think that even the exhibits or what they look and notice in an exhibition space could change according to the application of digital storytelling, because it has such a power to communicate and alter visitors’ experience. Among the total, 44.4% of the participants (8 participants) stated that, with the digital storytelling, the visitor is open to interactions while having an experience with different senses. It enables exhibition spaces to establish strong connections with their visitors and keep in touch. One of the participants expressed their feelings as:

“I think digital storytelling is highly accessible and versatile, especially when it comes to extend and elaborate contextual roots of the exhibit and connect it to the visitors. It also allows the exhibition space to go through more interpretation without extending to irrelevancy.”

Secondly, engagement to the exhibition was another highlighted point in the gathered data. Among the total, 44.4% of the participants stated that digital storytelling is an interactive experience as the visitors somehow engage themselves in that space they are present, and this results as a satisfaction of the visitors and the feeling of belonging to that specific space.

Similarly, one participant expressed as having feelings:

“I think it makes the experience much more interesting and can capture the attention of those who aren't necessarily regulars of museums or exhibitions, so that they become engaged to that space. It can work as a tool to speak to a variety of people and make them feel like they're a part of the whole experience, which will eventually result in greater appreciation of the exhibition and the space itself.”

The reason why these two themes emerged in digital storytelling question of the interview could be because digital storytelling is one of the successfully adapted digital technologies in exhibition spaces and also has a rooted history in people’s life as stated in the earlier sections of the text, so that participants also felt more closer comparing to other digital technologies developed for exhibition spaces. It helps visitors to follow and understand the path of the exhibition, enhances the overall experience, if it is applied properly. Participants, albeit having a positive disposition on this topic, criticized the way such digital technologies are employed in exhibition spaces. Among the total, 11.1% of the participants highlighted that issue as application of digital storytelling could decrease and dispel the sensation of the experience with those wrong applications. Yet, the same wrong applications could help to develop better digital application and therefore, better visitor experiences. It would be

beneficial to continue developing these applications for exhibitions and collect feedbacks on their usage. One participant has expressed the feelings about this digital technology and everyday life as:

"I think, the visitor of 21st century has the urge to be included in the exhibition. I think that digital tools are an integral part of everyday life, and the use of these digital tools, including digital storytelling, in exhibitions gives the viewer an easy and familiar feeling of involvement, like a daily communication."

ONLINE ART PLATFORMS

As the last question in the online interview, participants were asked about their feelings and thoughts on art and art related spaces that had shifted to the online platforms. This question was more general in terms of revealing the digital native participants' opinions on online platforms, since they are the ones who use the online platforms mostly compared with the other people in the society. Answers of 22.2% of the participants supported these online platforms since they are more accessible compared with the real ones, just because physically visiting those spaces requires much more commitment than visiting virtually, even for enthusiastic people. On the other hand the majority, 66.7% of the participants, stated that they were supportive but also sceptical about the execution. They supported the idea that it should not be a cause for not visiting the real spaces just because it is more accessible, it does not mean that it gives the same satisfaction, curiosity and authenticity as the real practice. There were some answers in terms of not supporting the online art platforms with 11.1% of the participants. They stated that there could not be any comparison with the real practice. Therefore, the answers were divided around these aspects as positive, positive but sceptical and negative for the question about online art platforms.

Findings of Questionnaire

In order to examine participants' overall experience with the online virtual exhibition tour, five-point Likert scale, one corresponding to "Strongly Disagree" and five corresponding to "Strongly Agree", was used. The middle ground (three) was neutral. There were different categories under this questionnaire. Since these categories include different variables, combination of these different existing variables into one variable was made by using Compute Variable in SPSS. Then, the mean results were calculated and comparisons were made accordingly.

Experience and Interaction

The mean results were calculated for the questions related to the participants' experience and interaction and it was found as 3.74 with a mode of 4.17 and a median of 3.91 (STD=0.447). These results show that participants were mostly positive about their experience and they were agreed that they had sufficient information and guidance in the online virtual exhibition tour. Also, 61.1% of the participants stated that the virtual representation of both the architectural space and the exhibits were quite convincing to them, while 22.2% of the participants disagreed with that statement. Twelve participants (66.7%) stated that they could explore all types of media presented throughout the online virtual exhibition tour, whereas 4 of them (22.2%) disagreed with this statement. Also, 8 of the participants (44.4%) were agreed that they focused too much on the interactivity itself that they could miss some parts of the exhibition, while 4 participants (22.3%) were disagreed with this statement and they had no problem with the interactivity.

Engagement

The questions covering the engagement part of the study were consisted of statements that highlights personalization, feeling close enough to be present in the real space, and engagement with the digital storytelling. Among all, 33.4% of the participants (6 participants) had agreed that they felt a more personalized experience during the online virtual exhibition tour in comparison to the real world experience, since they could move around freely. Although, the majority (44.5% of the total participants) disagreed with the personalization. In terms of feeling close enough to be present in the real space, 10 participants (55.5%) disagreed and stated that feeling present in the real space were almost impossible whereas 6 participants (33.3%) were neutral. For this result, it could be said that a majority of the participants could not feel as present as they feel in the real space. In terms of engagement with the digital storytelling, 44.4% of the participants (8 participants) stated that they could engage with the exhibition's story provided by the online virtual exhibition tour, but 44.4% of the participants (8 participants) were neutral to this statement. On the other hand, 12 of the total participants (66.6%) agreed that they will look for more online virtual exhibitions after this experience that showed their engagement to this experience. Only 2 participants (11.1%) stated that this experience did not attract their attention on the online virtual exhibitions.

Perceived Issues

Last part of the questionnaire consisted of questions regarding to the participants' perceived issues during their experience in online virtual exhibition tour. This part is emphasized in order to understand the technical problems of the participants, and also the exhibition itself. According to the answers, the mean result of this category was 3.82 (SD= 0.473) with a mode of 4.33 and a median of 3.67. Eleven of the participants (61.1%) agreed that they could focus on the online virtual exhibition without any major distractions arising from internal and external sources, whereas only 4 participants (22.2%) disagreed stating that they got distracted during the exhibition tour. Since the NGV's website link provided for this virtual exhibition tour provided different multimedia elements (audios, photographs, videos, virtual tour, texts etc.), it could cause some technical problems with the participants' internet connections and their computers. Therefore, there was one question regarding participants' connection and the majority (77.8%) of the participants stated that their internet connections operated perfectly.

Discussion

The present study, conducted on a small group of individuals, shows that participants assessed their experience with the online virtual exhibition tour as the more interactive and informative form of presentation that offers accessible, rich, and complete experience compared to the physical exhibition experience. Besides, participants agreed on the fact that they gathered sufficient information and guidance throughout their online virtual exhibition tour experience. However, the majority also stated that they focused too much on the interactivity itself that they could miss some parts of the exhibition. The same majority also reached a consensus that the virtual representation of both the architectural space and the exhibits were quite convincing. These results demonstrate that even though comments on the rendering of the space are positive, if the setting of an online virtual exhibition is too realistic, some feedback such as attention to the content might be inevitably negative. Hence, it should be considered as two different kinds of experience, two experiences that have diverse characteristics and different outcomes. Similarly, the present study also shows that the majority of the participants could

not feel their presence as they would in a physical space. The reason for this result, again, can emerged from the same execution problems as it was explained above.

On the contrary, the most positive attitude exemplified from the present study is that participants searched on the online virtual exhibitions they visited even after their tour, as they stated on the results part of the study. Therefore, the present study also points out that the participants concluded their experience with a positive attitude, and this positive attitude was also connected to an interest to visit this kind of experience in the future. As a consequence, this also shows their increased engagement with the virtual tour. Another positive feedback drawn from the present study is the engagement with the digital storytelling, and how participants felt connected with different senses and engaged throughout the overall virtual online space. Digital storytelling, in all its different forms as explained in the previous sections, is successfully adapted and executed to enhance the regular experience. In short, it can be said that these results correspond to the objective of the present study with additional contributions such as the design and execution of digital technologies for the online virtual experience of an exhibition, and authenticity problem.

CONCLUSION

According to our study, the fruition of an exhibition via interactive technology, expanded with digital storytelling, offered in an online environment substantially enhanced visitor experience and generated possible long-term engagement with following experiences of the same kind. Although, it is understood that the peculiar design of such interactive platforms is decisive for the feedback on the quality of the virtual visit. Different points of view and contributions gathered from the participant group, which are digital natives, shaped the objective of the present study relying on their previous knowledge and experience on the digitization topic. Better visitor experience, high interaction, and long-term engagement are the intended achievements of these art and exhibition spaces in order to attract new and different types of audience. Their improvement will advance in parallel with that of the digital technologies on which they are based. As per this study, the selected sample was considered as an experimental testing ground for a future large scale study that will be conducted on a wider number of participant, which will adjust the aforementioned results with more scientific confidence.

APPENDIX A. DEMOGRAPHIC QUESTIONNAIRE

Please answer the following questions regarding your socio-demographic variables.

Participant No : ____

Age : ____

Gender : ☐ Female ☐ Male ☐ Not stated

Profession : _____

How many hours do you spend on the computer per day?

☐ Less than one hour

☐ 1 - 3 hours

☐ 3 - 5 hours

☐ 5 or more hours

How often do you visit art related spaces, such as museums, galleries etc.?

☐ Every month

☐ 5 - 6 times in year

☐ 3 - 4 times in year

☐ 1 time in year

Have you ever participated in any kinds of online art activities, such as discussions, webinars, virtual tours etc.?

☐ Yes

☐ No

Have you ever experienced any kinds of virtual environments?

☐ Yes

☐ No

APPENDIX B. ONLINE INTERVIEW QUESTIONS

Q1: What do you think about the application of digitization (such as interactive maps, audio guide, video guide, VR applications, AR applications, digital collections, etc.) in exhibition spaces and its relation to the architectural space?

Q2: What do you think about the contribution of digital storytelling (which includes all digital media and narratives to create a complete journey about the exhibition in general, and exhibits) to visitor experience in exhibition spaces?

Q3: How do you feel about the remediation of art related spaces (art galleries, museums, etc.) on online platforms (websites, virtual tours, web galleries, instagram accounts, etc.)?

APPENDIX C. SURVEY QUESTIONNAIRE EXPERIENCE AND INTERACTION

Q1: There is sufficient information on the context of the exhibition which is explained clearly through the online virtual exhibition tour.

Strongly Disagree				Strongly Agree
1	2	3	4	5

Q2: There is sufficient guidance for facilitating the movement in online virtual exhibition tour.

Strongly Disagree				Strongly Agree
1	2	3	4	5

Q3: The provided audio and videos can be found, and accessed easily through the online virtual exhibition.

Strongly Disagree Strongly Agree

1 2 3 4 5

Q4: The virtual representation of both the architectural space and the exhibits is convincing (when comparing to real ones).

Strongly Disagree Strongly Agree

1 2 3 4 5

Q5: I explored all types of media provided through the online virtual exhibition tour.

Strongly Disagree Strongly Agree

1 2 3 4 5

Q6: I focused too much on interactivity more than the exhibition itself.

Strongly Disagree Strongly Agree

1 2 3 4 5

ENGAGEMENT

Q1: Having a chance of moving around freely, without any disturbance, felt more personalized comparing to the real world exhibition experience.

Strongly Disagree Strongly Agree

1 2 3 4 5

Q2: During the online virtual tour, I could feel close enough to be present in the real architectural space.

Strongly Disagree Strongly Agree

1 2 3 4 5

Q3: Starting from the beginning, I could engage with the exhibition's story provided by the online virtual tour.

Strongly Disagree Strongly Agree

1 2 3 4 5

Q4: After experiencing this online virtual tour, I believe that I will have more search on these types of experiences.

Strongly Disagree Strongly Agree

1 2 3 4 5

PERCEIVED ISSUES

Q1: During the tour, I could focus on the online virtual exhibition without major distractions (arising from internal or external sources).

Strongly Disagree Strongly Agree

1 2 3 4 5

Q2: My internet connection operated well enough through the online virtual tour.

Strongly Disagree				Strongly Agree
1	2	3	4	5

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A STUDY ON THE SEMIOTIC PERCEPTION OF GOTHIC CHURCHES IN TURKEY

ELİF ATICI, MEHMET İNCEOĞLU

ABSTRACT

Individuals, as social beings, are necessarily in communication with each other. There are many ways in which this communication takes place. Consciousness, in other words the reactions people have towards their surroundings within the society, constitutes a necessary factor for healthy communication. However, inter-personal communication has been deteriorating due to technological advancements. People can no longer transmit their reactions properly to the other side. As a result, the communication cycle between the recipient and transmitter cannot be attained in the desired form. Communication does not only take place between people, but also between people and the structures surrounding them. This study aims to examine how churches, as shared spaces, are perceived in Turkey. It particular, the focus is on gothic churches, as this structure group has a common architectural language. Since language is the most basic level of communication, a structure group with such a common language has been selected for this study. God, Jesus Christ, and the Holy Spirit are the three metaphors used in Christian churches. This study shows how metaphors used for the church (God, Jesus Christ and the Holy Spirit) have changed in the Turkish society.

Keywords: Gothic church, communication, semiotics, denotation, connotation.

INTRODUCTION

Communication takes place through the creation of the 'other' by people. Due to technological advancements, communication can now proceed in many ways. Yet, these advancements have also decreased the rate of conventional forms of visual and sensual communication. Architectural communication is a mode of communication that brings together vision and senses. Many architectural structures around us are in communication with us. One method used in the analysis of this communication is semiotics. While Saussure and Peirce are known to be the founding figures of semiotics, Umberto Eco, Barthes, Guiraud, Derrida, and many other important thinkers have carried out studies in this area. Saussure distinguished the signifier and the signified in semiotics, and explained this method of analysis as denotation and connotation within the context of language (Özmakas, 2010, s. 52). The signified refers to the reaction that concepts arouse in our minds, while communication or expression constitutes the signifier (Erkman, 1987, s. 67). The signified, in turn, indicates denotation, whereas connotation, not being entirely independent of denotation, refers to meaning based on individual interpretation (Erkman, 1987, s. 73). Peirce argued that perception varies from person to person; and thus, he added the interpretant as a third factor in the dual context that Saussure proposed (Özmakas, 2010, s. 17). Derrida noted that sound is a signifier that unites with the signified and reaches the consciousness. Based on this argument, he claimed that the human sound is consciousness itself (Derrida, 1994, s. 39). When one says "we are conscious", there are two underlying assertions being made, namely the reaction given to one's surroundings and our ideas and emotions, which do not exist in inanimate objects (Russell, 1997, s. 81). People communicate with the structures constituting their surroundings by reacting to them. This dynamic supports the condition of being conscious. It is at this stage that semiotics becomes visible. According to Barthes, the aim of semiotic research is to delineate systems of understanding outside of language (Barthes, 1979, s. 93). These analyses may be employed in many areas. Architectural communication takes place through the approach of functions, as put forward by Umberto Eco. This approach arises from the functions of objects and thereby, structures. The function of a structure does not change. Its primary meaning emanates from denotation, while connotation – dependent of and yet outside this function – is made up of the feelings experienced by the perceivers (Erkman, 1987, s. 87-100).

Since the easiest way for communication is language, a group of structures needs a common language for us to understand their messages. One of the structure groups with a common language is gothic churches. Sharp lines of architectural elements constitute this common construction language. Gothic churches display parallels in terms of their purpose and method of construction. Since visual and sensual communication decrease in line with developing technologies, the rate of conscious reaction to surroundings also diminishes. Within this context, there are no studies focusing on gothic churches, which are only a few in number in Turkey. In this study, which was carried out to fill this gap in research, questions of how people in Turkey react to gothic churches, how they communicate with these structures, and which characteristics of churches arouse such reactions were examined.

CONCEPTUAL FRAMEWORK

In the Turkish Republic, churches, as structures of Christian architecture, are overshadowed by Islamic architecture. Islamic practices and the architectural styles they inspire stand in contrast with Baroque, Rococo and Gothic styles. In particular, Islamic architecture is plain, in terms of expression, and exhibits a silent movement. Gothic, Baroque, and Rococo styles, on the other hand, strive to impress people with a stylistic expression reflecting enlightened products, which are based on movement, and their technical success (Cansever, 1996, s. 133).

Çam noted that Islamic houses of worship do not have the showy elements, which have no structural function, that characterize the gothic churches of Europe (Çam, 1997, s. 75). At the time of the Crusades, Crusaders were impressed by the magnificence of Istanbul (Constantinapolis) and Hagia Sophia and felt that the city and the churches in Istanbul surpassed those in France. When the Crusaders returned to their homelands after the first Crusade, they started building cathedrals. Roth argued that this situation was not

a coincidence and went on to suggest that gothic cathedrals were byproducts of the crusades (Roth, 2006, s. 397).

According to Moore's definition, gothic architecture features an independent web of arches and a roof system which is carried by and covers pillars and footing (Begeç, 2012, s. 73). Gothic architecture is an architectural style that prevailed over all parts of Europe from the 12th century to the 16th (Begeç, 2012, s. 74). Edged arches, arched roofs supported by thin pillars, and ribbed vaults are prominent characteristics of this architectural style. Gothic cathedrals are structures constructed with an aesthetic refinement that serves to produce the feeling of reaching out to God (Kaya, 2010). Since religious life constituted the center of human practices during the gothic style era, structures with the most advanced architectural design and technology were constructed by the church. Le Corbusier claimed that the gothic cathedral represented a drama and a struggle against the forces of gravity.

Cathedrals, as an integral part of Christianity, have been visible since the period of Constantine the Great. Although architectural styles change throughout history, a generally similar pattern can be discerned. Defining aspects of the designs are found in their geometrical differences (Scott, 2003, s. 103). Hans Sedlmayr and Otto von Simson defined gothic cathedrals as mystic "Gesamtkunstwerk", i.e. as buildings where all artistic media can be experienced. Gothic churches, as an artistic whole, stand in opposition to the integrity of the original cathedral (Frankl, 2000, s. 24). Panofsky remarked that high scholastic philosophy sharply distinguished the sacred temple of faith from the sphere of rationality. Still, this line of thought sought to make the temple entirely comprehensible, and therefore, the ideas governing the design of gothic architecture placed great importance on the comprehensibility of the facade covering the outside of the interior space, an area which was also filled with meaningful designs to offset the concept of universal emptiness (Panofsky, 1995, s. 30).

Pevsner argued that structures have a message for the perceiver. In other words, structures want to convey a story to us. According to Umberto Eco, the architectural object is a signifier that has the ability to transmit meaning on its own (Eraslan, 2014, s. 18). Architectural signs bring forth the phenomenon of meaning of place. For G.K Koening, a follower of Morris' semiotic theory, semiotics in architecture develops a certain order in reading a place. One of his examples in support of this argument was that both mosques and churches connote religious life (Gümüş & Şahin, 1982, s. 36). Venturi made use of semiotics as proof of figurativeness in architecture. According to Gombrich, forms have visual or discursive expressions, which engage with us directly (Venturi, Brown, & Izenour, 1993, s. 135-136). Ruskin argued that architecture needs to convey something. He asserted that buildings are not simple objects that appeal to the eye, but rather have concepts, which can be analyzed and interpreted (Şenyiğit, 2010, s. 28). For Eco, semiotics is a science based on understanding and interpretation, which includes the examination of cultural phenomenon in the process of communication (Şenyiğit, 2010, s. 24). Architecture and architectural sites are designed for making people experience certain emotions and feelings. Semiotics plays a significant role in transmitting these emotions and feelings. For this reason, churches, as cultural phenomenon and as shared living spaces, constitute the main focus of this study.

Semiotics in Architectural Communication

Architecture is a communicational and symbolic discourse modality. Like all branches of art, architecture is the material representation of human thought and desire. In effect, it is the record of cultural values and faith of human beings (Eraslan, 2014, s. 18). The function of the sign is to express thought through messages. In this transmission, the sign is a communication tool; therefore, it consists of a receiver and a transmitter (Guiraud, 2016, s. 21). Gothic churches express an idea in a similar way. It transmits its messages through a common construction language. Guiraud explained this process using the following three points:

1. The sign is always an indicator of a meaning.

2. There are deep connections and shared problems between communication and perception.

3. Perception is a type of communication that takes place between the sensual reality that emits energy and our senses receiving that energy (Guiraud, 2016, s. 39-40).

Architectural objects express the function as denotation and a certain ideology of the function as connotation. The architectural object may also convey other things as denotation (Erkman, 1987, s. 100). The function of a structure constitutes the primary meaning; in other words, denotation. Connotation is not independent of denotation. Connotation refers to the figurative meaning, shaped by symbolic, cultural and individual perceptions. In this study, denotation is made up of connotations shaped by the emotions aroused in people by gothic churches, which function as sanctuaries. These connotations consist of messages that churches wish to convey to people. Interpreting architecture as a form of communication and as a signification system allows for the application of semiotics and linguistic methods in practice (Kalpaklı, 1998, s. 68). In this study, semiotic analysis was applied to unravel these messages.

CASE STUDIES

According to Downey, after the crucifixion of Jesus Christ by the Jews, some of the apostles in Jerusalem went to Antakya to disseminate the message of Jesus Christ. The reason behind their decision to go to this city rested on the fact that Antakya was a big city with an autonomous government tied to the Roman Empire (Bahadır, 2013, s. 209). A turning point in the history of Christianity was realized in Antakya, where Jewish Christians conveyed Jesus Christ's messages to pagans. Antakya is where the faith of Jesus Christ was first organized in the Hellenistic world and where the term Christianity was first applied (Aydın, 2015, s. 3). Anatolia, therefore, is recognized as the land where Christianity was born. As early as 37 AC, Antakya served as the first episcopal region of Christianity, and from this period on Christianity has continued in Anatolia. When the historical transformations of episcopal regions in Turkey are examined, it is seen that the four distinct regions in 1845 were reduced to three regions in 1896, with its final form taking shape in 1990. These transformations were presented in Figure 1, where it can be observed that the first region was never changed 1. In analyzing the gothic churches, it was discovered that while the first and the second regions included gothic churches, there were none in the third region.

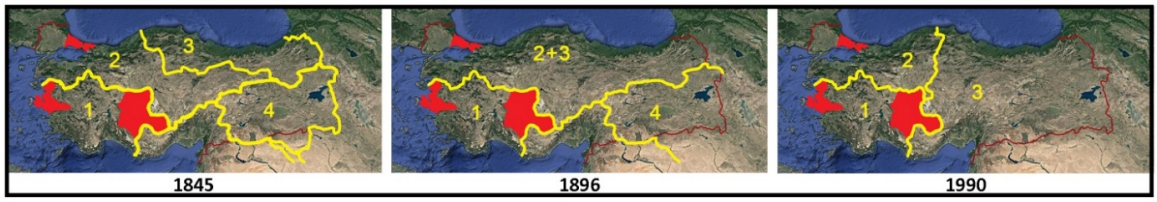


Figure 1. The Transformation of Latin Episcopal Regions (in Years)

A two-staged survey study was carried out, using qualitative and quantitative methods, to examine how churches are perceived by people in our society. The first survey study was conducted to assess participants. People from 18 to 30 years old, from various cities, from architecture, have participated in this work. These participants were expected to make evaluations about architecture and communication as well as gothic churches and signification. This study was finalized by developing theoretical knowledge, conducting analytic evaluations, and carrying out experimental fieldwork (Tokman, 2016). According to the participants' responses to close-ended questions, a majority were found to agree on the following arguments: architecture can be a communication tool; different places may influence communication; structures may communicate with people; and structures have messages for us. Open-ended questions were asked in the second survey study to identify the emotions felt for churches. For sake of comparison with the first study, the second survey study was administered to people who were trained in design. These participants included 70 architects, in the 18-30 age range, from the cities of İzmir, Konya, and Istanbul. The results of this study revealed the link between selected gothic churches and emotions. The analyses performed as part of this study are shown in tables.

1 http://www.anadolukatolikkilisesi.org/tr/storia.asp (date of access: 26.05.2017)

The Studied Churches

Changes in the episcopal regions of Turkey by years were also shown in the Field Work-Methods section. The regions were first divided into four groups in 1845, and then became limited to three regions as of 1896. Episcopal region division was finalized in 1990. The analyzed churches were selected from episcopal regions (See Figure 1). In the region numbered one, there were actively used gothic churches in the cities of Izmir and Konya, while in the third region, there are no examples of gothic churches. In Konya, there is only one gothic church. Findings were attained by comparing the gothic churches in Izmir, the church in Konya in the same region, and a church boasting the largest community, in the cosmopolitan city of Istanbul, located in the second region. These churches are presented along with photographs. The number of congregants of the churches were also determined and are shown in visuals.

St. John Evangelist Anglican Church (The Church of Light- Izmir)

This church, which was granted to the British people by Sultan Abdul Hamid II, the 34th Sultan of the Ottoman Empire, is in Izmir. Serving as one of the three Anglican churches in the service of British origin citizens in Izmir, it is located in the province of Alsancak. The church is made of sandstone and has a marbled interior. Today, the church still stands as a sacred site of worship for the Baptist community.2

Figure 2. Photographs of the interior of St. John Evangelist Anglican Church

Buca Protestant Baptist Church (Izmir)

The Buca Protestant Baptist Church is a small village church, which was originally built as a chapel in 1834. It was renovated in 1865 under the edict of the Ottoman Sultan Abdulaziz Han.3 The Buca church has a cross-shaped plan, and features an inner dome made of wood in the central hall.4

Figure 3. Photographs of the Buca Protestant Baptist Church

2 Baptistlerin kutsal mekânı: St. John Kilisesi, *İzmir Kültür ve Turizm Dergisi, 12. Sayı http://www.izmirdergisi.com/tr/dergi-arsivi/36-12nci-sayi/2010-baptistlerin-kutsal-mekani-st-john-kilisesi* date of access: *11.02.2020)*

3 https://www.buca.bel.tr/Buca-Hakkinda/16/protestan-kilisesi/tarihi-yapilar.html (date of access: 11.02.2020)

4 http://www.kultur.gov.tr/TR,72705/kiliseler.html (date of access: 26.05.2017)

St. Helene Catholic Church (Izmir)

This is the first Catholic church in Karşıyaka, and it was built in 1904. In 1968, the interior architecture of the church was renovated. Its façade, however, was not changed and its windows are of the neo-gothic style.5 (See Figure 4 for photographs of its interior)6

Figure 4: Photographs of the St. Helene Catholic Church

St. Paul Church (Konya)

Located in Meram, Konya, this church was built in 1910 in the French gothic style by the Assomptionnistes priests, who gave religious support to French families.7 It is the only standing church in Konya.8

Figure 5: Photographs of the St. Paul Catholic Church

5 https://izmir.ktb.gov.tr/TR-210611/saint-helen-katolik-kilisesi.html (date of access: 11.02.2020)
6 https://www.erolsasmaz.com/?oku=558 (date of access: 11.02.2020)
7 https://tr.wikipedia.org/wiki/Aziz_Pavlus_Kilisesi (date of access: 11.02.2020)
8 http://old.cinquepani.it/Casa_frat/Konya/ch_turco.htm (date of access: 11.02.2020)

Church of St. Anthony of Padua (Istanbul)

This church was built in Beyoğlu in 1906. It is the largest Catholic church in Istanbul. The structure was constructed in the neo-gothic style, and its plan is in the form of the Latin cross. Its façade rises high into the sky and consists of bricks and mosaics.9

Figure 6: Photographs of the Church of St. Anthony of Padua

In the evaluation of the findings from the first survey study, seven main concepts were identified: glory of God, monumentality, possession, admiration, magnificence, belittlement, and pessimism. The relationship of these concepts with gothic churches are presented in the following analyses.

ANALYSIS AND EVALUATIONS

In the first survey study, the responses given regarding the emotions experienced for the selected churches were gathered under the following concepts: "sacredness, power, splendidness, very large structure, curiosity, impotence, and gloominess". In the second survey study, these seven concepts were analyzed for each church in light of the responses given by the participating architects in Izmir, Konya, and Istanbul. İsmet Eşmeli conducted research where he examined the metaphors used for churches throughout the history of Christianity. For the purposes of this study, his analysis was adopted and is presented in the Table 1 below (Eşmeli, 2014, s. 953-966).

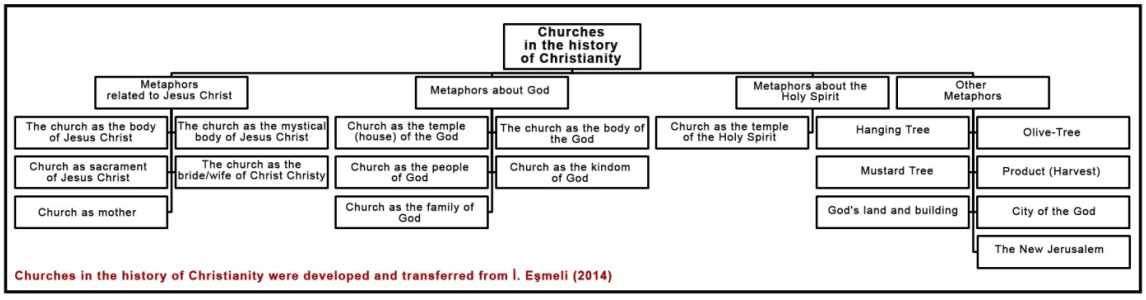


Table 1: Metaphors used for churches throughout the history of Christianity

Table 1 presents the categorization of the metaphors used for churches throughout the history of Christianity. Generally speaking, these metaphors are distinct from the metaphors used within the context

9 https://tr.wikipedia.org/wiki/St._Antuan_Katolik_Kilisesi (date of access: 11.02.2020)

of Jesus Christ, God, and the Holy Spirit. In contrast, meanings related to nature were ascribed to churches. In addition to the metaphors used for churches throughout the history of Christianity, concepts associated with gothic churches in the Turkish society were identified. These concepts are presented below in Table 2.

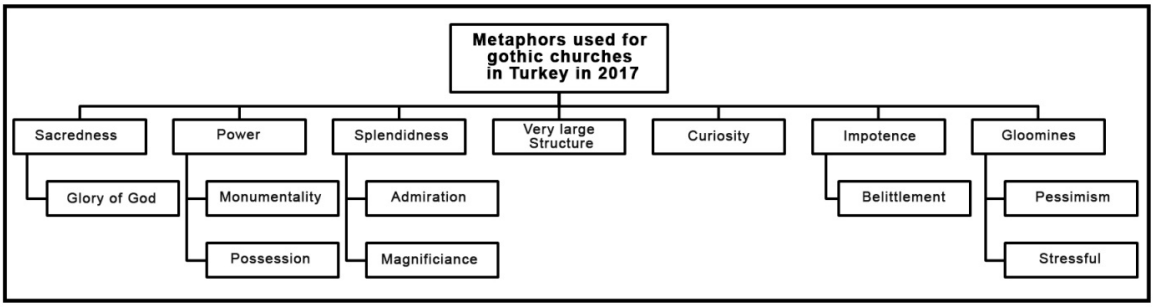


Table 2: Concepts used for gothic churches in Turkey

Table 2 displays how the meanings ascribed to churches particularly take shape for gothic churches in Turkey. Feelings experienced by people were gathered under main themes. As a result of the analyses, three main concepts were found. These concepts are described below.

Sacredness: In Latin, the sacred is defined as the sphere belonging to God (Kalın, 2014, s. 71). It is rare for a sacred place to lose this characteristic. These places may be transferred from one culture to another or from one religion to another (Kalın, 2014, s. 78).

Magnificence: According to the Turkish Language Society, the third meaning of magnificence refers to having a striking quality; in other words, being attractive.[10] In this study, magnificence indicated the significance of colors. Herman Cerrato claimed that red is the color of fire and blood; and therefore, it is associated with energy, battle, power, danger, and darkness (Cerrato, 2012, s. 4).

Curiosity: Curiosity is an intervention from the start (Leslie, 2014, s. 60). It does not arise when an individual has either low or high level of knowledge, astonishment and trust. This is because there is nothing to be curious about without knowledge, astonishment and trust. Similarly, higher levels of knowledge, astonishment and trust indicate the absence of curiosity because there will be no unknown point in such a case. Knowledge, astonishment and trust should be at a medium level in order for curiosity to arise because people wonder about cases they have little knowledge of; but the contrary is the case when they have in-depth or no knowledge of them (Leslie, 2014, s. 73,77,82). Jean Piaget asserted that curiosity is a cognitive activity that consists of our need to understand the world. According to this description, a person's curiosity arises when there is an incompatibility between one's expectations and the situation in real life (Leslie, 2014, s. 73).

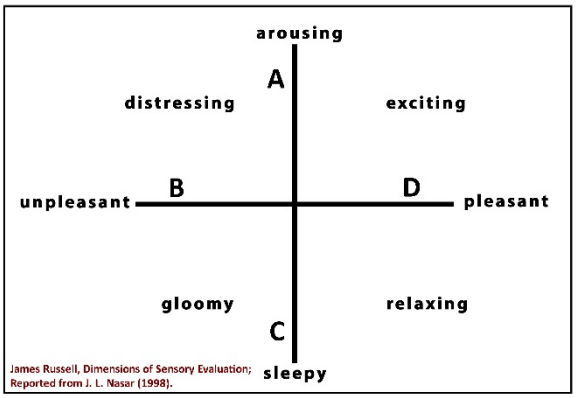
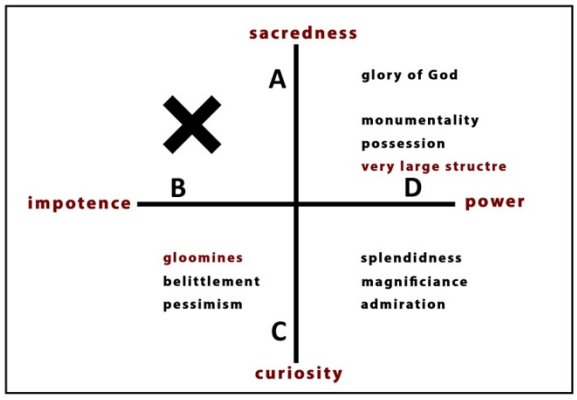


Table 3 delineates James Russell's dimensions of emotional evaluation. These dimensions include four main concepts: active, inactive, pleasant, and unpleasant. The concepts of distress, alertness, depression, and serenity are found among the four main themes.

10 see. https://dictionary.cambridge.org/tr/s%C3%B6zl%C3%BCk/ingilizce/attractive

Table 3: James Russell Dimensions of Emotional Evaluation (Nasar, 1998, s. 28)



Taking James Russell's study on churches as a basis, the classification of emotions obtained through surveys is presented in Table 4. Sacredness, power, curiosity, and impotence were identified as the main themes. Other responses, however, were also found among these concepts. There were no concepts that expressed the emotions of sacredness and impotence together.

Table 4. An Evaluation of James Russell's Study

The signs presented by churches were influential in the formation and transmission of these feelings. Semiotics enables the transmission of these feelings to the other party. It also helps us to discern the receiver-transceiver context of communication. Signs are only meaningful within a particular context. As a context, the church brings together the signs that constitute feelings. Our analyses identified the feelings that gothic churches aroused in people, while it also provided a definition for the existence of gothic churches.

After the establishment of Christianity as the official religion in Rome, Christianity first began to be disseminated in Anatolia, and later in the Balkans and Europe. This process brought political power to the church. While borders of many countries were changing due to the threats stemming from the North, the church, as it gained more power, began to pose a threat to the Empire. In the early and late scholastic periods, political struggles between popes, kings, and lords were common. Along with the increasing power of popes, a class of monks began to emerge, and they started building monasteries on the mountains. During this period, the church grew to become the center of power (Topakkaya, 2017, s. 15). Although the power of the church has fluctuated throughout history, today it still has an influential position. Table 5 outlines the categorization of churches selected for this study in terms of power.

According to the Turkish Language Society, the fourth meaning of power refers to a quality that has a large impact and significance.11 Gothic churches carry this meaning of power. The root meaning of the word power is "being able to do something" (Wood, 1990, s. 7). According to Nye, power is one's skill to realize their aims and goals. This skill endows us with the ability to do things and control others (Nye, 1990, s. 177). Historical conditions are influential in understanding the definition of power. Each period determines the components of power. Today, power refers to the skill an individual, a group or the state has in affecting other's behaviors in line with her own aims. It is the skill to overcome ideational disputes (Hacısalihoğlu, 2006, s. 7). Psycho-social and cultural power constitute the basis of social structure. It is a reflection of the historical process (Hacısalihoğlu, 2006, s. 10). Religion, an important element of culture, and gothic churches as structures of religion, involve a psycho-social and cultural power in themselves, and as such they influence people's behaviors and ideas in line with the goals of their own structure.

DISCUSSION AND CONCLUSION

Communication enables the coexistence of people living in a society. Today, it is realized more easily and quickly due to the advancements in technology. One does not really need to move from one place to another for communicating with others. Despite such positive outcomes of advancing technology, conventional forms of visual and sensual communication are now decreasing. Communication takes places between two systems, regardless of their qualities. There are also architectural elements among these

11 see. https://dictionary.cambridge.org/tr/s%C3%B6zl%C3%BCk/ingilizce/significance

systems. Architecture has an important place in communication. Architectural spaces are designed to arouse certain emotions and feelings in people. Semiotics play a prominent role in the transmission of these emotions and feelings to the other parties. The communication between buildings and people and the messages these buildings convey to people were determined in this survey study. In order to realize communication between these parties, information about the source needs to be transmitted to the receiver. This communication takes place within a particular context. When people as receivers and gothic churches as transmitters are placed within the context of this communication, we see that there are messages that churches impart to people. This study delineates the changes in communication between gothic churches, which has a particular architectural language, and people, as well as the factors that influence the transmitted messages, within the context of communication.

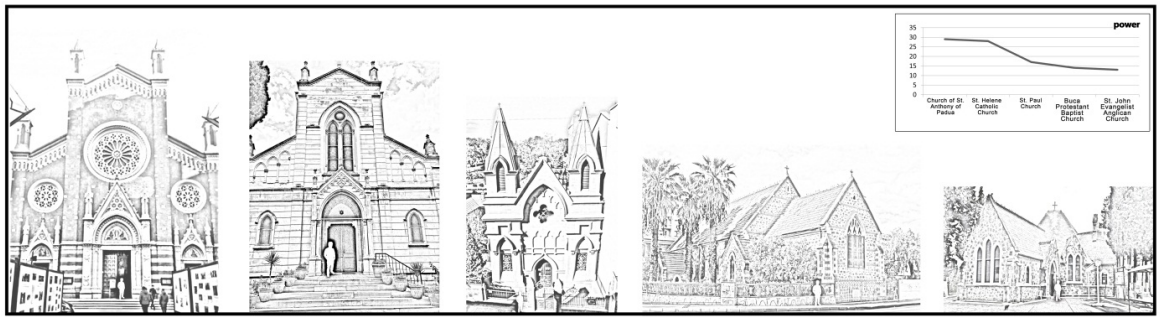


Table 5. The feeling of power in churches

Table 6. The feeling of splendidness in churches

When we look at Table 5, it can be argued that the feeling of power is directly proportionate to the heights of churches. According to Table 6, the feeling of splendidness displays an affinity in binary groups, except in the case of the Catholic Church of St. Anthony of Paudo. These binary groups included St. Paul Catholic Church and St. Helene Catholic Church on one side, and St. John Evangelist Anglican Church and Buca Protestant Baptist Church on the other side. This exception arises from the fact that, unlike other churches, the facade of the Catholic Church of St. Anthony of Padua is covered by red mosaics. In addition, there are two supporting structures around this church which serve to increase its grandeur. In comparison with the Catholic Church of St. Anthony of Paudo, St. Paul Catholic Church and St. Helene Catholic Church are more like to each other in terms of color and adornments. St. John Evangelist Anglican Church and Buca Protestant Baptist Church have similar heights and they both have stone façades. In terms of their sizes, these two churches are smaller than the other three churches. By and large, it can be said that the idea of splendidness is directly related to adornments and colors of the façade as well as the height of the structure.

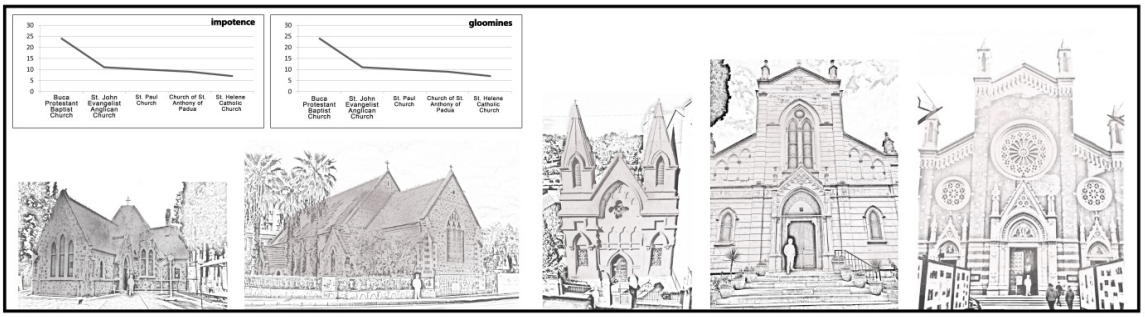


Table 7. Feeling of impotence and gloominess in churches

Table 7 shows that feelings of impotence and gloominess are related with small churches. For example, Buca Protestant Baptist Church is smaller compared to the other churches studied and is associated with the feelings of impotence and gloominess. Power and impotence are in opposition to each other. Table 6 outlines this situation, where the rankings of churches are presented in terms of power and impotence.

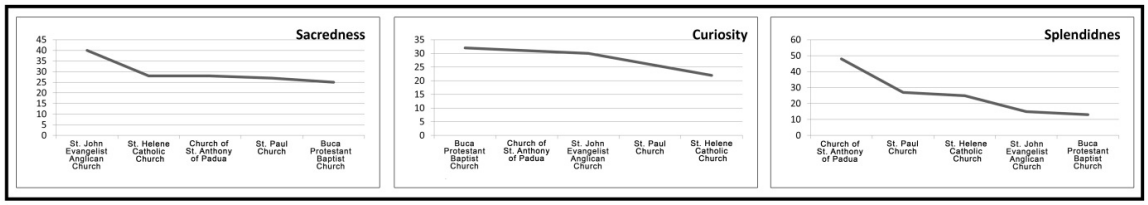


Table 8: Common feelings of sacredness-curiosity- splendidness in churches

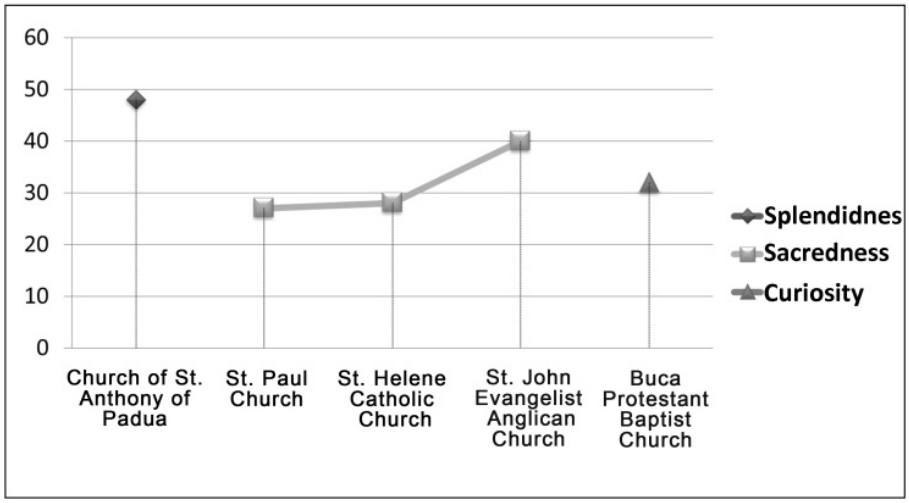


Table 9. Common feeling themes in churches

As a result of the analyses, the concepts of sacredness, curiosity, and splendidness were gathered under a common heading for the selected churches. It was found that the concepts of sacredness and curiosity were dominant for each church. The concept of splendidness varied in line with the colors on church facades and church heights. Gothic churches are distinguished by their colors, façade designs, and geometric forms.

Three main concepts were found as a result of the analyses, a finding of which allows for a new definition for gothic churches: “The gothic church, which embodies sacredness, also includes the emotions of curiosity and splendidness. Therefore, if there is sacredness, there is also splendidness and curiosity.”

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ALOIS RIEGL, TIME AND ARCHITECTURE: RE-INTERPRETING VALUE SYSTEMS

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ABSTRACT

The following essay was incited by our concern whether there is a tool or, even better, a theoretical context that influences and elaborates the manner of intervention in the diverse urban landscape, that is, the contemporary field of architectural practice. The complexity that characterizes the built environment is confirmed by the layers of history that remain resistant to contemporary dynamics of human activity. Space, indeed, is not a blank canvas; it is directly linked to time and time's remnants in the present. The relevant criticism upon these remnants—concerning aesthetics, form, function and ideology— affects architectural decisions. Thus, each subjective opinion and evaluation of heritage is also linked to time as it determines future design practices. Perhaps, then, we can argue not only that time claims materiality but also that space has a temporal dimension. What if space-related problems—concerning values assignation and architectural design—can be addressed as time-related problems? If values were sorted and defined in relation to time, heritage-based design issues might be handled more efficiently. Therefore, what is the role of time in attributing value to an architectural work? Time can be perceived only through the alteration of matter, itself spatially classified into forms that were, are and will be. In order to assess and signify each work according to time, the definition of certain criteria and their connection to past, present and future are considered essential. If these criteria are determined and prioritized per work through their association with time dimensions as stated, the manner of intervention can be formed. Our aim is to examine the relationship between time and architecture with reference to values. Time is analyzed through its threefold segregation and resultant theories; as established mainly by Bergson, Bachelard, Agamben and Augé. Concerning values, we refer to Alois Reigl's value system due to its relation to time; hence we examine it through these same time-related constructs. This analysis generates the necessity of reinterpretation and extension of Riegl's value system. The new set of values we propose can become a useful tool for future design decisions and reaffirms the great importance of time in the architectural process of synthesis and practice.

Keywords: Values, time, Riegl, monument, reinterpretation.

INTRODUCTION

The historical layers that manifest within structured spaces, both interior and exterior, constitute a composition of sorts—one that may be likened to a rhythmic, enduring mosaic of buildings that forms the contemporary image of the city. However, this image is constantly shifting, altering, creating new spatial qualities and engagements. How is this never-ending alteration related to the structures of space and the criteria by which they are crafted—and, as well, dismantled? What deserves to be preserved and why? How do we intervene in the existing built environment and, to more specifically, how do design decisions achieve coherence between them while embracing and endorsing new trends? The answer certainly is complicated, but perceiving built space as an assemblage of structures that either existed, exist or will exist, we comprehend that time—as it has material substance—constitutes a determinant factor on architectural decisions. Therefore, could we claim that such decisions, i.e., on preservation, restoration, demolition and the like, depend not only on the factor of space, but also on time as catalysts for the assignation of values and related management of architectural projects?

Seeking answers to the aforementioned questions, we examine the relationship between time and values through the interplay of time theories and the value system as developed by Alois Riegl.[1] The time theories result from an analysis of time's meaning and an assumption of the indisputable dominance of its linear dimension. The assumption of this linearity is legitimized through the continuum of singular events that characterize human life. (Agamben, 1993/2003; Bachelard, 1932/2013) According to the above, we will attempt a segregation of this broad inheritance into three subunits that serve to parse out—yet also connect—past, present and future. Therefore, we assert that, depending on the time dimension that is considered significant, a different perception of time prevails. These time perceptions are established by situations of consciousness, relating to *duration* and *rhythm*, *progress* and *reality*—elements that associate with and intensify, respectively, the past, the future, and the present.

1. THREEFOLD COMPOSITION OF TIME

If importance is attached to the past, time is considered finite and conceivable, accessible to us. (Augé, 2012/2015) According to the laws of time, all current actions and occurrences come to an end; it is obvious that, at some point, they will transcend their present state and move to the sphere of the past. (Agamben, 1993/2003) Past and future, the now, appear to be correlative and time introduces an immutable wholeness, which Bergson (1910/1950) defines as *duration*. Moreover, the past relates to the concepts of *rhythm* and *habit*, as Rupnel formulates them, based on the function of human consciousness. (Bachelard, 1932/2013) If the future is emphasized, it embodies the concept of *progress*, as it expresses the idea of a "chronologically oriented progressive process" (Agamben, 1993/2003, p.25). Progress is depicted in some cases by the addition of novel elements in recurring situations while, in other circumstances, by the denial of anterior situations. (Augé, 2012/2015) Last but not least, examining the present as the *dimensionless instant* that separates and merges past and future, we comprehend that it assures the continuum of time and becomes an essential attribute of that element. Thus, the instant—due to its experiential, fruitful, authentic nature—constitutes the human means of reality's composition and interpretation. (Agamben, 1993/2003; Bachelard, 1932/2013; Bergson, 1910/1950)

Subsequently, we define the present as the composer of time, providing the subject with a panoramic perspective of previous and forthcoming instants through the experiencing of the current moment. This perspective is our tool for synthesizing the temporal continuum, reformulating anterior situations and achieving their "making-present" (Delahaye, 2016, para.44) through innovations. (Agamben, 1993/2003; Pangalos, 2011) Consequently, we are driven to the assumption that the instant is the reference plane of both the past and the future—a phenomenon fixed in temporality but with existential privilege. (Bachelard, 1932/2013)

[1] The present essay is a condensed version of the dissertation of Olga Psarri and Myrto Venizelou at the National Technical University of Athens, School of Architecture (June 2019). Supervisor: tenured Assistant Professor Nikolaos-Ion Terzoglou.

2. CONCEPTS OF TIME AND MONUMENT

We argue that the concept of time is multidimensional and directly linked to the architectural way of thinking due to the amount of questions arising from their correlation:

“Why is the concept of repetition important to the presentation and the assessment of the past? Why and how is the lifespan of buildings used? Which is the emerging relation between the rational way of thinking and the architectural ‘use’ of time?” (Pangalos, 2011, p.79)

In order to examine the relation between time and architecture, we will refer to the value system proposed by Alois Riegl in his essay entitled Modern Cult of Monuments: Its Character and Its Origin. In this essay, Riegl (1999) formed a database as a referential framework for assigning values to artwork and condensing the current intervention trends in monuments. In the formation of this system the factor of time is decisive, since its passage can be perceived only through the alteration of matter, itself spatially classified into “forms that were, are and will be”. (Pangalos, 2011, p.26-27) Nevertheless, Riegl (1999) categorized values into *commemorative* and *present-day*, based on their relation either to the past or to the present.

We argue that Riegl’s theory can be regarded as an important design asset, applicable over time through various reinterpretations. The necessity of reinterpretation is based on the constantly increasing architectural diversity and the discovery of new foregone elements that can alter our attitude toward the past and redefine the management of future occurrences. (Pangalos, 2011)

Accordingly, we considered necessary the expansion both of the field of reference and the time frame of its application. This is being achieved in twofold fashion: with the addition of the future factor in the form of a third category of values—the evolutionary values—and a reinterpretation of the term *monument*. We mainly refer to the etymology of the word in Greek, originating from the ancient Greek verb *mimnḗskō*, which means to recall, to remember. In this sense, we can regard monument as a work of art that was created in a past time or is connected to the past through intense feelings and memories. (Riegl, 1999)

3. A DIALECTIC OF VALUES AND TIME

		VALUES CATEGORIES		
		COMMEMORATIVE VALUES	PRESENT-DAY VALUES	EVOLUTIONARY VALUES
TIME DIMENSIONS	PAST	Intentional Commemorative Value		
		Historical Value		
		Age-Value		
	PRESENT		Relative Art-Value	
			Use-Value	
	FUTURE			Essential Art-Value or Newness-Value

Table 1. Riegl's value system

The previously-cited theory of values indirectly includes temporal references, which we detected and by which we created a values-and-time dialectic with reference to their material expression. More specifically, in the commemorative values' category, *historical value* is related to the theory of habit, which is established through the permanence of material evidence intact throughout time. (Bachelard, 1932/2013; Riegl, 1999; Ravaisson, 1838/2008) This evidence concerns indicative points that refer to particular anterior moments they represent. The composition of these moments by consciousness and their spatial detection in permanent traces form a conceptual historical continuity. This process is eventually repeated, as new projects are constantly introduced. In that way, permanence and repetition form a rhythm. Thus, the remembrance of this rhythm comprises the expression of habit (Bachelard, 1932/2013).

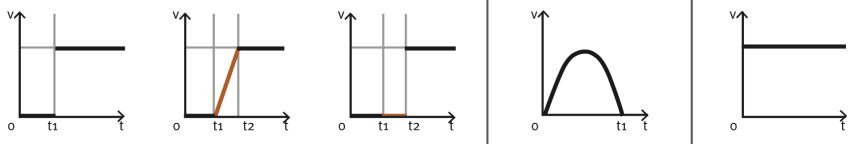
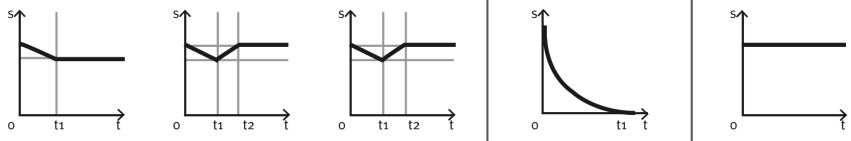
Because of the dominance of vision in the aforementioned synthetic process, we comprehend that historical value is directly proportional to the situation of the monument over time. In practice, the historical value has two aspects. The first is connected to the claim that the artwork is historically justified. Thus, the structure's preservation in its current condition when detected, or detracting features as may be produced by decay, disfigurations or additions can all be deemed as necessary. The second aspect concerns the claim of consistent style in monuments. Therefore, in this case, the required measures are the elimination or even alteration of additions to the monument in order to align with its initially original style. (Riegl, 1999) The restoration of Paris' Notre Dame by Viollet-le-Duc is a case in point. The restorer moved forward with modifications and additions which heightened not a clear historical form but rather one defined by conceptual unity, structural adequacy and stylistic coherence—elements that, taken together, enabled a historical symbolism, rigidly consistent with the original architectural style, which imbued the structure with an equally consistent expression. (Spurr, 2012).

Similarly, *age-value* associates with the concept of duration, namely the historical and chronological continuity—that is, comprised of the traces of former moments combined with current and following ones.

(Agamben, 1993/2003; Simmel, 1958) Point of direct interest, in this case, is the past itself, as an archive of all previous moments that are imprinted onto the creation and imply the passing and the fluidity of time. (Riegl, 1999) This consideration of the past is evident in the monument, specifically—according to Simmel (1958)—in its patina, in the material expression of time imprinted upon it. Thereby, the current form of the monument is shaped by the action of natural forces. This action—following completion of the monument's creation—aims at its return to an initial, amorphous state and to its integration into the surroundings; accordingly, we comprehend that the more ruined the creation is, the less extensive its spatial substance and the more sensible the effect of time on it (Riegl, 1999).

Concerning age-value's practical implementation, every action which prevents the natural development of the artifact, and also, every human's interference which aims to its premature destruction are condemned. (Ruskin, 1849) However, human presence is to be welcomed and anticipated since it leads to the artwork's gradual decay and the tracking of human history. Thus, destruction and decay are desired interferences insofar as they occur gently, steadily, and inevitably. (Riegl, 1999) The marks of decay—according to the art critic John Ruskin—are the ones that grant allure and richness to the creation (Spurr, 2012).

Lastly, *intentional commemorative value* relates to the static, uncorrupted nature of the moment: while referring to a former situation, it aims for its constant making-present; hence, constitutes a transition to present-day values. The reinstatement and revival of each given occurrence, immutable in the present, is achieved through matter (Agamben, 1993/2003). Time, in this case, is captured, dilated, and subdued to the permanent human work of art (Pangalos, 2011). Consequently, the monument requires suppression and deceleration of natural forces in furtherance of its preservation as the original structure, authentic and imperishable in perpetuity. Accordingly, its value remains intact in the long term. (Riegl, 1999)

	COMMEMORATIVE		
	HISTORICAL VALUE	AGE-VALUE	INTENTIONAL COMMEMORATIVE VALUE
VALUE (V) / TIME (t)			
MONUMENT'S STATE (S) / TIME (t)			

*where t=o the moment of the monument's creation, t1 the moment of its value's recognition and its conservation at the current state and t2 the moment of its restoration

*where t=o the moment of the monument's creation and t1 the moment of its destruction

Table 2. Correlations between commemorative values and time

As for the category of present-day values, the *relative, modern art-value* relates to the authentic moment that ensures time continuity while recognizing relevant elements in past works (in which resides a promising perspective). In particular, the aesthetic satisfaction one receives at the sight of an artwork fully characterizes its pure artistic assertion. This primarily concerns the present, hence the term modern. Secondarily, it hearkens to the past as it is formed in relation to the artistic qualities of anterior works—hence the term relative (Augé, 2012/2015; Agamben, 1993/2003). It is thus possible to speak of creating a broader approach framework of art-value in which the spatial-temporal chain of former works is recognized as an evolutionary process (Riegl, 1999).

In practice, this framework requires the status of a work—current or primary—to be maintained, provided the creation is composed of contemporary elements in terms of conception, form, color, and style. It is neglected and destroyed if considered to be devoid of artistic value. Thus, through a process of making-present elements of the past (as are considered adequate in terms of their contemporaneity) are redefined. (Augé, 2012/2015). This process could be applied as a revival of the elements of the classical syntax in a new work, following a selective sorting of some and their enhancement in their purely elemental dimension (Terzoglou, 2009).

Respectively, a structure's *use-value* is interpreted through the experiential nature of the instant. We refer to the instant when the artifact is experienced, time dilates through the stimulation of human senses and as the subjective interpretation of reality in question is formed (Agamben, 1993/2003; Augé, 2012/2015). The instant the architectural work is used is the moment when the experiential aspect of time faces the objective; it is one that contributes to the preservation and permanence of the project in space. It seems, therefore, that through experience, by remembering past moments, one is able to connect with the past and shape his/her own modern interpretation (Pangalos, 2011). Thus, in the Punta della Dogana Museum, while the modern use requirements are satisfied, they harmoniously coexist with its old shell. At the same time, the prominence of the patina upon its shell stimulates the visitor's senses and enhances the experience of the space.

Therefore, it is evident that the need to inhabit and use a monument can be detrimental to it. Conversely, though, that use is also necessary, indeed, it is the reason for a building's existence and persistence over time, an integral factor in its natural life cycle (Riegl, 1999; Agamben, 1993/2003). However, the more severe the damage to the monument, the lower its use value; the negative assertion of the monument occurs when it is already entirely unsuitable for use and decay begins.

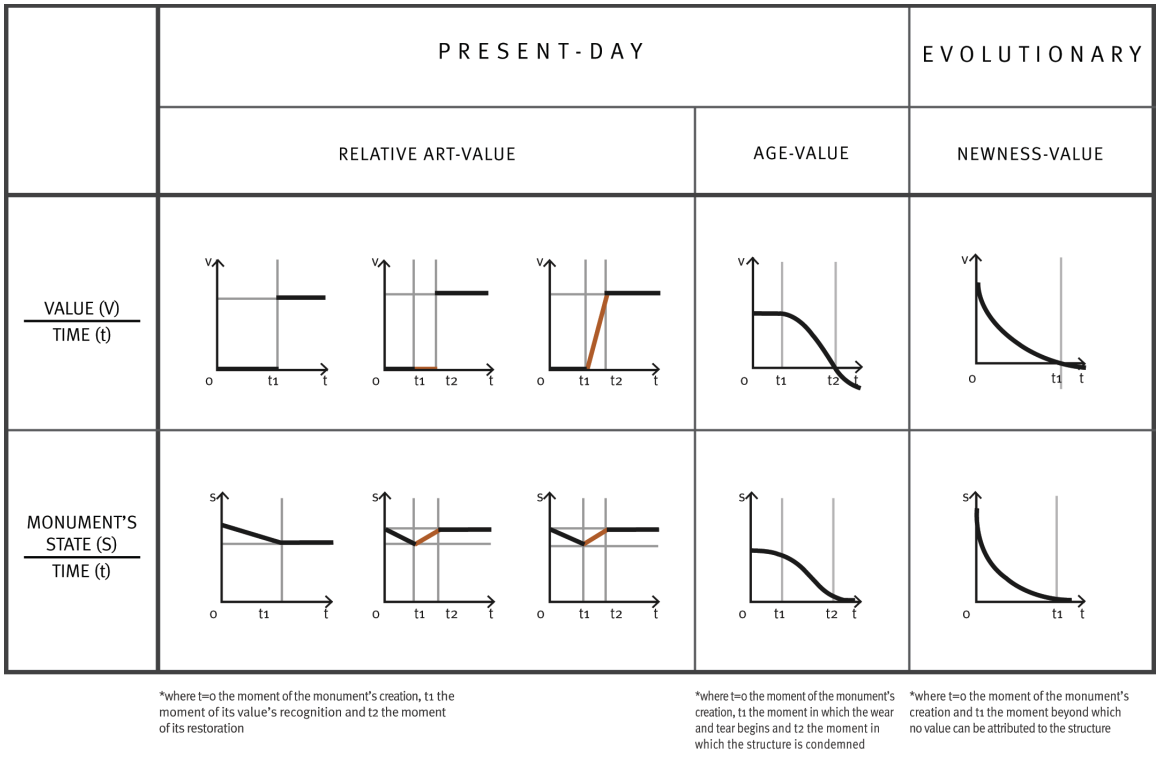


Table 3. Correlations between present-day values and time/ Correlations between evolutionary values and time

Despite the fact that a structure's *newness-value*—according to Riegl (1999)—is intertwined with the present, we propose its inclusion in the proposed *evolutionary values*. This is due to its relation to evolution and progress, either through the theory of denial of past elements in a monument or by adding innovations to their repetition. As the newness value seems to be traced in any whole and new work that provokes us and draws attention—as something unprecedented and unrepeatable in terms of form, color, or conception—its visual distinction from anything precedent is required (Riegl, 1999; Terzoglou, 2009). Case in point is the Bauhaus Dessau Building due to implementation of the conception of the interior that revealed itself to the public. Essentially, the aforementioned innovative element of its conception—compared to respective others— was the one that led to progress (Pangalos, 2011).

The newness value is also linked to liberation from anything that belongs to the past and to the denial of any style-related obsolete element—as may stem from that style, construction of a work, or the perceptions that it represents. Such an artifact, characterized by the success of its liberation from the past, is usually an unpredictable spectacle (Ravaisson, 1838/2008). However, it is worth noting that each new artwork at some point becomes accustomed and is recognized as obsolete; hence the newness value decreases over time.

However, in order to further strengthen the timeless and crucial importance of time in defining the value system, it is worth mentioning the present as a field of continuous change that makes its apparent mark on space. These marks on the architectural works can create more and more conflicts of values while, at the same time, forging connections between them that contribute to the predominance of one theory or intervention over another. To fully understand these complex relationships, a reinterpretation of values through the present is required. We therefore propose a value system that is consistently valid through its various reinterpretations while, at the same time, always maintaining its origin in Alois Riegl's theory. Through this reinterpretation, we propose a new complex of values that projects and expresses their elaborate temporal character.

4. TOWARDS A RE-INTERPRETATION OF VALUES

More precisely, a structure's historical value is associated with the present, since foregone concepts can be approached from a new perspective through the preserved monuments (Pangalos, 2011; Agamben, 1993/2003). Consequently, according to these remnants, a perception of history, one that intensifies and supports present decision-making, is structured. History is transformed into a design tool by its making-present; in this regard, the present can be perceived as “the genuine time of history’s creation” (Agamben, 1993/2003, p.37) by the historical value’s claim (Pangalos, 2011).

When interest lies in preserving the monument as historical justification, we propose using the term *evidence value*. *Style value* denotes decisions related to the preservation or restoration of works with an initial and consistent style (Riegl, 1999). Such a creation, able to be asserted for such a cohesive style, is Le Corbusier’s Villa Savoye—a building that incorporates the five points of architecture and thus can be categorized as fitting squarely within the modern movement (Tournikiotis, class lecture, September 9, 2015).

The age-value is preserved unaltered, as it expresses the concept of duration completely, while, at the same time, connecting with the present. This assumption is evident through the presence of traces upon the creation (which imply the recognition of the past at the present time). The coexistence of these traces and the addition of new ones form a cohesive panorama—one, that reconciles the difference between past and present. (Simmel, 1958) “Matter becomes a temporal passage to the past” (Pangalos, 2011, p.85), while being connected with “defined expectations for the present and the future” (Pangalos, 2011, p.80).

In this attribution of balance and unity to contradicted elements lies the aesthetic satisfaction of the viewer at the sight of corrosion or destruction of human works as part of a surrender to nature’s laws. As an expansion of age-value, we recommend the term *value of the everlasting*, since the allure of ruins, representing the expendability of materiality and fostering the idea of a progressive permanence in space, will always be acknowledged (Bachelard, 1932/2013; Simmel, 1958).

The progression that derives from the passage of time changes the nature of the work with the constant addition of surfaces that eradicate and, at the same time, cover the initial level under a patina. If changes attending the passage of time were to be examined, they could be predicted and pre-designed in a new work—thus forming a tool for synthesis. (Mostafavi & Leatherbarrow, 1993) The now predesigned endless procedure of remaking triggers a dialectical relation between the work's future aspect and its current one.

This shift to the future can lead us from age-value to a new measure, *foresight value*. In this case, the design is not perfected by completion of the creation; it can only be achieved through changes that arise from the effects of time. A similar design approach is detected not only in Carlo Scarpa's Brion Vega Cemetery (Great Buildings, n.d.)—where a lyrical architecture based on the concepts of time and the ephemeral is promoted—but also in the implementation of rusticated surfaces on building facades in general (Mostafavi & Leatherbarrow, 1993).

As for the intentional commemorative value, we suggest its expansion to another new criterion, *immanence value*. The underlying theory is closely related to the present because of the material evidence (and their respective former occurrences) that persist in the present space and enable one to mentally proceed to the past. (Foucault, 1984) This transition is achieved over experience and sensation, as in the case of the Holocaust Memorial in Berlin, where, with no intention of replicating such an incident, an experience of contemplation, loss, and memory as well is fostered (Eisenman Architects, n.d.). Therefore, anything that persists allows its multiple reinterpretations towards progression (Bachelard, 1932/2013). This possibility, as created by direct experience, constitutes the main design principle regarding this value.

As relative art value is linked to the authentic instant of the present, we recommend its bifurcation into two sub-values: *value of the everlasting* and *contemporaneity value*. Value of the everlasting could be assigned to new artworks, provided that they contain elements related to the past—which are constantly repeated through the passage of time and yet do not forfeit their place in modernity. (Augé, 2012/2015) At the sight of these elements, a pure beauty emerges, in which one realizes a permanence in comparison to an ephemeral life. Such indicative elements could be order and symmetry in architectural works. In fact, the value of the everlasting indicates the depth of cultural time (as measured and expressed through architectural constructions) (Pallasmaa, 2007).

As for contemporaneity value, this quality is commonly detected in new works that use the past as a dynamic archive and a comparative tool for their legalization. (Terzoglou, 2009) The aforementioned works—as contribute to the configuration of this archive—consist of past elements that are carried to the present to lead to its evolution (Foucault, 1984). Thus, an individual is capable of redefining the past—through the act of making-present—and being spiritually or emotionally connected with non-contemporary elements that, from one's perspective, are relevant. When it comes to design, the contemporaneity value is commonly used to legitimize a present-day architectural approach by constructing mechanisms of imitation or correlation with works and concepts of the past (Terzoglou, 2009).

Use value can be re-interpreted as *experience value*, since it is related to the experiential instant (in which a more authentic relation between the user and the building shell emerges). In such architectural works—that project the experiential value and where the duration of time is conceived—one can perceive the real dimension of time, its quality (Bergson, 1910/1950).

As building shells fail to follow the expeditious growth of human needs, the idea of finishing a work at the moment of its creation is abolished (Pangalos, 2011). Thus, the requirement of buildings' adaptability and their "smart behavior" are introduced so that not only will they last longer, but also will maintain their functionality over time. Therefore, we propose a category termed the *adaptability value*.

The newness-value is preserved unaltered, as it expresses the concepts of evolution and progress altogether. However, its connection with the past is worth mentioning, as through the juxtaposition of old with new, newness value is attributed to the latter. The adaptive reuse of a building shell is itself a case in point, as it creates a present state of merging by the interpenetration of old and new moments (Bergson, 1910/1950). This permanent interaction expands time; thus, it can be described as an additive progress (Augé, 2012/2015).

A further dimension of newness value is termed *foresight value*. This measure utilizes the repetition of progressive past elements in order to imagine and introduce novel elements in advance. We are referring to the ability to predict the unexpected, assess and control the work progress during its lifespan (Bachelard, 1932/2013; Pangalos, 2011). In practice, architectural design itself is already a prediction of the innovative work, while as Panagiotis Pangalos (2011) mentioned:

"Design is a temporal pro-gram [and] its substance is in the prefix pro-" (p.25), which etymologically originates from the Latin preposition *prō*, akin to pre-, and signifies before in time or place. Thus, architectural design is based on the acts of "pre-paring, pro-viding and pre-dicting spatial states before their construction" (p.25).

Similarly, the newness-value connects with the present. An artifact, through its current dynamic, tends to be disengaged from known construction methods and to search for new ones. When this negative sentiment is detected in a work, the latter one seems to be able to adapt to the prevailing dynamic of the present (Agamben, 1993/2003). Thus, we expand the newness value to the *adaptability value*. In practice, what entirely represents this measure is the idea of creating a work that itself serves as a trigger for society's progression (Bachelard, 1932/2013). Centre Pompidou is a striking example in this case. The creators relied upon a machine-like logic and employed new technologies in order to achieve its adaptable function. As a result, the building itself will be able to cope with its current demands as well as those in the future, i.e., throughout its lifespan (Rogers Stirk Harbour + Partners, n.d.).

Last but not least, we suggest the *value of the unexpected* as a new aspect of the newness-value. This value derives from the structure's connection with the past and the present through the concepts of repetition and denial. A work's complete differentiation from anything preexisting is considered to be a prerequisite. Consequently, the aforementioned intentional comparison with and differentiation from past creations are this value's design requirements. If the relational nature of an object's identity is comprehended, its complete distinction from anything else is what renders it radically innovative (Agamben, 1993/2003; Ravaisson, 1838/2008). Thus, a building can claim the value of the unexpected—mainly through its form and the produced overbearing image that is responsible for time's discontinuation (Augé, 2012/2015). This perception of the unexpected and liberation from historical forms are pursued by the architects Peter Eisenman and Richard Trott in the Wexner Center for the Arts. The historical references are only used in order to be rejected; typical architectural elements are deprived of their function and renounce the spatial conventions—effectively creating, in this manner, the so-called "semantic distortion." (Pangalos, 2011, p.24; Langdon, 2014).

TIME DIMENSIONS		VALUES CATEGORIES		
		PAST VALUES	PRESENT VALUES	FUTURE VALUES
	PAST	Intentional Commemorative Value	Immanence Value	
		Historical Value		
		Evidence Value / Style Value		
		Age-Value	Value of the Everlasting	Foresight Value
	PRESENT	Value of the Everlasting	Relative Art-Value	
			Contemporaneity Value	
			Use-Value	Adaptability Value
			Experience Value	
	FUTURE	Foresight Value	Adaptability Value	Essential Art-Value or Newness-Value
				Value of the Unexpected

Table 4. Value system's reinterpretation

5. TIME, SYNTHESIS AND PRACTICE

In conclusion, through their synthesis at the present time, Riegl's values have been expanded. The extensive mention of values that initially associate with the future is due to an aggravation of the diverse architectural issues. These issues are deduced from the coexistence of the increasingly challenging social needs and the restrictions accompanying tracing and accessing of the built environment's historical layers. The above-mentioned conditions, practically, direct the design in applying innovative approaches that dialogue with past forms.

Thus, new potential prospects of the proposed value system are emerging. The presented analysis could constitute a new tool for critical identification, mapping of the building stock and, as well, creating a theoretical background for its understanding (with time serving as the common point of departure for the above). The new temporally-defined values can become not only a source of inspiration, but also a starting

point for heritage-based design decisions concerning modification of an existing shell and the integration of new buildings in a preexisting architecturally-sensitive environment.

Therefore, we can't help but wonder, is architectural design also a matter of time?

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THE PANDEMIC AND THE CITY

URBAN PLANNING FOR THE ERA OF NEW NORMAL AFTER COVID-19

CHULOH JUNG, JIHAD AWAD, NAHLA AL QASSIMI, BASSIM SALEH

ABSTRACT

2020 is a year of the unprecedented change to our daily life, economy and culture. The Covid-19, which was declared to be a pandemic on 11 March 2020, had caused 41,570,883 cases and 1,134,940 deaths as of today. Many people in the rural areas of developing countries and in the Third World live below the conditions of living in the 19th century. The poor who are unable to work in low-wage factories are exploiting natural resources through illegal production and trade in underground and informal economic fields. Based on World bank projection, 6 to 8 percent of the global population (49 million) will be drove into extreme poverty due to current covid-19 situation and these new poor in new normal era will come from mostly high-density cities. According to the level of socio-economic development, covid-19 is having different effects on urban residents even in the same city. This kind of urban inequality will put urban residents in great dangers if the realities are keeping being ignored. Compared to many pandemics in history, there are no differences in causes and reasons of Covid-19. Pandemics in history had occurred at a time when the global economy was highly competitive, exchanges with foreign countries increased, and the movement of people rapidly increased just like nowadays. To resolve this urban inequality in urban planning in post Covid-19 city, the scale and control of the movement of people and goods should be carefully planned from the initial phase. It is crucial to control urban functions and land use since Corona-19 pandemic is also a hygiene problem in traded products. It is necessary to establish an independent space unit. It is necessary to consider multi-regional unit plans with quarantine and basic production systems.

Keywords: Covid-19, post-pandemic, urban planning, urban inequality, density control.

1. INTRODUCTION

2020 is a year that bring an unprecedented change not only to our daily life, but also to our economy and culture. The novel coronavirus pandemic, known as Covid-19, is a predicted pandemic that came in 100 years after Spanish Flu (Walsh, 2020). It was announced by WHO (World Health Organization) as a public-health emergency in global scale on 30 January 2020, and then was declared to be a pandemic on 11 March 2020 (WHO, 2020). The world's confirmed cases of COVID-19 reaches 41,570,883 and death toll reaches 1,134,940 as of today (Figure 1) and the majority of which occur in United States, Europe, and Southeast Asia (Figure 2). Unprecedented travel bans and city lockdowns have been implemented in countries all over the world (Graham-Harrison, 2020). Despite pandemic warnings from epidemiologists, most governments and politicians were shrinking rather than investing more in medical facilities or urban environments (Staples, 2006). For economic efficiency, the spread of high density in large cities has been intensified (Giuliano, Kang & Yuan, 2019). The fundamental birth of urban planning was forgotten since there have been no pandemics around the world for 100 years, even though there have been few local epidemics, but Covid-19 had created an opportunity to introspect the methods of urban planning.

In this article, it will be examined how cities have changed in history with high relevance to economic and social development as well as infectious diseases and sanitation and based on that, the direction of urban planning in the 21st century that can respond to Corona 19 would be explored.

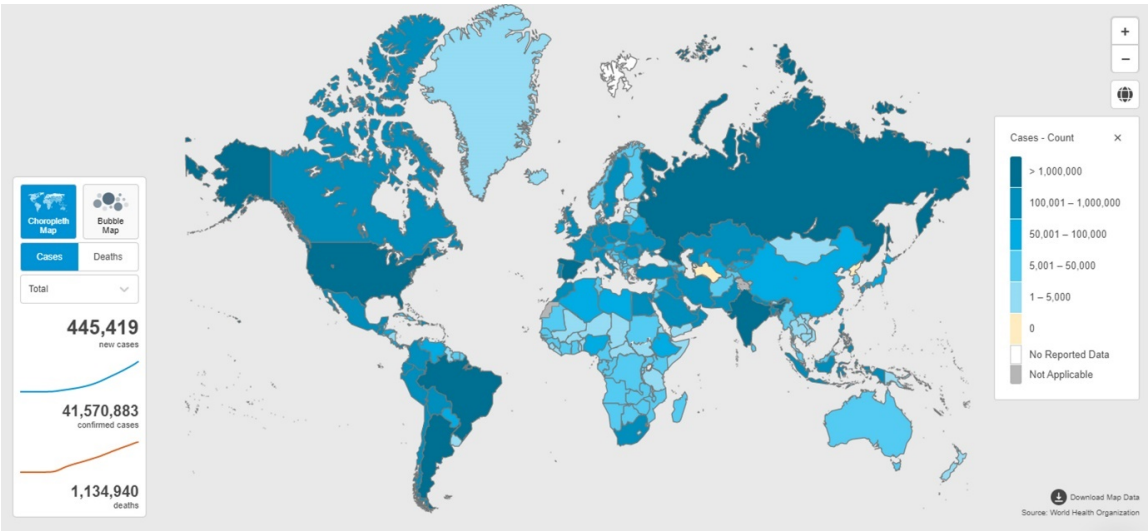

Figure 1. Map of Covid-19 cases in the world (Source: World Health Organization)

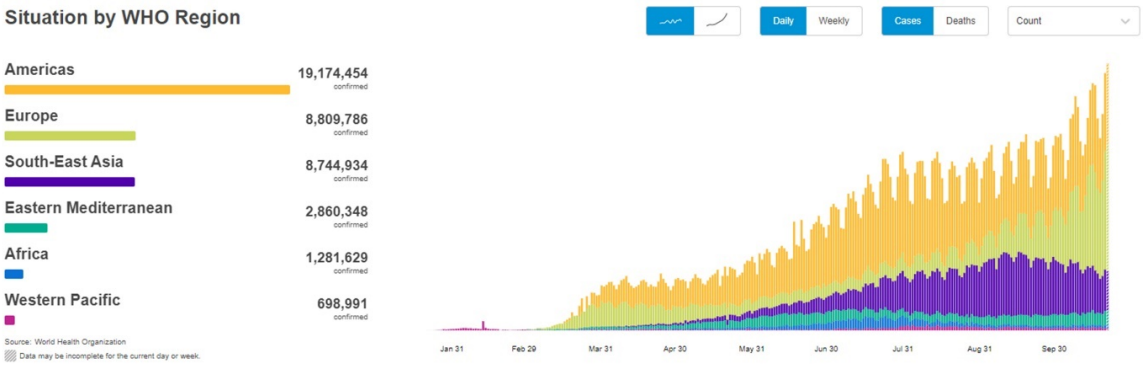

Figure 2. Covid-19 situation by WHO Region (Source: World Health Organization)

2. COVID-19 IN HISTORICAL CONTEXT

The epidemics in the 21st century are cutting across the world much faster and farther than ever, but humanity had always fought natural disasters and diseases. In history, it is easy to find data that humanity was threatened by an infectious disease even before 5,000 BC (Jenkinson, 2020). From around the 5th century to the 18th century, the plague pandemic, mainly transmitted by rats, spread among large cities with nigher population, and from the 18th to the 20th century, the cholera pandemic spread through water. In the 20th century, the HxNx flu, spread due to airborne infection, was prevalent, and in recent years, SARS and MERS, caused by the coronavirus, were prevalent (Table 1).

These pandemics were the cause of the decline in population of each continent in each era and had a great impact on cities and countries. Roman plaques in the 6th century had occurred when urbanization became extremely severe and had led them to the onset of Roman empire's collapse (Rosen, 2008). The 14th-century Black Death plague, caused by rats from Asia, estimates that 40% of the population died in Italy alone (Kelly, 2006). It took 500 years for the population of Europe to be recovered to that of pre-14th-century pandemic. It is also said that Black Death had a great influence on the beginning of the Italian Renaissance (Deming, 2012). Due to these sanitation issues, the idea of improving the urban environment was raised, and it was assumed that the ideal city theory came from this background. After the First Industrial Revolution, large cities in Europe renovated cities to demolish the harsh conditions of medieval cities and built wide roads and city parks (Friedrichs, 2002). From the 19th century, in response to the cholera pandemic, infrastructure construction for the water supply and sewage system and the mandatory flush toilet in houses were promoted at the same time (Lenger, 2012).

Name	Time Period	Type/Pre-Human Host	Death Toll
Antonine Plague	165-180	Believed to be either smallpox or measles	5M
Japanese smallpox epidemic	735-737	Variola major virus	1M
Plague of Justinian	541-542	Yersinia pestis bacteria/ Rats, fleas	30-50M
Black Death	1347-1351	Yersinia pestis bacteria/ Rats, fleas	200M
New World Smallpox Outbreak	1520 – onwards	Variola major virus	56M
Great Plague of London	1665	Yersinia pestis bacteria/ Rats, fleas	100,000
Italian plague	1629-1631	Yersinia pestis bacteria/ Rats, fleas	1M
Cholera Pandemics 1-6	1817-1923	V. cholerae bacteria	1M+
Third Plague	1885	Yersinia pestis bacteria/ Rats, fleas	12M (China & India)
Yellow Fever	Late 1800s	Virus / Mosquitoes	100,000-150,000 (U.S.)
Russian Flu	1889-1890	Believed to be H2N2	1M

		(avian origin)	
Spanish Flu	1918-1919	H1N1 virus/Pigs	40-50M
Asian Flu	1957-1958	H2N2 virus	1.1M
Hong Kong Flu	1968-1970	H3N2 virus	1M
HIV/AIDS	1981-present	Virus / Chimpanzees	25-35M
Swine Flu	2009-2010	H1N1 virus / Pigs	200,000
SARS	2002-2003	Coronavirus / Bats, Civets	770
Ebola	2014-2016	Ebolavirus / Wild animals	11,000
MERS	2015-Present	Coronavirus / Bats, camels	850
COVID-19	2019-Present	Coronavirus – Unknown (Possibly pangolins)	1.13M

Note: Many of the death toll numbers listed above are best estimates based on available research. Some, such as the Plague of Justinian and Swine Flu, are subject to debate based on new evidence.

Table 1. A Timeline of Historical Pandemics (Source: Visualizing the History of Pandemics)

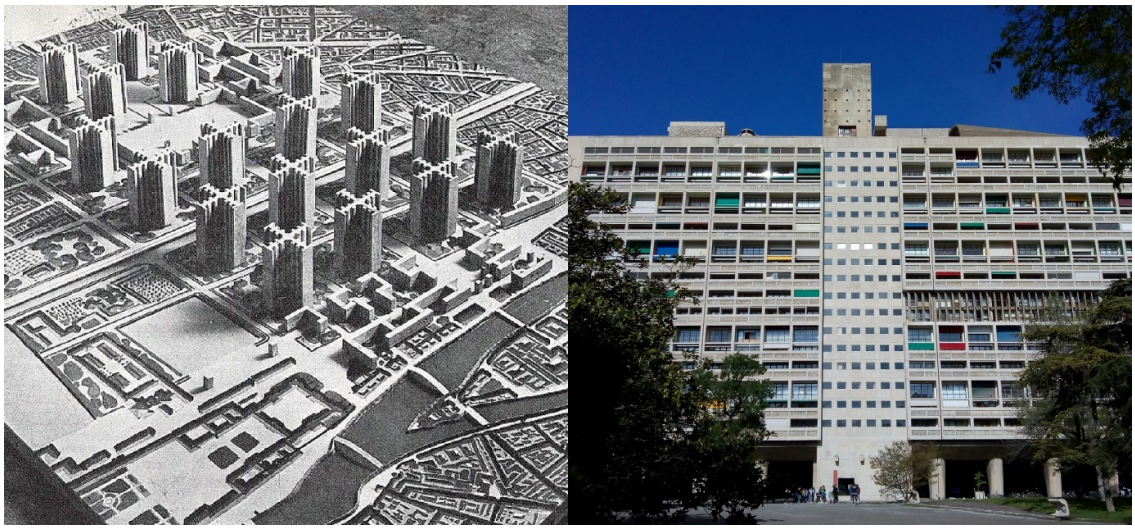

Figure 3. The Ville Radieuse (Left) and Unite D'habitation (Right) of Le Corbusier (Source: Wikipedia.com)

The death toll of Spanish flu pandemic in 1918 was estimated in 100 million people and had a major impact on urban, architectural and sanitation policies (Locke, 2020). This is because it appeared in a dense and poor residential environment (Holt, 2002). Bauhaus, which can be seen as the beginning of modern

architecture, can be seen as a project to provide healthy housing to the working class (Dearstyne & Spaeth, 2014). Modernism was a search not only for the interior of the house but also for the residential environment as a whole. The Ville Radieuse and Unite D'habitation of Le Corbusier are the blueprints of a new modern city, and the idea of creating a city technically while putting an emphasis on the sunlight and natural ventilation (Ottmann & Konig, 2019). In the United States, Frank Lloyd Wright had suggested Broadacre City to propose a low-density self-sufficient city and Ebenezer Howard's Garden City Movement took place to create a medium-density rural city in the UK.

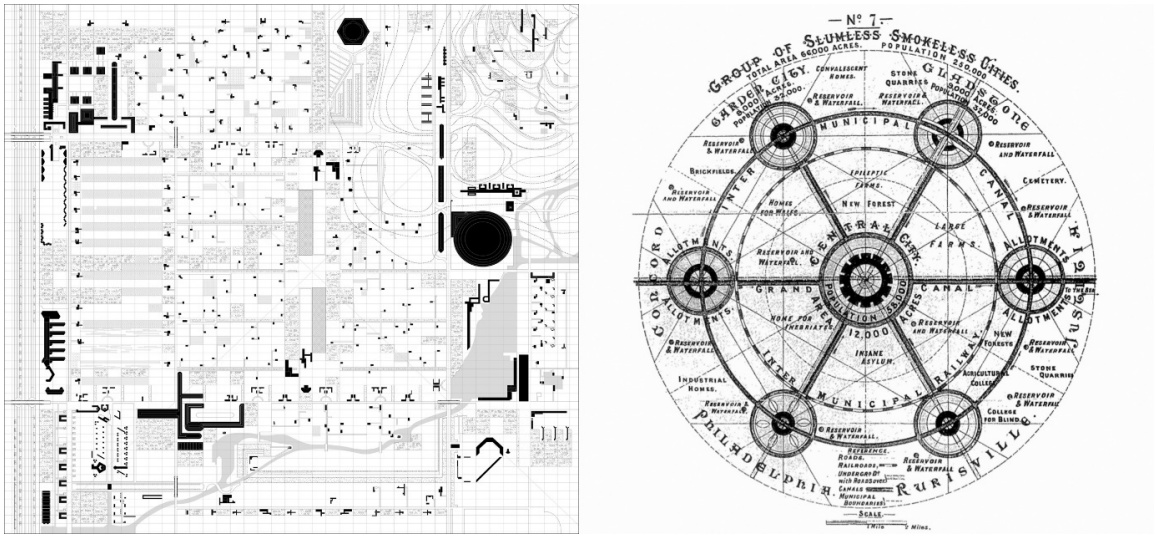

Figure 4. Frank Lloyd Wright's Broadacre City (Left) and Ebenezer Howard's Garden City (Right) (Source: www.wikipedia.com)

There have been three coronavirus pandemics in the 21st century such as SARS (Severe Acute Respiratory Syndrome) in 2004, MERS (Middle East Respiratory Syndrome) in 2014, and the current Covid-19 pandemic. The virus described above has been passed mainly from wild animals to humans. The reason that these diseases have spread as a pandemic, however, is that firstly, air transmission is faster than other pandemics, and secondly, air travel is possible, and the worldwide infection spreads rapidly (Hewings-Martin, 2020). In addition, many human activities have changed into a form of close contact in a high-density environment. SARS, MERS and Covid-19 have been found to be more severe especially in highly populated cities in the world and it presents new urban planning challenges.

3. PANDEMIC, ECONOMY AND CITY

By analyzing the reason why the biggest pandemics in history occurred in specific time, it is possible to find out the reasons for their occurrence and spread and the relationship between economy and urban development (Zakaria, 2020).

The period when there was no pandemic in history was between 11th and 13th century in Europe (Wickham, 2016). It was a period in which movement was extremely limited as it was divided into a feudal state after the fall of the Roman Empire and was based on a self-sufficient agriculture. It can be said that this was the time when society lived in harmony with nature due to lack of organizational ability. In the late 13th to early 14th centuries before the first pandemic, however, the population of Europe was almost the same as that of the 19th century, and the population of cities increased rapidly (Davies, 1998). In order to secure food and trade high value-added goods, ancient merchants began to travel the world to trade further and bring diseases from new regions to Europe. They began sailing for the spices of Asia, discovered the American continent, and advanced to India, Indonesia and Japan. From the late Middle Ages to the industrial era, European countries expanded their territory, secured natural resources, and raised the power of the state, and all resources were used to build the empire. This political necessity to extend outward and colonize was also influenced by nature. Even after the declination of the population between the 17th and 19th

centuries, famine intensified due to the deterioration of global climate, there was no choice but to leave to find a better climate and land. Many historians believe that Genghis Khan's Mongol armies had invaded Europe and China between the 11th and 14th centuries because of the shortage of food due to climate change in Asia (Chamber, 2003).

Figure 5. Factory worker's housing in London in 19th Century (Left) and Chinese Railroad Worker housing in America in 19th Century (Right) (Source: www.wikipedia.com)

Cholera was a disease that only existed in Asia, but the outbreak of the cholera pandemic was due to the global movement of not only goods but also labor force in the industrial era (Quinlan, 2020). Chinese workers come into contact with local residents in unclean urban environments in the United States and Europe, which has led to secondary infection. As transportation became faster and faster, cholera in Asia quickly spread around the world. Whether it was an imperial home country or a colony, all the cities with poor water and sewage systems in the 19th century were good environments for cholera outbreaks (Williamson, 1990). The density and the level of hygiene of the residential environment of factory workers in British industrial cities had reached an extreme low (Figure 5).

In the early 20th century, when influenza emerged as a dangerous epidemic disease, industrialization, urbanization, and World War I made inexpensive food supply urgent, and the agricultural and livestock industry began to be factorized. The unsanitary livestock environment soon led to chicken and swine flu and became the cause of the Spanish flu (Hadfield, 2020).

Considering the early 21st century when series of coronavirus outbreak, the continuous global economic slowdown after the global economic crisis of 1998 and 2008 had intensified the competition among countries. Global cities had fierce competition due to the globalization of production lines and the vitalization of the tourism industry, and the movement of capital and population had increased significantly due to changes in digital and aviation technologies. In order to solve the donut effect which make city center more empty, as businesses and people move into the outskirt of the city since the 1990s, metropolitan cities had reached the era of urban renaissance, and have become more flamboyant amid global competition (Luenendonk, 2015). To be a renowned global city, it was necessary to have at least one or two iconic skyscrapers and moreover a large-scale convention center is a new form of architecture in the 21st century (Van Uffelen, 2012). Based on the theory of high-density development to overcome the environmental problems of low-density cities in the United States, cities in East Asia and Latin America had pursued higher-density urban development (Figure 6).

Figure 6. High-rise/high density apartment in Singapore (Left) and High-rise/high density apartment in Hong Kong (Right) (Source: www.wikipedia.com)

As 90% of global wealth is concentrated on 1% of the global population, slums had been expanded behind these flamboyant global cities. The second spread of covid-19 infection in Singapore shows the risk of spreading the epidemic in slums and refugee camps with high-density and poor hygiene housing facilities (Figure 7). Recently the value of modern urban planning was forgotten.

Figure 7. High-density and poor hygiene apartment in Hong Kong (Source: www.wikipedia.com)

Many people in the rural areas of developing countries and in the Third World live below the conditions of living in the 19th century. The poor who are unable to work in low-wage factories are exploiting natural resources through illegal production and trade in underground and informal economic fields. With multinational corporations on their backs, developing countries are cutting down primeval forests and driving rare species to extinction. In addition, in rural areas of Southeast Asia and Africa, where survival is extreme difficult, the trafficking of wild animals known to be the cause of the corona virus, especially pangolin, is supplementing household income (Briggs, 2020). The impact of the severity of wild animal poaching on human societies around the world is being re-examined. Infringing on the natural environment of wild animals on the grounds of the current competitive accumulation of capitalism is not only unsustainable, but also a reason for causing new diseases.

Based on World bank projection, 6 to 8 percent of the global population (49 million) will be drove into extreme poverty due to current covid-19 situation and these new poor in new normal era will come from mostly high-density cities. (Mahler & Lakner, 2020). According to the level of socio-economic development, covid-19 is having different effects on urban residents even in the same city. This kind of urban inequality will put urban residents in great dangers if the realities are keeping being ignored. Approximately 1 billion people are living in poor conditions with daily wage, where social distancing for survival is physically impossible, in urban slums in global scale. This is a clear and present threat to not only urban slums but the rest of areas in the same city since the rest of city is exposed to rapid spread of pandemic (Figure 8).

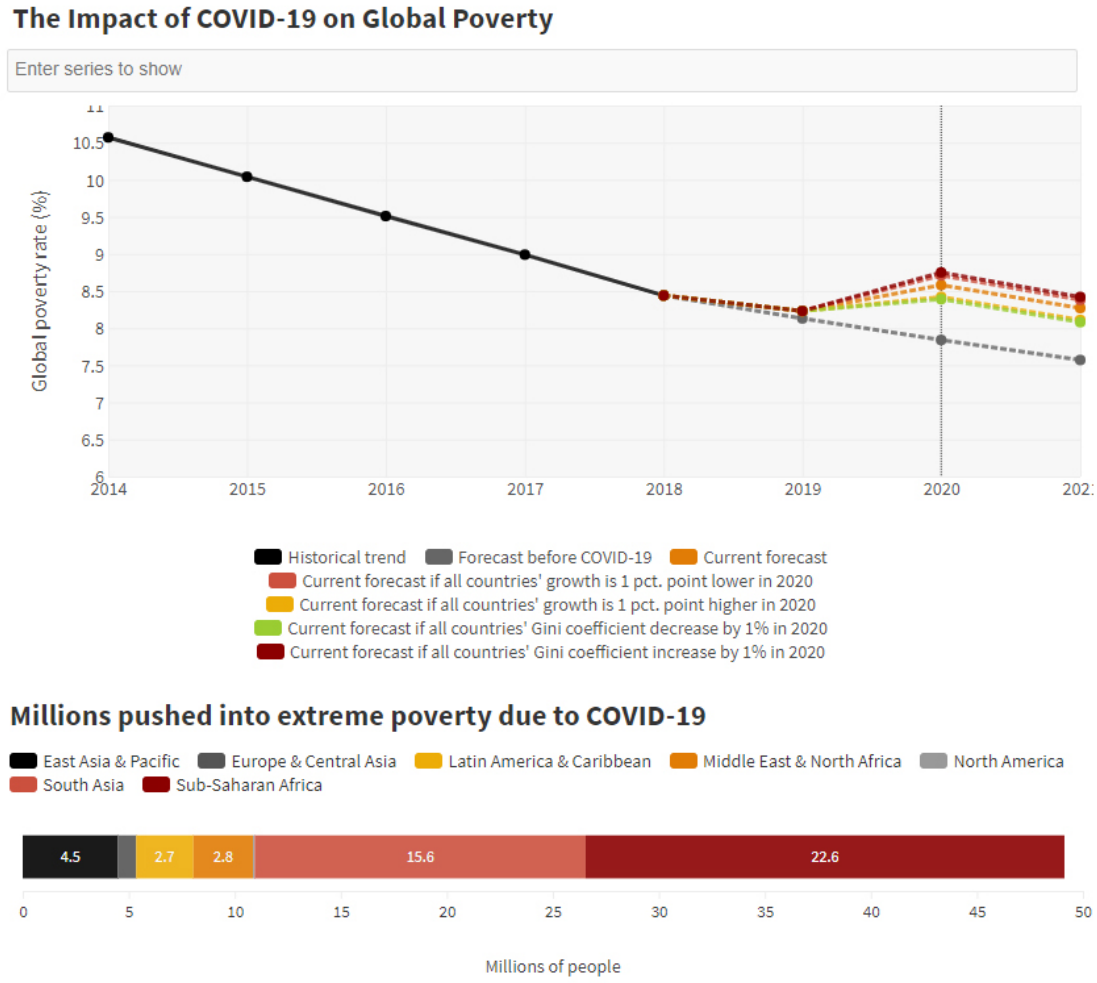

Figure 8. The Impact of COVID-19 on Global Poverty (Above) and Millions pushed into extreme poverty due to COVID-19 (Below) (Source: World Bank's PovcalNet)

4. THE CHANGES IN HUMAN BEHAVIORS

Covid-19 pandemic had showed us that not only low-income class suffered the dramatic changes in lifestyles but also the rest of society could undergo the same under pandemic situation. People had suffered 24 hours lockdown isolation in many countries and 14 days quarantine when people around them got infected and thanks to these restrictions the issue of space rearrangement between family members who shared home had risen above the surface (Turak, 2020).

The high level of stress had caused mental health problems of individuals and families and lead them to social conflicts. Thanks to online working and classes, the needs for extra space or home renovation were getting higher. If not possible due to financial reasons, community scale solution should be provided from the government. It is apparent to anticipate that employment and educational disruptions will happen during covid-19 situation and low-income class, younger generation, and females will suffer most for their career and create psychological problems. International travel with airline and inter-city travel were reduced dramatically and people go to community parks and public spaces (Lee, 2020).

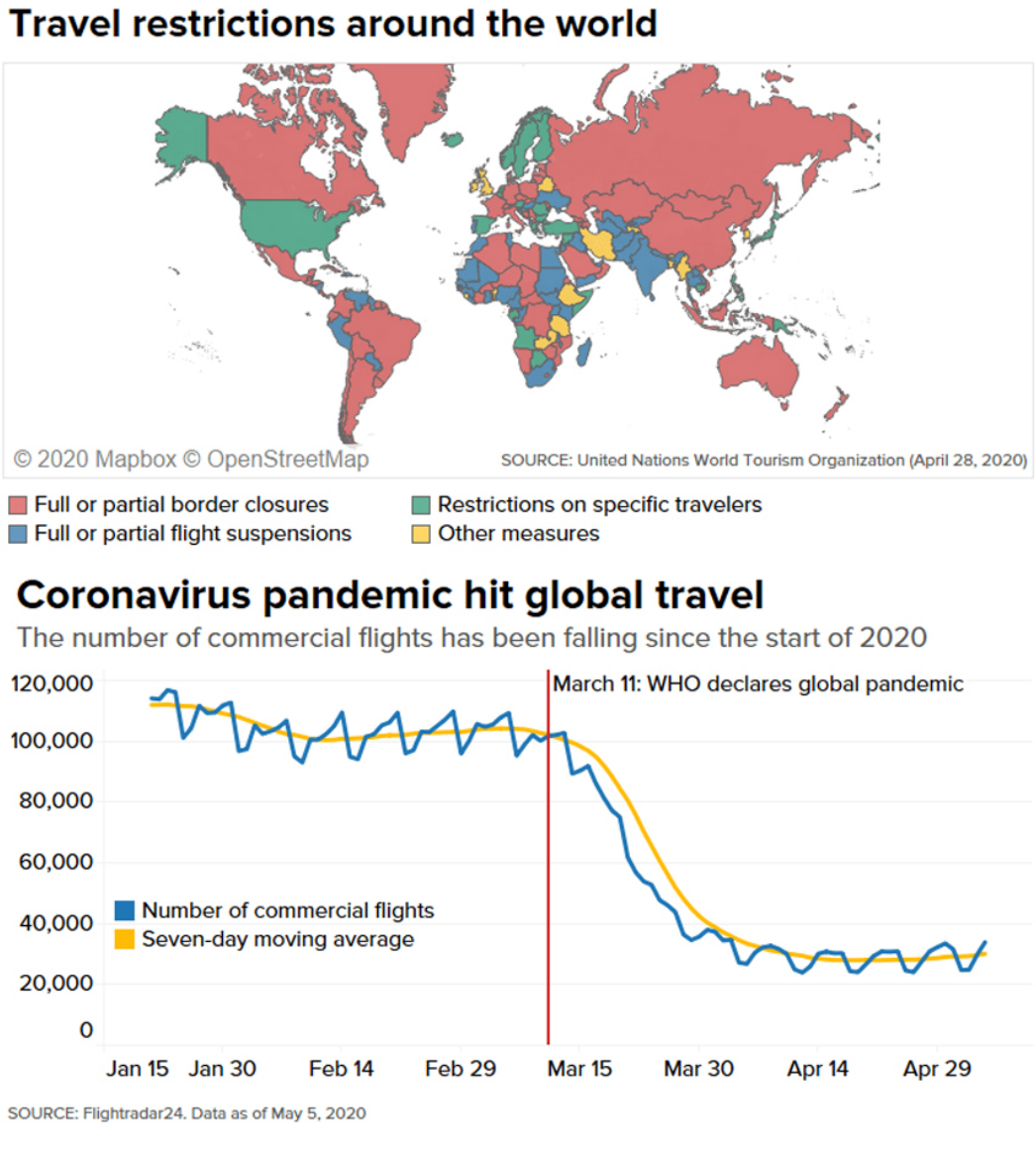

Figure 9. Travel Restriction around the world (Above) and Covid-19 hit global travel (Below) (Source: WTO)

Social distancing, maintain a distance of at least 2 m from others, had been accepted as a global standard (Figure 10) but most of the cases were implemented fast and people started to realize time shifting was required in many spaces (Maragakis, 2020).

Figure 10. Social Distancing Circles in New York's Domino Park (Source: New York Times)

5. MAJOR ISSUES IN URBAN PLANNING AFTER COVID-19

Compared to many pandemics in history, there are no differences in causes and reasons of Covid-19. This pandemics in history had occurred at a time when the global economy was highly competitive, exchanges with foreign countries increased, and the movement of people rapidly increased just like nowadays. In addition, the pandemic had always brought significant changes in urban planning and created new theories (Brumfield & Cubillos, 2020). The global economic crisis, as well as distrust, prejudice, xenophobia, and racism, will bring new methodologies to cope with urban planning. These changes depend on how global production subcontracting relations, which has been greatly affected by the covid-19 pandemic, is restructured and how the service industry (hospitality industry and aviation industry) is changes in relation to quarantine. Therefore, the following tasks were derived for new urban planning.

The first task is the scale and control of the movement of people and goods. In particular, the density of the hub space can be a problem. Hub cities are always exposed to the influx of viruses from abroad. Most of the global hub cities have high-density urban spaces, including public transport. Therefore, there was a high mortality rate due to the spread of the pandemic. It will be necessary to plan for an appropriate equilibrium between transient population and the resident population in the city center (Figure 11).

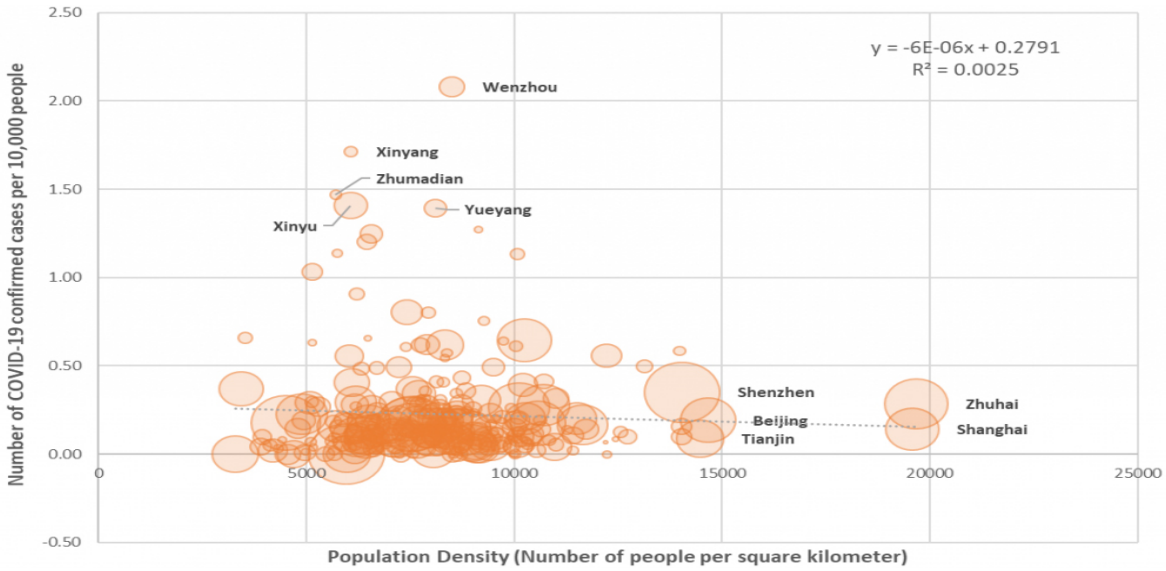

Figure 11. Infection rate of coronavirus and population density of Chinese Cities (Source: World Bank)

The second task is to control urban functions and land use. Like the plague pandemic, the Corona-19 pandemic is also a hygiene problem in traded products. In the process of importing grain, rats was transported together, and plagues were introduced into Europe. It is very crucial to control the products in the market since the outbreak of Covid-19 was caused by the illegal trafficking of pangolin in the market of Wuhan, China (Figure 12). Markets in which such goods, distribution and sales take place are usually close to downtown and residential areas. In addition, there are always a lot of pollutants in the market, but the waste and sewage treatment facilities are usually low. It should not be close, therefore, to residential facilities or public spaces where people gathers. Although such controls are very weak in China and other developing countries, the risk is increasing as the concept of multipurpose land use used in developing countries is prevalent.

Figure 12. Live animal and wildlife trade market in Wuhan, China (Source: Al Arabiya English)

The directions of urban planning in the era of New Normal for these tasks are as follows. First, urban planning to control the density and land use considering quarantine for a pleasant urban space is needed.

Expressway and railroad networks concentrated in the capital will increase the inflow population density higher than the present one, which will intensify the problem of quarantine.

Second, it is necessary to establish an independent space unit. It is necessary to consider multi-regional unit plans with quarantine and basic production systems. In order to conserve energy as well as for quarantine, a neighborhood and district system that can control and minimize the movement of population, food and supplies is needed.

Third, it is necessary to fortify the spatial distribution plan of infrastructure. The reason why Republic of Korea controlled Covid-19 more efficiently, compared to other countries, is because of well-distributed infrastructure (Lee, 2020). Not only medical facilities, but also various public support facilities should be spatially distributed.

6. CONCLUSION

Diseases that are likely to develop into a pandemic are lurking all over the world, and virus mutations continue to accelerate and become stronger, but the development of treatments has not been able to keep up. Therefore, urban planning methods such as control of the cause of the outbreak and prevention of spread must be taken, but ultimately, sustainable development must be sought in which our society can coexist with nature. Pandemic is a disaster that starts with people. It is questionable, however, whether the post Covid-19 new normal will bring a sustainable society. In particular, the introduction of new technologies for remote classes and telecommuting will be promoted to break the practice that was an obstacle in the digital age. As social contacts decline, individuals may become more isolated and alienated. The society of capitalism will encourage the introduction of robots and AI after covid-19, making employment opportunities that have already diminished pandemic even narrower.

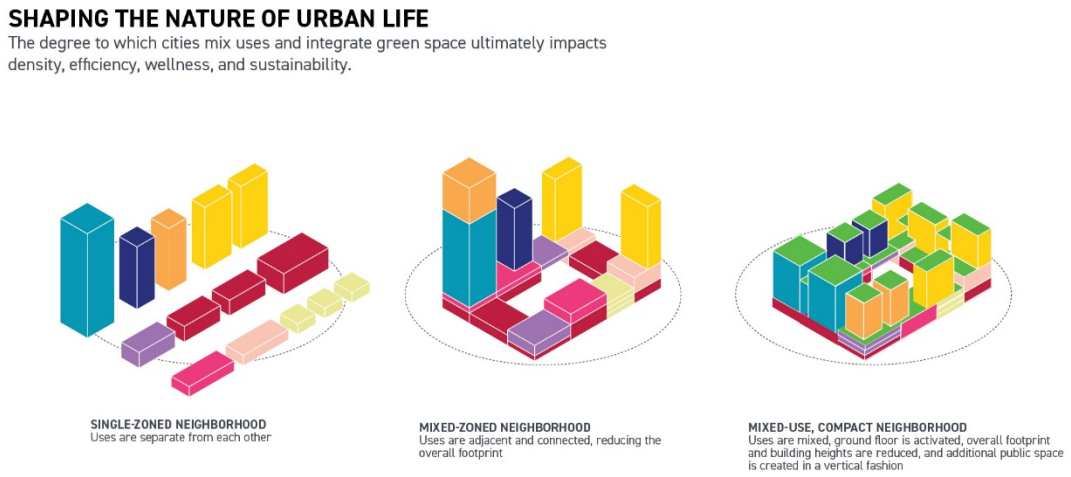

Figure 13. Shaping the Nature of Urban Life (Source: Gensler)

In new normal era, people took the meaning of safety and security extremely seriously, which remind of Oscar Newman's Defensible Space theory. Urban planning in new normal will regard safety in public space as equivalent to investment in public health and have different perspective on the planning of open space after pandemic (Newman, 1972).

In high-rise/high density city, sky garden and connect green roof can be a solution for high density residential area by reallocate the green area vertically for people to move and socialize, for children to play and for residents to produce foods like Singapore. In low-rise/high density city, the complementary use of ground floor in residential zone can be a solution to allow community to support retail and services for residents because this kind of city usually defined with superblocks and inner courtyards.

The polycentric model in urban planning, in which self-sufficient districts are distributed around cities and function like urban villages, can be a solution in this time of critical pandemic. This model has the potential to enhance the quality of life, promote walking, and free up space in city center for parks and gardens for sustainability (Figure 13).

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THE ARCHITECTURE OF QUARANTINE: A HISTORIC EXPLORATION OF THE MIGRANT ANTIDOTE ARCHITECTURE

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ABSTRACT

Disease and isolation strategies to curb pandemic transmissions of human migration have been employed on travel routes for a millennia. Detached spaces for temporal quarantine were largely antiquated as a historical architectural antidote of physical separation between immigration and inhabitant. This essay questions how antidote architecture has previously affected migration and how these findings are applied as contemporary quarantine measures at ports of travel. Historically architectural characteristics of sequestered infrastructure proliferated prominent trade routes of the Old World, facilitating the moderation of economic globalisation affecting immigration of the migrant across trade, employment and settlement into colonisation. The historical research critiques of antidote architecture suggest immigration laws imposed on human migration across transpacific routes are reflective of emerging localised state authority, deployed through spatial planning and infrastructure. Moreover, these texts indicate a paradigm of humanistic freedom to both protect and segregate geo-political migration across conflicting idioms in seeking to control spread of infectious disease. Evidently, past academic research reveals economic globalisation impacts of migration quarantine, largely suspending the migrant workforce and commerce contributions to a global economy. With this understanding, this essay investigates antidote architecture introduced at historic ports of globalised migration recognising quarantine architecture as patterns of human movement. Largely categorised as self-contained satellites, this essay investigates the underlying tension relevant to the connections of quarantine stations employed as an antidote to disease and contemporary immigration detention facilities where non-criminal populations are held in custody en masse. In reference to a twenty-first century application, regenerative principles of antidote architecture are reconsidered across modern typologies of migration referencing the continued historical convergence of quarantined sites.

Keywords: Migration, quarantine, antidote architecture.

1. BACKGROUND AND INTRODUCTION

Chronological manifestation of coordinated quarantine measures suggests antidote architecture has been deployed as a public health response to infectious disease since the plague epidemic first spread through maritime ports in 1347-1352 (Tognotti, 2013). The first known major port of quarantine within the Old World, consisting of Africa, Asia and Europe prior to the connection with the Americas and Oceania, was introduced along the coast of Dubrovnik in 1377. Transpacific transportation of cargo posed an increased pandemic risk during port migration with contaminated maritime ships harbouring pneumonic and septicemic plague outbreaks unable to be contained by medicinal practice. Within this demographic, historiographical references of maritime encompass travellers, migrants and merchant mariners experience of quarantine having undertaken oceanic journeying (Bashford, 2016). The confined nature and regular port migration at which the maritime vessels operated exposed high risk to trading nations that relied upon increased coastal port activity contributing to trade and commerce of the established city. In particular, intensification of mercantilist states within ports of the Mediterranean relied upon the regular migration of goods through maritime importation and exportation. Therefore, following Croatia's sanitary maritime cordon, ports throughout the Mediterranean were swift to adopt similar carceral archipelago and offshore confinement measures to distance ports of migration from susceptible civilisation.

Sophistication of antidote architecture in managing the contagion risk of migration was realised in the following century by the Republic of Venice in 1423; implementing a series of defensive lazarettos that were widely adopted in the Old World. The first of which being a maritime port and plague hospital on the island Santa Maria di Nazareth. Notably it was at this port the term quarantine and 40-day confinement period was introduced. However there are conflicting theories outlining the origin of designated isolation time in the Venetian antidote architecture model. In the journal 'Epidemics Over the Centuries' Le Huec surmises this could be considered as a derivation of religious ideologies.

"This 40-day isolation period during Lent came from the Latin Quadragesima (fortieth), which also refers to the 40 days that Jesus spent in the desert, as well as the 40 years of wilderness that the Israelites endured following their exodus from Ancient Egypt" (Le Huec et al., 2020).

However, Tognotti in "Lessons from the history of quarantine, from plague to influenza A" proposes the importance of the 40 day period should not explicitly be recognised as a single source but may be attributed to theoretical drivers such as Hippocrates theories regarding illness or Pythagorean theory of numbers (Tognotti, 2013). The imposed 40 day confinement period was widely adopted at quarantine sites outside of Italy and is considered in Architectural Review (Garcia, 2020) to be radicalisation of thinking by emerging localised state authority where formalised time and incubation periods are formally introduced to the antidote architectural paradigm previously sequestered by barriers. Of course, quarantine measures of the Old World were not only adapted at ports of migration once infectious disease spread inland beyond the encasement of maritime ships. Containment measures of isolation resulted in the closure of land borders, strict impeachment of immigration and establishment of inland lazaretto hospitals. However, it is argued by Bashford in the book "Quarantine: Local and Global Histories" the importance of early maritime adoption of antidote architecture at these historic ports as representation of notable etymologically of manifested quarantine to curb the spread of infectious disease.

2.0 GEO-POLITICS OF MIGRATION AND QUARANTINE

In the book "Figure of the Migrant", author Thomas Nail (2015) defines migration as not solely representation of global patterns of human movement rather as "several specific historical conditions and techniques of social expulsion" (Nail, 2015). In Nail's argument, the social expulsion is largely a consequence of spatio-temporal mobility in seeking access at ports of travel and catalogued against the historical counterpoint at which the migration occurred. Transpacific migration for purposes of trade, employment and settlement into colonisation during historic periods of contagion was obstructed by the problematic lack of international agreement in quarantine measures adaptive to dynamic human mobility. Nail argues therein antiquates the hierarchy of underlying tension for migration occurrence during historic infectious disease.

‘The problem is that the migrant has been predominantly understood from the perspective of stasis and perceived as a secondary of derivative figure with respect to place-bound social membership. Thus more than any other political figure, the migrant is the one least defined by its being and place and more by its becoming and displacement by its movement’ (Nail, 2015).

Nail’s argument of movement being a significant and defining factor of migration represent the conflicting idioms of confinement and conformance of antidote architecture at migration ports. In the second edition of the book ‘Migration’, authors Michael Samers and Michael Collyer categorise historic migration across two prominent academic distinctions providing basis for interpreting drivers for migrants accessing ports of entry. The authors argue the spectrum of migration operates on a correlation of choice, and therefore historic migration has occurred as result of forced or voluntary choices to enact movement of place. Notably the humanistic dynamics of forced migration are further categorised by nature of ‘refugees and asylum seekers recognised by international conventions’ (Samers & Collyer 2013), and the economic drivers resulting from poverty, low wages or inequitable access to locality opportunities. Through understanding of the driver of the migration, the geo-political access to internal or international challenges at ports can be better correlated with an understanding of continuous patterns of human movement. Applied to the context of quarantine measures, journal authors Alice Mesnard and Paul Seabright argue concomitantly counter-history of migrant social organisations affecting immigration across trade, employment and settlement into colonisation.

"It has long been known that migration affects the spread of disease, and this influence has for centuries been used to justify placing restrictions on the movement of individuals suspected of carrying infections" (Mesnard & Seabright, 2009).

Indeed, studies have shown that antidote architecture, employing largely physical and geo-locality quarantine barriers at ports of migration with the inclusion of incubation periods, have historically proven effective at curbing the spread of infectious diseases (Chen, 2012). However, the geo-politics of migration characterised by movement and statis quarantine can have adverse effects through the suspension of personal liberty against already marginalised migrant groups. Historically, outbreaks of plague in the 14th century through to the cholera pandemic of the 18th century adopted similar intervention idioms employing the use of port lazarettos and quarantining migration where infectious disease was present. However the arising sophistication of the health officials attempt to control the spread of new infectious disease indicates new powers adopted by the state through largely unknown enforcement interventions resulted in policies to restrict migration, disrupting the movement and proliferating quarantine sites as that of detention. Tognotti suggests this reasoning grounded the anticontagionists movement of 1835 when past relics of maritime quarantine were largely contested.

"During outbreaks of plague and cholera, the fear of discrimination and mandatory quarantine and isolation led the weakest social groups and minorities to escape affected areas and, thus, contribute to spreading the disease farther and faster, as occurred regularly in towns affected by deadly disease outbreaks" (Tognotti, 2013).

The Trustee of the National Maritime Museum, Alison Bashford, agrees with this sentiment but with implicit historical connectivity of intercontinental migration and maritime quarantine laws. Bashford reasons the regulatory quarantine laws that sought to detain vessels for inspection provided pre-existing spatial conditions conducive to isolation and confinement, noting that quarantine must be considered as part of a global framework of migration geo-politics, economy and health. Bashfords proposition suggests historical antidote architecture is a ‘portal into the history of globalisation and the counter-forces to globalisation’ (Bashford, 2016). Conclusively the fundamental movement underpinning migration across transpacific borders is closely linked with an increased risk to spread infectious disease, condensing high risk of exposure to migration at ports of travel. This reasoning has historically been used as justification to impose restricted sanctions and enforced protocol on migrants through antidote architecture, raising concerns for the suspension of personal liberty through adaption of these geo-political laws.

3. ECONOMIC CONTRIBUTION OF MIGRATION

Quarantine measures impede the flow of migration movement, largely suspending the trade and commerce contributions to a global economy. The report by Organisation for Economic Cooperation and Development (OECD) “How Immigrants Contribute to Countries’ Economies” (OECD, 2018) argues economic contributions of migration are largely positive across three main sectors of the labour market, economic growth and public finance, and migration is therefore an integrated component of the globalised economy. While Thomas Nail defined migration as movement, the economic contributors of migration can be characterised as roles that exert an influence or redistribution of income in the host country. Notably, economic stimulus is often introduced through the migrating workforce that provide impact to the domestic labour market with formalised policies then recontributing to the public budget as taxpayers.

‘All immigrants are not workers, but most are. Labour immigration makes up a large portion of total immigration worldwide. The average share of labour immigration at the global level, measured by the labour force participation rate of the immigrant population, is 72.7% (and 63.9% for the non-migrant population in 2015). (OECD, 2018)

Interestingly, migration of the student population has become an increasingly significant contribution to the economy of education in a pseudo-international knowledge trade with student migration creating demand for accommodation, transport and services. Notably, and increasingly relevant in a contemporary application migration of intermediate tourism, beyond a period of three months, has subsequent contributions as consumers altering the demand for domestic and foreign trade balances. However, interpretation of these findings also highlights the complexity in assessing country context economic contributions of migration as these are interrelated to the existing economic conditions and characterises of the migrant. In the book, “The Age of Mass Migration: Causes and Economic Impact”, the authors investigate the possibility of overstating the localised economic contributions of migration. The further consideration suggests previous insights have the potential to ignore the hypothesis that— when considered globally— capital might chase after labour. Therefore capita before individual is no less prior to the migration occurrence and is rather a shift in locality (Hatton & Williamson, 1998).

An agreed consensus across the influencing factors of economic contributions of migration is the insufficiency of existing transnational coordination of entry policies, confounding the flow of movement across varied entry ports of travel. In the journal, “Migration: An Economic and Social Analysis” the authors argue a need for policy development to generate economic contributions better aligned with the Governments overall objectives.

"Migration policy as a whole is not joined-up, and is not closely related to its stated objectives, either economic or social. This has likely contributed to the varied and polarised experiences of migrants" (Glover et al., 2001).

In this approach, the movement tied to migration is argued as a continuum supporting entry through ports of travel into settlement better supporting the contributions of economic integration tied to the globalisation objectives. The flow of migration across largely homogeneous groups of unskilled, semi-skilled and highly skilled migration workers is important to aid in addressing localised skill shortages across varying degrees while fostering innovation in the working sector. However, during times of quarantine where antidote architecture is deployed, past academic research reveals economic migrant contributions to globalisation largely suspend the migrant workforce.

A lack of policy alignment at ports of travel further restrict the ability for migration to occur and impeded settlement across transpacific borders. Indeed, Le Huec advises the uncertainty of the powers of intervention evoked by local authorities during these quarantine periods "generated widespread fear and resentment" (Le Huec et al., 2020). with anticontagionists arguing enforced quarantine infringed on the free trade movement impacting commercial imperatives at a greater cost than the maximisation of health. This opposition to quarantine measure has gained traction as a response to the novel coronavirus disease (COVID-19) outbreak which has spread to over 200 countries since its outbreak (Mansoor et al., 2020) and lead to a global health emergency, classified by the World Health Organisation (WHO) as a pandemic.

In response, national Governments have enacted quarantine measures largely leveraged as a system of health governance, impacting contemporary flow of migration at modern ports of travel with wider effects to the global economy. Anti-movement arguments counter the variations in mobility imposed by quarantine measures adversely affect the economy and the migrant contributions. Indeed, outlined in a July 2020 study, “Economic and social consequences of human mobility restrictions under COVID-19”, the research findings indicate an unprecedented fiscal challenge greatly faced by the already marginalised population:

"First, the lockdown seems to unevenly affect the poorer fraction of the population. Second, we find that the reduction in mobility and connectivity induced by the lockdown is more pronounced for municipalities with stronger fiscal capacity. Finally, the distribution of income plays a role: Municipalities where inequality is higher experience more pronounced mobility contractions" (Bonaccorsi, 2020).

Indeed, academic sources state that economic contributions of the migration pose largely positive benefits to the localised economy. The adoption of quarantine measures during periods of infectious disease restrict the flow of migration movement and subsequent fiscal contributions. Better alignment of transpacific migration policies is needed to facilitate mobility associated with migration to diminish adverse fragmenting impacts when imposing antidote architecture.

4. CHARACTERISTICS OF QUARANTINE ARCHITECTURE

Disease and isolation strategies to curb pandemic transmissions of human migration have been employed on travel routes for a millennia. While contemporary terminology is often being used as interchangeable, general agreement is reached on the strategic terms applied to pandemic diseases whereby ‘Quarantine is defined as the restriction of persons who have been exposed to a contagious disease, and Isolation is defined as the separation of ill individuals’ (Bonaccorsi, 2020) Largely antidote architecture is the physical embodiment of quarantine strategies intended to create physical separation through isolation of those that are ill and/or potentially ill to curb the spread of infectious disease. Maintained in the current context much of the characteristics of antidote architecture at ports of travel, particularly through a Eurocentric historical view, are derived from the lazaretto model developed with sophistication from the ports of Venice. The initial need for quarantine measures largely stems from the inability of medical intervention to subdue the disease escalation, therefore driving a risk to established settlements through person to person transmission. The characteristics of quarantine architecture may be scaled to suit the sub context of the infectious disease, locality and climate of the area however largely ports of travel share epochs of alignment in their approach.

Indeed, a prominent characteristic of quarantine architecture is related to the contextual geo-politics and urban space planning, largely interconnected with the wider masterplanning of migration routes. The settlement of quarantine spatial planning intersects with the globalisation and convergence of movement, followed swiftly by displacement from urban density to decrease community transmission. In researching the journal “Emerging Infectious Disease”, Tognotti suffices the spatial programming as paramount in understanding the effectiveness of the lazaretto model sealing architectural iconography from site to building.

"Lazarettos were located far enough away from centers of habitation to restrict the spread of disease but close enough to transport the sick. Where possible, lazarettos were located so that a natural barrier, such as the sea or a river, separated them from the city; when natural barriers were not available, separation was achieved by encircling the lazaretto with a moat or ditch. In ports, lazarettos consisted of buildings used to isolate ship passengers and crew who had or were suspected of having plague" (Tognotti, 2013).

However, what is specified less prominently in discussing characteristics of antidote architecture is the employment of natural air filtration and recycling in the urban planning of quarantine sites, selected due to the direction and prevalence of wind patterns along coastal locations. This characteristic suited the existing migration at ports of travel and aligned with the use of natural barriers, while seeking to dilute the circulation of infection through wind vectors. Deployment of such model was evoked by M. R. Penchaud on

Frioul Island to the south of Marseille in 1821, eventually revised and becoming the largest quarantine station of the Mediterranean (Bataille & Philippe, 2017).

Figure 1. Frioul Archipelago, located off the coast of Marseille, France. A. Ruins of the Caroline Hospital on Ratonneau Island. B. Chateau d'If on If Island, used as a fortress and prison. C. The city of Marseille (Bataille & Brouqui, 2017).

Interestingly, the masterplanning characteristics that present an ideal endotopian convergence of siting quarantine architecture have historically demonstrated a risk of maligned space, forming a quasi-exotopia for ongoing dispelling of the undesirable spectrum. The bounded off-shore location of quarantine and disease treatment sites present a size-driven confinement risk of developing a territorial state imploring defensive isolation strategies intended to disconnect from the greater society. For example, similar offshore segregated zoning defended by sea bounds in a strategical proactive locality is mirrored in the quarantine hospital on Ratonneau Island and the adjoining fortress Chateau d'If, the later used for political and religious detainees. Both spatial planning seeks to utilise zoning as an isolation strategy, combating the possibility of community contact through restraint with limited possibility of advocacy from the outside state. The nature of the zoning and antidote architecture draws a parallel to the design for quarantine hospitals and detention centres.

In the context of migration, the ethical archipelago of quarantine jurisdiction is raised when enforcing antidote architecture that employs confinement space form as extensions of exemption to the existing jurisdiction. The correlation of quarantine architecture with restricting free moment is explored by Godfrey Baldacchino in the journal, "Islands and the Offshoring Possibilities and Strategies of Contemporary States".

"Excising, zoning, detaching, niching, outbordering, dislocating, insulating, unbundling, quarantining and offshoring are some of the performative active verbs that can describe a clutch of different initiatives which, while diverse, share one intent: the endowment of a specific place within a state with particular and closely

circumscribed privileges or penalties. These specialised services have led to various island detention camps and quarantine sites" (Badacchino, 2017).

Indeed, organized institutional responses to disease implore four key characteristics of quarantine architecture seeking to isolate, contain, harness ventilation to dilute and easily cleanable materiality to disinfect. These methods have historically proven to be effective at reducing transmission of infectious disease, however critical reflection suggests implementation of these strategies may be pervasive in the restriction of personal liberty of individual rights with architecture similarities drawn between antidote architecture and enforced detention at immigration facilities.

Figure 2. View from British Commissioners Officer, overlooking the North Jetty. The island gained independence from Britain on 30 November 1967. (Melamid, 1996)

5. CONTEMPORARY REFLECTION OF ANTIDOTE ARCHITECTURE

The global health crisis arising from COVID-19 raises the question of sovereignty in contemporary applications of antidote architecture. Specifically, the spectrum of implications in enforced quarantine and isolation that greatly restriction globalised migration with clear hierarchy established in protecting collective security over individual freedom. In researching historical quarantine, Alison Bashford reflects on the temptation to connect quarantine architecture to detention camps with clear alignment in the architectural solutions that raise discourse across political, economic, social, and ethical issues. However, Bashfords assessment guides a more divisive undertone to these built form similarities, outlining the connectivity is enforced through a continuous history of exclusionary laws and policies for migrants, marginalising a demographic already placed at greater risk of infection and detention due to a lack of stasis.

"The link we draw between quarantine stations, internment camps and current detention centres turns out to be far more than a process of comparison or drawing resemblances between detention strategies. Rather, there are telling connections and overlaps here, some direct and some indirect, but all circling around questions or citizenship, security, alien-ness, unfreedom and national security" (Bashford, 2002).

With this understanding, antidote architecture stemming from initial plague outbreaks is historically presented as the first horizon of antidote architecture for immigration detention centres. In a contemporary sense, the complexity effects are evident in the case of Kamaran. The insular nature of the shelf island presented as a categorically ideal quarantine location for sea migration on the Hajj ceremony journey from East Africa, the Persian Gulf and India to the holy city of Mecca. However international control over the pilgrimage delayed and confounded the migration route and increased tensions with migrants forced to rely on authorities for essential rights to food and water while quarantining at the facility. The resulting antidote architecture is likened to that of a detention facility, with the arrival centre and wider camp encompassed in restrictive barbed wire and administrative huts too small to safely accommodate migration and quarantine through this route. Subsequently the quarantine measures and antidote architecture resulted in instances and revolt, particularly where the penal style practices delayed the purpose of the migration and the flow of movement constricted to a conclusion of travellers missing the spiritual Hajj ceremony.

However, the complexity of antidote architecture in Kamaran is partly reflected in the temporary prosperity from the resident Islanders. With new infrastructure, new business and thereby refreshed economy, the period of quarantine undertaken at the Island resulted in short-lived improvements to the island infrastructure including services upgrades to water and power stations, a minor transport railway and increased trade. The island underwent a transformation in correlation with the increased migration through ports of travel resulting in population growth, juxtaposed against global strained economies of prosperity during periods of infectious disease. However as these measures were directly interlinked to the global politics of migration and quarantine, decline in the use of the island as a mandated port of travel ultimately circumvented the need for quarantine measures on Kamaran and the subsequent prosperity tied to antidote architecture was deserted. Indeed, contemporary antidote architecture faces many similar challenges in balancing the coerced restriction to curb the spread of infectious disease and the deployment of detention centre principles in antidote architecture. Albeit limited, the availability of scholarly research of Kamaran demonstrates the social and economic complexity of adopting quarantine measures, blurring the factions of free and restricted movement and weighted against the economic principles of migration at ports of travel (Melamid, 1996).

6. CONCLUSION

Over half a millennium since antidote architecture was first adopted as a health strategy to curb pandemic transmissions and contemporary quarantine measures continue to marginalise movement associated with migration. From the past centuries of maritime law in the Old War, the initial principles of quarantine that isolate, contain, ventilate and expunge have proven to be an effective public health practice in reducing person to person transmission of infectious disease. Therefore, the adoption of these methods in response to COVID-19 are deemed to effectively protect the globalised interest of safety with a proven ability to delay spread of the disease while safeguarding established density and societal infrastructure. The historical reflection provides context to the prioritisation of these collective health safety and the counterpoint of fear and mandatory quarantine faced by persons undertaking migration across differentiating transpacific travel routes, faced with greater risk of infection and discrimination. Indeed, much agreement is reached that further policy consideration is needed to facilitate migration movement through ports of travel to generate economic contributions better aligned with the Governments overall objectives regenerating a wider globalised economy already impacted by restriction. However, a global reconfiguration must be considered in quarantine discourse for the recrudescence of citizenship and nation relationship, particularly as quarantine measures are redeployed and reflected in immigration detention facilities. When quarantine measures are deployed on travel routes, the confinement unevenly affects the migration faction of the global movement society. Most notably is the national defence and wider security historically proposed as a justification for non-criminal detention, raising broader questions to the unification of individual freedom. The opportunity remains for effective quarantine measures to undergo a period of enlightenment that better balances public health interventions and the intrinsic liberality of migration rights.

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AN ARCHITECTURAL DESIGN STUDIO ADVENTURE IN PANDEMIC: A BACKWARDS DISCUSSION ON THE COMPETITION

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ABSTRACT

The current pandemic first froze and then rapidly transformed the flow of life globally. The disruption of the spatial construct that organizes physical encounters in education as well as in economic and social life led to a digital meeting space environment. This fast transformation required to question the design problems and their functions introduced in education. In architectural project studios, where interaction and communication are very important, it initially led to a panic in the construction of digital meetings, but then allowed the development of new perspectives in design problems and novel means of expression. Eskisehir Osmangazi University, Department of Architecture started the semester with the theme "A Backwards Discussion on Competition" in the Habitat project studio. The concept of a backwards discussion on competition aimed to analyze of the process and results of the "Olivelo Izmir Suburban Ecological Common Habitat Project Competition" and to reconstruct the design problem based on the data, and to provide solutions. The semester that started with this content and its narrative tools was frozen for a short time due to the pandemic and required a rapid decision on how to proceed. The "Backwards Discussion on Competition" construct was transformed into"If the Olivelo competition was announced after the pandemic, what would be the competition set up and how the discussions would be conducted?" Considering the competition from a post-pandemic perspective, an attempt was made to define the process backwards. In this process, it became necessary to question the current and future state of affairs within the 4 walls that surround us and to understand the new world order, and to prepare ourselves for the future. During the pandemic, the youth, who rapidly returned to their hometowns, experienced a novel fear for the protection from the disease and survival of their families. The students claimed that online meetings and design discussions alleviated the anxiety in their lives, and they could spend good effort on their designs. In this process, our duty and responsibility as educators was to provide young adults the opportunity to develop and realize their ideas, to help them improve means of expression and to adapt ourselves to this new life without panic. In this new process, predictions about the future, the novel social, socio-economic and physical environment, and the reasons for this change and transformation were discussed as a design problem. The students were asked to design the changes and transformations in Yelki Campus", which was the venue of the competition, as the final product. In this process, students improved their digital expression means, and presented their design constructs with images, 3-dimensional visuals, sketches and 5-minute short movies. The discussion on the future led them to question both themselves and their world and prepare themselves psychologically and sociologically for the new future.

Keywords: Olivelo, backwards discussion of the competition, Habitat design studio, ESOGU Architecture Department.

1. INTRODUCTION

Design studios, which is fundamental in architectural education, are a requirement in architectural design instruction. Because design studios are learning environments where students can communicate their ideas and utilize the opportunity to improve these ideas as a result of the products they design. The methods employed in architectural studios are not always the same. The adopted method varies based on the studio functions (Yılmaz & Ulusoy, 2016, p.336)

Architectural design studios constitute the backbone of architecture education since they allow learning by experimentation. Thus, the term "space and event designer" was proposed to describe the architect. Therefore, it could be suggested that architecture and architectural education will change due to current living conditions. The constant end product in architectural education is the students. While providing students the opportunity to have different experiences, architecture education aims to teach how to learn (Karamaz & Ciravoğlu, 2017, p.418).

The current pandemic led us to ask the question "How can we exist in the future?". in the Architectural Design studio and revealed the requirement to discuss the physical and spatial conditions in the pandemic. It is not easy to make predictions on any case due to uncertainties. Expectations, and therefore hopes play a role in future predictions (Özerk, 2015, p.23). Students employed the concepts of "Utopia and Dystopia" to achieve future predictions in the architectural project studio course.

Etymologically, the term utopia, developed by Thomas More in 1516, was a reaction to undesirable conditions and aimed the design of the beautiful. Thus, utopia has been in constant contact with the our world and directly associated with current conditions (Ağkaya, 2016, p. 24-25). The concept that confronted the happiness and beauty introduced by utopia with discourses on fear and ugliness was dystopia. Dystopia draws the pessimistic picture that predicts that beauty and happiness will never be possible, emphasizes that the heavenly lands promised by utopia could not exist, and aims to reveal the facts and inform humankind about the distant future (Takış, 2017, p.7-8).

Although the concepts of utopia and dystopia seem to be contrasts such as heaven and hell, dystopia was born of utopia and its functions are not independent of utopia. Both initially perceived the social order and were based on that period. The only difference was that while utopia focused more on the problems and solutions of the period, dystopia warns about the future based on the current period (Akkoyun, 2016, p.12-13).

When talking about utopia, ideal and imaginary places are mentioned. This concept that aims to design the better, could not be tackled independent of the environment, the space and the city. There is a direct correlation between utopia and place, space and city. This is the most important reason for the reflection of utopia on spatial and urban models. Utopias are a solution to social and urban problems, and they emphasize an ideal (Alver, 2009, p.140,153).

Studies demonstrated that the correlations between architecture and space would lead to de-spatialization. Architecture and the role of architecture has always changed over the course of history. However, despite these changes, the architect has always been included in the process of design (Sezgin, 2005, p. 7-8).

Architecture entails a close interdisciplinary interaction between technology, science and art. Although architecture is an individual act, architectural actions are social. The language of the profession could be individual or universal. All these contradictions lead to the questioning of architectural education (Dikmen, 2011, p. 1510).

In his book titled "Physic of Future", after the interviews he conducted with 300 scientists who shape the future based on the question "How will science shape the fate and daily life of humanity until 2100", Dr.

Michio Kaku demonstrated that scientific data, not speculation, would define the year 2100: “Of course, it is impossible to predict the future with absolute certainty. I feel that the best method is to take advantage of the ideas of marginal scientists, who alone are busy with the very difficult task of inventing the future. They are the ones who will create the tools, inventions and methods that would fundamentally transform our civilization” (Kaku, 2011). Humanity, going through the biological evolution, conducted revolutions in design and creativity. Revolutions, in turn, led to the evolution of the society.

Architects, who are among the important representatives of creative mind, should be aware of their duties and responsibilities in the discussion about the future and in the creation of future design scenarios. The renewal of architectural education content and tools should include the construction of architectural design studios based on problems and solutions that would help predict the future that discuss associated social and spatial transformations.

2. CONSTRUCTION OF AN ARCHITECTURAL DESIGN STUDIO PROCESS

Eskişehir Osmangazi University Department of Architecture determined the topic of Habitat Project Studio as "Backwards Discussion of the Competition " in "402 Architectural Design (Graduation Project) Course" during the 2019-2020 academic year spring term. Project topic included the follow up of the processes and results of the "OLIVELO Ecological Common Habitat Idea Project Competition" organized by Izmir Metropolitan Municipality, and related discussions, critics and analysis of technical information to reconstruct the problem. The project process was structured as follows:

The architectural project included

The analysis of the competition process, data, and results,

The analysis of natural material and natural construction techniques based on selected design samples with various scale models,

The transformation of the project construct towards 2100 future predictions as a result of the pandemic,

The development of theoretical content based on future predictions and association of this content with YELKI,

The creation of 5-minute short movies that reflect theoretical content in design predictions,

The scripting of design content with spatial and affective descriptions based on the flaneur subject,

The finalization of design predictions with various presentation techniques (technical drawing, models, PPT, short movies, and scripts).

2.1. The Competition

The topic of the contest was the development of an original architectural and landscape design with an identity that include ecological, sustainable, innovative and economic solutions and allow urban integration of the area on 57 hectares of land in İzmir province, Güzelbahçe District, Yelki neighborhood "Qualified Natural Reserve" and “Sustainable Preservation and Controlled OccupancyArea.” The contestants are provided detailed competition data on competition web site (current and future preserved natural plant flora, wild and natural living conditions, etc.).

Figure 1: İzmir Metropolitan Municipality Olivelo Idea Competition Location, Yelki Campus

The area, which is significant with an ancient olive culture and ecological character, is in need of preservation, development, and the description of the relationship between the area and urbanites. Duw to these factors, it is important to allow the experience of learning nature by living in the project area. The location of the area, which is at the intersection of olive orchards and bicycle routes, amphasizes its potential to become an important ecological station in the future, and it is expected that the focus on olives and bicycles would develop under these conditions.

Initially, the area, its relationship with İzmir and immediate surroundings, natural and cultural qualities and potential were determined in the project. Then, construction techniques in nature and tectonic constructs were discussed through the analysis of the samples.

2.2. The Analysis of Natural Material and Natural Construction Techniques

Construction techniques and material selection are important in the development of program construct in an area like Yelki, where sustainability of natural biological diversity is important. Thus, initially, the selected samples were analyzed in the development of tectonic constructs with natural material. The samples were selected by the students based on the strong tectonic setting in the natural environment. Selected samples as presented in Figure 2 in 1/5, 1/20, 1/50, 1/100 scales and analyzed based on models.

Figure 2. The relationships between the material, techtonic construct and detail

2.3. The Evolution of the Project Construct into "Future Predictions Towards 2100" During the Pandemic

The COVID-19 pandemic that started in late 2019 and affected Turkey after March 12, 2020 altered all human needs and habits by fundamentally affecting the economy, education and all socio-cultural structure. It does not seem possible that the world order that rapidly changed and transformed would return to normal after the pandemic. Thus, we need to prepare ourselves for the future, discuss the distant future predictions and design for the near future.

ESOGÜ Architecture Department Habitat Studio felt the need to change the original design construct determined as "Backwards Discussion of the Competition" to "If the Olivelo competition was organized after the Covid-19 pandemic, how would the competition be organized and which discussions would take place?" Thus, an attempt was made to define the process backwards by analyzing the competition based on the pandemic and its aftermath.

In our current environment surrounded by "4 walls", we need to try to understand the new world order by questioning ourselves, the current situation and the future, and prepare ourselves for the future. From now on, our duty and responsibility as educators should be to provide young individuals the opportunity to come

up with ideas and intellectual infrastructure, help them develop their tools, and to adapt ourselves to the novel conditions without panicking.

2.4. The Development of Theoretical Content Based on Future Predictions, and Association of this Content with Yelki

Students employed the concepts of utopia and dystopia when predicting the future. There are several definitions and discussions on the concepts of utopia and dystopia in the literature. This is due to the fact that large research groups with various specialties have been interested in these concepts. Simply, utopia could be described as individuals' desire for happiness in their habitats, and the dreams of individuals about theie society (Çörekçioğlu, 2015, p. 9,13).

When talking about utopia, expressions such as ideal and imaginary place are employed. This concept that aims to design the better, is not independent of the environment, the space and the city. There is a direct correlation between utopia and place, space and city. This is the most important reason for the reflection of utopia on spatial and urban models. Utopia is a solution for social and urban problems, emphasizing the ideal (Alver, 2009, p.140,153).

Habitat project studio students developed their "predictions towards 2100" based on the conceptual constructs presented in Table 1.

Habitat Studio Theoretical Constructs for YELKI Towards 2100					
Ecotopia	Eco-ship	Eco- symbioss (hybrid)	Eco-tech (Life Network)	Eco-niche	Ecosophy (Holding on the roots when dispersed)
Eco-oasis	Life Void	Physical Penance	Undergroud Society (2200)- Dystopia	Lost self-iso self	Immunity
Olivelo Light Center	Nature Commune	Cycle	Pleistocene Age	Parasito- velo	Biome Island

Table 1. The theoretical constructs developed by the students

The social structure, physical environment, economic and cultural changes were discussed based on the developed conceptual constructs, and new roles that could be undertaken by Yelki in the predicted future were determined.

2.5. The Development of 5-Minute Short Movies that Reflected the Theoretical Content Based on Design Predictions

The architectural design 402 project course also aimed to develop students by exploring different expression styles other than conventional presentation techniques. Thus, they were asked to explain their design constructs, future predictions and future solution proposals for Yelki with a 5-minute short movie.

Figure 3. Short movie visual content on the Project concept

The aim of a short movie is to tell a lot within a short period of time. Short movie is a way to describe and introduce the filmmaker within a short time through narrative style, editing, script and techniques. The technique of the movie is as important as narration. Due to the disappearance of the physical encounter spaces during the pandemic and the transfer of these encounters to the digital media, communication tools also have changed in architecture. The short movie was selected as a means of communication where students could express design ideas and constructs in a short time. During the development of the short movie, the visuals and music were selected based on the design construct. Verbal narratives were employed to support movie presentation and the movies were suitable for individuals with visual impairment.

Before the short movies were shot, a training was provided on script and editing, using technical equipment (Adobe Premiere, Sony Vegas, Final Cut Pro, etc.) by Dr. Kamil Mingu, a short movie director.

2.6. The Development of the Script Based on Flaneur Subject with Spatial and Affective Descriptions

The world of design is lost in a culture dominated by image, where the relationship between the part and the whole has been gradually lost. Design, which has gradually become the product of image design technology, is more about form and technological design than the essence of the object. The search for identity in design is a professional and academic concern. Due to globalization, the rapid acquisition of visual images in the world of design increased the same, while leading to a loss of creativity, imagination and the essence of design. Today, the design discipline requires designs that allow people to acquire various perceptions beyond the visible. Visual coding with only two- or three-dimensional technical drawings

restricts the access to design. Coding the designs by removing the dominance of a single sense and activating other senses improves the longevity and accessibility of the design.

Based on this requirement, “script-based description” aimed an experience that starts from design ideas and to trigger creativity. In the process of materialization of the design idea that starts with an idea, scenario-based narrative passes through connecting the idea to a fictional story. Scenario-based description allows visible design elements and events by drawing a picture with words. The scenario-based design technique developed in the Habitat Studio is presented in Table 2. It speaks to the emotions and imagination of the audience. In all design disciplines, starting the design with scenario-based descriptions triggers creativity while strengthening the concept of “accessible design” by allowing visually impaired individuals to understand or perceive the design. Increasing social and cultural awareness in design education, and designers' ability to discover new creative design methods and elements by adopting universal design principles would also improve the accessibility of the design.

Habitat project studio has been using the methodology of designing with scripts in the project for the last 5 years, and this design technique was considered to allow the affective perception of the design.

Described by Walter Benjamin as "the wandering traveler", the flaneur was tackled as a designer subject in the Habitat project studio. As a designer subject, flaneur experiences the designed space in the outdoors and conveys this experience through script-based descriptions.

In the present study, young individuals who were immersed in visual digital media during the pandemic were asked to employ the "verbal description technique" to improve their verbal language memories. As a result, a rich design script transfer was created by each student.

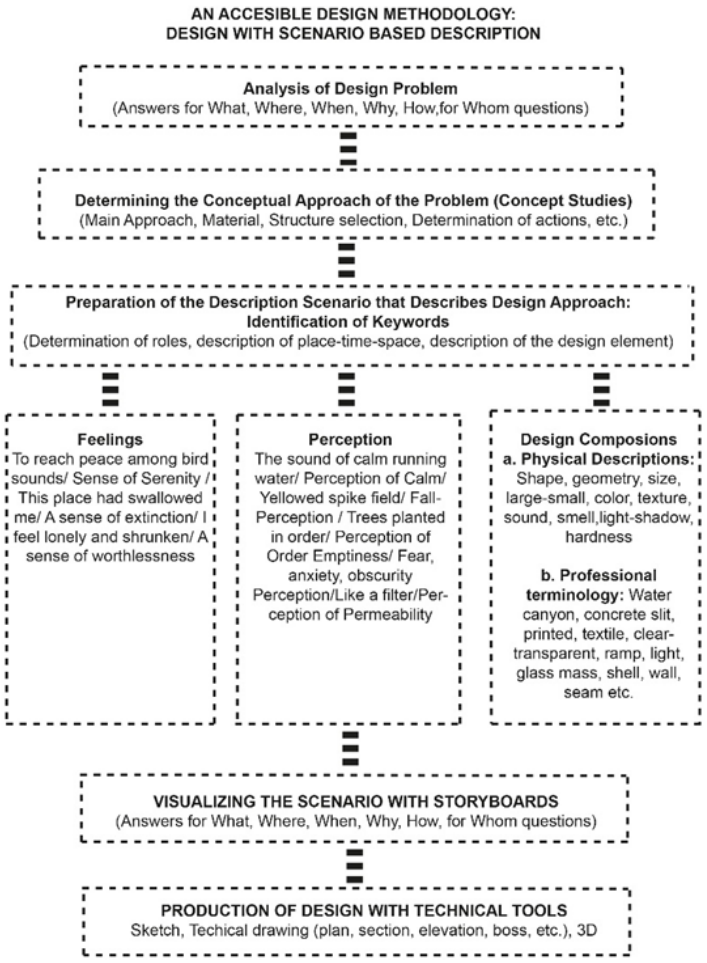

Table 2. Design with Scenario-Based Description

2.7. The Finalization of Design Predictions with Various Presentation Methods (Technical Drawings, Models, PPT, Short Movies and Scripts)

At the end of the design process, all processes and designs were uploaded to individual folders in online storage. At the end of the process, the jury members in various disciplines (movie director, electrical engineer, psychologist, economist, art historian, building biologist, winners of the Olivelo competition, and jury members, etc.) were asked to review the links for the works in advance. On the day of student jury, students in groups of 5 made their presentations online and eye-opening discussions were conducted.

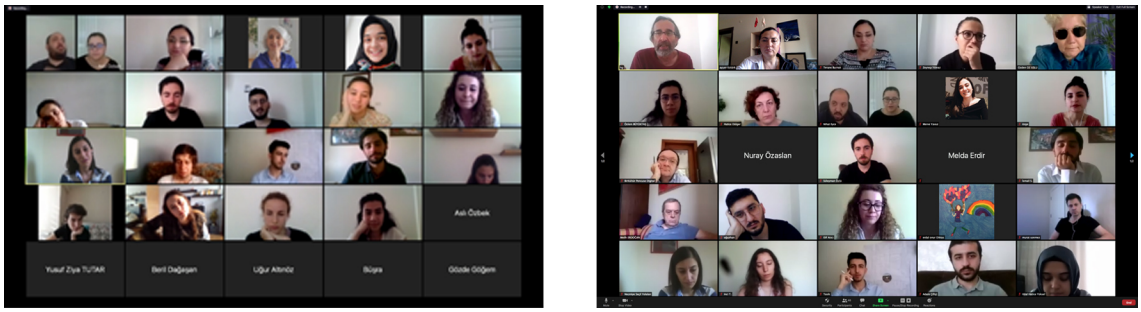

Figure 4. The jury members from various disciplines and online jury experience

3. SAMPLE STUDENT WORKS

3.1. "Physical Penance" by Zeynep Yılmaz.

"People once lived in the depths of nature. We lost it and now we pay the price". Buzzels-Salztman

Figure 5. 2100, climate crisis, pandemics, disasters

The design by Yılmaz was based on the question "can we help preservation of nature by adopting the original life cycle in nature, while aspiring to be immortal with the ever-advancing technologies? We are born, and we die. Life goes on like this. What will happen to the body in the afterlife depends on one's beliefs. What happens to your body after life ends in this world is your choice." Based on this idea, she addressed the concept of "Ecological Embedding" with "Rebirth in Olivelo".

Figure 6. Rebirth in Olivelo

Ecological embedding is a process also known as "promession," cryogenically freeze-drying of the body remains. After the dead body is passed through liquid nitrogen, it is broken into pieces by vibration, then it is frozen and buried. To turn the body into the adequate compost and bury in the soil without adverse effects associated with rotting, it is necessary to divide the body into smaller parts.

The idea of resurrection as a tree in nature after death. Especially, as an immortal OLIVE TREE.

A group that set out to root down and discover their belongingness, decided on rebirth to heal and be healed in nature and to raise awareness. They will be reborn without alienating each other in the journey they started by adopting nature. Their aim is to "reclaim" the nature they do not want to lose, as well as their losses in epidemics and disasters. To revive the OLIVELO area by symbolizing it with the slogan "life again". If people replace the trees destroyed by acid rain and fires in Yelki with loved ones, they predict that they will reclaim nature through physical penance.

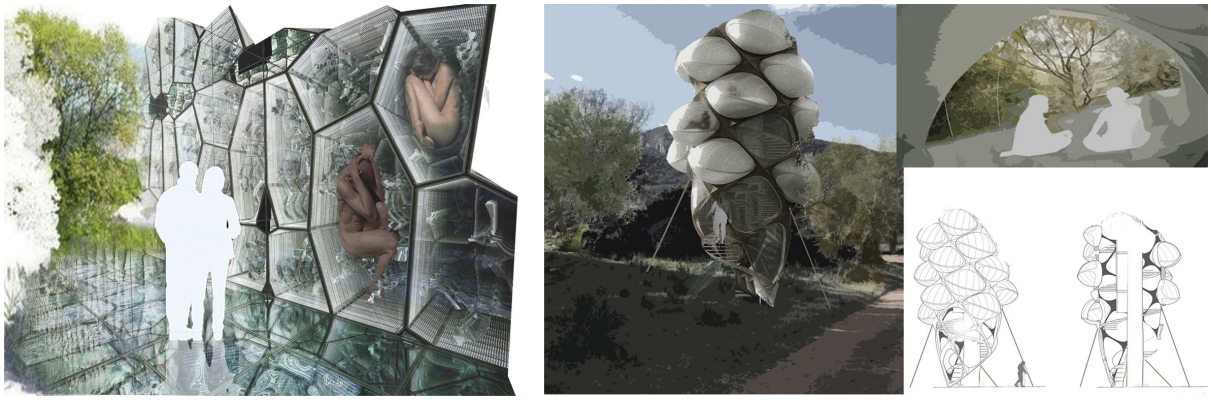

Figure 7. The body gate at the entrance in Yelki and housing cocoons

At the entrance of Yelki, the Body Gate creates a THRESHOLD between the past and the future. Physical penance is necessary for purification from the past sins. After passing through this door, Nature and Bodies are intertwined. Personal cocoons provide pre-ritual shelter and purification by solitude.

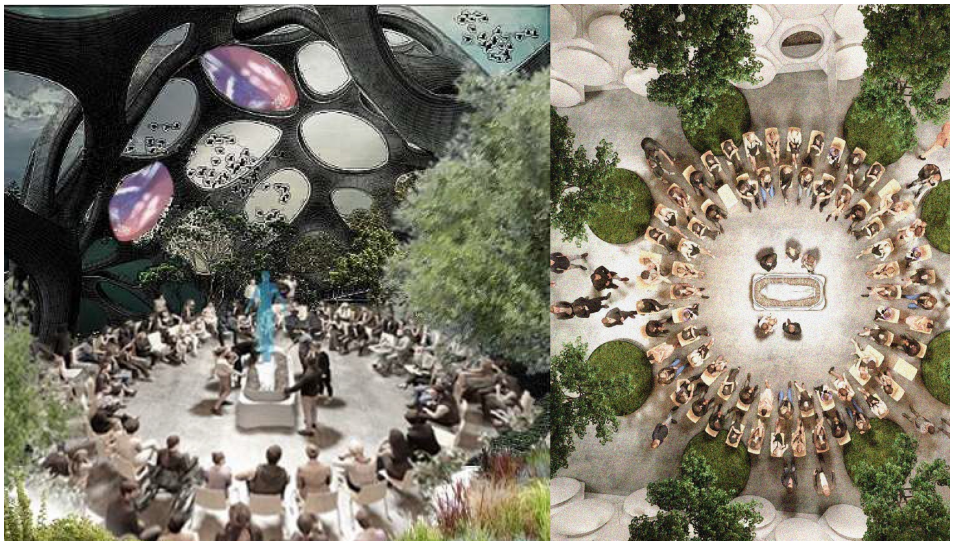

Figure 8. Pre-cryogenic memory transfer in a ritual

3.2. “Eco-Hybrid (Eco-symbiosis)” by Buket Yaş

Figure 9. Future predictions and eco-hybrid design construct

A future prediction was designed as seen in the Figure 9. This prediction included the following:

Year 2020: As we were convinced that no natural disaster would happen to us other than global warming, as we were worried about whether we used too much concrete when there was a disaster in the world for forty years, when we even developed action plans for an alien invasion, a disaster that no one could foresee quickly affected the world (PANDEMIC).

The year is 2050; Due to the disruption of the natural balance, disasters, epidemics and resulting deaths, the domination of humans over nature weakened. The population growth led to depletion of resources. Several animal species on earth were doomed to extinction. Studies on underwater life accelerated in some parts of the world. Efforts to find a new life to continue with this population level. However, if the population growth is not controlled, it is said that the end of the human race is imminent.

Year 2080: Humans reached the end of the process of mechanization, exploitation of nature and natural resources, and polluted and consumed the submarine world. In this process, studies on genetically modified tree cultivation due to changing climatic conditions started.

Year 2100: The ecological hybridization of the local and the new has begun. Due to the danger of extinction of the human race, colony life in small groups is adopted. Weak genes are completely destroyed, and genetically modified trees are used for accomodation.

In Yelki Colony, 2100: fauna and flora were genetically modified due to inefficient and weak trees. Strong genes, hybrid material and accommodation units were constructed on genetically modified trees. Weak genes are eliminated by hybridization, individual living units and common spaces are connected by above

the ground bridges, the area is filled with this bridge network; thus, protecting soil genetic. The new colony constructed central hybrid buildings with materials such as BioBrick, BioGlass and energy collectors.

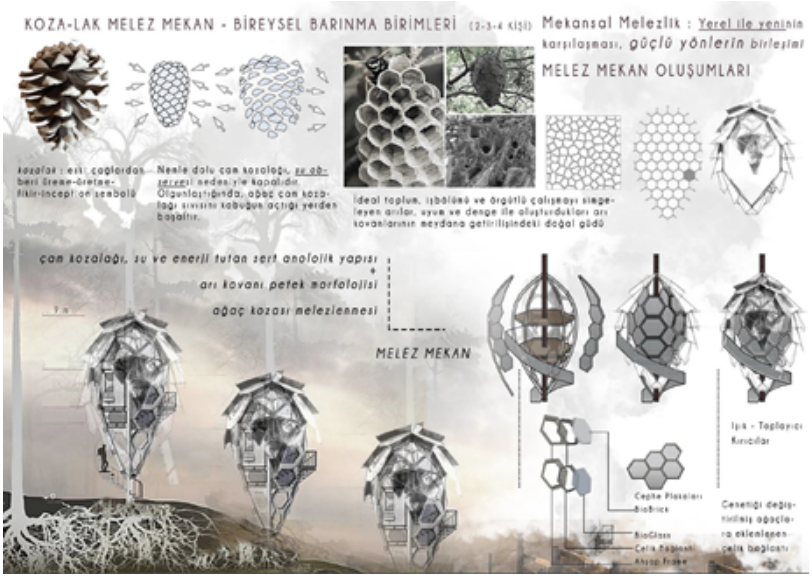

Figure 10. Cocoon building analysis for hybridization

Eco-Hybrid structures are created by combining the volumetric structure of PINE CONES and the shell texture of ARMADILLOS. The flexible shell of the armadillo species that covers a large part of the body, closes up in case of danger, contributing to the design as a type of armor. At the same time, not to disturb the genetic structure of the soil, the fine naive foot structure of the heron strengthened the hybridization to establish a relationship with the surface. These hybrid units are detailed to collect water.

Figure 11. Armadillo, Pine Cone ve Heron hybrid accomodation units

Figure12. Colony life on genetically modified trees

3.3. "Ecosophy" by İnci Türk (Holding on the roots when dispersed)

A psychological disaster was inevitable. It was as if all the senses were atrophic. Even waking up and talking to another was meaningless. Psychologists were concerned about the impact of digital life on mental health. It was stated that the cause of several illnesses was due to the detachment from the roots and nature.

The diversity of species was severely affected between 2020 and 2050. Waste polluted the wildlife. I wanted to reclaim the essence of nature again and find my ecological self. As the new world philosophers who question everything, we went off the road that was laid for us. We were looking for meaning. We needed a guide and we returned to where it all started; to the birth of the philosophy of nature...

Figure 13. The antique cities route in the ecosophy construct (Ephesus, Theos, Klazomenai, Pergamon)

Several philosophers, poets and painters such as Homer, Hermogenes, Heraclitus, Galen, Hippocrates, Ksephones, Anaxagoras, Anaximenos, Kadri of Pergamon, and İsmail Hakkı İzmirli grew up in these lands. Philosopher is an individual who discovers by questioning. The names mentioned above spent their lives

walking under the ancient olive trees and asking themselves questions. Even today, visitors of this land where western philosophy was founded could find their traces in Ephesus, Theos and Pergamon.

Nature philosophers are philosophers who think about the creation processes and roots of nature and try to make sense of nature. The four most important nature philosophers also lived within the borders of Izmir in Ancient Greece (Homer, Thales, Anaximander, Anaximenes).

Ecosophy is ecological wisdom. It is the philosophy of harmony and balance within nature. This term was created by Thedore Rozsak in 1973. According to psychologists, the root of the depressions and unhappiness that humanity has fallen to is their detachment from nature (the essence). Theemotions of the ecological self should be stimulated again by turning to nature.

Figure 14. Life School in ecosophy construct

“We hit the road early every morning; We learn by walking, hearing, touching, breathing ...

We trace natural patterns in the shades. We walk around ancient olive trees, then the roots of a tree serve as a step down the path. Another tree offers a shade under the sun.”

“We enter the living units by leaning as if we enter a tree hollow. Two meters after this narrow pass, the space expands so we can stand.”

Figure15. Programmatic proposals and sound chimneys in Yelki

The Ecosophy School of Life includes 7m. and 10m. diameter sound chimneys, living units, olive trees, grass-shrub density, medicinal herb route, paths, observation route and a creek. 80% of the human perception about the world is based on observation. Therefore, it is aimed to improve other perceptions by limiting this sense in blind chimneys.

"School of life" proposed in the concept of ecosophy is not a school, but a school that provides the urban dwellers a new practice in life. It is expected to make people think about the relationship between them and the nature and raise awareness. The experience-based learning process was constructed on thematic routes. The urbanites test their habits and ideas there and takes a break from urban life.

4. ANALYSIS AND CONCLUSION

During the pandemic, questions and discussions were raised on how COVID-19 will change architecture. For a while, architectural profession and education have been discussed but not neoliberal economic models. Thus, the effects of COVID-19 were not considered as a radical change, but as a step towards the acceleration of current changes (Boyacıoğlu, 2020).

In globalization, lifestyles follow their natural course. The concept of home-office, which was introduced at Environmental Psychology Conference in LUND in 1991, became quite popular. During the pandemic, online architectural education could be considered as a dimensional change in this concept. What the process basically revealed was that fact that communication was independent of place. Thus, it is inevitable that we should learn technologies (Gür, 2020).

It has been observed that architecture, which is centered at humans and human life, has never been insensitive to current conditions and survives by evolving based on these conditions. Architecture, which keeps up with the conditions of the era, exhibits the same reaction in architectural education. In this process, a little different from the face-to-face project studio education, the importance of the learning imperative of technological opportunities became prevalent. A new experience was gained in architectural design studios by supporting the design ideas and their expressions increasingly with digital techniques.

Furthermore, it was suggested that this would allow the young individuals, who will be architecture professionals in a short time, to anticipate the future and produce projects that would prepare the society for the future, and ensure that they are prepared for the future sudden crises.

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CONTEMPORARY ISSUES IN ARCHITECTURE

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Contemporary Issues in Architecture Ecology, Urban Environment, and Experience is an edited (multi-authored) book focusing on the new trends and frontiers in architecture. Architecture renews itself in terms of structural, aesthetical, and functional aspects that correspond to the needs of every age. Unlike artistic creativity, innovation in an architectural sense has to be evaluated differently as an object of use in social life. The innovation might include technical, design, manufacturing, management, and commercial aspects related to presenting a new (or improved) product. In other words, innovation, as a novel idea bringing an added-value, is an enterprise tool, in which change is used as an opportunity. Originality, on the other hand, the quality of being special and not the same as anything else, opens up a a discussion of how an original architectural move relates to the context, history, and cultural background. Original and/or innovative, new social demands and new technological apparatus challenges architecture every moment by calling out the creativity of the designer.

Within that scope, the concepts of innovation, originality, and creativity had been brought into focus.

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