Architecture with Immersive Technologies*

Next Generation Architects and Clients

Waldemar Jenek
QUT Design Lab
Queensland University of Technology
Brisbane, Australia
waldemar.jenek@hdr.qut.edu.au

ABSTRACT

Virtual Reality (VR) and Augmented Reality (AR) technologies have the potential to augmented experiences within the design process of architecture. Technology devices like smartphones have become an important part of our everyday lives. Younger generations even see these devices as an extension to their personalities. However, more research is needed to understand the benefits and risks of this technology-based design approaches as their application in the context of the architectural design process has not been explored. Therefore, the main aim of the paper is to discuss the states of these technologies, the adaptive/evolving nature of young peoples relationship to technologies and the use of these tools in the design process of architecture. This will show that VR and AR technologies should be part of the education process in architecture schools. It is necessary for architects to use the potential of these tools to create new design solutions rather than letting unaided machines create designs. Technology on it’s own cannot generate effective design solutions. It has to be applied with critical thinking and nuanced human reasoning to be truly effective in the design process. This needs to be instilled in the design education stages itself.

KEYWORDS

VR; AR; Digital Design; Interaction Design; Architecture; Virtual reality; Augmented reality, Design Education;

ACM Reference format:

Introduction

Virtual Reality (VR) and Augmented Reality (AR) solutions are not only entertainment tools and able to display information. They can be used as communication- and checking tool for professionals and non-professionals in everyday life and design processes.1 The relationship between humans and technologies is changing.2 Considering the results of Hurrelmann & Albrecht (2014), researchers predict that the relationship between humans and computers will become even stronger, the increased ratio of urban space and the expanded range of possibilities of digital and physical realm can introduce increased risk of uncertainty and disorientation.3 On a professional level, there are more and more companies that relocate their work from analogue into the digital space, for example, to make their data accessible and automated.4 Especially in the field of architecture, this trend is to be observed through the use of design and management software like for example the architects Lyons+Sleeman+Hoare.5

Technology Development*

AR and VR technologies did reach the mainstream as it nowadays more affordable than in recent years. Hardware requirements become easier to access and set up. Today most personal devices like smartphones are capable to show AR and VR content. AR and VR need compatible power to calculate and render content. In addition to that AR needs a camera to view the real world and possibility to interact with the content.

Today content can reach millions of users and provide an immersive experience through the internet and social media. Companies understood the importance of the trend and provide software solutions to create own AR and VR experiences. These solutions may need training but they become more intuitive and user-friendly every day. With the accessibility of augmented reality hardware, the support of major corporations, and the huge market available augmented reality content, the technology has everything it needs stay for a long time. This is why it is important to familiarize with the potential and its concept.
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The understanding and the relationship to modern technologies varies in the different generations. A large proportion of adolescents and preadolescents nowadays are going through emotional and social development on the Internet and on smartphones (ibid). A “digital native” is a person of the social generation that grew up in the digital world, while a “digital immigrant” describes someone who was introduced to this world only in adulthood. (ibid). These “digital natives” have an inherent understanding of themselves on the internet. They see social media as an extension of their offline lives. Previous generations may have a basic technical understanding of what the purpose of this media is, but they do not see it as a part of their personality. This leads to a disconnection between the “digital natives” and older generations. It is therefore very likely that certain groups will feel a greater need to interact with technologies like VR and AR. In addition to the reasons that these technologies are affordable, accessible and more user-friendly than in recent years.

Figure 1: Group-VR-Experience

Architecture Design

The permanent development of information technologies does open new possibilities for the construction industry. Many processes can be accelerated to become more efficient. It is expected that digital technologies will be used more as supporting tools and design tools in the future. They have and will continue to change the way architecture will be designed. New technologies like AR and VR can be used as a tool to create Media Architecture for planners and allow for meaningful engagement with citizens and clients. Media Architecture can be understood as materials or objects with dynamic properties, such as interactive sources of light or moving elements, which embody the physical space on an architectonic scale. Most Media Architecture installations allow dynamic interaction behaviour or show interactive content. Architectural offices and the construction industry are looking for employees who are able to acquire knowledge and are open to new developments to save time and get new perspectives. It will depend on the ability of each participant to change how successful new media and technologies become.

Future research has to investigate strategies that convey the design but do not overwhelm the viewer and distract him from the essential, at the same time. A challenge is to deliberate omission of clichés and unnecessary effects is desirable. Critical thinking is an important matter in the design process and this needs to be done especially with new media tools. This approach has to be addressed in the education of following architects generations.

Conclusion

„If we teach today's students as we taught yesterday's, we rob them of tomorrow“, John Dewey

This position paper shows what is needed to use immersive technologies like VR and AR. It explains why behaviour and the relationship between humans and technology is changing. The paper provides an overview of how their technologies are used by architect and influence the design process on an architectural scale. This Aspects show that technologies should be used in design education because of the relationship and influence to each other cannot be ignored the design process. VR and AR technologies allow a new way of design thinking and design solutions. Critical thinking is necessary with the use of these technology solutions. Professional architects see the bigger picture and are able to critic these technology solutions and see the benefit and risks. Non-professionals might be not capable to see other things than the own needs or short-term goals. It is vital that architects are able to understand new tools, but it is even more important that the next generations is taught how to work with these tools, as personal and professional lives move more into the digital realm.

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