# LIVENARCH VIII

livable environments & architecture

RE/DE/
GENERATION(S)
IN
ARCHITECTURE

proceedings volume I

8th International Congress

September 27-29 2023 Trabzon TÜRKİYE

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**liv**able **en**vironments & **arch**itecture

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TÜBİTAK

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september 27-29 / 2023, Trabzon – Türkiye
karadeniz technical university, faculty of architecture, department of architecture

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KEYNOTE SPEAKERS *

Carlo RATTI *"Senseable Cities: Towards the Integration of Natural and Artificial"*	Massachusetts Institute of Technology Cambridge, Massachusetts, USA
Jose Pareja Gomez *"Fostering Resilient Architecture"*	Zaha Hadid Architects London, England
Styliani LEFAKI *"Urban Regeneration in Words And Praxis: The City in Crisis"*	Polytechnical Collage of Aristotle University of Thessaloniki Thessaloniki, Greece
Vahid GHOBADIAN *"Sustainable Traditional Buildings of Iran: A Climatic Analysis"*	Islamic Azad University Tehran, Iran

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ACKNOWLEDGEMENTS

We have successfully concluded our eighth LivenARCH (Livable Environments & Architecture International Congress) Congress, which we organized this year under the roof of Karadeniz Technical University Faculty of Architecture, Department of Architecture. First of all, I would like to say that I am honoured to chair this year's meeting of our congress, which has been going on since 2001. For three days, participants presented and discussed their original research under the congress theme. The observations I obtained from the thematic presentations, each of which was interesting from each other, and the sessions I was able to attend as much as possible, showed me that our Congress achieved its main purpose.

As it is known, the most important widespread effect of every congress that has a strong scientific background and addresses current problems based on the needs of the society is that it produces solutions to these problems. In this context, our LivenARCH Congress, which has been organised periodically and with certain current themes for 22 years, has been contributing for years to produce solutions at the theoretical level within the framework of the field of architecture and planning and other related disciplines and within the scope of the determined theme.

So far, our Congress has been organised under the themes of "Nature-Cities-Architecture", "Contextualism in Architecture", "Re/De Constructions in Architecture", "Rejecting / Reversing Architecture", "Replacing Architecture" and "Other Architect/ure(s)". The theme of this year's congress was "Re/De/Generation(s) in Architecture".

As is well known, our world has been witnessing rapid changes in recent years, perhaps more than ever before. Wars, migrations, terrorism, poverty, inequality, lack of education, climate change, pollution, health problems growing with pandemics and economic crises are among the main factors that deeply affect human life and force the transformation of ordinary patterns in all areas of life. The generations that are new to these transformations and whose expectations are shaped according to the new world conditions they live in, create environments suitable for the system in order to capture the dynamics brought by these transformations and to sustain their existence. The generations evolve situations that have disintegrated, deteriorated, and degenerated. Thus, the damaged parts return to their initial states, to their essence, the lost or damaged ones are restored.

In biology, regeneration can be defined as the natural process of replacing or restoring damaged or missing cells, tissues, organs to full

function in living things, in other words, it is the regeneration of a body part that has been lost. By considering the definition of regeneration outside the field of biology, it can be said that all the mental (knowledge) construction processes of human is generated through regenerations, and all the historical actions of human are shaped by regenerative fictions. When this (historical based mental and active) reproduction is evaluated in the context of architecture, it is seen that all the renewed architectural actions are produced through the part of the architectural thoughts and acceptances that are considered as damaged, corrupted or have lost their functions or characteristics. The main goal of our congress, which was held between September 27-29, 2023, was to discuss the phenomena of "generation", "degeneration" and "regeneration" in the context of the act of "architecture" within the framework of the theme "Re/De/Generation(s) in Architecture".

In this framework, 60 papers carefully selected by 34 members of the Scientific Committee met with the audience within the scope of this congress. On this occasion, we are grateful to the esteemed members of the Scientific Committee Göksun Akyürek (Bahçeşehir University, Türkiye), Müjde Altın (Dokuz Eylül University, Türkiye), M. Beatrie Andreucci (Sapienza University of Roma, Italy), Jasim Azhar (King Fahd University, Saudi Arabia), Aydan Balamir (Middle East Technical University, Türkiye), Beatriz Bueno (University of Sao Paulo, Portugal), Gökçen Firdevs Yücel Caymaz (İstanbul Aydın University, Türkiye), Shuva Chowdhury (Southern Institute of Technology, New Zeland), Pelin Dursun Çebi (İstanbul Technical University, Türkiye), Polat Darçın (Yıldız Technical University, Türkiye), Yüksel Demir (İstanbul Technical University, Türkiye), G. Deniz Dokgöz (Dokuz Eylül University, Türkiye), Sıla Durhan (Işık University, Türkiye), Özlem Eren (Mimar Sinan Fine Arts University, Türkiye), Mine Esmer (Fatih Sultan Mehmet Vakif University, Türkiye), Aslı Sungur (Yıldız Technical University, Türkiye), Onur Erman (Çukurova University, Türkiye), Şengül Öymen Gür (Beykent University, Türkiye), Tayfun Gürkaş (Özyeğin University, Türkiye), Ferhat Hacıalibeyoğlu (Dokuz Eylül University, Türkiye), Orhan Hacıhasanoğlu (Özyeğin University, Türkiye), Badiossadat Hassapour (Eastern Mediterranean Univesity, North Cyprus), Pınar Dinç Kalaycı (Gazi University, Türkiye), Carlos Machado e Moura (Univesity of Porto, Portugal), Esma Mıhlayanlar (Trakya University, Türkiye), Ahmet Vefa Orhon (Dokuz Eylül University, Türkiye), Zafer Sağdıç (Yıldız Technical University, Türkiye), Gökçeçiçek Savaşır (Dokuz Eylül University, Türkiye), Semra Arslan Selçuk (Gazi University, Türkiye), Murat Sönmez (TOBB ETÜ Univesity of Economics & Technology, Türkiye), Marc Aurel Schnabel (Victoria University of Wellington, New Zeland), Levent Şentürk (Eskişehir Osmangazi University, Türkiye), Fatih Terzi (İstanbul Technical University, Türkiye), and Belkıs Uluoğlu (İstanbul Technical University, Türkiye).

For three days, we listened to thematic presentations, each of which is interesting and engaging. In his opening presentation, Carlo Ratti, through the projects of the "Senseable City Laboratory", a research initiative of MIT, and the design office Carlo Ratto Associate, critically examined a new generation of practice defined as the "Internet of Things" or "IoT" in the context of architecture. The reviews we listened to under the main title of "Senseable Citys" were quite interesting.

Manuela Gatto from Zaha Hadid Architects was scheduled to give the second thematic presentation. However, Gatto expressed his regret and made an excuse, stating that someone else would make the presentation instead. In his thematic presentation titled "Zaha Hadid Architects: Fostering Resilient Architecture", Jose Pareja-Gomez emphasized the importance that Zaha Hadid Architects, a globally recognized pioneer in the field of innovative architecture, attaches to research and development. He noted that the projects are supported by information from ongoing academic research. And he showed very striking examples of this.

The third thematic presentation was made by Styliani Lefaki from Polytechnical College of Aristotle University of Thessaloniki. In her presentation titled "Urban Regeneration in Words and Praxis: The City in Crisis", Ms. Lefaki evaluated urban transformation practices through selected examples in contexts such as the aims, objectives and characteristics of renewal plans.

We listened to the fourth thematic presentation titled "Sustainable Traditional Buildings of Iran" from Vahid Ghobadian from Islamic Azad University. In his presentation, Mr. Ghobadian talked about a series of rational solutions offered by traditional builders in Iran, which is located in a wide geography with different climatic zones, which can be an example for today's architects. It revealed what kind of ways and means Iran's traditional masons and builders designed for human well-being and comfort in various climatic conditions and without using modern technologies, resorting exclusively to natural resources such as soil, sand, stones, water and plants.

We were going to listen to the last thematic presentation from Sofia Aleixo from University of Évora. But this was not possible. I would like to thank all the keynote speakers for their seminal presentations to the theme of the congress. We listened to them all with pleasure and interest.

The content of 60 presentations made in 16 separate sessions planned in parallel shows that the researches are generally collected under the

main headings of philosophy, theory, history, discourse, urban, city, landscape, rural, criticism, method, politics, policies, laws, regulations, ethics, design, education, conservation, transformation, re-use, technology, material, and sustainability. However, it was interesting to see that about a third of the research presented at the Congress was concentrated in the sub-headings "urban, city, landscape, and rural". It was meaningful that various urban and rural practices that occupy the architectural agenda of Turkey were opened to discussion in this Congress whose theme was "regenerations / degenerations". I would like to thank all the paper owners who contributed to our Congress with their valuable researches.

The sessions were conducted smoothly thanks to the selfless efforts of the session chairs. Endless thanks to Asu Beşgen (Karadeniz Technical University, Türkiye), Gökhan Hüseyin Erkan (Karadeniz Technical University, Türkiye), Serap Durmuş Öztürk (Karadeniz Technical University, Türkiye), Beyza Karadeniz (Karadeniz Technical University, Türkiye), Serdar Aydın (Mardin Artuklu University, Türkiye), Aygün Erdoğan (Karadeniz Technical University, Türkiye), Zafer Sağdıç (Yıldız Technical University, Türkiye), Ayhan Karadayı (Karadeniz Technical University, Türkiye), Aktan Acar (TOBB ETÜ Univesity of Economics & Technology, Türkiye), Selin Oktan (Karadeniz Technical University, Türkiye), Şölen Köseoğlu (Atatürk University, Türkiye), Ersin Türk (Karadeniz Technical University, Türkiye), Murat Tutkun (Karadeniz Technical University, Türkiye), Aysun Aydın Sancaroğlu (Karadeniz Technical University, Türkiye), Çağlar Aydın (Karadeniz Technical University, Türkiye), and Muteber Erbay (Karadeniz Technical University, Türkiye) for accepting our invitation.

It is not possible to realise any congress without institutional support. I would like to thank especially our rectorate, dean's office and the head of the Department of Architecture. I would also like to thank the Scientific and Technological Research Council of Türkiye (TÜBİTAK) for supporting our congress.

However, the biggest thank you goes to the members of the Congress Organising Committee. Endless thanks to Nilgün Kuloğlu, Asu Beşgen, Nihan Engin, Nilhan Vural, Hare Kılıçaslan, Özlem Aydın, Aysun Aydın Sancaroğlu, Semih Yılmaz, Kıymet Sancar Özyavuz, Gürkan Topaloğlu, Çağlar Aydın and Selin Oktan, who have contributed to every stage of the congress organisation with great devotion for the last one and a half years.

I would also like to thank graphic designer Cansu Beşgen, who has been preparing the thematic visuals of the congress for a long time. This year, the visual editing of the congress was entrusted to him. I would also like

to state that we are happy to see the valuable academic and administrative staff of our Department of Architecture and our students among us.

And finally, endless thanks to Merve Tutkun, Büşra Topdağı Yazıcı, Mehmet Ali Otyakmaz, Güray Yusuf Baş, Barış Çağlar, Tayfur Emre Yavru, the valuable Research Assistants of our Department of Architecture for their extraordinary contributions to the remote execution of the congress and to Beliz Büşra Şahin, who undertook the presentation of the congress.

In 2025, I would like to extend my regards to all of you with the hope of meeting face to face at our Congress in Trabzon (Türkiye), which we will organise for the ninth time.

Prof. Dr. Ömer İskender TULUK
LivenARCH-VIII 2023 Congress Head

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CONSERVATION/TRANSFORMATION/RE-USE

A COMPUTATIONAL APPROACH TO RESTORING HISTORICAL TIMBER STRUCTURES

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ABSTRACT

This study offers a grammar-based computational approach to developing repair suggestions for the deteriorating timber roof structures in historical buildings. In traditional restoration practices, timber elements are typically completely replaced in roof restoration. With the aim to enable partial intervention in roof elements, we present a grammar of joint details and a method for forming parts. We use non-destructive analysis methods to identify and optimize areas of the structure that require intervention.

As outlined by the charters of Venice, ICOMOS, NARA and UNESCO, authenticity in restoration is not only concerned with formal preservation methods. In our study, we focus on using digital production methods in tangible and intangible cultural context. Heritage structural elements for two main reasons. Our analysis of literature on digital production methods indicates that collaborations in applying digital design to heritage are inadequate, and the use of digital tools reduce human errors during the restoration process and create the corresponding output. The case examined in our study is Göğceli Mosque, located in the Çarşamba district of Samsun. Built in 1206, the construction of the building is masonry and its roof is timber frame construction. The mosque is known to have seen repairs as early as in 1335 and requires restoration once again in 2023 due to deformation such as sinking and tilting in the eaves of the roof. Our initial observations suggest that the absence of a supporting element in the damaged area may be responsible for this deterioration. Based on the common practices of joint detailing in historical timber roof structures of the region, we develop a grammar for the roof structure of the mosque and for integrating alternative partial or whole 3D forms to the existing structure.

Keywords: Design Grammar, Historical Timber, Timber Roof, Non-Destructive Analysis, Timber Joint

CONSERVATION/TRANSFORMATION/RE-USE

INTRODUCTION

One of the areas of use for timber material is in the structural system of the building. This study uniquely proposes a computational design workflow in the restoration process of timber structures. It examines the interventions followed during the restoration of timber structures. The current understanding of restoration is in the direction of preserving original values. According to this understanding, the approach of preserving the original values is generally in the direction of changing the structural elements of the structure in timber buildings. The complete replacement of the structural elements is shaped only on the formal qualities of the heritage building.

Designing the repair process and using the material in sufficient quantities so that it is not wasted is considered as an important factor in our study. The elements of timber structure were analyzed in the context of a cultural heritage case and it was determined that its form embodies process-related factors that are physical, historical and application-based. In the context of these factors, a study data was created with the parameters of the timber element according to the load, deformation area, and the location of the structural elements over time. In line with this data, it was determined that the rule-based grammar approach offers the chance of devising a smaller intervention in the restoration process. The computational approach proposed for the restoration process aims to create attributes by providing data for a digital design. The design and interface of this approach in the workflow and in restoration constitute the main part of this study. The workflow follows the ICOMOS and Venice principles accepted by UNESCO (ICOMOS, 2017) and envisions a future role of digital design methods in restoration processes. The case at hand shows a production method with the frame system.

Restoration Process of Historic Timber Buildings

Wood is one of the oldest and most preferred building materials. It has been used in many parts of the monument considered in this paper, namely the Göğceli Mosque. These parts are as supports, roof, spatial separators and ornamentation. The main reasons for the common use of wood in building are its accessibility as a material from the past to the present, its easy processing with simple tools and its transformability. In this respect, wood can be considered as a construction technology (Larsen & Marstein, 2016). Wood is shaped with detail information, especially in the structure of the building. It needs repair in case of biological and physical deterioration (Ellingwood, Rosowsky, Li, & Kim, J. 2004). For this reason, it needs versatile ways of working when it needs

repair. In line with international regulations and doctrines, the repair process of the structure can be evaluated and reconsidered with detail information according to time (Figure 1). In this case, the main objective is the maximum protection of the structural wooden element with minimum intervention (Monaco, Balletti, Pelosi, 2018).

Figure 1. Oyama Dera realized the repair of the elements with partial intervention in the load-bearing elements of the burning pagoda. He developed a detail that ensures interlocking at the joints (Larsen, Marstein, 2016).

The repair process in structural restoration is shaped in line with the analyses (Kudde, Sürücü, & Köroğlu, 2009). The techniques used in restoration generally consist of six techniques. These are consolidation (on-site protection), integration, renovation, reconstruction, cleaning and transportation techniques (Figure 2). These techniques can be applied together according to the repair needs of the building. In scientific restoration, the repair method should be carried out with as little intervention as possible (Ahunbay, 1996). Preservation of cultural heritage, documents, memory and aesthetic values is the main objective at this point.
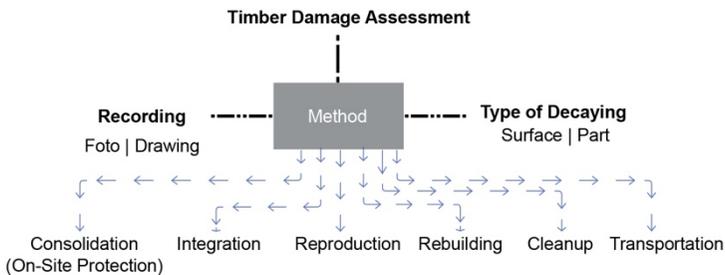
Figure 2. A typical restoration intervention flow.

In addition to conventional methods, today, the repair process can be monitored with non-destructive methods such as analysis, simulations and construction technology such as digital fabrication in order to obtain qualified and efficient results in production. In this way, sustainable, transformable and high-performance repair solutions are being developed (Bianconi & Filippucci, 2019). These solutions are shaped together with conventional restoration processes. For this reason, when recent studies are examined, they are generally limited to digital archive, analysis and fabrication (Figure 3). The limitation in the process; separate processes such as analysis, evaluation and application cause standardization in conventional restoration processes. Therefore, an unforeseen problem in the next step increases the cost of restoration (Selbesoğlu, 2009).
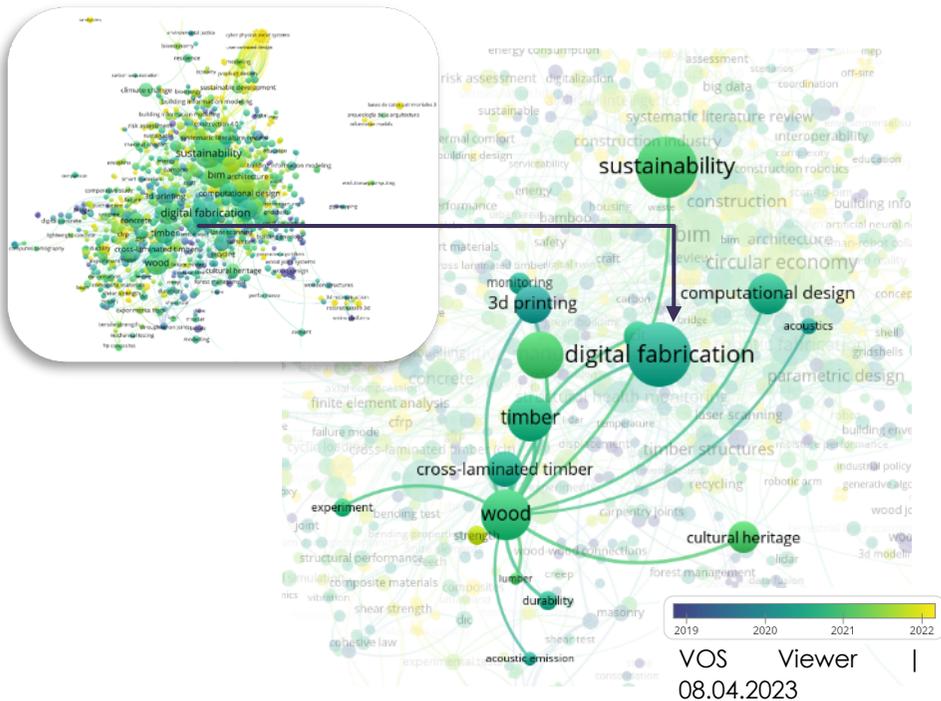
Figure 3. Literature search analysis with VOS Viewer software according to Web of Science database. A concept network was created based on the keywords Timber, Structure, Digital, Heritage.

The "decision-making" process progresses step by step with computational design. Planning, interdisciplinary work and the application of numerical calculation ensure the traceability of the restoration process in the workflow (Gürsoy & Özkar, 2015). Ultimately,

computational design prevents human errors that occur in the conventional workflow, problems that may arise in accessing technical drawings and records, and problems that may arise in accessing the master of the building. In the restoration process, there are elements that will affect each other such as cultural memory, tangible and intangible heritage, authenticity value and physical structure that structural element information points to. Computational thinking is important at this point to ensure multidimensional work and to design the process. Because with "computational thinking", information can be processed and evaluated in multiple ways and solutions can be produced in complex problems (Soleimani, 2019).

Computational Approach as a Contemporary Repair Method

Both contemporary and conventional repair methods are available for repairing historical wooden structures in restoration processes. Especially after the 19th century, repairs were carried out using a secondary material such as iron in the wooden structure. In this period, when structural repair gained importance, there is a search for repair approaches (Bertolini Cestari & Marzi, 2018). The type of intervention to be made is determined in line with international acceptances. ICOMOS, NARA, UNESCO documents published in this regard include international acceptances. In particular, articles 9, 10, 11, 12 under the title of repair of the Venice Charter, which is the basic document, offer up-to-date repair approaches by examining contemporary methods in restoration processes and encouraging the application of contemporary repair (Ahunbay, 1996). In cases of physical transformation in the restoration process of heritage wooden buildings, it is advocated to prefer the same type of wood. The aim is to ensure the unity of the style.

In heritage buildings, the criterion of authenticity is evaluated under the upper heading of stylistic unity. However, in conventional restoration approaches, the titles of authenticity and style are confused with each other. Basically, authenticity should be handled with today's technology and knowledge in heritage buildings in social life (Smith, 2006). For this reason, purely stylistic concerns lead to "repetitive" restoration processes. As stated in the Venice Charter, it is necessary not to ignore the differences of the building depending on time by making the unity of style the main goal (Rittel & Webber, 1973). At this point, authenticity constitutes a dynamic response to decisions and needs that may change over time. As a matter of fact, when ICOMOS and UNESCO documents are examined, the preservation of the unity of style, which is the dull face of the building, should not be made the primary goal. It is aimed to protect dynamic processes such as the building's application methods, practices, master-apprentice relationship (ICOMOS, 2017).

Ultimately, it is not only the tangible heritage that is aimed to be preserved, but also the intangible heritage. Because the protection of cultural memory in a building can be handled in this way. The traditions, social practices, rituals, etc. that communities pass on to generations can be considered as intangible cultural heritage (Bouchenaki, 2003). In this study, the master-apprentice relationship that constitutes the knowledge of wood details is analyzed by rule-based grammar method. The method based on wood details offers a computational repair approach in restoration.

Damage Detection and Optimization in Historic Timber Structure

When the restoration process starts, one of the first procedures is to document the building photographically and to identify the damaged sections. The document obtained in this process constitutes only the visual information. For this reason, it is not possible to use the data that make up the photograph in multiple ways (Lawson, 2006). In the study, photogrammetry, one of the non-destructive methods of surveying, was used to identify the damaged section (Figure 4). Since the obtained document consists of volumetric and pixel scale data, it can work in multiple ways. In addition, the digital document also enables integrated processes simultaneously. In this study, an integrated process was used to determine the location of the fabrication (Serafini, Riggio, & González-Longo, 2017).

Figure 4. The roof of Göğceli Mosque as photographed from the inside (left), the interior photogrammetry study of the roof (right).

For restoring load-bearing timber elements, firstly an optimization of the whole deteriorated element was performed. With Topological Optimization, the load map of the timber element to be repaired was created. The factors affecting the formation of this map were based on three basic data: the amount of incoming load, the type of timber and the location where the wood is supported (Figure 5). In line with this data, the optimization varies according to the location of the element to be repaired in the support system of the timber construction. As a result of

the optimization, the work area data was determined. Then, data such as load flow, deformation limits and joint details were defined as attributes of optional outputs as was proposed in literature (Karagöz & Kesik, 2021).
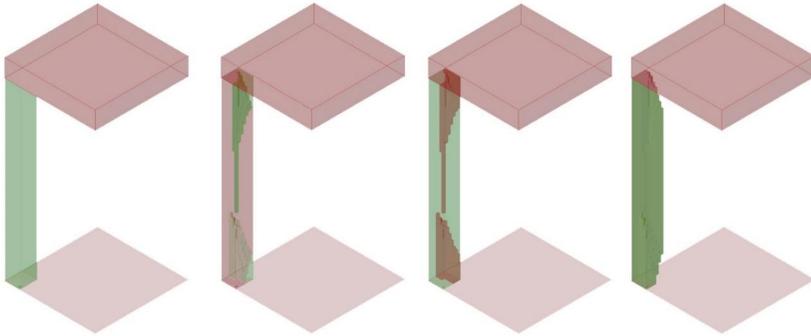
Figure 5. Stages of optimizing the support element, from left to right: Topologized Element, Deformed Part/Surface, Conserve Part/Surface, Digitized Timber

In order to define the deformed part with a computational approach, the values of the deterioration section and the preserved section were computationally determined in stages. In the final result of design, digital timber data was defined to create the workflow. In this study, the data obtained from the computational approach process and the parameters in the structural system of the cultural heritage building constitute the basis of digital optimization (Larsen, Marstein, 2016).

Digitalization in the Repair of Historic Wooden Structures

According to the Venice Charter and ICOMOS document interventions from different times should be legible in the building (Erder, 1968). For this reason, in addition to the tangible reality, the intangible cultural heritage of the element should also be evaluated with today's tools. A system created in this way was created in line with calculable data. On the one hand, it will provide a basis for the intervention method envisaged in the following times. For this reason, the computational repair method, which can be an alternative to the conventional restoration workflow, is of vital importance in restoration processes. The methods examined and applied in this study are the creation of a rule-based grammar and its completion with discrete units in fabrication.

Computational design with rule-based grammars has been a popular subject in the field of design computing. Rule-based approaches may be of use to analyse and document both tangible and intangible

heritage that conventionally relies on master-apprentice knowledge. Computability of this knowledge delivers potentials to determine methods of interventions in repair and restorations. Shape grammars, a rule-based visual methodology, enables the step-by-step formation of the form and the decomposition of other embedded forms (Stiny & Gips, 1971). The definition of the embedded form proceeds with rules. As a result of the analysis of the structural system in the study, a common usage area is created for experts by creating a grammar and documenting it. This workspace makes interdisciplinary research accessible by serving restoration experts, architects and building workers. With the creation of a rule-based grammar and the creation of a system, computational design knowledge provides a more accessible, reliable, high quality and fast working area (Gray, 1999). While the outputs of the study serve as an archive, they can also vary according to changing possibilities or parameters. Variables can be monitored in the workflow according to the differences of the parameters.

Digital Fabrication in Timber Structure Repair

In this unidirectional workflow, restoration knowledge is constantly shaped through a one-way feeding and only "doing". The structure shaped by today's intervention, which is shaped solely by human-centred intervention, has no effect on the previous restoration knowledge, and how the future intervention may be transforms into a mysterious system. (Selbesoğlu, 2009) At this point, one of the methods that enable data to be transferable is digitized data. For this reason, the data turns into information that affects the past and the future, rather than something that is only used today. While it is possible to read this information on a structure with application knowledge by experts in this field, it is also aimed to show how a processed data is transformed (Figure 6). This way, the restoration workflow should not only be transformed into a "doing" process but also into a process of "making decisions while doing" (Gürsoy & Özkar, 2015). Rather than the result of a restoration, the design of its process, is the subject matter in this study that focuses on repairs that utilize wooden units. Separate working units are known as "discrete architecture" in contemporary architecture (Retsin, 2019). We do not only aim to create the formal integrity of discrete units but also to adhere to the rules in the area where the repair will be seen in the restoration "orkflow (Figure 9,10). It is possible that the working system and the output itself can be handled as an artifact in architecture, in other words, what returns to the system and what is produced can return to the future artifact.
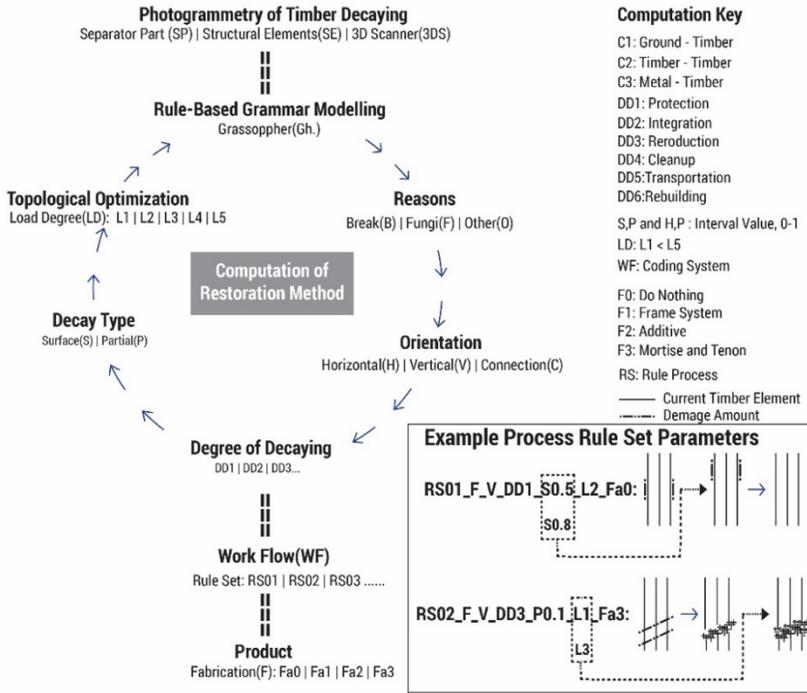
Figure 6. Novel workflow of the restoration process with the computational design developed within the scope of the study. The majority of the steps are collective. Example study prepared according to the need for repair in restoration within the square.

The Timber Roof Structure of Göğceli Mosque as a Case Study

Considering the roof structures of historical wooden masonry buildings, the study focuses on the Göğceli Mosque that is currently an object of restoration. The roof structure was chosen as the application area of this study because of the risk of collapse. The other reason for choosing this part of the building is that structural elements can be easily removed with the idea of deduction in restoration processes. Factors such as the fact that deterioration in the face of environmental factors basically starts from here and the spatial nature of the structural elements can be counted among the reasons for choosing it as the application area of the study (Bertolini, Marzi, 2018). Göğceli Mosque (1206), built with the "Çantı" technique with a wooden masonry system in Samsun/Çarşamba, was selected as a case study example (Figure 8). The interior of the building, also known as the cemetery mosque, is included after the portico section. It is known as the largest wooden mosque structure in Türkiye with its original joint details of wooden elements, spolia roof

coverings and masonry system. In line with the investigations, it underwent its first repair in 1335. On May 16, 1986, it was registered as an immovable cultural property with the decision numbered 2289. In 2007, it was included in the restoration process for the second time (Furtuna, 2018). In 2023, the building was included in the restoration process again because it suffered serious damages especially in the roof section.

Figure 7. Plan and visuals of Göğceli Mosque, which can be considered as conventional documents for its restoration.

A rule-based grammar was used to follow the details of the junction and the non-destructive method of photogrammetry was used to identify areas that could be repaired (Figure 8). Factors such as detail joint dimensions and the change of the area where the details are located were determined as attributes. These variables were analyzed in accordance with the rules and the basis of the construction method was created.
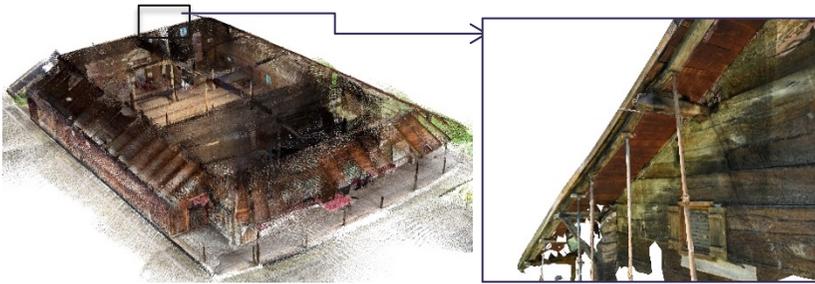
Figure 8. Photogrammetry is used to determine the damaged section of the Göğceli Mosque.

In order to form the basis of the rule-based grammar and to determine the formation process of detail joints, the joint details preferred in wooden masonry buildings in Türkiye were compiled (Figure 9).

In the rule-based grammar, a research itinerary that is far from the architectonic formal concerns of stylistic unity and is not solely product-oriented has been determined. With the rules created, the decision-making processes of the wooden detail and verbal knowledge were transformed into applicable technical knowledge (Figure 10).
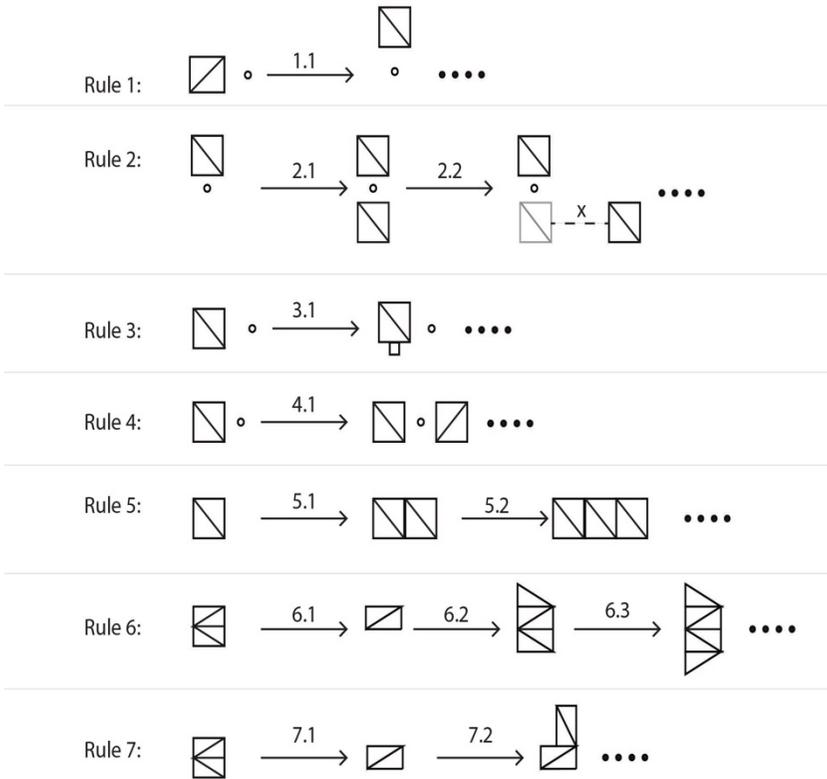
Figure 9. These are the steps in the formation of the joint details of the Göğceli Mosque structure. These steps were created according to the rules of the form. Within each rule there are sub-rules that form its own process. As a result of these rules, the currently used combination details are obtained.

It is envisaged that the serendipitous results of technical knowledge can feed future restoration studies. The models to be developed in computational architectural design systems enable a system to return to the discovery process while at the same time offering "happy accidents/surprise encounters". In this respect, the options of the result of the question that a modeling sets out to answer are expanding. The

alternative repair method to take place in a restoration process is the model "...of model" of the theoretical knowledge involved in the restoration process. After the "Shape Description" process of explaining the form that will take place in the repair process, it is examined in the context of "model for..." (Cannaerts, 2009). Because the information coming from the theoretical has turned into applicable information by gaining explanatory power. In other words, it finds its practical counterpart in the field. One of the basic elements of a space is the structural system. In addition to the fact that this structure has a different preferred system according to different conditions in the space, its support has an important place in heritage buildings. While defining a limitation in heritage spaces, it is also necessary to define it morphologically. Existing topological information allows the formation of a productive system by examining it in the CAD system. At the interface of the possibilities of geometry and the morphology of form, there are rule sets (Shape description) (Steadman, 1983). These systems basically require the design of the process. Rule-based grammar defines one of these approaches in these systems where optional results are generated. When analyzed in terms of form, it is observed that the grammar is created and progress is made step by step with a set of rules.

CONCLUSION

In this study, which presents a computational approach to the restoration practices of the historic timber structure, a new intervention model was created for the repair processes. Within the scope of the study, detail grammar was made with a set of rules. By analyzing and optimizing the joint forms, detail stages that form the memory of historical wooden elements were created. With this approach, the formation and assembly of the wooden joint details of the Göğceli Mosque, which was taken as a case study, was examined. While this examination is carried out through the physical structure of the details, it also includes the embedded knowledge developed between master and apprentice as intangible heritage. At the end of this study, the expectation for future work is that the tacit knowledge embedded in technical knowledge as intangible cultural heritage will be analyzed in restoration processes. The focus is on the form of the joint details of heritage structural elements. The joint detail affects the physical dimension of the space with its tangible reality such as the bearing aspect. In this study, although the roof section of the wooden masonry systems is spatially selected, other spatial sections are affected and influenced. In this respect, the spatial equivalent of wooden masonry structures was examined with the commonality of the sections. The commonality within the space, complex data in restoration processes, control of workflow, traceability of the intervention process, etc. factors were considered in the context

of computational design. In the end, the set of rules obtained constitutes a basis for other buildings. In the future, it is envisaged that it can turn into a workflow created with rule sets in the restoration of each building.

Goğceli Mosque
Junction Details
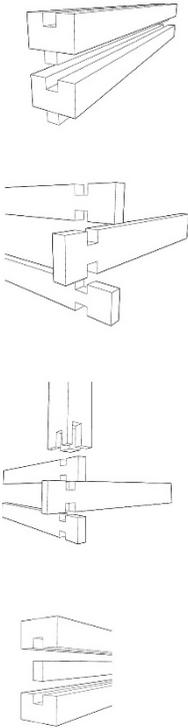
Figure 10. The joint details were obtained by matching the rules created based on the Göğceli Mosque Structure (Figure 9).

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REGENERATION OF KARGI KHAN THROUGH REUSE AND INTEGRATION INTO AN EXPERIENCE ROUTE

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ABSTRACT

The symbiotic regeneration of Kargı Khan and its close-by environment is aimed in this study by eliminating its abandonment problem as the main source of its degeneration process and by integrating it into an experience route. Kargı Khan is a 13th century Seljuk Period khan. It is a unique well-preserved khan example located in an isolated natural context close to Beydiğin village of Antalya. Historic road networks of Pamphylia region and Alanya-Konya caravan route accommodate Kargı Khan as a stopover. The khan buildings are generally considered isolated from their context and they are registered as individual buildings. However, the buildings that are associated with each other and with a route cannot be considered separately. The continuing attempts to protect the historic routes in the world by UNESCO can be a driving force for conservation and regeneration of Kargı Khan with its context and the routes that it is located on as a stop. To plan the regeneration process, firstly the case studies from the UNESCO World Heritage List for the conservation of historic routes and the routes where Kargı Khan is located as a stopover are investigated. Values, problems and potentials of Kargı Khan are identified which will be directive for the adaptive reuse choices of it, as well. In conclusion, by the revival of historic routes and expansion of them by the inclusion of natural and historic sites, the integrated presentation of Kargı Khan with its context is planned in a refunctioned state as Beydiğin Village Cultural Promotion Hub.

Keywords: Regeneration, adaptive reuse, experience route, Seljuki Period, Kargı Khan.

INTRODUCTION

The conservation field experiences a change from monument-based registration to context-based ideas in contemporary approaches. The attempts by UNESCO for the conservation of historic routes worldwide can be an example for the new point of view to conserve and be a potential to regenerate abandoned monuments by making them a stopover on a larger network to be experienced by visitors. Kargı Khan (13th century) located close to Beydiğin Village in Antalya is an abandoned and authentic Seljuki Period khan building waiting for required conservation applications which will provide its regeneration. This study aims to plan the holistic conservation and regeneration process of Kargı Khan together with interrelated khan and earlier period historic site remains by the activation suggestions for Side-Aspendos with Side-Ormana route and Alanya-Konya caravan route. The enrichment of the routes by the inclusion of close-by cultural and natural heritage sites will also be realized.

In the followed methodology, firstly the case studies from the UNESCO World Heritage List for the conservation of historic routes is examined to create an insight for the conservation strategy determination. Then, the routes that Kargı Khan is located as a stopover are investigated and presented together with the other structures that exist as stops. The conservation state for the khan buildings on Alanya-Konya caravan route is expressed. The detection of values, problems and potentials of Kargı Khan is realized which will be directive for the adaptive reuse choices of it, too. As the last step, Khan is refunctioned as Beydiğin Village Cultural Promotion Hub to present the intangible values of Beydiğin Village and close-by villages. By the revival of existing historic routes and expansion of them by the inclusion of close-by historic and natural sites, the integrated presentation of Kargı Khan with its context is planned.

Case Studies For Historic Route Preservation

In the convention organized by UNESCO (1994), historic routes were evaluated as a part of our cultural heritage with their intangible and symbolic dimensions. The Way of St. James to Santiago de Compostela and the Kumano Kodo to Kumano are registered pilgrimage routes on the World Heritage List (UNESCO, 2023). The first one is the pilgrimage route, followed by different route suggestions crossing Spain, Portuguese and France. In the journey, medieval towns and natural sites are experienced, and the center of the routes is Santiago de Compostela where Cathedral of Santiago is located and is sacred since the tomb of St.James, one of Jesus' twelve apostles, is located. Via Francigena, Via

di Francesco and Via Appia are other three choices for the routes finishing in Rome, Italy (Roland, 2022) (Figure 1).

Figure 1. Route choices for The Way of St. James to Santiago de Compostela (Source: https://caminoways.com/the-way-of-st-james#:~:text=Often%20referred%20to%20as%20the,in%20the%20north%20of%20Spain., 2023)

The UNESCO Silk Roads Programme (2023) aims to examine historic Silk Roads crossing Europe and Asia. It tries to understand the mutual exchange and dialogue realized on this route by creating an online database.

The Main Andrean Road which is a network used by Inca Empire and passes through production, administrative and ceremonial centers, is in the nomination process to be included in World Heritage List (UNESCO, 2023) (Figure 2).

Kargı Khan can be preserved and revitalized with its context and the route it is placed in the light of UNESCO's ongoing efforts to protect the world's historic routes.

On the other hand, the nominations from Turkey still adopt a fragmented approach. For example, one of the last nominations to the tentative list is the Seljuk Caravanserais on Denizli-Doğubeyazıt route (UNESCO, 2023). A detailed description of the caravanserai building type is made. On the route, the examples of well-preserved caravanserais are listed as Akhan, Ertokuş Khan, Saadettin Khan, Obruk Khan, Ağzıkarahan, Sultan Khan, Öresin Khan, Sikre Khan, Mamahatun Caravenseria and Hacıbekir Khan. The context, the intangible values of the caravan route, and surrounding settlements are not mentioned; instead, only building scale qualities are

proposed. Consequently, even if the inscription gives the impression that the road and the Khan buildings are taken into account together, the nomination description makes it clear that just the khan buildings are considered (Figure 3).

Figure 2. Main Andrean Road
(Source: https://whc.unesco.org/en/qhapaqnan/, 2023)
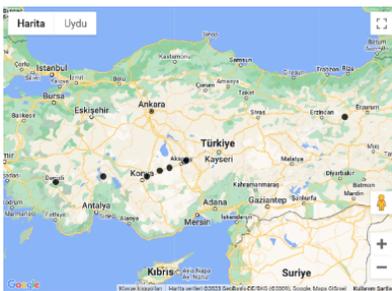
(a)   (b)

Figure 3. Locations of caravanserais on map (a), photos of caravanserais on the route(b) (Source a and b: https://www.worldheritagesite.org/tentative/id/1403, 2023)

The Relation Of Historic Trade Routes And Kargi Khan

The road network organized in Pamphylia Region where the Kargı Khan is located dates back to Ancient period. The historic road starting from Side reaches Aspendos and the next stopover is the Kargı Khan. Then, this road intersects with another road network named Side-Erymna (Ormana) line and Kesikbeli road. Side is the harbor of this road network where the goods are transported. Then, Seleucia and Etenna ancient cities are reached. After passing this site, Eynif plain as a natural landscape in a preserved state and Tol Khan are the next stops. They are a part of the Pamphylia region historic road network and the traces of these roads are trackable at some parts (Ercenk, 1992) (Figure 4).

The Caravan route spanning between Konya and Alanya accommodates many Seljuki Period Khans including Kargı Khan. From Alanya, the first stopovers are Şarapsa Khan and Alara Khan. Both of the khans are restored. Then, the Kargı Khan or Murtbeli Khan is reached because the road is separated into two (Kunduracı, 2017). There are remains of Murtbeli Khan but it is abandoned currently. According to another source, after Alara Khan, there is Homa (Oymapınar) Khan, but no remains of this khan reached today (Bakkal, 2019). If the Kargı Khan is the next stop, Burma Khan or Eynif Tol Khan becomes the upcoming stopovers according to the road choice. There is no remain of Burma Khan and the majority of the Eynif Tol Khan structure has disappeared, only a few arches remain has reached today. Both of the roads arrive to Kubad-Abad Palace constructed in 1236 by I.Alaeddin Keykubad and situated next to Beyşehir lake. It is currently abandoned and its superstructure is completely demolished. If the next stop is Murtbeli Khan, then again Eynif Tol Khan located in Eynif plain is reached. Then, Ortapayam Khan is the next stopover which has remains totally integrated with the landscape and towards the northeast direction the road network continues. Several khans are located till reaching Konya such as Kireli Khan, Kızılören Khan, Altınapa Khan, etc. (Kunduracı, 2017). Kireli Khan has a minority of its structure. Kızılören Khan is restored while Altınapa Khan is abandoned and half buried in soil and water because of being in the borders of Altınapa Dam. The figure 5 reveals that Kargı Khan is the only not restored khan conserving its structural integrity among the khans located on the Alanya-Konya caravan route in addition to Altınapa Khan. However, the Altınapa Khan is in danger of losing its structural integrity because of the existence of a dam (Figure 5).

Figure 4. Historic routes of Pamphylia region and location of Kargı Khan
(Source: Revised from Ercenk, 2017); (a) Eynif plain and Tol Khan, (b)
Erymna, (c) Etenna, (d) Seleucia, (e) Kargı Khan, (f) Aspendos, (g) Side
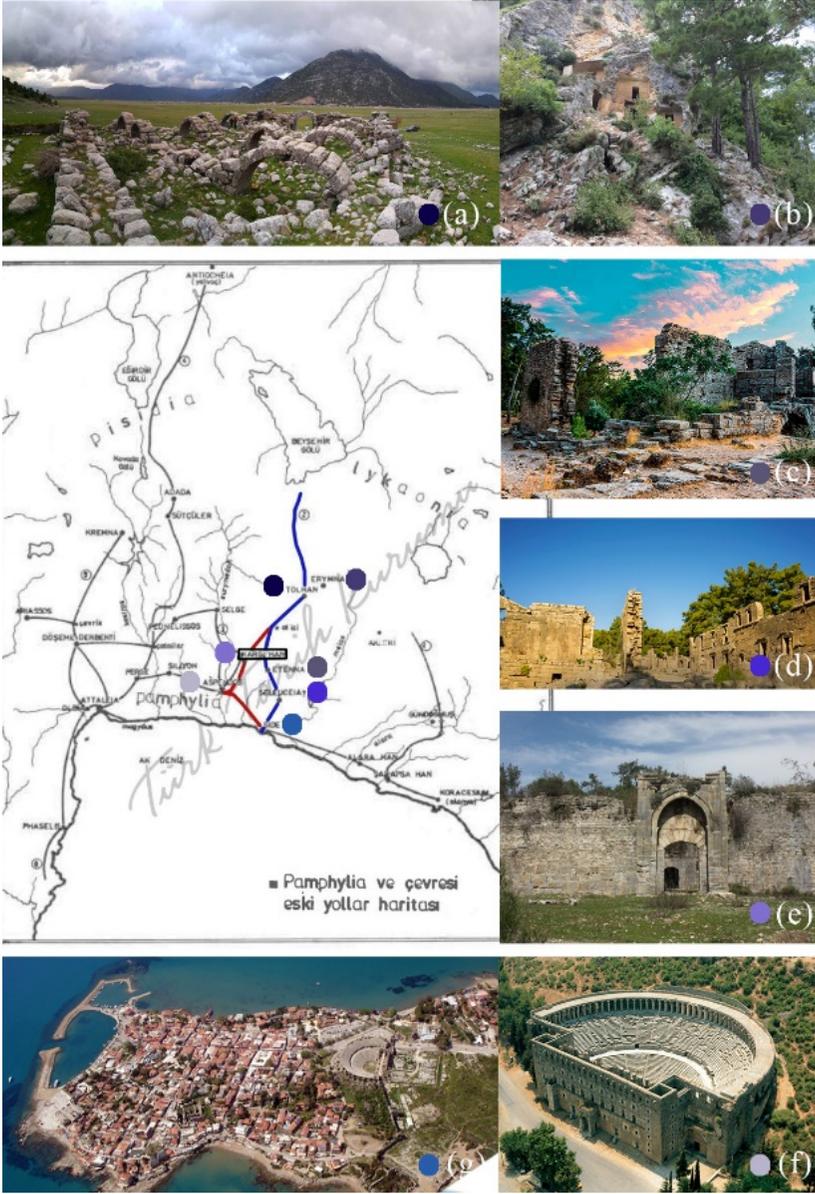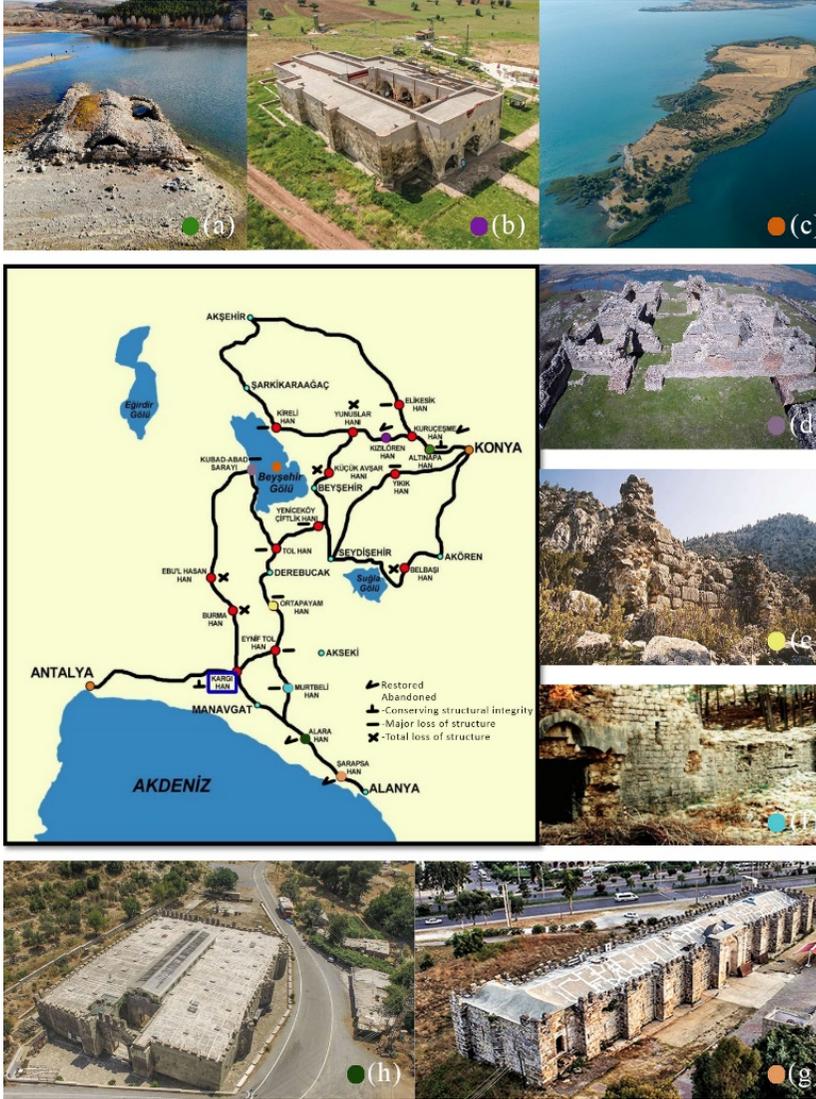
Figure 5. Seljuki Period Khans on Caravan Route between Alanya and Konya (Source: Revised from Kunduracı, 2017); (a) Altınapa Khan, (b) Kızılören Khan, (c) Beyşehir Lake, (d) Kubad-Abad Palace, (e) Ortapayam Khan, (f) Murtbeli Khan, (g) Şarapsa Khan, (h) Alara Khan

Values, Problems, Potentials Of Kargi Khan And Its Context

The values, problems and potentials of Kargı Khan and its context are evaluated in site scale and building scale. For site scale values, it is a part

of an impressive cultural landscape. The Kargı River flows just next to east facade of Kargı Khan. The mountainous landform covered with trees surrounds the khan environment. Beydiğin village is located close to Kargı Khan and the landscape is also a grazing place for the animals of villagers (Figure 6).

Figure 6. Cultural landscape components of Kargı Khan

The other close-by villages accommodate different craftsmanships and lifestyles with their built environment, too. The weaving rug of İbradı and Döşemealtı, Gılamık fabric and Düğmeli Houses of Ormana, food culture, music culture, and transhumance can be given as examples. So, the close-by villages are important components of this cultural landscape with their tangible and intangible aspects. This cultural landscape is also on a road network connecting different ancient cities like Erymna, Etenna, Seleucia, Aspendos, and Side by being in Pamphylia Region. The natural beauties like Manavgat waterfall, Köprülü Canyon, Oymapınar Dam and Ormana Yılkı Horses watch area are the close-by spots to Kargı Khan (Figure 7).
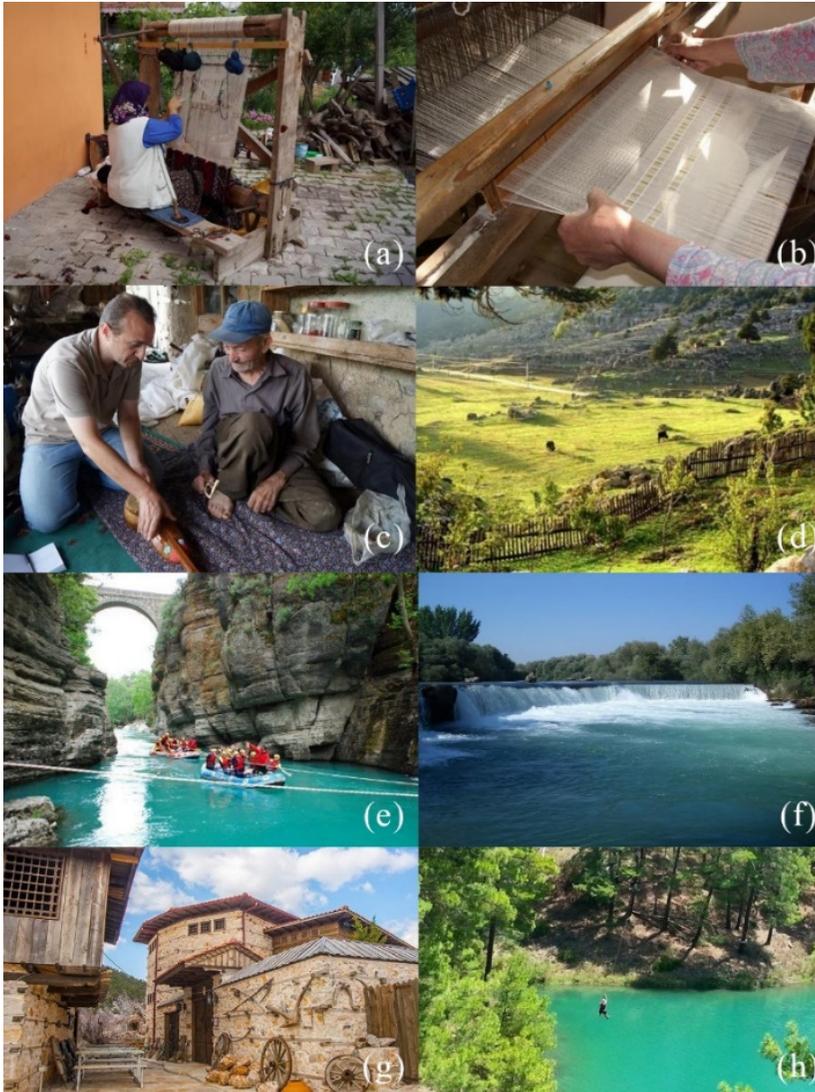
Figure 7. Intangible values in site scale and close-by natural-cultural sites; handicrafts as weaving rug (a) and Gılamık fabric (b), *iklığ* musical instrument production (c), transhumance (d), Köprülü Canyon (e), Manavgat waterfall (f), Düğmeli houses (g), Oymapınar adventure park (h)

For building scale values, Kargı Khan is a unique example of 13th century Seljuki Period khans within a mostly preserved state with its authentic characteristics. It exemplifies construction techniques and material

technology of Seljuki Period and Ottoman Period. Outer facades of khan were plastered most probably in Ottoman Period and there is a signature possibly belonging to the plaster master. Relieving vault design in shelter roof, representation of different arch types, triangular buttress design as a rare example, different material usage as rough cut stone, fine cut stone and rubble stone and the flat roof tile remain as a clue of roof covering and bath remain are the valuable qualities of the building in terms of construction and material technology. It has unique architectural element remains in preserved condition. Illumination hole designs with closing stone remains, preserved platform design and latrine design, unique portal designs, *yemlik* design remains in both shelter and courtyard, *çörten* hole remains for water drainage in facade walls and courtyard drainage system remain are examples for these architectural elements (Figure 8).

Figure 8. Values in building scale; plaster mason signature (a), triangular butress (b), relieving vault in shelter roof (c) platform design (d), south facade with different stone usage and portal design (e), latrine design (f), room with *tandır* remain (g), authentic roof tile (h), *yemlik* remain (ı), illumination hole with closing stone (j)

Site scale problems can be summarised as wide asphalt road that is close to the khan, the lack of public transportation, the lack of tourist accommodations, and the lack of connectivity between Beydiğin villagers and the Khan (Figure 9).

Building scale problems are related with structural, material deterioration, architectural element loss and disuse aspects. Abandonment can be evaluated as the basic cause of other problem types leaving the building unmaintained. For structural and material deterioration problems, crack, splitting, discoloration and microflora can

be given as examples. All of them lead to the degeneration process of Kargı Khan (Figure 10).

Figure 9. Site scale problem example as wide asphalt road close to khan

Figure 10. Problems in building scale; crack and splitting in main portal (a) and portico pier (b) discoloration and microflora in shelter (c)

Potentials of Kargı Khan in site scale can be listed as alternative tourism opportunities like camping, trekking etc. with its natural beauty like Kargı River and mountainous landscape, Antalya road existence passing close to khan which can make easy the transportation, historical trade routes existence and revival possibility of these routes by connecting them to close-by alternative tourism sites, Beydiğin village existence and its cultural values, Eynif plain for agricultural activities of Beydiğin village, and intangible values of close-by villages like weaving rug, food culture, music culture etc.(Figure 11).
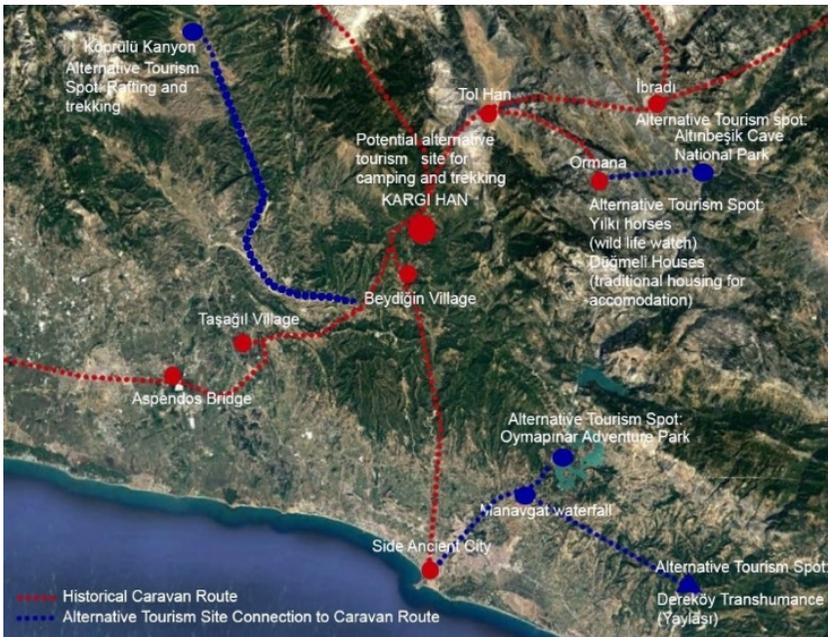
Figure 11. Connection potential of historic trade route to close-by historic and natural sites

In building scale, refunctioning, increasing connection between khan and villagers, being a meeting and socializing space potential for villagers, a trade space potential to sell local products of villagers, an exhibition area potential to display and document villagers' cultural values by creating awareness for their own values, too, being an introduction and cultural exchange center potential for close by villages/settlements, answering potential to different activity types with a variety of space designs of khan as open, semi-open and closed, a big courtyard design which can be useful for open-air public activities, shelter as a big space with the leveled design which can allow function separation between levels in same space, portico as a wide semi-open

space for public activities and room designs which can accommodate functions requiring less closed area can be listed as potentials (Figure 12).

Figure 12. Space types of Kargı Khan
(Source: Ground floor plan of Kargı Khan revised from IZTECH, 2020)

Experience Route And Adaptive Reuse Decisions

The holistic conservation and regeneration of Kargı Khan is suggested by the integrated evaluation of historic routes in its context while creating an expansion through the addition of close-by sight-seeing places to the route. Two route types is proposed each accommodating Kargı Khan as a stop. The first type is gained through the overlap of Ancient Period route and Seljuki Period caravan route. Since the portion of Ancient route from the Side to Beyşehir lake overlaps with the caravan route mostly, the integration of these two routes is proposed by including the Ancient route stops into the caravan route. The completely disappeared khan stops will have the info boards to remind the stopover and camping opportunity at these locations will also be provided. In the second route suggestion, the expansion of the historic trade route by the addition of close-by natural beauty areas as caves, waterfalls, and

adventure parks is realized. In both suggestions, Kargı Khan will be in a centralized position by its location and its landscape will be refunctioned as an alternative tourism site, as well. The North side of the Khan near to Kargı river will be a camping site for the route followers (Figure 13).

Figure 13. Experience route designs

In building scale, Kargı Khan will be refunctioned as Beydiğin Village Cultural Promotion Hub. By the implementation of this decision, Khan will be a place where the intangible values of Beydiğin Village and other close-by villages are presented to the public. As can be seen in the plan view, the shelter space will accommodate workshop space for handicrafts in the platform part, while the lower level space connected to the entrance will be the area for the exhibition of traditional daily stuff of villages and the handicrafts produced in the workshops. The four rooms will sell the local products as Gılamık Fabric, weaving rug, musical instruments and Beydiğin village ethnographic stuff. The rooms that have authentic architectural element remains as *tandır* and latrine stone will not be refunctioned to allow displaying themselves. The semi-open space as a portico in the west side of the courtyard will be the area where local food and produce belonging to villagers are sold. Open-air activities related to the culture of villages as local music and folk dance will take place in the courtyard. The iwans as semi-open spaces looking to the courtyard will be evaluated as resting areas where also courtyard activities can be watched. The room next to the entrance iwan will be the administrative unit of this complex (Figure 14).

Figure 14. Function suggestions for the spaces of Kargı Khan
(Source: Ground floor plan of Kargı Khan revised from IZTECH, 2020)

CONCLUSION

The holistic manner for the conservation and regeneration of Kargı Khan which is a 13th-century Seljuki Period khan building together with its context is aimed in this study. The current actions by UNESCO to preserve historic routes with their intangible aspects all around the world create inspiration for the development of a conservation strategy for Kargı Khan.

The investigation for the existing historic routes around the Kargı Khan context which is named as Pamphylia Region in Ancient Period showed that the Khan building is a stopover on both Side-Ormana-Kesikbeli road and on Alanya-Konya caravan route. It is also the only not restored Seljuki Period khan conserving its structural integrity on this caravan route in addition to Altınapa Khan which is in danger because of the existence of a dam.

Kargı Khan is located in a preserved cultural landscape with tangible components as Kargı river, mountainous landscape and Beydiğin Village existence. The intangible components of this landscape cover the handicrafts and lifestyle in the Beydiğin village and close-by villages. The sightseeing natural and historic sites surrounding the close-by landscape of Kargı Khan are also valuable components of the cultural landscape in a larger site scale. In building scale values, the exemplification of different construction techniques and material usage, the authentic architectural remains in differently-characterized spaces of Kargı Khan can be listed.

For the problems, the wide asphalt road existence close to Kargı Khan gives damage to the natural scenery of the landscape. The abandonment of the khan leads to the unmaintenance and degeneration process of the khan as the basic cause of other structural and material deterioration problems.

The potentials in site scale constitute the revival opportunity of historic trade routes and the expansion possibility of the existing road network by the inclusion of close-by historic and natural sight-seeing areas. In building scale, since the Kargı Khan has a variety of space designs as closed, semi-open and open, it can accommodate various types of activities which will be useful in adaptive reuse decision-making stage.

As proposal, two route suggestions are developed one gained through the overlap of existing historic routes and the other is the expanded version of the first one by the addition of close-by historic and natural sites. The adaptive reuse of the Kargı Khan is planned to represent the intangible values of its context while being an alternative tourism spot

CONSERVATION/TRANSFORMATION/RE-USE

by the use of its landscape as a camping site. In the revived and suggested route network, Kargı Khan becomes the central spot both by its location and by displaying the intangible values of Beydiğin village and close-by villages thanks to the adaptive reuse decisions.

By the followed approach, the integrated presentation of Kargı Khan and other cultural and natural sites will be provided in a mutual relationship.

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AN ASSESSMENT ON THE CONSERVATION OF HISTORICAL BRIDGE STRUCTURES: BRIDGES OF THE UPPER EUPHRATES SECTION

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ABSTRACT

Bridges have been important structures throughout history that enable to overcome obstacles related to transportation, especially water resources. These structures, which date back to ancient times, have been used extensively in Anatolia, as in many parts of the world. Anatolia, which is a transition point between east and west with its strategic location and rich cultural background and attracts the attention of many civilizations, has many bridge structures dating to the Roman and Ottoman Periods as well as modern bridges. The Eastern Anatolia Region, where there are many water resources, is one of the areas where many of these bridges have reached today.

The aim of the study is to contribute to the conservation of historical bridge structures in the Upper Euphrates Section of the Eastern Anatolia Region. Due to the fact that the study area covers a very large surface and the number of bridges is high, the provinces of Elazığ, Malatya and Tunceli are mainly limited in the Upper Euphrates Section. The current status of the bridge structures that are known and under protection in the area have been examined in general and the conservation status of the registered bridges that are in ruins have been discussed. However, bridges that have not yet been taken under protection were also

examined within the scope of this study. The method of the study consists of field studies, visual documentation studies and literature reviews. It is aimed that the data obtained as a result of the study will contribute to the conservation of the architectural heritage of similar quality throughout Anatolia and the world, especially the historical bridge structures in the Upper Euphrates Section, and to bring them into the future.

Keywords: Historical bridges; conservation; restoration; Upper Euphrates Section; Stone bridges

INTRODUCTION

Changing places, traveling and going to different geographies for any reason in human life has always been an important necessity. For this, solutions have been developed to overcome the harsh earth conditions. Bridges, one of the most important transitional structures throughout history, are at the forefront of these solutions (Kıraç et al., 2015; Saka Akın and Sezer, 2023). Bridge is defined as "a road built on masonry, stone, wood, iron, steel or reinforced concrete pillars and arches to cross a stream, a river or a high valley and strait on both sides" (Tunç, 1978). In this context, bridges have been vital throughout history for all kinds of transportation requirements that people need.

Bridges are not only with water resources; these are the structures used to connect the two sides, which are separated by the effect of landforms. In this context, they have a great importance in terms of contributing to tourism, trade, architecture, history or cultural heritage, like many other structures in the historical process (Ceylan, 2011). However, not only with its architectural and engineering features; In terms of establishing a tangible connection between human relations and cultures, they have qualities worth examining in terms of intangible cultural values. In this sense, the evaluation of historical bridge structures as both tangible and intangible cultural heritage is important in terms of considering these structures holistically.

There are much different geography in the world that are rich in historical bridge heritage. It can be mentioned that there are rich water resources and landforms in these areas. One of these geographies is Anatolia, where diversity is seen quite a lot in every sense and therefore, it has attracted the attention of many civilizations throughout history. The Euphrates and Tigris Rivers, which are among the most important rivers in the world, pass through Anatolia; however, the fact that it consists of an area surrounded by the Black Sea in the north, the Mediterranean in the

south and the Aegean Sea in the west makes this geography rich in terms of bridges, which are transitional structures.

It is possible to talk about different areas where bridge structures are concentrated in Anatolia. The geographical, military, commercial, etc. reasons of the many bridge structures in these areas. There are many different reasons. In this context, especially the settlements connected with the Euphrates River, the fertile lands around the river and the climate features suitable for comfortable living, contain many bridge structures. Although there are many bridges known to exist in the areas within the Upper Euphrates Section, it can be mentioned that there are dozens of bridges that have not yet been discovered.

The Upper Euphrates Section is one of the four sections that make up the Eastern Anatolia Region today. This section, mainly formed by the provinces of Malatya, Elazığ, Tunceli, Bingöl and Erzincan, is defined as the region where the Euphrates River takes its source. In this context, there are many large or small water resources connected with the Euphrates River in this section. It is possible to talk about the existence of many bridges built for commercial, military and social purposes in this section, which was frequently preferred as a residential area both in prehistoric times and in recent history due to the favorable landforms and climate.

The bridges in the Upper Euphrates Section are very important in terms of reflecting the political, social, military, architectural and engineering qualities of the period they were built. About 85 of these structures have been taken under protection and restoration projects have been prepared for about 20 of them. Conservation practices have also been carried out in some of those whose projects have been prepared, and they have been brought to today's use. Some of these can be listed as Malatya/Arapgir Tarhnik Bridge, Elazığ Palu Bridge, Tunceli Hanım Bridge (Archive of the General Directorate of Highways, 2023). However, it can be stated that although many bridges are under protection, they are not yet documented and are in a dilapidated condition. However, the fact that there are many historical bridge structures in the region whose existence is not documented and not taken under protection makes this area worth examining in terms of the conservation status of the bridge structures.

The aim of the study is to contribute to the conservation of historical bridge structures in the Upper Euphrates Section of the Eastern Anatolia Region. In this context, first of all, bridge structures were examined conceptually and studies for the conservation of these structures were evaluated through examples especially in Turkey. In addition, the scope

of the examined area was concentrated on Elazığ, Malatya and Tunceli taking into account the high number of bridges belonging to the Roman and Ottoman Periods that have survived to the present day. The current status of the bridge structures, which are known and under conservation in the study area, have been examined in general and the conservation status of the bridges that are in a dilapidated state and rapidly disappearing although they are registered are discussed. However, bridges that have not yet been taken under protection were also examined within the scope of this study. While the method of the study mainly consists of field studies, the literature on the subject has also been scanned in detail. It is aimed that the data obtained as a result of the study will contribute to the conservation of the architectural heritage of similar quality throughout Anatolia and the world, especially the historical bridge structures in the Upper Euphrates Section, and to bring them into the future.

General Characteristics and Conservation of Bridge Structures in Anatolia

Bridges have been one of the structures that humanity has benefited most throughout the historical process. Today, with the development of technology and material opportunities, there have been great advances in bridge architecture. However, mostly wood and stone materials were used for the construction of bridges, which was an important need in the past. At this point, the transition from wood to the use of stone can be considered a milestone for almost all features of bridge structures. The durability of the stone material for the bridges, which are mostly built at the points where there are harsh natural conditions, has ensured that these structures have survived for centuries (Eyüce, 1998 as cited in Ceylan, 2013).

Bridge architecture is affected by many factors. The first of these is the depth and width of the bed of the water source. Other influences and traditions, artistic style and elements vary according to the region and time of the bridges, as well as the cultures to which they belong (Ceylan, 2013). In this sense, there are many historical bridge structures in Anatolia, especially from the Roman, Seljuk and Ottoman periods, and shaped depending on the geographical conditions. On-site observations indicate that some bridges were built during the Roman-Seljuk Periods and continued to be used in the Ottoman Period.

The first bridge in Anatolia is known as the stone bridge built in the Hittite capital Boğazköy in the 13th century BC. However, it is known that there are 124 bridges that have survived from the Roman Period. 145 bridges from the Seljuk Period and 1231 from the Ottoman Period were

documented by the General Directorate of Highways (General Directorate of Highways Archive, 2023). When these bridges are examined, some architectural elements that are common to almost all of them attract attention. These can be listed as follows:

- Stone Raft Foundation: A stone foundation covering the area where the building sits on the ground in order to reduce the negative effects of the foundation base due to water.
- *Tempan* Wall: The wall that limits the body of the building from the upstream (water direction) and downstream (water going direction) directions.
- Deck/Floor: The part of the bridge that can be crossed on foot or by vehicle.
- Arch Face: The row of stones that can be seen when looking at the arch from the front.
- Belt Belly: The lower/inner surface of the belt.
- Belt Back: The upper/outer surface of the belt.
- Cutwater: The element in the bridge piers that allows water to pass through the gaps without damaging the structure.
- Lightening Chambers: Gaps in the bridge that reduce the load of the bridge piers.
- Guard Rail: The element on the *tempan* wall and used for security when passing over the deck.
- Cornice: The protrusion that separates the *tempan* wall and the balustrade on the upstream and downstream facades.
- Baluster Stones: Vertical stones placed at the beginning of bridges and at the starting points of the balustrade.
- Springer Stone: The first stone where the arch arc begins and sits on the foot (Sert, 2007).

With the construction of new bridges in Turkey, it is the duty of the General Directorate of Highways to ensure the maintenance and repair of historical bridges. In this context, in the inventory of the relevant institution, 1774 within the borders of Turkey as of 2014; there are 308 historical bridges outside Turkey (Sert et al., 2015). While some of these structures have been reused with the restoration application, some of them are in a dilapidated condition. At the beginning of the restored bridges are the important works belonging to the Roman Period and the structures designed especially by Architect Sinan during the Ottoman Period. Some of these can be listed as Aydın Çakırbeyli Bridge, Kastamonu Stone Bridge, Adıyaman Cendere Bridge, which has survived from the Roman Period and Istanbul Büyükçekmece Bridge, which has been inherited from the Ottoman Period (URL 1; Derinoğullu, 2021; Yazıcı, 2000) (Figure 1).

Most of the bridges, which were built to meet the needs of the times they were built, are abandoned because they are not suitable for today's needs (Akın et al., 2023). There are many examples of bridges abandoned in this way in the Eastern Anatolia Region. In this context, the Upper Euphrates Section, where the bridge structures in the region are centered, especially the provinces of Elazığ, Malatya and Tunceli contain important examples in terms of identifying the conservation problems of historical bridges and putting forward suggestions for them.

(a)   (b)

(c)   (d)
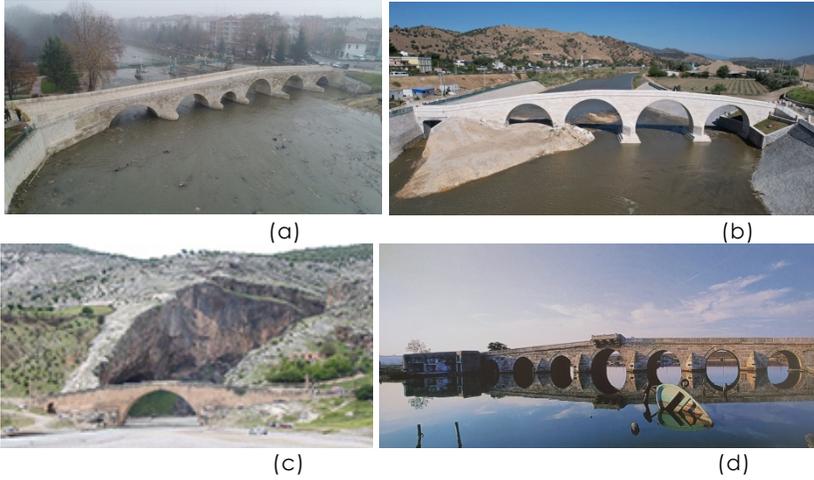
Figure 1. Roman Period Çakırbeyli Bridge-Aydın/Türkiye (a), Stone Bridge-Kastamonu/Türkiye (b), Cendere Bridge-Adıyaman/Türkiye (c) and Architect Sinan's work Büyükçekmece Bridge-Istanbul/Turkey (d) (URL 1; Derinoğullu, 2021; Yazıcı, 2000)

CONSERVATION OF UPPER EUPHRATES SECTION BRIDGES

The Upper Euphrates Section is one of the four sections located in the Eastern Anatolian Region of Turkey (Figure 2). This section, which includes Malatya, Elazığ, Tunceli, Bingöl and Erzincan, is also very rich in terms of water resources. This wealth has brought with it the establishment of many civilizations and the construction of many water structures in the Upper Euphrates Section throughout history. Most of these structures are bridges.

According to the inventory of the General Directorate of Highways, there are a total of 85 historical bridge structures in the Upper Euphrates Section, 34 in Malatya, 17 in Elazığ, 9 in Tunceli, 2 in Bingöl and 24 in Erzincan, within the borders of the provinces within the scope of the study. Restoration projects of 12 bridges in Malatya, 6 bridges in Elazığ, 1 bridge in Tunceli and 2 bridges in Bingöl have been prepared (General

Directorate of Highways Archive, 2023). However, only some of these projects have been implemented. Malatya Arapgir Meydan (Sultan Murat), Tarhanik, Kale, Kozluk, Mavilik, Darende Uzunok and Nadir Bridges; Elazığ Maden Şadyan Bridge, Palu Bridge and Tunceli Pülümür Hanım Bridge are some of the bridges that have undergone restoration (Figure 3).

Figure 2. The location of the Upper Euphrates Section (edited by the authors, taken from URL 2)

(a)

(b)

(c)
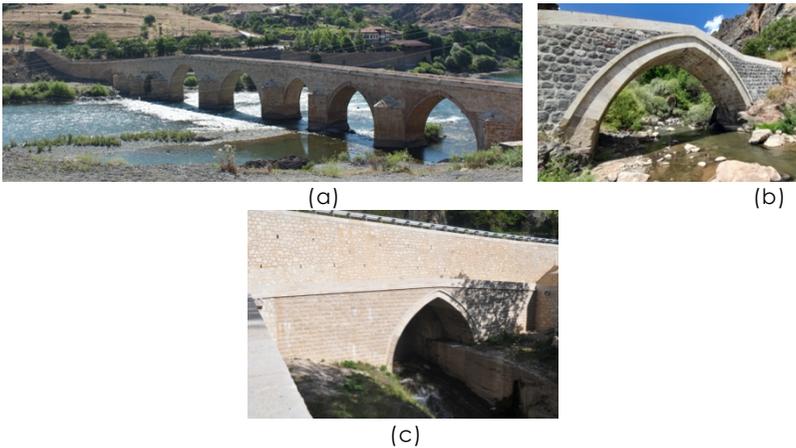
Figure 3. Bridges restored in the Upper Euphrates Section, Elazığ-Palu Bridge (a), Tunceli-Pülümür Hanım Bridge (b), Malatya-Arapgir Small Bazaar Bridge (c) (Authors archive, 2023)

According to the inventory of the General Directorate of Highways, there are a total of 85 historical bridge structures in the Upper Euphrates

Section, 34 in Malatya, 17 in Elazığ, 9 in Tunceli, 2 in Bingöl and 24 in Erzincan, within the borders of the provinces within the scope of the study. Restoration projects of 12 bridges in Malatya, 6 bridges in Elazığ, 1 bridge in Tunceli and 2 bridges in Bingöl have been prepared (General Directorate of Highways Archive, 2023). However, only some of these projects have been implemented. Malatya Arapgir Meydan (Sultan Murat), Tarhanik, Kale, Kozluk, Mavilik, Darende Uzunok and Nadir Bridges; Elazığ Maden Şadyan Bridge, Palu Bridge and Tunceli Pülümür Hanım Bridge are some of the bridges that have undergone restoration (Figure 3).

Within the scope of the study, on-site observations were made in Elazığ, Tunceli and in the Arapgir district of Malatya. According to this, the existence of 27 historical bridges in Elazığ, 10 in Tunceli and 21 in Arapgir have been determined. However, field studies continue. From this point of view, it can be stated that there are more bridges in the investigated area than those included in the inventory of the General Directorate of Highways. Some of these have been reopened with the restoration application, some are used without any conservation work and some are in a dilapidated condition and unusable (Figure 4, Figure 5, Figure 6).

(a)

(b)

(c)
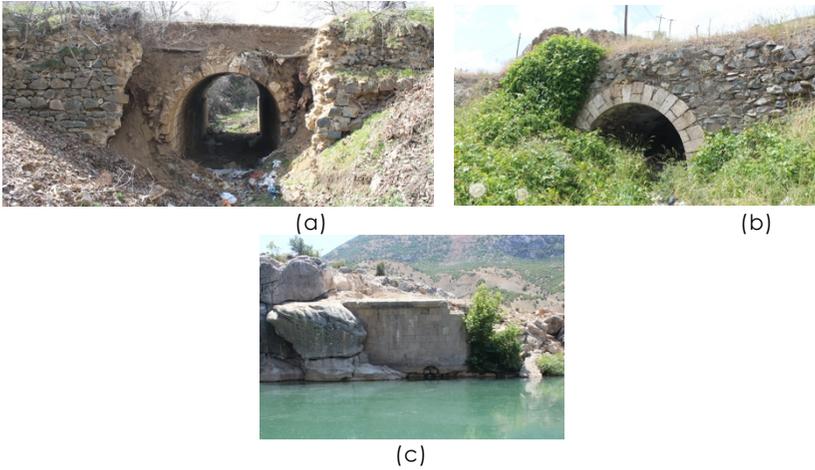
Figure 4. Examples of unused/ruined historical bridges examined on site in Elazığ, Baskil District (a), Maden District (b) and Arıcak District (c) (Authors archive, 2023)

(a)

(b)

(c)
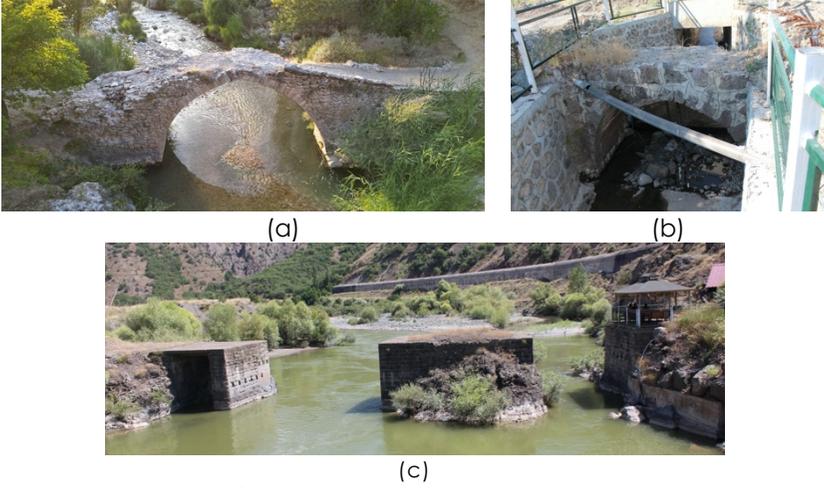
Figure 5. Examples of unused/ruined historical bridges examined on site in Tunceli, Pertek District (a), Mazgirt District (b) ve Pülümür District (c) (Authors archive, 2023)

Figure 6. Examples of unused/ruined historical bridges examined on site in Malatya, Arapgir district (Authors archive, 2023)

Many examples of historical bridges examined on-site within the scope of the study are abandoned and in ruins; it is seen that if conservation work is not done quickly, they face the danger of extinction. In this

context, the conservation problems of these structures were discussed and suggestions were presented.

Conservation Problems Detected on the Bridges

Observed in situ from the bridges in the Upper Euphrates Section are mostly single-arched structures with stone materials dating to the Roman and Ottoman Periods. However, a small number of structures with more than one arch were also encountered. In this context, it has been observed that some of the structures examined continue to be used. Although some bridges have been abandoned, their structural integrity has been conserved to a large extent. Many bridges have partially or completely lost their structural integrity. Accordingly, the conservation problems identified for the bridges in the study area can be listed as follows:

- Floods and overflows are among the most important conservation problems of bridges. Many structures in the region, especially Maden Bridge, which was heavily damaged due to the floods in 2019, were significantly affected by this problem (Figure 7).

Figure 7. Elazığ-Maden Bridge, part of which was destroyed due to flood and overflow (Authors archive, 2023)

- The temperature differences and harsh climatic conditions in the region cause the stones forming the bridges to wear out rapidly and to be exposed to much physical deterioration (Figure 8).

(a)   (b)
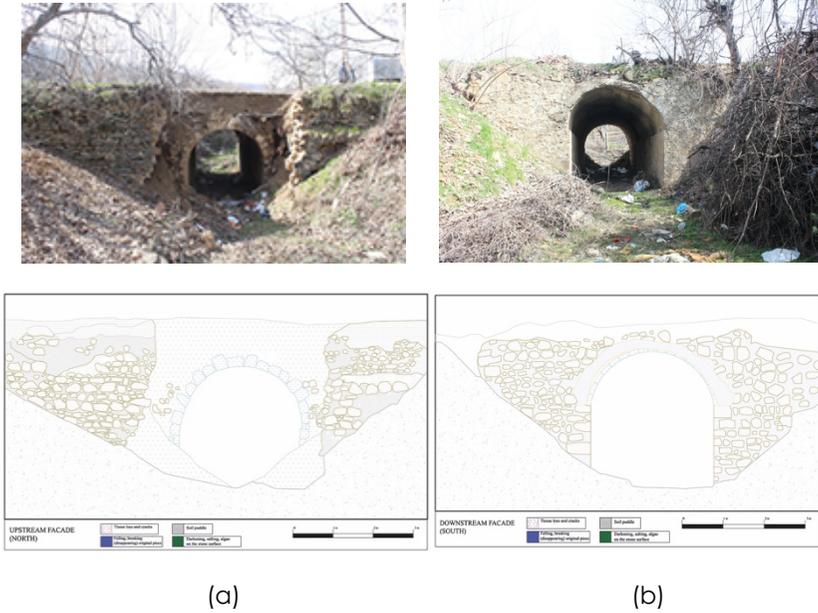
Figure 8. Deteriorations on the upstream (a) and downstream (b) facades of Elazığ-Baskil Yalındamlar II Bridge (Authors archive, 2023)

- Some bridges are partially underground; for this reason, it has become very difficult to detect and document their existence (Figure 9).

Figure 9. A bridge that was largely destroyed and remained underground in Elazığ-Maden (Authors archive, 2023)

- Plants growing and multiplying around the water sources on the bridges and on them from time to time, due to neglect, also cause great damage to the structures.

- The change of transportation routes is an important factor in the abandonment of bridges. Many bridges that fall outside the new routes are being lost rapidly.
- The use of motor vehicles, especially heavy tonnage vehicles, increases wear and tear, although some bridges that are still in use are not maintained and repaired.
- Excavations for treasure under and around bridges negatively affect the strength of structures.
- The bridges, which are currently in a damaged condition, have been more damaged due to the severe earthquakes frequently experienced in the region in recent years, as they have not been intervened (Figure 10).
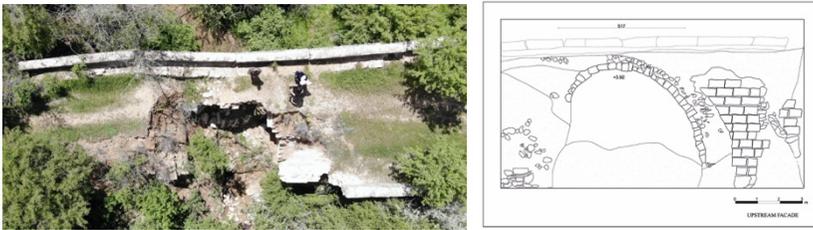
(a)   (b)

Figure 10. Photograph of the decking (a) and schematic survey (b) of the downstream facade of Gözpınar Bridge, whose downstream facade was destroyed due to adverse natural conditions and earthquake, Elazığ-Baskil (Authors archive, 2023)

- The limited resources related to the bridge structures in the region, the insufficient research on the historical past of the structures and the absence of some structures in the inventories cause the disappearance of these structures before their importance is understood yet.
- For many registered bridge structures, no conservation work has been carried out yet, and no written, visual and survey-based documents have been created. For this reason, some bridges can disappear with almost no documentation about them.

The problems listed above can be considered in much greater detail for each bridge studied. These problems, which are put forward in general, have been determined to draw attention to the conservation of historical bridges in many parts of Anatolia, primarily the examples in the Upper Euphrates Section, which is the subject of the study.

CONCLUSION

Historical bridges are structures that reflect the construction technology and material usage of the period they belong to. At the same time, they can be characterized as intangible cultural values that enable to understand military and commercial routes, caravan routes, social and physical connections between settlements. In this sense, it is important to detect all of these interconnected structures on site, to illuminate the history of the regions in which they are located, and to transfer them to the future as an architectural heritage.

Due to its strategic location, Anatolia has been a transit route for commercial and military communities from many parts of the world (Naumann, 2007). In order to provide these transitions, many bridges were built both in the Roman and Ottoman periods at many points where difficult geographical conditions and water resources were concentrated. While some of them were demolished, some of them have survived to the present day by being partially or largely conserved. It is the responsibility of the General Directorate of Highways, an institution affiliated to the Ministry of Transport and Infrastructure, to protect the existing bridges and transfer them to the future. In this context, an inventory study has been made and historical bridges that have survived in many parts of Anatolia have been identified and recorded.

Located in Anatolia, in the west of the Eastern Anatolia Region, the Upper Euphrates Section is an area where bridge structures are concentrated with its rich water resources and difficult geographical conditions. In this context, many bridge structures have survived to the present day. Some of these have been reused through conservation and repair works. Some continue to be used without any conservation work. Many bridges are abandoned and in a dilapidated condition. While most of these structures are registered in the inventory of the General Directorate of Highways, some of them are not.

Within the scope of the study, approximately 58 historical bridge structures, registered or not, were examined on site. It has been determined that the buildings have common conservation problems in general and that each has its own problems. In the study, especially common problems were revealed. In order to overcome these problems, it is thought that the suggestions listed below will be beneficial in the conservation of historical bridge structures and in the process of transferring them to the future:

- In order to protect all historical bridges in Anatolia, especially the Upper Euphrates Section, detailed field studies should be carried out and the deficiencies in the inventory should be completed and an upper scale conservation plan should be made.
- In order to prevent historical bridges from being affected by disasters such as floods, floods and earthquakes at a devastating level, the points with the highest risk in this sense should be determined and repair works should be started on the bridges in these areas quickly.
- The stone materials on the bridges should be meticulously examined, physical and chemical analyzes should be made and the intervention methods needed should be decided accordingly.
- Harmful plant layers formed around the bridges should be cleaned quickly with the support of both local governments and the General Directorate of Highways. Regular cleaning should be carried out to prevent these formations from recurring.
- The old roads leading to the abandoned bridges due to the change of transportation routes should be arranged and these bridges should be visited and regularly maintained.
- Bridges that are still in use and that have not been protected should be strengthened. Heavy tonnage vehicles should not be allowed to cross these bridges; alternative routes and structures should be created for these vehicles.
- Treasure excavations under and around bridges should be prevented and security measures should be taken.
- By conducting field studies on bridges in the region, historical research on these structures should be carried out through primary sources, especially the Presidency archives.
- All bridges in the inventory that are detected on-site should be documented quickly, their measurements should be taken and their surveys should be drawn. Documenting these structures, which are on the verge of extinction for various reasons, in the architectural context is also of great importance in terms of identifying and conserving other bridges that are likely to be discovered in the future.

As a result, the aim of the study is to draw attention to the rapid loss of the historical bridge structure, which has many and unique qualities in the Upper Euphrates section and to emphasize the importance of these structures. However, it is thought that the study will contribute to the conservation of structures with similar characteristics in Anatolia and many parts of the world.

NOTE

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SPATIAL SUSTAINABILITY IN REUSE OF INDUSTRIAL HERITAGE AREAS: THE CASE OF MANUFAKTURA ("ŁÓDŹ, POLAND)

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ABSTRACT

Following the intense globalization and transformation in the world, especially since the 2000s, societies have begun to realize the significance of their own unique cultural values, aiming to revive collective memory and preserve societal identity through efforts to reuse historical sites. One important area where the approach of reusing spaces is frequently applied is historical industrial areas that have played a significant role in the transformation of cities, both during their active use and after becoming obsolete. The spatial needs generated by the introduction of new functions, completely different from their original ones after the refunctioning interventions in these heritage areas, along with the new identities aimed to be instilled in the space, lead to comprehensive spatial transformations.From the perspective of ensuring spatial sustainability for the transfer of cultural heritage knowledge to the future, this situation can be considered a threatening action.

The aim of the study is to examine the concept of spatial sustainability and identify the parameters through which it can be analyzed, as well as to assess the impact of transformations occurring in industrial areas that have been repurposed for uses completely different from their original function on spatial sustainability. In this context, the transformation of the Manufaktura complex in Łódź, Poland, which was transformed from an old textile factory into a space for commercial, entertainment, accommodation, and cultural purposes, is investigated. The project process for this complex, which consists of numerous buildings and open spaces, will be documented, and spatial transformations will be examined.

The assessment of the sustainability of the space's values in a tangible dimension will be conducted through intervention analyses. Furthermore, the evaluation of sustainability in an intangible dimension will rely on data gathered through a user survey, providing insights into how visitors perceive the space. This approach will allow for an interpretation of the extent to which the space's values are being preserved and effectively transmitted to present-day users and future generations.

Keywords: Industrial heritage, spatial sustainability, reuse, authenticity & integrity, Łódź.

INTRODUCTION

The fundamental idea of sustainability, as outlined in the Brundtland Report, revolves around the concept that the progress of human civilization should serve the current needs of society without obstructing the ability of future generations to meet their own needs. This principle is grounded in the equitable distribution and balanced utilization of all the social, economic, and cultural resources available to humanity. (Brundtland Commission, 1987). Initially, this principle was primarily associated with the preservation of environmental resources. However, over time, as it became widely acknowledged that environmental issues resulting in the degradation of the world have serious consequences for economic and social development, the preservation of cultural heritage has also become an integral part of the sustainability concept. Furthermore, the reuse of historical sites has gained prominence as a conservation approach that supports the principles of sustainability. This approach aims to ensure the transfer of collective memory and societal identity created by the cultural values of societies to future generations, promote economic revitalization, and enable the reevaluation of existing building stock from an environmental perspective. According to Altınoluk, the most successful way to sustain the knowledge associated with historical buildings that need to be preserved is to transform them into "living entities" by using them actively and continuously, and adapting them to serve a purpose that may differ significantly from their original function when necessary (Altınoluk, 1998).

Historical manufacturing facilities dating from the industrialization era, which bear witness to a past epoch in societies and continue to exert their cultural significance in contemporary times, are progressively being acknowledged as invaluable assets within the framework of the adaptive reuse paradigm.This recognition has been supported and tapped into, particularly through the scientific publications and guides produced by committees such as the International Committee for the Conservation of the Industrial Heritage (TICCIH), the International Committee for the Conservation of the Industrial Heritage (ISCIH), the European Route of Industrial Heritage (ERIH), the Society for Industrial Archaeology (SIA), and the Industrial Archaeology Association (AIA). In the post-industrialization era, the recommendations put forth by TICCIH and the International Council on Monuments and Sites (ICOMOS) have played a crucial role in involving industrial heritage in adaptive reuse efforts within societies. A review of the advice contained in the documents of TICCIH and ICOMOS reveals that the emphasized points

often revolve around the preservation of authenticity and integrity as the foremost objectives in the adaptive reuse of industrial heritage. These documents underline the necessity of documenting this heritage type, which holds significant information in both tangible and intangible senses, and stress the importance of adapting these spaces to contemporary living conditions as the most effective way to facilitate their productive reuse.

Reutilization of Industrial Heritage

In terms of sustainability, it is generally accepted as an approach to transform and utilize all objects that are inactive and have the potential for reevaluation. It is evident that industrial areas, with their socio-cultural significance, the equipment that serves as indicators of the technology of their original era, sturdy structures, architectural and aesthetic features, as well as their current urban positions, also possess the potential to be reevaluated as heritage elements. When examining international conservation documents, it is noted that the reuse of these heritage elements is mentioned as an appropriate method for preserving industrial heritage, except for structures and sites with exceptional architectural and artistic values, as outlined in the Taipei Charter on the Conservation of Industrial Heritage in Asia (TICCIH, 2012).

Several guiding principles have been established on an international level regarding the adaptive reuse of industrial heritage. One of these principles, the Nizhny Tagil Charter on the Preservation of Industrial Heritage, emphasizes the importance of respecting the existing material and preserving the original circulation and operational structure after transformations for new uses. It highlights the need for the new function to be as compatible as possible with the original usage. If practical, it recommends creating a space that revives the previous use (ICOMOS, 2003). Considering this viewpoint, historical industrial structures and sites should undergo interventions that aim to maintain their original identity and traces, rather than freezing them in a specific period or erasing their authentic character when they no longer serve their original design purposes. This approach not only allows for the addition of new values to the structures and their presentation to contemporary users but also provides the opportunity to convey the historical significance of the existing structure to future generations.

The principles outlined in the Dublin Principles by ICOMOS-TICCIH emphasize that in the reuse of industrial heritage, physical interventions should be reversible and respectful of the historical and physical traces of the buiding. The integrity between structures or groups of structures within industrial heritage is highly important. Therefore, preservation

measures should be applied in a way that remains true to the content and authenticity of the structure, taking into consideration its interior fittings (TICCIH, 2011). Another crucial aspect of the adaptive reuse of industrial heritage is the documentation of all interventions during the transformation process, documenting the forms, functions, and locations of components, and collecting oral and written stories related to the work processes of the workforce. This documentation should take a holistic approach to the historical, technological, and socio-economic dimensions of the structures and areas. Industrial heritage sites should, to the extent possible, be used for educational purposes by institutions and organizations involved in research and preservation. Presentations on production processes and intangible heritage should be organized to inform the public about the values of industrial heritage, and museums should be established for this purpose (TICCIH, 2011).

When considering the charters established by TICCIH and ICOMOS in the context of the adaptive reuse of industrial heritage, it is often emphasized that while the transformation of this heritage into a new use can be an effective conservation approach, the forms of intervention in this approach should not harm the originality and integrity of the historical fabric. Furthermore, the importance of functional integrity is emphasized; it is stated that if machinery, equipment, and similar elements in historical industrial structures are removed, and the spatial integrity is disrupted, many values and original features of the structures will be lost. In this context, the concept of "authenticity" is said to depend on reliable sources for the continuity of elements such as form, design, materials, use, traditions, techniques, location, environmental elements, spirit, and emotions (UNESCO, 2005). "Integrity," on the other hand, can be defined as the architectural heritage's structural and architectural description of a whole and its existence with all elements that document its heritage status. Another dimension of integrity is that architectural heritage should demonstrate continuity with the environment in which it exists and with other heritage elements (ICOMOS, 2013).

The charters frequently emphasize another aspect, which is the necessity for interventions in the adaptive reuse process to be based on documented historical research. Interventions should be reversible, considering future changes in use. Furthermore, it is crucial to document both the existing condition before intervention and the interventions themselves step by step within the historical site. This way, cultural heritage knowledge can be effectively conveyed to contemporary users and future generations.

CASE STUDY

After conducting a comprehensive literature review, it has been concluded that there are two fundamental aspects of spatial sustainability in the context of reusing historical industrial areas. The first one concerns the extent to which the values associated with the space can be preserved, including the degree to which its authenticity and integrity are maintained after comprehensive interventions have taken place. The second aspect revolves around the documentation of spatial knowledge during the transformation process and how effectively this knowledge can be conveyed to present and future generations. During the case study, the tangible dimension of the sustainability of heritage values will be assessed by analyzing the physical transformations generated by interventions classified at different levels. Meanwhile, the intangible dimension will be addressed through a survey aimed at understanding user perceptions.

Description of the Case Study

The research area, Manufaktura, spans across a vast 27-hectare complex located in the city of Łódź. Its origins trace back to the inception of Israel Kalmanowicz Poznański's former cotton industry factory in 1871. During its active years, this site featured a five-story spinning mill facing Ogrodowa Street, complemented by a weaving mill running parallel to the north, yarn processing facilities, a dye house, and additional auxiliary structures. Furthermore, the complex encompassed the owner's residence and office space on its western periphery (Markiewicz-Kozańska, 1995). Starting its operations in the mid-19th century, Poznański achieved remarkable success in textile production and processing. As time progressed, the complex underwent significant expansions, evolving into an extensive industrial zone. This transformation included the incorporation of worker housing, storage facilities, office buildings, and various other amenities, eventually establishing itself as one of Poland's, and subsequently Europe's, largest textile production hubs.

Despite the long-standing success of the production facility, the company operating the factory began to decline gradually with the outbreak of World War I. During World War II and following the end of the German occupation, the complex was nationalized and continued to operate for a while. However, the company declared bankruptcy in 1991 and was closed in 1992. Although the area was completely abandoned and fell into disuse, this space, which was highly attractive for new investments and contributing to urban life, did not remain vacant for long. It was evaluated by foreign investors as part of the local

government's revitalization plans for the city. Starting from 2002, efforts to revive it with a new function began.

The various-sized block buildings within the Manufaktura complex, mostly characterized by long volumes, have created a street pattern and a courtyard within themselves, serving internal communication and material/product movement related to their function. During the registration process in 1993, the buildings in the complex were classified as preserved, high-quality structures and later period additions. The red brick material used on the façades of the evaluated structures, along with high ceilings, large windows, and spacious openings, create a unique atmosphere specific to the complex's architecture. The expansive spaces were achieved through innovative construction techniques, such as steel supporting structure and also jack arch flooring systems. The later additions, built around the 1910s, differentiate in terms of façade and structure, incorporating elements of the modern era. Large workshops, where machinery and production equipment were installed, are located at the heart of the factory, and these areas were organized to support industrial production processes.
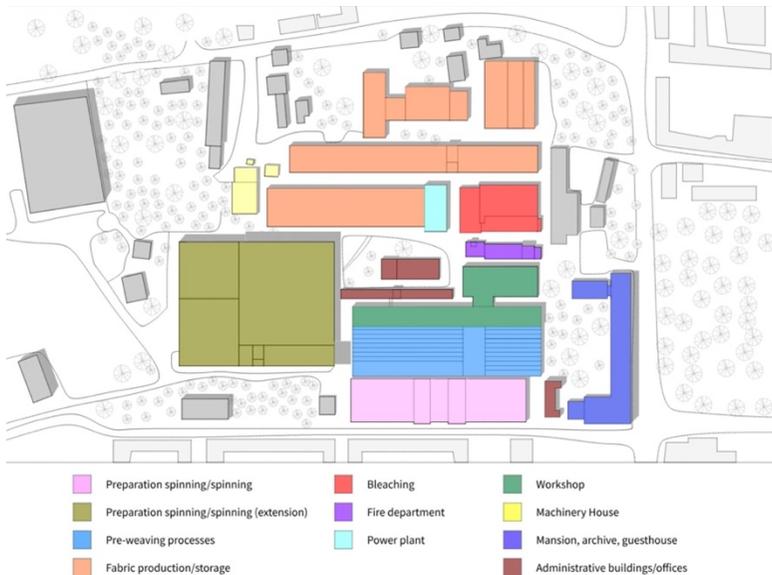
Figure 1.Original functions on the site

The transformation Process of the Poznański Textile Factory

Shortly after the abandonment of the Poznański factory, two local plans were developed. The first one was created in 1997, and it aimed to transform the area into a mixed-use space, including functions such as shopping, education, dining, accommodation, hotels, craft services, and green areas. Within this framework, the urban settlement plan and the forms of the structures were to be preserved. All adaptations, demolitions, and modifications for new uses were to be carried out in agreement with the competent authority responsible for monument preservation. Additionally, as adapting the complex structures for new functions could lead to significant changes, the preservation of the external shell of the spaces was mentioned as an intervention method, allowing for more flexibility in the interior spaces. In 2001, a second plan was introduced, partially modifying the previous decisions, permitting the transformation of old industrial buildings within the historical area as well as the construction of new facilities. This plan was developed, taking into account the decisions made by the private investor, the French-based "Apsys" company, which had initiated transformation efforts in the area since 1999 (Hanzl, 2008).

According to Ebel's statements in the Manufaktura documentary, the design process primarily focused on two main aspects. The first was the removal of all non-qualified constructions to cleanse the area, and the second was to determine the focal point of the project. In this sense, the vast open space in the middle of the area will be transformed into a square, and the service buildings will be positioned around this center, which becomes the focal point (Ebel, 2006). The creation of this square and the associated arrangements were inspired by the concept of "Rynek," which refers to a vast square that historically represents the center of every city in Poland and is used exclusively for pedestrians (Museum staff at Manufaktura , interview, 2022).

The revitalization of the area for commercial use was completed on May 17, 2006, and it started hosting an average of nearly 17 million visitors per year (Apsys Group, 2009). One of the significant reasons for this high demand was the establishment of an information center immediately after the project's goals were set in 2002, even though the area had not yet been opened for use. With the establishment of this center, the public was informed about the project, its objectives were explained, and potential prejudices that the public might have had were eliminated in this way.

Analyses of Architectural Interventions

The new functions created after the transformation of the historic area include commercial spaces comprising shops, an entertainment center, restaurants/cafes, a cinema, exhibition and event areas, a museum, offices, a hotel, and recreational areas located throughout the open spaces. To achieve this, commercial spaces have been largely integrated into the new building constructed to the west of the area, while the historical fabric has assumed other functions through various degrees of intervention. Additionally, due to the project's "Rynek" concept, the square designated as the focal point has been carefully designed, aiming to encourage visitors to spend more time there (Figure 1).

Figure 2. The "Rynek" concepted square and the new commercial building (Source: www.manufaktura.com/; http://www.sudarchitectes.pl/)

When examining the interventions carried out on the existing structures within the area, it can be stated that various levels of practices have been implemented between two contrasting approaches: the complete demolition of buildings and leaving them entirely untouched, similar to the worker residences. These interventions can be categorized into two different scales: **(1) Partial Interventions:** These involve preserving the structural elements and materials of the buildings while making alterations to the interior spatial arrangements.

(2) Extensive Interventions: These involve the transformation of internal building elements while preserving only the shell. Furthermore, in addition to the removal of numerous buildings within the area, it is noteworthy that various parts have undergone new construction or additions.

When assessing structures subjected to **partial interventions**, it can be stated that, in the context of façades, there is generally a commitment to maintaining the forms and dimensions of openings as well as façade ornamentation. Various interventions have been implemented within the interior spaces to accommodate new functions, resulting in

significant transformations of spatial configurations. An analysis of interventions on architectural components within the interior spaces reveals that external and load-bearing walls have mostly undergone basic repairs with original materials. Some areas, such as guest rooms and the restaurant in the converted hotel, have preserved traces of deterioration. However, in certain sections, the original texture has been concealed through plaster and paint applications over the brick surfaces. Furthermore, both in the entrance and exhibition area of the MS2 Art Gallery and a significant portion of the hotel block, vertical load-bearing elements and voltaic flooring have been faithfully preserved, accentuated with various lighting arrangements to become prominent features of the spaces, emphasizing the original ceiling forms and textures (Table 1).

Figure 3. Before and after transformation photos of the volumetrically preserved spacious areas in the hotel building (Source: Digital Poland National Heritage Institute archive; https://www.manufaktura.com/)

In some areas, although interior layouts for new functions have been reorganized, it can be observed that attempts were made to use large halls with spacious volumes where significant machinery such as preparation spinning/spinning machines were lined up side by side without partitioning in order to maintain the perception of long volumes (Figure 3). However, in many cases, this was not feasible, and divisions were made to create smaller square meter areas, such as hotel rooms, exhibition halls, meeting rooms, restaurants, cafeterias, and other service areas. These divisions have resulted in the loss of the originality of the spatial volumes.

Table 1. Buildings transformed within partial interventions

Original Function: Pre-spinning and spinning
New Use: Hotel

Original Function: Pre-spinning and spinning (extension)
New Use: MS2 Art center
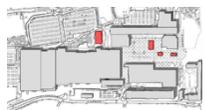
Original Function: Administrative and office building, fire department
New Use: Restaurant, shop, activity

Significant interventions that greatly impacted the interior and exterior volume of the hotel took place in the southern block. In the central part of this block, to infuse a new touch to the space and create a gallery

void for natural light to penetrate down to the ground floor, the floor between two axes was removed to differentiate this area with a contemporary design. Additionally, in this axis, a contemporary addition of steel and glass materials was made to the roof of the building to accommodate its new function (Figure 4). This transparent addition, currently serving as an indoor pool for the hotel, stands out across the space and can be considered a distinctive addition that gives the complex a new identity.
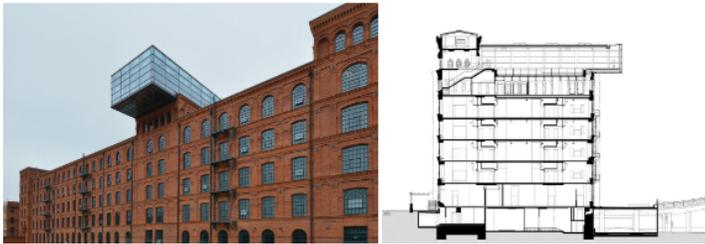
Figure 4. Contemporary addition to the roof of the hotel building (Source: Digital Poland National Heritage Institute archive)

Table 2. Assessment of the preservation of spatial authenticity and integrity in buildings transformed through partial interventions

Authenticity and integrity: **1 -** Did not alter **2 -** Partially altered **3 -** Altered		1	2	3
facade:	*Cleaning and completion of missing components*	■		
Structural component:	*Mainly minor repair*		■	
Interior furnishings:	*Relocation of machinery and equipment, partially exhibited*			■
Additions:	*Additions to create gallery voids, steel and glass new rooftop add*		■	

Concerning buildings that have undergone extensive interventions, it is conceivable that two primary factors contribute to their more intensive transformations compared to partial interventions. Firstly, as discerned from archived images depicting their pre-intervention conditions and expressions documented in registration records, these buildings have experienced more pronounced deterioration. This phenomenon is notably conspicuous in the case of the large weaving workshop featuring a glass window roof, where such deterioration is conspicuously observable. Another factor arises from the imperative to undergo substantial interior layout transformations, driven by the demand to facilitate functions that necessitate intense and elevated visitor

circulation, as observed in spaces like the fabric manufacturing and storage block situated in the northern section of the complex.

In the case of extensively intervened structures, it is known that in a significant portion of the considered buildings, only their façades have been preserved, while all structural and architectural elements have been reconstructed. In these buildings, to accommodate new functions, intermediate floors and roofs have been completely removed, and a construction has been created with reinforced concrete columns and steel supporting beams spanning the entire width of the structure. Consequently, the original steel I-beam and masonry brick jack arch flooring system have been entirely removed, and the structural elements and the original interior layout of the building could not be preserved (Table 3).

The glass elements on the roof of the textile preparation/weaving block, as well as the façade of the textile block itself, represent innovative applications for their time in the context of industrial buildings. However, due to significant deterioration over the years, these elements have largely been unable to be restored and have been completely removed. Among the reasons for this are the costliness of renovation and the incompatibility of the original roof shape and materials with the new intended function for the building.

Figure 5. The original appearance of the glass roof on the bleaching facility building and the post-renovation condition (The Digital Archive of the National Heritage Institute of Poland)

Table 3. Buildings transformed within extensive interventions

Original Function: fabric manufacturing and storage
New Use: Activity, entertainment, restaurant

Original Function: Bleaching building
New Use: Restaurant, fitness center

Original Function: Pre-weaving preparation building, repair workshop
New Use: Commercial, parking

In this regard, a portion of the building's façade has been preserved while the area behind the façade has been entirely cleared of the

original glass roof and the space has been converted into a commercial area with a parking facility on the top. Similarly, the glass-roofed workshop section on the south façade of the bleaching facility has been entirely removed due to the challenges posed by structural element renovation, and this area has been transformed into a semi-open restaurant space (Figure 5).

An example of contemporary additions integrated volumetrically into historic structures during the transformation of the old textile factory can be illustrated by the repair shop building. The façade facing the square has been fully preserved, while the long, narrow space between the other long façade and the weaving workshop has been filled with a contemporary extension. This has allowed the area to be used for commercial purposes. However, this transformation has resulted in the elimination of the important street pattern that characterized the space, and the building's façade has been enclosed within the interior, disrupting the overall façade integrity (Figure 6).
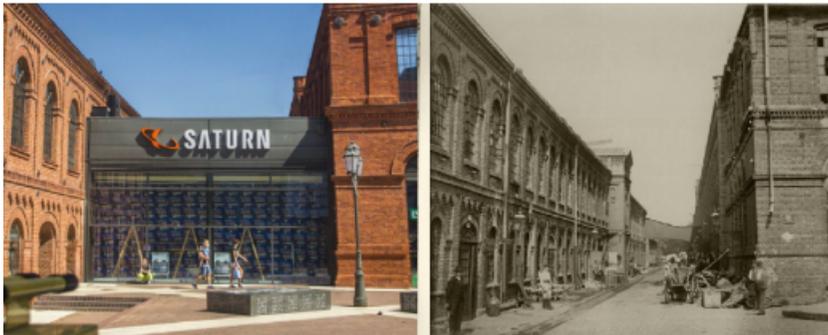
Figure 6. Transformation of the street between repair shop and weaving workshop (Source: Personal archive; Archive of A. Wach)

Throughout the area, old photographs provide evidence of the presence of numerous machines inside the interior spaces, which were used for cotton processing, and the existence of tracks for inter-building product transportation in open areas. However, in the present day, these facilities are largely absent. Some of both fixed and non-fixed equipment can still be found in the museum located within the area, which provides information about the production that took place here or occasionally in some parts of the buildings independently from their original locations (Figure 7).

Figure 7. Examples of original equipment exhibited in the spaces (
Archive of M. Czechowicz, 2013)

Table 4. Assessment of the preservation of spatial authenticity and
integrity in buildings transformed through extensive interventions

Authenticity and integrity: **1 -** Did not alter **2 -** Partially altered **3 -** Altered		1	2	3
Facade:	*Cleaning and completion of missing components*	■		
Structural component:	*Mostly removed*			■
Interior furnishings:	*Relocation of machinery / equipment, partially exhibited in museum*			■
Additions:	*Reconstruction of structural components and architectural elements outside the facade using new materials and techniques*			■

Analysis of Documentation Studies

The most concrete research aimed at documenting and archiving the spatial information of the area was conducted during the registration studies in 1993. In this study, all existing structures in the area before implementation were categorized as original structures, altered original structures, and late-period additions. All architectural drawings were compiled, and photographs of each building facade were taken. In the created registration records, the architectural characteristics of the buildings, both their facades and interior spaces, were documented in textual form, and descriptions of their deterioration conditions were provided. It is evident that decisions were made during the transformation process of the area based on all of this information.

Figure 8. The documented sources of information presented in the museum

When the area is visited today, it is possible to obtain information about the history of the complex, its original function, and the transformation efforts through various means (Figure 8). Information panels are used to convey the original functions of each transformed building to visitors. An outdoor exhibition, consisting of photographs depicting the area before and after the transformation, is presented. Information boards provide details about the project's nature, including its financing, management, and milestones. Detailed information about the original functions of the buildings is presented to visitors through information panels on the observation terrace.

Furthermore, the Museum of the Factory (Muzeum Fabryki), located within the complex, offers access to historical information about the complex, old photographs, original architectural plans, various historical maps, drawings related to the transformation process, and detailed drawings of distinctive elements in the area. Some of the original equipment can also be viewed here.

Table 5. Questions directed to the user

Q1	Were you aware that Manufaktura functioned as a historical industrial complex prior to your visit?
Q2	Did you gather information about its history through exhibitions or informational panels at Manufaktura?
Q3	Have you had the opportunity to visit the Factory Museum located in Łódź Manufaktura?
Q4	After your visit to Manufaktura, did you feel the desire to learn more about its history and transformation or conduct in-depth research?

| Q5 | To what extent did you understand the historical and cultural importance of Łódź Manufaktura during your visit? |
| Q6 | Regarding the revitalization of Łódź Manufaktura, do you believe that there has been an increase in awareness within the community about preserving historical and cultural heritage? |

Survey Study

In today's context, the transformation of the historical textile complex has evolved the area into a space that accommodates thousands of daily visitors. Analyzing the contemporary user's perception of the space following its transformation, their level of knowledge about the area's original characteristics, and the avenues through which they acquire information, all through direct user opinions, provides significant insights into the intangible dimension of spatial sustainability. In this context, a questionnaire prepared in digital format was administered to visitors, directing questions related to the topic (Table 5). A total of 34 respondents participated, representing different age groups: 16-25 years (47%), 25-45 years (32%), and 45-65 years (21%). This survey aims to provide important data on the extent to which spatial sustainability can be achieved in an intangible dimension by examining how effectively post-transformation spatial information is transferred to today's users.

According to the conducted survey (Table 6), it is observed that a significant portion of the visitors already has prior knowledge about the history of the area. However, the rate of using the information provided by signs and the museum about the historical background, architectural features, the production process, and products in the area after the transformation is almost evenly split among the visitors. During the visit, many participants felt the historical and cultural significance of Łódź Manufaktura, but a small percentage only partially felt it or did not feel it at all. On the other hand, it is seen that more than half of the visitors do not have a desire for deeper knowledge or curiosity about this area. Additionally, about half of the participants have a neutral opinion regarding the impact of the transformation and preservation of cultural heritage after the redevelopment, indicating that it does not significantly affect their perception.

Table 6. The data resulting from the conducted survey
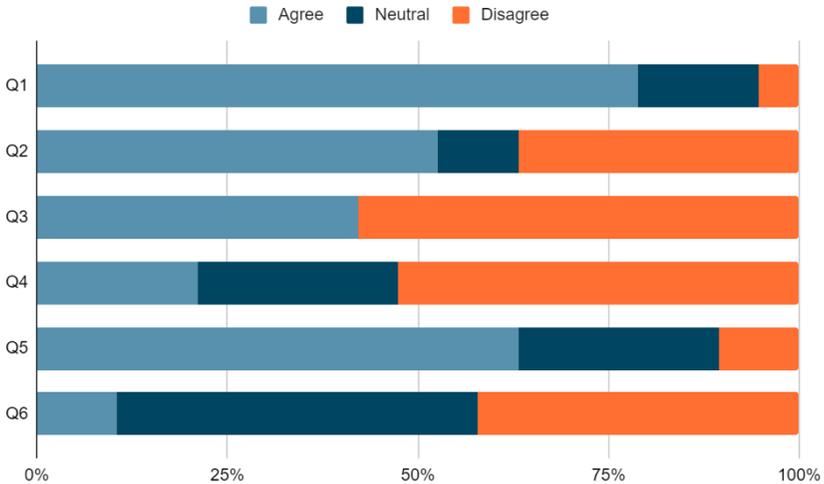
CONCLUSION

In the study, the sustainability of the space after redevelopment has been associated with the preservation of authenticity and integrity, as well as the documentation and transfer of tangible and intangible knowledge related to the space's history. The fieldwork has been evaluated in line with this context.

When considering the transformation of the historical textile factory in the context of preserving authenticity and integrity of spaces, it can be said that partial interventions have been made, preserving the building structure and materials while altering the interior layout. An important aspect of the preservation in these cases is the retention of original interior furnishings, which largely contributes to conveying the historical and cultural significance of the space to visitors, as also indicated by the survey results.

On the other hand, in the group of buildings where external elements underwent transformation, there is a significant loss of authenticity and integrity. It is evident from this analysis that the high level of deterioration of historical structures, intensive intervention decisions due to the nature of the new functions assigned to the buildings, and the difficulty of reproducing architectural elements manufactured using past technologies have all contributed to the substantial loss of authenticity and integrity in historical buildings. As a result, these actions have

hindered the preservation and sustainability of concrete spatial knowledge.

The survey results indicate that visitors to the area have some prior knowledge about the complex, but a significant portion of them has not taken any action to acquire information from information panels or the museum, despite their easy accessibility. An important reason for this can be attributed to the fact that visitors primarily focus on activities such as shopping, dining, and entertainment when they come here, especially with the new functions introduced to the area. As time goes on and new generations visit the historical area, this trend may lead to a further disconnect from the original context of the site, potentially resulting in a decrease in the permanence of both tangible and intangible knowledge associated with the space and a decrease in awareness of its historical and cultural significance.

The exhibition of details related to the production that took place in the area, such as machines, weaving looms, textile samples, the unique characteristics of end products, examples of raw materials used, and the method of energy production, serves as an important source of information in the museum. Additionally, the accessibility of extensive documentation efforts, photographic documentation, architectural drawings, and written records carried out in the area before the transformation in the museum environment is highly positive.

However, the survey results also indicate that the effective utilization of this source of information is limited to those who actually visit the museum. In this sense, the lack of traces of the production process and end products in the rest of the historical area restricts the transfer of knowledge associated with the space. Furthermore, when visiting the area, which has started to deviate from its original context with a new usage program after the transformation, it is evident from the survey results that visitors who do not encounter any traces of the original experience in the area do not have a curiosity about its history.

In conclusion, achieving spatial sustainability in historical industrial areas is possible through the appropriate preservation and transfer to the future of architectural features, equipment related to production, and traces reflecting the lifestyle of the era, all of which encompass the qualities of their time. In areas that have been revitalized with completely different functions through intensive programming, several factors negatively affect spatial sustainability. These factors include large-scale interventions carried out for transformation, visitors primarily focusing on activities unrelated to the original context and created functions, erasure of production traces, removal or in-situ preservation of

machinery and equipment that may hinder new functions, and the ineffective presentation of information resources that are meant to be conveyed to visitors and have documentary value, often overshadowed by the area's primary functions.

To mitigate these negative factors, it is crucial to make appropriate function choices with less intensity, adopt the approach that information resources related to production and end products are as valuable for preservation as architectural elements, and find solutions for more efficient presentation of documentation efforts. As outlined in preservation regulations, the revitalization of historical industrial areas through adaptive reuse, with a focus on the reduction of these negative factors, is among the most effective methods to ensure the spatial sustainability of this heritage type.

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CULTURE AND ART FOCUSED TRANSFORMATION: YENİKAPI

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ABSTRACT

The cultural heritage and memory of cities is an important part of urban identity that needs to be protected. Therefore, it is important to develop cultural heritage and memory protection strategies in the regeneration process of cities. The main focus of this study is that these strategies can be developed through culture and arts elements such as supporting cultural activities, protecting archaeological sites and promoting tourism (Pinder, 2005). In the study, Yenikapı region, which has important references in terms of cultural memory, was selected as a sample area, and considering the location of the region within the city, culture and art-oriented strategic decisions and interventions were proposed to help the urbanites integrate with the city and revitalize the area. It has been pointed out that these proposed decisions will play a role in the preservation and transfer of the bostan, city walls, archaeological sites and Yalı Neighborhood, which has lost its identity due to the risk of transformation, to the future as heritage sites. In this context, the study is based on a holistic and systematic design approach, based on a comprehensive analysis of regional and urban relationships. Principal decisions have been formulated to contribute to the strengthening of the harmony between culture and art activities, urban identity and cultural heritage. Thus, a road map has been created for the regeneration of the historic urban area, which has lost its former vitality, through social, cultural and physical interventions.

Keywords: Cultural memory, urban identity, regeneration, cultural heritage, Yenikapı

CONSERVATION/TRANSFORMATION/RE-USE

INTRODUCTION

A city's culture, heritage and memory reflect its ties with its past. The historical and cultural heritage of cities is an important asset to be passed on to future generations. In recent years, the role of culture and history has often become a driving factor in urban renewal and transformation processes (Sepe, 2013). Historical and cultural values play a decisive role in building tourism, social and sustainable development. The preservation of cultural heritage in cities and its transmission to future generations is also related to the understanding of the layers of the city. Cities can have many different layers over time. These layers include elements such as historical buildings, archaeological sites, streets, parks, artworks and other cultural assets. By preserving these layers in the regeneration process, the memory and identity of cities can be strengthened (Roberts & Sykes, 1999).

The Yenikapı area, which has many different layers including Roman, Byzantine, Ottoman and Republican periods, was chosen as the study area. The paper starts with the processing of the data revealing the spatial, social, cultural and historical significance of the selected area, and presents the results and implications of the results obtained and develops appropriate strategies and policies for the preservation of the historical urban fabric and heritage of a place. The contribution of the developed decisions in determining the future and regeneration of the selected part of the city is presented. The study also aims to present design and intervention decisions that will guide urban planners and local administrators in their decision-making processes during the revitalization process of the city.

The demographic structure of the study area, the strategic location of the city from the past to the present, and its relationship with historical art have always kept it ahead of other cities. A series of strategies have been developed to create a cultural focus that can respond to the artistic, social, cultural and scientific needs of the citizens to strengthen their ties with the society and the city, to make interventions that will establish its relationship with its surroundings, to renew the historical texture in the region and to support it with artistic and cultural activities.

Literature Review

Cities have been seen as 'laboratories' where the boundaries between production and artistic and cultural consumption are defined in a continuous process, creating the conditions for general urban well-being (Glaeser, 2000). The relationships between culture, art, the city and transformation have been extensively studied by many scholars. In this context, transformations in urban areas are often associated with the

physical rehabilitation of industrial heritage, the beautification of public spaces and the integration of new economic activities, mostly cultural, artistic and creative industries (Baraldi & Salone 2022). Many studies have argued that investments in cultural facilities and cultural districts are important for sustaining the economic prosperity and social well-being of urban areas (Scott, 1997; Santagata, 2002). Recent global experiences have shown that culture-led regeneration plays a crucial role in the quality of urban life, especially in historic-cultural areas (Ebrahimi Ghorbani et al., 2021).

Among urban regeneration types, culture-oriented urban regeneration can be used to choose the direction of the transformation of a city with its own historical assets and local cultural potential. Culture-oriented urban regeneration has the quality of urban revitalization by using historical and cultural resources. According to studies in the literature, culture and arts-oriented transformation can transform a low-value or worn-out area into a high-value area, revitalize the local economy and make the city identity sustainable (Hwang, 2014). Sepe (2013) argues that renovation projects involving historical and cultural values have positive impacts on urban sustainability, tourism potential and social participation.

CASE STUDY

Reading Place

In the Roman-Byzantine period, the harbor in the Yenikapı Region, which was the gateway of Istanbul to the world with the port of Theodosius, started to fill with alluvial soils brought by the river over time. Throughout the Ottoman period, these lands became one of the most important urban agricultural areas, known as "Langa Bostans", meeting the fruit and vegetable needs of Istanbul. The walls of Theodosius harbor to the north of this area were preserved until the 19th century. However, the major urban development activities of the 19th-20th centuries led to the destruction of the walls to a great extent, and only some remains of the walls have survived to the present day (Tekeli, 1999). During the Ottoman period, the sea was filled in and new land was created and the Yalı Neighborhood was established, which is a cultural heritage site that is disappearing today. After the Sirkeci-Yedikule railway line (Figure 1) was put into service in 1872, the Yenikapı region was connected to all regions of Anatolia and European countries with trains departing from Sirkeci Station (Batur, 2010; Tekeli, 2013). With the arrival of the railroad in the city, station buildings and squares have gained importance by creating vibrant urban spaces, creating mixed-use areas, having human-scale design, strengthening the use of ground, creating safe and attractive

public spaces, and being imaginative elements that provide belonging to the urban space (Dinçer & Enlil, 2020). However, with the addition of the suburban line to the city, the relationship between the south of the city and the north began to break. Afterwards, its relationship with the sea was shaken with the creation of Kennedy Street, the coastal road (Figure 2). Finally, Kennedy Street became an access-controlled road and the Yenikapı filling area was built. Thus, the relationship with the sea was completely severed due to the many border elements between the city and the coast (Figure 3). It has been observed that the Yenikapı region is composed of layers belonging to the Greek, Roman, Byzantine, Ottoman and Republican periods in the historical process and today only traces of these layers can be read. Today, it has become one of the most important transportation, transfer and transfer centers of Istanbul as the node point of Marmaray and Metro lines, sea bus and ferry lines.

Bizans döneminde "Theodosius limanı" olarak anılan liman zamanla bu derenin getirdiği alüvyonlu topraklarla dolmuş, 12. yüzyılda kısmen karaya katılmıştır. Osmanlı dönemi boyunca "Langa Bostanları" olarak anılan ve İstanbul'un meyve ve sebze ihtiyacını karşılayan en önemli kentsel tarım alanlarından biri olan bu bölgenin kuzeyindeki Theodosius limanı surları 19. yüzyıla kadar korunmuştur. Ancak 19.–20. yüzyılların kentsel dönüşüm niteliğindeki büyük imar faaliyetleri surların büyük ölçüde yıkımına neden olmuş, günümüze ancak bazı sur kalıntıları ulaşmıştır.

banliyo hattı, 1872

Figure 1. Relationship between railroad and workplace

Figure 2. 2001 The relationship between Kennedy Street and the study area

Figure 3. Kennedy Street and landfill area

Yenikapı is highly accessible by public transportation. The area is accessible by bus, metro, Marmaray and tram as well as ferry and sea buses. In terms of pedestrian access, there is a strong pedestrian circulation to the north of the suburban line, while the area to the south, including the study area, has limited pedestrian use (Figure 4).
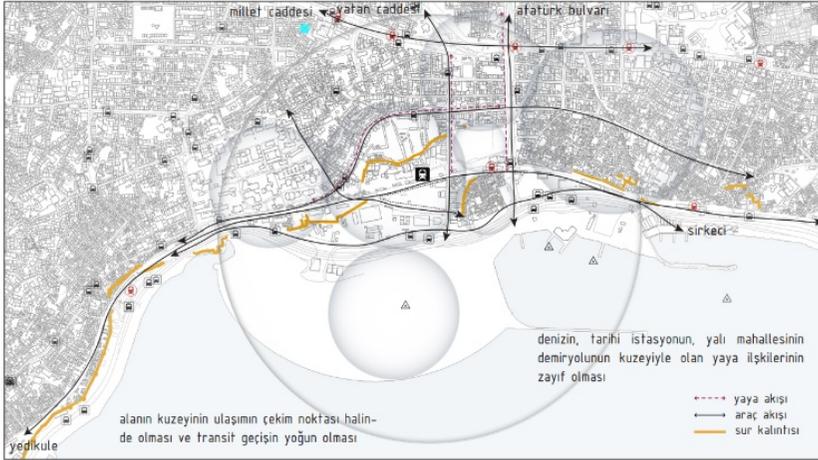
Figure 4. Public transportation and pedestrian access

There are storage and garage areas and commercial areas to the north of the study area, Yenikapı event area to the south, residential area with registered buildings that are cultural heritage and residential + commercial area with urban and historical protected area to the east, archaeological excavation area to the northeast and health areas to the west. In this area where there are many functions, the study area

appears as an unidentified area with a technical infrastructure function (Figure 5).
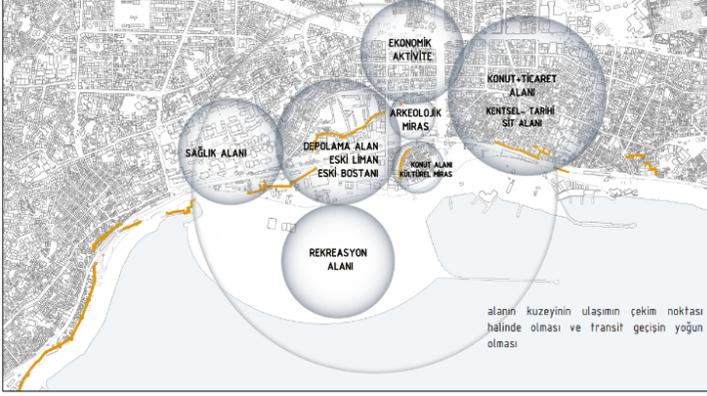
Figure 5. Functional areas in the study area

In Figure 6, the image sheet was created by indicating boundary elements, sign elements, focal points, roads and regions. Boundary elements include the suburban line, Kennedy Street and the coastline; focal points include Yenikapı transfer center, Yenikapı filling area, Cerrahpaşa Medical Faculty and Aksaray Square; zones include differentiated functions, roads include axes indicated according to vehicle and pedestrian density, and landmarks include the mosque, church, hospital and transfer center structure. As can be seen from the road representation, pedestrian mobility was found to be at a minimum level in the immediate vicinity of the railway (Figure 6).
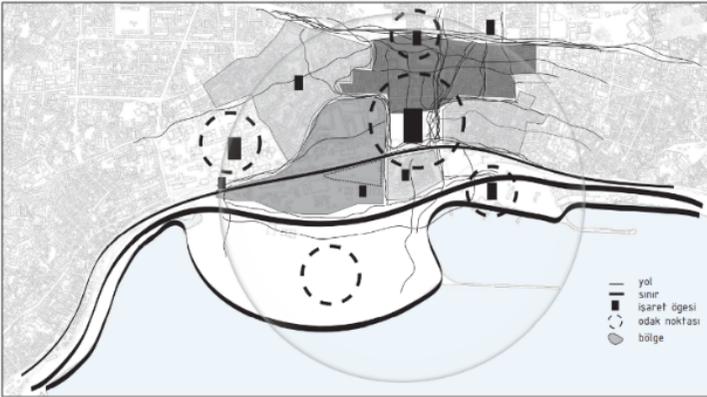
Figure 6. Urban image analysis

The Yenikapı area is used by public transportation users, workers in the existing commercial district, users of hospitals and educational buildings, local people using the Yenikapı meeting area, and local and foreign visitors to the existing touristic and cultural value (Figure 7). The history of an area, especially its historic urban fabric and heritage, is an important element in determining the future and regeneration of that part of the city, along with the development of appropriate policies (Carter et al., 1993).
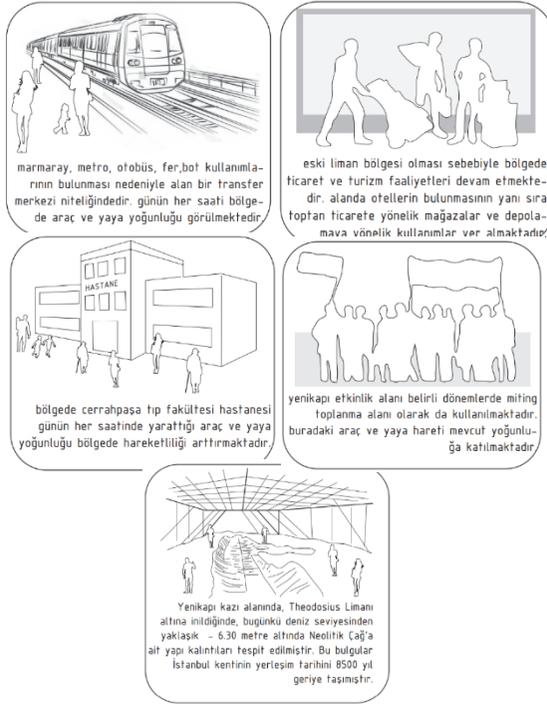
Figure 7. User Typology in study area

The city, which is registered as an urban and archaeological site, has been cut off from the study area by the railroad, and the study area has been cut off from the coast, with which it had strong relations in the past, by Kennedy Street and the embankment area. There are many boundary elements between the city and the coast. Cultural change brings with it a functional change in the area. In addition to having cultural heritage values belonging to many periodic layers, the city also consists of different functional layers of the area today (Figure 8).

KOPUŞ KAYBOLAN BELLEK KATMAN

kentsel ve arkeolojik sit alanı olarak tescillenen kent demiryolu ile çalışma alanından, çalışma alanı kennedy caddesi ve dolgu alanı ile geçmişte güçlü ilişkiler kurduğu kıyıdan kopmuştur. kentte ile kıyı arasında birçok sınır ögesi bulunmaktadır.

kentin yunan, roma, osmanlı ve cumhuriyet dönemine ait katmanlardan oluştuğu tarihsel süreç içersinde gözlenmiş günümüzde bu katmanların sadece izleri okunmaktadır.
kültürel olarak değişim alandaki işlevsel olarak deği-şimde beraberinde getirmektedir.

kent yeraltı ve yerüstünde birçok dönemsel katma-na ait kültürel miras değerlerine sahip olmanın yanı sıra günümüzde de alanın farklı işlevselsel kat-manlardan oluşmaktadır.

Figure 8. Conceptual implications

Methodology

The study progressed on the visualization of descriptive analyses and mapping of spatial analyses. Based on the synthesis data obtained as a result of the overlapping of the analyzes, principled decisions focused on culture and art were produced. The study also resulted in the formulation of goals and objectives and strategies for the revitalization of the selected area.

In order to increase the spatial attractiveness of the urban area, it is aimed to ensure the preservation of urban identity and to strengthen the harmony of urban identity and cultural heritage with culture and arts activities; to develop decisions for public uses in the light of past and present use values without ignoring the natural, historical and cultural values of the city. For this purpose, the objectives are to preserve and maintain cultural heritage and urban identity, to raise awareness of social problems in the urban and regional context, to transfer Istanbul's artistic past to the future, and to transform the residual space in between due to the transportation network extending east-west in the north and south in the study area determined as Yenikapı from an urban buffer to an urban attraction area.
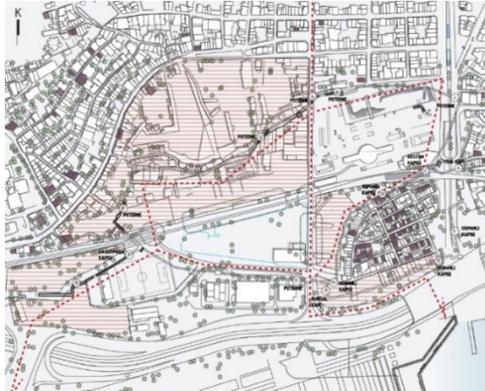
Figure 9. Study area showing the remains of the city walls and the planned pedestrian axis

Developed Strategies and Design Decisions

When approaching the study area, the area to the north of the railroad, which used to be used as an orchard in the past and nowadays has storage and garage areas, was chosen as the area to be intervened. The yalı neighborhood, which has preserved its identity and survived to the present day (Kültür Envanteri, 2023), was decided to be transformed into an area that will establish a relationship with the design area by clearing the parking areas and unqualified buildings on the periphery. It is envisaged that the design of the pedestrian path following the remains of the existing city walls and the destroyed city walls will refer to the place of the city walls in memory (Figure 9).

Thus, design decisions were shaped around the transit center and the circulation axis that will take people from the north of the city and bring them to the sea. Decisions were taken to turn the study area, which is the entrance gate of the city for outsiders, into a center of attraction by designing it integrated with its surroundings (Figure 10).

Figure 10. Traces of fortifications and urban mobility scheme

The area chosen as a center to develop culture and art-oriented decisions for urban regeneration is an area with no identity, which used to be an orchard to the north of the old suburban line and now includes storage and garage areas, and concrete silos, transformer building and parking areas to the south. By creating a culture and arts center in this area, it is thought that a center of attraction can be created by integrating the area with all the historical and cultural layers in its

immediate surroundings. The recreation area of the unidentified area, which was used as a port in Byzantine times and turned into an orchard area during the Ottoman period, which was also used as an entertainment area, and which is now used as a garage and storage areas, has been determined as a recreation area as a cultural park, freeing it from the garage and parking areas adjacent to the yalı neighborhood and designing it as an area that will serve the art center and host open-air activities, and recreating the open space texture of the past. It is envisaged to provide circulation between the cultural areas with the pedestrian path to be created along the destroyed and existing wall traces that will include the existing archaeological sites and strengthen the access to the sea (Figure 11). It is envisaged to create a cultural route passing through the historical axes along the periphery of the historical peninsula by putting the idle railway into operation and integrating it with pedestrian and bicycle paths (Figure 12). It was pointed out that the north of the city and the area designated as a cultural park should be designed in a way to provide leakages with the structure of the culture and art center and the railway should be removed from being a border element (Figure 13).

Figure 11. Attraction Center and its immediate surroundings
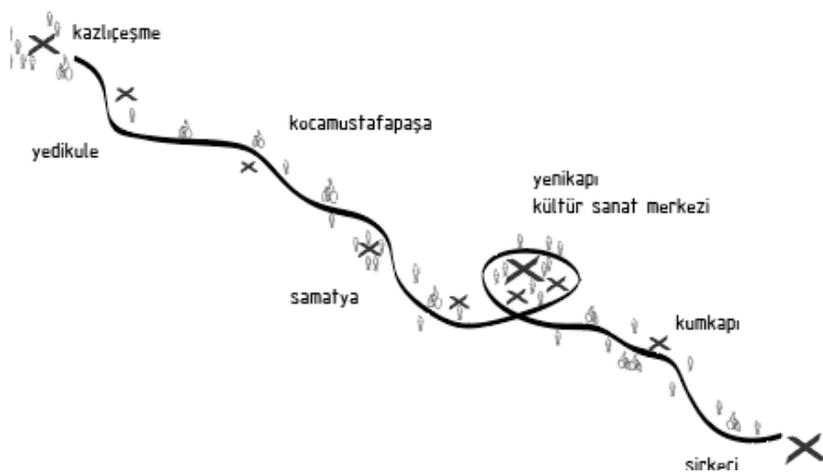
Figure 12. Culture route

Figure 13. Relationship diagram with the main focus

With the arrangement made in the north of the area where the culture and art center is planned to be designed, a design idea was developed

to bring together those coming from Yenikapı Transfer Center and the north of the city and direct them to the art center. With the idea of creating a culture and art center, it is aimed that the experience starts in urban open spaces and continues inside the building. A pedestrian axis was designed starting from the archaeological excavation area and continuing through the conservation areas and the existing city walls, allowing users to experience the old orchard area and archaeological sites. It is aimed to establish visual and spatial relations with the Yalı Mahallesi, which has registered civil architecture examples in the immediate impact area of the culture and arts center, the orchard area and the railway to the north, and the sea to the south. It is thought that the unqualified area to the east of the plot will not only be associated with the culture and arts center, but will also provide an opening in the direction of the overpass to the sea.
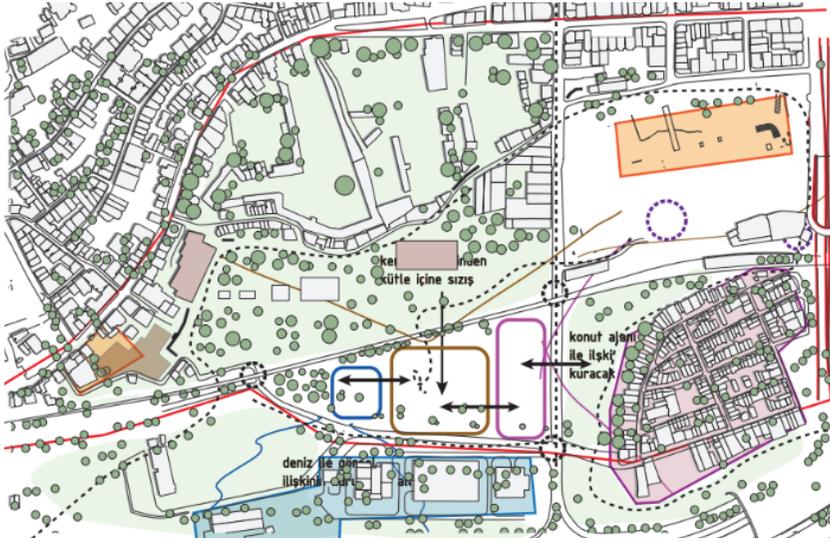
Figure 11. Attraction Center and its close surroundings

The pedestrian flow to the site from the transit center, the historical train station, which will be re-functionalized, and the yalı neighborhood is shown in Figure 12. Users from the transit center can access the site directly via Mustafa Kemal Street, but they can also use the pedestrian axis surrounding the archaeological excavation sites and the remains of the city walls to reach the main entrance square of the building. Access to the area from the direction of Yalı neighborhood is directly through the open activity area created on the east side.

The access of the building from the main pedestrian axis is shown in Figure 13. It is proposed to experience the area through the underpass and the west of the city and spend time in the information modules and recreation modules, and then access the main building and live this experience in all the spaces of the building.
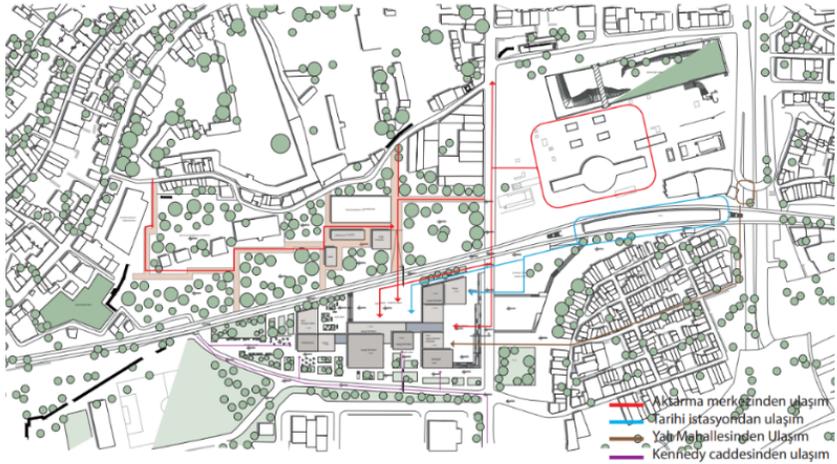
Figure 12. Pedestrian flow fiction
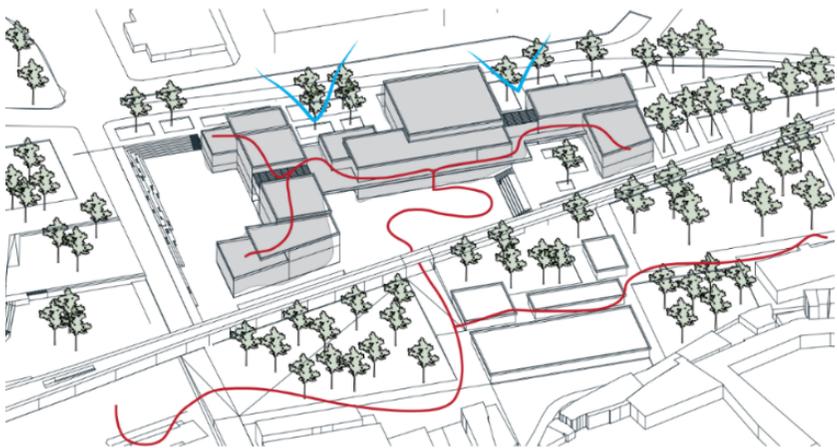
Figure 13. The pedestrian relationship of the focus of culture and art with its surroundings

CONCLUSION

The regeneration of an urban area requires the integration of actors, norms, processes, systems of plans and schedules at different scales. An important factor is the integration of idle space within the city into urban life cycles. This allows for continuous use and full integration with the city, which in turn increases the satisfaction of residents, visitors and tourists. The historic urban fabric and heritage of a place, together with the development of appropriate policies, is an important element in determining the future and regeneration of that part of the city. The creation of a model based on the development of culture encourages social regeneration in the region, creating a sense of belonging, increasing social capital, and changing the image of place (Sepe, 2013).

In order to revitalize the identity of Yenikapı and identify the most appropriate strategies for urban renewal, the starting point of the study is the history and culture of the place itself. Seven key strategies for the revitalization and regeneration of the area were formulated. Among the different aspects of the project, the most interesting are mixed uses, the transformation of old storage and parking areas, the promotion of culture and art-oriented functions, the creation of large public spaces, and the transformation of the railway from a border element to a structure that integrates with the city. They are planned as part of a balanced mix of historical memory, place identity and innovation.

It is stated that the main issues aimed with culture and art-oriented urban transformation are to make room for new investment areas to increase the welfare level of the city, to create social integration by increasing the quality and quantity of social interaction within the city, to improve the image of the city and to improve the image of the city as a city of culture and art through the improvement of culture and art activities in the city (Bovaird, 2005). The culture and art-oriented transformation of Yenikapı was tried to be achieved by creating a center, and culture and art policies in the formation of the city's identity were spatialized through the modern and contemporary art center. The historical texture and identity of the Yenikapı region has been examined and reinterpreted in the light of today's urban life, since the value given to local cultural characteristics such as cultural heritage and place identity can be incorporated into the local texture to such an extent that the renovation operation can be included in the local texture (Evans, 2001). With the Yenikapı Modern and Contemporary Art Center, which was created by taking into account the values of the Historical Peninsula, it was revealed how to strengthen the harmony of urban identity and cultural heritage

through culture and art activities, while increasing the spatial attractiveness of the area in Yenikapı, which has no identity.

ACKNOWLEDGEMENTS

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THE EFFECT OF THE RE-FUNCTIONALIZATION OF HASANPAŞA GASHOUSE ON THE PERCEPTION OF SPACE

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ABSTRACT

Industrial buildings are the reflection of the production process and life of the period in which they were built, to the physical space. As they could not meet the needs of the age with the development of urbanization and technology, they lost their functions in the city. As a result, they were at risk of losing their values and became inactive. Industrial structures that do not actively produce have been re-functionalized according to today's needs.

In this context; One of the industrial structures that lost its function and was re-functioned is Hasanpaşa Gashouse located in Kadıköy, Istanbul. The aim of this study is to evaluate the spatial transformation of Hasanpaşa Gashouse, which is used as the "Museum Gazhane", by measuring the functional and perceptual dimensions of the users.

In the literature review, perception, space perception, factors affecting user perception, industrial heritage, re-functioning in industrial buildings, gashanes in Istanbul and Hasanpaşa Gashouse are discussed. After the conceptual framework was determined by literature review, observation and visual documentation were made in the study area. Survey questions were prepared by grouping with the guidance of the sources discussed in the conceptual framework. The survey study was analyzed in the excel program. This study is important in terms of giving place to the findings about how the users evaluate the space within the scope of old and new functions according to the new functions, and how they perceive the spaces emotionally. Moreover; It is important in terms of enabling inferences for the appropriate function in similar transformation applications.

Keywords: Space, perception, re-functioning, Hasanpaşa Gashouse, Istanbul

CONSERVATION/TRANSFORMATION/RE-USE

INTRODUCTION

Industrial buildings built with a different architectural style in cities with the developing technology after the industrial revolution; Nowadays, it can become idle due to different technological conditions. Since industrial areas and structures bear traces of past industrial and production activities, they are in the status of cultural assets to be protected, which are considered in the context of industrial archeology. For this reason, these structures are preserved and given functions suitable for today's conditions. In this context, the purpose of the study is to measure and evaluate the functional and perceptual dimensions of the spatial transformation of the Hasanpaşa Gashouse, which was built in 1892 in Kadıköy for gas supply to the Anatolian side of Istanbul and is used as the "Museum Gashouse" today. In the first part of the study; The concepts of space, perception, factors affecting spatial perception, industrial heritage, re-functioning in industrial buildings are included. Information was given about Gashouses and Hasanpaşa Gashouse in Istanbul. The refunctioning of industrial buildings and the evaluation of the space-perception relationship over users were made by observation and survey technique. The survey study was analyzed in the excel program. This study includes findings on how the participants evaluate the space within the scope of the old and new functions, and how they perceive the spaces emotionally according to the new functions given; It is important in terms of allowing inferences for the appropriate function in such transformations. Moreover; It is aimed to present a method and create a base for the studies to be carried out on refunctioning and space perception.

SPACE AND PERCEPTION CONCEPTS

While spaces affect the way we perceive our environment, our perceptions also shape spaces. This complex relationship between space and perception helps people to understand both their inner world and their environment.

The definition of space has been handled by many disciplines and theorists, and each discipline has dealt with this concept from its own perspective In addition to the physical and functional needs of the users, their emotional needs must also be met. The relationship between human and space is provided through perception. Just as people send many signals and codes to the person in front of them with their tone of voice and body language, places also provide communication by sending signals and codes to their users with their setup (Gürpınar, 2000).

The relationship between space and perception is an issue that needs to be understood not only in understanding people's environments, but also in art, design, psychology and many more.

During the perception-design relationship, as indicated in figure 1, social, cultural and economic environmental factors and the individual characteristics and personality of the person are also effective (Polatoğlu, 2012).
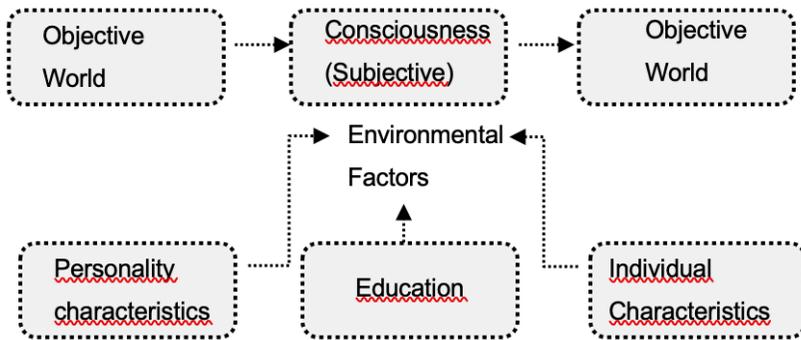
Figure 1. Perception-design Relationship (Rapoport, 1977; cited by Polatoğlu, 2012)

Lynch (2010) explains the role of personal differentiation in environmental perception with the two-way character of the image formation process of the interaction between the individual and the environment. In addition, he emphasizes that another factor affecting personal differentiation in environmental image is related to the time spent in the environment and how living in a place continuously or periodically affects this differentiation. Zeisel has made a classification about what individuals see about their environment, what they feel about the environment, what they do in the environment, what they do with the environment and what they know about the environment (Zeisel, 1995). The answers to the questions about the human-environment relationship, as stated by Zeisel, affect spatial perception. The factors affecting spatial perception are the physical characteristics of the user such as the natural and built environment, anthropometric dimensions, eye qualities, size, color perception, and the sociopsychological characteristics of the user such as experience, social dimension, personal characteristics, needs, memory, learning.

Urban image defined by Lynch for the legibility of cities; The components are listed as paths, nodes, landmarks, regions, edges, and borders. These physical components are accepted as an important reference source

for urban design theories and methods. It is critical to understanding how people perceive and understand a city or place. Therefore, the urban image components defined by Lynch positively affect human perception by increasing the legibility of the space. In this way, the interaction between the physical features of the space and human perception becomes an essential component of space design and planning.

Environmental Factors   Natural structure
                             Artificial cultural cover

User Physical Properties   User dimensions
                                Eye Attributes
                                Size Detection
                                Color Detection

User Socio-Psychological
Characteristics   Experience Personal Characteristics
                                 Social Dimension
                                 Need
                                 Memory, Learning
                                  Other Perceptions

Perceived World

time   location
culture   meaning

Image, Mental Map

Figure 2. Factors Affecting Spatial Perception (Erkan, 2007; cited by Polatoğlu, 2012)

INDUSTRIAL HERITAGE

The Industrial Revolution, which started in Europe at the end of the 18th century, affected the whole world, especially Europe (Pamuk, 1997:151-2 Cited by G. Köksal). Population mobility has been experienced in the industrialization process of societies that live on agricultural production

(Toprak, 1985a:1342 Cited by G. Köksal). As a result of the changes in social life and economy, architecture and urban space have also entered a transformation process.

While industrial buildings were first built; factors such as fire hazard, waste, raw materials and transportation were taken into consideration. For this reason, untouched lands outside the historical and traditional urban fabric are generally preferred as a location. However, the urban periphery has expanded due to the increase in migration to cities and the enlargement of cities with industrialization. As a result, industrial buildings remained in the city center. With the developing technology, some industrial structures have lost their function and closed. Some of these buildings, which have become idle in the city center over time, have been demolished due to internal and external reasons and have not reached the present day. Buildings that have survived to the present day are evaluated under the concept of 'industrial heritage'.

When the buildings, which are considered as industrial heritage, lost their current functions, they were re-functionalized considering today's needs.

Refunctioning of Industrial Structures

In the transformation-re-functioning processes of industrial buildings, it is aimed to design a design between the old and the new, to integrate the new function of the industrial heritage with the building, to meet the needs of the period and to ensure reuse for the public benefit. (Ayaz,2017).

In order for the new function and space to be included in life in a real sense and to be adopted by the user, it is necessary both to preserve and exhibit the unique qualities of the industrial structure and to be included in the city life in a long-term, qualified manner for the benefit of the society (Eryiğit and Anıktar, 2021).

Gashouses

Along with the industrial revolution, innovations in technological life have also affected social life. One of these innovations is activities related to enlightenment. Studies have been carried out on the illumination of public spaces in cities. As a result of these studies; Gas stations were built in the city center for the purpose of generating electricity, which attract attention with its different architecture.

Gashanes are monumental structures with steel constructions that draw attention in the urban fabric. Gashanes built on a large and large area;

They are complexes that serve functions such as heating and lighting. At the end of the 19th century, the first gas stations were established in the Ottoman Empire (Taştemir, 2022).

Gashouses in Istanbul

Dolmabahçe Gashouse was first established in Istanbul in 1853 during the reign of Sultan Abdülmecit to illuminate the Dolmabahçe Palace. In 1857, the streets of today's Istiklal Avenue, which was called Cadde-i Kebir at that time, were illuminated. Afterwards, the process of establishing coal gas facilities and distributing them to the city began. In 1880, Yedikule Gashouse was built and in the following process Kuzguncuk Gashouse was established to illuminate the Beylerbeyi Palace. In 1891, Hasanpaşa Gashouse was established in order to illuminate the region extending as far as Kadıköy, Üsküdar and Beykoz in order to distribute more widely to the environment due to the increased need (Özolcay, 2018).

Dolmabahçe Gazhanesi (1856-1993)	Beylerbeyi Gazhanesi (1862-1993)	Yedikule Gazhanesi (1873-1993)	Hasanpaşa Gazhanesi (1891-1993)

Figure 3. Chronological Order of Gashouses in Istanbul (Akkurt, 2023)

Hasanpasa Gashouse

The factory, which was planned to be established in Bostancı in 1891, was established in Hasanpaşa by taking advantage of the transportation of coal from Zonguldak to Kazlıçeşme via Kurbağalıdere by barges (Ercivan, 2004).

Afife Batur explained the situation of Hasanpaşa Gashouse while the re-functioning project was being prepared as follows:

"Ours used to be outside the city, but now it's in the city, surrounded by high masses, almost trapped, drowned, and has nowhere to move. Thus, it is not even a building block, because one side is not even a street, one side is a residential area, and it will be worked on an area that is not even a building block." Hasanpaşa Gashouse, which was built with a gasometer in 1891, served with 2 gasometers in 1958 and 3 gasometers in 1963, as the needs of the period increased. In 1958, the furnace was built with the increase in capacity, and in 1993, the Gashouse was closed with the use of natural gas, considering that natural gas had a negative impact on human health. After the gas station was closed, this area was tried to be completely destroyed and the buildings were

started to be dismantled. With the support of Gashouse environmental volunteers, neighborhood residents, Kadıköy Municipality, Kadıköy Branch Chamber of Architects and Afife Batur, an application was made to the conservation board. In 1994, Istanbul No. 2 Cultural and Natural Heritage Preservation Board registered the area and tried to stop the deterioration by declaring the area a site (Architects Association, 2021).

A restoration and reuse project was prepared for the area in cooperation with the City Municipality Investment Planning Directorate and Istanbul Technical University. After a project process that started in 2001 and spread over a long period of time, it was put into practice in 2015 (Kavut and Selçuk, 2022).

Today, Hasanpaşa Gashouse, which is used as a cultural center with the name "Museum Gazhane", has not been converted into a museum, but the scope of the function has been widened.
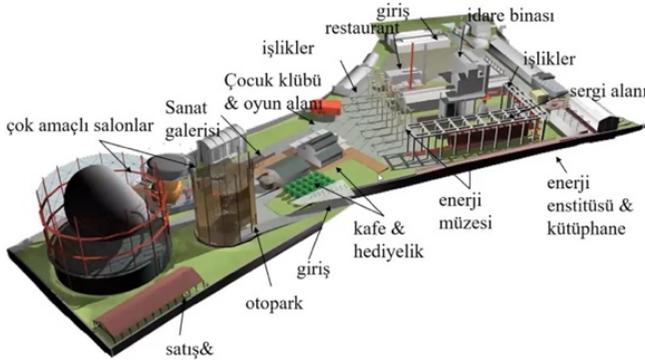
Figure 4. Hasanpaşa Gashouse site plan and function distribution (Architects Association 1927, 2021)

One of the most striking structures of the area, the partially standing Ga Gasometer, was completed and used as a multi-purpose hall. The sizes of the Gb and Gc gasometers were defined and their symbolic reconstructions were proposed, and one was used as a Cartoon and Humor museum, and the other was used as a circulation structure that leads from the entrance to the upper square and the parking garage. The re-functional building has created a participatory and inclusive public space for Kadıköy and Istanbul.

Figure 5. Ga, Gb, Gc Gasometers (Akkurt, 2023)

The coal transport colonnade, which has an L-shaped plan in the lower square, was defined as the information path of the energy museum and a circulation start after the restoration works.

Figure 6. Coal transport column, information path of the energy museum (Akkurt, 2023)

The buildings, which were originally used for production and administration purposes, were given functions such as workshop and exhibition spaces, bookstore, seminar rooms, restaurant and cafe.

Figure 7. Climate Museum (Akkurt, 2023)

Figure 8. Bakery Building and Event Space (Akkurt, 2023)
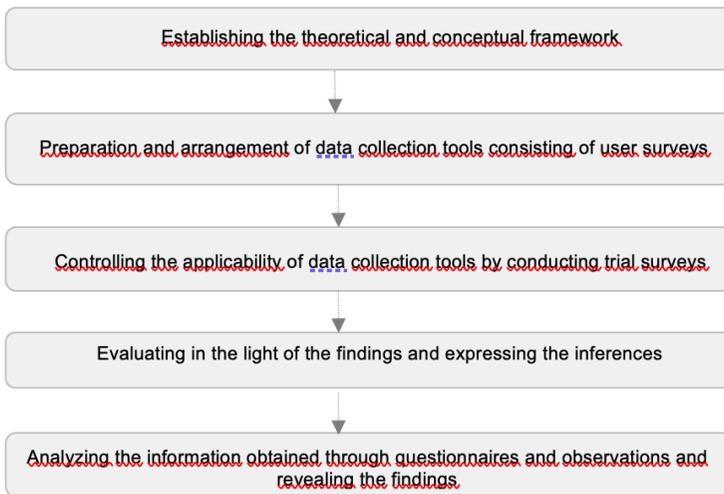
Figure 9. Method scheme of the study

METHODOLGY

In order to create the theoretical framework of the study, a literature review was made first. At this stage, articles, books, theses and other electronic resources related to the main subject of the study were examined. After the literature review, the conceptual framework was determined and the relevant area was visited for the fieldwork of the study; At this stage, observations were made and photographs were taken. Based on the resources in the determined conceptual framework, survey questions were created. Before the application of the questionnaire, a preliminary questionnaire was conducted as a preliminary step and the applicability of the questionnaire was tested.

Some questions were revised according to the results of this preliminary survey. The survey was applied to users with different demographic characteristics who visited the Museum Gazhane. The obtained data were then analyzed in Excel program.

Findings and Discussion

Evaluation of Survey Data

Gender Distribution of the Respondents

When the survey data were evaluated, it was determined that 54.4% of the respondents were female and 45.6% were male.

Distribution of respondents by age groups

54.5% of the users participating in the survey are between the ages of 18-24, 38.6% are between the ages of 25-34, 5% are between the ages of 35-44, 1% are between the ages of 45-54, and 1% are between the ages of 55. and above. According to the results of the survey, it was determined that the people between the ages of 18-24 mostly use the Museum Gazhane.

Educational status of the respondents

When the survey data is evaluated, 1% of the respondents are secondary school, 5.9% high school, 69.3% university, 23.8% graduate or doctorate.

Distribution of survey respondents by occupational groups

When the survey data is evaluated, 10.9% of the respondents are architects and 89.1% are from profession groups other than architects.

Distribution of respondents by place of residence

When the survey data are evaluated, 33.6% of the respondents reside in Kadıköy, while 66.3% reside in other districts of Istanbul except Kadıköy.

The length of time the respondents lived in Istanbul

When the survey data is evaluated, 40% of the respondents have been living in Istanbul for 1-5 years, 10% for 6-10 years, 15% for 11-20 years and 35% for 21 years or more.

Frequency of Use of Museum Gazhane by Survey Participants

When the survey data were evaluated, it was seen that 32.7% of the respondents visited the museum for the first time. 9.9% every 2 months, 11.9% once a month, 14.9% 2-3 times a month, 9.9% once a week, 12.9% 2-3 times a week, It was determined that 7.9% of them came every day.

Hours of Use of the Museum Gazhane by the Survey Participants

When the survey data is evaluated, 35.6% of the respondents are between 14:00-18:00, 22.8% between 12:00-14:00, 12.9% of them are between 10:00-12:00. It is seen that between 00 hours, 13.9% use the museum between 18:00 and 20:00, 7.9% between 08:00 and 10:00, and 6.9% after 20:00. The most used time interval of the museum has been determined as 14:00-18:00.

Users answered the question of what kind of vehicle they used to reach the Museum Gazhane by ticking a few options. Among the options, it has been determined that the highest rate of pedestrian transportation is provided with 42.6%, and the use of metro / marmara is also common with a rate of 41.6%.

When they came to the Museum Gazhane, they were asked which road they preferred the most, and it was revealed that 37.6% preferred Kurbağalıdere Street. When asked which of the functions of Multi-purpose Hall, IMM Cartoon and Humor Museum, Science Center, Climate Museum, Gallery Gazhane, Workshops, Afife Batur Library, Audio Workspace, Observation Terrace, Restaurant, Cafeteria and Bookstore in Museum Gazhane, users are asked to use % It was revealed that 57.4% of the Afife Batur Library, 55.4% of the Cafeteria and 45.5% of the audio study areas were used.

In the survey application, answers to the question asked to the users whether there is an activity/service that you would like to have in the Museum Gazhane;

"more seating", "larger and functional work areas", "cinema", "bigger library or more than one library", "open air movie screening, open microphone, street dances", "Cinematek, cinema library , open kitchen, more exhibitions", "semi-open and semi-closed seating areas", "more green spaces", "music activity, street artists", "sports area", "Concert-design and art fairs", "reading books" event, vocational seminars, conversations with celebrities", "Creation of sitting units in the garden outside the cafeteria and restaurant", "More workshops and courses, instrument workshops, etc.", "Concert-exhibition – Conversation", "Photography trip/course", " Model Workshop".
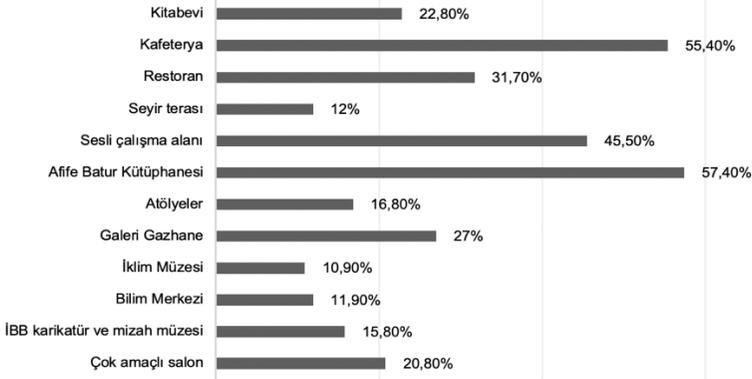
Figure 10. Distribution of functions of the respondents according to the purpose of using the Museum Gazhane (Akkurt, 2023)

In line with the answers, the green area, the inadequacy of outdoor seating and the absence of a movie theater are among the most repeated and desired functions in the Museum Gazhane.

Users who participated in the survey were asked to indicate the first 3 buildings/places that they think best describe the Museum Gazhane. Users have chosen the multi-purpose hall, bakery and library buildings.

Figure 11. The 3 buildings that best describe the Museum Gazhane (Akkurt, 2023)

Kevin Lynch defines readability as: "Readability is the ability of an environment to be organized in a recognizable and coherent pattern (Lynch, 2010)."

While determining the identity of the city, the whole is reached by considering the relations between the parts and the image; roads, borders, foci, regions, and triangulation-marking elements (Lynch, 2010). The readability of the Museum Gazhane was evaluated with the

physical components (roads, borders, foci, regions, landmarks-sign elements) revealed by Kevin Lynch (2010). Considering the average of the scores given in this context, the fact that Museum Gazhane became an important symbol for Kadıköy received the highest score.

Table 1. Evaluation of the readability of the Museum Gazhane in the context of the physical components revealed by Lynch (Akkurt, 2023)

	Average	Standard Deviation
Traces (pedestrian roads, green areas) are easily distinguished in Museum Gazhane.	4,22	0,82
Sign elements provide convenience in the use of spaces in Museum Gazhane.	4,25	0,86
Museum Gazhane is divided into zones with different functional uses (Culture, trade, history)	4,40	0,73
The museum has become an important symbol for Gazhane Kadıköy.	4,55	0,69
In Museum Gazhane, focal points help to determine the direction.	4,31	0,77
I feel safe at the Museum Gazhane.	4,53	0,60
The transportation links of the Museum Gazhane with the city and its immediate surroundings are quite adequate.	4,23	0,81

According to the answers given, users living in Kadıköy gave higher scores to the situation that Museum Gazhane became an important symbol for Kadıköy than users who did not live in Kadıköy. In this context, it can be said that the Museum Gazhane has become a symbol and adopted, especially for its users living in Kadıköy.

Contrasting adjective pairs were given to the participants in order to express the effects of the structures on them within the scope of the survey study. Accordingly, in the evaluation of the Museum Gazhane, according to the average scores of the adjective pairs, it was determined as lively, fun, comfortable, safe, peaceful, a dominant sense of belonging, inviting, modern, orderly and bright. According to the

average of the scores given to the adjective pairs, the adjectives "comfortable", "safe" and "inviting" came to the fore.

Table 2. Distribution of the readability of the Museum Gazhane according to the variables in the context of the physical components revealed by Lynch

	Gender		Age					Education				Job		Residence	
	female	male	18-24	25-34	35-44	45-54	55-	Middle school	High School	University	Master's, doctorate	Architect	Non-Architect	Kadiköy	Other districts
Traces (pedestrian roads, green areas) are easily distinguished in Museum Gazhane.	4,23	4,26	4,32	4,05	4,6	5	5	4	4,83	4,31	3,91	4,24	4,25	4,36	4,17
Sign elements provide convenience in the use of spaces in Museum Gazhane.	4,21	4,31	4,38	4	4,6	5	5	4	4,83	4,3	4	3,96	4,35	4,36	4,19
Museum Gazhane is divided into zones with different functional uses (Culture, trade, history)	4,41	4,4	4,5	4,2	4,6	5	5	4	4,83	4,51	4	4,24	4,46	4,57	4,3
The museum has become an important symbol for Gazhane Kadiköy.	4,67	4,4	4,5	4,5	4,8	5	5	4	5	4,51	4,58	4,6	4,53	4,65	4,49
In Museum Gazhane, focal points help to determine the direction.	4,23	4,35	4,43	4,05	4,8	5	5	4	4,66	4,38	4,04	4,24	4,34	4,44	4,23
I feel safe at the Museum Gazhane.	4,58	4,46	4,54	4,48	4,6	5	5	4	4,83	4,58	4,33	4,6	4,51	4,44	4,58
The transportation links of the Museum Gazhane with the city and its immediate surroundings are quite adequate.	4,14	4,35	4,12	4,33	4,6	4	5	4	4,33	4,31	4	4,2	4,25	4,13	4,3

Table 3. Average scores given to adjective pairs

	Average	Standard Deviation
Crowded - Desolate	3,34	0,99
Live-Stable	3,52	1,16
Fun-Boring	3,55	1,15
Comfortable-Uncomfortable	3,76	1,20
Safe-Unsafe	3,75	1,45
Calmfulll-Annoying	3,71	1,33
Belonging – Not Belonging	3,64	1,29
Legible-Mysterious	2,94	1,25
Regular-Complex	3,52	1,29
Inviting – Repulsive	3,79	1,27

| Modern - Traditional | 3,72 | 1,24 |
| Light - Dark | 3,74 | 1,39 |

Users living in Kadıköy found Museum Gazhane more legible, while those not living in Kadıköy found it mysterious. It can be said that this situation is related to the past experiences of the users living in Kadıköy.

In the answers to the open-ended question about the impact of Museum Gazhane on users, the expressions "peaceful", "spacious", "modern", and "historical texture" were frequently repeated.

Table 4. Distribution of mean scores given to adjective pairs according to variables

	Gender		Age					Education				Job		Residence	
	female	male	18-24	25-34	35-44	45-54	55-	Middle school	High School	University	Master's, doctorate	Architect	Non-Architect	Kadıköy	Other districts
Crowded - Desolate	3,35	3,33	3,54	3,12	3	3	3	5	3,6	3,37	3,1	3,12	3,42	3,63	3,17
Live-Stable	3,46	3,6	3,5	3,61	3,4	1	4	5	3,6	3,47	3,58	3,68	3,47	3,89	3,3
Fun-Boring	3,69	3,37	3,67	3,43	3,6	1	4	5	4,3	3,52	3,37	3,36	3,61	3,92	3,33
Comfortable-Uncomfortable	3,78	3,73	3,9	3,69	3,2	1	4	5	4	3,78	3,58	3,56	3,82	4,15	3,52
Safe-Unsafe	3,78	3,71	4,03	3,46	3,2	1	5	4	4,1	3,8	3,5	3,68	3,77	4	3,6
Calmfull-Annoying	3,73	3,68	3,83	3,61	3,4	1	5	5	4,5	3,67	3,58	3,36	3,82	4,1	3,47
Belonging – Not Belonging	3,89	3,33	3,81	3,48	3,4	1	4	5	4,5	3,61	3,45	3,48	3,69	4	3,42
Legible-Mysterious	2,92	2,95	2,08	3,02	3,4	4	4	1	4,1	2,78	3,16	2,52	3,07	3,39	2,66
Regular-Complex	3,32	3,77	3,58	3,41	4,2	1	4	5	3,81	3,45	3,58	3	3,69	3,68	3,42
Inviting – Repulsive	3,76	3,82	3,92	3,69	3,6	1	4		4,51	3,72	3,75	3,76	3,8	3,97	3,68
Modern - Traditional	3,71	3,73	3,83	3,61	3,8	1	4	5	4,1	3,68	3,66	3,6	3,76	4	3,55
Light - Dark	3,66	3,84	3,74	3,79	3,8	1	4	5	3,1	3,77	3,75	3,76	3,73	3,84	3,68

CONCLUSION

In this study; The spatial perception of the users of Hasanpaşa Gazhanesi, which was built in 1892 and is used as a cultural center today, was evaluated by conducting a survey.

According to the results of the survey, it was determined that the people between the ages of 18-24 mostly use the Museum Gazhane. Among the museum users, the number of people visiting the museum for the first time is high. The readability of the Museum Gazhane was evaluated with the physical components (roads, borders, foci, regions, landmarks-sign elements) revealed by Lynch (2010). In this context, traces such as pedestrian roads and green areas can be easily distinguished, signage elements provide convenience in the use of spaces, the area is divided into zones with different functional uses, focal points help to determine the direction, transportation connections with the city and its immediate surroundings are quite sufficient, and it has become a symbol for Kadıköy has been expressed.

When the users participating in the survey were asked to indicate the first 3 buildings/spaces that they think best describe the Museum Gazhane, they chose the multi-purpose hall, which makes you feel the volume of the old gasometers, the cartoon and humor museum, the bakery building, and the Afife Batur Library buildings. When the functional configuration of the Museum Gazhane is examined, it can be said that the functions are chosen by considering the public interest.

Emotions aroused in people are very important in the perception of a place. Humans express their feelings with various adjectives by perceiving the space. Contrasting adjective pairs were given to the participants in order to express the effects of the structures on them within the scope of the survey study. Accordingly, in the evaluation of the Museum Gazhane, according to the average scores of the adjective pairs, it was determined as lively, fun, comfortable, safe, peaceful, a dominant sense of belonging, inviting, modern, orderly and bright.

In line with the results of the survey, it can be said that the new functions of the Museum Gazhane, which was transformed from an industrial structure, were perceived and adopted by the people.

It is suggested that future research should approach this study from a more in-depth perspective and reveal the transformation in more detail.

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REINTERPRETATION OF CONSERVATION IN URBAN SITES WITH THE LIMITS OF CHANGE

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ABSTRACT

This article emphasizes the importance of integrating change management into conservation strategies to ensure the conservation of cultural and natural heritage values while adapting to the evolving dynamics of urban environments. This perspective on conservation, which underscores the continuity of heritage values within the bounds of acceptable change, was initially explored in the 1950s and formally codified through the UNESCO Historic Urban Landscape (HUL) approach in 2011.

Following the recommendation of the HUL approach in 2011, the development of an action plan aimed at systematizing HUL approach practices, fostering coordination among diverse stakeholders, and addressing global conservation needs has been discussed. This action plan is structured around a six-step model: mapping, consensus, vulnerability, integration, prioritization, and partnership. Several case studies were examined to comprehend the interplay between HUL approach implementations, development objectives, organizational structures, data sources, and collaborative platforms. The application of the HUL approach's six-step action plan in the context of the Bosporus conservation site in Istanbul is explained to illustrate its relevance in the Turkish context.

The discussion of HUL approach practices within these case studies reveals that this approach provides a comprehensive framework for delineating acceptable change boundaries within historic urban landscapes. It underscores the significance of factoring in change when making conservation decisions, particularly in climate crises, population growth, demographic shifts, resource constraints, and environmental pollution. The article further advocates for the dissemination of knowledge and practices derived from the HUL Approach to advance urban heritage conservation strategies on a global scale.

INTRODUCTION

To prevent the detachment of urban areas hosting natural and historical heritage values from their dynamics and to maintain their function and significance, it is imperative to approach conservation within the context of managing change. This approach is aligned with the change to ensure the continuity of the urban heritage, which defines the inherent values of urban areas initiated in the 1950s. Subsequently, the recommendation of the UNESCO Historic Urban Landscape (HUL) Approach delineated a change-oriented conservation framework in 2011. This approach tailors the city's conservation to the swift evolution of elements (UNESCO, 2011).

This research explores a decision-making process centred on change by employing the historic urban landscape approach as its framework. It investigates notable implementation instances to establish permissible boundaries of change for the sake of conservation following the principles of the HUL approach. The historic urban landscape framework has transformed conservation methodologies to adapt to the swift alterations in the urban environment driven by the city's dynamism. After scrutinizing critical examples of the historic urban landscape approach, the approach is interpreted to gauge change and assess the sensitivity of the İstanbul Bosphorus Conservation Site forescene and coastline zones. Consequently, this framework has become indispensable for managing tangible and intangible natural and cultural heritage values, enabling a deeper understanding of the change phenomenon (Koyunoglu, 2023).

In this context, discussions on preserving authenticity have given rise to "limits of change" and the "acceptable level of change" by heritage values. These dialogues have ushered in a novel conservation context in which the historic urban landscape is pivotal in defining the thresholds of permissible change through a holistic lens encompassing both natural and cultural aspects of tangible and intangible heritage.

Its unique focus on change and management sets the historic urban landscape approach apart. The emphasis on change is underscored in Article 11 of the Recommendation, which highlights safeguarding the human environment's quality, promoting sustainable urban use, acknowledging the dynamic nature of urban spaces, and fostering social and functional diversity (UNESCO, 2011). Article 26 of the Recommendation underscores the necessity to document the state and

evolution of urban areas, facilitate the assessment of change proposals, and cultivate protective and managerial expertise (UNESCO, 2011). The recommendation imparts skills in documenting the status and progression of historic environments. The accompanying implementation guide, published in 2019, identifies indicators that aid in comprehending the landscape context (UNESCO, 2019). This guide, encompassing theoretical research and practical case studies, is a crucial resource for researchers seeking to navigate the application of the historic urban landscape approach.

THE HISTORIC URBAN LANDSCAPE: A CONSERVATION APPROACH

A conservation tool is not merely a suggestion but a crucial necessity in safeguarding urban landscapes' unique identity and historical significance. As cities grow and develop, the imperative to balance progress with conservation becomes increasingly apparent. The concept of a historic urban landscape is a testament to the intricate interplay between the past and the present within urban environments. In this context, recognizing change as a dynamic force and a tailored conservation approach emerge as a fundamental strategy.

The essence of a historic urban landscape lies in its dynamic nature, a living testament to the layers of history that have shaped it over time. This dynamism is not confined to mere temporal shifts; it extends to changes occurring at various levels and magnitudes. This concept, as articulated by Bandarin and Van Oers (2012), underscores the need for a conservation framework that is adaptive, flexible, and responsive to the evolving nature of urban environments. A city is a living entity whose historical landscape mirrors its growth, cultural shifts, and socio-economic changes. Therefore, any conservation tool must be designed to embrace change rather than resist it.

The recommendation for the HUL as a conservation approach gains significant traction within this framework. Cities possess unique identities shaped by historical, cultural, and geographical influences. A one-size-fits-all approach to conservation would overlook the nuanced intricacies of each urban landscape. The HUL acknowledges and respects these idiosyncrasies, allowing for a more holistic approach to conservation. For instance, a medieval European city and an ancient Asian metropolis require distinct strategies due to their diverse historical trajectories.

A conservation approach could hinder progress or economic development. However, the counterargument is that such a strategy enhances a city's dynamism. By preserving the authentic elements that

define a city's identity, the approach ensures that the urban landscape remains a compelling blend of tradition and modernity. This blend can serve as a unique selling point, attracting tourists and investors drawn to the authenticity of a city's heritage. A well-preserved historic urban landscape contributes to a sense of continuity, fostering community pride and a connection to the past.

Implementing the HUL as a conservation approach requires understanding the indicators defining historical layers. These indicators encompass not only physical structures but also intangible cultural elements. Architecture, public spaces, traditions, local narratives, and social practices contribute to a city's historical identity. Therefore, the approach must incorporate a comprehensive assessment framework that evaluates tangible and intangible heritage. This holistic approach ensures that the conservation efforts go beyond surface-level aesthetics and examine what makes a city unique.

The concept of HUL as a conservation approach is not a mere suggestion but an imperative step in preserving the historic urban landscape's integrity and significance by embracing change as an inherent part of a city's dynamism and tailoring conservation strategies to the specific characteristics of each urban environment. Such an approach safeguards historical layers and fosters a thriving urban landscape that remains relevant and engaging for future generations.

SYSTEMATIZATION OF THE HUL APPROACH THROUGH CASE STUDIES

The systematization of the HUL approach has emerged as a pivotal endeavour in heritage conservation and urban planning. With the backing of organizations like UNESCO, the World Heritage Centre (WHC), and the World Heritage Institute of Training and Research for Asia and the Pacific Region (WHITRAP), a series of case studies have been initiated to examine the practical implementation and content enrichment of the HUL approach (URL-1). These studies in various cities worldwide offer insights into the balance between preserving historical significance and fostering sustainable urban development.

One noteworthy case study can be found in the heart of Asia, where the ancient city of Luang Prabang in Laos has become a crucible of the HUL approach. In partnership with UNESCO, Luang Prabang has embraced a holistic approach to conservation that encompasses not just physical structures but also cultural traditions, social practices, and economic considerations (Tam, 2017). By integrating the HUL framework into urban policies and regulations, the city has managed to safeguard its rich heritage while promoting responsible tourism and community

engagement. This case exemplifies how the HUL approach goes beyond static conservation, becoming a catalyst for dynamic growth while respecting the intrinsic fabric of the city.

Another example this time in the Mediterranean, the city of Naples, Italy, has embarked on a journey to balance its historical significance with the demands of a modern urban environment. The HUL approach, supported by WHITRAP, has guided Naples in identifying the layers of its history and engaging local communities in the conservation process (De Rosa & Di Palma, 2013). By mapping out historical patterns and recognizing areas of potential tension between heritage and development, Naples has taken steps to manage change effectively. This case study illustrates how the HUL approach offers a structured methodology to navigate the complexities of urban evolution while respecting the values embedded in historic landscapes.

Shifting focus to sub-Saharan Africa, Zanzibar's Stone Town provides another captivating case study (Syversen, 2007). With UNESCO's partnership, the city has embraced the HUL approach to address the challenges of rapid urbanization and tourism. By actively involving local stakeholders, Zanzibar has formulated strategies that celebrate cultural diversity, empower communities, and ensure the longevity of historic structures. The case of Stone Town underscores how the HUL approach is not a rigid formula but an adaptable framework that considers the unique context of each city.

These case studies emphasize the HUL approach's significance as a multidimensional strategy. The partnership between UNESCO, WHC, WHITRAP, and the respective cities is a testament to the commitment to a sustainable future that acknowledges preserving historical layers within urban landscapes. Furthermore, these studies emphasize that the HUL approach is not confined to conservation specialists alone; it involves collaboration among urban planners, landscape architects, architects, historians, local communities, and various stakeholders.

The systematization of the historic urban landscape approach, as demonstrated through case studies supported by UNESCO, WHC, and WHITRAP partnerships, showcases the delicate interplay between history and modernity. The Luang Prabang, Naples, and Zanzibar's Stone Town cases exemplify how the HUL approach offers a structured framework for cities to maintain their historical identity while embracing change. These cities have balanced harmoniously by incorporating cultural, social, and economic dimensions, ensuring heritage continuity while fostering sustainable urban development. The lessons drawn from these cases reverberate globally, emphasizing that the HUL approach is not

merely a theoretical construct but a tangible guide for cities seeking to navigate the complexities of urban transformation while respecting their unique historical layers (Bandarin & Van Oers, 2014).

THE SIX-STEP ACTION PLAN OF THE HUL APPROACH

Specific research, including case studies, has commenced to organize the structure and application of the method, facilitated by on-site investigations supported by collaborative partnerships involving UNESCO, WHL, and WHITRAP (Chape, 2003). These case studies have led to the formulation of a strategic action plan. This action plan aims to streamline the practices associated with the historic urban landscape (HUL) approach. It aims to establish a coherent framework harmonizing divergent policies and actions, fostering collaboration among various stakeholders to address global requirements. This examination assesses a model with six sequential stages (Bandarin & Van Oers, 2014). This established action plan has been reconfigured utilizing this model, enhancing the prioritization of heritage elements susceptible to transformation, aiming to achieve conservation objectives. This prioritized approach contributes significantly to the effectiveness of conservation efforts.
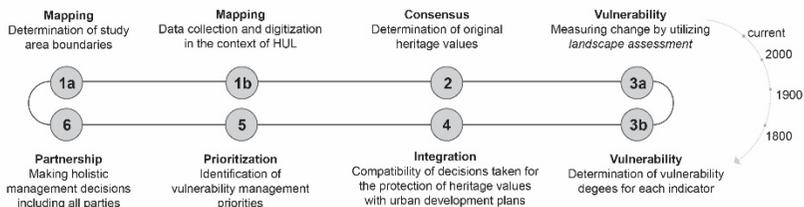
Figure 1: The flowchart of the HUL six-step approach (Koyunoglu, 2023).

The HUL approach employs a six-step methodology to ensure adequate conservation and sustainable development within urban environments of historical significance. To ensure both adequate conservation and sustainable development, this six-step model must be periodically repeated (Koyunoglu, 2023). The initial step involves mapping, creating a comprehensive visual representation of the urban landscape's historical layers. Subsequently, the original heritage value is determined through consensus among stakeholders, establishing a shared understanding of cultural significance. The third step focuses on identifying the trend of change or vulnerability the urban landscape faces, aiding in strategic planning. A contextually responsive evaluation

method should be integrated into the six-step model to assess vulnerability within the HUL context (Koyunoglu & Zeren Gulersoy, 2022).

The fourth stage revolves around defining urban heritage values and integrating cultural, social, and economic dimensions to foster holistic conservation. Prioritization follows, pinpointing components of heritage that are particularly susceptible to change, thereby enhancing the success of conservation efforts. The final step centres on formulating integrated management decisions through collaborative partnerships among various stakeholders, aligning actions for sustainable urban development while safeguarding historical identity.

The six-step methodology offers a comprehensive framework to navigate the complexities of urban evolution while preserving the essence of historic landscapes. To deepen the methodologic analysis, the HUL practices of Ballarat, Australia and Cuenca, Ecuador, have been studied in detail and are highlighted in this study.

THE BALLARAT, AUSTRALIA CASE

Applying the six-step HUL model in the context of Ballarat exemplifies a comprehensive approach to conserving the city's historical identity while fostering sustainable growth. Ballarat, a city in Australia with a rich heritage, has harnessed the HUL methodology to navigate the delicate balance between its historical significance and modern development (Figure 2).

Figure 2: Visualising Ballarat Project (URL-2)

Ballarat's historical layers were meticulously charted in the mapping stage, unveiling a visual narrative of its evolution. This mapping formed the foundation for subsequent stages. The city engaged various stakeholders, including community members, historians, and local authorities, to ascertain the original heritage value of different areas through consensus, fostering a shared understanding of cultural significance (Ballarat Municipality, 2017).

By assessing vulnerability and identifying trends in change, Ballarat's authorities gained insights into sites most susceptible to alteration due to urban development pressures. The HUL approach then facilitated the integration of urban heritage values, recognizing architectural structures and intangible cultural elements that contribute to the city's distinct character.

Through prioritization, Ballarat focused on heritage components requiring immediate attention. This strategic approach significantly heightened the effectiveness of conservation efforts. Finally, the city's collaborative partnerships among government bodies, residents, businesses, and cultural organizations allowed for formulation of integrated management decisions. This collective effort ensured that the actions aligned with heritage conservation and contemporary development goals (Veldpaus et al., 2016).

The implementation of the six-step HUL model in Ballarat serves as a testament to its adaptability and efficacy. The city's success in preserving its historical fabric while embracing change underscores the potential of the HUL approach as a guiding framework for urban development worldwide. By incorporating diverse perspectives, fostering consensus, and prioritizing heritage components sensitive to change, Ballarat's experience exemplifies how the HUL methodology can harmonize past and present, offering a sustainable path forward for historic urban landscapes.

THE CUENCA, ECUADOR CASE

Utilizing the six-step HUL model within the context of Cuenca, a city in Ecuador, showcases a comprehensive strategy for safeguarding its historical essence while navigating modern urban challenges. Cuenca's journey through this process exemplifies the effectiveness of the HUL methodology in harmonizing heritage conservation with sustainable development (Figure 3).

Commencing with the mapping phase, Cuenca charted its historical layers, unravelling a visual tapestry of its evolution over time. This initial step laid the groundwork for the subsequent stages of the HUL approach. By engaging diverse stakeholders – including indigenous communities – the city embarked on determining the original heritage value of its distinct areas through a consensus-building process (Rey Perez et al., 2019). This collective effort fostered a shared understanding of Cuenca's cultural significance.

Figure 3: The Historic Centre of Santa Ana de los Ríos de Cuenca (URL-3)

With a keen eye on urban development pressures, the vulnerability assessment identified areas of potential change and threats to heritage sites. This insight enabled Cuenca to proactively address challenges to its historic landscape (Rey Perez & Siguencia Avila, 2017). Integrating tangible and intangible aspects of urban heritage values underscored the city's commitment to preserving its multifaceted identity.

By prioritizing heritage elements most susceptible to transformation, Cuenca channelled its resources more effectively, heightening the impact of its conservation endeavours. The HUL model's flexible framework ensured that these efforts were not confined to static conservation but adapted to the city's evolving needs.

The collaborative partnerships fostered among local communities, government bodies, NGOs, and cultural institutions culminated in formulating integrated management decisions. This collective commitment enabled Cuenca to achieve a delicate balance between honouring its historical roots and embracing progress. The success of these partnerships is symbolic of the power of the HUL approach in uniting various stakeholders towards a common goal.

Cuenca's implementation of the six-step HUL model serves as an exemplary case study, highlighting the adaptability and effectiveness of this approach. As the city weaves its past into its future, the HUL methodology guides its actions in creating a harmonious urban landscape that resonates with history and contemporary needs. Cuenca's experience stands as a beacon for other cities seeking to

navigate the complexities of development while cherishing their unique historical layers.

COMPARISON OF BALLARAT AND CUENCA CASE STUDIES

Applying the six-step HUL model in Cuenca, Ecuador, and Ballarat, Australia, underscores the dynamic nature of heritage conservation and urban development strategies. Amid their unique cultural, historical, and geographical contexts, both cities have embraced the core tenets of the HUL approach while tailoring their implementation to address specific challenges.

Consensus-building has been a cornerstone of both implementations, highlighting the importance of engaging diverse stakeholders to collectively determine the original heritage value of different urban areas. This collaborative process fosters a shared understanding of the cultural significance and empowers communities to actively participate in shaping the destiny of their urban landscapes.

The vulnerability assessment step has proven to be crucial for both cities, guiding them in identifying potential change and challenges arising from urban development pressures. By gaining insights into at-risk areas, Cuenca and Ballarat have proactively formulated strategies to safeguard their historical identity, ensuring that conservation efforts are strategically targeted.

Integrating urban heritage values in both cities extends beyond physical structures to encompass intangible cultural elements. A city's multifaceted indigenous identity acknowledges that heritage is not limited to architectural monuments alone but includes cultural practices, traditions, and narratives contributing to a holistic sense of place.

Prioritization is another shared strategy, enabling both cities to concentrate on heritage components particularly susceptible to change. By allocating resources strategically, Cuenca and Ballarat enhance the efficacy of their conservation endeavours, ensuring that critical elements of their historic landscapes are safeguarded for future generations.

Collaborative partnerships have played a pivotal role in both implementations. By fostering cooperation among various stakeholders, including government bodies, local communities, NGOs, and cultural institutions, these cities have facilitated the formulation of integrated management decisions that balance heritage conservation with contemporary urban needs. This collaborative approach ensures that

actions align with historical conservation and modern development goals.

In summary, while Cuenca and Ballarat have followed the same six-step HUL model, their unique contexts have led to nuanced approaches. Both cities have capitalized on consensus building, vulnerability assessment, integration of heritage values, prioritization, and collaborative partnerships to steer their urban landscapes towards a sustainable future. These implementations highlight the adaptability and effectiveness of the HUL approach in preserving historical identity while addressing the diverse challenges posed by urbanization and development.

PROSPECTS FOR HUL IMPLEMENTATION IN THE BOSPORUS CONSERVATION SITE

Implementing the HUL approach in Istanbul, Turkiye, offers promising possibilities, especially considering the unique Bosporus heritage values. As the holistic representation of natural, cultural, and identity components, the Bosporus site holds exceptional significance due to its strategic location, connecting the Black Sea and the Aegean Sea and bridging Europe and Asia (Figure 4).

Figure 4: A view from the Bosphorus

The Bosporus Law, enacted in 1983, underscores the commitment to conserving these distinctive heritage values. This legislation divides the Bosporus region into coastal, forescene, backscene, and buffer zones, each reflecting specific topographic features and homogeneous values. The coastal zone traces the Bosporus waterway, while the forescene zone, situated adjacent to it, holds the most significant landscape values, emphasizing the importance of conservation. The

backscene zone complements this by framing the inner space of the Bosporus, defining its outer limits. Lastly, the buffer zone, especially the Urban Buffer Zone, faces significant settlement pressure, highlighting the need for carefully managed development that respects heritage values (Zeren Gulersoy, 1998). Incorporating the HUL approach into the conservation strategies of the Bosporus region can provide a comprehensive framework for balancing conservation with sustainable urban development, ensuring the longevity of this unique heritage (Koyunoglu, 2023) (Figure 5).
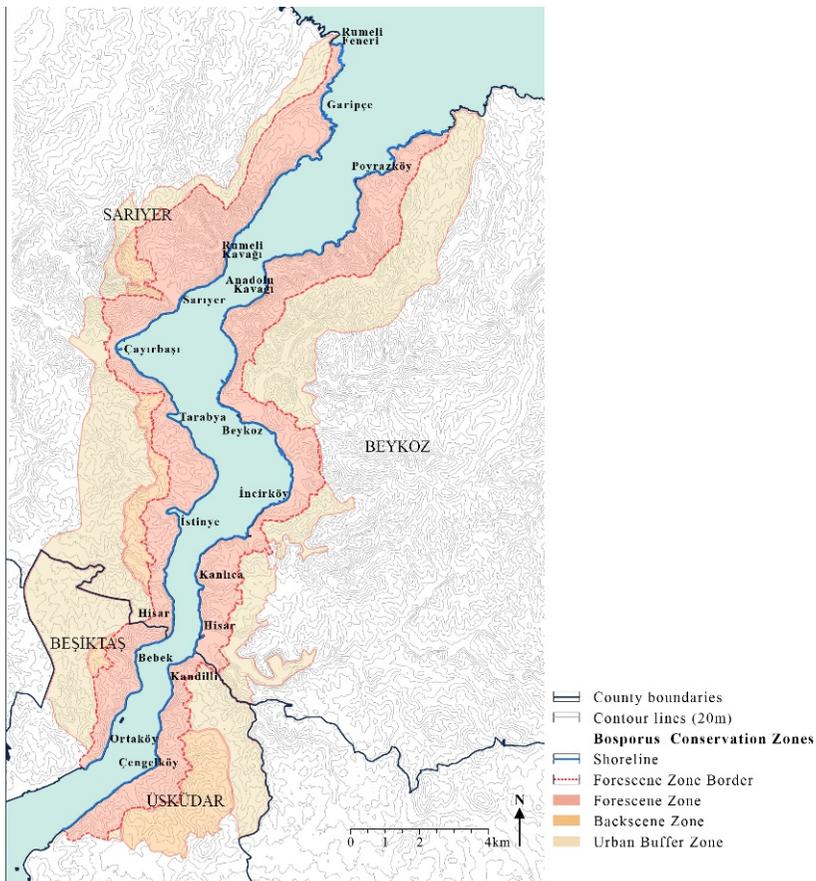

Figure 5: The map of the Bosphorus regions defined in the 1/5000 scale Bosphorus Master Plan dated 1983. This map was produced with data from IMM Bosphorus Zoning Directorate, 1/5000 scale Bosphorus Master Plan dated 1983, 1/1000 scale Bosphorus Coastline and Forescene Implementation Zoning Plan (Koyunoglu, 2023).

THE IMPLEMENTATION OF THE HUL APPROACH IN THE BOSPORUS COASTLINE AND FORESCENE CONSERVATION SITE

Aligned with Bosporus Law No. 2960, the coastline and forescene zones of the Bosporus have implemented stringent construction regulations, and prohibited new residences while permitted the restoration of historically listed buildings and the development of tourism and recreational facilities. These zones are the focal point of this case study, rooted in the principles of the HUL approach. In evaluating the Bosporus Coastline and Forescene zones through the HUL approach, this assessment followed Koyunoğlu's systematic analysis, closely adhering to the HUL's six-step process (Koyunoglu, 2023).

To commence, the consensus step was initiated following the delineation of the case study boundaries. This step encompassed extensive research, including literature reviews, archival investigations, and field studies within the Bosporus forescene and coastal zones. Additionally, meticulous examination of planning reports, such as the 1977 Bosporus Master Plan Report, the 1982 Bosporus Area Coastal Zone Conservation Plan, the 1983 Bosporus Front View Conservation Plan, and the 1/5000 scaled Bosporus Conservation Master Plan Report, laid the groundwork for defining the "values to be protected." These values encompassed a wide spectrum, from registered artefacts and preserved historical environments to village boundaries, social reinforcement areas, and agricultural spaces (Selcuk & Zeren Gulersoy, 2004; Zeren Gulersoy, 2017). The comprehensive approach also considered tangible elements, abiotic natural landscape components, like land and sea landscapes, and intangible identity components, including sociocultural practices and spatial memory focus.

Subsequently, the vulnerability step was conducted, examining data categorized into two domains: tangible heritage values encompassing cultural and natural landscape components and intangible heritage values encapsulating alterations within identity components. This scrutiny was conducted from 1983 to 2018, as detailed in Table 1 and visualized in Figures 6 and 7 (Koyunoglu & Zeren Gulersoy, 2022).

When assessing cultural landscape components, shifts in the equilibrium between the natural and built environment were observed by analyzing two pivotal datasets: the dataset concerning groves within green service areas and the dataset related to residential areas as a component of the built environment. These transformations could be attributed to the introduction of Articles 4 and 5 in 1984 as amendments to Zoning Law No. 6785, along with specific decisions regarding structures constructed before January 10, 1975.

Over time, vulnerability in the Bosporus site, as assessed through the HUL approach, has been influenced by various legislative and sociocultural factors. Legal changes, such as permitting construction in grove areas while excluding slums, led to a decrease in green grove areas and an increase in residential zones from 1983 to 2018. Additionally, publicly-owned historic recreation areas, known as "mesire," became vulnerable and were transformed into residential zones, parks, or wooded areas by 2018. Despite these imbalances, there were positive developments, including the afforestation of recommended passive green areas between 1983 and 2018, as suggested by "The Master Plan for the Conservation of the Bosporus." The region's historical reliance on fruit and vegetable production underwent a significant transformation during the same period. Nevertheless, the protection of historical villages, associated with fishing and production, and the increased recognition of monumental trees illustrate a commitment to heritage conservation.

Table 1: Table containing the percentages of change between 1983 and 2018 of the indicators considered within the scope of the HUL approach (Koyunoglu, 2023).

Values	Scope	Components	Datasets	Changing trend
Tangible Heritage Values	Cultural landscape	1- Regulatory	1. Bosporus forescene border	0% -
			2. County borders	0% -
		2-Infrastructure	3. Filling areas on the shoreline (m²)	12% ↓
			4. Excavation sites on the shoreline (m²)	54% ↑
			5. 1. Degree roads (m)	8% ↑
			6. 2. Degree roads (m)	2% ↑
			7. Access controlled roads (m)	100% ↑
			8. Piers (item)	32% ↑
		3-Built environment	9. Residential areas (m²)	31% ↑
			10. Commercial areas (m²)	97% ↑
			11. Industrial areas (m²)	77% ↓
			12. Educational facilities (m²)	40% ↑
			13. Military zones (m²)	6% ↓
			14. Public facilities (m²)	60% ↑
			15. Mixed-used areas (m²)	25% ↑
			16. Tourism areas (m²)	34% ↑
		4-Historic built environment	17. Fortresses (item)	0% -
			18. Castle and walls (item)	0% -
			19. Historic settlements (item)	0% -
			20. Listed historic buildings (item)	13% ↑
		5-Green areas	21. Groves (m²)	46% ↓
			22. Cemeteries (m²)	19% ↑
			23. Passive green areas (m²)	90% ↓
			24. Parks and green areas (m²)	49% ↓
			25. Sports areas and facilities (m²)	45% ↓
			26. Picnic areas (m²)	100% ↓
			27. Wooded areas (m²)	100% ↑
		6-Agricultural areas	28. Nurseries (m²)	13% ↓
			29. Agricultural areas (m²)	96% ↓
	Natural landscape	1-Abiotic landscape	30. Aspect, slope, geology, topography	0% -
		2-Biotic landscape	31. Forest areas (m²)	1% ↓
		3-Abiotic seascape	32. Coastal line (m)	12% ↓
Intangible Heritage Values	Identity	1- Sociocultural practices	33. Fishing foci (item)	0% -
		2- Spatial memory	34. Beaches and swimming spots (item)	33% ↓
			35. Monumental trees (item)	17% ↑

Meanwhile, alterations along the natural coastline, with extensive shoreline filling, have significantly impacted the Bosporus landscape. In this context, the legal framework outlined in the Bosporus Law aimed to protect and enhance the region's historic and natural values but ultimately led to coastline filling between 1983 and 2018. The sociocultural aspects of the Bosporus also evolved, with shifts in fishing activities from "Dalyan" fishing to commercial and individual angling. Individual fishing activities moved from the north to the south of the Bosporus during this period, reflecting changing sociocultural dynamics. Furthermore, swimming patterns in the Bosporus demonstrated a decline in swimming activities, primarily in the southern regions, while persisting in mansion gardens with Bosporus access and along waterfront promenades. These shifts in sociocultural practices and spatial memory underscore the evolving nature of the Bosporus landscape and highlight the need for adaptive conservation strategies that embrace tradition and change.
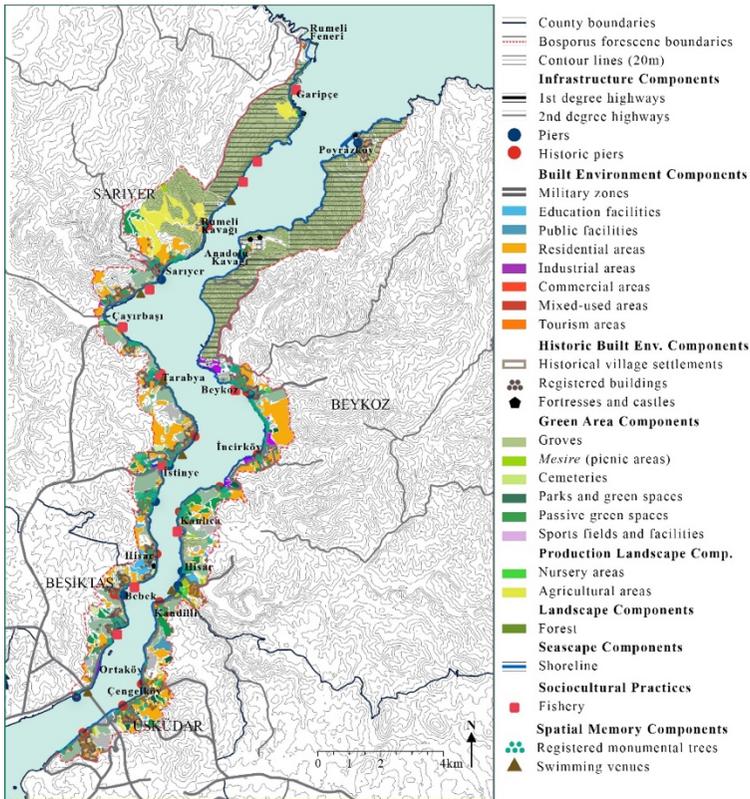

Figure 6: 1983 map of indicators used to measure change in Bosphorus Forescene and Coastline regions (Koyunoglu & Zeren Gulersoy, 2022).

The HUL approach's fourth step, which emphasizes the integrity of heritage sites, bears significant relevance in the Bosporus region's assessment. While the evaluation predominantly underscores the initial steps of mapping, consensus, and vulnerability, it is imperative to acknowledge the intrinsic connection between these stages and the conservation of the historic landscape's integrity. The erosion of integrity, exemplified in the Bosporus case through vulnerability in grove areas, coastline filling, and shifts in production culture, highlights the broader challenges inherent in safeguarding heritage values. This erosion of integrity can only be overcome by addressing development and conservation priorities together.
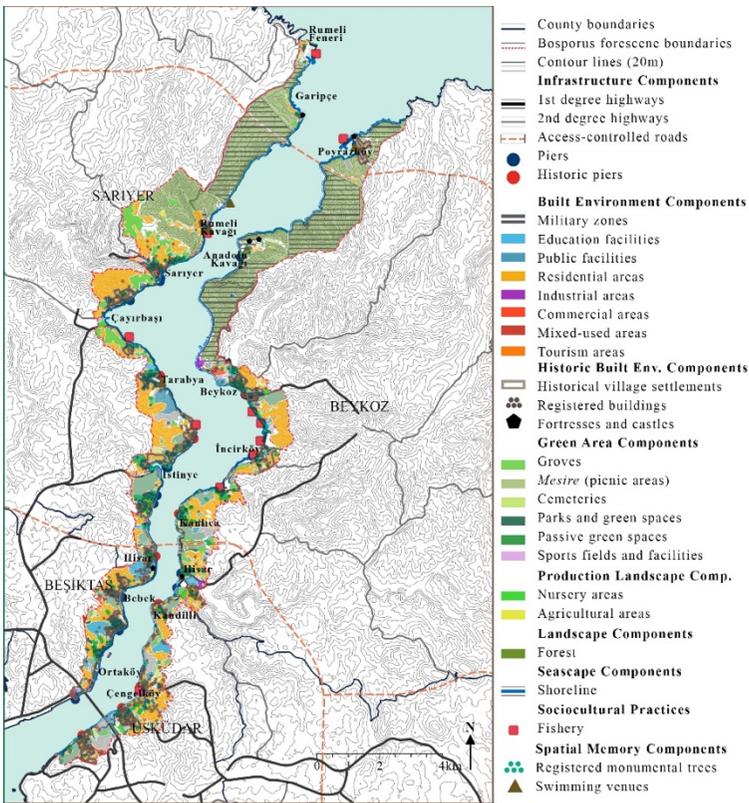
Figure 7: 2018 map of indicators used to measure change in Bosphorus Forescene and Coastline regions (Koyunoglu & Zeren Gulersoy, 2022).

Furthermore, the assessment of the Bosporus region's historic landscape integrity, unveiled through the HUL approach, intricately reflects a multifaceted interplay between legislative amendments and evolving urban dynamics. The introduction of Articles 4 and 5 in 1984, amending

Zoning Law No. 6785, profoundly influenced the cultural landscape, resulting in the legalization of structures within grove areas and the subsequent decline of these pivotal green spaces. The inherent conflict between the conservation-oriented Bosporus Law of 1983 and the subsequent Zoning Law of 1984 disrupted the equilibrium between the built and natural environment, culminating in irrevocable modifications to the historic urban landscape. These vulnerabilities underscore the necessity for adaptive strategies and nuanced comprehension of legal frameworks to effectively protect heritage values amid the backdrop of urban transformation.

The fifth step: prioritization emphasize the critical need to balance conserving heritage values and the adaptive measures required to address the dynamic urban context within the Bosporus site. Despite the challenges posed by shifts in production culture and alterations to coastal landscapes, the resolute commitment to heritage conservation is evident in the conservation of historical villages, listed structures, and monumental trees. These findings show the resilience of Bosporus culture, which continues to evolve while steadfastly embracing its deep-rooted traditions. Within this framework, the prioritization step of the HUL approach becomes instrumental in identifying key heritage values that necessitate immediate attention and protection while accommodating urban development dynamics, ensuring the sustained vitality of cultural and natural landscapes.

The comprehensive assessment of the Bosphorus using the HUL approach reveals a complex narrative of landscape change over time. It underscores the importance of addressing vulnerabilities in production culture and coastal landscapes through resilient strategies formed through various partnerships aligned with priorities. This highlights the delicate balance required between heritage conservation and urban dynamism and emphasizes the necessity of collaborative efforts to effectively tackle these challenges.

CONCLUSION

The insights gained from the Bosporus Istanbul HUL evaluation offer valuable guidance for future HUL implementations in Turkiye. Integrating HUL principles into urban planning and development becomes indispensable as urbanization accelerates. Turkiye boasts a wealth of cultural and historical heritage, making the adoption of the HUL approach a critical tool for sustainable development. Comprehensive mapping, vulnerability assessments, and robust stakeholder engagement must be prioritized to implement HUL effectively. Moreover, fostering public awareness and participation will be pivotal in

ensuring that preserving cultural and natural heritage remains a collective endeavour. By embracing the HUL approach, Turkiye can navigate the challenges of urbanization while safeguarding its unique heritage, ultimately shaping resilient and culturally vibrant cities for generations to come.

The global relevance of the HUL approach is underscored by a range of case studies in various urban contexts, including Cuenca, Ballarat, Naples, Zanzibar, and Luang Prabang. These diverse studies share a common theme: the intricate balance between preserving cultural heritage and accommodating urban metamorphosis. Whether it involves rejuvenating historic neighbourhoods in European cities, conserving the time-honoured cityscapes of Asian metropolises, or fostering the sustainable development of cultural landscapes in the Americas, the HUL approach emerges as a universal framework. It adeptly safeguards heritage values while effectively addressing the evolving needs of contemporary urban environments. These international instances collectively illuminate the HUL approach's adaptability and global pertinence, exemplifying its effectiveness on an international scale.

The rapid change in urban environments highlights the importance of implementing the HUL approach in future conservation strategies. As urbanization accelerates, preserving the historical identity of cities becomes increasingly challenging yet essential. HUL offers a versatile framework that transcends conventional conservation methods, acknowledging the intricate interplay between heritage and development. This adaptable methodology encompasses mapping historical layers, assessing vulnerability, and engaging stakeholders at various levels.

The strength of HUL lies in its ability to encompass both tangible and intangible aspects of a city's cultural heritage, weaving together architecture, traditions, narratives, and values. In doing so, it nurtures a sense of continuity amidst rapid urban transformations. By prioritizing collaboration among diverse stakeholders – from local communities to governmental bodies and NGOs – HUL ensures conservation strategies resonate with collective aspirations.

In a world grappling with the ramifications of climate change, urban expansion, and cultural homogenization, the HUL approach emerges as a vital instrument for harmonizing the conservation of historical legacies with the imperatives of sustainable development. In this symbiotic relationship between heritage and progress, HUL safeguards cities'

unique narratives, fosters social cohesion, and builds resilient urban landscapes that honour the past while embracing the future.

The comprehensive application of the HUL approach highlights a diverse narrative of cultural and natural landscape transformations over time. The fundamental theme of balancing heritage conservation with urban dynamism resonates locally and globally. The "limits of change" concept within the HUL framework emerges as a pivotal instrument in this narrative, offering structured guidance to strike a harmonious equilibrium between heritage conservation and urban development. By delineating acceptable boundaries for change, this principle ensures the safeguarding of heritage values while enabling adaptive strategies to accommodate evolving urban dynamics. It upholds authenticity and significance and facilitates the integration of historical sites into contemporary urban contexts. Recognizing these boundaries empowers decision-makers to honour the past while embracing the future, making the HUL approach, anchored in the concept of "limits of change," an essential navigational tool for addressing the intricate challenges of urban development while preserving the unique heritage that defines our cities, regardless of their location.

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CRITICISM/METHOD

GRAECO-LATIN SQUARES AND THE KNIGHT'S TOUR IN GEORGES PEREC'S LIFE A USER'S MANUAL AND ARCHITECTURE

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ABSTRACT

Georges Perec's *Life A User's Manual* (1978) is a novel that takes place in 11 rue Simon-Crubellier, a fictional Parisian apartment block, at a frozen moment in time. By looking at it through a vertical section, the book lets its viewers see the whole building at once. However, its most impressive feat are the multiple mathematical constraints that make up the book. The two main ones being the knight's tour, a chess problem that makes up the general structure of the book; and the Graeco-Latin square, an advanced version of the Latin square which determines several features of each chapter.

Although the mathematics of these constraints and how they are used in the original text have been discussed and documented before, the use of said constraints in different fields, the development of the mathematics since the time it was written, and the potential use of the constraints in architecture have not been discussed.

Here, by examining the constraints' use within the original text and in other creative areas, how they can be used in the field of architecture has been questioned. The constraints were applied to multiple existing designs and were also used to create new designs and the resulting designs were examined and compared.

While it is not yet possible to reach a definite conclusion about the usefulness of these mathematical constraints in real life architectural practice, the importance of testing new and unexplored constraints in architectural design is clear.

Keywords: Architecture and Mathematics; Constrained Architecture; Graeco-Latin Squares; The Knight's Tour; Life a User's Manual

INTRODUCTION

Georges Perec's 1978 novel *Life A User's Manual,* is a book full of mathematical constraints, references, puzzles and literary mind-games. In this paper however, we will be focusing on the two main constraints that make up the entire book: The knight's tour and the Graeco-Latin Square. The knight's tour being the constraint that determines the order of the book and The Graeco-Latin Squares being the one that determines multiple attributes of each chapter. There are also two hidden constraints that go with these two: The quenina, which turns the Graeco-Latin Square into Graeco-Latin Squares, 21 of them to be exact, and the grid that holds everything together. (Bellos, 1999)

Although its mysteries are not yet fully solved, there are many books and papers written on Georges Perec and his *Life a User's Manual*, the most important one being *Georges Perec: A Life in Words* (1999) by David Bellos, who also translated *Life A User's Manual* into the English language. It includes; along with Perec's biography; the constraints, backstories and the thoughts behind Perec's works including Life A User's Manual. While the book is filled with puzzles and games, the solutions or the keys to solve them are usually contained within the book itself. However, in some cases, figuring out whether there's a puzzle or a game to begin with can also be a challenge on its own.

The constraining methods discussed and experimented here are usually applied to already-existing designs; and in the process degenerate and regenerate them at the same time. Breaking them down to a set of elements, and piecing them back together in new ways. Creating something very new, that still carries pieces of the old within, in the process. Some of the methods could, arguably, be considered regenerating or degenerating, or both at the same time. When applied to an existing design, they might be very transformative, and their nods to the original design might be more on the subtler side.

Life A User's Manual

Life A User's Manual, takes place in 11 rue Simon-Crubellier, a fictional Parisian apartment. The novel, as such, looks into the lives of the inhabitants of said apartment. Specifically, it focuses on one, singular, still moment of their lives. Perec, by giving the reader a vertical section of the building, lets them see it in its entirety all at once. A drawing of the section is actually provided at the end of the book. (Perec, Life A User's Manual, 2008) (Figure 1) The book has 99 chapters, each named after an inhabitant or a specific part of the apartment building (example: the entrance hall, the stairs etc.) Some of those inhabitants become key characters in the story, and similar to the way the constraints create the

foundations of the book; said characters' lives and actions create the foundation of the story. (Perec, 2009) It is important to mention that, while it is hard to separate the novel from its constraints, outside of them, it still tells a story. It isn't created just to confuse the reader nor to be a simple combination of its constraints with no other substance. Which is how it proves its constraints useful.

						PLASSAERT		
	SMAUTF	SUTTON	ORLOWSKA	ALBIN	MORELLET			
HUTTING	GRATIOLET		CRESPI	NIETO & ROGERS	JEROME	FRESNEL	BREIDEL	VALENE
CINOC	DINTEVILLE					WINCKLER		
REOL						FOULEROT		
BERGER	RORSCHASH					MARQUISEAUX		
BARTLEBOOTH						THIRD FLOOR RIGHT		
ALTAMONT						BEAUMONT		
MOREAU				STAIRS		LOUVET		
SERVICE ENTRANCE	MARCIA ANTIQUE SHOP		OFFICE NOCHERE	ENTRANCE		MARCIA		
CELLARS	BOILER ROOM		CELLARS	LIFT MACHINERY		CELLARS		

Figure 1. Simplified recreation of the section of 11 rue Simon-Crubellier from *Life A User's Manual*

The Knight's Tour

As mentioned before, Life A User's Manual has 99 chapters each named after a part of the 11 rue Simon-Crubellier, and some places are visited multiple times. For example, there are 12 chapters named after the stairs; On the Stairs 1, On the Stairs 2 and so on. They are also visited and re-visited at seemingly random times; for example, chapter 22 is Entrance Hall 1 while Entrance Hall 2 is chapter 90. The chapter order isn't chronological either. Since the book takes place in one frozen moment there's no chronology to be followed. But even when the time does flow, such as when previous events are recalled (which is a technique used very often in the book) no such order is followed. (Perec, 2009)

Figure 1 shows a simplified version of the section drawing given in the book. By connecting some of the unfinished lines on this drawing, we

can actually turn it into a 10 by 10 grid. One can also get some help from the full story, which gives some clues as to how many rooms each flat might have. Meaning, each square can also represent a room of the building. One interesting thing to note is that, this fact implies the entire apartment can be seen through a single section, which is usually not the case in reality. Following the order of chapters on this modified drawing, again by getting some help from the full story to get clues as to which specific room the chapter might be taking place inside, one can see that it's actually following a strict pattern. This pattern being a 3 by 2 "L" shape, just like the knight's move in chess.

Once the book's full route is followed, it can be observed that the "L" shape is perfectly followed through almost the entire book, with one exception where, between the chapters 65 and 66, the very bottom left corner of the building is skipped. This is clearly done intentionally as if the bottom left corner was visited, it would fit the pattern perfectly between chapters 65 and 66. This leaves us with the following: A 10 by 10 grid, each square visited once and only once (except for one) and an L shaped movement between each step. (Figure 2)
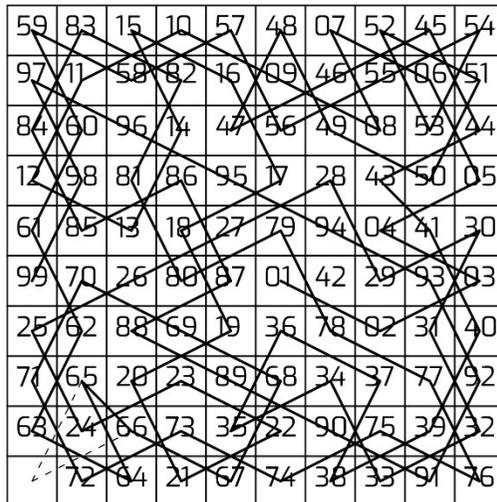
Figure 2. *Life A User's Manual*'s knight's tour on 11 rue Simon-Crubellier.

The idea of a knight touring around a chessboard, visiting every square and visiting each square only once is called the knight's tour, and a puzzle based on figuring out a knight's tour route that works for a given chessboard is called the knight's tour problem. (Parberry, 1997) The chessboard's dimensions can be the standard 8-by-8 or any other chosen number, for example, a 10-by-10 like in the case of Life A User's

Manual. The 10-by-10 knight's tour used in the novel was actually solved by Perec himself. (Bellos, 1999)

A knight's tour is closed if one can reach from the first step to the very last one within one knight's move and open if otherwise. Euler is considered the first person to research the knight's tour. His studies were conducted on the original 8-by-8 chessboard. (Parberry, 1997)

Other than being a puzzle on its own, the knight's tour was and is still used in many ways. One of those is its use in cryptology. Cryptotour is a puzzle in which 64 words or syllables are placed in an 8-by-8 arrangement, and they can be solved by reading said words or syllables in the sequence of a knight's tour. Since one chessboard can have multiple knight's tours, the solution texts were usually well-known verses (Hill & Tostado, 2004) The fact that these cryptotours used famous pieces of text made them two-way ciphers; the tour held the key to the verse and the verse held the key to the tour. By knowing one of these, even if only partially, one could begin to unravel both.

Another use of the knight's tour in cryptology can be seen in Singh, Kakkar and Singh's (2015) study on a visual cyryptology technique. It involves dividing an image into 8-by-8 pixel squares and shuffling the pixels according to a knight's tour. The encryption doesn't end with or simply consist of the Knight's Tour scrambler but it is an integral part of the process. One important thing to note about this encryption technique is that is it lossless, as both the keys used and the knight's tour are perfectly retraceable.

Inspired by the constraints' use in cryptology, the idea of scrambling an image by using a knight's tour will be explored in this section. Here the intent is, instead of hiding the original design, creating a new design by deconstructing and reconstructing the original one. Using a closed knight's tour can help the experiment, as one can easily pick and change the starting point of the tour while keeping the "shape" of the tour the same.

In Figure 3.a, a 6-by-6 closed knight's tour (Jelliss, 2000-2023), a starting point and a direction is shown. Figure 3.b shows an image of a colorful gradient placed on a grid, and its grid's squares numbered based on the knight's tour in Figure 3.a. Lastly, Figure 3.c shows the original image rearranged based on the numbering from Figure 3.b.
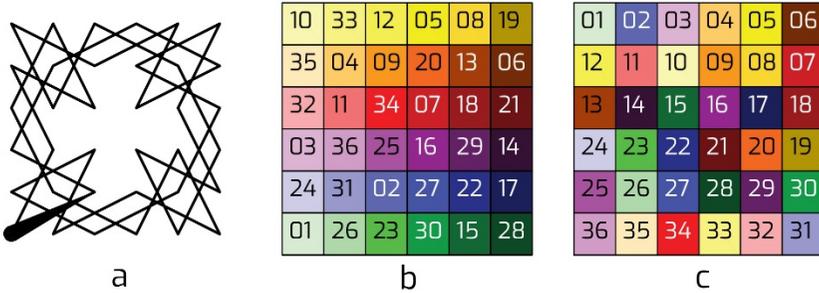
Figure 3. a. shows the knight's tour, its beginning and direction. b. shows the knight's tour steps numbered on an image c. shows the original image rearranged based on the tour from a.

Note. Information used to create Figure 3.a. obtained from: "Closed Knight's Tours of the 6 by 6 Board" by G. P. Jelliss, 2000-2023. (https://www.mayhematics.com/t/6a.htm)

After the rearrangement (Figure 3.c), the gradient order of the original image (Figure 3.b) is nowhere to be found, and whatever resembles an order seems to be coincidental. Given that the chosen knight's tour is a very symmetrical one, this seemingly random outcome is unexpected. However, this result might be caused by the chosen original test design (Figure 3.b) and will be further tested with a different design later in this paper. (See Figure 7)
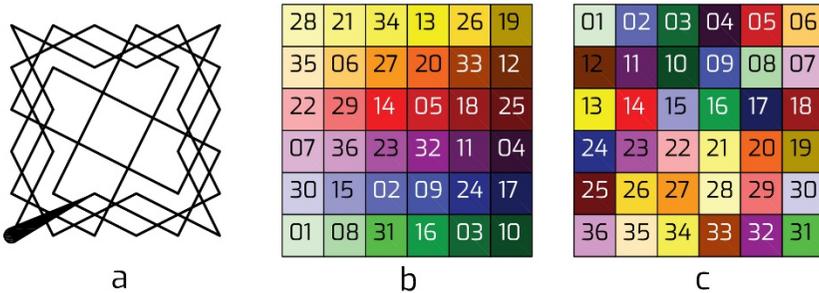
Figure 4. a. shows a knight's tour (other than the one from Figure 3.a.); it's beginning and direction. b. shows the knight's tour steps numbered on the original image c. shows the original image, rearranged based on b.

Note. Information used to create Figure 4.a. obtained from: "Closed Knight's Tours of the 6 by 6 Board" by G. P. Jelliss, 2000-2023. (https://www.mayhematics.com/t/6a.htm)

Figure 4 experiments with the same image but with a different knight's tour. (Jelliss, 2000-2023) Figure 4.a shows another 6-by-6 closed knight's tour, that is different from the one in Figure 3.a, but one that starts from the same square and moves in the same direction. Figure 4.b shows the same original image from Figure 3.b, but this time numbered according to the knight's tour from Figure 4.a. Finally, Figure 4.c shows the rearranged version of Figure 4.b based on the numbering from Figure 4.b.

Between Figure 3.c and Figure 4.c, some similarities can be observed, like the numbers 17,18,19,20 follow the same color order in both results. Numbers 26,27,28,29 from Figure 3.c and numbers 08,09,10,11 from Figure 4.c also have the same color order; just starting at different steps. (Visually they appear reversed, but this because the steps arranged to follow a continuous line on the grid.) Which can be due to multiple reasons such as the fact that many knight's tour patterns show some visual similarities with each other, including the two chosen for the experiment, and that there are only a certain number of squares a knight can go from any given square, so it is unavoidable that some similarities will occur. Despite these similarities and the same starting point and direction however, they produce patterns that are quite different at first glance.

a   b   c
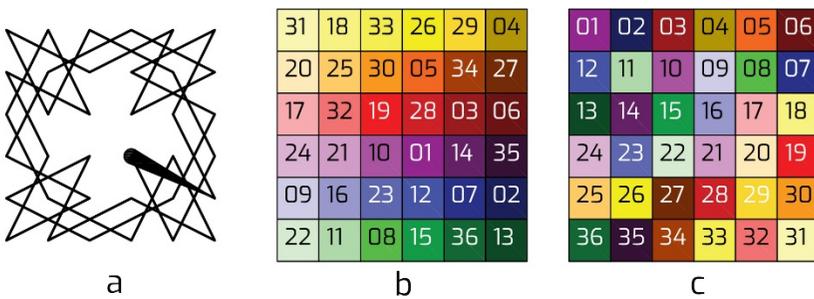
Figure 5.a. Shows the same knight's tour as Figure 3.a. with a different beginning and direction. b. shows the knight's tour steps numbered on the original image c. shows the rearranged image based on b.

Note. Information used to create Figure 5.a. obtained from: "Closed Knight's Tours of the 6 by 6 Board" by G. P. Jelliss, 2000-2023. (https://www.mayhematics.com/t/6a.htm)

Figure 5.a uses the same knight's tour as seen in Figure 3.a, but with a different starting point. As a result, while Figure 5.b experiments with the same image as Figure 3.b, this time it's numbered according to Figure 5.a. When rearranged, this results in Figure 5.c. While at first Figure 5.c and Figure 3.c may seem quite different and random, this time the

similarity is a lot easier to point out. In Figure 5.c, the color order from Figure 3.c is simply moved forward by 22 steps. The 1st step from Figure 3 and the 22nd step from Figure 5 are the same color. Following the steps after that, it can be observed that the color order continues the same. 02 from Figure 3 and 23 from Figure 5 are the same, 03 from Figure 3 and 24 from Figure 5 are the same and so on. This result isn't unexpected, as the tours are the same shape-wise and only the starting point has been changed.
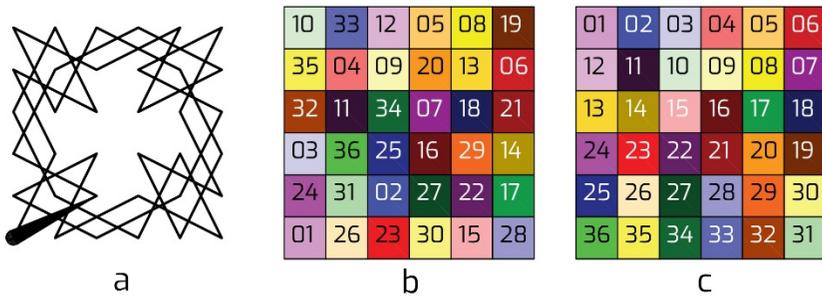

Figure 6.a. shows the knight's tour from Figure 3.a. with the same beginning and direction b. shows the knight's tour steps numbered on the end result from Figure 3.c. c. shows the image from b. rearranged based on the numbering from b.

Note. Information used to create Figure 6.a. obtained from: "Closed Knight's Tours of the 6 by 6 Board" by G. P. Jelliss, 2000-2023. (https://www.mayhematics.com/t/6a.htm)

Figure 6 uses the same knight's tour as Figure 3.a, with the same direction and starting point. Here however, the knight's tour scramble is applied to the already scrambled image from Figure 3.c. The result (Figure 6.c) is an image that resembles neither the original image (Figure 3.b) nor the version of it that was only scrambled once (Figure 3.c). It, similarly, doesn't display any clear symmetry or gradient-like color order.

The different colored squares of Figure 3.b (which is the same one as Figure 4.b and Figure 5.b, minus the numbers) make it easier to keep track of the squares' exact movements. However, due to its fragmented nature, it is difficult to detect and point out the changes in the whole image. It also doesn't have the point-symmetric quality of the chosen knight's tour. (Figure 3.a) For these reasons, at least one more design is required for this experiment.

The knight's tour seen in Figure 3.a is symmetrical with respect to its middle point, not an axis, which results in an inverted symmetry. Figure 7 shows a simple floor plan that shares the same middle-point inverted

symmetry as the knight's tour. It is also symmetrical with respect to the vertical and horizontal axis.

The floor plan is placed on a grid and each square is numbered according to the knight's tour's route. (Figure 7.a). Then the squares are rearranged according to the numbering (Figure 7.b) which results in the new floor plan shown in Figure 7.c. This new plan however, is symmetrical neither with respect to an axis like the original plan nor with respect to a point like the knight's tour. It can be observed that the end result of a knight's tour scramble will not necessarily be similar to the original scrambled image or the knight's tour, in terms of visual order or symmetry.
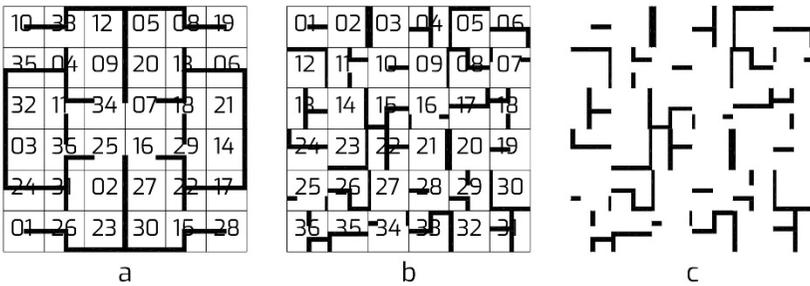
Figure 7.a. shows a floor plan on a numbered grid, b. shows the plan (a) rearranged based on the numbering and c. shows the plan (b) without the grid and the numbering.
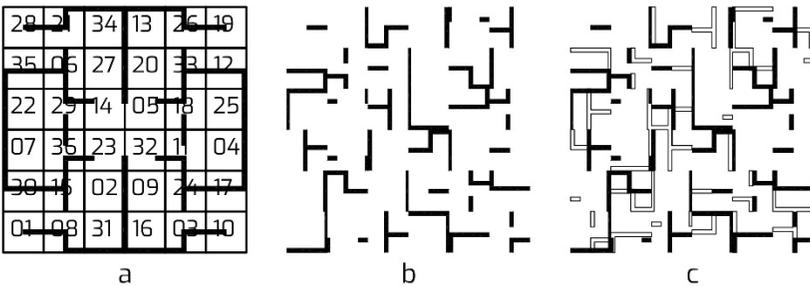
Figure 8.a. shows the floor plan on a numbered grid, b. shows the plan (a) rearranged based on the numbering without the grid and the numbering. c. shows the plan (b) (in black) superimposed with another floor plan (from Figure 7) (in white)

Figure 8 experiments with the same floor plan as Figure 7.a but with a different knight's tour, this time the same one from Figure 4.a. Again, the plan is fragmented and rearranged with respect to the knight's tour route (which also begins with the same square as Figure 7.a and moves

in the same direction) (Figure 8.b). Figure 8.c shows the results from Figure 8.b (in black) and Figure 7.c (in white) superimposed with each other. It can be observed that; even when using the same base design, the same beginning and the same direction; two different knight's tour's scrambles can yield visually distinct results.

A further experiment could be designed by applying this process to the 3rd dimension. Though plans and sections are architectural representations of 3-dimensional designs, they themselves are 2-dimensional. At the time *Life A User's Manual* was written, the knight's tour was also a movement contained in the 2nd dimension. Today, there are studies on the knight's tour in the third dimension. However, even the idea of exactly what a 3-dimensional chess is isn't one that is fully agreed upon between studies.

Raumschach (German: space chess) is one of the earliest known versions of three-dimensional chess. What makes it three-dimensional is its use of multiple chess boards stacked on top of each other. This version of the game had 5 boards that were all 5-by-5; meaning it was played on a 5-by-5-by-5 cube. (Balden & Bodlaender, 2002) (Maack, 1919) However, known studies done on the three-dimensional knight's tour use a board that is 3 boards-high.
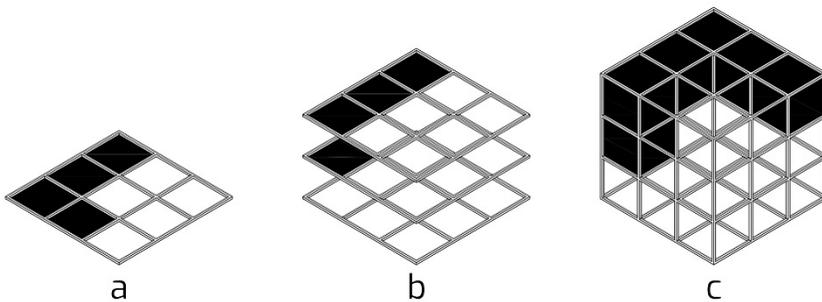
Figure 9.a. is a 2-dimensional (1,2) knight's move, b. is a 3-dimensional (1,2)-knight's move, c. is a 3-dimensional (1,2,2)-knight's move.

One such study is done by Gerlach and Gerlach (2019) which uses 3 8-by-8 boards. This study, along with most playable versions of 3-dimensional chess still treat the individual boards as 2-dimensional. Meanwhile; Bai, Yang, Zhu, Jiang and Huang, (2010) in their study, use a 3-by-4-by-8 rectangular prism shaped 3-dimensional chessboard, which has cubes rather than squares, and the knight moves along these cubes.

The knight's movement in 3-dimensional space is another idea that isn't easily agreed upon. Gerlach and Gerlach (2019) in their study, explain

that the knight in their version, still moves like a traditional knight: two-steps in one direction, then one step in a perpendicular direction. However, the knight's movement from one board to the next one is also considered one step taken. For example, a knight sitting on the lowest board can move up to the highest board, which is two steps taken in one direction, then move one more step on this highest board; and that would be considered one full knight's move. The knight can also, of course, stay on the board it is currently on, and move like any traditional knight as long as it stays on this board. Bai, Yang, Zhu, Jiang and Huang's (2010) study, explains that one full knight's move would be 1 step in one direction, 2 steps in a perpendicular direction and 2 steps in another perpendicular direction. Their paper calls this modified knight a (1,2,2)-knight and this knight's tour a (1,2,2)-knight's tour. Meaning these two studies together, provide us both the 3-dimensional (1,2)-knight's tour and the 3-dimensional (1,2,2)-knight's tour.

Examples of the three different ways a knight can move on a board are shown in Figure 9. Figure 9.a being a traditional (1,2) knight's move on a 2-d board, Figure 9.b being a (1,2)-knight's move on multiple stacked boards (Gerlach & Gerlach, 2019) and Figure 9.c being a (1,2,2)-knight's move on a 3-dimensional cuboid board. (Bai, Yang, Zhu, Jiang, & Huang, 2010)

The Graeco-Latin Square

A Latin square is an n-by-n arrangement of elements that each appear n times and yet no element repeats across the same row or column. A Graeco-Latin square, also called a Bi-square or Latin bi-square, is two Latin squares superimposed with each other, which results in an n-by-n arrangement with none of the pairs repeating. (Moolman, 2021) The name Graeco-Latin square comes from one set of elements being traditionally symbolized by Latin characters and the second set being symbolized by Greek characters to avoid confusion.

Graeco-Latin squares were studied by Euler in 1782. His version of the puzzle revolved around thirty-six officers of six different ranks, from six different regiments, placed in a 6-by-6 arrangement, in which no regiment or rank repeats across the same row or column. However, such an arrangement is in fact, impossible. A conclusion to which Euler also reached. However, he also (incorrectly) concluded that no Graeco-Latin square of size 4k+2 (any n-by-n square if n=4k+2) could ever be constructed. (Euler, 2018) (Bose, Shrikhande, & Parker, 1960)

At the end of 1950s, Bose and Shrikhande successfully solved a 22-by-22 Graeco-Latin square and later Parker proved the existence of 10-by-10 Graeco-Latin squares. In 1959 the three mathematicians announced

that, any and all sizes of Graeco-Latin squares, with the exception of 6-by-6, were possible. The Scientific American issue which includes Gardner's article on the discovery, also has the first artistic visualization of the 10-by-10 Graeco-Latin square as its cover, illustrated by Gardner himself. The illustration, represents the different elements of a Graeco-Latin square (which are usually represented by letters or numbers) by colorful squares-inside-squares. The outer-squares representing one set of elements while the inner-squares represent the other. Bose, Shrikhande and Parker, in their 1960 article, proved the existence of 10-by-10 Graeco-Latin squares. (Gardner, 1959) (Bose, Shrikhande, & Parker, 1960)

Perec had access to only one 10-by-10 Graeco-Latin square, which to him, wouldn't have enough data to work with. Based on his vision, it would likely produce a very repetitive outcome. To overcome this, he came up with a way to create multiple different Graeco-Latin squares from one. He used an altered version of the technique called *quenina*, which is an altered form of sestina, and ended up with 21 Graeco-Latin squares. (Bellos, 1999) This constraint will not be examined in this paper, however, pointing out the fact that Perec used an altered version of an already-altered technique to create more Graeco-Latin squares is important to show exactly how intricate his approach was.

While the knight's tour was used to determine the order of chapters; these Graeco-Latin squares were used to determine multiple different characteristics of the chapters. From the objects and the references to other pieces of literature found in these chapters to the lengths of the chapters themselves, 42 different characteristics were pre-determined by the 21 Graeco-Latin squares. The 10-by-10 grid containing the knight's tour (and therefore the chapter numbers) was superimposed with the Graeco-Latin squares each time to determine which set of elements corresponded to which chapter. (Bellos, 1999)

Figure 10 shows one of the 21 Graeco-Latin squares used by Perec. Each square on the grid contains 3 pieces of information: The ones on the top left represent the chapter numbers (based on the knight's tour) the ones on the bottom right are the two different Latin squares that make up the Graeco-Latin square. This specific Graeco-Latin square is the one that was used to determine the position and the activity that was supposed to take place in every chapter. Table 1 shows which position and which activity each number represents. (escarbille, n.d.) While a full list of every constraint that was supposed to be used in every chapter is available, a full list that explains exactly how they were used in book doesn't exist. But to give a known example, chapter 7's (first row from the top; seventh column from the left in Figure 10) supposed to contain position number

8 which is to exit; and activity number 6, which is to use a plan. The following sentences, from second-to-last paragraph of the chapter, contain said constraints: "Three workmen are now leaving the room." and "They have stuck on the bottom wall, by the door, a large tracing-paper plan showing the intended location of the radiator, the routing of the pipework and electrical wires, and the section of partition wall to be knocked down." (Perec, Life A User's Manual, 2008) (escarbille, n.d.)

59 1_1	83 7_8	15 6_9	10 5_0	57 0_2	48 9_4	07 8_6	52 2_3	45 3_5	54 4_7
97 8_7	11 2_2	58 1_8	82 7_9	16 6_0	09 0_3	46 9_5	55 3_4	06 4_6	51 5_1
84 9_6	60 8_1	96 3_3	14 2_8	47 1_9	56 7_0	49 0_4	08 4_5	53 5_7	44 6_2
12 0_5	98 9_7	81 8_2	86 4_4	95 3_8	17 2_9	28 1_0	43 5_6	50 6_1	05 7_3
61 2_0	85 0_6	13 9_1	18 8_3	27 5_5	79 4_8	94 3_9	04 6_7	41 7_2	30 1_4
99 4_9	70 3_0	26 0_7	80 9_2	87 8_4	01 6_6	42 5_8	29 7_1	93 1_3	03 2_5
25 6_8	62 5_9	88 4_0	69 0_1	19 9_3	36 8_5	78 7_7	02 1_2	31 2_4	40 3_6
71 3_2	65 4_3	20 5_4	23 6_5	89 7_6	68 1_7	34 2_1	37 8_8	77 9_9	92 0_0
63 5_3	24 6_4	66 7_5	73 1_6	35 2_7	22 3_1	90 4_2	75 9_0	39 0_8	32 8_9
– 7_4	72 1_5	64 2_6	21 3_7	67 4_1	74 5_2	38 6_3	33 0_9	91 8_0	76 9_8

Figure 10. One of the 21 Graeco-Latin squares used by Georges Perec while writing Life A User's Manual

Note. In-figure information obtained from: "Georges Perec "La Vie mode d'emploi"" by escarbille, no date. (http://escarbille.free.fr).

Table 1. One of Georges Perec's lists of constraints for *Life A User's Manual.*

1A/1a	1A - Position	1a - Activity
1	kneeling	paint
2	descend, squat	interview
3	face down, planking	toilet
4	sitting	erotic
5	standing	classify
6	rise, higher than ground	use a plan
7	enter	fix
8	exit	read write
9	laying on the back	hold a piece of wood

0	one arm in the air	eat

One different way to look at Graeco-Latin squares is to see the layering Latin squares as "dimensions"; which means the Graeco-Latin squares presented so far were two dimensional. Layering more Latin squares creates what's called Hyper-Graeco-Latin squares. An n-by-n Hyper-Graeco-Latin square can have as many as n-1 dimensions. (puzzlewocky, n.d.) While this opens up the possibility to create many complicated designs, specifically a three-dimensional Hyper-Graeco-Latin square may be useful to generate volumes or spaces. Specifically, by assigning the dimensions lists of literal dimensions. Even some of Perec's lists had information regarding the spaces, though those mostly focused on materials. As mentioned however, one list determined the size, not of spaces, but of the chapters themselves. (escarbille, n.d.)

Figure 11.a shows a three-dimensional visual representation of a 4-by-4 Hyper-Graeco-Latin square with three dimensions. This particular square was originally represented by colors (puzzlewocky, n.d.). By assigning the different colors different dimensions (Yellow=4h, Pink=3h, Blue=2h, Green=h), three pieces of dimensional information can be gathered for each 1-by-1 piece of the grid: height, length, and width. One important aspect of the Graeco-Latin squares can also be observed here: Since each color is used once in each row or column (of a dimension), the sum of each row or column will be the same (within the same dimension). Which means whatever's left of the grid on the width-length plane can be disregarded once the volumes are created.
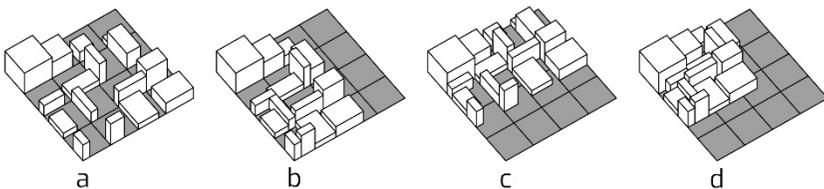

Figure 11. a. Various volumes placed on a 4-by-4 grid. b. Same volumes on the same grid as (a) compressed together along the widthwise axis. c. same volumes and the grid as (a) compressed together along the lengthwise axis d. Same grid and the same volumes compressed in both axes.

The volumes can be moved along either their widthwise (Figure 11.b) or lengthwise (Figure 11.c) axes and create 4 groups of 4 adjoined volumes. Once this process is completed these groups of adjoining volumes will all have either the same total width (like in Figure 11.b) or the same total length (like in Figure 11.c). However, it is not always possible to perform this operation on both axes at the same time, as movement in one axis can interfere with the other, like in Figure 11.d.

A further experiment could be performed by stacking 4 4-by-4 3 dimensional Hyper-Graeco-Latin squares on top of each other in a 4-by-4-by-4 cube formation. However, if we're to keep the rule of "no rows or columns having repeated elements" intact, stacking the same Hyper-Graeco-Latin square multiple times wouldn't work. Even different squares may not work together to create such cube. So far, no such example of a Hyper-Graeco-Latin square could be found. If possible, however, it could be useful, as it would contain enough dimensional information to create volumes and would allow said volumes movement in all three axes.

CONCLUSION

The knight's tour and the Graeco-Latin squares can be very useful when it comes to creating orders that are visually random, but aren't. This makes them easy to keep track of and control, as opposed to a true randomness. While at the same time, allowing one to benefit from the unexpectedness of the random. Graeco-Latin squares can similarly help avoid repetitions and creating non-repeating patterns out of a limited number of given "items". Again, creating new and unexpected from a hidden order. The techniques used in this paper mostly require already-existing designs to work with. A factor that helps greatly when regenerating the degenerated. However, more techniques like the one used for the Graeco-Latin squares (which is still too early in its stages to prove useful) that can create something out of nothing, may also be useful. Also worth noting is the fact that a design doesn't have to be degenerated in its entirety to be regenerated in this manner. Since both constraints use a grid, it is very easy to simply skip over some of the pieces, just like Perec did.

While one might expect a mathematical constraint to give very conventional and predictable results, that wasn't the case here, as even when using the same test subjects and the same mathematical constraints, simple changes are shown to result in completely different outcomes. Since the publication of his novel, the mathematics behind the two constraints have evolved. Meaning there is a lot more potential to be found by using them creatively. The developments towards the

third dimension are especially exciting when it comes to using them in architectural design.

Another important thing to note here is that, at the time Perec wrote his novel, the 10-by-10 knight's tour and Graeco-Latin squares were relatively new concepts. So new that Perec himself had to come up with the 10-by-10 knight's tour and a way to create multiple Graeco-Latin squares from just one. Yet these were only his tools to create the thing he actually wanted to create, not the creation itself. A similar approach and devotion must be applied to architecture as well, if one wishes to create the new.

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CRITICISM/METHOD

POWER'S CONTROL OVER THE SPACES OF THE HOT SKULL (2022) SERIES

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ABSTRACT

Space can be accepted as a political indicator of power relations that are changed and regenerated both on a global and local scale. While power ideologies become visible through space, they also generate systems of control over space. Power mechanisms use space as a tool to control the formation of all kinds of "others" united around a common set of values, against the ideological hegemony they establish over society. The Hot Skull series, which was released on Netflix in 2022 and adapted from Afşin Kum's 2016 novel of the same name, is a significant example of the representation of the changing power relations over space during the epidemic. In the series, after the worldwide epidemic, the Anti-Epidemic Institution (AEI), which was established in Turkiye, became the sole power in the country, legitimizing control over individuals' bodies through the epidemic by using different technologies. Due to the nature of epidemics, separating people that may be against the power facilitates the power's control over society and space. In this direction, the fear of being sick, the marginalization of the sick and the fear of the other trigger the emergence of new control mechanisms both in the city and in smaller scaled spaces. In this direction, the restricted areas, neighborhoods, streets, and other places where daily life takes place in the city have been taken under control by the power. The AEI limited the physical connection with the outside world by surrounding the entire city with high walls and established a new inward (closed) order by dividing the city into zones. In this order, the new image of squares, avenues and streets produced after the epidemic does not allow coexistence in the public sphere, thus preventing the formation of anti-power groups. The aim of this study is to discuss which dimensions and how the relationship between power control and space through the Hot Skull series.

Keywords: dystopia, power's control, spatial control, fictional space, city representation.

INTRODUCTION

It has been widely argued in the literature that space cannot be treated as a purely physical production dependent on environmental conditions, divorced from all kinds of individual and social practices that form its context. As much as space produces social practices, social practices also produce space. The actions of individuals and communities construct space with new contents repeatedly. Turning the direction of the thoughts on space beyond proportion, order, form, color, and other physical states that define an object makes it the center, the result, and the means of sociality. Henri Lefebvre addresses Karl Marx's statement that the identification of things as "objects" neglects "what these things contain, namely social relations and the forms of these "relations" through "space". According to Lefebvre, any empty space, although it contains "things", is not "a thing, a material object". Space contains, encompasses, and conceals social relations; it is not a "thing" but the relations between things (Lefebvre, 2014). In a parallel perspective to Lefebvre, Michel Castells describes space as a material product of a particular social formation. According to Castells, analyzing space as an expression of social structure means examining its shaping by the economic, political, and ideological system and the social practices derived from their combination (Castells, 1977; Gottdiener, 1994).

Social space is an invisible set of relations that tends to translate itself into physical space. In a hierarchical society, there is no space that is not hierarchical and whose social hierarchies and distances are not distorted or implicitly expressed (Bourdieu, 1996). From micro to macro scale, all mechanisms of power use space as a tool to legitimize their presence in society and to implement their political and ideological strategies. According to Edward W. Soja, the political organization of space means the structuring of human-space interaction to fulfill political functions. Soja defines political function in terms of three basic functions: control over the distribution, allocation and ownership of scarce resources, the maintenance of order and the exercise of authority, and the legitimization of authority through social integration, and brings these functions together in three basic contexts: competition, conflict, and cooperation. According to Soja, creating and maintaining solidarity within society by shaping the processes of competition, conflict and cooperation takes place through socially and politically organizing space and structuring the interaction between its constituent units (individuals and groups) (Soja, 1971).

While the ideologies of power become visible through space, they also produce control systems over space. The society, which is uniformized

by establishing hegemony over it, becomes a structure that the power can easily keep under surveillance by becoming each other's guardians. The power tries to marginalize those who resist the uniformization of society by otherizing them and keeping them outside the social sphere. Others, different political, ethnic and religious groups, are kept under surveillance by the group that is the carrier of the dominant political, ethnic and religious ideologies that hold social power outside the government (Çoban, 2019). In the face of the ideological hegemony, they have established over society, power mechanisms use space as an instrument to control the formation of all kinds of "others" united around a common set of values. Power organizes space by separating various strata and social classes outside the hegemonic one, forbidding their contact, giving them signs of contact (images) instead of contact (Lefebvre, 2014). In contemporary societies living in an area of surveillance beyond the public and private spheres, what legitimizes the use of surveillance technologies in the public sphere and thus the control of power is the need to control crime (McGrath 2004; Lyon, 2007). The recent re-emphasis on the supposedly lost urban commons, the recent privatization and closure of common spaces to the public, testify to the profound effects of this control and police surveillance. A recent wave of surveillance has targeted urban life in general, and the potential for new forms of social relations (a new kind of common space) to emerge out of urban processes influenced (or even dominated) by capitalist class interests. Hardt and Negri, for example, argue that we should see the city as a factory in which the common is produced, and they offer this as a starting point for anticapitalist critique and political action (Hardt and Negri, 2009; Harvey, 2013).

Released on Netflix, a digital streaming platform, in 2022 and based on Afşin Kum's 2016 novel (Kum, 2016), the series Hot Skull is a significant example of the representation of the changing power relations over space during an epidemic. In the series, following the worldwide outbreak of ARDS (Acquired reasoning deficiency syndrome), which is transmitted through hearing, the Outbreak Control Institution (AEI) established in Turkey has become the sole power in the country. To maintain its position of power, one of the prerequisites is to ensure continuity, AEI discreetly obstructs all scientific research aimed at acquiring immunity against the virus (Erdal, 2015, p.82). On the contrary, it adheres closely to the rules of the new order established with the aim of "containing the spread of the virus". Taking place in Istanbul, the narrative points out how the city is turned into a dystopian atmosphere as the ruling institution AEI rearranges the urban setting. The control of the AEI, which owes its existence to this pandemic, becomes visible in the city by dividing Istanbul into regions and taking control of neighborhoods, streets, and other spaces where daily life takes place.

The fear of getting sick, the marginalization of those who are sick, and the others trigger the formation of new mechanisms of control both in the city and in smaller-scale spaces. This study aims to discuss to what extent and how the relationship between power, control and space is produced through the spaces of the TV series Hot Skull. Although the book it is adapted from describes the spatial fiction in detail and gives names of specific neighborhoods, it cannot be said that the Hot Skull series follows this fiction to the letter. The director and the art team differentiated the story and created more developed and specialized locations. Therefore, the production of the Hot Skull series establishes a strong relationship with the discipline of architecture.

Power's Control over the Spaces of the Hot Skull Series

As power ideologies become visible through space, they also produce systems of control over space. In the Hot Skull series, the spatial effects of power mechanisms dispersed everywhere can be observed across various scales. Encompassing macro to micro levels, including the city, neighborhoods, streets, intersections of transportation networks, public structures, commercial buildings, and living spaces mediated by media, these spatial organizations are penetrated by the control of the AEI to maintain order. The spaces of the Hot Skull series have many references to urban and architectural design of early 20th century. During this period, the city played a role in legitimizing the power of dictatorships, achieving consensus within society, and asserting authority in European dictator regimes. However, with the downfall of these dictatorships, the city became a focal point of intense societal conflicts (Bodenschatz, 2015). In the Hot Skull series, AEI restricts the physical connection of the entire city to the outside world by enclosing it with high walls and establishes a new inward-oriented (enclosed) order by dividing the city into zones. Within this framework, the new imagery of squares, avenues, and streets after the pandemic fails to facilitate collective gatherings in public spaces, hindering the formation of anti-establishment groups. The inherent nature of pandemic diseases to segregate people and prevent the emergence of any form of mass opposition makes it easier for power to exert control both over society and space.

Urban control

In the Hot Skull series, the power mechanisms dispersed throughout manifest their spatial effects at various scales. The relationship between power and space, most prominently, becomes evident within the urban context. According to the narrative, due to the inability to find a cure for the disease, AEI segregates the city into zones using walls as a motivation to create safe areas. The main character Murat Siyavuş evaluates the division of the city into zones as the genesis of everything. In this regard,

the emphasis is placed on the urban-scale spatial arrangement orchestrated by power as the true catastrophe, rather than the emergence of the pandemic itself. The act of power, as described by Foucault's concept of enclosure, in creating enclosed urban spaces, can be interpreted as aiming to control individuals within society and consolidate their authority by dividing regions (Foucault, 1992). The endurance of power depends on constructing a homogeneous society composed of individuals that do not conflict with each or the authority. "The control of individuals' life practices through covert and overt means, and the ability to reshape them, when necessary, has become a fundamental practice in maintaining the stability of power. Ultimately, individuals possess a degree of freedom that does not question or jeopardize the existence of the dominant and powerful, in accordance with their presence." (Al, 2015)

AEI, by dividing the city with massive walls, has created enclosed zones where entry and exit are controlled or prohibited. By isolating infected bodies in quarantine areas, it has established secure zones where the risk of disease is minimized. AEI does not permit individuals with the disease to be present in the safe zone; occasional raids are conducted by units to gather patients from the region. Foucault draws attention to the function of institutions that subdue (enclose) bodies in this manner for surveillance purposes (Foucault, 1992). The power homogenizes bodies and distributes them into these parcels, thereby organizing analytical spaces. Lefebvre states that the power's strategy of spatial classification is generated from specific knowledge (Lefebvre, 2014). In the Hot Skull series, it can be argued that power legitimized its control over space by utilizing the knowledge of the disease.

Şule, the female protagonist who is a member of the anti-AEI group, clearly emphasizes this situation in her words:

"In the early days of the disease, we fell in love. First, the internet was cut off. Then schools closed, and other restrictions followed. It became very difficult for us to meet. Our anger towards AEI started from such an innocent place. Then AEI gradually stopped considering the sick as human beings. They gathered them, deprived them of food and water, and locked them behind walls. In their eyes, they were nothing more than expendable entities. AEI did everything in its power to make the public think the same way." (Kum at al., 2022)

She points out that in the early days of the disease, society's digital connections were restricted, and later institutions like schools were closed, limiting their freedom to use spaces. The authority took its initial steps towards control by weakening social bonds and restricting spaces.

In her speech, Şule highlights that sick individuals were locked behind walls and subjected to inhumane treatment. AEI ceased to consider them as humans and made efforts to shape public perception in the same way. This situation illustrates how the authority's spatial arrangements and communication tools can influence society's perceptions and behaviors.

Murat Siyavuş, who gains immunity against the disease while working in the AEI laboratory in the early days of the epidemic, spends almost all his time watching television when he is not asleep. It is striking that all the channels he can watch on television are only national channels. The fact that the media is also under the control of AEI highlights the transformation of the home, which is considered a space for protection and privacy, into a public space under AEI's surveillance. The conceptual boundaries of the public space, as defined by Stavros Stavrides as areas open to the public and under the control of an authority (Stavrides, 2019), have become increasingly blurred in the expressions of Beatriz Colomina. According to Colomina, being outside is no longer about the traditional notion of the public sphere - such as a public forum, square, or a crowd gathered around a speaker in such a place - but rather about the audience reached by every broadcasting medium; where this audience is physically located is not important (Colomina, 2020).

The attempts to establish control over society through enclosure/closure measures in the urban landscape of Istanbul have drawn significant attention. The high walls surrounding the city are indicative of the city's entire confinement for the purpose of control. These tall walls rising between the different districts can be seen as spatial elements symbolizing the power of enclosure in both directions, representing not only containment and protection, but also the unassailability and dominion of closure (Foucault, 2011). The Galata and Golden Horn coasts are enclosed by walls reminiscent of fortifications. The sight of Galata Bridge, which connects the relatively uncontrolled Karaköy/Galata and Eminönü-Sirkeci coasts referred to as the 6th district in the series, with its fish restaurants and people fishing, has given way to an abandoned appearance. Along the walls on the opposite shores of the 6th district, boats and small crafts are piled up. In areas where the control of AEI is diminished, the emergence of the anti-AEI +1 Group, mafia organizations, and the underworld becomes evident. Director Mert Baykal describes how the spatial arrangement of the uncontrolled zone they refer to as the 6th district was created in addition to the book, as follows:

"The region we've labeled as the 6th district is the uncontrolled part of the city (Figure 1). This area is where AEI's power won't reach; a harbor where, somehow, commercial goods, vegetables, and fruits could still come from outside if they can be produced. The region needed to be a more unrestricted place. We imagined that there would be mafia activity on the Eminönü side and a +1 organization on the Karaköy side. Therefore, Karaköy became the neighborhood of +1 organization and Özgür's spaces. We were already looking for that old texture of Istanbul." So, in that respect, they transformed the Galata Tower, established checkpoints on the bridge and build walls where we can sense the control of AEI. (Baykal, 2023).

Figure 1. An urban panorama from the Hot Skull series (Netflix Türkiye, 2022, November 25).

Surveillance in the urban context is a multi-dimensional, multi-layered, and real-time urban experience that encompasses the organization of daily life. Countless checks are conducted to ensure that individuals or societies are in the right place at the right time, traveling at the right speed, and carrying the right items. Sometimes as part of a social category, and other times individually, actions within the city are constantly monitored and observed. To become a secure place, the city is made visible (Lyon, 2001). These technologies produced by power are essential factors that facilitate non-contact between regions. Power seeks to maintain order through non-contact (Sennett, 2011). However, Berman points out that the segregation of individuals into different zones restricts the sharing of the same space and interactions within the community. The assertion of order in this environment where spatial division contributes to social division can be problematic (Berman, 2013). Here, Bauman and Lyon suggest that the surveillance technologies applied in these secure cities, built in response to real or imagined

threats, transform the city into the most fertile source of disorder (Bauman & Lyon, 2016). In the Hot Skull series, there are intensive security mechanisms that control the passage between zones. Transition from a safe zone to a quarantine zone is prohibited, and entry into the uncontrolled zone is subject to a visa registered on the identity card. On the bridges connecting the shores of the Golden Horn, vehicle entry and exit are controlled by AEI (Figure 2).


Figure 2. An urban panorama from the Hot Skull series (Netflix Türkiye, 2022, November 5).

Figure 3. Security measures in public space (Netflix Türkiye, 2022, November 5).

Due to these regional closures, the morphology of the city undergoes changes. The streets of the city can be seen as the most prominent areas of this transformation (Figure 3). For instance, by not allowing the

commemorative march of AEI, public space usage within the city is directly prohibited. Moreover, especially in the safe zone, the deterrent effects of AEI's controlling technologies have led to a significant decrease in the utilization of public spaces. To the extent that Şule sitting alone at a bus stop to read a book caught Murat's attention, and he warned her that the bus wouldn't come. This situation indicates that city dwellers now tend to view the street as merely a transitional space, highlighting the shifting urban spatial perception (Figure 4).

Figure 4. The public demonstration of the anti-AEI group in the urban space (Netflix Türkiye, 2022, November 25).

Figure 5. AEI vehicles as one of the control mechanisms in urban space (Netflix Türkiye, 2022, November 5).

AEI employs not only spatial organization but also visual and auditory materials to establish control over society within the city. The presence

of AEI vehicles roaming the streets and roads, accompanied by messages such as "We invite everyone to collaborate with AEI, to strictly adhere to the rules and regulations, and to remain vigilant against elements hostile to the institution," serves as another method to enforce control through fear within the community (Figure 5). To ensure the continuity of surveillance, AEI goes beyond auditory warnings, reinforcing its alert system throughout the city with visual materials such as "Put on your headphones first," "If you suspect the person in front of you is 'sick,' put on your headphones immediately," and similar messages (Figure 6). These visual cues strengthen the warning system. The surveillance systems established by AEI over the city and society function as intermediaries, tightly enveloping the city much like a network, thus sustaining the apparatus of domination created by AEI.

Figure 6. Visual materials organized for establishing control in public space (Netflix Türkiye, 2022, November 25).

As an example of the changes in the city, the iconic Galata Tower is depicted with its receiver antennas, covered by plastic, highlighting its loss of prominence in tourism activities (Figure 7). Similarly, in the Galata and Karaköy districts, historically vibrant commercial areas for centuries, all the shops have their shutters down, indicating a lack of commercial vitality. Additionally, both the 6th region and the safe zone feature second-hand markets, as well as a supermarket within the safe zone. The absence of visible production networks in the city, coupled with the characters' dialogues, suggests a stagnation in the shopping economy within the city. All these observations reflect the societal and economic consequences of changing power dynamics within urban spaces. They serve as examples illustrating how power can alter the use and perception of space in the city.

CRITICISM/METHOD

Figure 7. The transformed state of the Galata Tower (Netflix Türkiye, 2022, November 25).

Architecture of power

In urban spaces, power utilizes architecture to make itself visible and convey messages. In the series, the executive body of AEI is constructing a monumental-scale laboratory within the city. It is believed that this structure will announce AEI's efforts to end the pandemic to the public. While secretly obstructing the efforts to find an immunity for the disease, the hidden agenda of AEI's executive body is to prolong the pandemic. However, at this point, architecture is employed to convey the desired message to the public. The laboratory building can be seen as a vehicle carrying the messages of power. The organization of the laboratory's opening ceremony can also be viewed as a disciplinary tactic of power. The day when the +1 Group, opposing AEI, intended to hold a commemorative march coincides with the opening day of the laboratory building. AEI aims to strengthen its control over the usage of the city by banning the march and conducting the laboratory opening, using time scheduling to solidify its power over the city and discipline the opposing group.

The building used by AEI (Figure 8) also stands out with its monumental, symmetrical, and colossal dimensions. The director, who expressed that a brutalist architectural approach was adopted for the design of the building, described AEI buildings as "oppressive to humans." The public structures of Eastern Bloc countries, the Berlin of the time when the wall still existed, and the public buildings of Russia and Ukraine served as references for the design of the AEI building. While in the early 20th century, modern architecture was a key player in the efforts to construct

dictatorships; the modern architecture of 1920s Soviet Russia can be considered as part of a radical, socially egalitarian modernism program, whereas the equally radical modern Italian architecture of the 1930s served the project of Fascist modernization (Tonkiss, 2005). In this context, Sennet points out that while social ties are not permanent due to the constant change and transformation of society, power, on the other hand, creates authoritative monuments. Sennet emphasizes that power aims for the monumental buildings it constructs to be a tangible expression of authority and power, seeking to establish a sense of stability and order in society (Sennet, 2011). Accordingly, the colossal AEI building can be viewed as a tool that symbolizes the authority of power in the public space.

Figure 8. AEI building (Netflix Türkiye, 2022, October 20).

Figure 9. The market area in the 6th region (Netflix Türkiye, 2022, November 5).

While AEI is seen as a governing power shaping the urban space through the walls it constructs and public buildings it establishes, the power relations within the divided regions also undergo changes. In the safe zone, AEI aspires to control all possible relationships that may develop in the space, even though it may not be entirely achievable. This is because the relationships produced within the space can pose a threat to the authorities, and throughout history, authorities have tried to prevent this with various strategies (Öztürk, 2012). In this context, interactions produced within the space among different groups, especially in the uncontrolled zone, have moved away from AEI's control and created different dynamics. Accordingly, it is possible to speak of a tendency towards uniformity in the safe zone and diversity of vitality and interaction in the uncontrolled zone. This is reflected in the depiction of marketplaces in both zones. While the market in the safe zone appears stagnant and deserted, the marketplace in the uncontrolled zone is characterized by more intense circulation and a chaotic state. It is possible to find all kinds of goods that are not allowed for sale in the uncontrolled zone (Figure 9).

The authority that has the power to isolate and detain individuals affected by specific contagious diseases to protect the public (Lacey, 2003) has strictly prohibited entry and exit from the quarantine zone. As observed in other parts of the city, the quarantine zones are enclosed by high walls. The control of those placed in quarantine is maintained by tall towers and AEI employees at observation points (Figure 10). Even the personnel have minimal contact with the patients. Basic human needs are met to keep the patients alive. Despite being completely separated from society, those who have contracted the disease form a community among themselves. Depending on the speed of the epidemic, this growing community, which shares a common fate and conditions, is equal in terms of their collective destiny (Canetti, 2006).

The spatial control within the quarantine zone by AEI can be seen through the centralized food distribution system, which operates from a single point (Figure 11). Apart from that, there are very few surveillance technologies developed against the information of the disease within the zone. This situation could be attributed to the absence of the fear of mingling in the quarantine zone. The fear of mingling is generated within a society that harbors and coexists with different groups organized at various scales (Bauman, 2018). In the quarantine zone, however, the individuals affected by the disease do not have concerns related to security, and their mental state could also be considered a hindrance to their organization.

Figure 10. Entry to the quarantine zone (Netflix Türkiye, 2022, November 5).

Figure 11. Food distribution point within the quarantine zone (Netflix Türkiye, 2022, November 25).

In contrast to this situation, control technologies produced by various groups or individuals within both secure and Zone 6 areas have played a significant role in shaping the spatial configuration of the indoor environment. This phenomenon is notably evident within the Secure Zone's AEI building, where such dynamics are markedly pronounced. The interior design of the building incorporates advanced technological security systems. To access the interior of the building, individuals must first swipe their access cards at the turnstile (Figure 12), followed by entering a glass chamber equipped with cameras (Figure 13). Within this chamber, an oral interaction takes place via a microphone, during which the individual's health condition and authorization to enter the

premises are determined. This intricate multi-tiered security system thus emerges from a sequence of successive stages.

Figure 12. Encrypted turnstile at the entrance of the AEI building (Netflix Türkiye, 2022, November 25).

Figure 13. Glass chambers at the entrance of the AEI building (Netflix Türkiye, 2022, November 25).

Accessing the technological capabilities of AEI by the urban populace proves considerably challenging, which is evident from the spatial transformations observed within residential interiors, automobiles, and apartment complexes. With the onset of the pandemic, individuals were gripped by panic, prompting them to effect spatial alterations using available materials as a preemptive measure against the disease. Given the transmission of the ailment through auditory means, window perimeters of residences and vehicles were sealed using materials like foam and sponge. In certain areas, easily accessible substances such as

wood and nylon were employed to provide sound insulation by enclosing spaces. As a safeguard against the disease, the adoption of earphones became widespread, resulting in the installation of hooks on certain walls for suspending earpieces. Furthermore, the incorporation of soundproof double-pane glass in laboratories and numerous locations constituted spatial solutions to mitigate the transmission of the disease through auditory routes. Director Mert Baykal expounds on his motivations for interior composition as follows:

"As people endeavored to comprehend the situation, they engaged in measures to safeguard themselves, contemplating whether the infection could spread through sound, as conversations on the street might infect them. This led to actions like lining windows susceptible to sound infiltration with foam, sealing them with wood, or using nylon. We envisaged achieving such isolation with materials readily available within households. We also applied foam to car windows, prioritizing materials accessible and straightforward to be employed by everyone." (Baykal, 2023)

Figure 14. Glass cabins where patients are kept (Netflix Türkiye, 2022, November 25).

The widespread adoption of closure practices among individuals through adjustments made in everyday spaces is remarkable. In a supermarket setting, when a case of illness is detected, employees can promptly lower the shutters and confine occupants by activating an emergency button. The character Anton, who continues to keep his ailing spouse and child in a quarantined residence to prevent their separation, maintains them within a confined room under observation through surveillance cameras. In laboratory environments, patients are enclosed within soundproof glass cabins (Figure 14), considering their

need for observable containment. Collectively, these technologies confer upon individuals the authority to impose closures on one another.

Following the emergence of security obsessions, individuals become inclined to incessantly generate their own rationales without necessitating external factors (Bauman, 2018). Within the Hot Skull' series, these fixations give rise to the creation of protective spaces. Ideally, protective spaces are anticipated to be entirely purged of strangers, despite the awareness of their impossibility (Bauman, 2018). Consequently, regardless of the extent to which space is fortified by its users, the persistence of fear propels individuals to persistently devise diverse technologies. Particularly in regions with limited access to technology, like the space used by the +1 Group, despite passing through a few hidden passages, the final step involves entering with a verbal password. The continuous enhancement of the protective space's security is in question. In a similar vein, in the case of Murat Siyavuş, his mother hangs a car air freshener by the window. Green signifies a safe house, while red indicates a danger. It can be asserted that individuals and groups marginalized in opposition to the authority's control create an incessant mechanism of scrutiny against AEI's supervision by devising diverse security systems within spaces. At this juncture, it can be discussed that individuals develop strategies against the authority and exploit moments of partial weakening of power (De Certeau, 1990). De Certeau, who emphasizes the presence of a locus of power and a sense of belonging to it as prerequisites for the formation of strategies, asserts that strategies highlight spatial relations. In this regard, the mechanisms generated against AEI can be interpreted as individuals' tactics, emphasizing the acceptance of power in the city.

CONCLUSION

The concept proposed by Soja (1971) that space is organized by power to fulfill its political functions is notably evident in mechanisms of power depicted in the Hot Skull series. AEI's division of the city into regions, stating the epidemic for justification, and thereby creating a homogeneous and controllable community, constitutes just one of the spatial constructs aimed at sustaining their own authority. As articulated through Foucault's (1975) concept of "enclosure", the construction of a new societal structure has been achieved by subjecting inter-zonal transitions to rigorous control. In parallel with Berman's (1982) perspective, the division into regions, as a means of maintaining surveillance, minimizes interactions among members of this newly controlled society, thereby preventing any potential organization against the mechanisms of authority.

Hot Skull series' dystopian atmosphere manifests itself both in urban and micro spaces. AEI's excessive control over space and daily life can be seen in all spatial practices. The institution's presence is felt all over the space through various mechanisms of surveillance. Not only is the city divided and even private space is controlled all the time, but the society is disciplined, marginalizing those who question authority. Established with the aim of combating the pandemic, the AEI emerges as a power that creates a spectrum of spaces from the public to the private and exercises authority over these spaces in order to maintain its rule and achieve its political objectives. Drawing on Stavros Stavrides' (2016) conception of public space, which encompasses all forms of spaces under the control of power, the intervention of AEI into the domestic sphere through media surveillance, justified by the auditory transmission of the disease, signifies the blurring of boundaries between public and private spaces.

The legitimizing factor of the AEI's pervasive power of control across various scales is the pandemic itself, which simultaneously serves as the "raison d'être" of the institution. The recently inaugurated laboratory building serves as a primary indicator of how the AEI reinforces the image of being at the forefront of efforts to find a remedy for the disease, while simultaneously demonstrating how it instrumentalizes architecture and employs it as a screen against endeavors to safeguard its authority. Security measures, cameras, surveillance, and monitoring mechanisms within the series' settings serve as examples of Bauman's concept of fluid surveillance systems. Consequently, when the Hot Skull series is examined through the lens of the relationship between power and space, it becomes possible to discern the intertwined coexistence of space with sociality and its potential for mutual regeneration. In this sense, the Hot Skull Series, as an intriguing example, also illustrates how spatial constructs can be effectively generated through the representational tools of cinema.

ACKNOWLEDGEMENTS

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CRITICISM/METHOD

NEW MEDIA AS A RE-GENERATIVE TOOL IN ARCHITECTURAL STUDIES

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ABSTRACT

Before 2000, popular culture was represented by newspapers, radio and television. With the change in the dimension of technology, social media tools, which have influenced humanity on a global scale, have become the new representation of the media. With these tools, social, political, psychological, and economic orientations can be identified, and directions can be easily made on an individual, societal, and global scale.

Social media, which has provided a research area and tool for many disciplines in recent years, also provides an environment for the discipline of architecture as a representation of virtual space and human behavior. Architecture can contribute to architectural education, theory, and practice by viewing the social media field as a space production/design environment and as a data collection area. This study aims to support the determination and further development of the achievements of architecture through media studies by scrutinizing the discipline of architecture in studies on social media tools in the literature.

The methodology involves analyzing articles published from 2010 to the current day, indexed in the Scopus database. An overview of the various social media platforms' roles in this field is provided. Using VOSviewer, the study maps the potential knowledge domains that each social media platform supports.

Social media tools have, in this context, re-generated the scope and methodologies of scientific investigations to be conducted in the field of architecture. This re-generating enables hybrid studies that combine classic and established research methods with cutting-edge techniques. This study, conducted at the nexus of social media and architecture, is intended to serve as the foundation for future research in architecture.

Keywords: Architecture, Social Media Tools, document analysis, Scopus, VOSviewer.

INTRODUCTION

Before the 2000s, popular culture predominantly found its representation through traditional media channels such as daily newspapers, magazines, radio broadcasts, and television programs. However, with technological advancements, social media platforms emerged as the novel means of media representation following the turn of the millennium, fostering re-generative environments across multiple dimensions. The genesis of social media can be traced back to the United Kingdom, where it was initially conceived as a platform for schoolmates to locate and communicate with one another. Facebook originated at Harvard University in 2004 and has since proliferated globally. In 2005, YouTube introduced itself with the enticing proposition of "publish yourself," while Twitter, an application characterized by character limitations for text-based posts, was introduced in 2006 (O'Reilly & Milstein, 2009). Notably, Instagram, which currently boasts nearly two billion users, commenced as a photo-sharing platform in 2010 (Colomina, 2016; Url-1), and TikTok, centered around short video sharing, made its debut in 2018 (Montag et al., 2021).

In tandem with the exponential proliferation of these social media tools, the number of active users has seen a corresponding surge (Colomina, 2016). Social media has subsequently assumed a pivotal role as a conduit through which social, political, psychological, and economic orientations are either re-generated or steered, given the substantial user base. Moreover, its influence has continued to broaden and deepen across diverse spheres of society.

With this spread, social media has become a communication and value production environment, influencing architecture in all disciplines. It has also changed design, production, marketing, and advertising dynamics. Social media positively affects architecture to reach large masses, increase awareness, and create a critical architectural environment. However, its consumption-oriented functionality and manipulation feature can also be the source of an established reality that will conflict with the core values of architecture. Therefore, looking at the information and documents we can obtain quickly and intensively from a critical distance becomes more important than ever in this environment (Güzer, 2020; Esen & Kalaycı, 2021).

The dominance of conventional research methods and tools still grabs attention when trying to find answers to research questions in which the researched tool is either the subject or the object, even in academic studies in the field of new media / social media, which provides a suitable ground for interdisciplinary studies (Devrani & Kesici, 2020). This

study emerges from the questions of how the relations of the discipline of architecture with social media tools are reproduced and which social media tools and methodical approaches these developments involve. In line with these questions, the study aims to reveal the relations by examining the approaches in the new media studies associated with architecture.

In the Scopus database, articles published from 2010 to the present were scanned with social media tools (Youtube, Instagram, Facebook, TikTok, Twitter) and architecture words. Data were collected by examining the subjects and methods of these studies. The obtained data was transferred to VOSviewer in .csv format. Then, visualizations were created via the science mapping techniques by VOSviewer. Thus, the potential of each social media tool to create a field of architectural knowledge has been surveyed.

With this study, instead of defining a gap in the literature, the objectives are to expand the field of architecture and reveal the possibilities with the help of existing studies. By understanding the current methods used in the studies in this field, it will be possible to use it as a base to integrate it with the developments in contemporary architectural studies.

METHOD AND MATERIAL

This research was conducted using the quantitative research method, and data were collected and analyzed employing a bibliometric approach. Researchers in bibliometrics typically do not need to create their clustering techniques. Instead, they apply existing clustering methods within the bibliometric domain, which can be utilized without an in-depth understanding of clustering techniques (Van Eck & Waltman, 2017). VOSviewer, a freely available software tool, is a program for text mining, mapping, and data visualization, enabling bibliometric analysis. Built upon common citation theory and the Pathfinder network algorithm, this Java-based application conducts multivariate, real-time, and dynamic citation analysis on bibliographies within specific fields, aiming to unveil critical knowledge paths and milestones (Teng et al., 2022). To summarize, VOSviewer aids in the analysis by collecting metadata related to journals, citations, authors, or keywords from specific platforms. It paints a comprehensive picture of the previous research endeavors in a given area of interest.

In the current era marked by the exponential proliferation of information, VOSviewer assists in efficiently locating pertinent information and channeling efforts effectively. Researchers employ it when venturing into a new subject, enabling them to observe prominent studies, authors,

author relationships, word density, clustering patterns, trends, and changes over time. Also, VOSviewer offers profiling capabilities by analyzing linkages between countries, universities, and research institutes.

Data Collection

In this regard, the data collection methodology of this study, which focuses on using social media tools in architecture, is also based on the bibliometric approach. The Scopus database was utilized for data collection. Keyword searches related to the study were conducted within the Scopus database using filtering options. Articles published between 2010 and July 2023 were scanned separately using the keywords 'Youtube,' 'Instagram,' 'Facebook,' 'TikTok,' and 'Twitter' in conjunction with the term 'architecture.' The research scope was confined to social science and arts and humanities, and only publications in English were included (Table 1).

Table 1 Query in SCOPUS

Social media tools	Query details	results
youtube	(ABS (architecture) AND ABS (youtube) AND LANGUAGE (english)) AND (LIMIT-TO (SUBJAREA , "soci") OR LIMIT-TO (SUBJAREA , "arts"))	72
instagram	(ABS (architecture) AND ABS (instagram) AND LANGUAGE (english)) AND (LIMIT-TO (SUBJAREA , "soci") OR LIMIT-TO (SUBJAREA , "arts"))	56
facebook	(ABS (architecture) AND ABS (facebook) AND LANGUAGE (english)) AND (LIMIT-TO (SUBJAREA , "soci") OR LIMIT-TO (SUBJAREA , "arts"))	142
tiktok	(ABS (architecture) AND ABS (tiktok) AND LANGUAGE (english)) AND (LIMIT-TO (SUBJAREA , "soci") OR LIMIT-TO (SUBJAREA , "arts"))	4
twitter	(ABS (architecture) AND ABS (twitter) AND LANGUAGE (english)) AND (LIMIT-TO (SUBJAREA , "soci") OR LIMIT-TO (SUBJAREA , "arts"))	188

The authors checked the irrelevant articles. As a result, the articles related to architecture, including YouTube 8, Instagram 25, Facebook 11, TikTok 0, and Twitter/X 18, were evaluated. Since some studies used more than one social media tool, 51 studies were analyzed. The procedure followed to find irrelevant articles is as follows:

- Titles and summaries are checked, irrelevant ones are removed, and their relevance is determined.
- If the title and abstract present a weak relationship, the introduction and conclusion sections are read to determine relevance.
- Authors reach a consensus by discussing the relevant articles identified and reach the final data set.

Analysing the Data

The data analysis technique of the study is based on bibliometric mapping analysis within the scope of the data obtained. The study analyzed the data in three main approaches. Firstly, the research data analysis is presented by the bibliometric analysis method and, secondly, by the bibliographic mapping method. Finally, the topics and methods of the articles were discussed.

Bibliometric analysis data related to the year of publication, type of publication, and related graphs were created. Bibliographic maps were visualized using the VOSviewer program of the data obtained from the SCOPUS database.

Network visualization and density visualization analyses created in the VOSviewer program are included. Network analyses of the authors' co-authorship (co-authorship/authors), the most frequently used author keywords (co-occurrence/author keywords), the most cited articles (citation/documents), the number of citations of sources (citation/sources), and the number of citations of authors according to the institutions to which they belong (citations/organizations) were revealed. In addition, network analyses such as bibliographic coupling by documents (Bibliographic coupling/documents), bibliographic coupling by authors (Bibliographic coupling/authors), co-citation of cited authors (Co-citation / cited authors), and the number of publications (density and relationship analysis) according to the countries of the authors (Citation/country) were revealed.

In network visualization analysis, it consists of circles with the names of the items. The size of the circles represents the connection strength, while the lines between the circles represent the connections. The color of the items indicates the cluster they belong to. Overlay visualization creates the same configuration as network visualization. However, in this study, the colors represent the years of publication. Density visualization can be analyzed in two ways: density of items and density of clusters. In the item density visualization, items are represented by their labels, as in the network visualization and the overlay visualization. Each point in the item density visualization has a gradient color indicating the density of items at that point (Van Eck & Waltman, 2023).

FINDINGS

The findings of this study were evaluated through 51 publications related to social media tools obtained from the SCOPUS database in the field of architecture. The findings are interpreted under three headings: The findings of the bibliometric analysis and the distribution of publications

according to types are explained below (1). Bibliographic mapping was evaluated through the visuals and data in the VOSviewer program (2). It is analyzed according to the topic and methods (3).
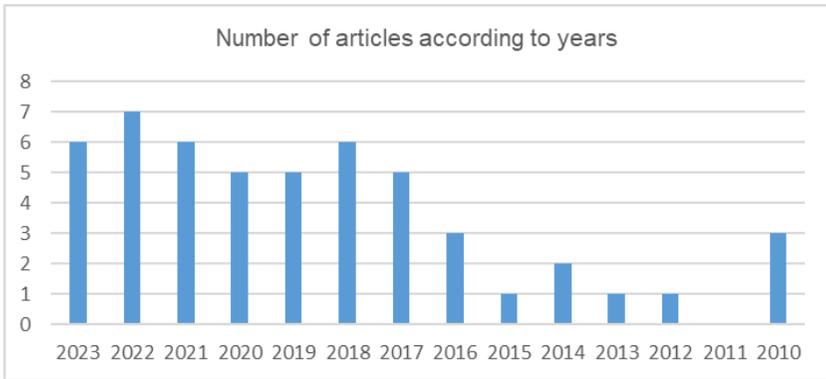

Figure 1. Number of articles according to years

Bibliometric Analysis Findings

According to bibliometric analysis, when the distribution of publications on social media in the field of architecture is examined by years, 6 publications in 2023, 7 publications in 2022, 6 publications in 2021, 5 publications in 2020, 5 publications in 2019, 6 publications in 2018, 5 publications in 2017, 3 publications in 2016, 1 publication in 2015, 2 publications in 2014, 1 publication in 2013, 1 publication in 2012, and 3 publications in 2021, and no publications on the subject in 2011 (Figure 1).
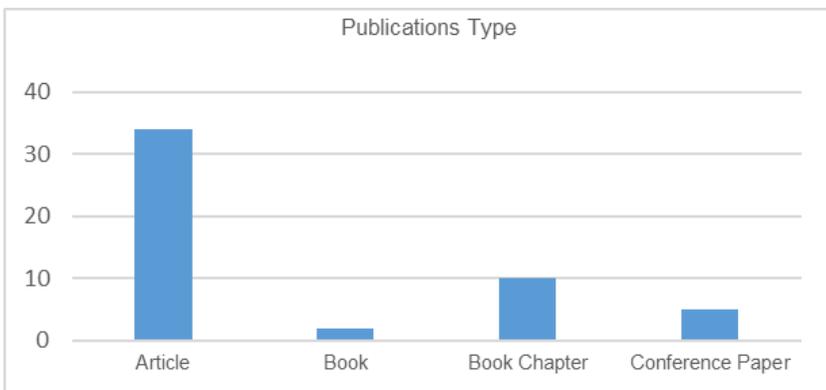

Figure 2. Publications Type

When the types of publications on social media in the field of architecture are examined, it is seen that the number of articles is 34, the number of book chapters is 10 publications, the number of papers is 5, and the number of books is 2 publications (Figure 2).

When examining which social media tools are the subject of the study, only Instagram 19, Twitter/X 11, Facebook 4, and YouTube 6 were used in the study, while TikTok was not used. There are 4 studies in which Instagram, Twitter/X, and Facebook tools are used jointly, Instagram and YouTube tools are used together, 4 Twitter and Facebook tools are used together, and finally, there is 1 study where YouTube and Facebook tools are used together (Figure 3).
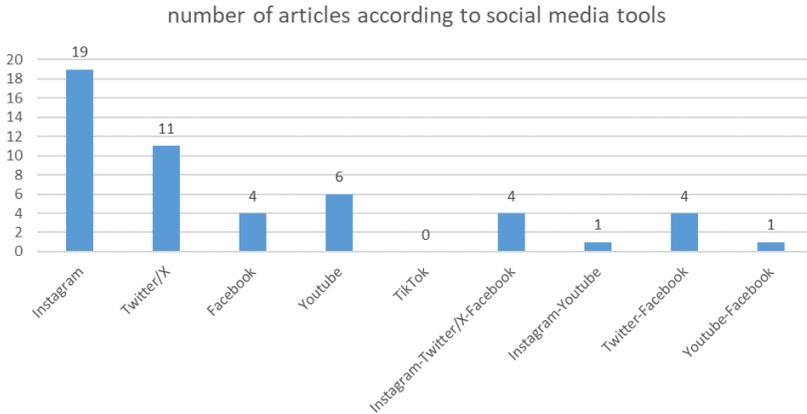
Figure 3. number of articles according to social media tools

Bibliographic Mapping Findings

Co-authorship/Authors

Disregarding the citation status, according to the co-authorship analysis of the authors, a network map was created by determining at least one publication to identify the most connected and collaborating authors.

Kheir Al-Kodmany has produced two publications. All other authors have one publication. According to the analysis data, there are no links to collaborating authors (Figure 4).
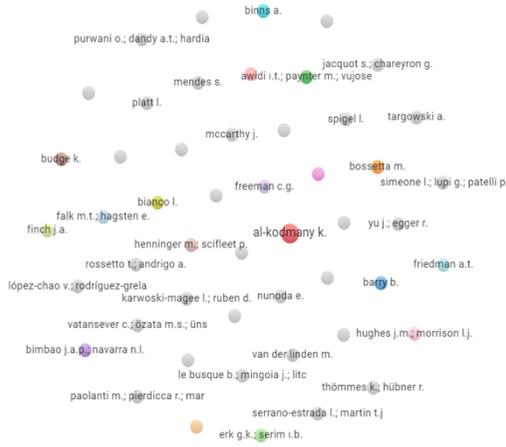
Figure 4. Co-author links Indicating collaboration between authors
(https://tinyurl.com/26k2ry9p)
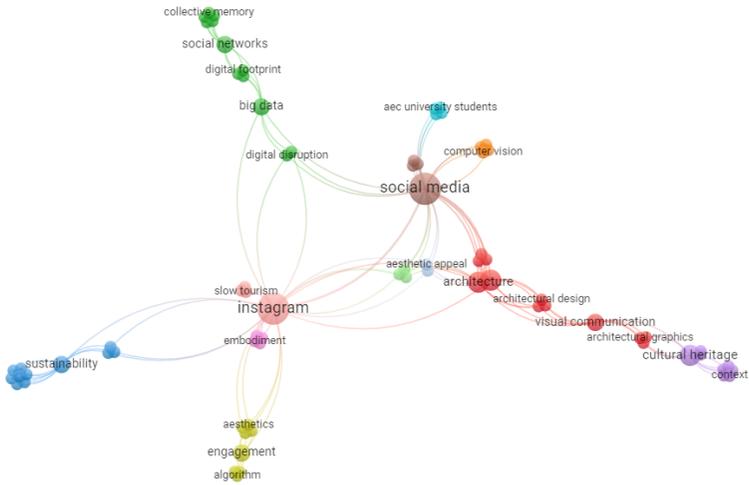
Figure 5. Most frequently used keyword links
(https://tinyurl.com/2ad6sf5d)

Co-occurance/Author Keywords

When the relationships of the most frequently used keywords in the related publications were analyzed, 169 keywords were identified. Instagram and social media with 7 repetitions; architecture, photograph, and cultural heritage with 3 repetitions. The strongest expressions in terms of total link strength are Instagram (29), social media (29), architecture (15), photography (14), cultural heritage (11) and sustainability (11) keywords. As a result of the analysis made with 76 observation units that were seen at least once and had a relationship between them, a total of 12 clusters, 214 links, and 219 total link strengths were determined (Figure 5).

Citation/Documents

The most cited authors are Bossetta (2018) (234), Mccarthy (2010) (184), Awidi (2019) (73), Budge (2017) (43) and Smirnov (2017) (40). According to the analyses of 51 observational units with at least 1 occurrence and a relationship between them, there is no link between the collaborating authors (Figure 6).
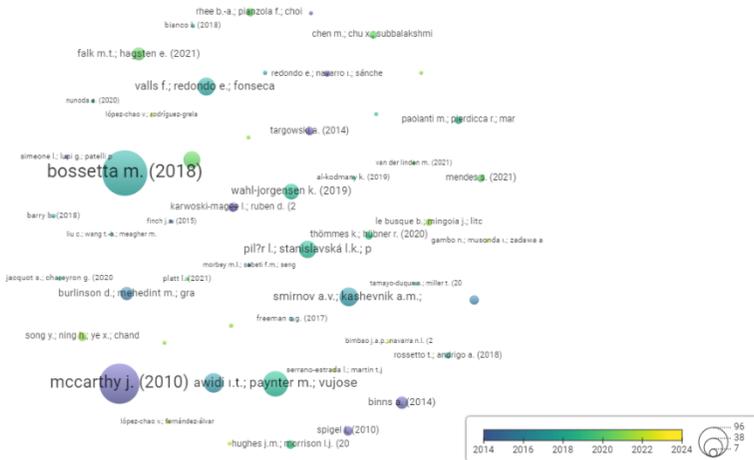
Figure 6. Citations according to documents
(https://tinyurl.com/2b82x2nc)

Citation / Sources

There is no significant difference between the number of documents of the sources. The number of citations of the sources are journalism and mass communication quarterly (234), australasian journal of educational

technology (184), computers and education (73), curator (51) and personal and ubiquitous computing (40) (Figure 7).
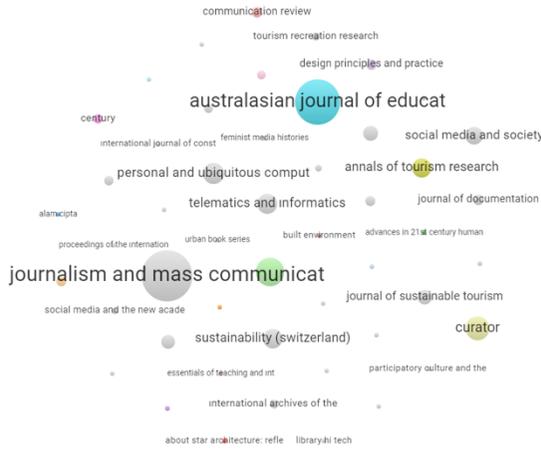
Figure 7. Citations according to sources (https://tinyurl.com/2397xze7)
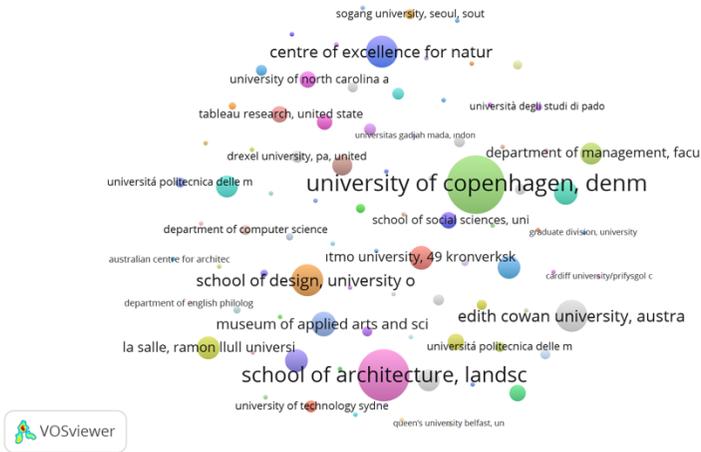
Figure 8. Citations by Organizations

Citations / Organizations

The number of citations of the authors based on their universities and departments are as follows: University of Copenhagen (Denmark) School of Architecture (234), Landscape Architecture and Urban Design,

University of Adelaide (184), Centre of Excellence for Natural Resource Management, University of Western Australia (73), Edith Cowan University, Australia (73), School of Design, University of Western Australia (73) (Figure 8).

Citation / country

The number of publications according to the countries where the authors are located are USA (12), Australia (7), Spain (5), UK (5), Italy (3) and Canada (3) (Figure 9).
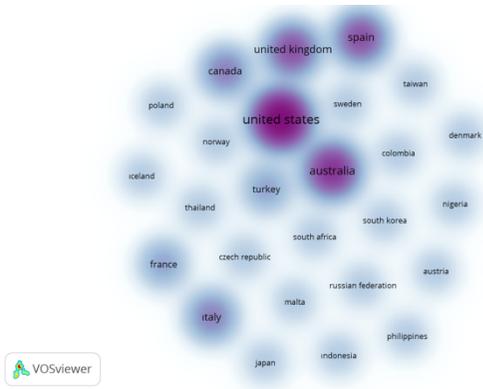
Figure 9. The density map of publications according to the countries

The number of citations according to the countries where the authors are located are Australia (318), Denmark (234), USA (69), UK (45) and Spain (41) respectively (Figure 10).
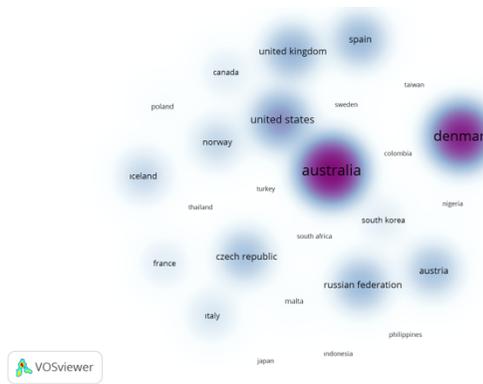
Figure 10. The density map of citations according to the countries

The relationship between citation and documents according to the countries where the authors are located is shown in figure 11.
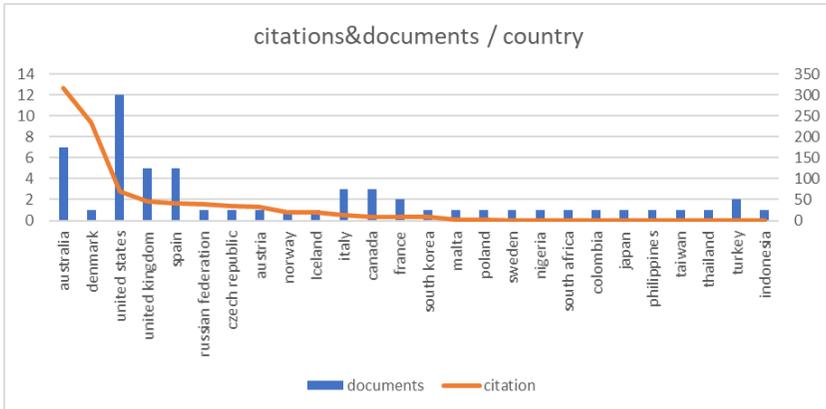
Figure 11. Citations and Documents by Country

Bibliographic coupling/documents

Bibliographic matching refers to the citation of a common work cited by two independent sources. The number of matches according to the documents are Awidi I.T.; Paynter M.; Vujosevic T. (2019) 4, Gambo N.; Musonda I.; Zadawa A.N. (2023) 3, Al-Kodmany K. (2019) 2, Falk M.T.; Hagsten E. (2021) 2 and Freeman C.G. (2017) 2 (figure 12).
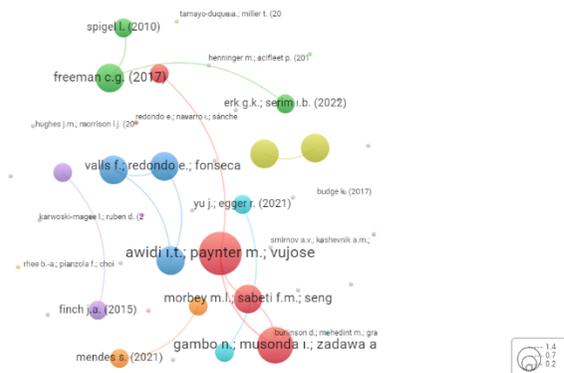
Figure 12. Bibliographic Match Analysis of documents
(https://tinyurl.com/26cznr8s)

Bibligrahic coupling/authors

According to the analysis made with 50 unit works selected with the criterion of having at least 1 citation and having links between them, 39 clusters, 13 links and 15 total link strengths were obtained. The publications with the most bibliographic matches are Awidi I.T. with 73 citations; Paynter M.; Vujosevic T. 4 links, with 1 citation, Gambo N.; Musonda Ii.; Zadawa A.N.. 3 links, 36 citations with Valls F.; Redondo E.; Fonseca D.; Torres-Kompen R.; Villagrasa S.; Martí N. Falk M.T.; Hagsten E. with 2 links, 19 citations. 2 links and Song Y.; Ning H.; Ye X.; Chandana D.; Wang S. 2 links with 9 citations (Figure 13).
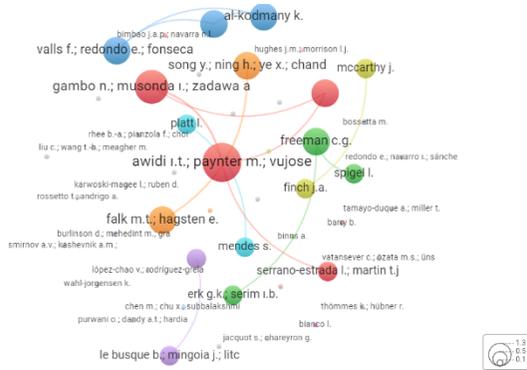
Figure 13. Bibliographic matching links of authors
(https://tinyurl.com/22zghzf4)
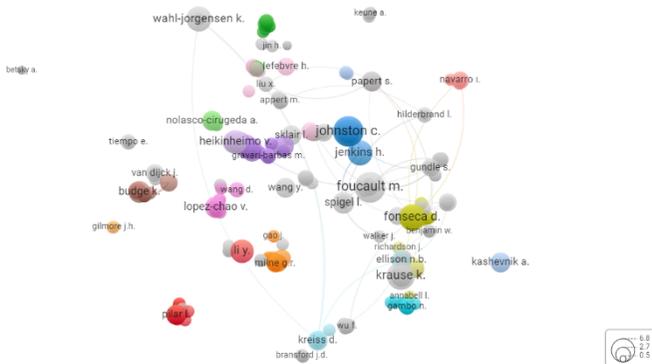
Figure 14. Links between co-cited authors
(https://tinyurl.com/2cqymlhn)

Co-citation / cited authors

According to the analysis made with 3798 units selected with the criterion of having published at least 1 work and received 1 citation, 36 clusters, 304243 links and 2294.98 total link strength were obtained. The authors with the highest number of bibliographic matches were Johnston c. with 12 citations (11.64 link strength), Foucault M. with 12 citations (10.90 link strength), Cutler P. with 11 citations (10.70 link strength), Krause K. with 10 citations (8.88 link strength) and Fonseca D. with 9 citations (8.73 link strength) (Figure 14).

Analysing the data according to their subjects and methods

The subject and methodological approaches / data collection techniques / data analysis techniques of the articles on youtube, instagram, facebook, tiktok, twitter/X and architecture were presented in a table.Common concept clusters were obtained by simplifying the authors in an agreed manner. And word clouds have been made to reveal prominent topics and methods.

In this direction; it is concluded that education (10), urban studies (10), public sphere (5), tourism (5), cultural heritage (4), built environment (4), perception (3) topics were carried out using social media tools (Figure 15).

Figure 15. Word cloud of topics

It is clear from the data obtained that the prominent methods are both traditional research methods and hybridised methods with current technology and software tools.In this direction, as can be visualised in

the word cloud, there are prominent approaches in methods and techniques (figure 16).Case study (8), data mining (5), experimental approach (5) and quantitative research (4) methodological approaches came to the fore. Instagram hashtag (11), twitter api (5) and instagram geotag (3) were the most frequently used data collection techniques.In data analysis, content analysis (11), visual content analysis (5), sentiment analysis (2) and semantic analysis (2) are the prominent analysis techniques.
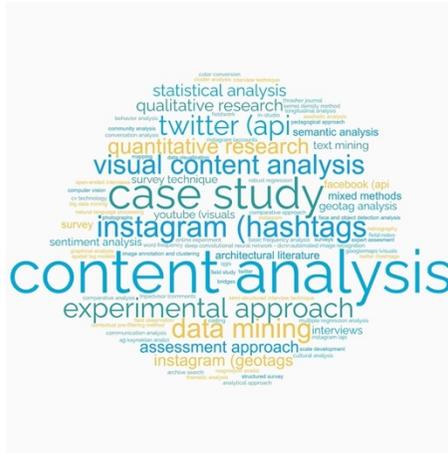
Figure 16. Word cloud of methods

CONCLUSION

In this study, which aims to reveal the relationships and approaches established with media tools by examining the literature on social media in architecture, 51 publications were reached in the Scopus database published in 2010 and later. These publications were analyzed by bibliometric analysis and bibliographic mapping methods. In addition, word clouds were created by analyzing the publications according to their subjects and research methods.

Firstly, the publications are classified by year and publication type; the distribution is shown in graphs. Accordingly, 2022 was the year with the highest number of publications, with seven publications, while no publications were made in 2011. According to the data for the first seven months of 2023, 6 publications were made. There is a balanced distribution in general according to the years. According to the type of publication, the publications classified as articles, books, book chapters, and proceedings were mostly published in journals as articles with 34 publications.

Bibliographic analysis was made via Vosviewer software. Co-authorship analysis of the authors, the keywords used by the authors, the most cited authors, the number of citations of the sources, the number of citations of the authors, the universities and departments where the authors are located, the number of publications of the authors according to the countries where the authors are located and the number of citations of the authors according to the countries where the authors are located, bibliographic matching, bibliographic matching author relationship, work citation relationship analyses were performed and the relationships were revealed.

These analyses show that the United States ranks first in publications, while Turkey ranks 8th out of 26 countries. While the most frequently used keywords by the authors are social media, Instagram, architecture, and cultural heritage, the strongest expressions according to the total link strength are Instagram, Social media, architecture, photograph, cultural heritage, and sustainability. The social media tools such as Instagram, Facebook, YouTube, Twitter, TikTok, and Instagram have been studied the most. Then, Twitter/X, Facebook, and YouTube are listed, while there is no study using the TikTok tool. In terms of keywords, while Instagram stands out in keywords, Twitter was not used in keywords.

The concepts that the studies on Instagram focused on about architecture were architecture, photography, aesthetics, color psychology, architectural atmosphere, sustainability, tourism, communication, embodiment, and content analysis. That shows that social media studies on architecture and its visuality are more common. However, experimental studies also deal with social media tools as learning environments.

When all publications are analyzed according to their subjects, it is understood that education, urban studies, and the public sphere are at the forefront. While Instagram hashtags, Twitter APIs, and Instagram geotags stand out among the data collection techniques of the studies, content analysis, visual content analysis, and sentiment analysis stand out in data analysis.

In this direction, social media tools have re-generated the environment and scope of scientific studies to be carried out in architecture in the context of subjects, methods, and techniques. This re-generative situation paves the way for hybrid studies with contemporary and traditional/established research approaches. Thus, in architectural studies as a field of science, the discussion ground of architectural practice and thought has expanded. Nevertheless, there is a need to increase the number of studies.

CRITICISM/METHOD

This study has revealed the potential of the field of study with an overview of media studies in architecture. In addition to Scopus, studies on databases such as Wos, which offer data analysis with Vosviewer, or CoHE Thesis Archive, Tübitak Ulakbim databases can be included in the scope of the research, and data sources that will offer a more extensive perspective can be expanded.

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UMBRA-STRUCTURE: EXPLORING THE PSYCHOSOMATIC EXTENSION OF ARCHITECTURE)

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ABSTRACT

The objective of this study is to analyze the role of context in architectural education. An experimental study was conducted with second-year architecture students to achieve this goal. The study involved altering the context and distorting the student's connection to a particular place. They were then tasked with creating a structure that could be incorporated into their body while conveying an emotional expression—the experimental study aimed to assess the sensory and artistic reflexes of architecture students following trauma. On February 6, 2023, Turkey experienced two significant earthquakes. Education resumed after a certain period. Trauma determined the project's criteria, focusing on the body, emotional state, and connection.

This paper consists of four sections. The first part consists of the problem statements and scope of the study, while the second part is about architecture and context. In the third part, a method of analysis is proposed by utilizing the literature. The visuals, words, articulation, metaphors, analogies, and stylizations used to describe the projects are tabulated. Adjectives for analyzing the visual form were used in the evaluation. It was observed that the words evoking positive emotions were expressed in soft forms. When the context pressure on the place was reduced, the relationships the students established between form and their bodies were diversified. The words used to create context supported the formal and semantic richness of the designs. In architectural education, this study increases the awareness of the sensory aspect of architecture.

Keywords: Architectural experiment, context, post-trauma architecture, umbra-structure

CRITICISM/METHOD

INTRODUCTION

Space is an empty expanse that harbors existence, and its formation requires the presence of constituents. The floor, walls, and ceiling are the most fundamental elements that define the space. The designer also constructs the internal and external organization of the space. In addition, the designer defines relationships, creates unions, and presents them to the user. Building such systems and relationships requires structures and constructions that ultimately shape the architectural configuration. Lefebvre (2014), an urban sociologist, refers to the space in the designer's consciousness (the ultimate architectural combination described in the preceding paragraph) as the conceived space. The architectonic shape exists primarily in the designer's mind and depends on the user's ability to create the space. According to Lefebvre, space production occurs within the context of a triangular relationship. These are conceived, perceived, and lived spaces. He even positions the perceived space in front of the conceived space. In this context, space is a system created in the designer's mind and where life and user interaction occur. This study examines this space definition, incorporating Lefebvre's space production approach.

Space embodies an imaginative expression of sensory perception and experience. What happens if it is a whole of architectural elements, which is life, not in space, but where it is articulated? How is the space defined if feeling becomes a structure composed of imaginatively expressive architectural elements? What if the architect's purpose is reversed, and the designer's emotions and body serve as the context? This study does not aim to resolve these problems. In contrast, it aims to challenge the conclusions and investigate what has been learned in depth. As a result, the contexts are reversed. What is the design itself? How does the emotional state of the designer affect the design? What if the location became the body's context? What happens if the architectural form completely defies gravity? In addition to the pandemic, two major earthquakes and hundreds of aftershocks that hit Turkey on February 6 and 7 are the reasons for the alterations to the context within the scope of this study. Efforts in this study promote a critical and curious approach to architectural education and eliminate the barriers that prevent students from braving out, expressing their emotions plainly, and designing.

This paper presents the results of a preliminary investigation carried out among the students of the Department of Architecture at KTO Karatay University, Faculty of Fine Arts and Design, in the aftermath of the earthquake. The preliminary investigation, commonly referred to as a kick-project, serves the purpose of assessing the student's responsiveness

to post-trauma architecture. Before conducting the study, a literature review was performed. A new experiment was designed. The novel experiment design considered the cultural codes and traumas specific to Türkiye and Turkish architecture students.

WHY DOES ARCHITECTURE NEED CONTEXT?

Context is one of the most essential characteristics that differentiate architecture from art. According to Hinton (2014, p. 25), it is the agent's knowledge of the relationships between the elements of the agent's environment. However, Kocyiğit (2022) provides a more inclusive definition, emphasizing the individual and the environment. According to Kocyiğit (2022), context is a concept that establishes the relationship of an element with other elements, refers to the integrity that makes sense of the coexistence of elements, determines the connection of many unique situations with the general, enables the thought of individual entities (particulars) together, and thus can be the ontological basis of universals. Context also implicitly refers to regularity, pattern, and serialism. It is the determination of an architectural object's conditions in architecture.

According to Kocyiğit (2022), context is defined in two ways. Ontologically, it pertains to physical and social reality; epistemologically, it is normative and dogmatic. In the article, Kocyiğit (2022) classifies context as physical, cultural, phenomenological, and historical, and the paper attempts to unravel multiple contexts. The concept of context, a topic that has undergone historical changes and extensive discussions, holds significant importance in architectural discourse.

Alagöz and Güner (2022) presented a diagram illustrating historical context transformation in their study. This diagram depicts the concept of context as originating from CIAM in 1928. Notably, Lewis Mumford's (1947)"Skyline Article" delved into this subject. Furthermore, the Team10 works and the symposium organized by MoMA in 1948 also dedicated their efforts to examining the trajectory of Modern Architecture. In architectural discourse, contextual influences hold significant importance. The works and ideas by Alvaro Size, Norberg Schulz, and Louis Kahn played a pivotal role in shaping this discourse. These influential figures have contributed valuable insights and perspectives that have significantly impacted the understanding and appreciation of context in architecture. By examining their discourses and studying their works, one can better understand the multifaceted nature of context and its profound influence on architectural design. In the Salk Institute, the setting sun plays a significant role in enhancing the visual appeal of the perfectly symmetrical courtyard. As the sun descends, its rays extend

the lines within the courtyard, creating a sense of continuation and amplifying the overall context of the space. This natural phenomenon adds an extra layer of depth and aesthetic charm to the architectural design of the institute (Figure 1).

Figure 1. Salk Institute

Thomas Schumacher (1996), in his article "Contextualism: Urban Ideals plus Deformations," defines context as emphasizing its role in bridging a city's old and new aspects while considering its future trajectory. The author references Colin Rowe's influential book, "Collage City," to provide illustrative examples. The article by Schumacher, Colin Rowe, and Koetter (1996) was included in the book "Theorizing A New Agenda for Architecture," which was edited by Kate Nisbett and published in 1996, with a specific title, "Urban Theory After Modernism: Contextualism Main Street and Beyond." This book provides a comprehensive overview of architectural approaches that emerged between 1965 and 1995, following the era of modern architecture. It explores various historical perspectives and trends (Nesbitt, 1996).

In addition, in his book "Image of The City," Kevin Lynch (1964) presents a radical perspective on context by introducing his method of analyzing the semantic side of form. The method aims to map the user's mental image of the city after their experience. This method explores various contexts associated with the city. Researchers shifted their focus from the physical context to imagism.

Furthermore, Contextual interpretivism, also known as critical regionalism, emphasizes the significance of place. In their article titled "The Grid and the Road," Tzonis and Lefaivre (2016) introduced a concept further expanded upon in Frampton's (1983) article titled "Towards a Critical Regionalism: Six Points for an Architecture of Resistance." In their work, Tzanis and Lefaivre (2016) drew inspiration from the ideas put forth by Habermas and Shklovsky. Critical regionalism is characterized by rejecting repetitive architectural forms derived from historical references. The aim is to explore novel approaches in integrating the tangible and intangible aspects that shape a particular location. Critical regionalism is a concept that emphasizes the significance of place in design without imposing specific norms or standards. Frampton (1983) focuses on the development of contemporary place-oriented culture. However, he is against the repetition of local forms. Differentiation can be used in unity with architectural elements.

Koçyiğit (2022) categorizes the context into four main categories: physical, cultural, phenomenological, and historical. Additionally, the author includes the context of becoming a phenomenological evaluation. The foundations of the context of becoming here were laid by Heracliotus and developed ontologically by Whitehead, Bergson, Dewey, and Deleuze. According to Koçyiğit, the close connection of architecture to the past is broken in the context of becoming. Displacement initiates with the advancement of communication tools, and new contextual frameworks emerge.

Metaphors are one of the various contextual frameworks that emerge. Furthermore, they employ a semantic analysis of the context. According to Demirkaynak (2010), architects of the 20th century frequently employed metaphors as modes of thought. The author argues that the architectural object is a form of communication analyzed using symbols, signs, conceptual processes, and metaphorical context. Barrnet (1999) reconsiders context and attempts to reconstitute it with Derrida's discourses in "Deconstructing Context: Exposing Derrida." The author views deconstruction as an instrument for reconstructing context and questions the context's norms. It utilizes the context-reproducing function of deconstruction at this juncture but does not formulate the context. Jakobsen (2012) considers physical and experiential context. The author uses Gilles Deleuze's concept of sinaletic materiality to characterize the relationship of material to movement and image in cinema, which consists of two distinct differentiation and specification processes. In this context, New Acropolis is a fieldwork that investigates the structure's allure. Jakopsen (2012) demonstrates that context is not only a comprehension of the inputs of architectural form during the design

phase but also a recurrent concept in the experience of architectural form.

Rem Koolhaas (1996, p. 502) presented one of the most radical perspectives on context. "Fuck the Context" The quote sourced from the essay titled "Bigness, or the Problem of Large" in Rem Koolhaas' book, S, M, L, XL.

When considering the historical, definitive, ontological, and epistemological aspects, the concept of context arises as a defining factor in architecture. It shapes the form and is continuously shaped by the user experience. However, the question remains: Why do architects require context? What happens if the context is differentiated and inverted?

MATERIAL METHOD

The study was conducted for the 2nd year students of KTO Karatay University, Department of Architecture, in the spring semester of 2022-2023 within the scope of Architectural Design 2 course. The experiment required students to collaboratively design a model that represents their psychological state, incorporating their bodies as an integrated component, such as a limb, while considering basic design principles. Before commencing the design process, the project coordinator instructed participants to select words that expressed their psychological moment. The formal counterparts of these words were the structures that assimilate into their bodies and synchronize with their movements. Architecture is a manifestation of the psyche within a given context. The task assigned was to simulate shadow or umbra structures. This research is part of an architectural studio experience. Students worked on concepts with words and phrases reflecting their psychology. In the following process, they worked with sketches and models to visualize their designs based on their concepts. They designed the output concept, integration, structure, and material of a new limb added to their bodies. 1/1, 1/2, 1/5, and 1/10 scale used for the drawings, 1/1 scale used for the models. Finally, the students physically exhibited their designs by carrying them on their bodies and moving with them. When examining context historically, definitively, ontologically, and epistemologically, it becomes evident that it is a concept that shapes the boundaries of architecture. The user experience reformed it. This study aims to investigate the potential changes in the visual impact of design when altering the fundamental criteria in architecture that are associated with the context. The user body is the location. Contexts are emotions.

In Çırakyılmaz and Aydın's (2021) article on the visual effect of form in architectural design, they utilized adjective pairs to determine the visual impact. The included semantic evaluation adjectives are simple/complex, dynamic/stagnant, strong/weak, balanced/unbalanced, harmonious/harmonious, full/empty, ornate/simple, animated/immobile, original/populist, free/restricted, hard/soft, ruleful/ruleless, emotional/rationalistic, dominant/reserved, and traceable/forgotten. In this context, the adjective pairs determined by Çırakyılmaz and Aydın (2021), which are about the visual effect of form in architectural design, were utilized. These adjectives, evaluated quantitatively in the article, were handled qualitatively in this research and evaluated by the project instructors. Out of 19 adjective pairs, 13 were selected as appropriate within the scope of the project, and two adjectives suitable for the definition of umbra-structure were added. These pairs of adjectives and the reasons for their selection are given in Table 1.

The authors prepared two tables to describe and evaluate the projects. The first table (Table 2.) aims to introduce the projects, umbra structure, and context in detail. In this context, the ID information, photographs, sketches of the projects, and the words that the students started with while preparing the project are part of the table. Information about umbra-structures and articulation style are also parts. The study focused on analyzing the utilization of metaphor, analogy, and stylization to assess these conceptual tools' role in conveying abstract thoughts and emotions inside design projects. The present analysis focuses on how students alter the visual impact of designs, specifically by exploring how they remove and reverse the conventional influence of context on location. Within this particular context, the project coordinators evaluated the project coordinators during the examination. The students made lexical choices, articulated their manner, and recorded the incorporation of metaphor, analogy, and stylization alongside these adjectives. Researchers attempted to analyze the relationships among lexical semantics, adjectival usage, and metaphorical expressions.

Table 1. Pairs of adjectives and the reasons for their selection

	Types of Adjectives	Reasons for Choice
Çırakyılmaz and Aydın' s (2021) Adjectives	Simple/Complex	Students can assess the design as a selectable, easily identifiable form or a hard-to-identify structure.
	Dynamic/Stagnant	Investigation of the liveliness and excitement or the calm and stable effect of the design in people with frontal and mass movements at first glance.
	Strong/Weak	Whether the design symbolizes its power by having a dominant feature around its surroundings.
	Balanced/Unbalanced	Whether the design has a balanced mass placement
	Harmonious/Unharmonious	Compatibility of the parts that make up the design in terms of their relations with each other
	Full/Empty	The effect of fullness due to the closed nature of the design form or the impact of emptiness due to its openness (connectivity of interior and exterior)
	Ornate/Simple	The state of being simple or ornate
	Original/Populist	Whether the design has an ordinary formal expression or an original formal design
	Free/Restricted	Whether the formal expression of the design makes people feel freedom or restraint
	Ruleful/Ruleless	Does the design have an orderly and clear understanding?
	Emotional/Rationalistic	Whether the design creates an emotional effect with a lyrical and poetic expression or whether it displays a logical attitude with rational and rigid solutions
	Dominant/Reserved	Does the design have leadership and freedom features or a recessive attitude according to its environment?
	Traceable/Forgotten	Whether the design is permanent and long-term in memory or is it short-term and temporary.
Added Adjective	Animated/Immobile	Whether the design moves within itself
	Hard/Soft	Whether the design has hard or soft lines in the expression

Table 2. The projects, umbra structure, and context

PROJECT				UMBRA-STRUCTURE			CONTEXT		
				Articulation Position	Way of Articulation				
ID	Photograph	Sketch	Words		Direct	Using Attachment Element	Metaphor	Analogy	Stylization
NO 1 D.E.K.			Our emotions are hidden deep inside us like pearls			Belt, Button	The feelings hiding the deepest		Mussel shell
NO 2 T.T.			The butterfly effect, (big consequences of small feelings) Butterflies in the stomach		D		Butterfly effect.	Butterfly flaying	Butterfly
NO 3 H.N.E.			Getting rid of the burdens on the back, think positive about the future		D		Load on the back and being positive		
NO 4 R.U.			Garden of emotion: flowers and thorns		D				Flowers and thorns
NO 5 B.D.			Carrying sadness on the shoulder, Cloud of sadness			Plastic handcuffs,	sadness		Cloud
NO 6 S.B.			Hubbub and insuppressible chaos			Wire, hairband			
NO 7 E.S.			Drag one's feet			Aluminium foil	Unable to move		tree root
NO 8 E.I.E.			Stab in the back			T-shirt			stab
NO 9 E.A.K.			Stress cube			hairband	Stress and feelings		
NO 10 M.B.K.			feeling the weight of emotions on your neck		D		weight of emotions		
NO 11 M.F.K			Mind sphere			T-shirt		Brain-sphere	
NO 12 S.M.A.			The colors of emotions in my mind		D	hairband	The colors of emotions		
NO 13 S.T.			Sharp Load		D		Emotional load		
NO 14 T.S.			Shoulder pain		D		Pain		
NO 15 T.I.S.			Anger glove			glove	anger		

Table 3. Evaluation of projects according to adjectives

ID	Simple	Complex	Dynamic	Stagnant	Strong	Weak	Balanced	Unbalanced	Harmonic	Unharmonic	Full	Empty	Ornate	Simple	Original	Populist	Free	Restricted	Ruleful	Ruleless	Emotional	Rationalistic	Dominant	Reserved	Traceable	Forgotten	Animated	Immobile	Hard	Soft
NO 1 D.E.K.	✓		✓			✓		✓	✓				✓			✓	✓		✓		✓		✓		✓			✓		✓
NO 2 T.T.	✓		✓			✓		✓	✓		✓	✓	✓			✓	✓		✓	✓		✓		✓		✓		✓		✓
NO 3 H.N.E.	✓			✓		✓	✓			✓	✓	✓		✓			✓		✓	✓		✓		✓		✓	✓	✓	✓	
NO 4 R.U.	✓			✓		✓		✓		✓	✓		✓			✓	✓		✓	✓		✓		✓		✓		✓		
NO 5 B.D.	✓		✓			✓		✓	✓			✓	✓		✓			✓	✓		✓		✓		✓		✓		✓	
NO 6 S.B.		✓	✓		✓			✓		✓	✓		✓		✓			✓		✓		✓	✓	✓		✓			✓	✓
NO 7 E.S.		✓	✓			✓	✓			✓		✓	✓		✓			✓		✓	✓			✓		✓	✓			✓
NO 8 E.I.E.	✓			✓		✓		✓		✓			✓		✓		✓		✓	✓		✓		✓		✓		✓	✓	
NO 9 E.A.K.		✓	✓			✓		✓		✓	✓	✓		✓				✓		✓	✓			✓	✓					✓
NO 10 M.B.K.	✓		✓		✓		✓		✓		✓		✓		✓		✓		✓				✓	✓		✓	✓		✓	
NO 11 M.F.K.	✓		✓			✓		✓	✓			✓		✓	✓		✓		✓			✓		✓	✓	✓	✓			✓
NO 12 S.M.A.	✓		✓		✓			✓	✓		✓		✓		✓		✓				✓	✓		✓		✓	✓			✓
NO 13 S.T.	✓			✓		✓		✓	✓		✓	✓		✓		✓	✓		✓				✓		✓		✓		✓	✓
NO 14 T.S.	✓			✓		✓	✓			✓	✓		✓			✓		✓	✓				✓	✓		✓		✓	✓	✓
NO 15 T.I.S.	✓		✓			✓			✓		✓	✓		✓	✓		✓			✓	✓		✓		✓		✓		✓	✓

ANALYSES

Fifteen practical projects were selected for the analysis study (Table 2 & 3). The individual projects are reviewed below:

- The starting point of the No.1 project is that emotions inside the individual are like pearls. It is attached to the body with a belt and button. The shell in which the pearl is hidden has been stylized. The metaphor used here is that emotions are hidden deep inside. A simple design concept was chosen when the semantic evaluation table was examined. Contrary to the stagnant of the pearl, the student used a dynamic design concept. The design is not dominant over the body. It has a weak character. Design elements have a harmonic feature when examining their relationship with the whole. Although the design was studied in three dimensions, no fullness or empty nature was formed. Form ornates the design. The design resembles a folding fan, so its visual connection is marked as populist. It is free and regulated. It was determined that the student made the design with an emotional approach. It is dominant. It is traceable. It is not mobile and has a soft character.
- The starting point of Project No.2 is that small emotions can cause significant changes. The articulation is direct, and no element is used for attachment to the body. The metaphor used is the butterfly effect. Analogistic is the flight of the butterfly. Here, the student has stylized the butterfly. The design is simple, not complicated. It goes

from the part to the whole. The stylized butterfly is reproduced, and a dynamic work is obtained. However, it has a weak character when the relationship between design and body is examined. It needs to be balanced. It has a harmonic structure. Elements follow each other in the same way in different colors. It has an empty sense of design. It is ornate, especially the colors used, and the stylization style made the design ornate. It has a populist understanding because it tries to match the butterfly, one of the first animals that comes to mind, with emotions. It is a free design. No rules are used. Colors are randomly placed. It is an emotional approach. It is recessive; he did not form a dominant character on the body. It does not have a catchy form. The student did not use movement as a design element. It has a soft character.

- The starting point of the No:3 project is to have loads behind it but to maintain a positive outlook on the future. However, the student associated the future with the front of the body and the past with the back; the student hangs it directly on the neck. The design uses past and future as metaphors. The design is simple. It does not possess a deconstructive attitude. The design character remains static. Researchers determined that the design was a weak character, examining its relationship with the body. However, the student searched for balance. He tried to design the rear form with the previous form in similar size and density to prevent the body from tipping over. It does not harmonize because it exploits contrasts. The use of color gives it an ornate character. The student attempted to attribute different meanings to the word balance. This originality lies in its attempt to capture the balance of two different formats. However, the student limited the design concept and could not move freely. It is irregular. They did not seek rhythmic balance. This work also evokes emotions. A dominant character does not cover the body. The forms were not catchy; they formed randomly. Designers do not consider motion as a design input. The stern character portrays the back side using the past as a metaphor. On the other hand, positive emotions are referred to by the front forms, and they have a soft character.

- Flowers and thorns are the starting point in the No.4 project. The student directly integrated this work into the body. The researchers obtained realistic shapes in this study despite stylizing the flowers. The design appears simple. The student created a composition with flowers and placed it from the shoulder down to the waist. The composition is static. It is weak when considering its arrangement with the body. There is no balance. The stylized flowers are randomly placed, which creates disharmony. The design has no gaps. The object is ornate. Populism is evident. Constructing the whole is free and unregulated. It evokes emotions. Its relationship with the body

has a recessive character. It does not catch attention, partly because it appeals to the masses. Designers did not use movement as a design element. The colors used in harmony with nature make it soft and versatile.

- The starting point of the No.5 project is carrying the load on the shoulders. The student used sadness as a metaphor and stylized the clouds. Plastic clamps attach it to the body. Although sadness is one of the interesting features here, the language of the form is sharp and extroverted. There are two structural elements and one color. Different dimensions place it in various parts of the arm, making it dynamic. It is weak, judging by its relationship with the body. The design does not search for balance. White creates a series in color and rhythm, making it harmonic. The room is empty. The design does not have a complete character. Its direct use of clouds makes it particularly fancy and leads to a populist approach. Since it uses the same articulation style in a single-arm placement, its understanding of design is limited. Creating a particular order makes it regular. It evokes emotions. When viewed visually, it dominates. The mind retains it permanently. The system moves with the movement of the arm, even though it does not use movement as a design element. Therefore, it operates on mobile devices. The clouds have a soft character, but the dominant character is harsh.

- The No.6 project starts with unstoppable chaos and hubbub. The headband and wire are integrated into the body and become a part of it. The student does not use any metaphor or stylization here. Design is a complex concept. It has dynamism. Examining its relationship with the body, we find that it is vital. The balance is off. It lacks harmony; it does not have a rhythmic sequence; it does not attempt to be harmonious. The student uses filled forms. The hubbub originates an embellishment. The design is original. It is free and has no rules. It does not stylize or use metaphors, making it rational. The form dominates the body. The design leaves a mark on the mind. Designers did not use movement as a design element. The design language is strict.

- In No. 7, The student's starting point was reluctance and dragging feet, using a root metaphor and stylization. The reason for its inactivity is its rooting. This root, however, inhibits movement. Using aluminum foil, he wrapped the design around his legs. It has a straightforward design concept. Although using a single color slows the foot's movement, it is active and dynamic. Examining its relationship with the body reveals that its personality is feeble. It is well-balanced because it stands on two legs and moves towards the earth. It lacks harmony. It is vacant. There is no complete form. It is intricate because of the nature of aluminum foil. Rooting is populist due to its direct application. It has limited knowledge of

design. It is visceral and disorderly. Regarding hue and texture, it is subordinate to the body. It is not an attractive layout. The design now includes leg-movement functionality. It is soft.

- In project No8: The student's starting point in the project is the knives on the back. The student wears it by integrating the design into a t-shirt and stylizing the knife. It has a simple design language. It is stationary. When its relationship with the body is examined, it has a weak character regarding height and design language. There is no search for balance. Despite the color transition, it is unharmonic. There is no empty or filled character. It is plain. It is populist because it is designed like a shield. It is limited. There is no rule for the design. The elements that make up the whole are arranged randomly. It is emotional. It is recessive in its relationship with the body; it has remained regional. It has a forgotten character. The movement was not used as a design element. It is hard to understand.

- In the No:9 project, the student's starting point is the stress cube. It is attached to the neck with a hair band. Stress and emotions are used as metaphors. The student mentioned that her neck hurt when she was in challenging situations. This pain stress cube, which she experienced daily, became the starting point of her project with the synonym of a stress ball. It Is complex. It is formed by combining the cube and two design elements with different characters. It is dynamic. Considering its relationship with the body, it is weak. It needs to be more balanced. There is no search for balance. It is incompatible because two different elements are used. Due to the cube shape, a void is formed. It is ornate due to the elements inside the cube and the use of color. It is original. It is not popular. It needs a greater understanding of design. Although the shape of the cube is regular, an irregular design has been formed. It is emotional, primarily based on neck pain. It is recessive. It is memorable because of its location. Movement is not included as a design element. It has a soft character.

- The starting point of the No:10 project is to carry the weight of emotions on the neck. It is attached to the neck like a necklace. The weight of emotions is used as a metaphor. The design is simple, dynamic. Its relationship with the body is strong and balanced. It is compatible. It is full. It is decorated due to the use of color. It is an original work. It does not resemble a form that existed before. It is a free design. It is regular. It is a rational work. It is located predominantly on the neck. It is traceable. Motion is included in the project as a design element. Rigid forms are used.

- The starting point of the No:11 project is the mind spheres. These spheres move within a specific structure. T-shirt is used as a form of articulation. A simple systematic is followed. It is dynamic as different sizes are used. When its relationship with the body is examined, it is

weak. It is balanced and harmonious. Black and white colors are used. It is an empty character with spheres and moving balls. It is simple. It is original. It has a free design concept. While design is free, it is normative. All spheres and balls are placed in the same way. It is rational and recessive. It has movement. It is soft.

- When the No:12 project is examined, the starting point is the expression of the colors in the mind. The form of attachment is the hair band. It flows from the back of the head like hair. The student chooses the colors of emotions as metaphors. It has a simple design concept. The elements are formed with the same system. It is dynamic and strong in location due to its use of color and mobility. However, it is of an unbalanced character, which is compatible with the body. It is full and intense. It is ornate. It is not populist; it has a free design concept. It is ruleless because desired colors are used. It is emotional. Considering its position in the body, it is dominant and is a design that leaves an impression and remains in the memory. The parts are movable when walking, but where they are attached, they are stationary. It is soft

- When the No:13 project is examined, the starting point is the sharpness of the loads. These words are used as slogans. Emotional loads are used as metaphors. The form of articulation is direct. Fullness and space are used together. It has a simple design language. It is stationary. It is weak. There is no balance. Considering its relationship with the body, it is harmonious because it is formed in the same way as the body's movement. It is simple. It is a populist approach because only triangles are used. It is recessive. It does not leave a trace in the mind. It is motionless and rigid.

- In the No:14 project, the student's starting point is pain. It is placed on his shoulder with s triangles. It is directly connected to the body. It has a simple design language. It is stationary. It has a weak character. Although any search for balance is not visible from the front, balance emerges as the design spreads to the back. There is no harmony. It has created fullness. It is plain because of the use of color and form. It is populist because specific formats are used. It is limited, it is regular, it is rational. It has a dominant character in the body area where it is placed. However, it is not a design that leaves a mark. Movement is not used as a design element. The language is rigid.

- The starting point of the No:15 project is anger. The glove is cut from certain parts and integrated with the hand shape. Its metaphor is anger; it can be identified with a fist. It is a simple design. It is dynamic because of the needle's shape and direction of movement. When the relationship with the hand is examined, it is strong and dominant. It is unbalanced. It is compatible with the body. However, there is no harmony. It has a complete and empty

balance. It has created fullness in form. It is plain because of the use of one color and form. It is original because of the articulation and the use of metaphor. It is free to place the form but limited in space. It is ruleless; it is emotional. Considering its relationship with the hand, it is dominant and is a work that leaves a trace. It is immobile, and its form language is rigid.

CONCLUSION

This study aims to improve architecture students' design reflexes following trauma. Instead of seeking definitive and unchangeable results, the study wants to start a discussion about the context in architecture. In this context, the formal reflexes of the students that correspond to their emotional reflexes were evaluated. The emotions identified by the research are negative. However, they attempted to mix these negative emotions with positive ones. They articulated using all body parts (shoulder, head, back, foot, hand, midsection). They tend to stylize the object they employ as a metaphor. They attempt to convey their emotions through color. Darker colors represent negative emotions, while a range of hues represents positive emotions. Ten or more is considered a dominant score for adjectives. Simple, dynamic, feeble, unbalanced, ornate, emotional, and immobile describe these adjectives. Negative emotions, such as anguish and burden, are evoked by rigid forms, whereas words with soft forms evoke positive emotions.

Furthermore, the design of the sharp uniforms emphasizes the body. The students projected their negative emotions onto the organs where they experienced discomfort. When the burden of the context on the ground is reduced, it is observed that students' relationships with form and body form diversify. The words adopted as context and chosen by the students themselves contributed to the formal and semantic depth of the visual meaning. This study will heighten awareness of the sensory aspect of architecture.

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DESIGN

VIOLENCE OF SPACE; DEGENERATION AS A CONSEQUENCE OF GROUNDLING REGENERATION[1]

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ABSTRACT

Ankara, parallel to the evolution of the modern Republic of Turkey, has gained prominence and was designated as the capital city. Existing as an Anatolian town during the Ottoman Empire, Ankara adopted a role representing the new state and its principles after the declaration of the Republic. The urban structure built upon these principles, however, deviated from them due to migration movements caused by economic crises, leading to a process of degeneration. During this period, several regenerative solutions have been proposed for the city, but these solutions are often reactionary and short-sighted rather than being deeply thought-out and planned strategies. This approach, in the long run, results in further degeneration of the city in various dimensions.

When examining the dynamics between regeneration and degeneration processes and their effects on the city in connection with the concept of violence, a striking situation emerges. As a result of legal regulations and policies, phenomena such as unauthorized settlements on state lands by migrants, specifically the "gecekondu" phenomenon, and regeneration proposals such as "construction amnesty" and "urban transformation" in response to this situation, encompass various forms of violence. These forms bring along multi-level and multi-dimensional forms of violence that negatively impact the city's physical and social fabric, and even its overall wellbeing. This situation indicates that these measures, which are expected to be part of the solution, are creating a new problematic area, further complicating urban dynamics.

Keywords: Violence, Spatial Potential, Degeneration, Urban Transformation, Gecekondu

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[1] This paper is based on my M.Arch Thesis supervised by Prof Dr. Tayyibe Nur Çağlar at the Department of Architecture, Applied Sciences Institution, TOBB University of Economics and Technology.

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INTRODUCTION

In today's major metropolises, the sharp contrast between central areas and their surroundings reflects economic inequality in space. Space is never neutral or passive; it is always filled with power relations and hierarchies, embracing one part of society while marginalizing another. The theme of the dualization, or polarization, of the city has taken center stage in the most advanced sectors of urban theory and research, as the extremes of high society and dark ghetto, luxurious wealth and utter destitution, cosmopolitan bourgeoisie and urban outcasts, florished and decayed side by side (Wacquant, 1996).

The increasing presence of urban outcasts highlights the broader deterioration of cities, reflecting challenges that are not just physical, but also social and economic in nature. Ghetto in the United States, banlieue in France, quartieri periferici (or degradati) in Italy, problemområde in Sweden, favela in Brazil and villa miseria in Argentina: the societies of North America, Western Europe and South America all have at their disposal in their topographic lexicon a special term for designating those outcasted neighbourhoods situated at the very bottom of the hierarchical system of places that compose the metropolis (Wacquant, 2008), In the context of Turkey, these marginal spaces are commonly referred to as "gecekondu." In urban planning and zoning literature, terms associated with degeneration such as "slum," "decay," or "deterioration" are often utilized to describe spaces or places that are experiencing declines in physical and social conditions. However, degeneration is a concept that manifests its influence not just in specific places but across urban spaces. It's important to note that 'spaces' and 'places' reference distinct realities. "Places' are 'full' and 'fixed', stable arenas' whereas 'spaces' are 'potential voids', 'possible threats, areas that have to be feared, secured or fled' (Wacquant, 1996).

Space is based on violence. The hegemony directed by the bourgeoisie class of a polarized society towards "spaces" and the marginalized class towards "places" ignites violence. In urban spaces, while violence is often perceived negatively as a threat, it is indeed a broad concept. Consequently, regenerative approaches aiming to improve the problems in cities also encompass violence. At this point, the pertinent question arises: what is the true source of the violence that degenerates the city? Is it the people living in the gecekondu, the gecekondu space itself, or is it a result of the organization process of the urban-society, urban-space, and space-place relationships?

This study aims to enlighten the content of the general term "violence" as a cause of spatial degeneration, forming an approach based on literature reviews. In line with this approach, it seeks to examine the violence of urban degeneration in two examples and scales: through Ankara's ghetto area "Çinçin" which is associated with crime and poverty, and the former "Atatürk Forest Farm" lands, now under the dominance of construction companies and the high society.

Conceptual Framework of Violence

In studying spatial environments, it's crucial to investigate into the concept of violence beyond its traditional definitions to truly understand its role in urban degeneration. Analyzing this relationship provides a unique perspective on how space and violence interact. While aiming for a specific understanding, it's helpful to start with a widely accepted definition of violence. One such definition comes from the World Health Organization (WHO). According to WHO, violence is "the intentional use of physical force or power, threatened or actual, against oneself, another person, or against a group or community, which either results in or has a high likelihood of resulting in injury, death, psychological harm, maldevelopment, or deprivation." Within this definition, the terms "force" and "power," though sometimes used interchangeably, reflect different aspects of the violent act.

The concept of "power," a component of violence, belongs to not only to an individual's ability to act but more importantly, to act in harmony with others. Power has never been solely attributed to an individual but rather is characteristic of a group. When referred to in the context of an individual, it typically implies that the person has been authorized to act on behalf of the group. Assigning the attribute of power to a single entity metaphorically is different from its literal implication, which aligns more closely with the term "strength." This term is associated with an individual who demonstrates an ability independent of others (Arendt, 1970). According to Arendt, while "strength" specifies individual and inherent capacity, "power" emerges amongst communities and is nurtured by collective action. Violence uses both these concepts, merging an individual's physical capacity with the socio-political dynamics of communities. These terms underscore relationships between subjects with direct and unambiguous expressions.

The term "force," another component of the concept of violence, consists of two semantic elements. One belongs to the ethical value of this concept. This value aligns with the definition, referring to instances of harm or injury. It is about persons and the borders of their body or mind. It is about how behaviors coming from persons may invade other

persons and cause suffering (Salanskis, 2019). Force is essential for violence. Utilizing force with the intent to harm results in injury. However, when "force" as a component of the violence concept is considered as a means of compulsion, it is synonymous with violence. Otherwise, in terminological language, this term pertains to the energy released by physical and social movements (Arendt, 1969).

> *"Is violence energy or force? Which means: do we understand violence as impulse, disposition, or expense, result? I think that for us the word "violence" refers to the actual expense of force (Salanskis, 2019)."*

The other semantic component of the "force" concept belongs to its ontology; this element extends beyond the physicality of the concept of violence. From this perspective, the term "force" can be considered or associated with energy; everything appears as potential energy or potential violence, accumulating behind objects or filtering through them as a force. Ontologically, violence is the energetic content of life, and life is truly alive only when it releases its violence (Salanskis, 2019). This notion of energy suggests that the nature of violence isn't solely confined to tangible actions; it can also be perceived through interactions, dynamics, and even existential frameworks.

From this viewpoint, we can also consider space itself as embodying violence. Ontologically speaking, this violent energy has the potential to constantly shape and influence the environment, individuals, and broader societies. The nature of a space is intrinsically linked to how it's imbued with this energy or how the energy propagates within it. Since space is the realm of human interaction and the shaping of societal norms and standards, it defines the repercussions of this energy, or violence, upon individuals.

Bernard Tschumi's relationship between space and violence lies in the essence that architecture encompasses not just the space, but also the events and actions that take space within them. Tschumi points out that the violence of space often doesn't mean physical harm. Instead, he approaches the concept of violence as the interaction between a space's user and the space's physical properties. How the space and the user intervene with each other, how they interact, and even how they sometimes conflict, is the base of Tschumi's definition of violence. He particularly focuses on how the space is altered, and even disrupted, by the presence of its user. Tschumi argues that the human body threatens architectural structures and that these structures have a certain order, but this order is constantly disrupted by the events and actions that occur in space (Tschumi, 1996). A similar relationship

between space and user is also present between space and place. Rafael Moneo describes the violence between space and place.

> *"To be on the site means to take possession of it, and to build implies consumption of the site. Thus, building always brings a sort of violence, accepted or not, to the site (Moneo, 1992)".*

Rafael Moneo, in the process of creating urban structures, emphasizes the dialectical nature of the "violence" directed at space in its relationship with place. Moneo points out that every architectural project intervenes in its location in some way, and this intervention reflects as a form of violence to the natural and historical integrity of that area (Moneo, 1992). He also stresses the responsibility of architects to understand and respect the place where a structure is located; therefore, the place also shapes the space and exerts violence upon it.

Space conceptualizes the relationship of violence between its place and its user not merely as a display of physical force, but as a broad-ranging influence or hegemony one entity imposes on another. In this context, the inherent violence of space does not define it as a destructive or degenerative element; rather, it is an acknowledgment that space, having a structural aspect, inevitably possesses such a type of force. The violence of space does not merely offer a limited perspective about its architectural dimensions. On the contrary, space is not just a product to be evaluated as a result or a phenomenon on a certain scale. Space integrates multiple actors, and sometimes disciplines that might seem unrelated. We cannot ignore the existing violence of all actors of space, from its user to its designer. Political, economic, and social factors are also significant elements influencing the nature and function of space. Therefore, space should be viewed as a concept independent of scale; everything from cities to buildings is a part of space. This multi-layered approach allows for a more comprehensive understanding of how space can serve as an instrument of violence.

For Henri Lefebvre, space is a "social product." This "product" does not denote any product, thing, or object, but rather a concept describing a totality of relations. Space cannot be thought of as passive, empty, or merely a "product" that, in mutual exchange, only bears meanings of depletion and disappearance. As a product, space intervenes directly in production through influence or reaction. Being intrinsically productive and a producer, space is part of the production relations and the (well or poorly-organized) productive powers (Lefebvre, 1991).

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As a social product, space is not merely a physical entity; rather, it is a dynamic phenomenon shaped by social relations and processes. Thus, the form of social space isn't familiar like the forms of physical space; it remains unknown. According to Lefebvre, this form is an encounter, assembly, and simultaneity. What comes together includes those produced either by nature or by society, either -through their co-operation or through their conflicts. Everything: living beings, things, objects, works, signs, and symbols. (Lefebvre, 1991). For instance, Urban space gathers crowds, products in the markets, acts and symbols. It concentrates all these and accumulates them. To say 'urban space' is to say centre and centrality, and it does not matter whether these are actual or merely possible, saturated, broken up or under fire, for we are speaking here of a dialectical centrality (Lefebvre, 1991).

Space is a dynamic phenomenon shaped by social relations and processes; it is the product of society's economic, political, cultural, and social interactions and is constantly transformed by these interactions. The factors that shape the form of the social structure include the structure of society, its function, and work relations; hence, the relationship of the urban fabric with the capitalist order.

In Lefebvre's social space theory, another crucial concept related to space is known as "abstract space." This concept examines the spatial understanding of modern capitalist societies and how these spaces tend to become homogenized, standardized, and oriented toward producing economic value. Abstract space refers to an environment predominantly shaped by consumption, capitalism, and bureaucracy, often overlooking individuals' authentic experiences and connections. The term "abstract space" delves into how space is produced and transformed within capitalist modernity. It represents a notion of space that's homogenized, standardized, and primarily serves the purpose of generating economic value. Its impact on an individual's life experiences and spatial relations is confined, reducing them to a homogeneous realm serving the requirements of a specific economic and social system. According to Lefebvre, at the core of abstract space lies violence and war, making it political since it's instituted by the state and, thus, institutional. However, it would be misleading to base the violence of abstract space solely on physical violence, such as war. All acts of homogenization encompass different facets of violence. It becomes an instrument to powers that obliterate any resistance, threats, or simply put differences. These forces seem to grind down and crush everything before them, with space performing the function of a plane, a bulldozer, or a tank. (Lefebvre, 1991).

When we consider space as an abstract entity, we encounter another dimension of violence. Examining the violence that the structure established by abstract space inflicts on the city and the individual could be a right step towards understanding the city's degeneration. At this point, the violence to be discussed is described as individuals being harmed in situations where there's no person (subject) directly engaging in a violent act within the current structure. It signifies that the violence is embedded within the structure and manifests as an unequal distribution of power/resources (Galtung, 1969). Structural violence occurs when individuals are victimized due to political, legal, economic, or cultural traditions, and the long-standing presence of structural inequalities leads to the perception that these inequalities have always existed. Structural inequalities also cause as much victimization as direct violent acts, but the harm in such inequalities manifests more slowly and is harder to remedy. (Winter & Leighton, 2001). Structural violence is the preventable restrictions imposed by society that prevent individuals from meeting their basic needs and achieving the quality of life they could potentially attain. These restrictions are embedded within social structures, and structural violence occurs through economic, political, or cultural processes that hinder individuals' quality of life. (Lee, 1969).

The "structural" aspect of violence emerges both as a consequence and a cause of imbalances and deprivations spawned by societal frameworks and mechanisms. Structural violence revolves around the imbalanced allocation of resources, societal rules, and the limitations imposed by these rules. As a result, the deterioration stemming from such violence is persistent and prolonged. degeneration can be attributed to societal mechanisms and rules, implicating both individuals and society.

When abstract space is first formulated, it inherently embodies the potential for creating either regenerative or degenerative scenarios within the urban landscape. This latent space brims with potential, reflecting Agamben's conceptualization of "potentiality". Agamben suggests that while potentiality indicates the possibility of realization, it simultaneously hints at the possibility of non-realization (im-potentiality). This likelihood of remaining unmanifested provides a fertile ground where violence can emerge. Agamben elucidates this scenario through the concept of "sovereign power", asserting that sovereign authority intervenes in the probability of unfulfilled potentiality, either directly or indirectly inducing violence (Agamben, 1999). Johan Galtung juxtaposes the notion of "potential" with that of "actual", forging a relationship between the two. While "actual" encapsulates the present state of an individual or community, reflecting their current realities, experiences, and circumstances; "potential" signifies the optimal state that an individual or community could achieve under ideal conditions.

Violence is here defined as the cause of the difference between the potential and the actual (Galtung, 1969).

The concept of potentiality is closely intertwined with the notions of violence and degeneration, and the sovereign power's intervention in the likelihood of unfulfilled potentiality can give rise to violence. In other words, when a society possesses the resources, knowledge, and opportunities to achieve a higher quality of life but fails to reach its potential due to various reasons, violence becomes an instrument of degeneration.

Violence as a Cause of Degeneration: The Case of Ankara

The beginning of Ankara city's degeneration process started in the 1940s and was shaped by crises. In response to the global economic crisis that dominated in 1929, the government sought solutions for economic development. Important steps taken to rescue the national economy from the crisis included the establishment of the Central Bank as outlined in the economic program prepared by the government in 1930, the commencement of foreign exchange transactions from January 1932, and the preparation of the "First Five-Year Industrial Plan" to bring industrialization into a planned state. In this period when industrialization accelerated, from the 1940s onwards, the intense migration from rural to urban areas began a problem.

Mustafa Kemal Atatürk emphasized the importance of agriculture and rural development during the establishment of the Republic of Turkey with his statement, "The foundation of the national economy is agriculture." At that time, 76% of the country's population lived in rural areas. This statement not only shaped the new form of the Republic of Turkey but also played a significant role in shaping its capital, Ankara. (Ergen, 2022).

In line with this primary objective, the establishment of Atatürk Forest Farm (AOÇ) encompassed various aims: from the research of new varieties suitable for the conditions of the Central Anatolia Region for the improvement of grain types, introducing and distributing them to the public; transitioning to mechanized farming and practicing agriculture over vast areas; conveying agricultural education to farmers through hands-on methods; supplying clean and affordable foodstuffs to the people of Ankara; afforesting the vicinity of Ankara; to creating sociocultural and recreational spaces for the public to visit and enjoy (URL-1). Initially spanning an area of 20,000 decares in 1925, it later expanded to 52,000 decares with the acquisition of various lands. As a capital, Ankara represents the transition from a traditional culture to a

modern mindset, and within this planning framework, AOÇ constitutes one of the most significant areas. (Kimyon & Serter, 2015).

Starting in the 1940s, as a result of the intense migration from rural to urban areas, cities, especially Istanbul and Ankara, began to grow rapidly. Due to the urbanization policies failing to keep pace with this growth, there was an insufficiency in the production of infrastructure-equipped lands and affordable housing, leading to the emergence of squatter neighborhoods. "Gecekondu" is the name given to the squatter's house in Turkish, meaning literally 'overnight-built house', which exactly corresponds to what is called favela, barriada, bustee and bidonville in other cultures. For the definition of squatter, the United Nations (UN) describes it as "illegal occupation of land or shelters constructed by low-income individuals" (Karpat, 1976). To put it differently, according to the UN-approved definition, it refers to a situation where an area is illegally seized and structures are built on it by low-income individuals. The administrations of Third World countries primarily address squatter houses from a legal perspective and consider these structures as violations of private land ownership. (Karpat, 1976). In Turkey, the definition found in the Squatter Housing Law (Gecekondu Yasası) No. 775, which is the source of measures and sanctions related to the issues of the squatter housing concept, states, 'The term "gecekondu" refers to unauthorized structures built without adhering to the regulations and general principles governing urban planning and construction, and constructed on land or plots not owned by the builder, without the permission of the owner." The term "gecekondu" as squatter housing is a compound word structurally formed from two words in Turkish. The first word is "gece," meaning "night," and the second is "kondu," derived from the action of settling or landing (Yasa, 1968). The introduction of this term into everyday language can be traced back to the 1940-50s. The creation of this concept was not mediated by cultural institutions or any specific organization. Instead, it emerged as a result of the society's act of "making," and was thus formulated by the society itself (Çakır, 2011). Consequently, the "gecekondu" space aligns with Lefebvre's definition of social space; regardless of its quality, it's contingent on the productive force and is a product created by the migrant society.

The rapid changes in Turkey's demographic structure and urbanization processes have made the phenomenon of gecekondu inevitable. Gecekondu not only represents the complex outcomes of rural-to-urban migration and urbanization through its physical structures but also through the socio-cultural and economic dimensions of these structures. The gecekondu phenomenon can be interpreted as a form of violence directed at the city. This violence is not limited to illegal constructions

within the rapidly expanding city limits but also manifests in the social and economic inequalities these structures introduce, the unjust distribution of resources, and the negative impacts reflected throughout urban life.

Urban Regeneration as the Spatial Counterpart of Structural Violence

The basis of "Urban Regeneration" is a comprehensive and integrated vision and action that leads to the resolution of urban problems and seeks to bring about a lasting improvement in the economic, physical, social and environmental condition of an area that has been subject to change. (Roberts, 2000). It is no longer possible to approach urban regeneration through the promotion of urban transformation projects in isolation. Instead, she states 'the emphasis should be creating the conditions for economic, social and environmental regeneration (Healey, 1997).

In Ankara, prior to the deployment of the "urban regeneration" paradigm, a series of legislative measures were introduced targeting gecekondu areas. The precipitous decline in the livability conditions within these gecekondu areas precincts necessitated an official response, leading to the enactment of Law No. 5218 in 1948. This legislation marked the genesis of the "construction amnesty" concept. Under this framework, the state sought to legalize edifices constructed either in violation of existing urban regulations or without the requisite permits, contingent upon certain temporal and conditional stipulations. Consequently, the urban landscape evolved, not towards the amelioration of these gecekondu areas, but towards fostering an environment conducive to their proliferation. Statistical data from 1945 highlights this trajectory: Of the 226,712 residents in Ankara, approximately 70,000 resided within these informal settlements. The act of construction amnesty to unauthorized constructors, thereby legitimizing their occupancy of state-owned land, increased the momentum of 'gecekondu' constructions, rather than decreased it.

Contrary to established definitions, in present-day Ankara, "rental value" is the foundational consideration in shaping urban transformation projects, with the priority of dilapidated areas being perceived and directed based on this value. Central residential areas in cities, once abandoned by middle and upper-income groups, have, over time, transformed into living spaces inhabited by various low-income groups and the marginalized sections of society, subsequently suffering degradation and regression. The deterioration in these areas has led to them being perceived as dangerous, resulting in further abandonment and a decline in their rental values. These regions, with their high

potential for profit, offer lucrative opportunities for investors (Türkün, 2012). The transformation projects targeting these areas, which have attracted the attention of the upper-income groups, have been bolstered by urban policies, with no reservations being held against implementing such transformations. With shanty areas being designated as "urban transformation zones" by local governments and the ensuing urban profit being channeled into specific interest relationships, the contemporary concept of urban transformation has been rendered vacuous, becoming an instrument of structural violence imposing dominance over the city.

Indeed, this concept has transcended mere construction activities in informal housing areas for profit motives. It began manifesting itself in locales with the potential for high revenue generation which, contrary to popular misconceptions, were devoid of unauthorized constructions or unpermitted settlements—essentially, areas that weren't characterized as gecekondu. In essence, the "urban regeneration" paradigm, originally proposed as regenerative solutions for the gecekondu, has perpetuated the degradation of the urban fabric.
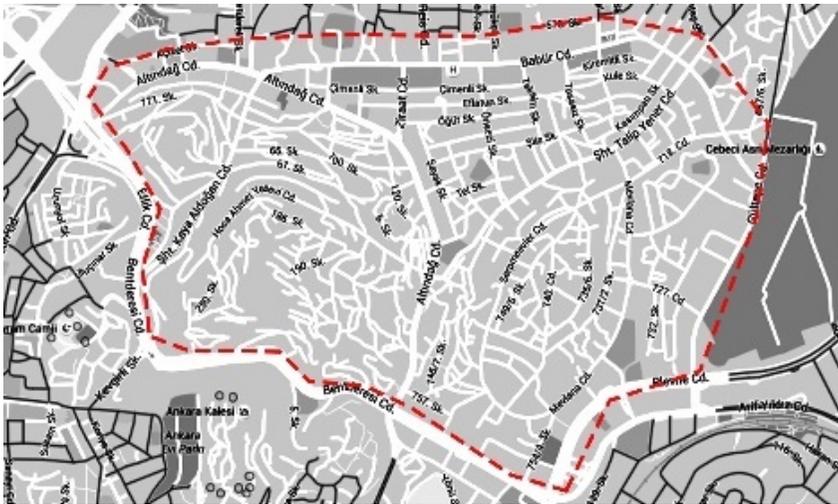

Figure 1. Google Street View accessibility in 2015. Retrieved from Google Earth

Violence, as interpreted spatially, emerges from the nexus between informal housing, often referred to as gecekondu, its proposed solution - urban transformation, and the prospect of profit. Examples of this violence are discernible in various parts of Ankara. Gecekondu spaces inflict violence both upon the city and the individual. Among these

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areas, Çinçin neighborhood is perhaps the most infamous, often advised against visiting and typically spotlighted in news bulletins for police raids and dawn operations. It has been portrayed as a perilous area, shrouded in legends where those who venture do not return and where various crime syndicates hold sway (Bayraktar, 2021). Notably, in 2007, news outlets reported that armed groups obstructed the Google Street View team from entering the Çinçin region (URL-2). A tweet by a user in 2015 humorously pointed out that while the Google team had not yet accessed Çinçin (Fig. 1), current Google Maps data (URL-3) might include some street photos of the area (Fig. 2). Yet, the mysteries of gecekondu regions persist (Fig. 3).
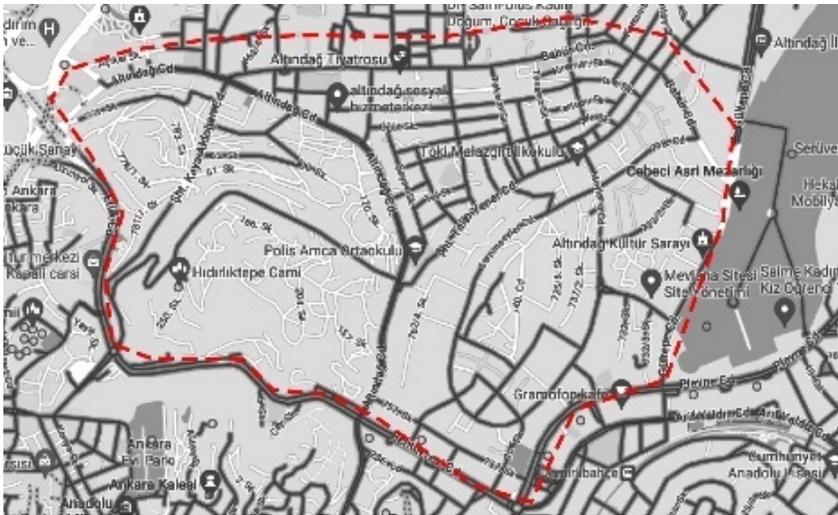

Figure 2. Google Street View accessibility in 2023. Retrieved from Google Earth

In the context of Çinçin, these slum areas are notably more deprived compared to the rest of the city. Defined broadly as a condition where one lacks sufficient resources and income, poverty also signifies the absence of basic human needs necessary for a life of dignity, such as access to food, water, clothing, shelter, medical care, and safety (Oktik, 2008). During the neoliberal era, capitalism, by accumulating "extreme poverty, social deprivation, ethnoracial divisions related to colonial history, and public violence" in urban areas of First World countries, has given rise to an underclass and the emergence of marginality (Wacquant, 1996). This systemic violence, stemming from marginality, is predominantly manifested through crime, as portrayed in media representations and cartographic data. Remarks from children in Çinçin, such as "We've become notorious now. We've delved into those

circles.", "In Bahçeli, they always scorned us. They eventually forced us out of legitimate jobs.", and "Our fate is either a bullet or prison.", highlight their acceptance of the societal tag of being "criminals" (Ümit-Atılgan, 2017). Furthermore, it's commonplace in Turkish mainstream media to describe these urban zones as "dens of crime" and "fear-inducing cities", while those committing crimes are often labeled as "perpetrators of crime" and "psychopaths" (Gönen & Yonuncu, 2011). Such media portrayals have stigmatized slum areas, thereby justifying urban renewal initiatives.

Figure 3. Accessed Google Street View of Çinçin neighborhood in 2023. Retrieved from Google Earth

Despite its association with crime, there's significant potential in the area. This potential lies in Çinçin neighborhood's role as a host to immigrants from various regions of Turkey, from Gümüşhane, Erzurum, Sivas, and Yozgat to Eskişehir and Bolu, thereby embracing a cosmopolitan culture (Bektaş & Türkün, 2017). Moreover, the concept of "marginality" linked to the region could serve as a crucial reference point concerning the identity of the area to be transformed.

However, the use of "potential" has not been observed in urban transformation practices in the region. Instead of a project proposal that addresses the welfare level of the local population and meets their humanitarian needs, an approach that considers rent relations has been adopted.

After urban transformation, government-built structures were settled by civil servants and white-collar workers coming from outside the area (int

ref). Only 66% of the current residents have been living in the neighborhood for less than 5 years, and only 1% of the current residents are former shantytown dwellers. It cannot be convincingly argued that crime rates have dropped in the gentrified area. Between 2010 and 2013, crime rates, especially drug trafficking, increased in many neighborhoods around Çinçin and its surroundings. Most residents still complain about "drug sales in the back streets, the disappearance of neighborly relations, and the inability for their children to safely go out on the street." (Aksoy & Kocataş, 2017).

The urban transformation processes in Çinçin have damaged the existing socio-economic structures of the neighborhood and further deteriorated them. While the media constantly stigmatizes these areas with poverty, crime, and violence, urban transformation projects aimed to revitalize and improve them. However, the results of the transformation process have fallen far short of these goals, destroying the potential inherent in the neighborhood's cosmopolitan and multicultural structure. While the concept of urban transformation should represent not only a physical change but also a social, economic, and cultural improvement process, in Çinçin this process has become a result of a rent-seeking approach that overlooks what transformation truly means, satisfying only specific interest groups. When urban transformation is implemented for profit motives, the transformed space continues to perpetuate violence.

Figure 4. Fragmented AOÇ lands in 1970. Retrieved from Ankara Metropolitan Municipality archive.

Urban transformation, as a legitimized method of profiteering, continues to be observed in other parts of the city. In this context, one of the

spaces affected by the violence of urban transformation is AOÇ (Atatürk Orman Çiftliği). Originally personal lands of Atatürk, AOÇ became public property when it was bequeathed to the treasury by Atatürk. It was a space where modern agriculture and economic development were studied and researched, thus having the potential to serve as an experimental field. However, over time, through special laws, protocols, and leases, it has changed hands numerous times, its land integrity irreversibly fragmented.

Some portions of the farmlands, fragmented into small pieces, have been lost within the urban area and are now surrounded by residential structures. The farmlands marked on the 1970 map have been enveloped by informal housing constructions, known as "gecekondu" in the neighborhood called Karakusunlar (Fig-4).

However, the threat to these state-owned farmlands is not, ironically, informal settlements or "gecekondu". With the enactment of law number 2823 on 24.05.1983, these three farmlands were handed over to Gazi University by the state in exchange for money under the pretext of "public benefit", thereby losing their status as farmlands. Subsequently, as part of the city's planning process, ownership of this land passed to the Metropolitan Municipality, which began the construction of a metro station and cultural facility in 2005. In this area, where the municipality owns the land but doesn't possess the zoning rights, the "iron cage" project was initiated, covering a total of 140,000 m2 and featuring a convention center, conference-meeting rooms, stores, cinemas, and a metro stop. Although it was presented as serving the people of Ankara (URL-4), it is an urban rent project.

Subsequently, within the urban planning processes, the old farmland and its surroundings were declared as urban transformation areas in 2007 with decision number 495 of the Metropolitan Assembly. As a result, zoning rights of the land were transferred from the district municipality to the Metropolitan Municipality. In 2008, the construction of the iron structure was halted. It stood as a gigantic billboard until 2013, serving as a canvas for graphic activists to convey their messages. It remained in this state for about eight years. In April 2012, the Ankara Metropolitan Municipality, following a closed-bid auction, reached an agreement with a construction company to build 2,450 residences and create a three-hectare commercial building (URL-4). Before this construction commenced, the iron structure was dismantled and replaced by a new project design that was then implemented (Fig-5).

At this point, urban transformation has become an act of violence that the capitalist system imposes on the city in its relentless pursuit of greater

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profits. The potential of AOÇ as a tool for regeneration has been ignored, and no transformation centered around this potential has materialized. On the contrary, AOÇ lands have been regarded as a "potential construction zone" for the city, consequently transforming its surroundings to align with this perspective.


Figure 5. The construction and destruction of the convention centre over the years (URL-4).

Figure 6. Constructed commercial building. Retrieved from Google Earth

CONCLUSION

Rethinking spatial violence outside the usual frameworks offers a deeper insight. It's important to differentiate between "power" and "force," both central to understanding violence. "Power" arises from group actions, while "force" has a moral aspect, often meaning harm or injury. However, when "force" is used to compulsion in violent situations, it becomes synonymous with violence itself. Both these elements shape the inherent potential of space and our interactions within it. In this scholarly framework, the "force" inherent to space is envisioned as an energy. Thanks to this energy's potential, space becomes a place where individuals engage, and social norms are established.

When examining the relationship between space and violence, it is crucial to understand how space interacts with its users. Interventions to the integrity of space can manifest as a form of violence when they disrupt or alter its potential. The violent aspect of space is not solely limited to physical harm; it is also determined by interactions with its users, design processes, and socio-political factors. Consequently, space is a product of social construction.

Space is not merely a physical entity but a "social product" that dynamically evolves with social relationships and processes. When viewed within this conceptual framework, the urban regeneration concept applied in Ankara becomes a form of violence based on the abstract space formed by power. This notion aims to discover the city's inherent potential and transform its existing structures, communities, and habits. While its nature seeks to make the city more sustainable, livable, and aesthetically pleasing, it is simultaneously characterized as a form of structural violence. Influenced by capital dynamics, the nature of this concept has shifted as trans, leading to rent-seeking approaches in critical areas such as the Çinçin neighborhood and Atatürk Forest Farm (AOÇ). This urban transformation has resulted in degenerative effects that harm the social and economic fabric of the city and its residents.

Ankara's Çinçin neighborhood is one of the rapidly developing informal settlement areas. Under the banner of urban transformation projects while Çinçin might have made a name for itself in the city through crime, the transformation projects have failed to address the core issues of insecurity and crime, erasing its multicultural and marginal potential. On the other side, the Atatürk Forest Farm (AOÇ), envisioned by Atatürk and designed as an experimental field for modernization in agriculture, boasts historical, cultural, and ecological potential. However, over time, this area has begun to rent ventures by various construction firms, causing it to drift away from its spatial potential.

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In conclusion, the violence of urban transformation is at the intersection of the ontology and ethical value of "power" and "force." While violence is ontologically inevitable, ethically, it has continued to harm the city rather than improve it. This ethical value indicates that the violence has provided a superficial physical improvement. Therefore, violence is perceived not only as causing physical harm to the city, but also as a case of degeneration that destroys urban life, demographics, culture, and history.

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DESIGN

(CA)RE-PAIRING DUALITIES THROUGH ARCHITECTURAL PRACTICES WITH CARE ETHICS

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ABSTRACT

A number of large-scale systemic challenges, such as ecological collapse, climate crisis, biodiversity decline, resource scarcity, migration, and poverty, highlight the need for spatial interventions that prioritize planetary repair and care over new designs. Since irreversible damage has been caused by human dominance, the humanist paradigm, which has traditionally guided ethical behavior in architecture, has fallen out of favor. To address this, architectural approaches need to be reevaluated from an ethical and critical standpoint, employing a relational ethical framework such as care ethics. By embracing the concept of architectural caring, it is possible to mitigate some of the social and environmental impairments resulting from humanistic dualities. Building upon this premise, this study aims to identify and discuss the potential of architectural practices that focus on care and repair within a broad posthumanist ontology, specifically addressing dualities such as human-nonhuman, nature-culture, and social-material. To explore this further, the study examines several architectural projects that demonstrate care ethics, including The Barley Field (The Barley Field Collective, 2010), Superkilen (Big- Bjarke Ingels Group & SUPERFLEX & TOPOTEK 1, 2012), Pieter de Raadtstraat 35 & 37 (The City in the Making, 2014), Winter Garden (KHORA, 2018), Zwaluwwand (Superuse Studio, 2018) and As Close As We Get (SUPERFLEX, 2022). As one of the qualitative research methods, an interpretive approach is utilized in this study, incorporating references from related literature and project websites. This study highlights that these architectural practices, guided by care ethics and aimed at repairing and reconciling dualities, conscientiously tackle interspecies companionship, co-living, recycling, as well as economic and ecological sustainability.

Keywords: posthumanist paradigm; care and repair practices in architecture; care ethics; ethics in architecture; dualities

INTRODUCTION

The concept of care is gaining more prominence in architecture. Defining care as a theoretical framework, as an ethos, as a methodology, and as a political framework, Shannon Matter states that it is the subject of many academic disciplines and professional practices, including architecture and urban studies (2018). Today, the effects of large-scale systemic problems such as ecological collapse, climate crisis, decrease in biological diversity, resource scarcity, migration, and poverty are becoming more noticeable. In this respect, it seems meaningful to bring forth repairing and caring for the sake of the planet rather than designing new buildings. According to Steven Jackson, focusing on corruption and dissociation is better than forwardness and growth that come with a modernist mindset (2014). The humanist paradigm, which liberates people in their actions and makes them superior to others, has been the determinant of the ethical behavior of the architectural profession. However, the planet has been suffering irreversible damage because of the humans' dominance on the complex problems caused by all professional actions and practices that human being carried out from within the humanist paradigm today not only threaten our existence but also pose a danger to all human and nonhuman beings on the planet. Among these professional practices, architecture is an important agent, and it is important to rethink critically this agency in the context of ethics. Thus, reconsidering architecture together with care ethics as a relational, posthumanist and inclusive understanding is meaningful and significant for the maintenance of the planet.

Architectural care addresses some of the social and environmental challenges posed by humanistic dualities. In the line of this hypothesis, this study inquires the architectural practices that focus on care ethics within a broad post-humanist context. This study aims to reveal these architectural practices' potentials and achievements for overcoming dualities. After laying a conceptual framework on care ethics and its counterparts in architecture, this study examines ethical perspectives in care practices in architecture, and the issues addressed by them. The research adopts an interpretive approach, a qualitative research methodology, using data sources that include literature and project-related websites. It includes cases from Europe, where care practices and literature on care ethics have flourished, as well as a project carried out in Istanbul by a Turkish team with European connections. The selection of projects implemented since 2010 is deliberate, reflecting contemporary cases that reflect the growing prominence of complex systemic challenges in ethics and discourse of architecture. The projects reviewed are The Barley Field (The Barley Field Collective, 2010),

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Superkilen (Big- Bjarke Ingels Group & SUPERFLEX & TOPOTEK 1, 2012), Pieter de Raadtstraat 35 & 37 (The City in the Making, 2014), Winter Garden (KHORA, 2018), Zwaluwwand (Superuse Studio, 2018) and As Close As We Get (SUPERFLEX, 2022). They consist of examples of architectural materials research projects, low-budget housing restoration, square organization, winter garden interior space, and nest design for animals, which vary in use, scale, and program. This study highlights that these architectural practices, guided by care ethics and aimed at repairing and reconciling dualities, conscientiously tackle interspecies companionship, co-living, recycling, as well as economic and ecological sustainability.

A CONCEPTUAL FRAMEWORK FOR CARE ETHICS AND ITS COUNTERPARTS IN ARCHITECTURE

Architecture has an inherent connection to care, as it involves the creation of shelters that are suitable for human life. Furthermore, it is both influenced by and influences various social, cultural, economic, and material processes. According to Elke Krasny, despite its fundamental role in providing protection from climatic conditions and facilitating daily life, architecture has historically been associated with autonomy rather than relationality (2019, p. 33). However, for the preservation of our world, it is crucial to view architecture as a perspective and process that extends beyond individuals, materials, and discursive conditions, rather than as a singular, static, and autonomous object.

Care ethics has emerged as an ethical approach that promotes the capacity to provide care with good morals. First discussed in the 1980s, care ethics adopts an understanding of morality based on interpersonal and mutual care, challenging the distinctiveness and autonomy of traditional moral discourse. Nel Noddings argues that traditional ethical discourse is grounded in male-dominated narratives and proposes an ethical approach rooted in women's care practices. Consequently, Noddings presents care ethics as a relational practice, positioning the human self as part of a network of mutual care and commitment, exemplifying the importance of attention and care during childhood (1984). According to Berenice Fisher and Joan Tronto, care can be defined as the actions we undertake to maintain and repair our world, allowing us to live our best lives (1990, p. 40).

According to the caring approach in architecture, the only subject of care is not a completed architectural product, it is the architecture itself, or the social or environmental context. For Tronto, architecture is merely responsible for taking care of everything and everyone related to any architectural product (2019, p. 28). Tronto claims:

Because care emphasizes processes and relationships that extend back and forward through time, and concerning all of the created relationships, applying care theory to architecture would involve making a fundamental shift in perspective: Care does not view the completed 'thing'—building, park, city zone, etc. —as its object. It starts instead from responsibilities to care, not only for this 'thing' or its creator, builder, or patron but for all who are engaged in contact with this thing. For example, what happened to the people, shops, goods, and community, displaced to make room for this park? Who will occupy the space in the future? How were the building materials collected? (Do the LEED standards sometimes also get 'gamed' for example?) Who will clean and care for this building, street, and infrastructure? Has it been built to last, or only built to last for as long as the builder remains responsible for manufacturing defects? (Tronto, 2019, p. 28).

Architectural approaches rooted in humanist ethical foundations perpetuate dualities between human-nonhuman, nature-culture, social-material, and object-subject relationships, often with a focus on anthropocentrism. Conversely, architectural approaches informed by a care ethic have the potential to transcend these dualities and foster inclusivity within the field of architecture. According to Krasny, architecture guided by care ethics can provide a comprehensive form of care that considers the interconnected needs of humans, nonhumans, and their environments, essential for the preservation of the planet (2019, p. 34). Therefore, it is crucial to redefine architecture as a practice guided by care ethics within a paradigm shift that emphasises the need to make the practice of architecture aware of its environmental impact and to recognise it as a relational practice.

TRANSCENDING DUALITIES THROUGH CARE ETHICS IN ARCHITECTURAL PRACTICES

Care ethics in architecture can operate at various levels of sensitivity and play a vital role in dwelling on dichotomies that create divisions between human and nonhuman entities. An example of this post-anthropocentric approach is the Zwaluwwand Project (2018) developed by Superuse Studio. Situated in the vicinity of Zwijndrecht, a nature reserve in the Netherlands, this project was commissioned by the municipality. The project embodies multiple facets of care. Designed as a habitat for swallows and bats, it exemplifies an ethos of care towards nonhuman beings by providing support for wildlife. Moreover, alongside catering to the needs of the intended users, the project subtly demonstrates sensitivity towards the broader environment on a global

scale by opting for the recycling of waste materials. Within this project, the nests for swallows and bats were thoughtfully designed, considering the specific requirements of each species' habitat. According to information obtained from the Superuse Studio's website, the swallow's nests consist of a wall constructed from a series of perforated concrete manholes, which had become waste due to manufacturing defects. These holes are filled with clayey sand to create an optimal climate for the swallows. Additionally, this wall serves as a retaining wall, covered with soil to minimize disturbance to the natural environment and support biodiversity (n.d.). The Zwaluwwand Project serves as an inspiring example of how care ethics can transcend traditional boundaries and foster harmonious relationships between humans and the natural world. By embracing the principles of care and sustainability, architecture has the potential to create spaces that not only cater to human needs but also nurture and coexist with diverse forms of life, promoting a more holistic and inclusive approach within the built environment (Figure 1).

Figure 1. Zwaluwwand, Superuse Studio, 2018 (Source: Url 1).

According to Superuse Studio the flooring of the space created for bats behind the manhole wall is also made of waste material, specifically recycled paving tiles. The floor covering is an important part of the project as the dirty soil on the ground is not suitable for bat habitat (n.d.). In the project, the human-nonhuman dichotomy is overcome by extending care to specific nonhuman beings through the design of a

shelter that provides protection from weather conditions and potential threats posed by other animals. While caring for the bats and swallows, the project also takes into consideration the continuity of the habitat for other living and non-living beings, thus preventing the formation of priority or duality among nonhumans. This project manifests not only the ontologically expanding inclusiveness of care but also the temporal continuity. With the construction of the building, the care process did not end; instead, volunteers regularly changed the sand in the nest at intervals to ensure the continuity and sustainability of the care.

The other example of care practice is 'As Close As We Get' (2022), which is part of the SUPERFLEX research project that explores the relationship between humans and other species. The project serves as the research and experimental phase of a repair action aimed at preserving and increasing marine biodiversity, as the decline of Danish rock reefs has had adverse effects on the marine ecosystem. According to the information on the SUPERFLEX website, the research involves observing and testing whether specially developed concrete types, in collaboration with DTU Sustain and By & Havn, create a suitable environment for algae and marine animals. Underwater cameras will be used to carry out these observations and tests, with the concrete types being placed in Copenhagen Harbour. The goal is to find a material that the construction industry can utilize in projects such as underwater bridge piers, offshore wind farms, and coastal protection projects (n.d.) (Figure 2). SUPERFLEX emphasizes the need to consider the built environment, especially considering the predicted rise in sea levels that will eventually submerge human structures. They believe that this research can also be applied to the production of the built environment on land. The results of this research will provide the necessary information infrastructure for the Superrev project, which aims to build at least 55 km2 of reefs in the Danish oceans (n.d.). This research project is driven by concerns about the fragility of the planet and the role of our anthropocentric ways of thinking and acting in its degradation. By restoring the connection between humans and nonhumans through the use of newly developed building materials, this project aims to transcend the traditional divide between humans and nonhumans. The development of care ethic for sea animals in future projections serves as is a prime example of the temporal nature of care. This project can be viewed as an initiative that promotes adaptability and resilience by catering to the needs of users who may vary in response to changing dynamics.

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Figure 2. As Close As We Get, SUPERFLEX, 2022 (Source: Url 2).

The soil, the foundation upon which everything is built, often remains invisible in cities. Under the umbrella of KHORA, Aslıhan Demirtaş and Ali Cindoruk explore the boundary between the city and the terrain, and how the two can coexist. The Winter Garden project, designed and constructed in 2018 as an interior design for the Salt Galata Building, an arts centre located in a heavily urbanized area of Istanbul, incorporated compressed soil and emphasizes the significance of soil as an entity in its own right (Figure 3). According to KHORA, the Winter Garden aims to position soil as an independent entity, moving away from its typical anthropocentric and utilitarian perception as a mere means for growing food or constructing shelters (n.d., para. 2). By reframing our relationship with soil, focusing on its intrinsic value rather than its instrumental use, the project offers an opportunity to transcend our anthropocentric perspectives. Moreover, the project prioritizes the comfort conditions of the plants over those of humans. According to KHORA, Winter Garden's air quality and comfort are tailored to meet the needs of the plants, rather than its human users (KHORA, n.d., para. 2). By demonstrating such attentiveness towards nonhuman entities within a building situated in the heart of an urbanized city, this project prompts architectural users to reconsider their roles and responsibilities, encouraging the development of an ethical understanding of caring for nonhuman beings. Through transcending the dichotomies of human - nonhuman, subject - object, and nature - culture, the project invites a re-evaluation of the user - subject relationship within architecture.

Figure 3. Winter Garden, KHORA, 2018 (Source: Url 3).

Care ethics can be applied at various scales, ranging from individual buildings and neighbourhoods to broader societal issues such as housing problems. Established in 2013, the City in the Making Foundation aims to explore how vacant real estate can be repurposed for social use and how city residents can actively participate in the development of their neighbourhoods. Recognizing the pressing housing shortage in Rotterdam and the detrimental effects of empty buildings on local communities, the foundation converts these vacant spaces into affordable living and working accommodations, fostering social and economic sustainability in cities and supporting collective life for a limited period of time. An example of this is the 'Pieter de Raadtstraat 35 & 37' project, undertaken by the City in the Making Foundation in 2014, which involves the refurbishment and management of two attached old apartments with two ground-floor workshops for a specific duration (The City in the Making, n.d.) (Figure 4). The project is designed as a space for both living and working, incorporating shared areas such as a workshop, laundry room, living room, residential units, and one office. Recognizing that housing is not the sole requirement in the current economic climate, the building has been transformed to generate resources that cover the costs of its maintenance, allowing it to become self-sustaining. Consequently, communal areas within the building are utilized for activities such as beer production, micro-cinema, laundry services, and soap production. Additionally, communal open spaces are used for planting and gardening, reducing kitchen expenses. These commoning practices foster a sense of belonging, making it easier for economically disadvantaged individuals or short-term immigrants to adapt to the neighbourhood, while also preventing potential social segregation and bridging divides, thus supporting a diverse community. The principle of

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commoning, upheld in this project, enables residents to meet each other's needs through mutual solidarity. In this regard the City in the Making Foundation not only revitalizes unused buildings through design and construction, but also establishes a framework for community organization, contributing to the long-term self-sustainability of the community. The revitalization of these buildings has not only added social and economic value to the neighbourhood but has also improved the quality of life for both the team involved in the project and the residents. Through direct and indirect care, potential conflicts and dualities are mitigated, fostering a harmonious neighbourhood.


Figure 4. Pieter de Raadtstraat 35 & 37, The City in the Making Foundation, 2014 (Source: Url 4).

Another spatial practice that can be followed with care ethic is the repair of a public space called 'The Barley Field', created by a platform of the same name. The project involves transforming the Plaza de la Cebada (Barley Square) in Madrid, which is the former municipal market of the La Latina neighbourhood, into a space for interaction and activity. The transformation took place in 2010, with the collaboration of the city's residents and the City Council, using a participatory method. Previously, the space had been inactive and had become a passive spatial object after the demolition of the sports facility and the market on the square. However, through spatial care interventions, the space was given a living material quality and agency, overcoming the subject-object distinction. The platform 'The Barley Field', created by the residents, designers, architects, and engineers involved in the project, carried out the revitalization of the square with a participatory approach. These efforts aimed to open up the area for public use and make it accessible to the neighbourhood's local people in decisions about the square, a website was set up to receive their suggestions for the area. Additionally, a physical board was put up in the environment for people to write on. Following the proposals, the area was cleaned,

water and electricity were installed, and basic facilities such as sports pitches, basketball and football goalposts were provided. These efforts aimed to open up the area for public use and make it accessible to the neighbourhood. (Public Space, n.d.). The design and the implementation of the urban equipment were in line with the demands of residents. Through the graffiti created by the painters and local artists on the square, and the furnishings created by the residents, designers, architects, engineers, and craftsmen, the culture of the neighbourhood was embodied in the square and the material-cultural duality was overcome (Figure 5). The ownership of the square by the residents has contributed to the continuity of care developed in the square. Furthermore, a calendar of events has been created to contribute to the social sustainability of the neighbourhood. This has prevented the square from becoming idle and neglected, strengthening the neighbourhood's sense of togetherness.

Figure 5. 'The Barley Field, The Barley Field Platform, 2010-2011 (Source: Url 5).

Designed in 2009 in collaboration with BIG-Bjarke Ingels Group, SUPERFLEX, and TOPOTEK 1, and completed in 2012, the public space project 'Superkilen' is located in Nørrebro, a suburb of Copenhagen, Denmark, known for its diverse ethnic groups. The project employed an inclusive design process, aiming to foster a sense of belonging and a strong identity by bridging potential differences among social groups. According to Jonathan Daly, the project area contains 108 objects representing 60 different nationalities of residents in Nørrebro residents

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(2020) (Figure 6). The spatial approach, utilizing these objects as tangible representations of culture and as means to mend social divisions, demonstrates that spatial care can extend beyond architectural elements. By incorporating ethnic elements in contrast to Eurocentric planning and design approaches, the project seeks to address dualities between self and other, such as religion, culture, language, and ethnicity, with a sense of care ethics.
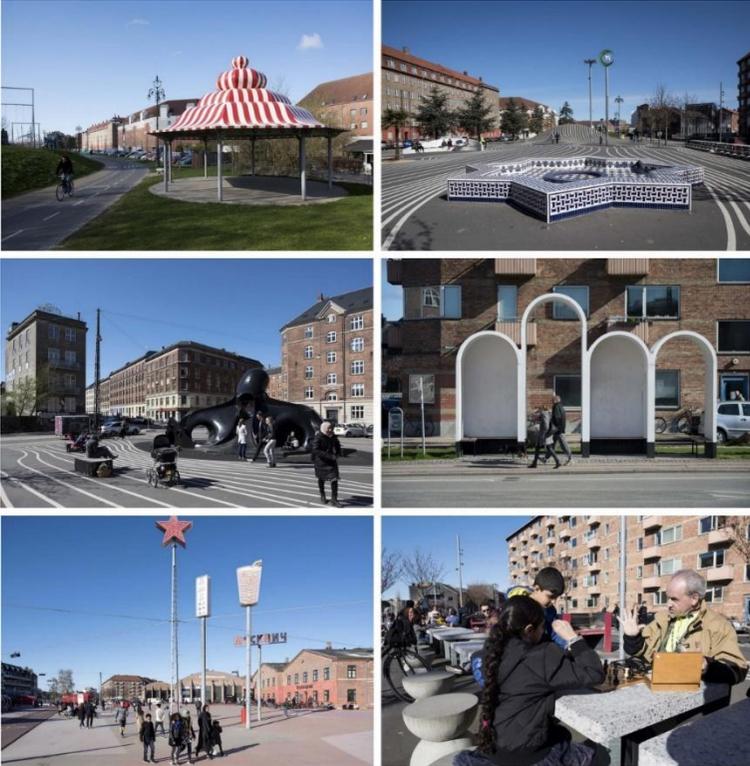
Figure 6. Superkilen, BIG-Bjarke Ingels Group, SUPERFLEX and TOPOTEK 1, 2012 (Source: Url 6).

CONCLUSION

In today's world, as we face numerous crises, it becomes increasingly important to respond to degradation and vulnerability with care ethics and to integrate care into our practices across all professions, including architecture. Adopting a posthumanist perspective, care ethics encompasses not only the well-being of human beings on the planet but also promotes the well-being of all living and non-living beings collectively. This study examines approaches that are sensitive not only

to social issues impacting humans but also to broad range of planetary problems observed in the selected projects. The study's findings highlight ethical and practical actions that identify common themes across various continuums, including human-nonhuman, culture-nature, socia-material, and object-subject.

Human-nonhuman continuum is evident in various projects. 'The Winter Garden' by KHORA, 'As Close As We Get' by SUPERFLEX, and 'Zwaluwwand' by Superuse Studio prioritize the comfort conditions of animals and plants, thereby supporting biodiversity and breaking down the traditional divide between humans and nonhumans. KHORA's Winter Garden project and SUPERFLEX's 'As Close As We Get' also blur the nature-culture continuum by integrating natural elements and objects into urbanized areas dominated by human culture. On the other hand, the Superkilen project by BIG & SUPERFLEX & TOPOTEK 1, addresses the human-nonhuman duality through intercultural objects, simultaneously challenging the social-material agency. In The Barley Field project, the design objects and artistic elements in the square embody the culture of surrounding neighbourhoods, effectively challenging the social-material dichotomy. Similarly, in the Pieter de Raadtstraat 35 & 37 projects by the City in the Making, the organization and management of the square blur the boundaries between the social and the material, fostering an ecosystem for cultural interaction and collective production.

Revitalization projects go beyond mere design and construction actions to repair buildings or public areas. They also contribute to social, cultural ecological, and economic sustainability. These projects, rooted in care ethics, offer solutions to systemic problems. They establish continuity between human-nonhuman and the natural-built environments, promoting biodiversity by challenging the dualities of human-animal, human-nature, natural-built, and social-material within architectural practices. Many of the studies prioritize a low carbon footprint by reusing existing waste materials or favoring repair actions over new construction. In some of these projects, the production of the built environment extends beyond the physical realm, ensuring material-social continuity by supporting social sustainability. Additionally, some projects approach care as a constant ethical awareness over time, emphasizing the importance of temporal care perception, application, and dissemination. The examined projects foster social sustainability through spatiality, facilitating partnerships and solidarity among citizens and residents, enabling them to care for one another. In conclusion, adopting care ethics in architectural practices allows for responsible engagement in interspecies companionship, co-living, recycling, economic and ecological maintenance. By addressing the dualities

prevalent in the field, architectural practices guided by care ethics can contribute to the resolution of large-scale planetary issues. It is crucial to expand architectural frameworks for care ethics, diversify practices of care, and promote their widespread adoption to ensure the sustainability of our planet for both humans and other beings.

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Url 2: https://superflex.net/works/as_close_as_we_get_cph_harbour

Url 3: https://aslihan-demirtas.com/archives/portfolio/wintergarden-2018

Url 4: https://www.stadindemaak.nl/pieter-de-raadtstraat-35-37/

Url 5: https://www.publicspace.org/works/-/project/g362-the-barley-field

Url 6: https://www.arkitera.com/proje/superkilen/

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EXPLORING THE REGENERATIVE CAPACITY OF ARCHITECTURE IN THE ANTHROPOCENE ERA THROUGH ANNE HERINGE'S ARCHITECTURE

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ABSTRACT

In this Anthropocene era, the destruction of nature by humankind is primarily driven by the excessive activities of various industries. The various applications of these industries, across different scales and in other parts of the world, are having increasingly degenerative impacts on nature. The study aims to discuss the potential and responsibilities of the field of architecture to be regenerative for nature, knowing that nature still has the power to heal despite all that humans have done to nature. In this study, the regenerative potential of architecture in the Anthropocene era is discussed through regenerative design that aims at the co-evolution of human and natural systems. The scope of the study will be explained through one prominent work of architect Anna Heringer. The traces of Heringer's architecture philosophy, which is rooted in holistic local sustainable development, first emerged in the structure known as METI Handmade School in the Dinajpur region of Bangladesh. As a method in the study, Heringer's work will be analyzed through deep readings on the potential of architecture to be regenerative and these readings will be presented with a relational diagram/ collage. In this study, the situation of METI School during and after the construction is examined. The regenerative potentials of Heringer's architectural philosophy, grounded in the fundamental principles of local materials, local energy sources, and global knowledge, have been discussed. Following the investigations, it has been seen that regenerative catalyst effects can be produced through architecture in a living environment. It is claimed that the construction of local with environmentally-focused decisions promotes social and economic development locally and contributes to the community's ability to create strong and well-connected social capital. As a result of the study, it is argued that the regenerative effect of architecture in the Anthropocene era will not be possible only with environmentally focused decisions and that it can be achieved by including strong, interactive local human capital in sustaining these decisions.

Keywords: Anthropocene; Anne Heringer; Regenerative Architecture; Deep Reading; Sustainable Development

THE ANTHROPOCENE ERA AND THE DEGENERATIVE EFFECTS OF ARCHITECTURE

Figure 1: 'Cave of the Hands' in Argentina, Río Pintura (Url-1, 2023)

Since the beginning of their existence, human beings have acted as though they were the sole owners of all actions in the world and have caused positive and negative transformations in their environment. For this opinion, a striking metaphorical example can be given: the 'handprints' cave art found in Cueva de las Manos in Argentina, Río Pinturas. Its history dates back between 13,000 and 9500 years (Url-1, 2023; Figure 1). This cave painting is like indication that, hypothetically, humans have had dominion over nature since ancient times. Although the influence of humans on the planet he lives in has manifested itself from the moment of his existence, it is a fact that in the past the scope and intensity of this influence were less compared to today. In 1993, Cesare Emiliani proposed a new geological calendar called the Holocene Epoch, in which he assumed that it began approximately 11,000 years ago as the starting point for modern humanity. It is known that in the Holocene Epoch when the transition to settled life began with the end of the ice age, the influence of humans on nature began to increase slowly. However, in this age of millennia, it is thought that the influence of humans on nature is considerably less than today. The realization that human impact on nature had reached harmful levels is

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most commonly dated to the Industrial Revolution (Crutzen and Stoermer, 2000). The industrial breakthroughs, especially the invention of steam engines, led to the rapid development of certain countries. Eugene F. Stoermer and Paul J. Crutzen, in their article titled The Anthropocene, published in 2000, emphasized that the age we live in has changed considerably due to the results of human actions, and therefore it should be referred to by a different geological name. As of this date, this age in which human beings cause almost irreversible destruction by putting themselves in the place of nature's only creature is called The Anthropocene Era by the scientific community.This name is derived from the Greek words 'anthropos-' meaning human and '-cene' meaning age. It is defined as 'The Human Epoch' in English and as the 'İnsan Çağı' in Turkish.

In this Anthropocene era, the destruction of nature by humans is primarily driven by the excessive activities of various industries. The use of non-recyclable and toxic materials for nature as a cumulative human action, the production of wastes that will destroy nature, and the occurrence of these actions faster than nature can handle are the main destructive reasons that cause the name of a geological age to change. Alongside the widespread pollution around the world, there are also human actions (such as atomic bombs, and nuclear wastes) that occur singularly leave very destructive traces. The most important consequence of this age is the climate crisis. The deterioration of the balance of nature due to the climate crisis results in drought, floods, fires, deforestation, depletion of freshwater resources, warming of the earth, and extinction of species. Rockström et al. (2009) discuss the Anthropocene Era under nine main topics: climate, ocean acidity, chemical balance, atmospheric emissions, biodiversity, land use patterns, clean water, nitrogen and phosphorus cycles, and ozone layer thickness.

It would be unfair to hold all humanity or all manufacturing industries responsible for the destruction of the planet due to the total actions of all humanity. Donna Haraway (2015) blames not all humans for the destruction in the Anthropocene, but the capitalist states, corporations, and their human forms, which have carried production to a point that is too much for the planet to bear. Donna Haraway, when contemplating the Anthropocene, does not attribute responsibility for the damage to all humans but rather blames capitalist states, corporations, and their human forms for pushing production far beyond what the planet can sustain. People in various places of the world consume energy differently depending on their modern level of 'development', and their carbon footprints are quite different from each other. Although not all people are responsible, the consequences affect all of humanity.

In this age, one of the important stakeholders of the human-made destruction to nature is undoubtedly the construction sector. Regarding the construction industries, the 'handprint' of human beings on nature appears as the destructive traces of architects, engineers, and contractors on nature. The various applications of this industry, across different scales and in other parts of the world, are having increasingly degenerative impacts on nature. In particular, the rapid urbanized world defines a rapid order that turns villages into towns, towns into cities, and cities into megacities (Roös, 2021). In this rapid order, architecture serves the consumption-oriented progress order of the world as a development subject. It is a fact that the adopted development ideologies are aimed at exploiting nature and living beings. Architectural sustainability paradigms adopted due to the damage caused by architecture to nature and the physical environment have become a series of actions that have been emptied over time. Companies, organizations, or governments may prefer the concept of 'development' to the concept of sustainability especially in sustainable development decisions. The powers that hold capital use seemingly positive concepts like development, progress, and advancement to rationalize their right to harm people, nature, and our physical environment.

With the transition of architecture from "design for need" to "design for profit" for development purposes (Madge, 1993), it is seen that production within the framework of industrial innovation and economic growth creates rapid degenerative effects. Architecture consists of many practices that do not accord with nature, including small and large projects. The practices of 'excavation' and 'filling', which are the basic actions of architecture, are among the most destructive effects as they cause significant ecosystem transformations. As one of the basic action practices of architecture, 'destroy-build' architecture causes damage to the natural and physical environment by increasing construction waste. Planning decisions, which stand at the intersection of architecture with politics, also contribute to this degenerative order. Irrational and out-of-context planning decisions have other devastating effects: For example, urban transformation decisions that do not coincide with earthquake risk maps. As another example, mega projects that ignore the context and ecosystem also have a destructive effect on operational processes. One of the biggest effects of architecture on the planet is the materials that are incompatible with nature and the pollution caused by the supply of these materials to different regions. About this subject, according to the United Nations Environment Program (2022), the construction industry and built environment are responsible for 39% of global carbon emissions on an annual basis (Url-2, 2023). The construction industry appears to be responsible for a significant portion of the pollution produced on the planet. It is a fact

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that the common production methods of architecture create a separation between nature and humans and exploit nature.

In environment-friendly works produced in the Anthropocene era, designers' environmental awareness is taken into consideration, while different professionals are brought together by blurring their boundaries. However, the regenerative design approach tries to position designers and different professionals in a holistic system. In this context, the regenerative design will be discussed as a new environmental approach in the Anthropocene era.

REGENERATIVE DESIGN AND ARCHITECTURE

Regenerative design is about people and aims to develop approaches that support the 'co-evolution of human and natural systems' for both natural and social capital; regenerative design requires a fundamental re-conceptualization of the act of building design primarily in terms of imagining, formulating and enabling its role within a larger context (Cole, 2012). According to Lyle (1994), the regenerative approach emerged from earlier concepts of sustainable development. While the ecological order or energy lost in a sustainable system cannot be released again, regenerative design allows lost systems to exist by renewing themselves. In the current Anthropocene era, the limitlessness of human intervention in the environment increases the loss of systems, so humans cause a damaging transformation in nature. The Anthropocene offers an integrated socio-cultural-spatial framework for understanding global and environmental change and creates a platform for environmental politics (Polat and Kahraman, 2019). The Anthropocene Age (Castree, 2014), which is a common discussion topic among natural and social sciences with an integrated framework, can be removed from its negative effects with regenerative design, an environmentally holistic approach that supports natural and social sustainability.

Regenerative design requires changes in the existing design and planning processes by shifting from a piecemeal, technological, and mechanical approach to a model that better reflects the understanding of how the universe as a whole actually works (Roös, 2021). Regenerative supports a holistic environmental approach instead of a piecemeal modern working system. Although the technical strategies of the green design/sustainable approach, one of the approaches popularized before regenerative design, will remain valid, the purpose and language of regenerative design offers a significant potential for a broad-based environmental approach, especially for the partnership and coexistence of human and natural systems (Roös, 2021). According

to Robinson and Cole (2015), all future goals in the Anthropocene age should be brought together in a common pot with a certain understanding of the social, economic, technological, and ecological constraints to change. Reed (2007) states that regenerative design is a living systems approach as a whole, unlike piecemeal and technologically based green buildings. At this point, the concepts of regenerative and Anthropocene are associated with each other, both in terms of their meanings and their positions in practice. As a different perspective on these two concepts that can leak into each other, regenerative design can be suggested as a key to the search for a common holistic system in the Anthropocene era.

The importance of understanding and caring for place permeates the regenerative design literature (Mang, 2007). For example, Littman (2009) proposes an expanded definition of architecture in this context as the art or practice of designing and building place through the integration of space and building. Regenerative design is a holistic approach that cares about considering all stages of design such as place, area, building, construction, process, and application together. The architectural results that emerge with regenerative design are expected to emerge by responding carefully and thoughtfully to the unique social, cultural, and ecological opportunities and constraints of place, and making equal use of the appropriate use of contemporary technological capabilities (Cole, 2012). Since regenerative design emphasizes a holistic view, it can be said that it aims to provide different types such as social, economic, and environmental sustainability at the same time. Since a holistic view requires considering theoretical and practical factors together in design, it makes it possible to be sustainable as it allows the continuity of these factors together.

Regenerative design directs the design process as well as the application, production, and relationships for the sustainability of the environment. Within regenerative design and development, built projects, stakeholder processes, and inhabitation are collectively focused on enhancing life in all its manifestations (human, other species, and ecological systems) through an enduring responsibility of stewardship (Mang and Reed, 2012).Regenerative design responsibilities are suitable for design work at different scales and contexts such as city, urban, neighborhood, and building. In this context, to summarize regenerative design, its prominent principles can be listed as follows:

- By their nature, regenerative approaches require an adaptable direction to building design and operations.
- It allows combined human-technical systems in the construction process to adapt to change over time.

- Many of the core aspects of regenerative design and development (systems thinking, community engagement, and respect for place) are well-defined and accepted practices.
- It collectively emphasizes a qualitative context for building design, together with the concepts of partnering, co-evolution, and socio-ecological.
- Developing the 'capacity to take transformative action and to navigate transformation' (Griffith et al., 2010) is a primary objective of regenerative design and development.
- It assumes that neither human systems nor natural systems are embedded in each other, but rather that they co-evolve (Cole et al., 2013).
- Regenerative design requires changes in the temporal and spatial scope of the design process. The first change is to think of buildings as processes that can be adapted over time, rather than as human artifacts.The second is to focus on the neighborhood in which the building is located, rather than focusing on the individual building and its location. Both of these changes apply not only to ecological systems but also to socio-cultural processes.

Since regenerative design is in its embryonic period, it also has some outstanding difficulties. For example, since this approach is still in its development stage, it must be clearly and firmly proven that the claimed benefits can be achieved and that the necessary efforts will yield results (Cooper, 2012, p. 358). Additionally, the concept of co-evolution points to a developing future. For this reason, it raises a number of problems such as sociocultural and ecological systems, cycles, uncertainties of results, constant commitment, and participation. Since the built environment is located in an overlapping region between culture and nature, the fact that it has the potential to be a problem in both areas which are cultural and natural can be shown as one of the challenging aspects of this design approach.

The city plays a role as an initiator and consequence of the Anthropocene, and many cities around the world face a variety of challenges and opportunities linked to changing demographic and environmental pressures; for cities and their inhabitants to survive and develop, they need to be well coordinated and respond effectively to different pressures (Polat and Karaman, 2019). At this point, regenerative design can be mentioned as an effective method to solve problems because it is an approach that can be adapted to all scales and scopes in a city. Regenerative design is a suitable approach to discuss problems such as biodiversity loss, changes in atmospheric and ocean chemistry,

urbanization, and globalization triggered by the Anthropocene era. It is also suitable to address problems such as democracy, sustainability, and sustainable development, which have become distant from their purposes and distorted in a way adapted to the Anthropocene era. As seen in Figure 1, the regenerative principles of regenerative design can bring environmental, social, and economic sustainability to the causes and consequences of the Anthropocene. In this context, regenerative design must accept the complex and constantly evolving interrelationship between socio-cultural-ecological systems and understand the role of construction within this evolving context. To understand this role, Aga Khan award-winning architect Anna Heringer, who tries to achieve social, economic, and environmental sustainability in the best possible way, can be mentioned. Her architectural approach has become valuable in exploring the potential of regenerative design in the Anthropocene era through her works.
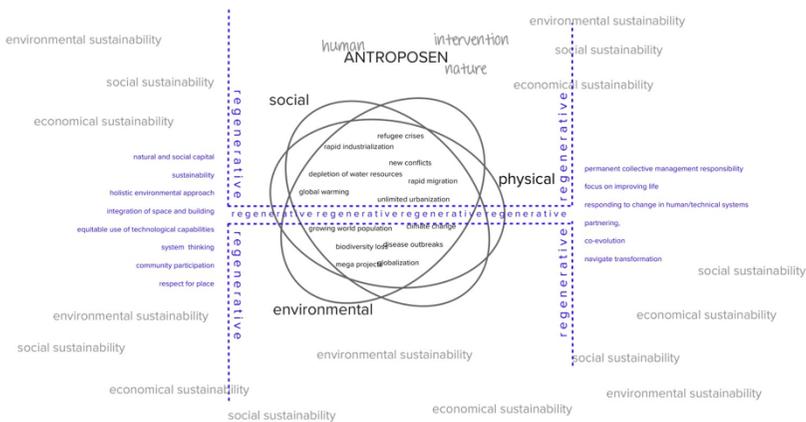
Figure 1. Diagram of Regenerative Design in Anthropocene Era

METHOD AND MATERIAL

The Anthropocene has comprehensive literature in the context of sustainability through socio-cultural and ecological systems as a new topic of discussion, but it has not yet been subjected to serious scrutiny within the framework of new design approaches and its concepts. In this study, a discussion is initiated on how the Anthropocene can be connected to the concept of regenerative design by drawing upon interdisciplinary literature. In the study, Heringer's work has been analyzed through deep readings on exploring the capacity of architecture to embody regenerative principles and these readings have been presented with a relational diagram/collage.

In the study, various examinations are presented on how, in the Anthropocene era, an environmentally focused regenerative design can provide a stronger theoretical framework for sustainability. This analysis is carried out in conjunction with diagrams, which explain the facets and potentials of regenerative design, using Heringer's works as a focal point. The methodological steps of the study are as follows: A literature review on the Anthropocene era and regenerative design, establishing a conceptual relationship between these two subjects, conducting an in-depth analysis with a focus on regenerative design within Heringer's works, and interpreting the findings within the context of the Anthropocene era.

General Features of METI Handmade School

Anna Heringer created many significant architectural products aimed at preserving and fostering ecological balance. She aims to utilize architecture as a tool to enhance people's lives, depending on local materials and sources to promote and empower communities and individuals (Parkes, 2022). The experiences she gained during her travels to Bangladesh during her student years played a significant role in Heringer's perspective on architecture (Url-3, 2023). She has a profound interest in the sustainable development of diverse societies and their built environment. She has been participating actively in the development cooperation efforts in Bangladesh since 1997. The METI (Modern Education and Training Institute) School is significant as the first building where Heringer's architectural principles took shape. Heringer conducted the design and concept development of the structure, while the architectural construction process was a collaborative effort with Eike Roswag. The main purpose of the project is to enable sustainable development in rural areas to prevent mass migration from rural to urban areas.

The METI Handmade School is located in Rudrapur, a district in Bangladesh's Dinajpur. The school presents an alternative to the typical frontal teaching method. The design of the new school aligns with this concept, offering various types of spaces and functions to support this teaching and learning approach. On the ground floor, which features sturdy earthen walls, three classrooms are situated, each with its own entrance leading to an organically designed system of 'caves' located at the back of the classroom. These cozy interiors are intended for tactile engagement, relaxation, exploration, or focused study, whether individually or in groups (Url-4, 2023). The school is a perfect example of sustainable architectural practices and was awarded the Aga Khan Award for Architecture in 2007. The jury emphasized that the structure ''creates beautiful, meaningful and humane collective spaces for

learning, so enriching the lives of the children it serves' in their evaluation (Url-5, 2023). It was recognized for its simple yet compassionate design, its striking visual appeal, and the exceptional level of collaboration that took place among the architects, craftsmen, clients, and beneficiaries.
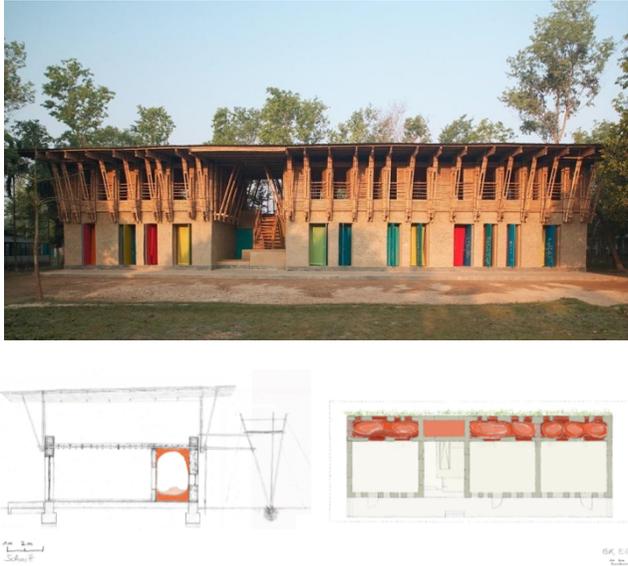
Figure 2. The Overall Appearance and Drawings of the Building (Url-5, 2023).

Exploring the Regenerative Potentials of Architecture Through the METI Handmade School

The concept of regenerative design, based on the idea of the co-evolution and systemic integration of human and natural capital (Cole, 2012), can be discerned in Heringer's structure. Heringer aimed to use local resources and reduce external dependencies in her architectural approach, which is rooted in respect for nature, in the METI School project. This section explores the environmental, social, and economic regenerative impacts of the school it has been generated during both the construction process and its ongoing existence. The structure's regenerative potential is being revealed. This discovery is presented through a relational diagram (Figure 3). The diagram illustrates how the environmentally oriented decisions targeted during the construction of the structure are interconnected with social outcomes.

In the METI School project, Heringer implemented the working principle of Local materials, local energy sources, and global knowledge (Url-3, 2023). This design principle has served as a fundamental catalyst for

sustainable development through architecture. The principle adopted by Heringer for the construction process of the structure continues to be applied during its usage phase as well. When renewing aging parts of the structure, this working principle is revisited to re-establish regenerative effects.


Figure 3. Regenerative Potentials of MEDI Handmade School

Local materials: In the project, materials reachable in the construction area, including mud, bamboo, and textiles produced by local artisans, have been utilized. These materials are locally recognized and commonly used in the traditional construction methods of the region. Heringer believed that the creative potentials of materials could be combined through a fusion of traditional and modern methods. In addition to being used in the ground walls of the school, mud was also utilized to construct the back corridor, which functions as an unexplored cave for students. The cave has been creatively constructed to facilitate activities such as play, relaxation, exploration, and interaction for the

students. The most important environmental characteristics of mud/earth as a material include its easy availability from the local environment, its traditional use by the native community, its non-toxic nature making it usable for everyone, its suitability for low-tech processing, and the ease of renewal when needed, utilizing local human and material resources. Another important material in the structure is bamboo, which has been creatively combined into the first floor and roof of the building using innovative joining methods. Bamboo, with its significant environmental features, such as being a natural material, locally grown, familiar to the native community, having a high load-bearing capacity, and the ease of sourcing new bamboo when needed, has been utilized in the project due to its regenerative potential. In addition to the sustainable properties inherent to the plant, the architect has creatively and aesthetically integrated the material into the design. It can be said that traditionally these materials had limited usage patterns. However, the combination of traditional materials with global knowledge and creativity is believed to create a highly regenerative cycle for the native community. The creative and aesthetic use of locally sourced materials is also seen as contributing to the formation of a local identity.

Another material that shapes the character of the structure is textiles produced by local women. Fabrics are used as a semi-open divider between the interior and exterior on both the ground and first floors. The utilization of textiles produced by women is considered regenerative from environmental, social, and economic perspectives, serving as both an empowerment tool for women and a means to reduce external material dependency.

Local Energy Sources: During the construction process, local energy sources were used to minimize external dependency. Local energy sources included local laborers, volunteer community members, craftsmen, and even buffaloes. In an area considered economically disadvantaged, even the supply of electrical power is a challenge. Hence, the construction maximized the community's self-sufficiency capacity. For instance, during the construction, buffaloes and people were employed to mix the mud. Human labor was utilized in various stages, including sourcing bamboo, preparing it for construction, and making necessary adjustments during the building process. In the plastering of mud materials, initially, men started working, but as women in the area showed interest, Heringer requested their involvement (Url-6, 2023). Children also participated in the production of this communal space alongside women. The non-toxic nature of the material, made primarily from pure natural earth, allowed all members of the community to willingly participate in the production. In this sense, the earth stands

out as an inclusive material, both environmentally, socially, and economically. In achieving environmental sustainability, the individuals living within the community have actively participated in these actions, becoming an essential part of sustainable development. This sustainability concept has been holistically realized not by certain individuals but by the entire community. This participatory approach can be said to have paved the way for the development of social capital, increased social interaction, empowerment of women, enhanced community production responsibility, and engagement within the community. Active involvement in the construction process of the structure not only fostered a sense of place and belonging but also maintained feelings of pride and a host of positive feelings associated with the space's utilization.

Global Knowledge: The construction involving earth building and bamboo was carried out by local laborers, with building techniques being developed and implemented in collaboration with architects and craftsmen from Germany and Austria. This project also provided training to 25 local tradesmen from the area, creating employment opportunities and offering professional assistance for self-sufficiency (Url-4, 2023). The convergence of traditional knowledge with global knowledge has created a regenerative impact in the field. A sustainable system has been established where individuals who participated in the construction process can undertake restoration if the structure deforms in the years following its construction. These same individuals have also acquired the knowledge to construct similar buildings without the need for external sources. This situation defines a process that can contribute to the regenerative sustainable development of the region.

Within the sixteen-year lifespan of the structure, the ability to repair and restore damaged areas using local knowledge, resources, and capital is a significant regenerative effect for the region. The capacity to complete repairs using materials sourced from nature without leaving toxic ruins is a notable example of environmental sustainability. Additionally, relying on local energy and human capital instead of exporting high-tech solutions for repairs showcases social sustainability. The fact that the region does not have to depend on other countries or engage in commercial relationships to repair this architectural structure demonstrates efficient resource utilization for economic sustainability. The strong relationship this building establishes with the local environment references all dimensions of sustainability, affirming the region's sustainable development.

CONCLUSION

The study investigates the regenerative potential of architecture, which has significantly caused the planet's mass degenerative effects during the Anthropocene Era. Through the examination of Heringer's METI Handmade School structure, the article has produced several findings indicating regenerative potential. It is believed that Heringer's environmentally-focused design ultimately fosters community spirit creation.

Bangladesh, specifically the Dinajpur region where METI School is situated, is characterized by rural-to-urban migration, poverty, and a lack of established local development. Local nongovernmental organizations collaborated with the METI organization with the goal of promoting the level of education in the area and creating a school where students can freely showcase their abilities. METI School was constructed based on Heringer's holistic design principles of local materials, local energy sources, and global knowledge. The study has focused on the regenerative outcomes of these design principles. As a result of the analysis, it has been observed that these design principles work in conjunction with each other. The environmentally oriented design decisions have generated outcomes in the field that contribute to social and economic development. Local materials like mud and bamboo have enabled the entire native community to participate in the construction process. The use of non-toxic materials is believed to reinforce strong social sentiments such as community participation, social interaction, and a sense of place within the local population. It is believed that the community members who participated in the construction process will establish a different type of pride, ownership, loyalty, and appreciation relationship with the building during its use. In the event of the building's restoration, the building material is demolished by mixing it with the earth, ensuring that no harmful waste is generated. This offers a regenerative proposal to counteract the degenerative act of demolishing and rebuilding in current architectural tendencies. Additionally, a cyclical regenerative effect has been generated by teaching local individuals the global know-how for using these materials in construction through creative designs in this field. In production utilizing the resources of the land, economic sustainability is established by not allowing the economic resources of the region to flow outwards. The study reveals that positive impacts can be generated without the need for high-tech solutions. The school was produced through the alternative design power with the community against technological determinism.

DESIGN

The study concludes that one-dimensional actions often struggle to create regenerative effects. For instance, in environmentally oriented decision-making, the lack of community involvement causes unsustainable situations. The sense of inclusion within the community is an inevitable factor in regenerative impact. In the Anthropocene era, it is believed that the regenerative potential of architectural work can only be realized through environmentally conscious decisions and the understanding, adoption, and preservation of these decisions by the community. Regenerative potential varies according to the context. This variation is influenced by various factors such as rural-urban distinctions, scale, level of development, political circumstances, climate, opportunities within the context, and human resources. In determining regenerative effects through architecture, it is important to thoroughly analyze the context and define its possibilities. The regenerative impact generated by Heringer's example in Bangladesh may not necessarily be applicable in the same way in another context. Understanding the context is crucial in achieving regenerative effects. The carbon footprint of individuals in Bangladesh is different from that of individuals in Western countries. It can be argued that people in Bangladesh have the least impact on the destructive causes affecting the Anthropocene era. Therefore, the regenerative impact generated for our planet in Bangladesh through architecture should be quite different from the regenerative impact generated through architecture in Western countries.

By conducting an in-depth analysis of a specific region's challenges and implementing unique measures, it can be established a sustainable development cycle. This cycle can strengthen local attachment within the community and mitigate migration. It has been understood that rural areas can contribute to their own social and economic development through environmentally conscious architectural design decisions. The development of local areas can potentially reduce urban migration and allow cities to remain more manageable, thereby reducing cities' destructive impact on the environment. As a result, in this study, the belief that the solution of the climate crisis will be possible not by nature itself but by changing the life of the human species is defended. It is suggested that the regenerative potential of architecture will be possible with the analysis of contextual information and the application of the analysis based on local resources and knowledge.

In the study, potential outcomes of the environmental-social relationship have been discussed. To obtain more concrete results regarding regenerative impact, methods such as on-site observation and in-depth interviews in these areas could be operated, contributing to a deeper conceptual understanding of regenerative effects.

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TIME-SPACE POSSIBILITIES IN LEBBEUS WOODS ARCHITECTURE

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ABSTRACT

This study focuses on a subversive architectural approach that questions traditional architectural principles and rejects the boundaries, control mechanisms, and social structures that have been prevalent throughout history. It explores five key concepts guided by Lebbeus Woods' "anarchitecture" perspective: counter-architecture, free space, heterarchic zones, time-temporality, and network systems. These concepts reflect a perspective that challenges traditional norms in the field of architecture. Additionally, it highlights efforts to accelerate the design process and gain a deeper understanding of architectural concepts using digital technology.

The study examines the perception of urban space and the role of touch through tactile experience and Walter Benjamin's concept of the distraction situation. Lebbeus Woods' subversive architectural approach supports activism that questions and disrupts the existing order in response to social crises. Free spaces are considered laboratories of individual autonomy, while heterarchic zones reject hierarchical structures. Temporality reflects the continuous change of space and societal intervention, while network systems focus on spatially reorganizing social structures.

In conclusion, this study addresses Lebbeus Woods' subversive architectural perspective and examines how designers can be more effective in creating spaces that challenge existing power structures, emphasize individual autonomy, and promote social change..

Keywords: counter-architecture, heterarchy, free space, haptic, strategy

DESIGN

INTRODUCTION: LEBBEUS WOODS` ARCHITECTURAL PHILOSOPHY

Lebbeus Woods was born in the United States in 1940 and received his architectural education at the Cooper Union School of Architecture and Princeton University. Woods' biography is one of the cornerstones of his architectural career. After acquiring the fundamental knowledge of architecture at these prestigious schools, Woods began to develop his own design philosophy. During this process, he started to be recognized as a radical figure in the architectural world.

> *"Make visible what, without you, might perhaps never have been seen."* Robert Bresson

As an architect working in the realm of representation without construction, Lebbeus Woods signals the possibility of another "act of making." Leon Krier says, "I am an architect because I do not build" (Robbins, 1994, p. 42). We can think of representation as a mirror reflecting a reflection. In this case, the mirror becomes the architect. The ideas reflected by the architect can be a critical gaze, a landscape element, or the silhouette of a building. In this context, we can refer to the representation (expression) technique as the filter in the architect's hands. Woods transforms this representational filter into a design strategy, aiming to trace the creation process of a plane that can generate the possibilities of space and time.

Lebbeus Woods' architectural philosophy challenges traditional architectural norms and represents an innovative approach. Woods' design strategy encompasses the following fundamental principles:

Counter-Architecture

Woods aims to question the existing architectural order and challenge traditional norms. His designs critique the current built environment and demonstrate how space can be reimagined in unconventional and alternative forms. This approach embodies a revolutionary perspective in architecture. Woods' "Einstein Tomb" design is an example that challenges traditional monument designs by questioning the spatial and temporal relationship. While paying homage to Einstein's theories and thoughts, this design offers a radical approach beyond traditional monument designs.

Free Space

Woods' designs emphasize the freedom and flexibility of space. They transcend the fixed boundaries of space, allowing users to transform and adapt it according to their preferences. This is the key to dynamic

designs where users can shape space to suit their needs. The "The Underground Berlin" project underscores the idea of making space more free and adaptable for users. Woods removes the boundaries of space in this design, creating an environment where users can shape space as they wish. According to Woods, free spaces are laboratories of individual life. They are characterized by the absence of control mechanisms that allow individuals to construct their own responsibilities independently of authoritarian control. Woods argues that for a free space to emerge, the individual's center and the structure around it must constantly move and evolve in response to crises, wars, and societal structures. In cities where rigid mechanisms exist, free spaces cannot be liberated, so Woods often believes they come before a crisis. He illustrates this concept with examples such as the free zones in Berlin and Zagreb.
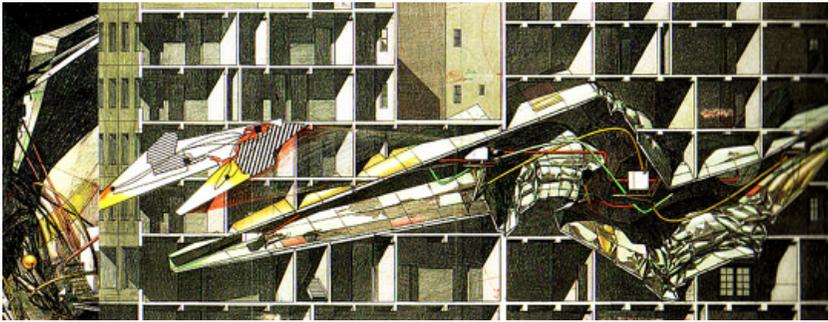
Figure 1: Lebbeus Woods, Berlin Free-Zone 3-2, 1990

Heterarchical Zone

The heterarchic region is a concept that challenges the hierarchical structure of cities. Woods argues that the destroyed, scattered city cannot make its own urban collage, and that architects must seek ways to transform the existing one according to the possibilities of time and society(Woods, L. 1992). There can be no hierarchy in the resulting urban collage because the collage has to be made according to the dynamism of the user.

When the social order breaks down in hierarchical cities, free zones emerge and these free zones are heterarchic cities because the individual builds his own responsibility independently of an authoritarian control. In this context, free space can be interpreted as a new spatial manifestation of individual autonomy

Time-Temporality

Temporality is a crucial component of Woods' anarchitecture. In contrast, he believes that time is the main founder of space, because the existing order must be disrupted in order for the space to realize itself. Moments give birth to space, they are created by a social intervention as they transform at the point of deterioration at every moment. Woods saw uncontrolled tectonic, disorder, and social structure as important parameters in contrasting architecture. Space is liberated at the point where the individual loses his way, is uncontrolled or uncontrolled, neutralized and left completely to himself. The aim is to recreate the system in which the social order has been disrupted, with the power of heterarchic individual autonomy.

Network Systems

Finally, network systems are essential to understanding Lebbeus Woods' architectural philosophy. He has viewed the space of social structures established by their subjects as slippery, variable, and free. When social order is disrupted, a network system must first be established to recreate itself. This network system is created by the community, and as space organizes itself, it must not be based on a single 'thing' but should be done according to a certain plurality because organization is not singular. As the network system constructs itself, the social structure is also established and changes according to its subjects and circumstances. This network system organizes space and a different space is formed at each transformation during continuity moments. This space is organized, used, abandoned, rediscovered by another user, transformed again, and the chain continues in this way.

Haptic Diagrams

In contemporary design practices, diagrams have emerged as active tools to transform form and matter into architectural space. Drawing from the theories of Michel Foucault, Gilles Deleuze, and Felix Guattari, diagrams are seen as abstract machines that construct new unrealized realities (Deleuze, Guattari, 1987). Architects use diagrams as a means to envision the "unnecessary" act of utopian imagination, delay the relationship between sign and meaning, and shift from architecture as form or sign to forces, performance, and process in architecture. Haptic Diagrams are a model developed to critically engage with the formal possibilities generated by digital tools. This methodological approach aims to challenge the immediate formal translation of diagrams, emphasizing the importance of cinematic frames and sequences that question traditional forms of architectural representation. Haptic Diagrams offer a new arrangement to experience space, events, and

movement, thereby providing architects with a more nuanced design approach that takes into account the sensory and experiential dimensions of architecture. Understanding Lebbeus Woods' architectural representation requires understanding the relationship between the body and space. In this context, the production technique of the required diagrams will be based on understanding the reflection and the reflecting instrument when positioning the impact of the body on space and time.

RESULTS

Probabilities of Time: Expression of Time Perception in Lebbeus Woods' Illustrations

Lebbeus Woods' illustrations serve as a powerful tool for expressing different dimensions and possibilities of time. His drawings are characterized by temporal rupture points, where he constructs parallel universes and envisions utopias (often more like heterotopias) that seize the complete authority of this newly created universe. He explores scenarios such as post-war cities and post-earthquake cities, reflecting impressions that emphasize the non-linear progression of the destiny of shattered, fragmented, and dispersed urban spaces.
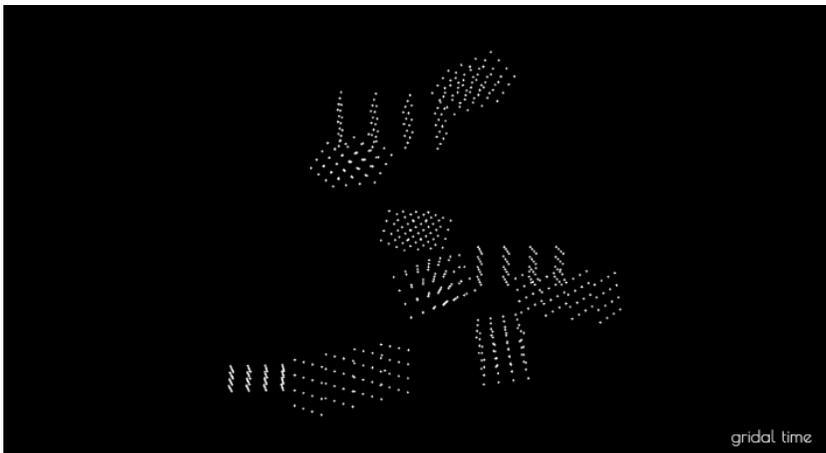
Figure 2: Gridal Time Diagram, Elif Rüzgar, 2023

Figure 2 aims to depict the possibilities of time by representing time as a grid-like fabric, unraveling its cyclical and intricate nature. Woods' representation of layered and parallel expressions of time forms a pattern that overlays without directly touching, thus opening the

window to these possibilities. Woods' illustrations express the perception of time in the following ways:

 Woods' illustrations portray time in a fragmented and layered manner, incorporating complex compositions that simultaneously represent different time frames and possibilities. These layers bring together the past, present, and future of a space, revealing the multi-dimensional nature of time. The design "Centricity (Figure 1)" focuses on different layers of time, emphasizing the fragmented perception of time and highlighting the dynamism of space.
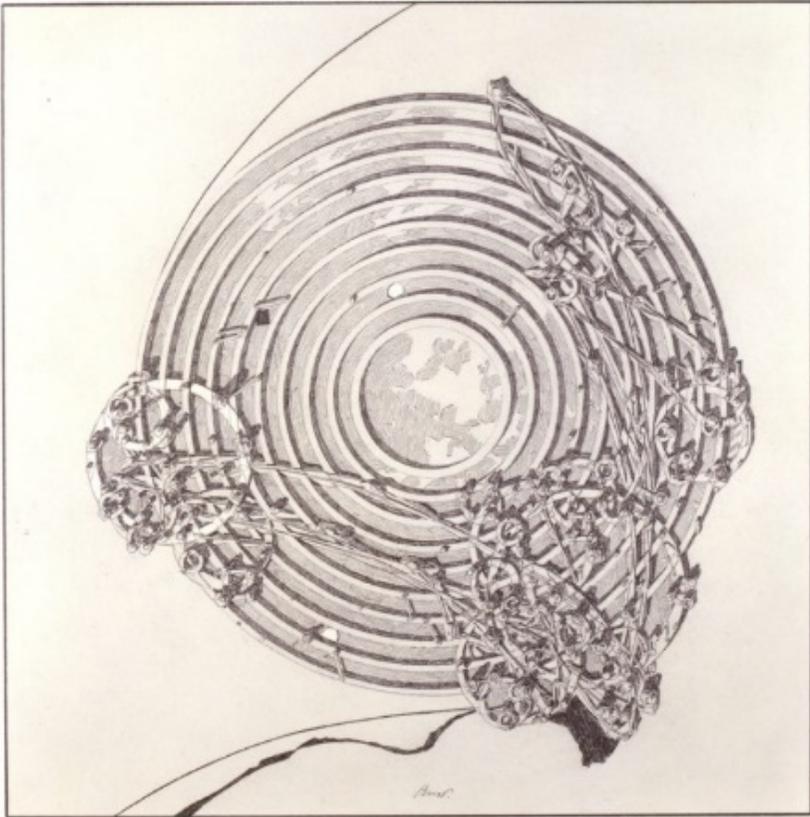
Figure 3: Lebbeus Woods, Concentric Field, from the series Centricity, 1987

According to Woods, a critical point in time is opened when an event has occurred. These points must be pioneers in shaping space. Rupture points also emerge in the creation of heterotopias. Ignoring these ruptures in urban planning leads to the artificialization of space. With a

realistic and idealistic perspective, this diagram (Figure 4) aims to reveal the time ruptures in Woods' representation, displaying the forces that compel transformation.
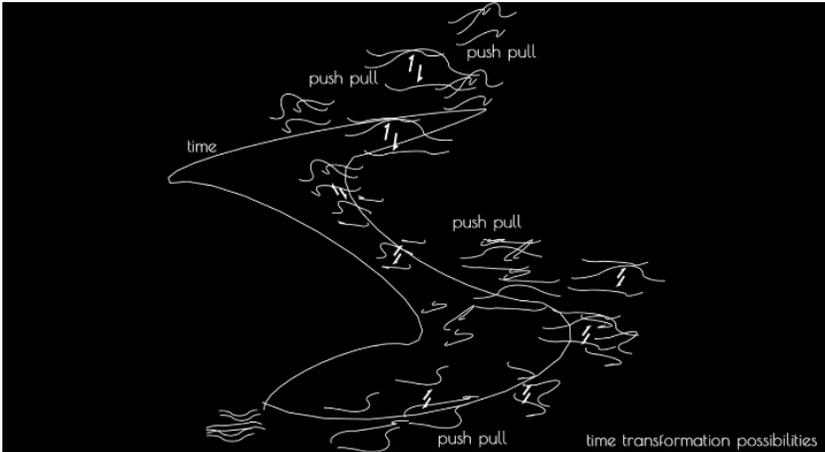
Figure 4: Time Possibilities Diagram, Elif Rüzgar, 2023

Illustrations visually narrate the progression of time and how space changes. They explain the interaction between time and space, illustrating how time influences space. The "Terrain" design demonstrates how time can alter space. Through this design, Woods visually communicates the interaction and transformation of space by time.
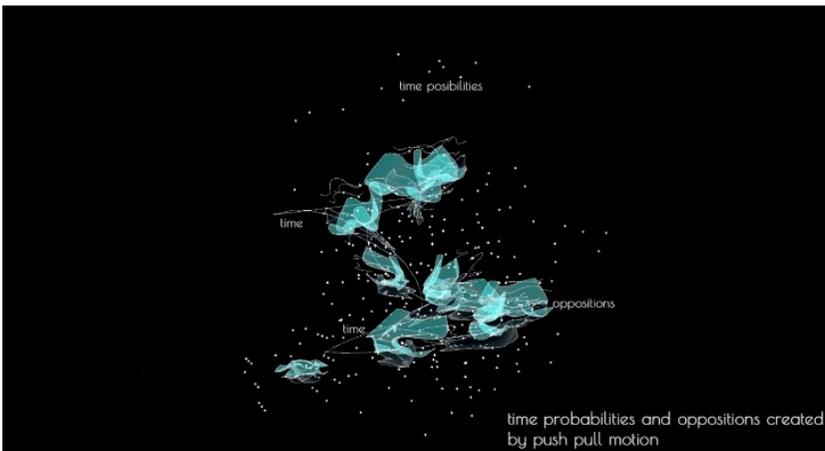
Figure 5: Time Probabilities and Oppositions Diagram, Elif Rüzgar, 2023

Figure 5 illustrates that time is now converging with the power to chart its own course. Woods' representation quest empowers this phenomenon. The cyclical perspective on time, as evident in this expression, is not limited but rather expansive. This expression reveals the movement of forces that challenge transformation.

Woods' illustrations demonstrate how spaces can appear in different time frames and possibilities. They are used to showcase the potential variations of design over time. The "San Francisco Project" design, for instance, depicts how space can change and presents various possibilities across different time frames. This design serves as a tool to visualize the potential diversity and transformation of space over time.
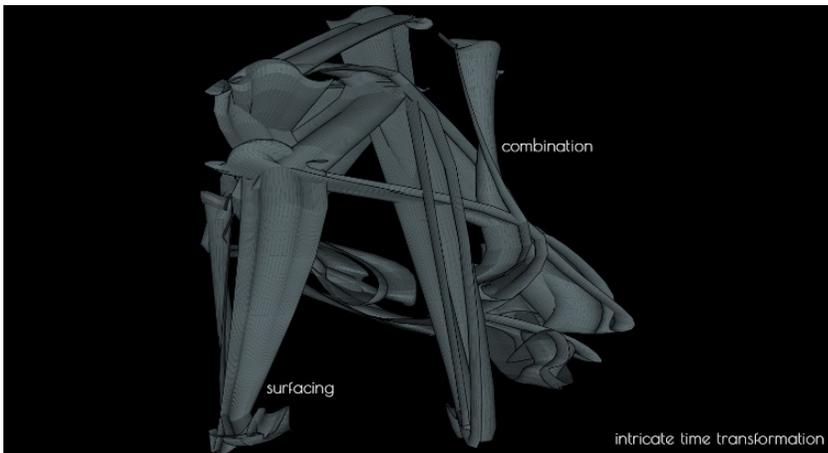
Figure 6: Intricate Time Transformation Diagram, Elif Rüzgar, 2023

Just as time can shape space, the creation of space also influences time. This representation aims to predict how time can behave in a virtually surreal context, allowing us to comprehend possibilities and create a form accordingly (Figure 6).

Woods' illustrations serve as a means to express different dimensions and possibilities of space. In this context, Woods' illustrations reflect spatial possibilities as follows:

Depiction of Spatial Interruptions and Layers in Illustrations

Woods' designs emphasize that space is characterized by interruptions and layers. The illustrations showcase the complexity and depth of space. Different spatial layers provide viewers with the opportunity to explore various facets and depths of space. The "Centricity (Figure 3)"

design illustrates the interruptions and layers of space. Woods' design captures the complexity and layered structure of space.

Illustrations portray various spatial possibilities and heterotopias. Woods explores the extraordinary and intellectual dimensions of space. The illustrations visualize different spatial scenarios and possibilities, emphasizing the potential diversity of space. "The Underground Berlin" project, for example, represents different spatial possibilities and heterotopias. Through this design, Woods explores the unconventional and diverse dimensions of space. Foucault argues that realized utopias are heterotopias. Heterotopias emerge from the chaos and complexity brought about by the perfection and singularity of utopia. This chaos necessitates the amalgamation of differences. Woods' perspective on utopian cities reveals the heterotopian foundation beneath the grid-like structures and underscores the integration of differences and chaos into a comprehensive whole.

Woods employs illustrations to demonstrate various spatial possibilities and experiences. This is used to showcase the potential diversity and transformation of space. The design "Aerial Paris" illustrates different spatial possibilities and experiences. This design serves as a tool to express the potential diversity and change of space. The concept of spatial possibilities fundamentally touches upon a system. This system is akin to the imaginative processes generated in the mind through literary lyrical indicators. In literature, we can consider any form of expression technique as a literary text, even without any written inscription. Woods' works can function as literary texts in this sense since they contain possibilities.

When analyzed within the parameters of semiotics, Woods' works reveal a connection established through contrasts. The semiotic square is an important analytical method for examining event and character narratives. According to this method, it is possible to extract concepts such as utopia, war, chaos, and transformation as contrasts in Woods' works. These contrasts strategically influence our analytical approach when creating possibilities in the mind.

The Use of Woods' Illustrations in Cinema

Lebbeus Woods' illustrations have had a significant impact on the world of cinema, influencing the cinematic expression of space and time. In this context, the relationship between Woods' illustrations and cinema can be explained as follows:

Woods' designs have influenced the way cinema portrays space and time, offering new possibilities in this realm. His illustrations have been a

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source of inspiration for exploring different aspects of space and time in the world of cinema. Woods' designs have influenced the expression of space and time in cinema. Particularly in science fiction and fantasy films, Woods' designs have inspired the creation of different spaces and time periods.
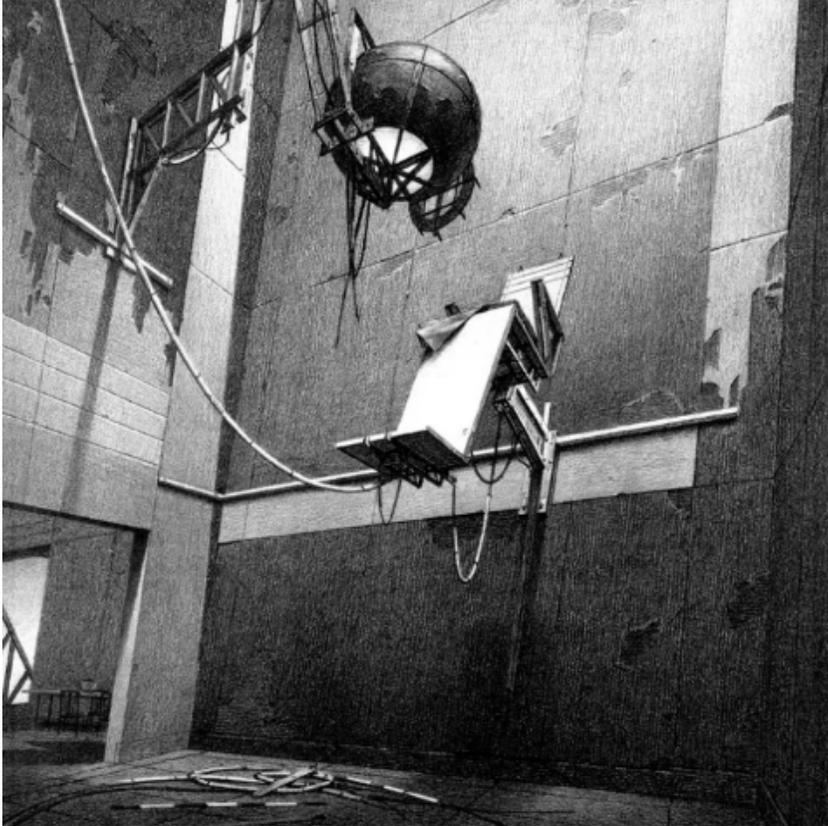

Figure 7: Lebbeus Woods, The System, New York, 1996

Illustrations demonstrate how time and space can be used in cinematic narratives, providing an understanding of how cinema exploits the complexity of space and time. Woods' designs encourage a deeper exploration of space and time in the world of cinema. Filmmakers use Woods' illustrations to express different dimensions of space and time. For example, in films like "Blade Runner," the influence of Woods' designs can be observed. These designs play a crucial role in creating depth and complexity in cinematic narratives. In the film "Twelve Monkeys," a scene featuring Woods' drawings was used (Figure 7).

Woods' illustrations demonstrate how space and time can be used in cinema. Particularly in science fiction films, scenes that depict different time periods and spaces simultaneously reflect Woods' influence.

DISCUSSION : THE RELATIONSHIP BETWEEN UTOPIA AND DYSTOPIA IN WOODS' ILLUSTRATIONS

Woods' designs express various types and elements of utopia. Some of his designs exhibit traces of an ideal world, while others reflect dystopian elements. In Woods' idealized world, life is not confined to a framed structure but rather thrives in a flow filled with concealed realities, allowing chaos and differences to govern. This convergence is evident in both ordinary modern cities and historically layered cities like Berlin. The reflection of a parallel world in his representation shows the surreal and utopian aspects, but it also presents an internalized heterotopia in the world we live in. The relationship between the body and space, as Deleuze puts it in the concept of "sieve space/body," is one of mutual influence. His intricate diagrams convey this relationship, showing the interplay between different components of space and the body. The understanding of this complexity requires the assimilation of chaos and differences into a coherent whole, which is essential for discussing architecture and designed cities.
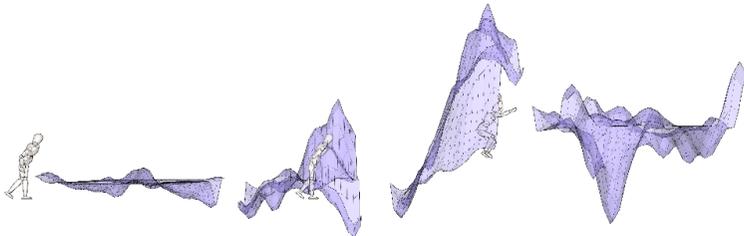
Figure 8: Deleuze's "Sieve Space/Body Relationship" Diagram, Illustrated by Elif Rüzgar, 2023

His designs showcase the possibilities of utopia and dystopia. They reflect the complexity of idealism and realism. Woods' designs reveal that space carries the potential of both utopia and dystopia, urging viewers to contemplate and question different aspects of space. For example, the "San Francisco Project" project emphasizes the freedom of space while also reflecting social tensions and conflicts (Figure 9).

Figure 9: Lebbeus Woods, San Francisco Project: Inhabiting the Quake, Quake City, 1995, San Francisco.

CONCLUSION: THE EMERGENCE OF POSSIBILITIES OF TIME AND SPACE

Lebbeus Woods, toward the end of the 20th century and the beginning of the 21st century, emerged as a prominent figure known for challenging traditional architectural norms and adopting radical design approaches. This essay examines how the possibilities of time and space emerged in Lebbeus Woods' architectural practice and how these phenomena were integrated into his design philosophy.

Several key elements form the basis of the possibilities of time and space in Woods' work. Firstly, Woods views space not merely as a physical entity but also as a dynamic entity interacting with time. He emphasizes how space evolves, and he highlights the interaction between time and space in his designs. In his illustrations, particularly through complex compositions that express different time periods and possibilities simultaneously, he reflects the layers and fragmented nature of time.

Secondly, Woods sees the design process as a journey of exploration and experimentation. He employs a trial-and-error approach to discover the possibilities of space, considering each design as a laboratory of sorts. This approach involves merging modern technologies such as algorithms and artificial intelligence to unveil how space can be bent and transformed. Designs like "Einstein Tomb" demonstrate how space can be bent and express different possibilities.

Lastly, Woods utilizes network systems and hierarchical structures in his designs. He emphasizes how different components of space are interconnected and interact with each other. This approach aids in understanding the complexity of space and its connections and helps us better comprehend the possibilities of changing spaces over time.
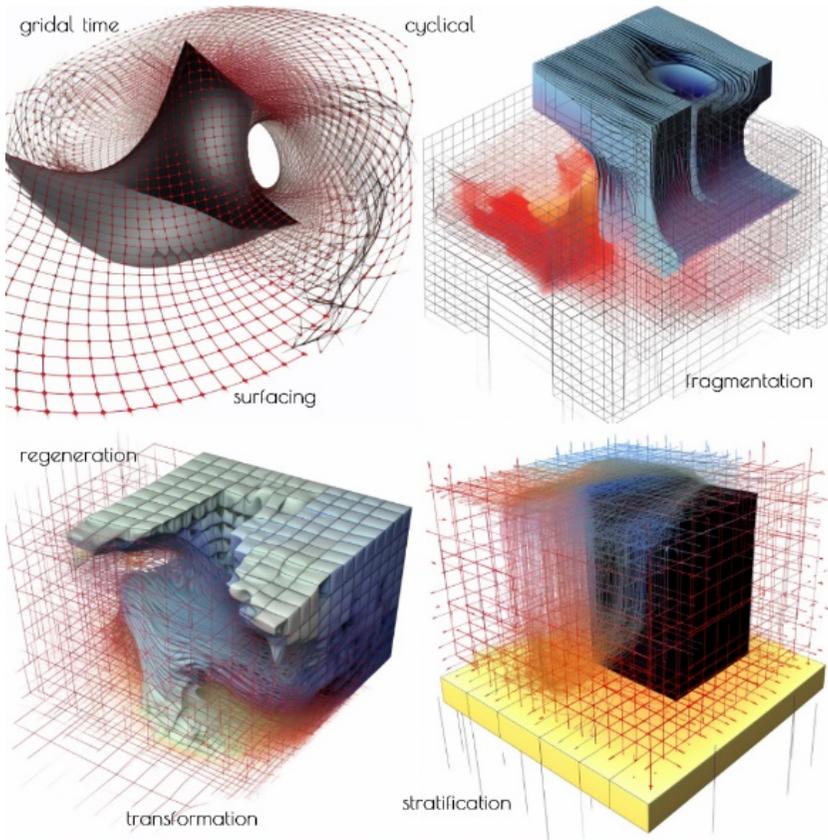

Figure 10: Conceptual Coding and Analysis, Midjourney, Elif Rüzgar, 2023

In conclusion, Lebbeus Woods' architectural practice focuses on exploring and expressing the possibilities of time and space. His designs combine the layers of time, the bends of space, and the possibilities in a complex and inspiring manner. Woods' architectural philosophy represents an approach that questions traditional norms and reveals the infinite potential of space.

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REDESIGNING WITH CLASHES: CLASH DETECTION STRATEGIES FOR EARLY DESIGN PHASES IN BUILDING INFORMATION MODELLING CULTURE

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ABSTRACT

The utilization of digital modeling, monitoring, and simulation techniques in architectural and engineering projects at a real-world scale, following a predetermined workflow schedule, presents numerous advantages to key players and users involved in the construction process. Building Information Modeling (BIM) and its associated advantage, clash detection, are of utmost importance during the first stages of design. The analysis of clash detection, which is a method that effectively identifies the overlap between spatial and three-dimensional geometric entities, plays a significant role in facilitating a feedback design approach. The process of identifying and analyzing clashes can be conducted prior to the implementation phase, so guaranteeing long-term viability in relation to both temporal and financial aspects. In the context of this work, an examination of the available literature was conducted utilizing bibliometric approaches to get insights into the theoretical underpinnings of clash detection. In the present situation, significant clusters were acquired. In the methodology section of the research, the conceptualization of the architectural design and static project design for a two-storey socio-cultural complex, spanning roughly 1200 square meters, was undertaken. Subsequently, clash detection analysis was employed. The architectural and structural concepts of this project were designed using Autodesk Revit 2020, which is one of the Building Information Modeling (BIM) tools. The process of clash detection analysis was conducted via Autodesk Navisworks Manage 2020 software. The clashes, both soft and hard, were categorized and examined based on the achieved outcomes.

Keywords: Building Information Modelling, Clash Detection Analysis, Design Error, Bibliometric Analysis, Co-occurrence Analysis

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INTRODUCTION

The successful implementation of digitalization processes holds significant value within the architecture, engineering, construction, and operations (AECO) industries. Computer-aided design (CAD) technologies and the adoption of building information modelling (BIM) practices have exerted a significant influence on both national and worldwide contexts within the facility management and construction industry. Numerous benefits of employing building information modelling approaches are used by stakeholders within the sector. Various users in the organization, including design teams, project managers, developers, investors, and field engineers, can derive advantages from the potential offered by building information modelling. Architectural design and planning processes encompass multiple dimensions and layers, necessitating collaboration with various disciplines, including civil engineering, mechanical engineering, geotechnical engineering, landscape design, and electrical engineering. Accordingly, the management of these disciplines and sub-components from a singular source is a considerable challenge. The development of industry-specific digital technologies and the establishment of effective team collaboration are highly advantageous for the construction operations. The utilization of computer-aided design tools (e.g., parametric modelling techniques) has served as the foundation for the advancement of digitalization in the field of construction, leading to the development of building information modelling methodologies. Though object-based parametric modeling is crucial to BIM, other design, analysis, control, presentation, and reporting tools can also play an integral part in BIM processes (Eastman et al., 2011). Building information modelling culture has the capacity to coordinate the cohesion between all building components (e.g., architectural, mechanical, structural, etc.) and stakeholders through virtual platforms. Furthermore, the utilization of building information modelling tools facilitates the generation and supervision of virtual digital twins of infrastructure projects such as highways, water facilities, tunnels, dams, etc., as well as superstructure projects including public housing, hotels, cultural and sports venues, etc., and industrial facilities. There are potential benefits for the architecture, engineering, and construction industries to use these BIM digital tools for a variety of purposes throughout project development phases. One of these tools is the clash detection, analysis, and prevention methods for monitoring design error occurrences. Chidambaram (2020, p.58) asserts that clash-detection procedures utilize either "rule-based or geometry-based algorithms" to analyze the model and recognize probable conflicts. Transferring digital models of the same building from different disciplines to a common environment and computing their spatial and geometric relationships in terms of

intersections and three-dimensional proximity constitutes clash detection (Figure 1). Clash detection, a parametric modeling technique that evaluates the proximity of 3d constituents in a model, can be performed by stand-alone BIM tools (Bockstael and Issa, 2016).
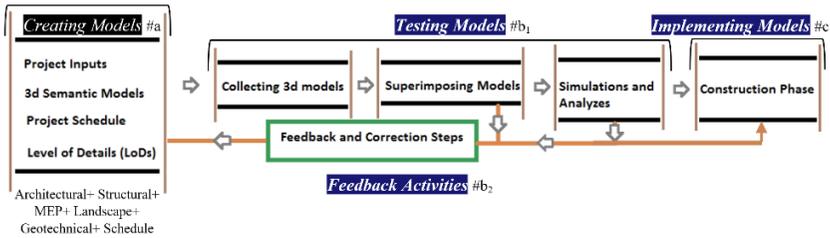

Figure 1. Building information modelling-based clash detection workflow

Clash detection analysis necessitates the inclusion of task packages. Initially, it is important to develop project models and establish a comprehensive project timeline. The initial phase encompasses several components, including the collection of project data, the development of three-dimensional semantic models that incorporate both geometric objects and qualitative data, drafting of a preliminary project schedule outlining the sequence of work packages, and the determination of the desired level of detail for the models (Figure 1). The initial stage is conducted by all project teams, including architectural, mechanical, electrical, and other relevant disciplines, with the purpose of generating models specific to each respective field. The subsequent phase involves the gathering of models from many disciplines of study. The subsequent phase involves the superimposition of the models. Subsequently, the amalgamated models are transported to alternative contexts to facilitate simulation and analysis. Given that the stages are all part of the pre-production process, it is feasible to conduct tests and simulations in virtual environments, hence allowing for the identification and rectification of design mistakes. The practical detection of clashes is encompassed within the technique employed in this study, as depicted in Figure 1. The present study involves an examination of a specific scenario, wherein a clash detection analysis is conducted utilizing contemporary digital resources. The approach employed in this analysis is thereafter presented in a diagram. This study additionally investigates the various aspects related to the architectural and structural systems of a two-story social and cultural center, spanning approximately 1,200 square meters. These aspects include design, modeling, clash detection, labeling, reporting, and comparative analysis.

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THEORETICAL FRAMEWORK

The approaches of building information modelling (BIM) provide the potential to significantly transform the design culture and, consequently, the construction phases. In contrary to computer-aided design methodologies, the utilization of building information modeling technology and its various components, including inter-systems coordination and tangible contributions to early design phases (such as clash detection, mass modeling, and early building physics analysis), holds promising benefits for numerous designers and decision makers. This study uses bibliometric tool to explore the terms of clash detection and building information modeling as discussed in the existing literature. The field of collision detection in 3D building information modeling has undergone significant advancements since its initial development in the disciplines of computer graphics and robotics (Akponeware and Adamu, 2017). Tommelein and Gholami (2012) suggest that clashes can be categorized into three distinct types: soft clash, hard clash, and time clash. Soft clash or clearance clash is a failure caused by insufficient space between components (for reasons such as "access, insulation, and safety") (Seo et al. 2012, p.306). In a hard clash, two building components occupy the same space completely or partially (Trebbi et al., 2020). Time clash, in contrast to the definitions of soft and hard clash, "includes spatial challenges to constructability or operability" (Tommelein and Gholami 2012, p.3). Besides, according to Wang and Leite (2016), the speed of the clash detection technique has been increased, and the visualization capabilities have been improved by utilizing programs, such as Autodesk Navisworks Manage and Solibri Model Checker. According to Elyano (2021), building information modeling-based clash analysis is a potential task for productivity on construction projects.

To comprehend and interpret the concept of "clash detection", which is a subcomponent of building information modelling technology, using bibliometric analysis on academic big data, the first step is defining the scope of this research's theoretical framework section. One of the objectives of this study is to understand the relationship between building information modeling and clash detection, using academic big data (Figure 2).
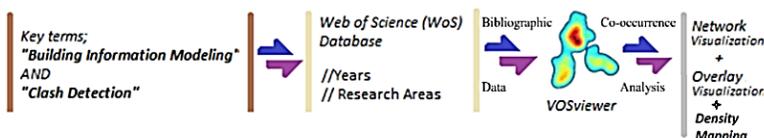
Figure 2. Bibliometric analysis path for this study

Using VosViewer (Van Eck and Waltman, 2010), a visual representation was generated to illustrate the interconnections of scholarly publications pertaining to clash detection, which were sourced from the SCI-E and SSCI databases. Initially, the phrase "building information modeling" and "clash detection" were inputted (together and separately) as search keywords within the Web of Science (WoS) database, and the resulting metadata was subsequently transferred to the VosViewer (Van Eck and Waltman, 2010) digital tool. Based on the findings of the co-occurrence analysis, it is evident that the word "Clash detection" has emerged as a prominent focus in recent scholarly investigations (Figure 3).
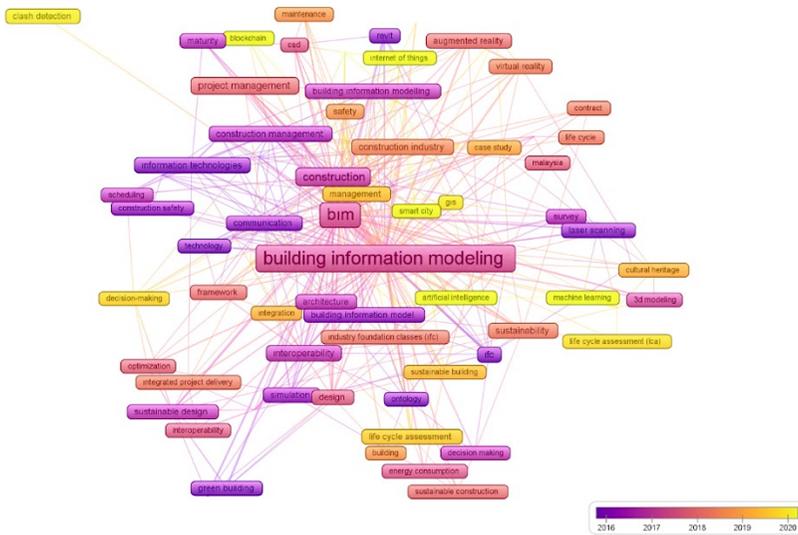
Figure 3. Results of co-occurrence analysis via network mapping

Subsequently, an analysis centered on the term "clash detection" was conducted by establishing rules, fine-tuning parameters, and implementing filters (e.g., cleaning repeating terms) within the VosViewer platform. According to the co-occurrence analysis performed on the term "clash detection," seven clusters were established, and the number of items inside each group was distributed in a non-normalized technique (Figure 4). An examination of the group components reveals that their applications are most prevalent in the sectors of construction management, information system, 4-D simulation, and design coordination. Other groupings include data visualization, perception, simulators, simulations, enjoyment, game play, and experiences.

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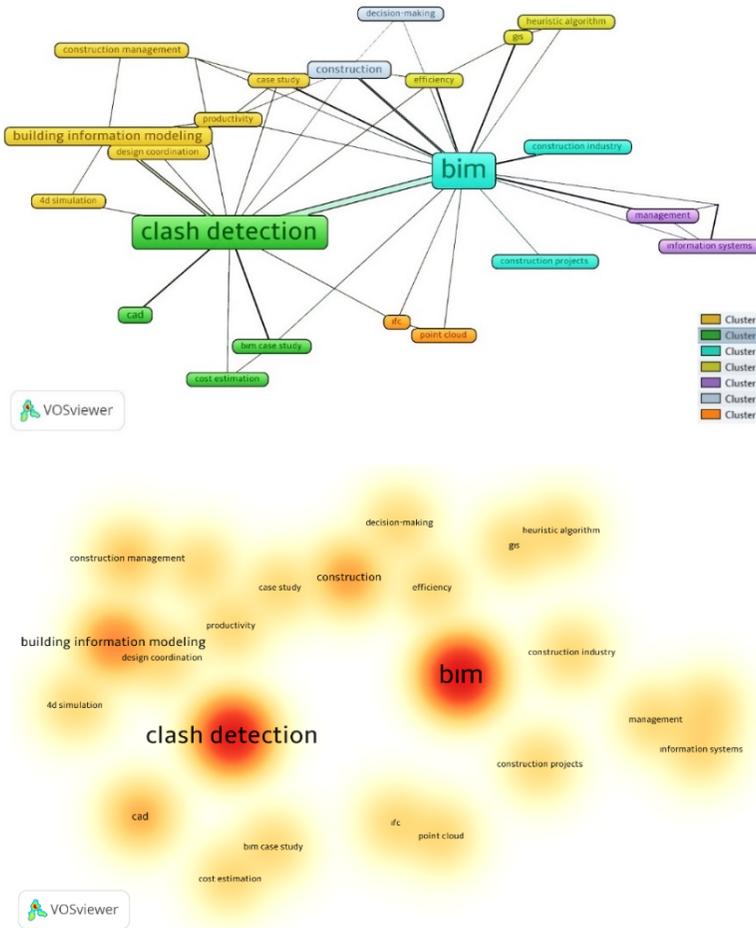
Figure 4. Results of co-occurrence analysis via network (upper) and density mapping

METHODOLOGY

A process referred to as clash detection, collision detection, or coordination must be performed on multiple BIM models to achieve harmonious coordination (Chidambaram, 2020). This study encompasses several aspects related to a two-story social-cultural institution with an enclosed space of approximately 1200 square meters, including design, modeling, clash detection (for both architectural and draft static projects), manual inspection and labeling, reporting, and comparative analysis. Initially, the requirements program was delineated, and subsequent design selections were formulated through

a collaborative manner, incorporating ergonomic and sustainable considerations pertaining to the facility. The project aims to create a novel environment that facilitates student interaction, as the current lack of designated spaces for socializing, collaborating, studying, and knowledge exchange among students is evident. The objective of this project was to include principles of sustainability into the curriculum of architecture students as well as extend its impact to the entire campus community. The proposed project is intended to be constructed on the northeastern side of the E block, which is situated at the Urla campus of IZTECH, specifically within the premises of the Faculty of Architecture. The determination of the spatial arrangement of semi-open, open, and closed areas, as well as the selection of landscape features and architectural spaces, was undertaken at the initial phase of concept design. Concurrently, an architectural model was generated using building information modeling tools (i.e., Autodesk® Revit® 2020) to facilitate the conceptual mass design and visual depiction of preliminary concepts (Figure 5). The level of detail (LoD) was established as 100 during the concept phase and increased to 300 for the final model. The proposed project's structural system, characterized by a composite form in structural terms, has been meticulously planned and modeled with a comparable level of detail.

Level	Room Name	Area (m²)	Level	Room Name	Area (m²)
ENTRANCE LEVEL (-3.00 m)	Entrance Hall	38.00 m²	SECOND LEVEL (+1.00 m)		
	Cafe & Bar	151.40 m²		Administration Office	30.43 m²
	Hall	49.28 m²		Conference Room	92.63 m²
	Multifunctional Area	101.01 m²		Entrance Hall	75.39 m²
	Stores	71.52 m²		Hall	73.46 m²
	Service Room	23.50 m²		Lecture Room	56.19m²
	Storage	32.26 m²		Medical Room	12.74 m²
	WCs	6.68 m²		Meeting Room & Group Study	30.87m²
				Office	38.04 m²
				Rest Room	4.54 m²
				Service Room	23.50 m²
				Storage	7.40 m²
				WCs	18.06 m²

Figure 5. Architectural program and proposed conceptual mass model

The final stage of the process was conducting a clash detection analysis (Figure 6). The three-dimensional geometric system was subsequently loaded into Autodesk® Navisworks® Manage 2020, utilizing the (.NWC) file format. Several research have demonstrated the contribution of this digital tool to the process of clash identification and reporting (Porwal and Hewage, 2013; Valunjkar, 2017; Kermanshahi et al., 2020). After filtering and extracting the analysis results in XML format, a thorough examination was conducted to identify and classify both soft and hard overlaps. Prior to conducting an analysis, it is necessary to establish clear and well-defined clash rules. The determination of tolerance value ranges is conducted during this stage. Besides, the precision of clash detection can be enhanced by eliminating conflicts that are no longer pertinent (Hu et al., 2019). Hasannejad et al. (2022, p.2431) posit that the present approaches to enhance clash detection precision can be classified into three key sections: "avoiding clashes, improving clash detection algorithms, and filtering irrelevant clashes." During the final phase of the project, 4-D simulation models were generated at a macro level of detail, taking into consideration schematic construction durations.
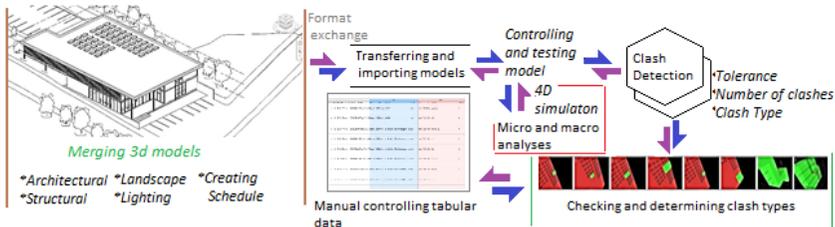
Figure 6. Workflow of this study's clash detection process

RESULTS

The verification of integrated complex digital models across all disciplines for a given building is an essential step that should be undertaken prior to the commencement of manufacturing or implementation. Clash management plays a crucial role in ensuring the consistent quality of design and mitigating the need for adjustments or rework at the construction site (Hu et al., 2021). Hence, the present study aimed to evaluate the efficacy of clash detection analysis in the context of architectural and static projects pertaining to a small-scale socio-cultural facility (Figure 7).
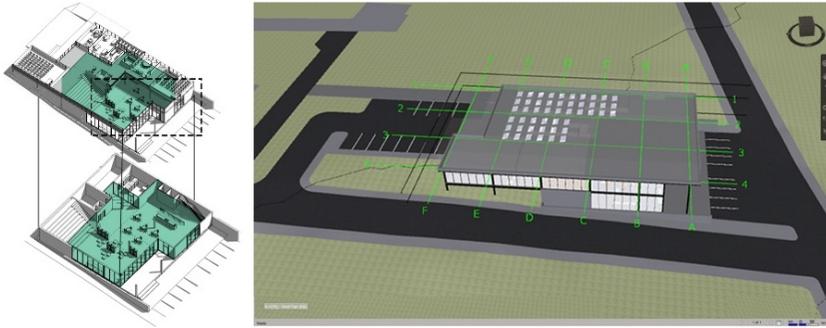
Figure 7. Preparing Integrated 3D BIM Model for Clash Detection Test

Within the scope of the study, the clash detection tests were examined in two distinct areas, namely the bottom floor and the first story. Overlap locations and items can be categorized into two main groups: architectural components, such as interior walls, span elements, objects, structural elements, including columns, beams, and slabs. Each section's soft and hard overlaps were painstakingly fine-tuned and manually regulated to ensure consistency (Figure 8).
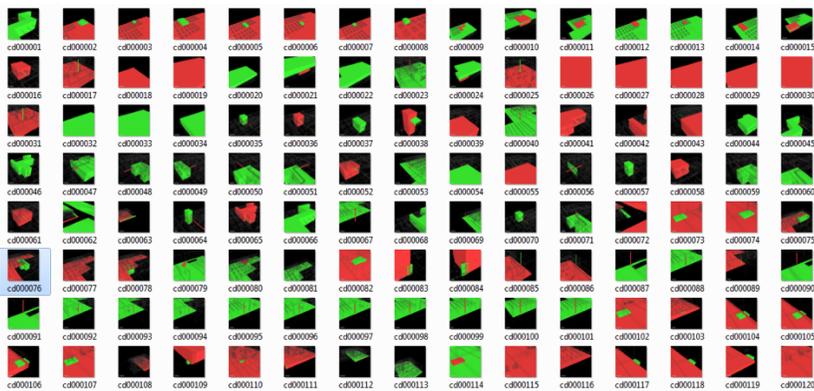
Figure 8. Preliminary Results of Soft and Hard Clashes

Based on the findings, the first floor exhibited the highest level of inaccuracy, while the bottom floor demonstrated the lowest level of error. The primary factor contributing to the higher rate of overlap on the ground floor can be attributed to the points of connection between the partition walls and the steel beams. The presence of soft overlaps has been attributed to modeling flaws, particularly those related to the inaccurate positioning of components and their interconnections with other objects. While analyzing the geometric relationships between intersecting and closely positioned pieces, it was observed that there

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were a greater number of architectural-static groups compared to architectural-architectural and static-static groups. When analyzing time overlap at the macro detail level for the BIM model, the schedule generated with schematic durations does not contain nesting.

CONCLUSION

The utilization of digital environments to produce 1:1 scale replicas of architectural and engineering projects, along with their subsequent monitoring and simulation in accordance with the workflow schedule, offers numerous benefits to stakeholders and participants within the construction industry. The utilization of computer-aided design and building information modeling tools has resulted in a pervasive demand for digital documentation within the construction sector. Virtual 3D modeling and clash detection analysis provide numerous advantages to design teams, particularly throughout the design phases of extensive projects. Primarily, it enhances the ability to predict and intervene in the architectural project, hence mitigating the likelihood of comparable challenges being encountered by other teams. The technique facilitates the three-dimensional assessment of the compatibility between architectural projects and projects from other disciplines, including static, mechanical, and electrical aspects. Hence, the presence of any potential issues related to the intersection of distinct geometric entities becomes apparent.

Clash detection constitutes a fundamental component within the building information modeling (BIM) process, enabling pre-production assessment in both field and factory settings. Clash detection analysis effectively unveils the junction between spatial and three-dimensional geometric entities. Besides, the improvement in the design-focused teams' cooperation and problem-solving approach. Spatial and geometric overlaps are a source of difficulty. The model's outcomes in this context are useful for identifying and assessing prospective clashes, as well as developing viable resolutions. Throughout all phases of the project, designers must employ clash avoidance tactics or conduct clash detection testing. Thus, as part of this study's scope, clash detection, analysis, and reporting were performed on a sample model, and the error causes were identified and reported. Throughout the design phases, there were also tests into the effectiveness of generally clash detection systems, which proved to be useful. This practice yields significant benefits in terms of cost reduction, time efficiency, and labor optimization. The present study exhibits a limited sample size, hence necessitating future investigations to encompass larger and more intricate endeavors.

ACKNOWLEDGEMENTS

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INTANGIBLE|TANGIBLE: REGENERATING CRAFT THROUGH DESIGN

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ABSTRACT

Cultural heritage embodied in traditional crafts is an integral part of the culture, economy, and society in developed and developing countries. Even though it is widely acknowledged that handicrafts have value as unique and sustainable forms of production, their preservation, promotion, and growth have been threatened by the forces of globalization and mass production. Due to the decline in interest among younger generations in traditions characterized by antiquated features, staticity, irrelevance, gender, and marginalization, weaving by women in rural communities in the United Arab Emirates has become extinct. In 2011 the traditional form of weaving known as Al Sadu was added to UNESCO's list of Intangible Cultural Heritage of Humanity in need of urgent protection. This prompts a crucial query: Could weaving's RE-GENERATION from a handcraft to a comprehensive and transferrable design form GENERATE new modes of design, making, and building, to protect it from the prospects of potential extinction?

Through the creation of a continuous woven plane that unfolds and folds throughout the space, our proposal INTANGIBLE|TANGIBLE for the United Arab Emirates' Pavilion for the Venice Biennale 2023 addressed this question and revealed the complex relationships between craft and design, material and space, and gender and making. The traditional biodegradable woven textile becomes a tangible structure when its complex forms and intricate connections are decoded as it unfolds. The proposal blurs the line between craft and design while materializing the weaver's tangibility through the noble act of making.

Keywords: handcrafts; design; culture; heritage; weaving

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INTRODUCTION

The cultural heritage manifested in traditional crafts is an integral part of culture, economy and society in established and emerging nations. We can say that every period of history and every community has its artifact and its dynamic way of transmitting knowledge that can guarantee the survival of the individual and the collective as a carrier of identity. One such artifact is the generations-old craft of weaving practiced mostly by women in rural communities in the United Arab Emirates (Figures 1-3). As an anthropological sign of the nomadic life of Bedouin culture, weaving seems to embody collective memory. Although the value of this craft as an individualistic and ecological form of production and cultural identity is widely recognized, its preservation and transformation have been challenged by the forces of mass production and globalization. The availability of cheap, mass-produced textiles has made handwoven products less economically viable. As a result, the relevance of handcraft and handwoven products in contemporary life has also become challenged.
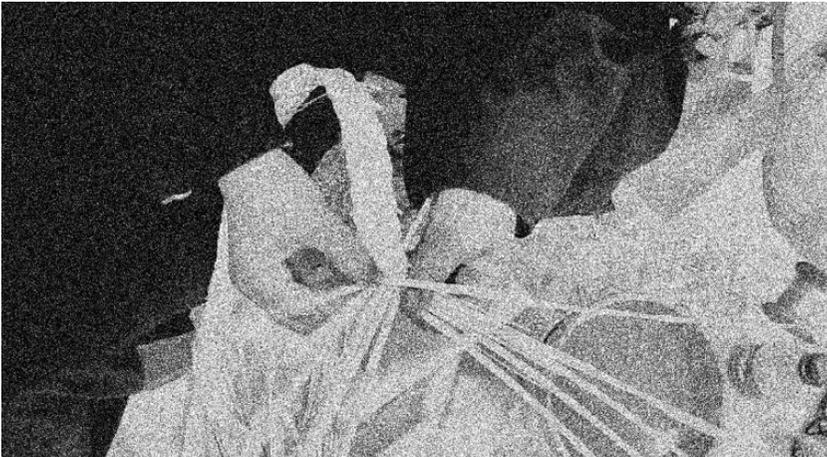
Figure 1. The Weaver

Its value as a unique and sustainable form of making continues to be reduced to decorative objects rather than exploring its potential as a design and architectural material. The decline of traditional weaving has also been influenced by changing gender roles. In the past, weaving was practiced primarily by women in rural communities. However, as women have been given more opportunities for education and employment outside the home, fewer young women are choosing to pursue traditional crafts, which are characterized by antiquated features, irrelevance, and gender marginalization. This has led to a loss

of intergenerational knowledge and skills, further contributing to the decline of traditional weaving. In addition, the perception of weaving has also changed over time, as it is no longer seen as a prestigious or valued profession in many societies.

Figure 2. Traditional Weaving of the United Arab Emirates

Figure 3. Weaving Apparatus and Cultural Heritage

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The inclusion of Al Sadu weaving (Figure 4) in the UNESCO List of Intangible Cultural Heritage of Humanity in 2011 recognized its cultural significance and the need to protect and preserve it. According to UNESCO, intangible cultural properties such as orally transmitted cultural materials, performing arts, rituals and crafts are traditions inherited from ancestors and passed on to future generations (Figure 5). Their importance lies in the wealth of knowledge that is passed from one generation to the next. The question arises however, whether the inclusion on this list is a guarantee of craft regeneration, or whether weaving can be saved from imminent disappearance through active practices with other disciplines? What are the challenges or limitations of incorporating weaving into design? How can the integration of weaving into design contribute to aspects of sustainability, overall aesthetics, and the experience of a space? How can it help promote and support local artisans and craftspeople?
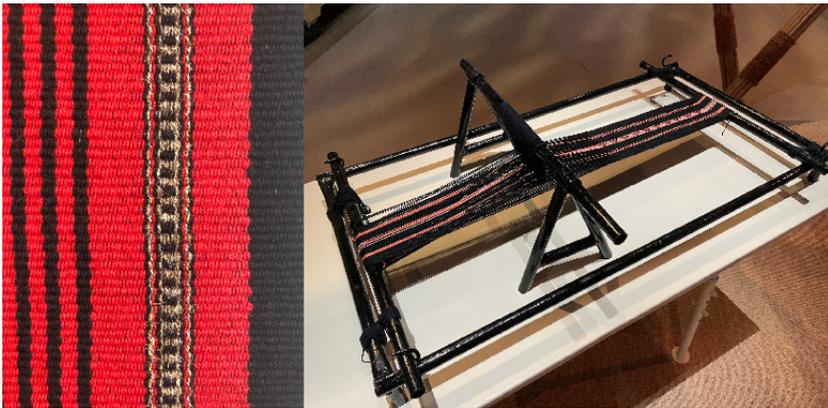
Figure 4. Al Sadu

Figure 5. Transmission of Knowledge

Theoretical Considerations

The topic of our research is significant because it highlights the challenges and limitations of incorporating weaving into the realm of design and architecture. Weaving, as a traditional craft, carries memories and cultural significance. However, when integrated into architectural design, it becomes part of a larger historical narrative and construct of identity. To explore these issues, our research builds upon the theoretical ideas of Pierre Nora and Regis Debray, as well as the analysis of two case studies leading to our proposal for the UAE Pavilion for the Venice Biennial 2023. The material research of Italian designer Paola Anziché, and the application of weaving to the exterior façade of the House of Artisans in Abu Dhabi by the firm Austin Smith Lord, examine the potential developments and advancements in the field of weaving and design, while considering how architects and designers may incorporate weaving techniques, materials, and symbolism into their projects. By studying these examples, our proposal aimed to address the challenges and limitations faced by practitioners and the implications for architectural design and cultural identity.

According to French cultural critic Pierre Nora, new links are being drawn between a respect for the past and a sense of belonging, between collective and individual awareness, and between memory and identity, as memory and history appear to be in opposition. For Nora, memory is a living and evolving aspect of individuals and communities, while history is a constructed and incomplete representation of the past.

This understanding has led to a revaluation of official historical narratives and a search for alternative perspectives and personal connections to the past. In the context of incorporating weaving into architectural design, this concept is significant because it highlights the challenges and limitations of integrating traditional practices into contemporary design disciplines. Weaving is often associated with cultural heritage and historical traditions, and its incorporation into architecture can be seen as a way to connect with the past and express local identity. However, it also raises questions regarding authenticity, cultural appropriation, and the tension between preservation and innovation.

Recent critical considerations propose that memory and identity are hermeneutic constructs aimed at "recovering" and "inventing" the past. In the text Transmitir, Régis Debray states that 'just as inheriting is not like receiving (but rather as selecting, reactivating, restating), transmitting is not transferring (something from one place to another). It is reinventing, and therefore, altering. Why? [...] The mediation's substantial character makes transmission seem like transubstantiation, a dynamic transmutation, and not just a mere mechanical reproduction that both adds and subtracts. It bears noting that memory and forgetting do not each go their way: loss is linked to the very act of recollection; alteration is the other face of preservation. Everything is preserved, it may be said, and everything is lost, and both are the same." Debray's text is significant, as it suggests that memory and identity are not fixed entities, but rather constructed and reinvented through the process of transmission. It argues that transmitting memories and knowledge is not simply a mechanical reproduction, but a dynamic and transformative process. This challenges the idea of authenticity and nostalgic historicity, suggesting that current practices of craft preservation can contribute by embracing continuous transformations and creative regenerations.

The problem of transmission is particularly evident in the context of weaving, as traditional weaving techniques and knowledge are being lost with each passing generation. In the past, weaving was not just a practical skill, but also a cultural tradition that was passed down from mother to daughter, ensuring the preservation of techniques, patterns, and stories associated with the craft. Our visit to Al Ghadeer UAE Crafts and the House of Artisans in Abu Dhabi provided valuable insights into the gender dynamics of weaving. Through interviews and observations, we learned about the techniques, role of women, and methods of production of this craft. However, we faced a challenge in effectively communicating with the weavers, which hindered our understanding of the intricacies of their craft. Nevertheless, we were able to appreciate the skill and artistry of their work through our observations. The precision and attention to detail displayed by the artisans highlighted the mastery

of their craft through the Al Sadu, Khoos, and Talli weaving techniques (Figure 6) that revealed the intrinsic properties and transformative possibilities of the materials used.

Figure 6. Traditional Weaving Types of the United Arab Emirates. Al Sadu (left), Khoos (middle), Talli (right)

Al Sadu weaving (Figure 7), for example, utilizes camel, goat hair, and sheep wool on a horizontal loom. Talli (Figure 8), on the other hand, involves embroidery with cotton or silk threads intertwined with gold and silver threads on a round cushion. Unlike these techniques, Khoos (Figure 9) is practiced by both men and women and involves weaving or braiding date palm fronds together using no other tool but the hands. The craft of weaving not only allows for the creation of tangible sustainable pieces but also facilitates the creation of human relationships.

Figure 7. Al Sadu

Figure 8. Talli

Figure 9. Khoos

Untold Stories | Case Studies

The integration of traditional weaving into architecture and design has gained significant attention in recent years. This trend focuses on creating new sustainable materials, using minimal resources, and incorporating weaving into the overall aesthetic and structural experience of a space. Designers, such as Paola Anziché, have been inspired by the weaving and dyeing traditions of the United Arab Emirates and have incorporated these influences into the production of experimental woven textiles. The House of Artisans in Abu Dhabi by the British firm Austin Smith Lord reflects upon the use of arish, a traditional weaving technique that utilizes palm fronds, to create a visually stunning, light filtering façade. Our proposal, Intangible | Tangible, for the UAE Pavilion at the 2023 Venice Biennial, explores the intricate connections between craft and design, material and space, and fabrication and structure. The proposal aimed to highlight the relevance of traditional woven handcrafts and their potential to create natural, reusable, reconfigurable, and spatial temporary architecture using local materials and resources.

The textile pieces of Paola Anziché (Figure 10), a Turin-based artist, created during her four-month stay at the Tashkeel Residency program in Dubai, investigated the intersections of tradition, culture, and nature. In partnership with the Italian brand Loro Piana, a luxury fashion brand specializing in high quality environmentally friendly and ethically sourced materials, her work incorporated a variety of materials such as wool, cashmere, silk, and lotus flower, as well as traditional local fabrics that are closely tied to the UAE's heritage. While researching traditional architecture and archaeological sites all around the Emirates, Anziché's body of work, named "Entwined Matter," investigated the hidden culture that surrounds Dubai. The artist incorporated components of the area into her textiles and fibers. For instance, she utilized spices to represent the long-standing ties and trade channels between the UAE and neighboring regions. Salt is a motif in her production, signifying both the need of desalination in obtaining drinkable water and the distinctive

desert salt lake forms (sabkha). Furthermore, the sun is emphasized in her work as an active force that unites the spices and fabrics. By bringing together traditional crafts and experimentation, the artist is creating unique and innovative pieces and raising awareness about the importance of preserving and valuing traditional craftsmanship. The collaboration with branded designs also has the potential to promote and create economic opportunities for local weavers, as their work is showcased and potentially sold by well-known fashion brands.

The House of Artisans in Abu Dhabi by Austin Smith Lord (Figure 11), serves as a prime example of how traditional techniques can be integrated into contemporary buildings, creating a harmonious blend of past and present. The building explores the use of traditional construction to weave an exterior skin made of independent woven panels attached by a simple steel frame. The woven skin not only serves as an aesthetic element but also provides functional benefits as a natural shading system that allows for the regulation of temperature and the filtering of sunlight.

Figure 10. Textile Pieces by Paola Anziché

Figure 11. House of Artisans in Abu Dhabi by Austin Smith Lord

Proposal: Intangible|Tangible

The proposal, Intangible|Tangible (Figure 12), for the United Arab Emirates' National Pavilion at the 2023 Venice Biennial, highlighted the importance of handcraft in contemporary design by focusing on weaving techniques that integrate structural properties into the design of habitable spaces. The proposal consists of a system of expandable and collapsible woven modules joined by woven hinges that transcend decorative surface and object making, to become space-defining, structural, transformable, and transportable architectural space.
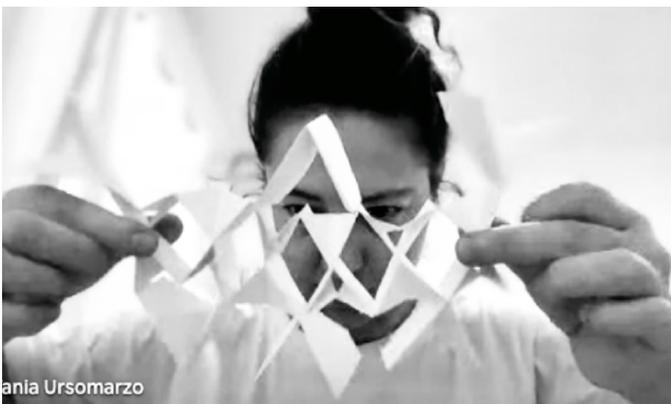
Figure 12. Intangible|Tangible Proposal: Early Study Model

Sited in the Arsenale building (Figure 13), the official exhibition venue of the Venice Biennial, the modular woven system evolved from the site's geometries (Figure 14) and the intention to design a contiguous woven skin. The innovative use of traditional materials, namely palm fronds, and the design of folds (Figure 15) into a larger woven skin creates a self-supporting module, adding spatial dimension to what would otherwise remain a two-dimensional surface. The folds in the woven skin created enclosures and openings, and acted as a filter for natural light, composing a unique play of light and shadow within the space.

Figure 13. Site of UAE National Pavilion within the Arsenale Building
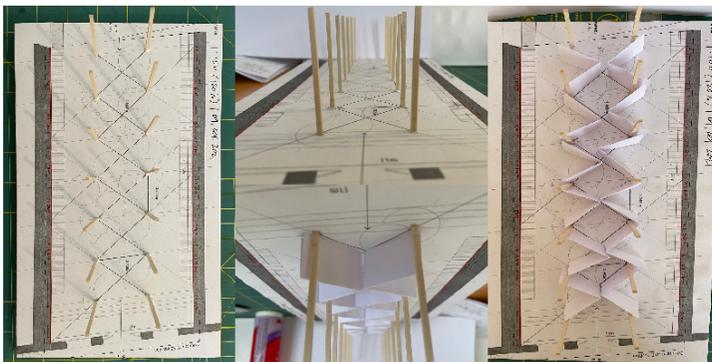
Figure 14. Studying Geometries of the Site in 2D and 3D

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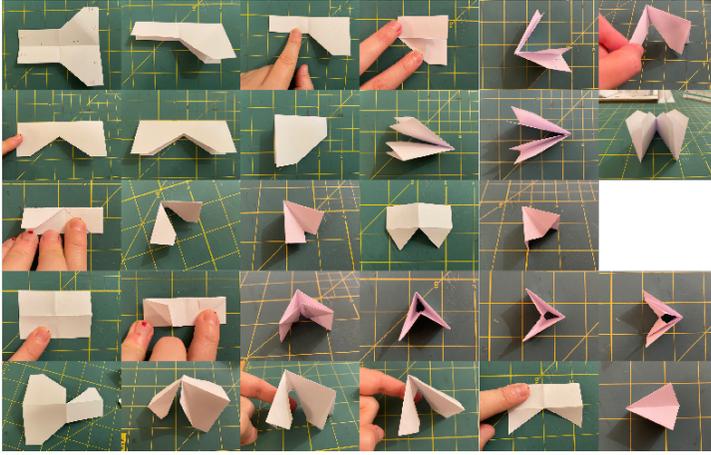
Figure 15. Development of Folded Modules

The overhead structure was formed by a central "spine" of modules, from which other modules joined and branched out into the exhibition space, interacting with the space between the columns and between the columns and the walls (Figure 16 - 17). Five final module types resulted (Figure 18); the "overhead modules" — those within the central "spine" lifted above and the "threshold modules" — those that intercept the central spine and move through the site's periphery while contacting the ground. A photographic taxonomy of the five folded modules (Figure 19) catalogues the variety of formal qualities that each unit embodies.
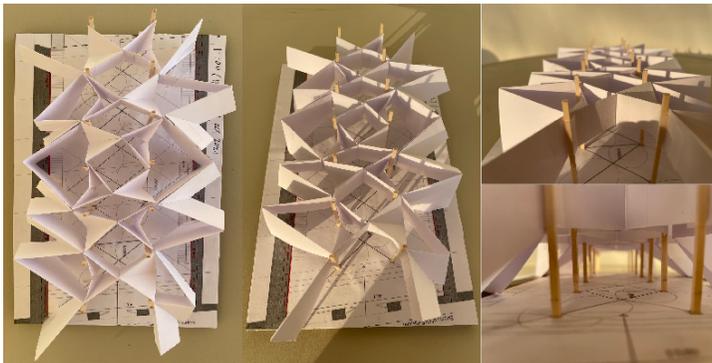
Figure 16. Model of Proposed Assembly with Folded Module Types 1-5
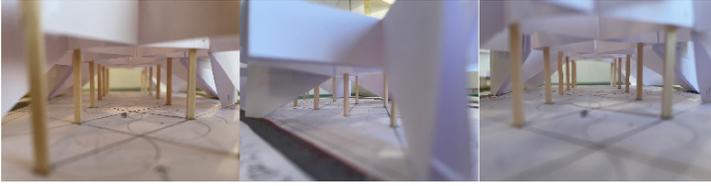
Figure 17. Interior Views of Proposal Assembly in Model
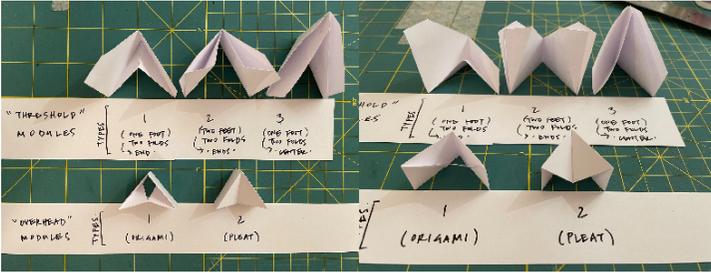
Figure 18. Final Folded Module Types

The woven modules are a type of spatial apparatus that combines form, volume, and structure and allows for independent deployment across the exhibition area without the need for additional support. This allows the woven modules to unfold, fold, rotate, pivot, connect to other modules, and be reconfigured freely.
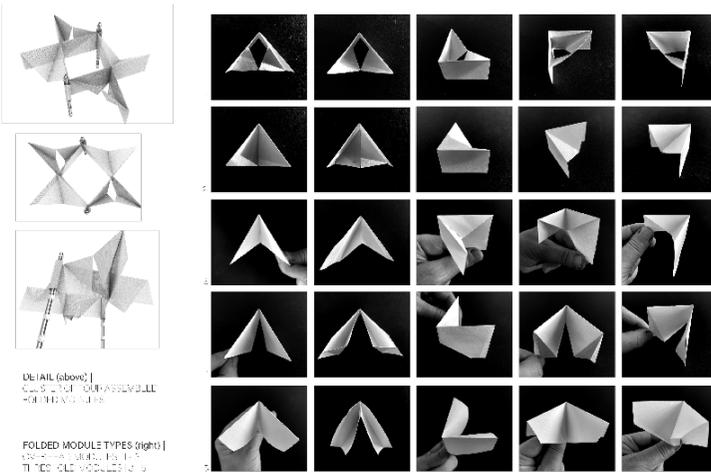

Figure 19. Taxonomy of Five Folded Modules

Overall, the modular woven system transformed into a three-dimensional spatial experience that allowed visitors to move freely between a realm of overhead folded planes and a mapping of mobilities marked on the floor (Figures 20 – 26).

Figure 20. Plan of Final Proposal
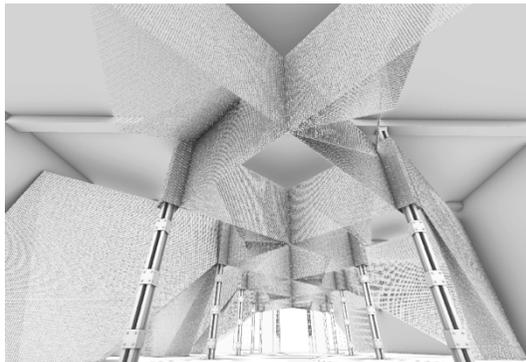
Figure 21. Interior View of Final Proposal
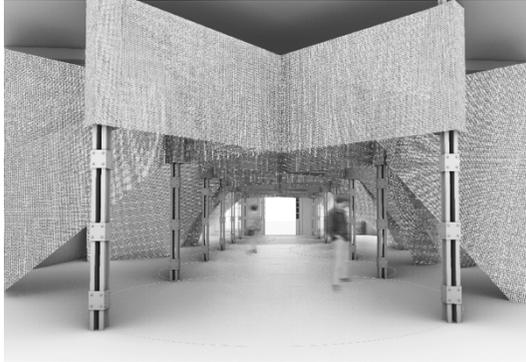
Figure 22. Interior View of Final Proposal

Figure 23. Interior View of Final Proposal
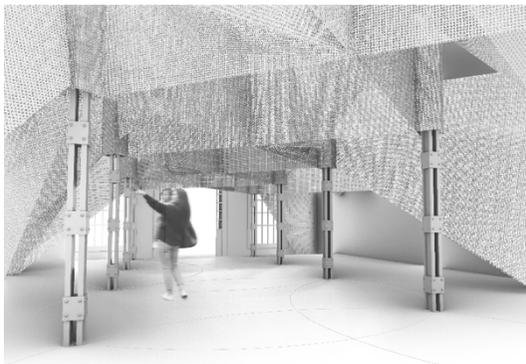

Figure 24. Interior View of Final Proposal
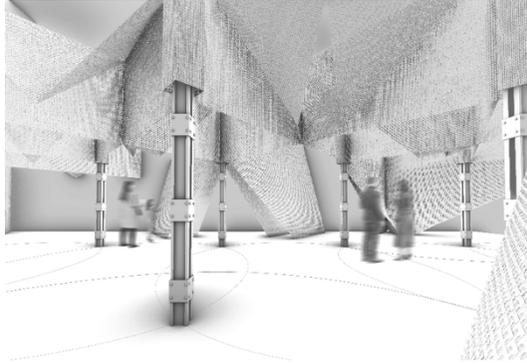
Figure 25. Interior View of Final Proposal
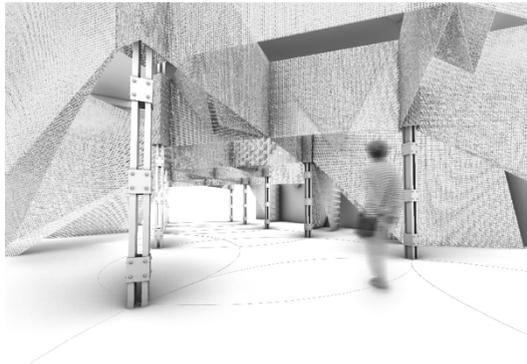
Figure 26. Interior View of Final Proposal

CONCLUSION

The interaction between the permanence of the existing historic space and the space of the temporal woven folds created a synchronous environment that blended the traditional with the contemporary, convention with invention, and degeneration with regeneration. The use of locally available natural biodegradable materials together with the process of weaving and assembling, reflects Immanuel Kant's idea of the sense of touch as a vehicle that ensures the reality of an object and gives an account of its truthful being. The proposal is an attempt to reconcile design and craft with the juxtaposition of generations, geographies, and traditions through the creation of a spatial apparatus capable of solving global problems such as shelters for refugee camps or areas of natural disaster and war.

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DESIGN

HOUSING FROM PAST TO PRESENT: APARTMENTS AND MIXED USE BUILDINGS

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ABSTRACT

The modernization movements that started all over the world in the 19th century also affected Turkey. The proclamation of the Tanzimat Edict and the recognition of some rights to non-Muslims living within the borders of our country led to changes in housing architecture, society's lifestyle, shelter culture, etc. in many cities, especially in Istanbul. While entering the 20th century, Ottoman residential architecture began to give way to apartment buildings produced by non-Muslims. It is possible to see the western influences intensely on the facades and plans of the first apartment examples built in the Galata and Pera (Beyoğlu) regions of Istanbul. Many reasons such as industrialization, worker migration from the village to the city, fires in that period, earthquakes, the proclamation of the Republic, the change in the family structure living in the residence, the change in the role of women in the society, and the zoning movements have triggered the spread of apartment-type houses in our country. The apartments, which started to be produced for the elite as a step of modernization, have become the most important building type that meets the housing needs of people from different income groups in time, either by private entrepreneurs or by bodies created by the state. With the start of apartment building, the production of multi-storey housing continued to increase, and new housing types emerged in big cities, depending on the needs of the increasing population and income distribution, starting from the middle of the 20th century. According to Görgülü and Koca (2007), housing and housing styles have taken their present form by going through a system that has been changed by many inputs such as social life, economic developments, and political relations. The apartments, produced with different presentation styles over time, have diversified from cooperative residences, closed security complexes, to luxury multi-storey housing such as residences, to mixed-life concept residences. In this paper, the phenomenon of renewal in architecture will be discussed through the diversification of apartment-type houses depending on today's needs. A general review will be made on the historical development of the

apartment in Istanbul, where it was first born in Turkey, and on mixed-use residences, which is a new apartment format today.

INTRODUCTION

In Turkey, apartment type residences were first used in the 19th century. It was seen in Istanbul at the end of the year, diversified over time and became widespread throughout Anatolia. Apartment-type houses, which are multi-storey housing structures, have evolved in the direction determined by the needs, with the change in construction techniques. The change has been in the form of mass, facade design and planning. These changes were triggered by social, cultural, political, demographic and economic changes in the society. The article aims to examine what kind of a change process the apartment-type houses have gone through from the past to the present. Influence of Turkey by the modernization movements that started in Europe in the 18th century, found the second half of the 19th century. The European travels of Abdülmecit, who was at the head of the Ottoman Empire, and the commercial agreements made with the west had a large share in this (Uludüz, 2014; Tanyeli, 2000). With the declaration of the Tanzimat Edict in the 19th century, some privileges were granted to non-Muslims living in our country. They started to carry western influences to the regions where they settled heavily, and the understanding of architecture and housing was also affected by this situation. Istanbul, the capital of the period, has become a place where political and cultural influences from the west are seen intensely. Western influences continued until the abolition of the rights granted to foreigners by the 1923 Lausanne Treaty. After that, with the proclamation of the Republic, modernization movements continued in our country (Barkul, 1993). With the Tanzimat, the western understanding of municipalism was also taken as an example. In Istanbul, in 1855, the Sixth Department Municipality was established in Galata and Beyoğlu (Uludüz, 2014; Es, 2008). The changes in the zoning movements have affected the city and the housing space. Different types of housing have emerged from the traditional Turkish housing type. These are houses such as mansions, suburban houses in gardens, row houses, and apartments (Erol, 2011; Bilgin, 2002). Apartment building started in Galata and Pera regions of Istanbul, where non-Muslims were concentrated, and then spread to Kadıköy - Yelmişi, Moda, Laleli, Aksaray regions, in this period when modernization and interaction with the West began to show itself within the borders of Turkey. The change in furniture over time has been added to the change in housing type and planning. The break from the traditional

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understanding of housing took place gradually, but the spread of apartments was relatively faster. In this study, the process of apartment building in Turkey from its first emergence to the present will be analyzed by dividing it into five periods:

- End of 19th century - beginning of 20th century
- Republican period
- Period between 1940-1950
- The period between 1950-1980
- The period after 1980

Late 19th Century – Early 20th Century

In this period when early apartment housing examples were seen, 2-3-storey apartments were built in accordance with a single large family, where the ground floor was a workplace and the owner and his family lived on the upper floor. Located in Beyoğlu and still in existence today, Decugis House is one of the first apartment examples (Figure 1). It was built in 1895 by Alexandre Vallaury for the Decugis family. The ground floor is a shop and it was built on 3 floors. Later, 2 more floors were added to the structure. It has been evaluated as a hotel since 1987 (Görgülü, 2016; Can, 1993). When the plan is examined, it is seen that there is one housing on one floor. It is seen that there is a distribution from one hall to other rooms.
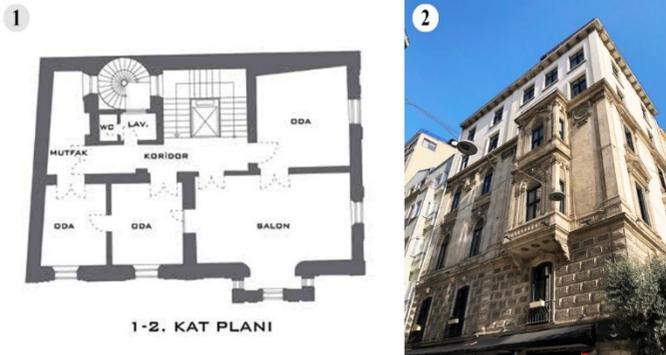

Figure 1. Decugis House, today's Galata Hotel, Beyoğlu
Floor plan (Görgülü, 2016), 2. Appearance (URL-1, 2022)

Another surviving example of the first apartment buildings is the Botter Apartment, which was built in 1900 by the Italian architect d'Aranco for the palace tailor Botter and his family. The building is also known for its features such as being the first Art Nouveau style building built in Istanbul, being the first apartment building in Turkey to use steel construction, and

being the second building with an elevator after the Pera Palas Hotel. The building, which was restored by the Istanbul Metropolitan Municipality, was reopened in 2022 as an Art and Design Center under the name of Casa Botter (URL-2, 2022; Görgülü, 2016).

Figure 2. Botter Apartment, Beyoğlu
Cumhuriyet Dergi, 2001 2 ve 3. (URL-3, 2022)

Row houses built in the late 19th century are a type of housing that accelerated the transition to social housing. It was generally built to provide income for a foundation and appealed to the middle income group. Akaretler (1875), which means "residences that generate income" and was built for the employees of Dolmabahçe Palace in Beşiktaş, was built to provide income for the Aziziye Mosque that was planned to be built in Maçka (Figure 3) (Kılıç, 2009; Kuban, 2007, p.554). Similarly, Surp Agop Church Social Residences (1890) in Harbiye (Kılıç, 2009; Sakaoğlu, 1994, vol:1, p.281) are row houses built to provide income for the Surp Agop Hospital Foundation (URL-4) (Figure 3).
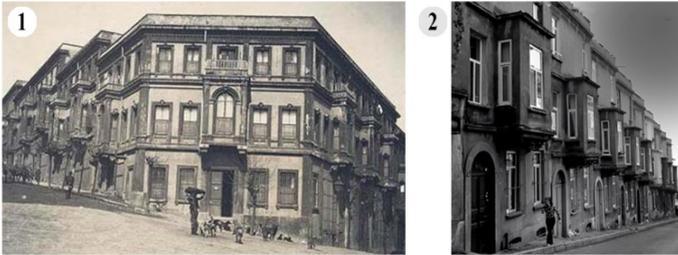
Figure 3. Examples of row houses built in Turkey in the 19th century
Akaretler, Beşiktaş (Kuban, 2007, s:554)
Surp Agop Houses, Elmadağ (URL-4)

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Later, with the shrinking of the Turkish family structure, more multi-storey apartments with flats were started to be built for collective life, with housing units appealing to the nuclear family. In addition, apartments with a courtyard in the middle and a large number of housing units on one floor have been built in the form of mass housing. Doğan Apartment (Naib Bey Apartment), built in Galata in 1893, is one such example (Figure 4). This building, built by a Belgian banker family, has a courtyard in the middle and has a plan with two entrances. On the façade, there are decorations in Baroque style and french balconies (URL-5).
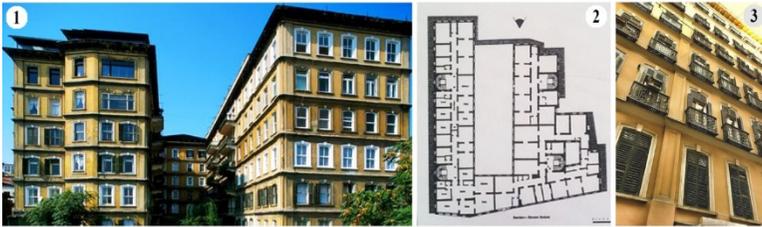

Figure 4. Doğan Apartments, Galata Appearance (URL-6, 2022)Plan (Mutdoğan, 2014; Öncel, 2010, 404)facade detail (URL-7, 2022)

In Figure 5, there is a housing plan diagram of Doğan Apartment. It is seen that there is a distribution from the sofa space to all the rooms, and in the plan in Figure 4, there are direct transitions from one room to the other at the intersecting edges of the rooms.
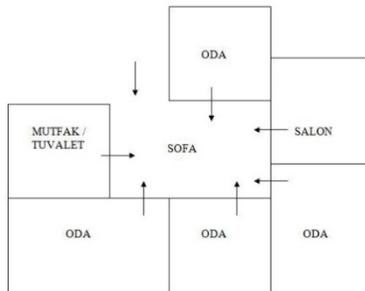

Figure 5. A housing plan scheme in Doğan Apartment (Mutdoğan, 2014)

The following images were taken from a real estate page to observe the transitions between rooms in Doğan Apartment, which still exists today and continues to be used as a residence (Figure 6).

Letafet Apartment in Şehzadebaşı, another example of an apartment building, is a mansion built at the beginning of the 20th century (Figure 7). The building, which hosted Darülbedayi, the core of the city theaters in 1914, was demolished at the end of the 1950s (Kılıç, 2009).

Figure 6. Photographs from inside the Dogan Apartments (URL-9, 2022)

Figure 7. Letafet Apartments (Kılıç, 2009; Sakaoğlu,1994, vol: 5, p:203)

As can be seen, in the examples of the first period, there are houses that appeal to a single family + apartments with workshop / shop use on the ground floor, multi-storey multi-dwelling apartments with courtyards suitable for collective life, and mansion-type apartments. Because these first apartments were built by European architects, they have very similar

façades and planning features to their western contemporaries. After these first examples, it will be looked at what processes the house went through and what kind of change it went through as of the 20th century in Turkey.

Republican Era

Apartment-type houses started to become widespread in Anatolia during this period, and this spread was parallel to the transportation possibilities of the cities. First of all, apartment buildings started to be built in cities with ports and railway lines (Bilgin, 1992; Mutdoğan, 2014). The change of users has started to change the residence as well. The transformation of house users into nuclear families has caused the rooms in the house to be private. In this period, the wet area, where the bathroom and toilet are located, was included in the housing plans. In the Republican period, the change in the residence was also reflected in the furniture in the space. Fixed furniture in the traditional house has been replaced by movable furniture specific to the person and function (Mutdoğan, 2014). Apartments for collective living were built by Turkish architects by the central government. It is possible to see that western influences continue on the facades of these structures. Tayyare Apartments in Laleli, built by Architect Kemaleddin Bey, is one of the first examples of mass housing in our country (Figure 8). The building, which was built in 1922 for the shelter of fire victims, is Turkey's first reinforced concrete structure. It is still standing today and is used as a hotel (Görgülü, 2016; URL-8, 2022). In the mass housing structure consisting of 4 blocks, each block has a gallery within itself, and there is a courtyard between the blocks. Looking at the plans, it is seen that the transitions between the rooms are also present in this example.
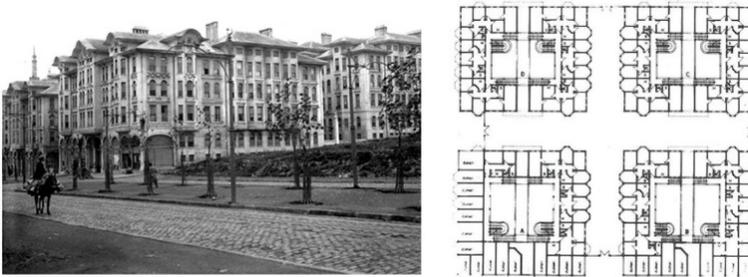

Figure 8. Tayyare (Harikzedegan) Apartments, Laleli (URL-9, 2022)

Again, in 1922, Maçka Palas was built by Mongeri in Teşvikiye (Figure 9). It is a row house formed by placing 4 blocks with 2 flats on each floor in an adjacent order. At that time, all construction materials for this project

were brought from Italy. Maçka Palas, which was transformed into a bank's administrative building by making renovations over time, is used as a hotel today (Görgülü, 2016; Anon, 1995).
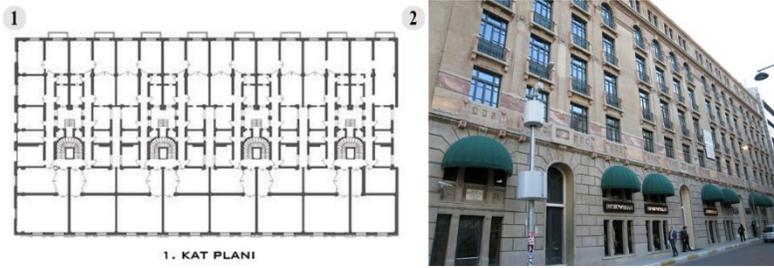

Figure 9. Maçka Palas, Teşvikiye Floor plan (Görgülü, 2016) Appearance (URL-10, 2022)

The spread of apartment buildings in Anatolia coincides with the period after the proclamation of the Republic. In this period, apartments were built by wealthy people and rented out to generate income. These houses, which are called rental apartments, have a different appearance from the early period apartment examples (Figure 10). Considering the first apartment examples with artistic value and eclectic façades, it is seen that with the increase in the need for housing, apartment building has begun to become more and more simplified and standardized.
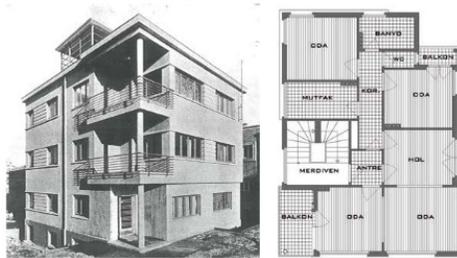
Figure 10. Facade and plan of Osman rental house in Ankara (Anon,1937)

When we look at the apartment houses of the late 19th - early 20th century and the Republican period, it is seen that reinforced concrete and steel constructions were used. Western influences in the facades and plans of the first apartments whose architects were European, were later applied by Turkish architects. Until population growth required faster housing production. By the 1940s, a period in which the appearance characteristics of apartment houses changed significantly,

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aesthetic concerns remained in the background, and rapid and rapid housing production came to the fore.

Period Between 1940-1950

In 1937, the state started to play a role in housing production, and for this purpose Emlak Bank Ltd. Sti. was established. Memurin Apartments, completed in 1945, is the first project realized by the government (Figure 11). There are 145 flats in the structure designed as a low-rise row house, and it is seen that it bears traces of Turkish House architecture on its façade (Görgülü, 2016; Güvenç and Işık 1999).

Figure 11. Memurin Apartmanları (Görgülü, 2016)

The need for housing has increased due to reasons such as increased migration to big cities and natural disasters, and housing production by the state has become insufficient (Görgülü, 2016; Tekeli, 2012, p:23-26; Mutdoğan, 2014). Three different types of housing production emerged in the 1950s:

- Build-to-sell production style
- Illegal building production (slums), which enables people who do not have financial means to acquire housing and which has increased as a result of immigration to Istanbul, especially after 1960.
- Cooperatives that emerged to meet the housing needs of groups with regular income (Bilgin, 2006).

The break from traditional housing took place in this period. In this period, when conservation rules had not yet been established, wooden buildings were demolished and build-sell apartments were built in their place. In short, during this period, apartments that were far from ostentatious and aimed at meeting the housing needs were built.

1950-1980 Arası Dönem

With the involvement of the private sector in the industry, the factories increased, which brought the need for cheap labor and labor migration to the city. People who came to the factories for the purpose of working started illegal construction in the areas where they worked, and slums were built. The Ministry of Construction and Settlement was established in 1958. In 1966, the Property Ownership Law came into force. With this law, the flat owners became the real owners of their houses instead of owning shares on the land of the house. Slum structures were also legitimized (Şenyapılı, 1996, p:347; Bilgin, 1992, p:83; Mutdogan, 2014). Yap-sell apartments, on the other hand, were built to meet the housing need quickly. In this type of housing, it has been important to produce and sell affordable housing rather than the use value of the house. The build-and-sell apartments are similar to each other, and since the user is determined later, they do not have any say in the housing planning and material selection (Figure 12) (Kıray 1998; Görgülü, 2016).

Figure 12. Mosaic covered build-and-sell apartments built in the 1960s around Kadıköy, 2014 (Görgülü, 2016)

In this period, some experimental structures for collective housing production were also built. The Lawyers' Complex, built in Şişli in 1961, is one of these structures (Figure 13). Designed by Haluk Baysal and Melih Birsel, there are 66 apartments on 12 floors, and there are also mezzanine apartments as seen from the front. Mezzanine flats are used for commercial purposes, and there are social areas on the roof. It is known that this project was inspired by Le Corbusier's Unité d'Habitation project in Marseille, both philosophically and physically (Figure 14). (Görgülü, 2016; Mutdoğan, 2014; URL-11, 2022).
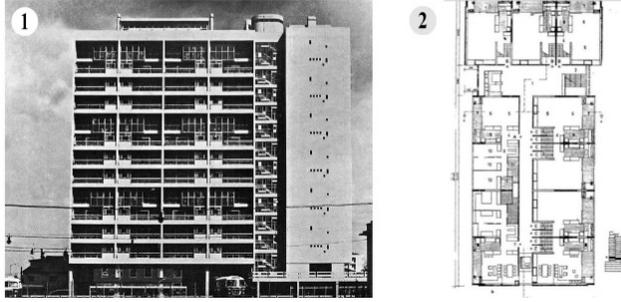
Figure 13. Hukukçular Site, Şişli
Appearance (URL-12, 2022)
Floor plan (Sözen, 1984, s: 313-314; Mutdoğan, 2014)

Figure 14. Unité d'Habitation, Marsilya (URL-13, 2022)

In Figure 15, there is a 3+1 single storey residential plan type of this project. Looking at the planning, it is seen that it is quite similar to the housing plans made today.
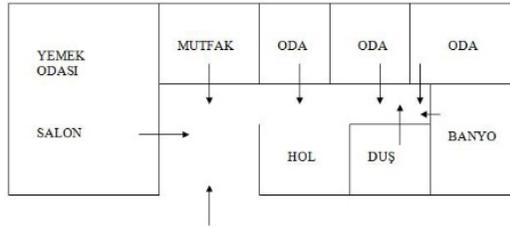

Figure 15. A single-storey residence plan scheme in Hukukçular Sitesi (Mutdoğan, 2014)

The economic situation of the country affects the production style and amount of housing as well as many products. With the economic crisis in 1973, mass production was stopped and production was started on

order. The advertising sector has started to develop for the sale of the remaining mass production products (Görgülü and Koca, 2007). In short, it is seen that during the 1950-1980 period, build-and-sell apartments became widespread, illegal construction increased and slums became legal, and some experimental building examples for collective life were implemented. Cooperative housing, on the other hand, will become widespread in the period after 1980.

Period After 1980

After 1980, build-and-sell practices continued, paving the way for larger-scale housing projects. It was aimed to make low and middle-income people homeowners, and large-scale projects were encouraged with the enactment of the Mass Housing Law in 1984. The state hand (TOKİ), cooperative unions and municipalities have built self-contained systems that are closed to the outside, secure, and have opportunities such as shopping-sports-social facilities in the newly developing areas of the city (Erol, 2011; Mutdoğan, 2014; Görgülü, 2016). Satellite cities with a wide range of housing offerings were built. Bahçeşehir and Ataşehir, built with the initiative of Emlak Bank, are important examples in this regard. Due to reasons such as the lack of sufficient land area for large-scale projects in the city center and the high land prices, the private sector also turned to empty and large lands in the city periphery in this period. Sites consisting of low-rise blocks and villa-type houses with gardens were built that appeal to the upper income group (Görgülü, 2002). In the period after the 1999 earthquake, the slum areas in the city began to be renewed with urban transformation, improvement and gentrification projects. Thus, large areas were obtained for large-scale projects in the city center, and mixed-use projects, multi-storey and multi-functional residence blocks were started to be built in these areas. These transformations in the city have also brought social changes, as they have also changed the housing users. The development of technology and the diversification of construction materials have caused construction companies to show themselves with multi-storey sculptural buildings in the city center and to ensure their prestige with the ostentatious facades of their projects. Multi-storey building groups have begun to be built, which combine uses such as offices, residences, shopping malls, entertainment centers and hotels. The buildings in the office towers, where the banks and companies' headquarters are located, have started to form new centers in the city center. Büyükdere Street, located on the Maslak - Zincirlikuyu axis in Istanbul, is one of these important focuses (Figure 16). (Yüksel, 2010).

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Figure 16. Plazas District, Levent, İstanbul (URL-14)

The change in the concept of privacy in society has also changed housing. While some spaces were added to the house, some were decreased. For example, the use of sofas was removed from planning, and with the shrinkage of residential areas, the use of open kitchens began. The house has ceased to be a closed living space, and its connection with the external environment has been strengthened thanks to large window surfaces and open space usage (Mutdoğan, 2014). The dissolution of many housing units on one floor in houses intended for collective living has caused the houses to become narrower. This has necessitated the increase of social environments that allow spending time outside the home. Thus, concept projects that serve the residential environment and work like a business began to be carried out (Bilgin, 2006).

New Housing Types

Due to reasons such as expensive land prices in the city center and limited vacant land, multi-storey housing blocks have begun to be built on small parcels. In this section, mixed concept projects and residences, the first examples of which were encountered after 1990 and which have become widespread today, will be mentioned. The prominent feature of the residence type, which appeals to high-income young people who want to live in the city center, is that it provides various services to its users in the comfort of a hotel. These buildings mainly serve as accommodation functions, and side functions include shopping, entertainment, sports centers and office spaces. Residences offer their users a variety of residential and office plan types, and can have different plan schemes for each plan type. Users are not disconnected from the visually and socially vibrant city life. Mixed concept projects, on the other hand, are formed by the combination of building units that have different functions and capacities and appeal to different users. These structures form a system and composition that is unlike any other structure (Derman, 1989). Since many functions that can be found in the

city center or in a traditional neighborhood environment can be found together in mixed-use buildings, it can be said that these buildings are a scaled-down city center model. The first mixed concept projects and residence towers in Turkey were built in Istanbul in the 1990s. In this respect, it is possible to say that Istanbul is the place where the first examples of new versions of apartment buildings have been seen since the first period of apartment building. The Akmerkez project, built in Etiler in 1993, is the first mixed concept project in our country, combining 2 office blocks, 1 residence block and a shopping center with 175 stores (URL-15) (Figure 17).

Figure 17. Akmerkez, Etiler, İstanbul (URL-15, 2022)

Süzer Plaza, which was started to be built in 1987, was completed in 1998 due to various legal obstacles, is one of the first examples of tower type residences in Turkey (Figure 18). The building, which was opened for use in 2000, consists of 41 floors. The building, which rises in the form of a single tower, has offices, hotels, residences, movie theaters, restaurants, shops, ball and invitation halls, and 5-storey skyscrapers at the top (URL-16).

Figure 18. Süzer Plaza, Beşiktaş, İstanbul (URL-16, 2022)

Mixed-use concept building groups and residence-type houses started to become widespread throughout Turkey in the 21st century and

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increased in number. The Zorlu Center project, implemented in Beşiktaş, Istanbul in 2014, was designed by Emre Arolat and Murat Tabanlıoğlu. It is one of the current examples of mixed-use buildings and is actively used. The project includes a residence, a shopping mall, an office, a hotel (Raffles Istanbul), a performing arts center (Zorlu PSM) and a town square (Figure 19) (URL-17, URL-18).

Figure 19. Zorlu Center, Beşiktaş (URL-17)

The Sapphire project can be mentioned as one of the current examples of tower type residences. Sapphire, whose construction was completed in Maslak in 2011, contains residence, shopping center and entertainment center functions in a single block (Figure 20) (URL-19).
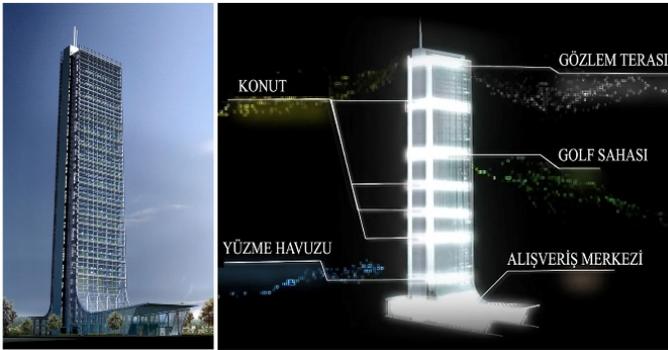


Figure 20. Sapphire, Maslak (URL-19)

Figure 21. Sapphire floor gardens (URL-19)

The use of balconies or terraces in such multi-storey buildings has been reinterpreted. In order to partially meet the need for green space, floor gardens, roof or terrace gardens are organized as common spaces accessed from the floor hall. In Sapphire, the floor gardens are inside the outer shell as seen in Figure 21.

It is seen that some spaces have been added to the housing with the emergence of new housing types in the development process of apartment building. These; study room, dressing room, servant room, warehouse, pantry, cloakroom, air conditioner balcony etc. additional venues.

Table 1. Development of housing and apartment building in the 19th
century - 21st century

THE DEVELOPMENT OF HOUSING IN THE 19TH - 20TH AND 21ST CENTURIES

Late 19th - Early 20th Century Period

Decugis House, Beyoğlu, 1895 | Botter Apartment, Beyoğlu, 1900 | Akaretler, Beşiktaş, 1875 | Doğan Apartment, Galata, 1893

Republican Era

Tayyare (Harikzedegan) Apartments, Laleli, 1922 | Maçka Palace, Teşvikiye, 1922 | Osman Rental House, Ankara

Period Between 1940-1950

Memurin Apartments, 1945

Period Between 1950 - 1980

Build-sell apartments, Kadıköy, 1960s | Hukukçular Site, Şişli, 1961

Period After 1980

Akmerkez, Etiler, 1993 | Süzer Plaza, Beşiktaş, 1998

Zorlu Center, Beşiktaş, 2014 | Sapphire, Maslak, 2011

CONCLUSION

According to Harvey, one of the postmodernist social theorists, the fiction and meaning of space changes in every capitalist period. Space is reorganized with the effect of social, cultural, economic and political developments (Süer et al., 2002). The habits acquired with modernization and the improvement of the economic level are reflected in the lifestyle and change the expectations from the places (Erol, 2011). These statements also apply to housing. In this study, the change process of housing in Turkey was examined in the 19th-21st century period.The process, which started with the first apartment buildings built by western architects in our country, has been discussed until the new housing types built in the 21st century, residences and mixed-use buildings (Table 1).

First of all, apartment building started in Istanbul with the effects of modernization, then with the proclamation of the Republic, apartment-type houses became widespread in Anatolia. The shrinkage of the family unit and the increase in the need for housing due to rapid population growth have led to the spread of apartment buildings. The forms of presentation, production rate, production quantity and quality of the house have been affected by the economic and political situation of the country, natural disasters. The state of being multi-storey in the house first started with 2-3-storey apartments, and the number of floors and the number of apartments on one floor increased over time. After the 1980s, large-scale projects were paved and satellite cities were formed. Cooperative houses that appeal to collective life, both by the state and by the private sector, have begun to be built in closed security complexes. After 1990, multi-storey residence towers and mixed-function building examples started to be implemented in the city center. By intervening in the collapsed areas in the city, vacant lots were created, and large-scale urban renewal and transformation projects were implemented there.

Today, the residence is not only limited to the accommodation function, but also intertwined with the service sector, which has many functions in its immediate vicinity or in the same block. The decorated and western-inspired facades of the first apartments were replaced by multi-storey and mixed-function buildings with glass facades, similar to their western contemporaries, with the development of technology and construction techniques and the increase in material diversity.

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