A STUDY ON THE IMPACT OF EXPERIENCING 'CULTURAL HERITAGE' IN DIGITAL ENVIRONMENT ON URBAN MEMORY AND FUTURE SCENARIOS

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ABSTRACT

This study aims to investigate the impact of using digital technologies on representation of multi-cultural heritage sites and its possible consequences on 'memory' of the place by literature survey and theoretical proposals. Multi-cultural is the keyword, because being settled at a strategic point from many aspects such as liveability, vitality or security cause the further civilizations have settled on the footprints of previous civilizations. Consequently, settlements turned into multi-layered areas mostly and a conservation problem occurs due to representation of such a cultural diversity or historic and architectural continuity. Urban settlements have important phases, which were significant and represents the characteristic of a specific period. Accordingly, representation of significant periods of the past of urban settlements is vital and also important to create and sustain of the urban memory. Conventional conservation and representation technics are not enough to provide a sustainable conservation process, because if the audience would not appropriate the cultural heritage, they do not endeavour for preserving it. However, it is mostly not possible to experience all the previous layers at multi-cultural heritage sites. In single building scale, it is harder in comparison with in urban archaeology scale due to following the urban topography at least for experts is possible. Still, to foster public awareness and attraction, alternative methods are being tried to represent the cultural heritage, because a sustainable conservation needs participation of the audience. CAVE (Computer Aided Virtual Environment) and BIM (Building Information Modelling) are the examples of creation of built environment in digital context. CAVE is the one, which creates a digital environment to feel and live in; on the other hand, BIM is the source for documentation. Whereas the documentation is the first and the most important phase of conservation, representation of documented heritage is the final phase and these processes are integrated. However, they should be discussed considering their impact on spirit of the place. Is it possible to experience the place without losing spirit of the place in a digital environment? Or, does it help the audience feel, understand and keep the memory of the place? For the future scenarios, cultural heritage sites or cities can be produced -without demolishing the existed ones- in digital environment for keeping the significant periods and contribution to urban memory.

Keywords: Representation of the past, Cultural Heritage, Digital environment, Urban memory, Spirit of the place

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1. INTRODUCTION

Contemporary cities or settlements are mostly developed on the footprints of previous civilizations. Since the beginning, the formation of a settlement has started with searching a place, which is supposed to be secure, defendable, liveable and sustainable (Rkywert 1988). In addition, the natural and geographical factors had to be in the inhabitants' advantage due to having no technologic possibilities to achieve the difficulties. Considering all the criteria, the settlements have turned into multi-layered places in terms of housing the traces of different periods, cultures, social structure and the way of life. So, in many places, recognizing the characteristics of the previous periods is possible with respect to the archaeological remains, urban topography, built environment, architectural elements or the artworks. Actually, it is a great potential for a city or settlement having this kind of characteristic and cultural wealth, but at the same time, it is an important challenge that documentation of the heritage and representation of it with its all strata.

Conventional methods or technics are not enough and efficient for all the cultural heritage sites, essentially impossible, and preserving the data opened to update is another problematic of documentation. Surely, through the worldwide, cultural heritage sites were determined according to the international or national regulations and criteria; furthermore, they have to be documented. These regulations or criteria lead the value assessment process, which is one of the methodologies of determination of the significance of cultural heritage. The historical value, cultural value, social value, spiritual value, religious value and political value can be defined as the basic types of the value assessment (De La Torre 2002, Feilden and Jokilehto 1998). In the scope of this study, historical, cultural and spiritual value will be focused without underestimation of the others due to emphasizing the relation and integrity between them and their contribution to urban memory. Urban memory is a kind of intangible archive representing the identity. The identity of the city makes it unique in associated with the architectural heritage within the built environment belonged to the history of the city. In addition, the continuity of urban memory in order to sustain and transfer the identity with its all aspects to next generations depends on preserving the cultural heritage.

Back to the documentation, it is also vital for keeping the urban memory and is the first phase of the conservation process of cultural heritage. In this phase, traditionally, drawings of the plans, sections or elevations (scaled and sketched), perspective drawings, illustrations, engravings, miniatures, photographs are the fundamental techniques of documentation of a single building or a site. However, these techniques are still prevalent although the process of the data needs a serious time, which generally depends on the scale or type of the heritage. Together with the technologic development, CAD programs are begun to be used for drawing and keeping the data. The data processing in digital environment becomes faster compared to hand drawings. After that 3D Modeling programs come to the forefront and reveals a different perspective towards documentation and also presentation of a new building or currently an existing one. In digital environment, updating the data is easier due to the operational conveniences. In addition, the usage of digital techniques and keeping the data in digital environment is advantageous for not only documentation, but also representation of the data. Production and representation in digital environment continues its development gradually, and today, there are advanced programs creating a digital environment along with all the details such as BIM (Building Information Modelling), CAVE (Computer Assisted Virtual Environment) and VR (Virtual Reality). It is possible to create a single building or even a whole city in digital environment and walking inside. It looks like a more affective method to process, save, update and present the data. The contribution of VR technology to sustain the

urban memory by modelling the significant phases of the city, but for instance, does the experience of cultural heritage site in digital environment have the same affect with the experience in a real and existing environment? Can the place still keep its spirit in digital? In this study, the main research topic is researching the impact of experiencing cultural heritage in digital environment with respect to the different conditions affecting the process and its contribution to the future scenarios.

2. THE SPIRIT OF THE PLACE AND THE MEMORY

2.1. The Spirit of the Place -*Genius Loci*- and the Spiritual Value

'Genius Loci' was a Roman belief, which means each place is special and significant and has a protective spirit due to its uniqueness (Norberg-Schultz 1980). The concept, genius loci, was not only used in architecture, also it was used in art or poetry (Jiven and Larkham 2003). The spirit is the character of the place and the evidence of being alive and has an idiosyncratic impact on audience. In spatial context, being alive refers to collecting memories. Still, if the process of collecting memories ends, the place remains dysfunctional or abandoned, it may keep its spirit by keeping the remains and traces of the period and respect them. In addition, the spirit of the place can be indicated as the inspiration to search, comprehend and also visit the place (Norberg-Schultz, 1980).

Spiritual value or the spirit of the place is one of the strongest characteristics of the cultural heritage sites attracting the audience's attention. This concept was underlined in Burra Charter (1999) first and defined as one of the values, which creates the cultural significance of a place. The spirit is directly related to the physical existence indeed and belonged to the place itself. It is debatable to experience the spirit of the cultural heritage without visiting the actual place due to its being an intangible value. Except Burra Charter, there is another international regulation entitled 'Quebec Declaration on the Preservation of the Spirit of the Place' and it was published in 2008. In this declaration, the constituent elements of the spirit are explained as:

"Recognizing that the spirit of place is made up of tangible (sites, buildings, landscapes, routes, objects) as well as intangible elements (memories, narratives, written documents, festivals, commemorations, rituals, traditional knowledge, values, textures, colours, odours, etc.), which all significantly contribute to making place and to giving it spirit, we declare that intangible cultural heritage gives a richer and more complete meaning to heritage as a whole and it must be taken into account in all legislation concerning cultural heritage, and in all conservation and restoration projects for monuments, sites, landscapes, routes and collections of objects. "

Considering the article, the spirit has many intangible and tangible parameters, which are also integrated. Besides, it makes the place distinctive and significant in its habitat. However, the spirit basically refers to the sense of the place (Jiven and Larkham 2003) and considering the parameters, it is explicitly hard to perceive and preserve its existence. Conversely, the spirit is definitely considered as a value that must be preserved during the conservation process, because, it refers to the identity and retains the memory of the place.

2.2. The Urban Memory and the Identity

Before focusing on the urban memory, the interaction between the human and the place should be examined through the memory context. Trigg (2012) explains the relation between the human and place as an immeasurable and vital experience defining the identity and culture of the inhabitants. In addition, the continuity of the memory is up to a cognitive remembrance

depends on the feeling when the inhabitant is inside (Trigg, 2012). Three main themes, which are experience, affectivity and particularity, identify the place and place is considered as a concept in between the idealist and realist attitude (Trigg, 2012). Memory can be interpreted as a mental capacity based on preservation of the moments and an abstract repository (Nora 1989, Wang et al. 2016). The human being without a memory is like non-existing until that moment, so are the places and cities. The places and cities save and keep the moments, events and traces throughout the history, and all these intangible savings create the identity of the place. The memory of the city sustains its existence and development together with the city (Hebbert, 2005, Wang et al. 2016). However, memory can be seen as a reflection on the built environment although it is an abstract concept (Basa, 2015). The continuity of the urban memory is up to being a part of a daily life of the cities (Basa, 2015) which means the representatives of urban memory should be preserved in order to keep the identity and authenticity of the city. The impact of urban memory is denser in cultural heritage sites and public spaces; maybe it can be interpreted as the number of users and the time spent in a place increase the variety of events. Thus, the emphasis on a place strengthens due to the parameters classified as time, users, and frequency of events, function and significance of the place. On the other hand, identification of the elements of urban memory differentiates according to the attitudes of the scholars (Wang et al. 2016). The urban memory can be consisted of the references belonged to the built environment and the spiritual activities (Nora 1989), or the spaces between the buildings such as streets or squares and significant monuments (Rossi, 1982). In brief, given the considerations about -urban- memory and its, significance upon identity, dynamics and defined components, settlements and cities are alive, Furthermore, they cannot sustain their existence regarding to their wisdom, peculiarity and vitality without the memory.

3. CULTURAL HERITAGE EXPERIENCES

Cultural heritage sites[3] are the places including historic, cultural, social, political, spiritual or economical value and represent their significance and characteristics depending on the conditions that they are in. These sites can be archaeological, urban or rural and also a single building. All of these kinds have their own parameters to analyse, identify, interpret and represent for a better understanding and experience. Another important factor affecting the experiences in cultural heritage sites is the situation of existence. Cultural heritage sites may include many historic layers from different period or denote the architectural characteristic and the culture of a single civilization. On the other hand, they may keep or loss their integrity, which means perceiving the original structure or settlement as a whole, may not be possible. Thus, the variety in existence changes the approach towards cultural heritage sites considering the values attributed to the sites. For example, archaeological sites that are non-living remain of older civilizations (in particular, the cases classified as a topic of urban archaeology) and the spirit or the sense in these areas are totally different from a monumental structure in city centre even they are dated in a same period. In that case, cultural heritage experiences in-situ or in digital environment will be discussed considering the qualification, classification, and situation of existence in order to compare the two approaches and identify the possible results.

[3] In this text, the term ‘site’ is used to indicate cultural heritage ranging from evidence of material culture to archaeological and urban settlements.

3.1. *In-situ* Experiences

Cultural heritage sites are peculiar to the environment where they are situated. There are various reasons behind the selection of that place to settle. Besides, visiting cultural heritage sites has also several purposes such as cultural, touristic, social or academic. Each purpose has different motivations behind it and the experience naturally differentiates depends on the purpose, background of the visitor or researcher, etc. For instance, focusing on the audience of cultural heritage sites who attends for cultural or touristic activities, the qualification and methodology of the representation of the site is crucial in order to foster the public awareness and narrate the story through the built environment. Because, the image appears on the mind varies according to the perception of the place and the parameters affecting the perception could be tangible and intangible. We perceive with our senses and intelligence, and also tangible parameters such as the existence, the observable strata, condition of the spaces or materials, ratio of integrity, source of sound (for example, water sound in cisterns), humidity, and smell. These are sensory descriptors of the space and also the quantitative data. Being physically in or around the place is the key point to experience these sensory characteristics.
Another important parameter except tangible and intangible ones is the type and the scale of the cultural heritage sites during *in-situ* experiences. Perceiving and experiencing an urban settlement is different from a single building. The feeling being inside or outside differentiates due to the factors affecting to be aware, understanding and interpreting the values of the site. For example, the archaeological sites are the non-living settlements belonged to previous civilizations and only the remains of that particular period -in Anatolian geography; Prehistoric, Classic, Roman, Byzantine, Seljuk and Ottoman- can be observed (Akurgal 1978). Considering the environment in archaeological areas, the urban topography, building types or functions and materials are observable and the original settlement with its components can be interpreted through the existing structures. The remains are the evidences of not only built environment and construction technology, but also the culture and daily life. For example, in Ephesus, the amphitheatre, some residences, churches and public spaces are still existed and its street pattern is comprehendible. When you walk through the main axis, you can see the buildings from different periods and try to understand the historic backgrounds, the relations between the buildings and culture of that period. You can feel the wind, the sun and its direction, the orientation of the buildings or touch the material. You can get tired when climbing to the top and dream about the topography of the settlement together with the development since its formation. This experience is peculiar to the place, the ancient city of Ephesus.


Figure 1a, 1b. Yamaç Evler at Ephesus, general view of the ancient city (S.N.Akgün, 2012)

The significance and characteristics defining the places' values or authenticity are currently the basis of attraction, but at this point, the representation of the cultural heritage site comes to the forefront for the audience. Since, the interaction between the place and the audience is up to the qualification and strategy of the representation in terms of visual, written or sensory. Visual representation tools should be attractive, objective and informative; written representation tools should be readable, comprehensible and instructive; and the sensory representation should keep the sensory data if possible, or it should be revived or experienced as suitable for the spiritual value of the place. There are some kind of revival applications in order to present the daily life and culture in archaeological areas or historical buildings. These applications can be classified as producing replicas, models or illustrations.


Figure 2a, 2b. A model of a house from Çatalhöyük at the Museum of Anatolian Civilizations, Ankara[4]; A replica house at the archaeological site, Çatalhöyük (A.E. Tozoğlu, 2012)

As underlined, being a living or non-living settlement or building of cultural heritage sites affects the experience. In non-living sites, which can be archaeological areas, abandoned settlements in rural or abandoned buildings or monuments in city centre; the audience discovers on his own related to the representation of the site. However, if the cultural heritage is a place which can be a rural settlement sustains its traditions and culture, a neighbourhood in the city centre or a transformed building in different purposes; the built environment and also the daily life, traditions, habits and culture are the integrated elements of the exhibition of cultural heritage sites. The inhabitants contribute the experiences of the cultural heritage by representing the intangible values of the place.

In-situ experiences are tried to be explained from the perspective of a visitor until this part, and the parameters and dynamics affecting the process are clarified in respect to the conservation and management policies and comprehensive representation approaches. However, the perspective of a researcher or a conservation expert should additionally be explored together with the other stakeholders of the conservation process. Because, these decision makers lead the process; they determine the methodology and approach towards cultural heritage sites. Thus, the interaction between the cultural heritage and the audience should be planned based on various parameters defining the characteristics of the place and reflect the identity of the place in terms of historic, cultural, religious, ethnic or social. In addition, all visitors from different ethnic or religious group, culture or nationality should comprehend the cultural heritage with its all layers from an objective point of view due to cultural heritage sites' being universal (Carman 2005, Serin 2008).

[4] http://www.anadolumedeniyetlerimuzesi.gov.tr/TR,77779/neolitik-yeni--cilali-tas-cag.html

In-situ analysis for the research phase of an academic study or a conservation project is the crucial step to determine the characteristics of the place and evaluate the values. This phase is the basis of the further decisions; because the architectural, topographical, natural, climatic features and also the spirit of the place are internalized depend on the depth of the in-situ analysis and literature survey. After the comprehensive evaluations about the cultural heritage sites, the application details of conservation project and the quality of interventions become essential to determine the future of the cultural heritage. There are international regulations describing the methodology, consideration and approaches towards cultural heritage such as the Venice Charter (1964), which is considered as the pioneer regulation of this area (Jerome 2014), or the Burra Charter. Considering the articles and main context of the charters, the permanent basis of conservation, the relation between the cultural heritage and its environment and the vitality of preservation of the cultural heritage independent from the scale in its peculiar place are emphasized. Because, the built environment has a strong link with its place, regarding to geographical, topographical, climatic or spiritual features.

3.2. Experiences in Digital Environment

In the 20th century, digital design, digital fabrication and digital representation started to be used in several study or commercial areas due to technologic evolution (Van der Wolf 1994, Kolarevic 2003). Computer Aided Design (CAD) programs were firstly became a hot topic at early 1980's (Van der Wolf 1994) and new technologies and software are developed rapidly due to the interaction between the users and the software and its innovative and successful results (Kolarevic 2003, Perez-Gomez 2007). Digital tools in architecture became pervasive in time and representation of cultural heritage in digital environment started to be used as an innovative method. However, before analysing the performance of representation of cultural heritage sites in digital environment, the possible areas of usage should be explained. In the scope of this study, 3 main digital tools are selected in order to researching about the advantages and disadvantages of using these tools in cultural heritage sites. First one is BIM (Building Information Modelling), which is a modelling technology that deals with the building life cycles with its all phases, analysis, design, construction, coordination, maintenance etc., in an integrative approach (Eastman et al. 2011). The data processing and also updating in BIM is very practical and efficient, so in this study, BIM is proposed as a data source and digital memory of built environment. Considering cultural heritage sites, documentation is extremely vital, because these areas are mostly at risk due to different parameters, for example natural determination factors, being dysfunctional, neglecting or vandalism. In addition, the condition of the cultural heritage is the determinant for the documentation process. If it keeps its integrity, it is easy to document rather than the archaeological sites in ruin condition. Thus, a detailed research phase is required to analyse and document an archaeological site or any other type of cultural property in ruin condition. Same principle is valid for all the lost layers or components of any cultural heritage site. Since, the reliability and confirmation of the information is vital for creating the memory, which sustains the history of the site. Besides, as Özdoğan (2008) notes, cultural heritage is more than a historic document, it should be considered as a source of knowledge and representative of a cultural, social and architectural wealth of a particular period.

The other two of selected digital tools are the VR (Virtual Reality) and CAVE technology, which are considered as the experimental place in digital environment. These are more recent technologies compared to the CAD drawings, they promise a digital environment, which includes the architectural or natural details but not a spiritual feature for a participant/visitor, and can be equipped properly if it is needed (Martens et al. 2006, Yee and Bailenson, 2009).

The VR and CAVE needs a determined space, preferably cubical and 3D images are projected to the walls, floors and ceiling; the participants need to be wear a head-up display to be inserted to the virtual reality room.[5] The buildings can be generated as exactly in reality and occasionally; but distinguishing the real one from the artificial can be confusing in terms of architectural details, lightning, proportion or quality of interior space (Martens et al. 2006). In conservation process, these tools can be used to present or exhibit the site in digital environment. Actually, cultural heritage sites can be simulated by using these tools apart from the conservation process. Since, conservation of cultural heritage is a long-term period, which has to be planned precisely and need a serious economical source. However, producing cultural heritage sites in digital environment makes them more accessible and contributes to develop a digital memory of the site. In addition, continuity of these implementations in cultural heritage sites can cause a digital network through cultural heritage sites, which enlarge the digital memory. At this point, it is obviously a practical method for representation of the past in digital, and the possible advantages such as seeing the different periods and characteristic of a determined site, explanatory information with regards to the historical background or the significant features. As emphasized, reconstruction is a serious issue, even it will be realized in digital environment, the assumptions have to be avoided no to mislead the audience.

Figure 3. Reconstruction of urban topography and a dwelling of Çatalhöyük[6]

In recent studies, 3D models of archaeological sites are produced to revive the ancient cities' built environment and experiencing the settlement such as Çatalhöyük, Priene or Miletus by virtual tours is possible from the websites. The remains of these settlements still exist and experiencing them *in situ* is possible. However, the experiences in digital and in situ cannot be the same due to the sensory factors, as underlined before, considering their impact on perceiving the place. The studies of Yee and Bailenson (2009) and Martens et al. (2006) about the difference between these two experiences are explained according to the data obtained from their researches. In the future, the sensory tools may be inserted in digital environment in a similar impact as in real; these theoretical inferences should be reconsidered.

4. CONCLUDING REMARKS

Given the parameters of perceiving and experiencing a place based on our senses and awareness about the history and significance of the place, it is noticeable that all of them are

[5] CAVE is a recent technology, so the sources of this topic are mostly based on internet sources and preliminary research rather than written academic publications.
http://whatis.techtarget.com/definition/CAVE-Cave-Automatic-Virtual-Environment
[6] http://www.archaeo3d.com/en/3-cesty-neolitizace/dlouha-predovychodni-cesta/dvojity-pahorek--atalh-y-k/

integrating each other. The most efficient and significant way of comprehend a place is physically going to that place and sense every detail in tangible or intangible aspect.
In this study, one of the cases exemplified Çatalhöyük in different representation techniques. First of all is in situ experience at archaeological site focusing on the remains or layers of the prehistoric settlement at Çatalhöyük. In this experience, the visitor should endeavour for an information of the place, imagine the peculiar settlement and interpret his/her observations. Second one is a replica of a dwelling at the archaeological site, obviously it is not located its original place, but still in the same context which it belongs to. This application can be considered as a revival of a daily life and culture, representation of the architectural characteristics, material and construction technique of that period. The next one is the Çatalhöyük dwelling that was reconstructed in the Museum of Anatolian Civilizations in Ankara and used as an exhibition material. This application is independent from its context that is specific to its environment and geography. It is obvious that the impact of the replica at the archaeological site is inevitably stronger than the one in the museum. Since, sensory experience is stronger due to being at the site where we can grasp the logic behind the settlement. The last one is the experience in digital environment where the prehistoric settlement is simulated in 3D setting in different scales. Surely, the experience based on a virtual tour from the screen is different from the experience based on the augmented reality supported by head-up displays, because, from the screen, analysing the real scale and its impact on human is impossible, but it is reasonable for comprehending the general view and characteristic of urban topography or a singular dwelling. On the other hand, perceiving the scale and the significance of the settlement or a monument is possible through VR and CAVE technologies by walking inside and looking around in digital environment. This experience may be exciting and attractive, but lack of sensory experience makes the visitor remember that it's being artificial and under these circumstances, the emphasis on spirit of the place stays weak.
The advantages and practical reasons of using the digital tools is acceptable and convincible, but they are supportive tools of documentation and especially representation of cultural heritage sites due to the potential of attracting of the audience's attention. Besides, it is a faster method of producing and processing the data in compared to the traditional techniques, hand drawings, long-term and confusing exhibition or representation processes. In addition, documentation and representation of digital environment helps create a digital memory, which contributes to urban memory defining the identity of the city or settlement. Urban memory is one of the strongest component of sustainability and continuity of a settlement. The cities or settlements will be lost without its memory, and digital environment is an alternative method to keep the memory alive and documented. However, any digital environment cannot be a prior preference of preservation and conservation. Since, the physical continuity and sustainability is the basis of conservation. Thus, the knowledge and wisdom would be learnt from the history and cultural heritage site is not a quantitative value and cannot be replaced by an alternative outcome.
In future scenarios, the significant periods of the settlements should be documented and transferred into digital environment supported with the past-oriented layers documentation. Thus, it is possible to collect the urban memory and wisdom through built environment and use them as an input for developing projects.

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