RUAS (Review of Urbanism and Architectural Studies)
eISSN: 2477-6033 | pISSN: 1693-3702
journal homepage: https://ruas.ub.ac.id
RUAS Vol. 23 No. 1 (2025) DOI: https://doi.org/10.21776/ub.ruas.2025.023.01.5

Media As Multi-Space: Spatial-Based Tourism in the Digital Virtual Era

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ARTICLE INFO

Article History:
Received: October 4, 2024
Received in revised form: January 5, 2025
Accepted on: January 20, 2025
Available Online: June-November 2025

Keywords: design, digital, spatial, tourism, virtual

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ABSTRACT

Studi ini bertujuan untuk memetakan karakteristik media virtual digital sebagai perluasan spasial arsitektur dalam konteks pariwisata. Lebih dari sekadar representasi, studi ini mengajukan argumen bahwa media virtual digital adalah alterasi dari spasial arsitektur. Konsep multi-spasial menyoroti hubungan antara arsitektur fisik dan digital sebagai sebuah kesatuan yang tak terpisahkan. Dalam konteks pariwisata, objek arsitektur seperti museum merupakan desain spasial berbasis pengalaman yang dapat diekspansi melalui medium virtual digital. Studi kualitatif ini menggunakan Museum Tsunami Aceh sebagai studi kasusnya. Melalui observasi, ditemukan berbagai model representasi media yang berkaitan dengan objek arsitektur tersebut. Studi ini berfokus pada pemetaan karakteristik dari setiap model spasial berbasis media. Temuan dari pemetaan karakteristik ini disintesiskan ke dalam tiga pemikiran utama: multi-akses, multi-pengguna, dan multi-waktu, yang merupakan perluasan dari pengalaman arsitektur itu sendiri. Studi ini memosisikan arsitektur tidak hanya sebagai bangunan fisik, tetapi juga mencakup ekspansi dan ekstensi spasialnya melalui berbagai media virtual digital, yang lebih dari sekadar duplikasi identik.

This study aims to map the characteristics and potential uses of digital virtual media as extensions of spatial architecture within the context of tourism. Beyond serving as mere representations, this study argues that digital virtual media function as a transformation of spatial architecture. The concept of multi-spatiality emphasizes the inseparable relationship between physical and digital architecture. In the context of tourism, architectural objects such as museums are experiential spatial designs that can be further expanded through digital virtual media. This qualitative study uses the Aceh Tsunami Museum as a case study. Through observation, various media-based modes of representing this architectural object were identified. This study focuses on mapping the characteristics of each media-based spatial model. The findings from this characterization are synthesized into three main concepts: multi-access, multi-user, and multi-time, which together represent an extension of the architectural experience itself. This study positions architecture not only as a physical structure but also as an evolving spatial entity, extending beyond mere duplication to encompass diverse digital and virtual dimensions.

1. Background: Digital Expansion of Space

Multi-space exists at the intersection of the physical and digital, where the once-clear boundaries between the two are increasingly blurred. It is not a singular space, but a hybrid one in which we effectively occupy multiple spaces simultaneously. Multi-space

emerges where the physical and digital collide, forming a dynamic, transitional zone in constant flux, with boundaries that are perpetually shifting (Hopkins, 2023, p. 2). This paper explores the potential of digital virtual media as an extension of architectural spatial presence, complementing the physical realm. Architecture extends beyond buildings to encompass cultural, economic, and local values, with spatial perception playing a central role (Pallasmaa & Holl, 2007). Various media influence spatial presence and are vital to architectural representation. Images are employed to produce accurate visualizations. Technological advancements have enhanced media representation, bringing experiences closer to reality (Stals & Caldas, 2022). Virtual reality, defined as a three-dimensional interactive environment simulated by computers (Mihelj et al., 2014; Putro, 2018), is increasingly used for architectural simulations.

The tourism sector integrates virtual technology, conceptualized as travel activities via digital media (Muhammad et al., 2021). Media creators range from entities like Google to tourist attraction managers, with museums offering significant opportunities for integrating architecture with virtual media experience (Achyarsyah et al., 2020; Howes et al., 2018). This integration has become especially relevant due to pandemic-related restrictions on physical visits. The study evaluates digital media as an alternative medium for experiencing space, analyzing various virtual media to provide an overview of technological advancements in architecture, and identifying the potential and characteristics of each medium for further development. The novelty of this study lies in the argument that digital virtual media is not merely a complement or duplication of physical architecture, but rather a means of enabling multi-spatial existence, an altered form of spatial experience that may even surpass the limitations of physical architecture itself.

2. Materials and Methods

2.1 Media as Multi-Spatial Museum: Virtual Media of Multi-Space Architecture

To fully appreciate its design essence, architecture must be experienced, not merely seen (Spence, 2020). This multi-sensory experience engages all senses and is no longer confined to physical interaction but can be represented as multi-space through various media (Hopkins, 2023; Redyantanu et al., 2023). Media used to experience architectural objects include photographs or 2D images, panoramic or 360-degree images, 2D videos, 360-degree panoramic videos, and interactive media—each offering unique ways to visualize design (Dio et al., 2019; Riesa & Haries, 2020). These media, ranging from static images on platforms like Instagram to immersive 360-degree videos on YouTube, demonstrate the connection between physical and digital spaces, enhancing the architectural experience through digital advancements. Figure 1 illustrates the connection between physical and digital spaces, as a multi-space.

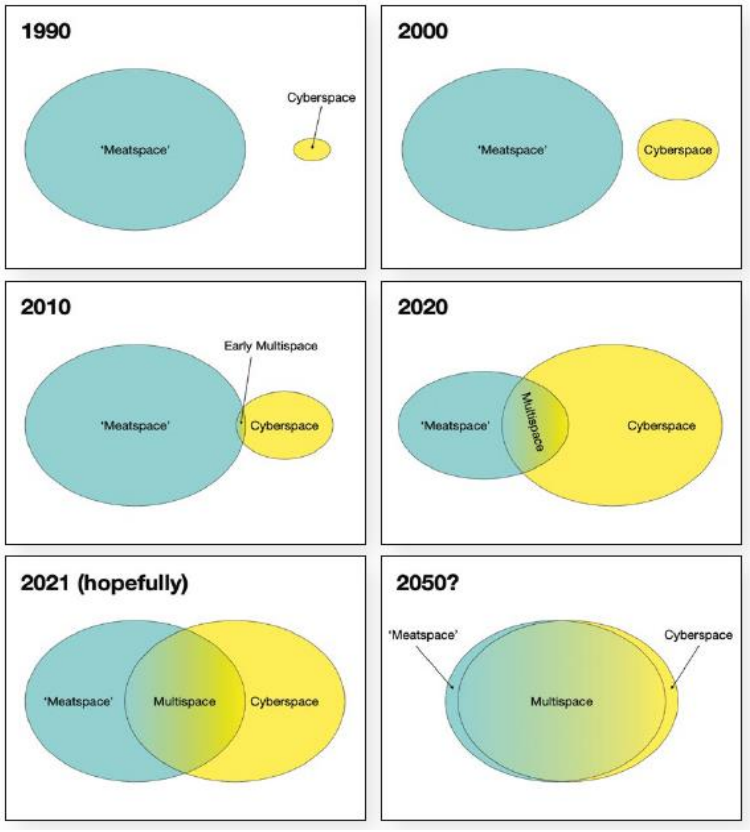

Figure 1. The concept of multi-space that merges physical and digital space
(Source: Hopkins, 2023)

The evolution of media has ushered in an era of digitized data and internet-connected devices, where users function as both consumers and content creators (Bryant, 2009). New media is characterized by interactivity—manifested through user actions such as clicks and swipes—and social presence, which enhances user experience through interpersonal engagement. Media richness engages multiple sensory modalities, thereby deepening understanding (Meechao, 2015; Miltiadis, 2020). Other defining attributes include autonomy, which allows personalized content consumption; entertainment value, which drives user engagement; and privacy, which fosters trust (Wiethoff et al., 2021).

Virtual architecture explores spatial experiences beyond physical structures (Flachbart & Weibel, 2005). Grosz (2001) describes virtual spatiality as future-oriented and intrinsically connected to media. The concept of multi-space emphasizes how virtual environments complement physical spaces (Hopkins, 2023).

This study maps the development of virtual tourism media by evaluating the characteristics, strengths, and limitations of each medium. It aims to provide insights for spatial designers to create diverse architectural representations and enhance user experiences through virtual media. The primary objective is to reposition media—not merely as a tool for representation—but as a means of spatial transformation that extends the boundaries of physical architecture.

2.2 Aceh Tsunami Museum as Multi Space Demonstration

The Aceh Tsunami Museum, designed by Ridwan Kamil and his team through a competitive process, was constructed around 2008 and officially opened in 2011. It stands as a physical monument to the devastating Aceh earthquake and tsunami of December 26, 2004. The museum incorporates historical artifacts and symbolizes the resilience of the Acehnese community. It aims to serve as a lasting legacy for future generations and functions as a learning center for disaster awareness, safety, and evacuation. Unlike conventional museums, its architecture is integral to the visitor experience, deeply influencing interpretations of the tsunami disaster (Dafrina, 2019).

Certain sections (Figure 2) are designed to evoke specific philosophical experiences, such as the Space of Fear (*Lorong Tsunami*) and the Space of Hope (*Jembatan Harapan*). Digital and virtual media can visually represent these spaces and engage other senses through interactive elements—an aspect this study seeks to evaluate. The research assesses various virtual tour media to determine their effectiveness in conveying these experiential spaces.

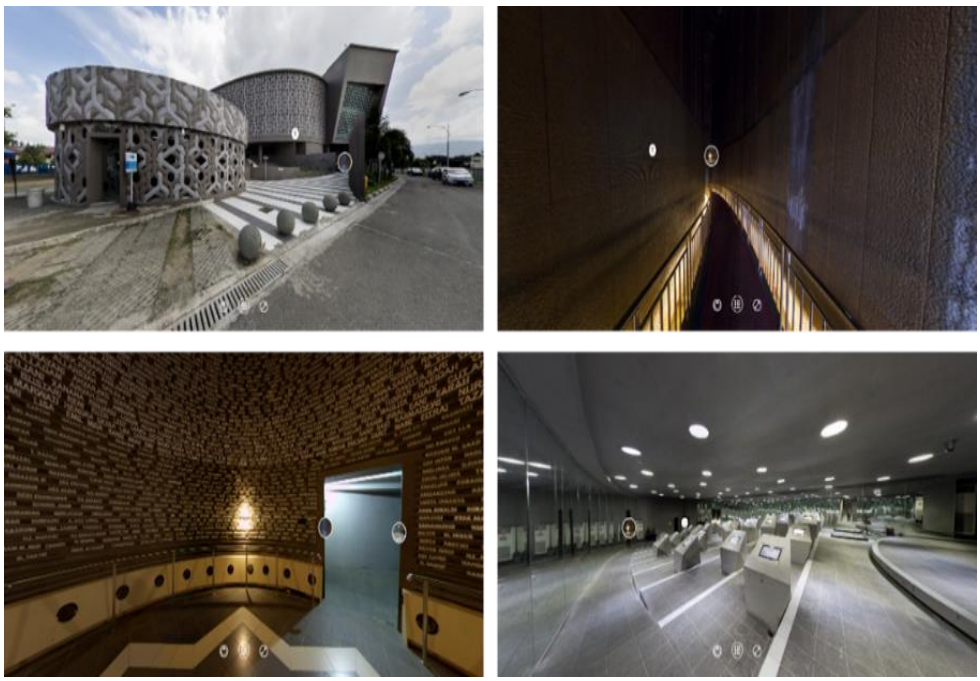

Figure 2. The Space of Aceh Tsunami Museum
(Source: 360indonesia.id)

Prospective tourists often research attractions to ensure their expectations align with reality, with virtual experiences enhancing satisfaction. During the pandemic, digital virtual visits became an alternative to physical tourism. Virtual museums, as digital collections of images, artifacts, and layouts, are accessible through electronic media (Achyarsyah et al., 2020). This study examines the development of media in architectural representation, highlighting its role beyond mere representation and its importance in offering an alternative and expansion of spatial experience.

2.3. Methods: Mapping Through Observing

This study employs a qualitative, single-instrument case study methodology to examine a specific case with a distinct theme (Groat & Wang, 2013). The research format focuses on the design object (Lucas, 2016) to generate design knowledge. Data collection methods include literature review and virtual observation. Data sourced from the internet and other publications will be analyzed using a comparative descriptive technique, discussing the characteristics of each medium supporting the virtual tour. The diagram illustrates a collage of spatial quality images curated through a specific process (Persohn, 2021). The parameters for analyzing each medium are derived from the previously described literature review. This comparative analysis aims to illustrate the current progress of media and identify future development opportunities.

The exploration of various digital media based on virtual tourism tours is categorized by type and character. The author conducts a direct exploration of each category and type of digital tour media. Virtual observations through desktop media have identified various inherent characteristics of different digital tourism media. These characteristics are presented in a comparative study format, allowing for a clear understanding of each medium's unique attributes. This study aims to provide an overview of various media that can facilitate architectural spatiality-based tourism activities and offer alternative and extension of spatial experiences through virtual digital tourism media, highlighting potential future developments.

3. Result and Discussion

3.1 Multiple Types of Digital Virtual Space

Based on the data collected regarding the virtual digital tour of the Aceh Tsunami Museum, the author identified several media platforms. These platforms were selected for their accessibility and widespread familiarity among internet users. According to Junawan (2020), YouTube, Instagram, Facebook, and Twitter are among the most prominent. The details of each platform are as follows:

1. Static Website: Information Space
   This official platform, managed by the museum administration, provides operational information, details of thematic events scheduled at the Tsunami Museum, and a photo gallery documenting these activities. However, the content is outdated, with the most recent updates relating to events from 2019. Additionally, certain sections of the webpage require refreshing. This digital informative function is not easily achievable in the physical spatial context of a museum, as it comprises data that can be continuously updated online.
2. Panoramic *Website: Interactive Space*
   Interactive media allows users to control and engage with various types of content. This format can be experienced in virtual reality, featuring curated photographs of

each special room within the Aceh Tsunami Museum. Users are invited to navigate through the museum and view each space from multiple perspectives, using a mouse or touchscreen on a smartphone. At least six rooms are presented in detail, each equipped with interactive buttons that provide additional information. These areas include the Gate Area, Space of Fear, Space of Sorrow, Space of Memory, Space of Hope, and the roof of the rescue shelter (Figure 3). The ability of interactive media to respond to user input places it on par with physical experiences. Beyond simple navigation, this media format can also emphasize key design elements within each spatial section.

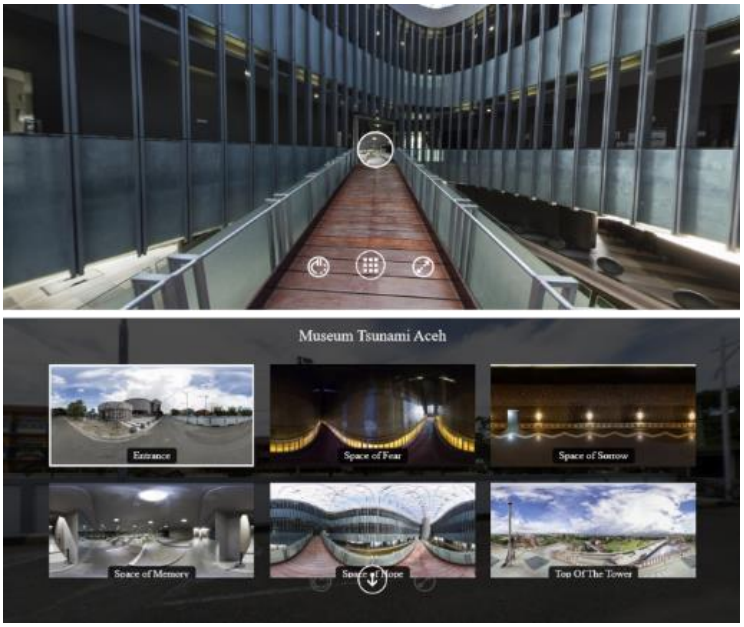

Figure 3. Interactive Space based on Panoramic Website
(Source: 360indonesia.id)

3. *Social Media: User-Generated Space*

Instagram and YouTube, as popular platforms for photo and video sharing, play a crucial role in virtual museum exploration. These platforms are continuously updated, with users documenting and sharing their experiences. They function both as repositories of memories and as sources of entertainment. User-generated content also enables official sources to share related media. However, while the Tsunami Museum's official Facebook page is outdated, its Instagram account has more recent updates (Figure 4). The strength of this media lies in its ability to offer diverse perspectives, continually refreshed by real-life user experiences. Such a dimension is not present in static physical exhibits, as it emerges from interactions facilitated by digital social media.

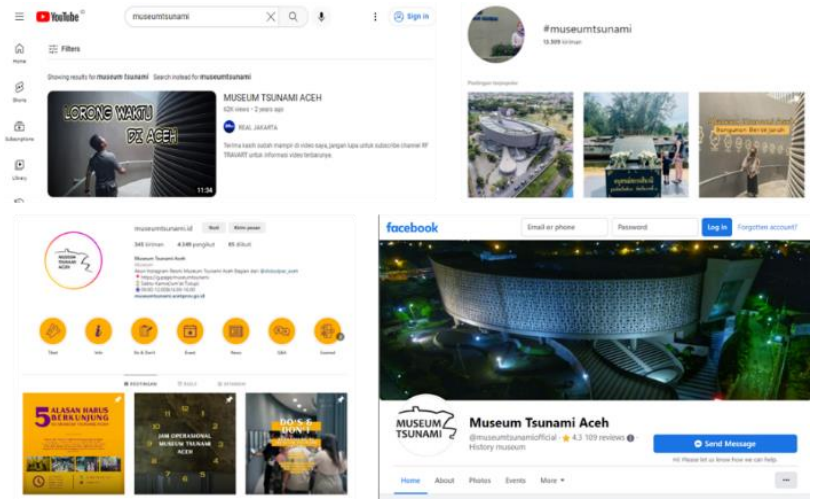

Figure 4. Social Media as User-Generated Space
(Source: Facebook, YouTube, Instagram)

4. *Google Location: Rated Space*

Google's review platform is one of the most influential media forms for virtual tours, supported by user-generated content such as photos, videos, and panoramic images. The content is relatively up-to-date and, being sourced directly from users, is considered relatively objective. A study by Haq (2020) found that tourist attraction managers use Google Reviews as a valuable reference for developing and improving their destinations. Rating-based spatial analysis reveals aspects of user satisfaction with public space performance that are not easily observed. Referencing earlier literature (Choi & Baek, 2011), which analyzes the characteristics of new media, this study compares various media using the aspects outlined in Table 1.

The processed data reveals that no single media platform is universally superior. Official websites offer strong data control and serve as authoritative references but are more difficult to update compared to social media. Official social media platforms allow for robust content control and user engagement but require consistent updates and management. User-generated social media benefits from diverse, automatically updated content, yet lacks control over content quality. Location-based media fosters strong user attachment and provides varied visual displays, with automatic updates offering valuable insights into the quality of museum exhibits. Interactive websites excel in delivering immersive experiences through curated content and virtual reality technology; however, like official websites, they tend to be updated less frequently and provide limited user interaction. Collectively, these media platforms transform into various types of spaces: discussion spaces, experiential spaces, evaluative spaces, interactive spaces, and more. Media is no longer static, it now possesses dynamic spatial capabilities.

Traditional media like photos and videos act as windows into places, while virtual tourism media creates entirely new spaces through immersion and interaction. Unlike static images, virtual tours with 360° panoramic views and VR technology allow

exploration and engagement, transforming users from passive observers to active participants.

Table 1. Comparative character between different types of virtual tour media

Type	Variant	Authorship	Media Type	Content & Information	Interactivity, Immersivity & Personalization
Static Website: Information Space	Official Website	Official Manager	Text, Photos	Limited to event, description, and operational information	Standard photo and text media with no additional technological aspects
Social Media: User-Generated Space	Official Instagram	Official Manager	Text, Photos & Video	Event Announcement, Activity Documentation, Museum Content	There is a comment section where other users can participate.
	Official Facebook	Official Manager	Text, Photos & Video	Event Announcement, Activity Documentation, Museum Content	There are comment and upload fields where other users can participate.
	Official Twitter	Official Manager	Text, Photos & Video	Information on current activities related to operations	There is a comment field for interaction without other immersive features
	YouTube Search	Public	User Video	User Generated (Experience)	There are opportunities to upload, comment, and control videos
	Instagram Search	Public	User Photo & Video	User Generated (Experience)	Opportunity to upload, comment, and save photos
Google Location: Review Space	Google Review	Official Manager & Public	Text, Photo, Video, Panoramic	User Generated (Experience)	There are opportunities to upload photos, panoramic photos, videos, and comments
Panoramic Website: Interactive Space	360 Indonesia.id	Official Manager	Text, Photo, Panoramic	Virtual Tour of Museum Spatial Aspect	Viewing angle control and navigation per room or space

Table 2. Comparison of the Medias

Character	Interactivity	Sociability	Media Variation	Playfulness	Autonomy	Personalization	Privacy
Static Website	x	x	v	x	x	x	x
Official Social Media	v	v	v	v	x	x	x
User Based Social Media	v	v	v	v	v	v	v
User-Review Based Media	v	v	v	v	v	v	v
Panoramic Website	v	x	v	v	x	x	x

These tours make locations accessible to everyone, fostering shared experiences beyond physical boundaries. Although not directly involved in construction, virtual tourism significantly connects to architectural spatial production, offering inspiration, user experience testing, contextual understanding, and marketing engagement for architects. Virtual tours of buildings, especially iconic structures, can inspire new designs, test proposed layouts, integrate environments, and serve as marketing tools during and after construction, providing a permanent record of architectural achievement.

3.2 Multi Space Through Multi Access, Multi User, and Multi Time

The advent of virtual digital spaces has revolutionized architectural accessibility. **Multi-access capabilities** allow users around the world to interact with designs, effectively breaking geographical barriers. Virtual tours of museums and historical buildings provide educational and cultural enrichment, making architectural marvels accessible to anyone with an internet connection. This democratization fosters inclusivity, enabling individuals with disabilities or financial limitations to explore architecture from their homes while supporting immersive educational experiences.

Virtual spaces also offer the advantage of **multi-user access**, accommodating unlimited users simultaneously. This feature is particularly beneficial in educational settings, where multiple students can engage with the same model, and in collaborative environments among architects and designers. Moreover, users can become content creators themselves, sharing experiences and enriching digital representations with diverse perspectives. This participatory approach fosters a sense of community and shared ownership over digital architectural spaces, enhancing user engagement.

In addition, the **flexibility of multi-time access** allows virtual spaces to be explored at any time, providing unparalleled convenience. This is especially advantageous for users with demanding schedules or those in different time zones, supporting asynchronous learning and collaboration. It accommodates various learning styles and preferences, enabling users to engage at their own pace. By eliminating temporal constraints, virtual spaces empower individuals to control their exploration, cultivating a deeper connection with architectural content.

Virtual spatial tourism leverages digital media to bridge the gap between existing built environments and conceptual or emerging architectural projects (Howes et al., 2018; Miltiadis, 2020). It serves as a source of inspiration, a tool for user experience testing, and a platform for public engagement. Virtual tourism constructs immersive, interactive, and accessible spatial experiences that users can explore, interact with, and learn from (Riesa & Haries, 2020; Stals & Caldas, 2022), transforming media from a passive window into an active doorway to new architectural realms.

The concept of **"media as space"** is supported by virtual media's capacity to deliver spatial experiences through immersion, interactivity, and accessibility. Virtual media offers an alternative to physical spatiality, providing access to unlimited environments enhanced by technological interventions that diversify user experiences. This shift repositions architecture beyond physical buildings, allowing virtual constructs to be recognized as legitimate forms of spatiality rather than mere digital duplications (Hopkins, 2023; Spence, 2020).

Architects can now present spatial experiences through the dynamic possibilities afforded by virtual media (Wiethoff et al., 2021). These digital representations democratize access to architectural spaces and offer a rich, engaging platform for exploration and comprehension. Digital virtual spatiality encompasses capabilities that often exceed those of physical environments. Dimensions such as experience, evaluation,

dialogue, and documentation, though not always directly observable, emerge meaningfully within the digital medium. Media is no longer a mere representation; it has evolved into a spatial entity with multidimensional depth.

4. Conclusion

This study emphasizes that media should not be seen merely as digital replicas of physical spatial sources, but as spatial extensions that offer distinct experiences and reveal multidimensional depth beyond physical observation, thus serving as both complementary and equivalent. The concept of multi-spatiality frames media as alternative forms of space that enrich physical spatiality through multi-access, multi-user engagement, and multi-temporality. Virtual digital media go beyond the notion of "twins," demonstrating significant potential in the design of experience-based architectural objects.

The limitations of this research include the variety of media and research objects involved. Future research could explore design-based studies, using this observation as a starting point for architects to view media as opportunities for crafting diverse spatial experiences. Further exploration may involve various media in spatial contexts, aiming to uncover new design strategies for presenting architectural works—strategies not limited to physical realization, but enriched through multimedia expansions and cross-media expressions. The core characteristics of various digital virtual media have been mapped in this study to support such future endeavors.

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