

Preserving the past in a digital age: How can heritage keep up?

Research paper

Heritage and Architecture

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i. Abstract

This paper examines how heritage and architecture can withstand the changes made by the virtual world. With the birth of the digital age, the online activity of teenagers and young adults has been rising. This not only contains the normal desktop with webpages but even in a virtual world. If society will gradually change to a virtual world, can heritage keep up with these changes? The dynamic process of developing values over time means that heritage is not static, and in the digital age, heritage and architecture can transcend from physical to virtual through various digital mediums. Based on qualitative analysis of literature studies it is concluded that digitised heritage is critiqued because of its inaccuracy and its lack of presence in time and space. The physical experiences of heritage and architecture provide a unique sense of place and connection to history.

Digital-born heritage could on the other hand give an opportunity for the world of heritage to grow in the direction of the virtual realm. This is not without its prerequisites that the material must be “born-digital” (there is no other format but the digital original), the resources must represent human knowledge or expression, and the resources must have lasting value and significance for current and future generations.

The concept of architecture-as-entity suggests that architecture can have its own identity and agency, separate from its users or broader context. However, architecture should not be completely divorced from its societal context. Heritage is defined by social and cultural values that are formed by communication within a society, while architecture can shape society and culture. Architects should strike a balance between these two understandings to create meaningful, flexible, and adaptable buildings that are both autonomous and responsive to the needs of society. Buildings that embody these principles may ultimately shape culture and history and earn the status of heritage.

I. Introduction

All over the world, there are places that are of personal or collective value to all mankind. This heritage is therefore to be protected from future conflicts or demolitions. When talking about heritage the first thing that pops into people's heads are buildings like the Colosseum or ancient amphitheatres. However valuable these buildings are, they are not the only things that can be classified as heritage.

With the birth of the digital age, the online activity of teenagers and young adults has been rising. This not only contains the normal desktop with webpages but even in a virtual world. Sales across the VR market sector are growing significantly in industries ranging from education, medicine, tourism and retail. Both consumer hardware and software are projected to rise from \$6.2 billion in 2019 to more than \$16 billion by 2022 (PR Newswire, 2020). If society will gradually transcend to a virtual world, can heritage keep up with these changes?

This study aims to determine if the world of architecture and heritage can transcend from physical to virtual. It will examine how heritage and architecture can align with the changes made by the virtual world.

This essay begins with bundling definitions. Here, literature studies will be used to study how heritage is defined and understood in the context of the digital age. It then moves over to the architectural side of the debate. In what way is architecture behaving as an autonomous entity in the digital age? It explores how architecture relates to heritage in the digital age and impacts cultural identity. To finalise this study, design principles are formulated that can help architecture remain an autonomous entity in the digital age.

II. Defining Heritage

The most important basic element in this discussion is our understanding of the word 'heritage'. Is heritage defined as a fixed entity or rather a process of developing values over generations? UNESCO has defined the word heritage as: "*our legacy from the past, what we live with today, and what we pass on to future generations.*" (UNESCO, n.d.).

To further explain the ambiguous word "legacy", UNESCO goes on with the definition of 'cultural heritage': "those sites, objects and intangible things that have cultural, historical, aesthetical, archaeological, scientific, ethnological or anthropological value to groups and individuals" (UNESCO, n.d.). These definitions proclaim heritage as a process of developing values over past and future generations, for it is not a fixed truth.

This definition is backed up by Smith (2006, p. 3) in her text *Uses of Heritage*, which states that "*heritage is used to construct, reconstruct and negotiate a range of identities and social and cultural values and meanings in the present*". It builds on the idea that heritage is negotiated and an unfixed and ultimate truth. Social and cultural values are formed by communication in a society. It is a process of engagement rather than a condition (Smith, 2006). "*It is a medium of communication, a means of transmission of ideas and values and knowledge that includes the material, the intangible, and the virtual*" (Graham, 2002, p. 5-6). If heritage is a process of engagement, a medium of communication, then heritage is formed in the present, not the past (Tilley, 1989).

To sum it all up, cultural identity, and therefore heritage, is formed by the present values that society communicates concerning its ideas, knowledge, and architecture.

III. Heritage in the Digital Age

Over the course of history, humanity has made a lot of effort to preserve, restore, and conserve its heritage to succumb to the passing of time. As we now live in a digital age, the preservation of digital documents has been made a lot easier. As long as the servers with these documents keep running, the documents are preserved. This is under the assumption that digital documents can be qualified as heritage.

We live in an age where in a couple of decades digital progression is gradually able to outrun physical progression. If heritage is to survive it must then look further than the physical

world. A legacy will go on no matter in which medium you operate. Smith (2006, p. 59) already pointed out that the medium of communication will transcend to the virtual. If communication is transcending to the virtual world, why isn't something based on communication, such as heritage, not?

According to UNESCO's Charter (UNESCO, 2003a, 13 April) for the Preservation of Digital Heritage, digital heritage (or virtual heritage) is the "cultural, educational, scientific and administrative resources, as well as technical, medical and other kinds of information created digitally, or converted into digital form from existing analogue resources" and includes "texts, databases, still and moving images, audio, graphics, software and web pages" (Article 1).

'Virtualised' or 'digitised' heritage means to actualise it digitally, to simulate it using computer graphics technology. It refers to 3D computer models of ancient buildings and artefacts like the Colosseum through a digital interface. With VR or AR, immersion can be created to interact with the heritage content. Virtual heritage involves synthesis, conservation, reproduction, representation, digital reprocessing, and display with the use of advanced imaging technology (El Razaz, 2007).

With these technologies, heritage can be transformed into the digital world with immersion at such a level that it feels like the physical world. Although, no matter how well executed, heritage is not just about tangibility or materiality. To understand the inherent significance of a cultural heritage site, merely watching or navigating through a 3D virtual model is inadequate (Rahaman & Tan, 2011). The experience and interpretation of a piece of heritage not only depend on visual engagement. It depends on our embodiment, subjectiveness and cultural positioning (Thomas, 2004). Content without being able to relate directly to how we perceive the world does not pass on any meaning; rather it causes heritage dissonance or disinheritance (Tunbridge & Ashworth, 1996).

This argument was already supported by Benjamin, who argued that "*even the most perfect reproduction of a work of art is lacking in one element: its presence in time and space, its unique existence at the place where it happens to be*" (Benjamin, 2006, p. 3). The lack of this presence, of the "aura" of an object, constitutes a major challenge to its authenticity, and ultimately its authority (Benjamin, 2006, p. 4). The digital representation of a piece of heritage is an interpretation in itself. This interpretation loses automatically a piece of meaning in its translation.

If virtual heritage still only consists of digitised heritage, creating physical heritage in the virtual world, then heritage will not develop. Born-digital elements are those which do not have an analogue equivalent. If born-digital elements can become cultural heritage, the digital legacy of society will continue to be documented.

Born-digital heritage is born-digital materials of enduring value that should be kept for future generations. As stated by (Ruan & McDonough, 2009, p. 746), only those materials which also meet the following prerequisites can be born-digital heritage:

- The material must be "born-digital"; there is no other format but the digital original.
- The resources must represent human knowledge or expression.
- The resources must have lasting value and significance for current and future generations.

These prerequisites can be backed up with the other definitions of physical cultural heritage: "born-digital objects or expressions that have cultural, historical, aesthetical, scientific, ethnological or anthropological value to groups and individuals in the present" (UNESCO, n.d., UNESCO 2003a, Ruan & McDonough, 2009, p. 746).

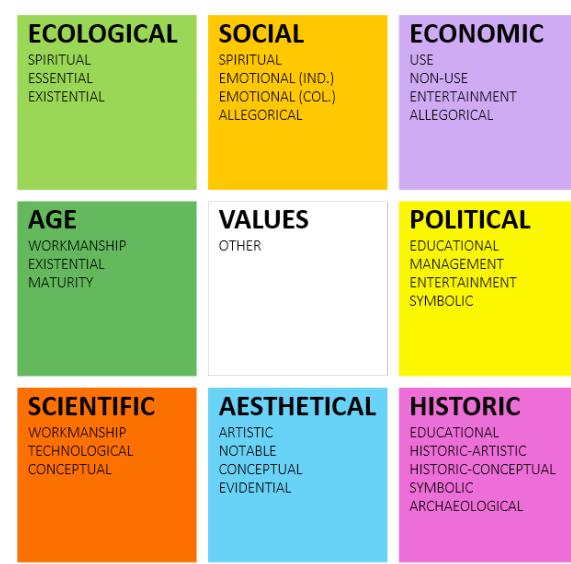
The transcendence of heritage to the virtual realm seems definition-wise as a clear step from physical to digital. However, in reality, complications can make things difficult. In the search for born-digital heritage, one thing causes complications: internet platforms. "*Platform user engagement is considered as being mediated by the conventions, design choices, and instrumentalities of social media technologies, and by the socioeconomic context in which social media qua organisations are operating*" (Alaimo & Kallinikos 2017, p. 175). Because of this mediation, digital-born heritage is not only the consequence of human interaction and acquired values but also the work of a complex algorithm that social media platforms use. Human users

with non-human components influence each other. As mentioned before, not everything is heritage. But let us sketch the following scenario. An image on the internet becomes widely popular. Over the years it is referenced as an iconic piece that is part of the Internet's legacy, thus many people will refer to it as the Internet its heritage. This all came to be because a big company regulated that people would see this specific image and not another. This scenario of course has a wide range of different factors into play but that doesn't mean that this scenario couldn't become a complication in the future of heritage.

As we move forward, it will be important to consider these complexities and to find ways to ensure that digital heritage is preserved and made accessible to future generations, while also maintaining its authenticity and cultural significance.

But in the end, what do all these conditions and annotations have for influence on how we value heritage? One accepted way of valuing heritage is through the framework that was set up by Tarrafa Silva and Pereira Roders (2012). The framework states 8 categories of cultural values, ranging from historic to ecological. How does the virtual and digital world fit into this framework? Does it fall under the grey area of 'other values'? Does it get its own category? This category could have, just like the others, its secondary values 'digitized' and 'born-digital'.

On the contrary, does digital heritage fit into this framework at all? Should and could there be a different method to value heritage where the physical and the virtual can co-exist in the same spectrum?



Values matrix (Tarrafa, 2012)

IV. Architecture as the broader Social Context

In all the above-stated definitions it becomes clear that heritage is an entity that is negotiated by the opinions and values of the people who use it. This coincides with the traditional view of architecture as an object that serves a specific function or serves the needs of a specific group of people.

Carpo (2017) argues in "The digital turn in Architecture" that the digital turn has brought about a profound shift in the way architecture is conceived, designed, and built. On the one hand, digital technologies have enabled architects to create new and innovative forms that would have been impossible to achieve with traditional methods. This has opened up new possibilities for architectural expression, challenging traditional notions of form, function, and materiality.

On the other hand, Carpo acknowledges the limits of digital technology and its relationship to traditional modes of architectural practice. He emphasises the importance of historical and cultural traditions in shaping architectural design and suggests that the digital turn has not completely displaced these traditions. Architecture should form society as an entity with intrinsic qualities based on traditional and cultural modes of architectural practice.

In "Architecture in a Simulated City," Ito discusses the idea of architecture-as-entity as a way to conceptualise the relationship between architecture and the broader societal context in which it exists. By "architecture-as-entity," Ito suggests that architecture can be thought of as an autonomous "being" with its own identity and agency, separate from the people who use it or the broader context in which it is located. This idea contrasts with the traditional view of architecture as a passive object and even goes further than Carpo which included qualities based on tradition and culture.

Furthermore, Ito is discussing the "simulation" of the city. This does not refer to a virtual representation of a city but rather to the idea that cities are becoming increasingly artificial and controlled. Their functions and identities are determined by a complex set of societal, economic, and political forces. In this sense, if the cities are determined by these outside forces, the architecture that makes up the city is part of an artificial construct as well. To escape this construct, Ito argues, architecture must be thought of as an active participant in shaping the world we live in, rather than simply a passive object.

If architecture has the potential to shape society and culture, it should be designed with this in mind. In the context of a simulated city, the architecture that makes up the city has the potential to shape the way that people live and interact. This is why it should be designed with care and consideration. According to Ito, architecture can be conceived and developed as a self-contained system with its own internal logic and rules. This means that architecture is not merely a response to external factors such as site, program, and context, but rather it has its own intrinsic qualities that define its form and function.

Where Ito argues that architects must take a more active role in shaping the city and creating new urban forms, Keiichi Matsuda emphasises in his article "The Liquid City" the importance of adapting to the new reality of a technology-infused urban environment (Matsuda, 2019) The power of architecture to transform.

The Liquid City discusses how technology is transforming the way in which we experience the space where physical and virtual collide. With the help of AR and VR, each individual can experience a different, subjective view of the world, isolated from each other. Besides that these technologies can create new forms of exclusion and discrimination, it can alter our perception of reality and our relationship with the physical world. We may become increasingly disconnected from the physical world and lose our sense of place and belonging. Matsuda states that the physical city becomes immersed with the virtual and merely connects the humans and machines that live inside it. This notion of just providing space and responding to changing user needs and preferences goes right against Ito's view of architecture shaping society.

Matsuda states that society will gradually be filled with "liquid spaces", where physically and virtually present people are able to interact naturally with each other. A concept of "liquid architecture" that is responsive, adaptable, and constantly changing, like a liquid that takes the shape of its container. In the adaptive architecture that is sketched, architects need to consider ethical implications. The organisation of space is always political. Different approaches can turn a

city into widely different outcomes. Therefore, the design of the Liquid City with its “perceptual filter that shapes behaviour and identity”, is entangled with the design of society.

In light of the above definitions, heritage can be set in comparison with the architecture itself. Heritage is defined by social and cultural values that are formed by communication within a society. It is not a condition but rather a process of engagement. This goes against the belief of architecture-as-entity which is not formed by communication with society but rather shapes society and culture. It can be seen as autonomous with its own identity and agency, separate from the people who use it or the broader context in which it is located. These two understandings form an endless loop of passive versus active, autonomous versus dependant.

Maybe buildings with heritage status are those pieces of architecture that live up to their status of an autonomous entity. The buildings that have shaped culture and history.

V. Design Principles for Architecture as an Autonomous Entity

How can designers create such architecture-as-entity? How can design principles help architecture remain an autonomous entity? And relate to the digital/virtual world?

Digital technology has enabled architects to conceive of architecture in new ways, by allowing them to simulate and test architectural ideas in virtual environments before they are realised in the physical world. This has led to a shift in the way architects approach design, from a focus on form and function to a focus on the internal logic and rules that govern the behaviour of architectural systems. In essence, Ito's definition of architecture as an autonomous entity suggests that architecture can exist as a self-contained system that is not bound by external constraints but rather defined by its own intrinsic qualities and rules. This view of architecture opens up new possibilities for design and innovation, as architects can explore new forms and functions that are not limited by traditional notions of context and program.

In this view, architecture only focuses then on its internal logic and metabolism while ignoring outside factors influenced by context. Cities will then be formed by a set of blocks that are self-contained beings in a space devoid of any relations. For architecture to still be part of society and be valued, the relation to society needs to be present.

One possible solution proposed by Kronenburg (2005) is for architects to pay attention to their designs' symbolic and social meanings. By creating buildings that have meaning and resonate with people, architects can help to create a sense of identity and community and promote social interaction.

Another solution he suggests is for architects to focus on designing flexible and adaptable buildings rather than rigid and fixed ones. He argues that buildings that can change and evolve over time are better able to respond to the changing needs of society, and can promote a more sustainable and resilient built environment. During the pandemic of the Coronavirus, it has become clear that the home had to take on many more roles, being a hospital, working space, workout space, recreation space, or isolation tank. For a home to house all of the functions, architecture should have the ability to be adaptable and evolve over time.

Ito (2004) continues on design principles by emphasising the importance of spaces that can be occupied and used by people, in the form of public spaces. Architecture should prioritise the creation of spaces that are accessible to all and encourage social interactions, such as squares and community spaces, where people can come together.

Finally, he stresses that architects should also be aware of the effects that architecture can have on the natural environment, and they should be designed to minimise negative impacts on the environment and promote a more sustainable built environment.

VI. Conclusion

This research aimed to determine how heritage and architecture can align with the changes made by the virtual world. Based on literature studies it is clear that the digital age offers new opportunities for communicating and experiencing heritage and architecture. The dynamic process of developing values over time means that heritage is not static, and in the digital age, heritage and architecture can transcend from physical to virtual through various digital mediums. The advanced imaging technology used for the synthesis, conservation, reproduction, representation, digital reprocessing, and display of heritage can enhance our understanding and appreciation of cultural heritage sites. However, the inherent significance of cultural heritage sites cannot be fully understood solely through a 3D virtual model. The physical experiences of heritage and architecture provide a unique sense of place and connection to history.

As we move forward, it will be important to consider these complexities and to find ways to ensure that digital heritage is preserved and made accessible to future generations, while also maintaining its authenticity and cultural significance. The question is if the digital and virtual world will also change the way we value heritage.

As heritage changes in a virtual world, so will architecture itself. The concept of architecture-as-entity suggests that architecture can have its own identity and agency, separate from its users or broader context. However, architecture should not be completely divorced from its societal context. Heritage is defined by social and cultural values that are formed by communication within a society, while architecture can shape society and culture. Architects should strike a balance between these two understandings to create meaningful, flexible, and adaptable buildings that are both autonomous and responsive to the needs of society. Buildings that embody these principles may ultimately shape culture and history and earn the status of heritage.

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