



What Got Us Here, Won't Get Us There

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The Impact of Virtual Reality in Service Design Research

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Abstract: This study presents the results of a systematic bibliographic review exploring the impact of virtual reality (VR) technology on service design research. The review identifies the potential benefits of using VR, such as simulating real-world scenarios, understanding emotional and experiential aspects of service design, and facilitating collaboration among stakeholders. However, the review also highlights the complexity and cost of implementing VR technology and the ethical considerations that must be addressed. The work discusses potential applications of VR in healthcare, education, and distance learning, and emphasizes the need for innovative research methods and tools to harness VR's capabilities. The review concludes that future research should address ethical concerns and potential biases associated with VR and explore its long-term impact on service design research and practice. Overall, the review demonstrates that VR has significant potential to transform service design research and enhance service experiences for users.

Keywords: Virtual Reality, Service Design, Research, Education, User Experience

1. Introduction

Service design is a rapidly evolving methodology focused on creating end-to-end customer experiences for products or services, covering the entire customer journey, from discovery to post-purchase support (Stickdorn et al., 2018). As organizations increasingly seek to differentiate themselves through exceptional customer experiences, service design has gained substantial importance. One emerging technology with the potential to revolutionize service design is virtual reality (VR), which offers immersive and interactive simulations of real-world scenarios, allowing designers to better understand and address customer needs.

The main research question for this study is: "What is the impact of virtual reality (VR) technology on service design research, and what are the benefits and challenges associated with using VR in this context?" This question aims to explore the implications of VR for service design research and practice.

To address the research question, the objectives of this study are to:

- Identify the benefits of using VR technology in service design research, including its potential to enhance designers' understanding of emotional and experiential aspects of service design, facilitate collaboration and co-creation among stakeholders, and enable the creation and testing of service design concepts in a safe, controlled environment.
- Investigate the challenges associated with using VR in service design research, such as the cost and complexity of implementing VR technology, ethical considerations (e.g., privacy and data security concerns), and potential biases and limitations of VR simulations.
- Examine potential applications of VR technology in various service design contexts, including healthcare, education, and distance learning, and explore how these applications can revolutionize the way designers approach service design.
- Discuss the ethical considerations and future research directions related to VR in service design research, addressing potential challenges, biases, and long-term impacts of using VR technology in this field.

The scope of this work is primarily focused on the impact of VR technology on service design research and practice. It aims to provide a comprehensive understanding of the benefits and challenges of using VR in service design research, discuss potential applications in various contexts, and address ethical considerations and future research directions. The study does not intend to provide a comprehensive review of all technologies that could influence service design research, but rather focuses specifically on the implications of VR technology for the field.

2. Method

In this study, the method employed to explore the influence of virtual reality (VR) on service design research was a systematic bibliographic review, following the SBR (systematic bibliographic review) proposed by (Santos, 2018). This method involves a structured approach to searching for and selecting relevant literature, ensuring that the review is comprehensive and rigorous.

To conduct the systematic bibliographic review, research strings were defined. A systematic search of electronic databases, including Scopus, Web of Science, and Google Scholar, as well as relevant textbooks and conference proceedings, was then conducted to identify articles related to the topic. Table 1 presents the search strings used and the number of articles found in the databases.

Table 1. Search strings and number of articles found.

Search Strings	Scopus	Web of Science	Google Scholar	Total
String 1 "virtual real*" AND "service design*" AND research*	35	13	136	184
String 3 "virtual real*" AND "service design research*"	1	1	0	2
String 3 "virtual real*" AND service* AND "design research*"	15	8	49	72
Total	51	22	185	258

After collecting the articles from different databases, the data filtering process was initiated. This process involved initially removing duplicate references. Then, the title, abstract, and keywords were read. This was followed by reading the introduction and conclusion sections. Finally, a full-text reading was conducted, only 10 articles were selected after the filtering process. The number of articles remaining after each filtering step is shown in Figure 1.

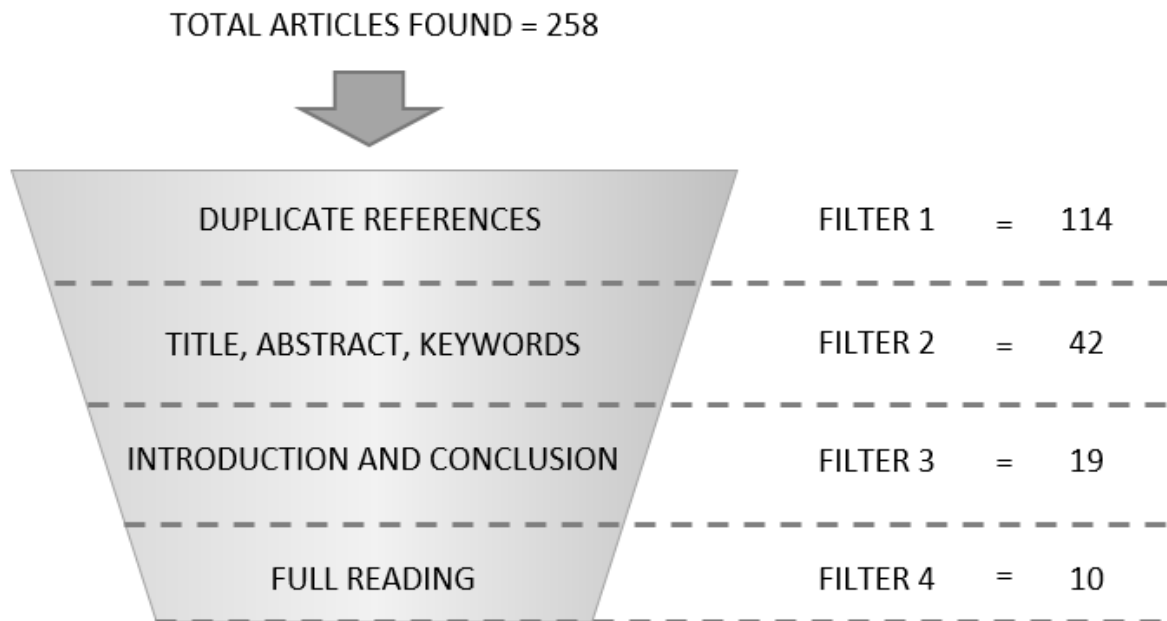


Figure 1. Data Filtering

The search results were screened using pre-defined inclusion and exclusion criteria based on factors such as relevance to the research question, methodological rigor, and contribution to the field of service design research. The final set of included articles was carefully analyzed, and data were extracted to synthesize the findings. The benefits, challenges, applications, and ethical considerations of using VR in service design research were reviewed.

By following the SBR method, a systematic approach to the literature review process was ensured, providing a comprehensive and insightful analysis of the impact of virtual reality on service design research.

3. Results

After conducting a thorough literature review, our findings demonstrate that VR technology offers numerous advantages for service design research. By creating a safe and controlled environment, designers can easily develop and test service design concepts without the need for costly and time-consuming field research (Bu et al., 2021). Additionally, VR provides a unique opportunity to understand the emotional and experiential aspects of service design by immersing users in realistic scenarios (Fromm et al., 2021). The technology also promotes collaboration and co-creation among stakeholders by allowing them to interact with service design concepts in real-time (Buhalis et al., 2022). Notably, as observed in a recent study by (Catapan et al., 2023), VR can serve as a powerful tool to create a first impression that can encourage users to try the service in the real world. Overall, these benefits highlight the potential of VR to enhance service design research and improve service experiences for users.

3.1 Benefits of VR in Service Design Research

Virtual reality (VR) technology provides several benefits in service design research, including:

Improved Service Prototyping: VR allows service designers to prototype and test their services in a virtual environment. This enables designers to create and test multiple scenarios without the need for physical spaces or equipment. VR prototyping also allows designers to test the usability and effectiveness of their services in a controlled environment, which can help them identify and fix issues before launching their services.

- **Enhanced User Experience:** VR can provide an immersive and interactive experience for users, which can enhance their engagement and satisfaction with the service. For example, VR can be used to simulate the service experience for customers, allowing them to explore and interact with the service before it is launched.
- **Increased Flexibility:** VR technology provides flexibility in service design research. Designers can easily modify and update their service prototypes in a virtual environment, allowing them to make changes quickly and efficiently. This flexibility also allows designers to test different scenarios and service features without the need for physical equipment or spaces.
- **Scalability:** VR technology enables designers to test their services on a larger scale, without the need for physical resources. Virtual environments can be easily replicated, allowing designers to test their services with multiple users simultaneously.

3.2 Challenges of VR in Service Design Research

Utilizing VR for service design research presents several challenges. Firstly, the cost and technical complexity of implementing VR technology may require specialized expertise and resources, making it difficult for some organizations to adopt (Baniyadi et al., 2020). Secondly, ethical considerations such as privacy and data security concerns can arise when using VR environments, particularly in cases where sensitive information is involved (Slater et al., 2020). Designers must take these challenges into account when considering the use of VR in service design research and take appropriate measures to address them.

4. Discussion

4.1 Applications of VR in Service Design Research

The integration of VR technology in service design research holds immense potential for transforming the approach of designers towards service design. Future research should focus on developing innovative methods and tools to harness the capabilities of VR in service design research and exploring its diverse applications across various fields. Specifically, researchers should investigate how VR can enrich the emotional and experiential aspects of service design and enable effective collaboration among stakeholders. As noted by (Catapan et al., 2021), VR technology can function as a multiplayer platform, enabling individuals from different regions to interact in virtual environments, offering an effective means of conducting remote service design research.

Healthcare is a sector where service design plays an increasingly crucial role, given patients' growing preference for personalized and engaging experiences (Patricio et al., 2020). VR technology can provide patients with realistic and immersive experiences of healthcare services, enabling them to offer feedback on service design by simulating hospital stays or medical procedures.

Another field where VR technology can find potential applications is education, where it can simulate classroom environments to enable educators to test and refine their teaching methods and

materials. Moreover, VR technology can create immersive learning experiences that enhance student engagement and active learning, offering opportunities for transforming traditional educational approaches (Buhalis & Law, 2008). As noted by (Mercado et al., 2021), virtual reality-based education can result in knowledge retention rates as high as 90%, making it a highly effective methodology for imparting knowledge.

Virtual reality (VR) has the potential to transform distance learning by providing remote learners with immersive and interactive virtual environments to engage with educational content and peers. By bridging the gap between traditional classroom experiences and online learning, VR can enhance collaboration and communication among learners and instructors, ultimately improving the overall learning experience (Brown, 2023). As noted by (Mercado & Catapan, 2022), VR-based education also offers a flexible and asynchronous learning model that does not require physical learning environments, making it an effective method for imparting knowledge, particularly in the context of pandemic-related isolation. The use of VR technology in distance learning has the potential to revolutionize the way learners access and interact with educational content, promoting active learning and improving learning outcomes.

4.2 Ethical Considerations and Future Research Directions

However, it is crucial to recognize that while VR technology offers numerous benefits for service design research, it is not a panacea. Designers must carefully consider VR simulations' limitations and potential biases, ensuring they do not replace real-world research entirely. Additionally, the use of VR technology in service design research should be approached cautiously to avoid exacerbating existing social inequalities or perpetuating harmful stereotypes (Griffin & Jones, 2015).

Future research should address the ethical concerns and potential biases associated with using VR in service design research, as well as the challenges of implementing VR technology, such as cost and technical complexity. Researchers should also explore the long-term impacts of VR on service design research and practice, including the potential for VR to transform the field fundamentally.

5. Conclusion

The findings of this systematic bibliographic review demonstrate that virtual reality (VR) technology has the potential to revolutionize service design research by providing immersive and interactive experiences that simulate real-world scenarios. Despite the challenges associated with implementing VR technology, including the cost and complexity of implementation and ethical considerations such as data security, the benefits of this technology are significant. These benefits include the ability to create and test service design concepts in a safe and controlled environment, understand emotional and experiential aspects of service design, and facilitate collaboration among stakeholders. Future research in this area should focus on developing new methods and tools for using VR technology in service design research and exploring its potential applications in a variety of service design contexts, such as healthcare, education, and distance learning. Ultimately, VR technology has the potential to transform service design research and improve service experiences for users, making it a promising area of research for the future.

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