

## IMPULSE: Performing Digital Heritage in Mixed Realities

By Adnan Hadziselimovic\*

*This paper discusses artistic research practices (Borgdorff 2010) through performing digital heritage, within the IMPULSE research project (Żegleń 2025), seeking ways digitised cultural heritage is experienced and interpreted through immersive virtual environments. The research project aims to utilize digital heritage assets in performances and exhibitions that engage audiences in innovative ways, employing artistic research methodologies to explore speculative interpretations of digital archives. It leverages emerging technologies and metaverses to expand the scope of heritage research (Azoulay 2019), addressing challenges such as accessibility, inclusivity, interoperability, and user-centered design. The paper examines the transformative role of artistic research as a methodology and explores its potential to foster emotional and cognitive engagement, highlighting how performing digital heritage can reshape the understanding and dissemination of cultural artifacts.*

**Keywords:** *Artistic Research, Digital Heritage, Performing Heritage, Practice as Research, Extended Reality, Immersive Experiences.*

### Introduction: Digitisation of Cultural Heritage

The digitisation of cultural heritage has become a cornerstone of contemporary efforts to preserve and disseminate historical and cultural artifacts. Defined broadly, digitisation refers to the process of converting physical objects, documents, or environments into digital formats for storage, analysis, and accessibility. This approach has its roots in archival practices, where preservation and safeguarding of tangible cultural heritage were prioritised. However, as Parry (2007) asserts, digitisation is not merely a technical process but also a cultural phenomenon that redefines how society interacts with its past. Initially, digitisation initiatives emphasised the creation of static digital archives designed to safeguard fragile or endangered materials. Such efforts were often guided by the principle of "preservation through representation," where digital surrogates served as proxies for physical artifacts (Hughes 2012). These archives have become important tools for research, education, and conservation, providing access to cultural heritage that might otherwise remain inaccessible due to geographic, economic, or political barriers (Wagner & de Clippele 2023). Programs such as the Europeana initiative illustrate the global scope of digitisation projects.

Despite these successes, the traditional focus on preservation and archival consistency has often limited the potential for dynamic and interactive engagement (Oh & Shi 2021) with digital heritage. Scholars like Cameron and Kenderdine

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\*Associate Professor, University of Malta, Malta.

(2007) have critiqued the static nature of many digital collections, arguing that the full potential of digitisation lies in its ability to create new contexts for interpretation and interaction. By incorporating immersive technologies such as Virtual Reality (VR) and Augmented Reality (AR), digitisation can transcend its original goals, enabling users to explore, manipulate, and experience cultural artifacts in ways that are multisensory and participatory (Champion 2011). The IMPULSE research project seeks to build upon these advances by leveraging emerging technologies to transform digitised cultural heritage into performative and interactive experiences. This approach aligns with broader shifts in the cultural heritage sector, where the focus is increasingly on engaging audiences in active and meaningful ways (Parry 2007).

### **Artistic Research Framework**

Artistic research represents a paradigm shift in the ways knowledge is produced and disseminated. Defined as a practice-based methodology, artistic research integrates creative processes with scholarly inquiry, treating artistic practice as both a method and a form of knowledge production (Borgdorff 2006). This methodology challenges the traditional dichotomy between theory and practice, emphasizing the epistemic value of intuition, creativity, and subjectivity. Barrett & Bolt (2007) highlights the iterative nature of artistic research, where experimentation and reflection drive the generation of new insights. Similarly, Hannula et al. (2014) argue that artistic research is uniquely suited to addressing interdisciplinary questions, particularly those that resist quantification or linear analysis. In the context of the IMPULSE research project, artistic research will serve as a framework for reimagining digitised cultural heritage, providing tools for speculative interpretation and collaborative engagement. By positioning artistic practice as a form of inquiry, the IMPULSE project aims to create new modes of interaction with cultural heritage. This approach is particularly relevant in the digital age, where the boundaries between creator and audience, physical and virtual, and material and immaterial are increasingly blurred (Leavy 2020).

Artistic research has gained prominence in recent years as a methodological approach that integrates creative practice with academic scholarship. According to Borgdorff (2006), artistic research is distinguished by its focus on the process of creation as a form of knowledge production (Fosnot 2013). This approach treats artistic practices as both the subject and the method of inquiry, allowing researchers to explore complex questions through experimentation, reflection, and interpretation. The iterative nature of artistic research makes it particularly well-suited to fields such as cultural heritage, where the relationship between material artifacts, historical narratives, and contemporary contexts is dynamic and multifaceted. Scholars such as Biggs and Karlsson (2010) and Leavy (2020) have emphasized the value of artistic research in generating new perspectives on cultural, social, and technological phenomena. Within the IMPULSE research project, artistic research will be employed to explore how digitised heritage assets can be transformed into performative and interactive experiences. By engaging artists, technologists, and cultural institutions in a collaborative process, the project aims to create speculative interpretations of digital archives that challenge conventional modes of representation.

Collaboration is a cornerstone of artistic research, particularly when applied to digitised heritage. By bringing together diverse stakeholders, including artists, curators, technologists, and community members, the IMPULSE project fosters interdisciplinary dialogue and co-creation. This collaborative approach is essential for addressing the limitations of existing digitised heritage resources, such as non-standard formats, resolution constraints, and prescriptive discovery tools (Hughes 2012). Collaborative workshops provide a platform for participants to explore the creative potential of digital archives (Spieker 2017), identifying opportunities for reinterpretation and innovation. These sessions also serve as a forum for addressing practical challenges, such as integrating heritage assets into immersive environments or enhancing the discoverability of underrepresented collections.

Institutional databases often present significant challenges for creative practitioners. As Rinehart and Ippolito (2014) observe, these databases are typically designed with archival consistency in mind, prioritising standardised metadata and controlled vocabularies. While these features are essential for research and conservation, they can hinder exploratory and creative engagement. Non-standard file formats, low-resolution assets, and prescriptive discovery tools further complicate the use of institutional databases in artistic and immersive contexts. The IMPULSE project addresses these challenges by advocating for more flexible and user-centered approaches to design. The integration of visual search tools and thematic filters can enable users to navigate collections based on aesthetic or conceptual criteria, rather than rigid taxonomies (Champion 2011).

Artistic research methodologies (Schulze & Waltenspül 2025), including speculative prototyping and participatory design, can play a critical role in informing the development of these tools. Speculative prototyping involves the creation of experimental models or mock-ups that explore alternative ways of interacting with digital collections. By engaging artists, technologists, and cultural practitioners in the prototyping process, institutions can identify innovative functionalities that enhance user engagement and creativity (Hannula et al. 2014). Participatory design, on the other hand, emphasizes the active involvement of users in the design process. By hosting collaborative workshops and user studies, institutions can gain insights into how diverse stakeholders interact with digital collections and what functionalities they value most. A participatory workshop might reveal that educators prefer tools that enable storytelling and contextualisation, while artists prioritize tools that support aesthetic exploration and manipulation (Leavy 2020). These insights can guide the development of tools that are not only functional but also inspiring (Song & Evans 2024). IMPULSE advocates for greater standardisation and interoperability in the design. This includes adopting open file formats, and consistent metadata practices to ensure that digital assets are accessible and usable across a wide range of platforms and applications (Hughes 2012). By addressing these technical challenges, institutions can create collections that are not only robust and sustainable but also adaptable to the evolving needs of users. By leveraging artistic research methodologies and emerging technologies, IMPULSE seeks to create prototypes that inspire and empower users to engage with digitised heritage.

## **Artistic Interpretation of Digital Heritage Objects**

IMPULSE aims to research ways in which digitised heritage objects are understood and experienced by reimagining them as dynamic components of immersive extended narratives. These extended narratives transform static digital artifacts into living, performative entities that connect audiences with the historical, cultural, and social dimensions of heritage in ways that are meaningful and engaging. This approach draws on speculative interpretation, a methodology rooted in artistic research (Arrigoni 2016), which encourages participants to explore digital archives (Bastian 2006, Ceuterick 2021, Eastwood 1994) through creative and transformative lenses (Haraway 2013, Haraway 2016, Jenkins 2006). Speculative interpretation challenges conventional approaches to heritage preservation by positioning artifacts not just as remnants of the past but as catalysts for imagination and innovation. A digitised artifact such as a medieval chalice might be interpreted not merely as an object of religious significance but as a symbol of craftsmanship, trade networks, and cultural exchange. Through immersive storytelling, users can engage with these multifaceted narratives, uncovering the layers of meaning embedded within the artifact. The emphasis on artistic interpretation aligns with the idea of performing digital heritage, where the focus shifts from static representation to dynamic engagement (Vaikla 2024). By incorporating speculative interpretation, IMPULSE seeks to reimagine digital heritage objects in ways that resonate with contemporary cultural and social contexts.

Interactivity is another key element for the artistic interpretation of digital heritage objects. Immersive environments allow users to actively explore and manipulate digital heritage objects, transforming the learning process into a dynamic and participatory experience. Users might engage in a virtual archaeology simulation, where they excavate artifacts, piece them together, and analyze their significance. This hands-on approach not only deepens their understanding of the artifacts but also encourages critical thinking and problem-solving. Interactive exploration (Bressan et al. 2017) also facilitates multidimensional understanding of digital heritage objects. Users could view a digitised artifact from multiple perspectives, examining its physical properties, its historical context, and its cultural significance. By integrating layers of information into the immersive environment, IMPULSE enables users to construct extended stories, enhancing cognitive engagement and creating emotional connections, making the learning experience more memorable (Jenkins 2006). Extended storytelling adds depth to the interaction, providing users with a vivid understanding of the digital artifact (Song & Evans 2024). Therefore, IMPULSE incorporates collaborative virtual spaces, where multiple users can interact with digitised heritage objects and with each other in real time. These spaces provide opportunities for collaborative extended storytelling, educational workshops, and co-creation. In heritage research, worldbuilding (Lee et al. 2021, Pearce 2011, Simoniti 2023) serves as a framework (von Osten 2011) for integrating disparate historical artifacts, narratives, and contexts into unified virtual environments. A digital reconstruction of an ancient temple could combine architectural models, textual records, and artistic representations to create a multisensory experience that captures the temple's aesthetic, cultural, and social dimensions. By contextualizing heritage objects within their broader historical settings, worldbuilding provides

users with a holistic understanding of the past, bridging the gap between isolated artifacts and their larger cultural narratives (Cameron & Kenderdine 2007).

Performance as a medium (Friberg et al. 2010) holds immense potential for reimagining and engaging with cultural heritage. It transcends traditional static methods of representation by incorporating dynamic, embodied practices (Bhattacharjee 2024) and interactive technologies to create multisensory experiences. The IMPULSE research project proposes to utilise performance as a transformative tool (Sedgwick 2003) to interpret and disseminate digitised heritage, fostering connections that are both emotionally resonant and intellectually stimulating (Dixon 2007). Through a combination of live, digital, and virtual performance modalities, the IMPULSE project aims to position cultural heritage not merely as an object of study but as a lived, shared experience.

Embodied practices (Heim et al. 2022), which emphasize the role of the body in perceiving and interacting with the world, are central to the IMPULSE project's approach to performing digital heritage. The theory of embodied cognition suggests that sensory and motor experiences are fundamental to human understanding (Johnson 1999). By incorporating physical movement, gestures, and sensory feedback into performances, the IMPULSE project aims to create experiences that resonate deeply with audiences on both cognitive and emotional levels.

Motion capture technology is being used to translate the movements of performers into digital avatars, bringing historical characters or narratives to life within virtual environments. This approach not only enhances the realism of the performance but also allows audiences to 'step into' the world of the heritage being presented. A user might, for example, navigate a virtual reconstruction of an ancient temple while interacting with digital avatars representing historical figures who narrate the temple's significance.

One of the most exciting aspects of performing digital heritage is its potential to transform audiences from passive spectators into active participants. Interactive performances invite audiences to engage directly with the content, whether by manipulating digital artifacts, influencing the narrative, or contributing their own interpretations. This participatory approach aligns with contemporary trends in cultural heritage, which emphasize inclusivity and co-creation (Cameron & Kenderdine 2007). An interactive performance might allow users to 'perform' historical roles, such as a scribe writing in an illuminated manuscript or a potter shaping clay on a virtual wheel. These embodied interactions not only deepen the audience's understanding of the heritage being presented but also create a sense of personal connection and ownership. The IMPULSE project will also emphasize the multisensory nature of performance, incorporating visual, auditory, and tactile elements to create holistic and immersive experiences. A performance centered on an ancient marketplace might combine digital reconstructions of the market's architecture with soundscapes of bustling crowds and the tactile sensation of handling virtual goods. By engaging multiple senses, the IMPULSE project aims to enhance memory retention and emotional resonance, making the heritage experience more impactful and memorable (Baker & Sicchio 2016, Champion 2011).

### **Critical Reflection: The Role of Performing Heritage for Institutions**

The IMPULSE project represents a bold and innovative approach to the transformation of digitised cultural heritage, positioning it as a dynamic and participatory medium rather than a static repository of information. By integrating artistic research methodologies (Kaila et al. 2017) and leveraging immersive technologies, the IMPULSE project aims to reimagine cultural heritage as an interactive, performative, and inclusive domain. This vision aligns with contemporary trends in heritage research and practice, which increasingly emphasize engagement, co-creation, and accessibility as central principles for the digital age.

The IMPULSE project's emphasis on performance as a medium for interpreting and exhibiting digital heritage challenges traditional models of curation (Kolb 2024, Krasny 2016, Martinon 2013, Orr 2018) and dissemination. Through the integration of embodied practices and interactive technologies, performance becomes a tool for bringing cultural heritage to life in ways that are both emotionally resonant and intellectually stimulating (Dixon 2007). This approach enables heritage institutions to move beyond static displays, creating immersive environments that foster deeper connections between audiences and cultural memory. Despite its transformative potential, the implementation of performing digital heritage requires careful consideration of several critical challenges. By prioritizing user-centered design and inclusivity, the IMPULSE project seeks to ensure that its digital environments are equitable and accessible to all (Jones 2021).

The integration of artistic research methodologies (Stadon & Grasset 2011) further distinguishes the IMPULSE project as a pioneering initiative in the field of digital heritage. By treating creative practices as a form of inquiry, the IMPULSE project highlights the value of intuition, experimentation, and collaboration in addressing complex challenges and generating new insights. This approach not only enriches the IMPULSE project's outcomes but also establishes a precedent for interdisciplinary innovation in heritage research (Borgdorff 2006).

Performing digital heritage offers a powerful tool for heritage institutions to engage with contemporary audiences and redefine their roles in society. As custodians of cultural memory, institutions are tasked with not only preserving artifacts but also making them relevant and accessible to diverse publics. The performative approach proposed by the IMPULSE project provides a means of fulfilling this mandate, offering interactive (Oh & Shi 2021) and participatory experiences that resonate with the values and interests of today's audiences.

Looking ahead, the IMPULSE project envisions a future where performing digital heritage becomes a standard practice for cultural institutions, transforming the ways in which heritage is preserved, interpreted, and shared. This vision is not only ambitious but also achievable, as the rapid development of immersive technologies and artistic research methodologies continues to open new possibilities for innovation. By building on the insights and strategies outlined in the IMPULSE project, heritage institutions can create experiences (Clifford 1997) that are not only technologically advanced but also culturally and socially meaningful.

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