

IMPULSE

IMmersive digitisation: uPcycling cULTural
heritage towards new reviving StratEgies

Deliverable 1.9:
**Online and offline workshops
with communities**



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2 Executive Summary

This deliverable, D1.9 'Online and offline workshops with communities', presents the methodologies and results of a series of online and offline workshops undertaken with the IMPULSE target communities at a local and institutional level, and a number of larger Consortium-level workshops as part of Task 1.3.1 'Preparation' of Work Package 1. Its purpose is to consolidate the questions, methods, and insights generated so far, and to frame them as preparatory work for the next phase of prototyping.

The research emerged from Work Package 1, Task 1.3: 'Teaching and Learning Prototypes', which explores how to engage teachers and students with digital cultural heritage collections through reciprocal learning techniques in XR environments. The work builds upon the results of the user survey of Task 1.1 'UX Research' and the ideation of Task 1.2 'Artistic Research Prototype' to develop a methodology for engagement in workshop formats that explore the interpretation of collections through sharing and co-creating with collection objects within the Multi-User Virtual Environment that is being developed by Work Package 2, as well as more speculatively.

This work is framed by Task 1.3.1: 'Preparation' phase, which involved in-depth reviews of collections and prototyping largely within the consortium, and with external community and institution-level workshops with prototype users. This preparatory work forms the foundation of Task 1.3.2: 'Co-creation', beginning immediately after the completion of this deliverable, which will implement more workshops based on the methodologies formed through Task 1.3.1.

The research was coordinated by Heritage Malta, the University of Malta, and Magna Żmien. The deliverable was written by Heritage Malta and Magna Żmien.

Key words:

Workshops, Human Computer Interaction, HCI, Research through Design, RtD Online community, Game Jams, Cultural Heritage, Speculative Design, Playfulness, Participatory Design, Co-creation, Education, Agency, Technology, Multiperspectivity.

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4 Abbreviations and Acronyms

Abbreviation / acronym	Description
AR	Augmented Reality
C&D	Communication and Dissemination
CC	Associazione Clust-ER Industrie Culturali e Creative
CCI	Cultural and Creative Industries
CH	Cultural Heritage
ECCCH	European Collaborative Cloud for Cultural Heritage
EV	Explodedview sp. z o.o.
G1	Group 1
G2	Group 2
G3	Group 3
GDPR	General Data Protection Regulation
GLAM	Galleries, Libraries, Archives, Museums
HCI	Human-Computer Interaction
IMCo	IMPULSE Community of Practice
IPR	Intellectual Property Rights
KPIs	Key Performance Indicators
MDA	Mechanics–Dynamics–Aesthetics
MR	Mixed Reality
MUVE	Multi-User Virtual Environment
RtD	Research Through Design
TIFF	Thessaloniki Film Festival
UI	User Interface
UX	User Experience
VR	Virtual Reality
XR	Extended Reality

5 Introduction

5.1 IMPULSE Project

Digital technologies are playing a key role in the sustainability transformation; therefore, IMPULSE applies a comprehensive approach to tackling some of the major pressing gaps in the European cultural heritage digitization processes. In doing so, IMPULSE will develop ground-breaking, comprehensive solutions and methods for digitization processes and accessibility of digital cultural heritage collections, that will enable their innovative (re)use, solve challenges related to the interoperability of platforms and facilitate the availability of existing digitized cultural heritage content in novel contexts like the Metaverse while creating innovative standardization procedures and adapting legal frameworks to contemporary transformations and creative processes in and for education, arts, and CCSI. IMPULSE will foster solutions that extend the range, and consequently the quantity, of artifacts and objects, that can be displayed through using XR to recreate objects, making collections more virtually accessible in order to enable original uses of digital cultural heritage archives to create diverse, and layered narratives, for the wider demographic audience and underrepresented communities, empowering them to engage more deeply with the topics and themes on display, also through artistic (visual artists and dancers) performance through IMPULSE's pilots and prototypes. IMPULSE will also enable connections and encounters among researchers, artists, cultural heritage practitioners, CCSIs, entrepreneurs, local institutions, companies, and other relevant stakeholders, through effective engagement such as IMPULSE Community of Practice, and appropriate tools and channels such as IMPULSE Hackathon and Acceleration & Mentoring Hub in order to facilitate effective dialogue, co-creation, and capacity building in immersive digitization.

5.2 Objectives of Work Package 1

Work Package 1 (WP1), entitled Extended Storytelling Towards Vivid User Experiences, is one of the foundational modules of the IMPULSE project. Its overarching goal is to conceptualise, develop, and empirically validate new modes of storytelling in immersive environments based on user needs, narrative diversity, and technological affordances.

WP1 seeks to:

- identify and define the information needs and behaviours of selected user groups interacting with immersive cultural content,
- investigate affective, cognitive, and social dimensions of XR-based user experiences,
- support the design of educational and artistic applications using extended reality (XR),
- produce guidance for narrative structures and interaction strategies that are accessible, inclusive, and adaptable to different audiences and contexts.

To achieve these goals, WP1 includes the design of a comprehensive research methodology (developed in D1.1), followed by empirical UX research (documented in D1.2), and culminating in behavioural diagnostics and persona construction (in D1.3 and beyond). The findings from WP1 are directly integrated into the technical development of the prototype platform in WP2, ensuring continuity between conceptual design, user engagement, and implementation.

5.3 Objectives of Task 1.3

Task 1.3: Teaching and Learning Prototypes (M13-36) (Lead: HM; Partners: UM, MZ, UJ, KUL, UNIBO, NKUA, FBKW). This task explores how to engage teachers/students with digital cultural heritage collections/curators in such a way that the learning experience is reciprocal. The key to this is a data-driven yet human-centred approach that intensifies interaction to the level of co-creation.

The partners in this task will build upon the results of the user survey in Task 1.1 and ideation from Task 1.2 to develop a methodology for engagement that focuses on collection interpretation by sharing and co-creating contextual layers around objects included in the Metaverse. Collaborative interpretation models employing novel, suitable discovery aids (the desktop and VR interfaces developed under WP2) will be developed on the basis of a use case that allows for replication and extrapolation in different settings and (upscaled/downscaled) dimensions. By making interpretation, contextualization and teaching/learning processes incremental and reciprocal, the target audiences/end users become the pivot of the heritage experience jointly with the collection holders.

Guided by a methodology designed to include use scenarios and interpretation models, this task will also produce a playbook for community interaction building on insights and experiences gathered through the teaching/learning use case. Both methodology and

playbook will be piloted in a series of practical workshops with the targeted end users exploring how less-visible collections and sources of knowledge can be creatively engaged with. The outcomes of the workshops will be key to shaping, operating and populating inclusive and purpose-focused metaverses that translate user needs and requirements into a digital environment that allows countering of traditional, hegemonic top-down approaches to digitisation. The project aims to create a prototype for reciprocal learning by focusing on university teachers/students and their historical pedagogical processes. Through hands-on activities and workshops, they will explore diverse heritage collections, reflect on historical teaching practices, and redefine the ownership of collections and narratives. This approach blurs the distinction between teacher and student, allowing both to have a hand in storytelling and interpretation and redistributes the inherent power relationships of knowledge-sharing in institutions. The project also questions the nature of co-creation and co-curation and seeks to move toward more equitable community-level engagement.

The results of this task will be threefold:

- a validated use case for student/teacher engagement in historical subject matter will be available for replication and further development;
- a methodology, a playbook and guidelines on how to use them will inform a wider circle of stakeholders, including GLAMs, on how to facilitate and deploy innovative user engagement scenarios;
- the Multi-User Virtual Environments created for this purpose will be developed around and populated by objects from a selection of archive materials supplied by the partners, in collaboration with the pilot audience.

Task 1.3.1: Preparation (Month 13-18)

Preparation of a method of involvement of prototype users based on research carried out as part of task 1.1. Cooperation with WP2 in the selection of digital tools and objects, which enables an inclusive interpretation of 30 collections. In part, the activity will refer to the experience of the prototype for artists, which begins before this task on the WP timeline.

Task 1.3.2: Co-creation (Month 19-33)

A programme of offline and (majority) online workshops with an international body of participants representing heritage institutions, university collections, students, NGOs, artists, and museum audiences. The workshop group will initially consist of individuals and associated parties from our project partners, later expanding to include others from

beyond. Collections held by KU Leuven, UNIBO, FBKW, JU, HM, NKUA and MZ will be examined along with their overt and latent narratives, along with their different existing methods of access and interpretation. New approaches will be workshopped with these communities relating to improving access and interpretation of diverse collections, including documentary sources painting a picture of life in European university cities 500+ years ago, notes made by students, illustrations depicting teaching practices, objects used in classrooms and laboratories, etc; evidence of student participation in political activities, community-level activism, and sources of knowledge beyond institutions; collections of material relating to vocational learning, such as technical and trade schools. Interaction with the target groups will inform the final selection of objects for the Metaverse, thereby reversing the top-down approach of the digitisation workflows commonly used in cultural heritage institutions and moving toward more equitable community level engagement. These workshops will therefore also question who owns such collections and who may contribute to them, questioning the nature of co-creation and co-curation.

Task 1.3.3: Exhibition (Month 24-36)

Co-created output in the form of an exhibition using technological solutions that are determined suitable (through the work of both WP1 and WP2) resulting from collaborative work undertaken in the workshops. These may be used by teacher or student in the present and the future, highlighting how knowledge acquisition, exchange of ideas, and collaborative thinking is key to developing interpretational skills suited to the complexity of today's world.

5.4 Scope of this Deliverable

Deliverable 1.9 documents and analyses the reflective co-creation processes carried out through the workshops conducted within Work Package 1 'Extended storytelling towards vivid users experience' as outputs of Task 1.3 'Teaching and Learning Prototypes'. The main focus of Deliverable 1.9 is to capture the intellectual and creative trajectories that emerged through these sessions, and to provide a structured foundation for subsequent prototyping and design activities within the Work Package.

Task 1.3 aims to deliver a reciprocal validated use case for student and teacher engagement with cultural heritage collections in a Multi-User Virtual Environment (MUVE), providing a model that can be replicated and further developed in educational contexts. It also seeks to produce playbook consisting of methodologies of engagement,

and guidelines to support a wider range of stakeholders, including GLAM institutions, in facilitating and implementing innovative user engagement scenarios.

Deliverable 1.9 specifically addresses Task 1.3.1 'Preparation'. This work builds upon Deliverable 1.1 'Review of UX Methodology and Tool Proposition' and Deliverable 1.2 'User Research Report: UX Evaluation of IMPULSE VR Prototype', both of which relate to Task 1.1 of Work Package 1. The research agenda of IMPULSE is being advanced through a combination of a series of online, offline, and hybrid workshops.

The process described in this deliverable is firmly grounded in Research through Design (RtD). Instead of treating workshops as a means of validating pre-defined outcomes, they were structured as generative environments in which new questions, speculative directions, and critical reflections could emerge. where methods, prototypes, and questions evolve hand-in-hand.

The report captures the evolution of research questions, beginning with a literature review and case study analysis, and developing progressively through structured exercises, live collection visits, and interviews with practitioners. Majority of findings emphasise the importance of designing within context, addressing hierarchies of knowledge and power, and avoiding reductive or gimmick approaches. Participants stressed the value of co-creation, alternative narratives, and new forms of engagement that expand beyond traditional museum practices. The workshops highlighted challenges such as metadata standardisation, ethical handling of sensitive content, and the balance between authority and community voices.

These questions have been grouped into thematic clusters, and their evolution has been mapped accordingly. The seven clusters focus on: 1) institutional responsibility and ethics, 2) speculation and artistic interpretation, 3) learning and education, 4) ownership and agency, 5) game-based approach, 6) materiality and preservations and 7) technology and mechanics. Each reflecting critical areas where IMPULSE seeks to intervene. Taken together, these directly inform WP2's prototyping activities as well as future workshops. The insights serve as both design feedback, to ensure that IMPULSE explorations remain user-centred, and also methodological scaffolding since they 1) allowed for evaluation of the approaches and methodologies chosen, and 2) informed the design and development of a template to be used to collect standardise feedback.

These workshops bring together carefully selected stakeholders in processes of iterative prototyping and collective reflection, enabling the development of innovative approaches that inform the Multi-User Virtual Environment (MUVE) being created in Work Package 2 Technical.

Deliverable 1.9 is a critical reflection on the epistemological foundations of IMPULSE. It maps how lines of questioning have evolved across different phases of Work Package 1

through workshops, and how participants from the diverse backgrounds of IMPULSE consortium and its external IMCo community of practice have contributed to the shaping of these inquiries.

The workshops undertaken within this scope include:

- A series of bi-weekly Consortium Discussions between consortium partners;
- A series of bi-weekly structured Ideation Sessions which followed the Consortium Discussions;
- Institutional Deep Dive sessions that explored each consortium partner's collections;
- A Pre-hackathon workshop convened in Leuven, Belgium for consortium partners and external participants;
- Five Community Workshops held in Malta for target audiences outside of IMPULSE;
- Four in-person Live Visits to explore consortium partners' collections.

Title	Location	Date
Consortium Discussions	Online	March - October 2024
Ideation Sessions	Online	October 2024 - September 2025
Institutional Deep Dives	Online	March - July 2025
Pre-hackathon 1 IMCo Workshop	Leuven, Belgium	18-19 February 2025
Community Workshop 1	Valletta, Malta	26 July 2025
Community Workshop 2	Valletta, Malta	28 July 2025
Community Workshop 3	Kalkara, Malta	4 September 2025
Community Workshop 4	Kalkara, Malta	4 September 2025
Community Workshop 5	Kalkara, Malta	5 September 2025
Live Visit (Jagiellonian University Museum Collegium Maius)	Krakow, Poland	14 May 2024
Live Visit (KU Leuven Libraries)	Leuven, Belgium	20 February 2025
Live Visit (Malta Maritime Museum)	Birgu, Malta	19 December 2024
Live Visits (Magna Żmien)	Valletta, Malta	20 December 2024, 19 January 2025

Tab. 1. List of workshops undertaken through Work Package 1.

These workshops have engaged a total of 93 participants, 63 of whom were external to the IMPULSE consortium members, involving them in discussions and feedback exercises designed to explore potential pedagogical applications of the XR platform. They have

revealed important tensions between education and artistic interpretation, institutional authority and community participation, factual accuracy and imaginative speculation. These tensions are not seen as obstacles but as productive spaces where new questions emerge about the role of museums, the ethics of representation, and the possibilities of digital cultural heritage.

A key outcome of this deliverable is to identify the most appropriate methodology (or methodologies) for further stakeholder engagement by testing different scenarios and interpretative models during these workshops in an iterative Research through Design process. These activities are intended to elicit critical responses that can guide the ongoing technical development of the XR platform in Work Package 2, Task 2.3 'Pilot concept development and design' and Task 2.4 'Pilot development and content processing' and ensure integration of its valuable feedback. The feedback and information collected are also informing Work Package 3 'Standards', Task 3.1 'Analysis of the current state' and Task 3.2 'Innovation'. This deliverable also feeds into the legal and IPR concerns of Work Package 4 'Legal Safety', Task 4.2 'Preparatory legal consultations and developing the operating frameworks' and Task 4.3 'Testing'.

Community and Consortium Workshops, Deep Dives, and interviews were chosen because they allow for:

- a) Multivocality by integrating the perspectives of professionals, students, and wider audiences, recognising that cultural heritage is shaped by multiple forms of expertise.
- b) Iterative questioning, by building questions across sessions, tracing their evolution, and allowing them to guide design choices.
- c) Situated engagement, by holding discussions not only in abstract terms but also in relation to specific sites, artefacts, and collections.
- d) Prototyping as inquiry, by treating speculative designs, case studies, and playful interventions as tools to surface underlying assumptions and open up new conceptual directions.

5.5 Structure of the Deliverable

This deliverable is arranged in 5 major sections.

Section 5 introduces the scope of the deliverable and the purpose of the workshops, specifically their value in informing the development of teaching and learning prototypes of the MUVE by Work Package 2.

Section 6 outlines the research agenda and specific clusters of research questions that have emerged through the workshops and their relevance to the IMPULSE project. It presents a synthesis of the themes and research questions in clusters, tracing how ideas such as agency, accessibility, education, speculative interpretation, and the ethics of representation developed across the workshop sessions in an iterative form.

Section 7 offers a description of the workshops that have been undertaken within the remit of Work Package 1, detailing the target groups, their recruitment and selection, and ethical considerations that have been implemented. It provides a detailed account of the discussions, activities, and emerging questions across the diverse groups of IMPULSE stakeholders. This is followed by reviewing the different types of workshops that have been undertaken so far, their rationale, relevance, and format. It reviews the user groupings according to target audience (students and educators, artists, and cultural and creative industry professionals) and their familiarity with XR technology (experts, users, non-users) that were devised in Deliverable 1.1, which focused on UX/UI research.

Section 8 describes the key methodologies that have been applied to the workshops, and an evaluation of their relevance and impact on the outcomes of Work Package 1 is presented. It situates the workshops as part of a Research Through Design process, collecting feedback that can be implemented into ongoing research, while also addressing recurring issues such as ownership of assets, the politics of metadata and paradata, and the overlapping roles of curators, educators, and the varied backgrounds of participating cultural heritage professionals.

Section 9 presents an analysis of each of the workshops, their general structure, the prototypes developed so far, and valuable observations and outcomes. It demonstrates how the outcomes of these preliminary workshops within Task 1.3.1 'Preparation' feed into future phases of Task 1.3.2 'Co-creation'. The questions and prototypes emerging from the sessions are not stand-alone but act as preliminary scaffolding for co-creation, Task 1.3.2. They reveal key areas of interest for different user groups, test speculative approaches to storytelling, and help refine the criteria for selecting collections to be interpreted within MUVE. A final section outlines the next steps of workshop development for Work Package 1.

Annexe 3 presents the reports from each of the workshops in the form of templates, including an evaluation of each of the workshops that examines how the research questions were explored and the processes of iteration that were employed to build on the successes of each.

5.6 Scope of the Workshops

The workshops were designed as exploratory, participatory spaces that brought together diverse stakeholders, to reflect on how digital cultural heritage can be reinterpreted and experienced through immersive technologies. Their scope was not to produce finished prototypes, but to generate and explore questions, test methodologies, and surface insights that inform the co-creation process of Task 1.3. The main focus is how the IMPULSE project can effectively make informed decisions and attempt to listen to the target audiences, while challenging top-down approaches that are usually encountered in educational approaches, questioning where learning takes place and how.

Task 1.3 of Work Package 1 examines the ways in which immersive environments and digital cultural heritage can be incorporated into teaching and learning processes, focusing on co-creation and co-curation opportunities in an educational context that can be explored within the multi-user XR platform.

There are three important groups that IMPULSE is targeting in this regard: educators and students, artists, and professional members of cultural and creative industries (CCIs).

For educators and students, the prototypes are intended as tools for exploratory learning that move beyond traditional didactic methods. Instead of static displays or text-heavy catalogues, interactive prototypes encourage students to engage with artefacts through play, speculation, and embodied interaction. Educators, in turn, gain access to new forms of pedagogy where heritage can be approached as an open-ended, participatory process rather than a closed narrative where learning becomes reciprocal.

For artists, the prototypes function as laboratories for experimentation, including with site-specificity, speculative storytelling, and the politics of representation. They explore possibilities for reimagining collections as materials for creative reinterpretation and affective engagement. Artists in the workshops often framed such interventions as both a privilege and a challenge: they were valued for generating curiosity but sometimes critiqued by curators as fragmented or out of context. This tension

is productive, as it reflects the role of art in questioning institutional authority and offering alternative readings of heritage.

For CCIs, prototypes are crucial in demonstrating scalable models of engagement that can be adapted across institutions and audiences. Ideas for future prototypes that emerged from discussions with CCI participants, such as AR-based collection games, conservation simulators, or interactive storytelling platforms, illustrate how digital cultural heritage can align with contemporary media practices and with professional use-cases.

The design and testing of the MUVE design and interaction prototypes for IMPULSE is with the needs of these target groups in mind. The workshops have been designed to engage with target groups (and levels of expertise) simultaneously, allowing ideas and perspectives to be shared across these professional boundaries. **This ensures that the outputs we develop are not only effective as teaching tools but are also flexible enough to respond to future cultural and creative contexts where learning and creativity overlap.**

Each group brings distinct expectations and forms of expertise, yet their engagement with the prototypes highlights important overlaps. This overlapping reflects the Research through Design (RtD) approach that underpins the workshops of Work Package 1; prototypes are not fixed solutions, but vehicles for ongoing dialogue (see Section 8.1.1).

6 Research

6.1 Research Agenda

The research agenda is being advanced through four strands of areas of investigations, structured around a combination of online, offline and hybrid workshops that serve as the primary research vehicle within Task 1.3. Their agenda is to test ideas and methodologies in practice, identify user needs and behaviours, and develop prototypes of interaction that question how teaching and learning can take place with digital heritage collections in virtual spaces. Each workshop builds on the previous ones, evolving the research questions iteratively. Each workshop focuses on how different groups (students, educators, artists, curators) interpret and interact with collections, how digital and physical experiences differ, and how creative practices (including speculative storytelling, playful mechanics) can be integrated into institutional contexts. In this sense, the workshops act as living laboratories, generating insights that guide both design and theoretical reflection.

One strand of investigation examines how cultural and educational spaces, ranging from museums and galleries to classrooms and online platforms, are being redefined and extended into hybrid environments. Workshops allow us to observe how physical and virtual domains intersect, revealing both tensions and new opportunities for learning, playfulness, and engagement. These explorations are connected to the development of interactive and immersive experiences, where user feedback directly informs the design of the MUVE being developed in Work Package 2.

A second strand of investigation explores how educational outreach in the form of edutainment strategies can bridge formal and informal learning. Collaborative exercises with educators and students guide us in aligning design outputs with pedagogical objectives. At the same time, experiments with digital and technological assemblages highlight the evolving role and value of digital artefacts, prompting questions of preservation, interpretation, and reuse.

A third strand of investigation explores how critical perspectives are integral to this process, especially concerning representation, accessibility, censorship, and bias. By involving diverse participants in workshops, we can identify cultural sensitivities,

inclusivity needs, and potential blind spots in our approaches. This supports the design of more equitable systems while also opening discussion around ownership, self-expression, and participatory practices.

Related to this is the exploration of narrative as a **fourth strand** of investigation. Workshops serve as testing grounds for non-linear storytelling, interactive fiction, and game design, all of which invite audiences to become co-authors of meaning and interpretation. Attention is paid to how digital folklore, and speculative futures emerge from contemporary practices, as well as how cultural and historical contexts can be re-situated through immersive technologies.

Across these strands, the focus on designing with care ensures that interfaces are intuitive, ethical, and context-sensitive, supporting both usability and critical engagement. Several key discussions emerged from the ideation sessions that significantly shaped our approach to the workshop themes, methodologies and questions. These discussions spanned a wide range of topics related to game design, digital culture, AI ethics, and gender studies. Drawing from diverse theoretical frameworks, these topics provided a foundation for how we conceptualised the workshops and informed the paradigms and research questions we aimed to address.

A central theme that was returned to revolved around the role of games, digital environments, and play in shaping social norms, cultural narratives, and individual identities, outlining how theoretical discussions directly influenced our focus on the ethics of game design, the intersection of memory and technology, and the social impact of digital play in future implementations of our workshops. These can be arranged in three broad categories.

1. The role of Game Design and its philosophical implications.

Discussions around game mechanics highlighted how seemingly simple design choices can significantly impact player behaviour and influence societal norms. Game mechanics, particularly those that address meaningful actions, were seen as tools for expressing deeper narratives about society, culture, and individual agency. Additionally, concepts such as transgressive play were explored, raising questions about how games can challenge conventional structures.

2. Digital Memory and technological influence on art and culture.

Another central discussion revolved around the role of digital technologies in shaping memory and cultural preservation. This theme emerged from the exploration of algorithmic folklore and how digital tools influence the creation of new forms of cultural

expression. As Gabriele de Seta explores in his work on the mutual shaping of automation and vernacular creativity, digital environments not only reflect but also actively create cultural narratives (de Seta, 2024). These conversations prompted us to frame the workshop as a space where participants can explore how digital artifacts, games, social media, and other interactive platforms, act as vehicles for memory-making and cultural transformation. The idea of memory as a digital construct was further influenced by projects such as Spencer Chang's 'Field Companions' (Chang, 2024) and the 'Sungrazer Project' (Pipkin, 2023). These projects explore how objects and digital spaces are imbued with memory, prompting us to consider how digital media can become archives of collective and individual histories.

3. The ethics and social impact of Digital Play.

Conversations were also prompted on how games can serve as platforms for addressing global crises, environmental concerns, and wider societal pressures. These were ideas developed from ecocentrism and existentialism in virtual spaces, such as those explored in Peter W. Zapffe's work on the 'virtual tragic', which illuminate how digital environments can explore profound philosophical themes (Gualeni & Vella, 2020).

6.2 Research Questions

The initial set of research questions for IMPULSE following the above research agenda were grounded in a literature review of cultural heritage, game studies, and hackathon design for digital museology, as well as an exploration of relevant applied case studies. Applying this research to each of our workshops generated new layers of inquiry, shaped by direct input from curators, conservators, artists, students, educators, and technologists. The process ensured that research questions evolved beyond theory into situated, practice-driven concerns. Through this iterative process, the questions became more specific, contextual, and attuned to stakeholders' lived realities.

The development of research questions within IMPULSE follows a Research through Design (RtD) trajectory, moving from theory to practice in an iterative cycle. Beginning with the literature review and case study analysis, broad and open-ended questions were formulated to map the field and frame the initial areas of inquiry. These were then tested and refined through the different types of workshops, where questions were grounded in the lived realities of cultural heritage professionals, artists, students and educators.

This process culminates in design-oriented questions, directly informing the prototypes that will be developed.

The questions and themes that ultimately emerged across the workshops were not incidental, but essential tools for structuring inquiry and shaping the design space. They were important precisely because they resisted easy answers and instead opened spaces of negotiation. Questions in design research frame opportunities for reflection and intervention rather than definitive solutions. In our case, questions around ownership, learning, agency, and representation became essential because they pointed to the tensions between institutional authority and community participation, between conservation and reinterpretation, and between fact-based education and artistic speculation. These research questions are not self-contained problems to be solved; rather, they share themes that can be best explored by approaching them from multiple perspectives. Ideas that emerge from tackling one question might unlock a new line of inquiry or association in another.

These are the main clusters of questions that we are exploring directly and indirectly, having emerged through the discussions in the workshops of Work Package 1 in iterative feedback cycles. All of the question clusters mentioned below touch thematically on the three categories mentioned in Section 6.1, Research Agenda.

Research questions Cluster 1: Institutional responsibility and ethics.

How should cultural institutions balance their role as custodians of factual knowledge with the ethical obligation to acknowledge contested histories, colonial legacies, and sensitive materials? What forms of responsibility emerge when institutions act as both authorities and facilitators of public dialogue? Can ethics be operationalised not only as safeguards against harm but also as opportunities for transparency, care, and dialogue with communities whose voices have been historically marginalised? How can artistic interpretations productively intersect with institutional frameworks to generate new meanings, challenge assumptions, and reframe cultural memory without trivialising or distorting it? Looking at historical precedents brings into focus questions that remain unresolved today: Access and reuse, issues of representation, mediation, and interpretation. How far do GLAM institutions allow for engagement with their physical and digital artefacts in alternative, perhaps subversive ways? Are collection objects digitised in ways that facilitate creative experimentation, or are they produced for a specific application? To what extent is the rigidity or flexibility of digital objects enabling or preventing reapplication, or upcycling, of digitised collection artefacts? Technical

questions such as these are not necessarily directly linked to the successful (or not) implementation of AR, VR or XR technologies within an institution.

Research questions Cluster 2: Speculation and artistic interpretation.

What role can speculative practices and subjectivity play in expanding narratives beyond conventional historical accuracy? When do such interventions enhance engagement with cultural heritage? How are artists approaching XR, and how do they interact with cultural heritage artefacts in their practice? By experimenting with interactive installations, speculative storytelling, and immersive theatre, artists extend the possibilities of heritage representation, highlighting alternative forms of engagement and care. Their approaches point to the importance of exploring alternative interfaces and modes of interaction, moving beyond conventional VR headsets to experiment with tactile, spatial, and multi-sensory formats. While institutional practices establish the frameworks through which XR is implemented, it is equally important to acknowledge how these boundaries are tested, redefined, or even subverted by artists. Institutions often prioritise accessibility, preservation, and education, yet artists introduce speculative, playful, and critical dimensions that expand what is possible.

Research questions Cluster 3: Learning and education.

First to consider in this context are institutional practices. What are cultural heritage institutions currently doing to integrate XR into their exhibitions and educational outreach, and how do these practices vary across contexts? Differences between large and small museums are particularly significant, as questions of scale, resources, and audience demographics directly shape how XR is implemented. In parallel, we must ask what cultural heritage institutions need from XR in order to remain relevant and sustainable? How can educational practices embrace multiplicity, layering, and speculation without losing sight of accuracy and care? In what ways might playful and participatory learning approaches encourage deeper connections between audiences, heritage, and institutions?

Research questions Cluster 4: Ownership and agency.

We also engage with cross-cutting issues of representation and mediation. Who owns cultural heritage and its digital versions? Who decides how artefacts are represented? Whether through games, installations, or digital archives, XR environments raise fundamental questions about what aspects of cultural heritage are emphasised, how

narratives are constructed, and who has the authority to decide. What should be augmented when cultural heritage assets, tangible or intangible, are represented in virtual environments: the object itself, the bond it creates, or speculative narratives that extend its meaning? How can interactive storytelling and non-linear design contribute to layered, co-created experiences?

Research questions Cluster 5: Game based approaches to learning.

The exploratory role of artists is part of a longer lineage of experiments that merge cultural heritage with new technologies. To better understand the place of contemporary XR practices, we must also situate them within their historical trajectories. To what extent can the wider field of edutainment, archaeogaming, and historical games provide instructive examples, demonstrating how play can function as a vehicle for both education and critique? Game-based approaches open questions around how history can be taught through play, storytelling, how meaningful mechanics and interactions can be embedded within cultural heritage experiences, and how audiences can be transformed from passive consumers into active participants.

Research questions Cluster 6: Materiality and preservation (and augmentation).

It is also crucial to consider infrastructural questions, including how these practices tie into the far-reaching preservation efforts of the European Collaborative Cloud for Cultural Heritage (ECCCH) (European Commission, 2022). Here, metadata, paradata, and standardisation are addressed as foundational challenges, not only for how heritage assets are digitised and represented, but also what elements could be augmented in a virtual environment: the object itself, the connections it evokes, or speculative stories that extend its meanings. How should digital heritage practices account for the material qualities and layered histories of artefacts? Which layers of an object's history should be preserved, highlighted, or left ambiguous? How do practices of digitisation risk replicating Western-centred concepts of preservation, and what alternative models, such as ritual rebuilding or ephemeral interventions, can challenge these norms? In what ways can preservation itself be understood as a speculative and interpretive act, rather than a purely factual one?

Research Cluster question 7: Technology and mechanics.

To what extent should technology remain a tool to support the artefact, rather than replace it, and how can speculative mechanics highlight rather than conceal the politics of representation? Technology also raises questions of longevity and obsolescence: how

can design strategies ensure that ephemeral prototypes remain pedagogically meaningful even as platforms and formats evolve? By embedding meaning into mechanics, interactions shift from being merely playful to becoming acts of critical engagement, enabling participants to experience heritage as something lived, embodied, and contested. Mechanics also impose boundaries, what is possible, permissible, or visible is constrained by the affordances and assumptions of the technology itself. In cultural heritage applications, this means that XR systems can inadvertently reinforce hierarchies by privileging certain narratives or modes of interaction over others. A virtual reconstruction, for instance, may present a polished but singular version of the past, reducing space for multiplicity or dissent. In this way, technology can operate as a silent authority, encoding decisions about what is remembered, forgotten, or reinterpreted.

This gradual grouping into clusters reflects what Gaver describes as design as a process of accumulation, where fragments of discussion begin to cluster into themes, gradually forming a more coherent Research through Design landscape (Gaver, 2012, p.8). Ultimately, the value of these questions lies in how they remind us that design within IMPULSE cannot be abstracted from its context. The project's research is an ongoing, organic process that grows with each workshop, interview, and exchange, continually re-shaping its focus in response to new reflections. At its core, this work seeks to confront the hierarchical imbalances that often define teaching and learning, instead positioning co-creation as a way to redistribute agency. These imbalances directly influence the narratives that are produced by institutions, and careful attention is needed to avoid outcomes that feel superficial or gimmick-driven. For IMPULSE, relevance means designing with and for the realities of the institutions, communities, and collections we are engaging with, ensuring that prototypes emerge as meaningful holistic interventions rather than detached experiments.

The development of these questions across workshops can be seen as a progression from broad, comparative inquiries ('What are other museums doing with their spaces?') towards more situated, practical and speculative concerns ('What level of agency should a virtual visitor have?' or 'How do we seduce people into learning without over-curation?'). Our process of question-building reflected the sometimes-contradictory institutional structures at play (e.g., Heritage Malta's top-down narratives versus Magna Żmien's multi-vocality, or curatorial narratives versus artistic speculation) as well as the artistic provocations that challenge them.

The process of developing these questions was itself iterative and participatory. Starting from a review of comparative case studies of other digital cultural heritage experiences,

the questions evolved through a range of workshops of different types with different stakeholders. This follows what Zimmerman et al. describe as the design research methodology:

"Through an active process of ideating, iterating, and critiquing potential solutions, design researchers continually reframe the problem as they attempt to make the right thing. The final output of this activity is a concrete problem framing and articulation of the preferred state, and a series of artifacts—models, prototypes, products, and documentation of the design process."

(Zimmerman et al., 2007, p.5).

This is what we see here: a layering of questions, each one opening further possibilities rather than closing them down. It is important to highlight that this process also reflects a pedagogy of inquiry. In IMPULSE, it can be useful to consider questions themselves as educational artefacts, tools for thinking collectively across disciplines, institutions, and cultural contexts.

These questions form a basis to explore the meaning and emotional impact of artefacts, their physical and contextual relationships, and how they can be translated into virtual environments while maintaining their integrity and serve as a foundation for identifying technical requirements for the platform and pilot projects.

In this light, the research questions and prototype ideas developed so far should not be seen as isolated design exercises, but as critical entry points into wider debates about how XR is currently deployed across cultural heritage. The reflections gathered during the workshops underline that what matters is not only what is represented in virtual environments, but also how and why it is represented.

7 Workshops

A range of workshops aimed at different user groups have been undertaken that fed the research questions and prototyping of the IMPULSE virtual world. Participants in these workshops were drawn both from within the consortium and beyond it, with educational staff and students, practicing artists and creatives, and CCI's including cultural heritage professionals.

The following table overviews the workshops, mapping each against date, location, format (online, offline, hybrid), and the number of times each workshop was repeated.

Title	Location	Date	Format	Sessions
Consortium Discussions	Online	Biweekly, March 2024-February 2025	Online	16
Ideation Sessions Tasks 1.2 & 1.3	Online	Biweekly, March 2025-June 2025	Online	76
Institutional Deep Dives	Online	March-July 2025	Online	7
Pre-hackathon 1 (Task 5.3.1 IMCo Workshop)	Leuven, Belgium	18-19 Feb 2025	Hybrid	1
Community Workshop 1	Valletta, Malta	26 July 2025	Offline	1
Community Workshop 2	Valletta, Malta	28 July 2025	Offline	1
Community Workshop 3	Kalkara, Malta	4 Sep 2025	Offline	1
Community Workshop 4	Kalkara, Malta	4 Sep 2025	Offline	1
Community Workshop 5	Kalkara, Malta	5 Sep 2025	Offline	1
Live visit (Jagiellonian University Museum Collegium Maius)	Krakow, Poland	14 May 2024	Offline	1
Live visit (KU Leuven Libraries)	Leuven, Belgium	20 February 2025	Offline	1
Live visit (Malta Maritime Museum)	Birgu, Malta	19 December 2024	Offline	1
Live visits (Magna Żmien)	Valletta, Malta	20 December 2024, 19 January 2025	Offline	2

Tab. 2. Details of workshops undertaken through Work Package 1.

The workshops can be divided broadly into two types: **Community Workshops**, which engaged largely with participants from the IMPULSE IMCo community of practice beyond

the IMPULSE consortium (see Section 3.2), and **Consortium Workshops**, which engaged mostly with internal IMPULSE consortium members.

Section 7.1 overviews the type and format of these workshops and their target audiences. Section 7.2 examines the structure of the Community Workshops, the demographics of the participants, and the process of recruitment. These workshops involve significant engagement with individuals external to the IMPULSE consortium, being examples of the reach and impact of the IMCo community of practice.

Section 7.3 examines the structure of the Consortium workshops, aimed at IMPULSE consortium members. These include a wider range of workshop types, including Consortium Discussions, Ideation Sessions, Institutional Deep Dives, Pre-hackathon, and Live Visits.

7.1 Workshops Framework

The workshops were undertaken with a qualitative focus in a mix of offline, online and hybrid formats. Each type of workshop generally followed a similar structural approach, with questions and discussion points adapted according to the participants' background and expertise. The feedback gathered from each discussion was reviewed and fed into the next session of that type of workshop. This produced an iterative, feedback loop process with an immediate impact on the workshop design. This section describes these workshops: the target groups and users, the format of the workshops, and the design of the workshops.

7.1.1 Target Groups and Users

The workshops and research within IMPULSE were synthesised in close dialogue with the UX/UI researchers of Work Package 1, ensuring that design and inquiry developed hand in hand. From the outset, when the structure of the workshops was being arranged, the insights and methods from UX/UI studies were taken into consideration. Our target audiences have been identified with reference to the pedagogical focus of Task 1.3, which centres on the use of collections in teaching and learning contexts, as well as the wider cultural and creative sector's interest in experimenting with XR as both a medium and a tool for engagement. As a result, the research and prototyping undertaken through these sessions were grounded in the expectations, needs, behaviours, and experiences of the participating groups. In particular, the workshops focused on how participants engage with digital cultural heritage interpretation and the

possibilities and limitations of immersive environments in this context, securing that the prototypes developed respond meaningfully to real-world conditions of use taking into account the digital literacy of the target audiences.

Within the framework of Work Package 1 three overarching groups of participants were defined as target users of the IMPULSE project's outputs. Individuals representing these groups of users were drawn from among the IMPULSE partners and through a wider call, coordinated as IMCo, and tasked to reflect and report on their interactions with VR and XR technologies and the interpretation of cultural heritage collections through them. These groups portrayed in Fig. 1. were defined by the UX team in Deliverable 1.1 as (G1) students, researchers and university academics from different disciplines; (G2) artists of different specialisations, art schoolteachers; and (G3) representatives of selected industries from the creative industry (e.g. filmmakers, scriptwriters, computer game developers, etc.) (Krakowska, 2024, pp.15-18).

Within these three groups were identified 'expert users', 'users' and 'non-users' of these technologies (Krakowska, 2024, pp.15-18).

'Expert users' consist of professionals who are proficient in their respective fields and have a deep and practical understanding of the VR and immersive technology landscape. They can be academics, researchers and professionals who have experience with both the creation and application of such technologies. They were engaged in the workshops to provide specialised insights and feedback on the prototype's technical and conceptual aspects.

The 'Users' group is composed of individuals who have practical experience with VR and immersive environments, but who are not necessarily technical experts. This can include students, artists and educators who use XR as a tool for learning, creation, or entertainment. They provided feedback on the usability, user experience and overall functionality of the prototype from a more practical and user-centric perspective.

The 'Non-users' group includes individuals who have little to no prior experience with XR technologies. They represent an audience that is new to immersive digital environments, or who need direction to appreciate the opportunities of these spaces for learning. Their participation is crucial to evaluate the prototype's intuitiveness and accessibility for a broader, non-specialised audience.

The groups and users can be visualised as below.

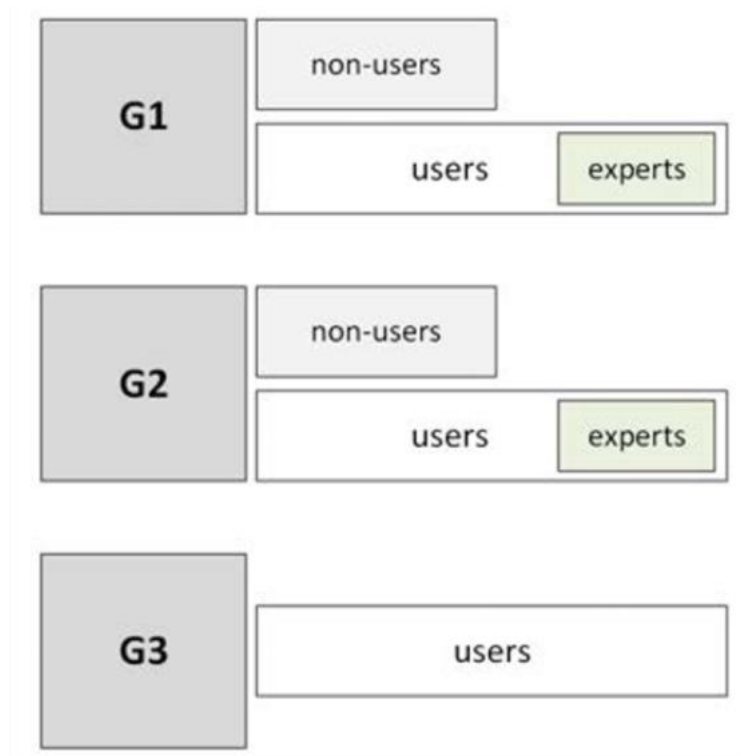


Fig. 1. Visualisation of Groups and Users developed in the UX/UI research conducted by 1.1 Task of WP1 of IMPULSE (G1) students, researchers and university academics from different disciplines; (G2) artists of different specialisations, art schoolteachers; and (G3) representatives of selected industries from the creative industry (e.g. filmmakers, scriptwriters, computer game developers, etc.) (Krakowska, 2024, p.14).

This multi-tiered approach to Groups and Users ensures that the project's outputs are not only technologically sound but also usable and accessible to a diverse audience, from professionals to those new to the technology. The design process therefore remains user-centred and allowed us to further test concepts and ideas within different group formation. The approach was structured around Hirsch et al.'s paper *Human-computer interaction (HCI) advances to re-contextualize cultural heritage toward multiperspectivity, inclusion, and sensemaking*.

Hirsch et al. (2024) argue that advances in Human-Computer Interaction (HCI) provide an opportunity to re-contextualise cultural heritage beyond mere digitisation, foregrounding multiperspectivity, inclusion, and sensemaking as central principles. Their work emphasises that traditional digital heritage initiatives often reproduce institutional biases, whereas HCI approaches can foster polyvocal narratives, participatory interpretation, and co-creation. Methods such as participatory design, speculative design, and embodied interaction are identified as particularly valuable in creating environments

where cultural heritage can be collectively reimagined and critically negotiated. Within the IMPULSE project, these perspectives directly inform the design and implementation of workshops and pilot activities. The UX research of Task 1.1 reflects Hirsch et al.'s concern with multi-perspectivity by engaging diverse user groups, students, artists, creative industry professionals, and cultural heritage experts, whose feedback is used to refine prototypes and ensure inclusivity in both representation and usability. The artistic research prototype of Task 1.2 responds to the call for speculative and creative practices by enabling artists to engage with digitised collections not as static artefacts, but as material for reinterpretation and worldbuilding. Something that was also reflected strongly in the Community workshops 1 & 2 where more artists were present. Through embodied experimentation being developed in that Task, such as motion capture and avatar-based interaction, artistic practices expose new ways of re-situating heritage beyond institutional framings. The teaching and learning prototype of Task 1.3 resonates with Hirsch et al.'s emphasis on reciprocal learning, providing opportunities for teachers, students, and heritage professionals to co-create interpretative layers around archival materials. This process challenges top-down narratives by situating interpretation as a shared endeavour, generating richer and more inclusive cultural accounts. Again this was also reflected in the Community Workshops 3-5 which were conducted internally within Heritage Malta, and all of the participants were CH professional from diverse backgrounds (curators, archaeologists, anthropologists, conservators, marketing department etc.) but also students who are interns within the institution and attempt to further their studies through hands on learning and real life experiences.

By including educators, students, cultural heritage professionals, and artists within our recruitment framework, we can question how XR can function both as a didactic instrument and as a creative and co-curative mode of interpretation. Each of the IMPULSE workshops and pre-hackathons are designed to engage with different Groups and Users and explore different questions.

7.1.2 Format of the Workshops

The workshops of IMPULSE have been categorised into three main formats: online, offline, and hybrid. Each format has supported different kinds of interactions, engagement, and knowledge exchanges, with unique advantages and limitations. This division has allowed the consortium to compare the dynamics of co-creation and to better understand how participants' feedback and collaborative practices vary depending

on the workshop setting. These are important factors defining suitable methodologies to use going forward.

Online workshops have included regular Consortium Discussions, Ideation Sessions, and Institutional Deep Dives that have explored artistic research, experimentation, and reuse of cultural heritage assets. These virtual interactions, conducted via platforms including Teams, Zoom, Discord, and the first MUVE (Multi-User Virtual Environment) prototype, enabled wide participation across the consortium's institutions, often in simultaneous parallel groups. They facilitated inclusive discussion, asynchronous collaboration (particularly on Discord), and documentation through AI-assisted transcripts.

From a methodological perspective, online workshops can successfully support iteration in a RtD feedback loop and allow user-centred evaluations of the prototype being built in Work Package 2. However, online workshops also raised challenges. Online settings revealed the importance of accessibility and intimacy in mediated forms. Embodied engagement was inevitably limited, limiting communication to an extent, and participation was not always consistent. In addition, the systematic storage and organisation of discussions and feedback across multiple digital platforms proved difficult to manage, which can hinder the continuity of discussions. Nevertheless, workshops that involved only consortium members were most practical in an online format, where participant engagement is guaranteed and conversations can span multiple sessions.

Offline workshops offered direct, in-person exchanges between consortium members and our external target audiences. These included the Live Visits to collections and digitisation facilities (e.g., Jagiellonian Museum, Malta Maritime Museum, KU Leuven Library), and the Community Workshops held in Malta. Discussions would be hard to encourage and manage in online or hybrid modes, and the level of engagement would naturally be lower, as distractions in the remote environments would interfere with the flow of conversations. An embodied experience was deemed more valuable for the short duration of 2-3 hours in which participants were engaged in the Community Workshops, in particular. Physical workshops proved crucial in fostering embodied engagement with collections and technologies, enabling participants to experience the tactile and spatial qualities of cultural heritage. They generated strong co-creative synergies and encouraged focused interdisciplinary dialogue, particularly in small-group settings of 7-8 participants, which allowed balanced discussion between diverse expertise such as game design students, XR artists, digital humanities researchers, and GLAM professionals.

Methodologically, these embodied and participatory encounters offered insights into intuitive design practices and situated applications of Research through Design. However, offline workshops were logistically more demanding to organise, less inclusive for geographically distant participants, and required limited group sizes to be effective. These factors placed constraints on scalability and accessibility despite the depth of engagement achieved.

Hybrid workshops combined physical and virtual presence, namely during the IMCo Leuven Pre-hackathon. This format expanded accessibility and reach by allowing participation from individuals who were unable to travel to attend the event, including those outside the immediate consortium members. Hybrid events therefore played an important role in testing accessibility strategies and developing approaches to inclusive interaction design. At the same time, they often fell short in sustaining the same intensity of engagement as dedicated offline, or even online, workshops. Remote participants, despite being present, frequently experienced a reduced level of interaction compared to those on-site, leading to an imbalance in dialogue that limited opportunities for genuine co-creation. While hybrid formats helped bridge physical and virtual participation, they underlined the methodological challenge of ensuring parity of engagement across both environments. Hybrid engagements need careful facilitation so that online audiences are not excluded and so that different institutional voices can be represented on equal terms.

By comparing these modalities against the objectives of each workshop, IMPULSE can better learn how different target groups (educators, students, artists, cultural heritage professionals) interact under different conditions to determine the most suitable methods going forward. We can gather first-hand insights into how our XR prototypes can account for physical presence, remote accessibility, and blended experiences. In this sense, the comparison is not just methodological but also thematic, because the very questions of placelessness, access, and mediation that have arisen in the workshops mirror the challenges of cultural heritage representation in virtual and hybrid environments.

7.1.3 Design of the Workshops

The workshops are central to advancing the research and prototyping of the MUVE virtual world. They are designed to bring together different stakeholder groups to test, refine, and co-create both the technological and pedagogical dimensions of the platform. For example, Pre-hackathons provide concentrated periods of experimentation and

prototyping with consortium members, allowing participants to engage in intensive, hands-on testing of the MUVE. These events are particularly valuable for pushing the technological development forward, encouraging creativity and rapid problem-solving while also keeping the development within context of the ongoing research. Community Workshops, by contrast, are short, in-person sessions with external stakeholders such as artists, creatives, cultural heritage professionals, educators, and students. They ensure that design and pedagogical features are tested in real-world contexts and that the platform remains responsive to the needs of those who will ultimately use it, even if the platform itself is not engaged with directly during those sessions.

A workshop is considered fruitful and impactful, if it produces actionable feedback on how the MUVE can support teaching, learning, and creative practices, or if it can identify and highlight areas of concern and note-able interactions and entanglements. This feedback is returned to Work Package 2 who update the MUVE with new features accordingly. Impact also depends on whether the sessions enable genuine co-creation and critical reflection, with participants from different backgrounds contributing meaningfully to the development process. A balanced representation of perspectives across user groups ensures that we integrate the voices of professionals and non-professionals, experts and novices. Negotiating a balance of digital literacy levels across the workshops was challenging, as our pool of participants available at any one session is limited. Finally, success relies on thorough documentation of participant contributions, allowing feedback to be systematically analysed and applied to subsequent project stages.

To measure our workshops in terms of impact, we can look to Sufi et al. (2018, pp-5-22) who defined ten rules for measuring the impact of workshops. A number of these rules have been applied to the workshops that have been undertaken to date and can be found in their evaluations in Section 9 of this deliverable. These were important factors when designing our workshops.

Setting goals effectively. For IMPULSE, this means specifying whether a workshop is meant to test pedagogical uses of the MUVE, gather feedback from artists, educational users, or CCIs (or a mix), or stress-test prototypes in pre-hackathons, for example. Goals should be explicit, and participants should be chosen who it is believed can achieve these goals.

Creating metrics purposefully. Metrics that measure the outcome of workshops should directly reflect the workshop's goals and research questions. Since IMPULSE workshops involve educators, creatives, and cultural heritage professionals, impact can mean different things. Educators may value clarity and learning outcomes, artists may value

creative flexibility, and GLAM staff may prioritise metadata or preservation fidelity. However, metrics inherently simplify complex information, so we must be aware of how this can mislead results that are synthesised from single or collective responses.

Understand bias. Biases more generally can mislead results, including confirmation bias (the tendency to reaffirm one's own beliefs, or the dominant beliefs of the workshop group), sampling bias (derived from the participants chosen for each workshop), or social desirability bias (participants responding to questions in ways that will ingratiate them with the coordinators, such as agreeing with their statements perhaps if their knowledge of the topic is limited).

Design participation well. Understanding the workshop participants' familiarity with XR, cultural heritage collections, or teaching practices ahead of the workshop will lead to formulate more pertinent questions and to evaluate whether the workshop has generally confirmed expected responses, or if there has been a change of responses or attitudes through the workshop discussions.

Ask about participants' 'confidence'. Understanding participants' prior experience with the tools, theories, collections and concepts being presented in the workshop can lead to a better implementation. This is a reason why User levels have been recorded, to give us an idea of how informed a participants' responses may be to a question. However, that is not to say responses from lower User levels is less valuable, but the context of their knowledge should be considered to better inform the prototyping.

Ask about specific skills. Understanding the skill level, background and expertise in their discipline was important information that we gathered about our participants. This manifested in their Group (G1, G2, G3), but also in capturing information about the participant's professional background.

Harness gamification to test participants' skills. Once the MUVE is in a condition to prototype during public workshops, it can be used to assess whether the needs of a participant can be met by the interactions offered by the platform. This can also be considered as an assessment of the platform itself and allows participants to ask and answer questions through those interactions and game mechanics.

These 'rules' were applied to the grouping of participants and the exercises and discussions that were planned in each workshop. Overarching these rules are broader workshop activity frameworks. Sufi et al. define two such forms of workshop in which these rules can be applied in the context of IMPULSE as 'Exploratory', and 'Creating':

"In **exploratory workshops**, ideas are analysed to better understand a topic and its associated problems, current solutions, and future challenges. These workshops can have aims such as identifying what actions are needed to move a particular topic forward or getting expert advice from and into different communities [...]"

Creating workshops bring together individuals with a common or intersecting interest to solve particular problems by collectively building something. They can include multidisciplinary teams in which problem holders guide the creative process."

(Sufi et al., 2018, pp.4-5).

'Exploratory Workshops' are the form taken in the Community Workshops, and to an extent in the Consortium Workshops through the Institutional Deep Dives and Ideation Sessions. 'Creating Workshops' have been implemented primarily in the pre-hackathon in Leuven and in the pre-hackathon in Malta. Creating Workshops will be the primary type in the next phase of workshopping directly with the MUVE. Further Exploratory Workshops are also being planned in upcoming Community Workshops with university professors and students in the form of game jams.

The feedback and results gathered from all of the workshops play a crucial role in guiding the future stages of IMPULSE. In terms of development, they will inform refinements to the MUVE's design features, interaction models, and pedagogical tools implemented in Work Package 2. For testing, they will identify areas where functionality or user experience requires further prototyping or redesign. And in terms of dissemination the workshops provide evidence of meaningful stakeholder engagement that can be communicated to wider cultural, academic, and creative communities. This iterative process ensures that the MUVE prototype(s) are not only technologically functional and useful but also pedagogically and creatively relevant to the audiences they are intended to serve and designed with care towards them.

7.2 Community Workshops

Community Workshops are short in-person workshops with IMCo members, including artists, creatives, educational staff and students, CCI's, and cultural heritage professionals. Five Community Workshops have been held, drawing on themes emerging from the Ideation Sessions and Institutional Deep Dives, tackling topics relevant to the participants. 38 individuals external to the Consortium participated in the Community Workshops, which were led by five coordinators from Heritage Malta, the University of Malta, and Magna Żmien.

Title	Location	Date	Format	Participants
Community Workshops 1 - 2	Mixed group: artists, curators, game designers, Academics (AI, IT, Digital Humanities) and students			
Community Workshop 1	Valletta, Malta	26 July 2025	Offline	10
Community Workshop 2	Valletta, Malta	28 July 2025	Offline	12
Community Workshops 3 - 5	Cultural heritage professionals of Heritage Malta and students			
Community Workshop 3	Kalkara, Malta	4 Sep 2025	Offline	18
Community Workshop 4	Kalkara, Malta	4 Sep 2025	Offline	9
Community Workshop 5	Kalkara, Malta	5 Sep 2025	Offline	8

Tab. 3. List of Community Workshops undertaken through Work Package 1.

The Community Workshops were devised as exploratory exercises to encourage participants to reflect and discuss the key research questions of IMPULSE. Each workshop followed a general structural approach. The specific structure/objectives/outputs and key observations of each workshop individually, can be found in the Annexe at the A.3 Workshop Reports while a description of valuable moments that shaped the approach are being described in Section 9.

First, IMPULSE was introduced to the participants, the general objectives and goals of the workshop were laid out, the collections were overviewed, and examples of interactive XR projects were presented. A strong, recurring emphasis within all these sessions was the project's collaborative and educational remit. As one of the workshop facilitators noted, IMPULSE is fundamentally concerned with "immersive digitisation, upcycling cultural heritage towards new reviving strategies," where "education [...] or at least a collaborative element is really important." This articulated aim shaped the tone of the workshops: conversations continually returned to how platforms might support reciprocal learning between institutions, creatives and general public audiences rather than merely a means to distribute or showcase assets.

After this largely presentational opening section, the floor was opened to the participants for an open discussion that was led by prompt questions drawn from feedback, reflections, and observations made by the participants during the opening phase of the workshop. This approach allowed the conversations to be initially led by the participants' observations. The focal points of each workshop therefore altered depending on the participants' engagement with the collections and the topics that were raised in the opening section.

The scenarios, tasks and questions presented to the participants of each workshop also depended on a number of practical factors:

1. The format (offline only in this case).
2. The number of participants.
3. The professional background of the participants.
4. The specific objectives aimed for, depending on the above.

These factors and their effects are evaluated most plainly in the workshop reports laid out in Section 9.1 and Annexe 3.

To help direct the conversations, Heritage Malta and Magna Żmien collaborated to create a document of XR-related case studies and projects that showcased innovative implementations and approaches to virtual worlds and digital exhibitions. Over 100 examples were noted, some of which were selected to be briefly presented during the workshops (depending on the composition of the participants) to provoke discussions of the possibilities of applying such examples to our consortium's collections. This was a useful resource that was referred to many times during the Community Workshops that helped to provide tangible examples and direct conversations. The document can be found at this link: [Web Resources for Workshops](#).

All of the workshops began with a review of the available cultural heritage collections and an introduction to the holders' institutions, outlining the formation and curation of the collections within their care. This provided important insights into the collections and the approaches of these institutions and are an important way to ground the objects in their tangibility and existing (and historic) contexts, before delving into the malleability of their digital possibilities. Factsheets describing the collections' formats and origins and the catalogued digital assets were collected from Work Package 3, making it possible for participants to explore the collections remotely.

During the Community Workshops at Heritage Malta the focus was on collections held by that institution (additionally including those not presented to the consortium more generally) but nevertheless also included a review of the other partners' collections. It was considered that owing to the unique composition of those particular workshops it would be more beneficial to invite the participants to compare artefacts that they are responsible for, rather than focus on the partners' collections. During the pre-hackathon in Malta, a selection of artefacts from all the consortium participants' collections were decided to be made available, based on suggestions and interactions that emerged through the ongoing process of the local Community Workshops.

These workshops are vital to the success of IMPULSE as these represent core users of the platform that is being developed in Work Package 2. The feedback from IMCo members provides important insights into the development of the platform and the interactions that are enabled through it, independent from the discussions and research being undertaken by the consortium. All these workshops occurred offline, as in-person events.

7.2.1 Recruiting Community Workshop participants

Our recruitment methodology for the Community Workshops follows section 3.1.4 of Deliverable 1.1, ‘focus group interviews’:

“For experts and users recruited using convenience sampling, a non-random sampling method (Galloway, 2005), participants are chosen based on the researcher's easy access (temporally and spatially) and the likelihood of their willingness to participate (due to personal acquaintance or knowledge of their qualifications, competencies, and experience, which is crucial in the Creative and Cultural Industries sector and for artists with specific specialisations)... An interesting approach would be to combine users from G1, G2, G3, experts and nonusers in the focus groups interviews sessions. Bringing together these two groups, observing their communication processes, knowledge transfer, perceptions, and understanding of the metaverse and immersive vs. traditional worlds would provide significant dynamics in focus group interviews. Questions would be broad, and expectations would involve comments and references to insights gained during discussions, shaping or deepening the knowledge of users and non-users.” (Krakowska, 2024, p.53).

Based on this approach, several potential issues may arise with our use of this qualitative methodology in the context of Malta that we attempted to address. One concern is the reliance on the coordinators’ professional networks to identify participants. While this is understandable in Malta’s relatively small cultural and academic community, it risks reinforcing existing circles and excluding those who are less connected to institutional or academic heritage networks. This can introduce bias and limit the diversity of perspectives, particularly from grassroots or underrepresented cultural groups, whose experiences may not align with those of established professionals. This was countered to an extent by the presence of Magna Żmien, who were able to draw in participants from an expanded audience. On the other hand, the Maltese Islands are often less represented at the European level, therefore the Community workshops functioned as a vehicle to communicate insights of institutions and NGOs from a smaller nation.

Participants of the five Community Workshops held in Malta were identified and invited by the workshop coordination team, comprising representatives from Heritage Malta, the University of Malta, and Magna Żmien. Selection was primarily based on the coordinators' professional networks and prior engagement with different categories of potential users. This recruitment method was considered appropriate given Malta's relatively small and closely connected cultural and academic communities, following Galloway's 'convenience sampling' method noted earlier, a non-random sampling where participants are chosen based on the researcher's easy access to them and the likelihood of their willingness to participate based on personal acquaintance (Galloway, 2005, p.859).

Of the 38 individuals external to IMPULSE who participated in the Community Workshop series, more than half came from the cultural heritage institution Heritage Malta. This creates a strong institutional weighting toward cultural heritage professionals, Group 3, which may unintentionally sideline the perspectives of Group 1 (educators and students) and Group 2 (artists), such as interested citizens, casual users, or community-level participants. As a result, workshop discussions could be dominated by professional viewpoints, reducing the inclusiveness and representativeness of the outcomes. This was mitigated by including Heritage Malta employees in a set of workshops separate to the more general ones. However, we intend to mix these in at least one future workshop.

The relatively small number of external participants also poses challenges for compiling conclusions at this stage. Participation in the workshops is voluntary and requires an investment of around three hours of time, raising questions about availability, timing, and the perceived relevance of the workshops for those approached. With smaller numbers, the representativeness of age, gender, and user-type diversity may have been affected, even if demographic considerations were factored into the groupings. However, the times proposed for the workshops were arranged to account for varied schedules. In future workshops we intend to engage more participants from Group 1 (educational institutions), as they will coincide with semesters and not take place over summer, as the workshops so far have done. We still managed to have at least one educator in every workshop and at least two students either pursuing their BA, MSc, or PhD, coming from Digital Humanities, Game Development, IT and Visual Arts.

There is also the risk of over-reliance on specific institutional staff. While Heritage Malta participants were recruited through an internal call, this method may not capture the full diversity within the organisation itself, accounting for differences in roles, levels of seniority, or staff who are less directly invested in cultural heritage work. In addition,

staff members may feel an implicit pressure to participate or to align their contributions with institutional expectations, which could limit the openness and authenticity of the discussions. Despite these concerns, the pool of 23 participants from Heritage Malta represents around 15% of the professional staff of the organisation. A further similar number of colleagues also expressed an interest in participating but were unavailable on the occasions we set, therefore, these will be approached for future workshops in this series.

Finally, broadly speaking there may be gaps in demographic representation. Participant lists for each workshop were shaped primarily through convenience sampling, drawing from existing networks and associations rather than by systematic efforts to ensure diversity and inclusivity. Looking ahead, since recruitment so far has leaned heavily on known contacts and institutional staff, maintaining a broad and varied participant pool for future workshops may prove difficult once these initial networks are exhausted. Reaching new voices will likely require more deliberate outreach strategies beyond the existing professional and institutional circles. It is also crucial to note at this point that the majority of the participants of the Community Workshops are Maltese or are permanent residents of the Maltese Islands. This was important for the Community Workshops because:

a) they functioned as a platform of usually less represented voices to be heard and be more visible in a European level, along with the struggles and perceptions of institutions and NGOs of small, underrepresented countries like the Maltese Islands,

b) Malta's colonial past under British rule further deepened these discussions, especially around decolonial practices. For instance, Magna Żmien's archive of Malta's Neolithic structures was highlighted as an invaluable resource for Heritage Malta archaeologists. In Community Workshop 3 (A.3.7), one participant reflected on how British soldiers stationed in Malta often took personal photographs of their time on the islands, images which later left with them and are now difficult to trace. These were not institutional records but personal photographs. Yet the discussion revealed how even such intimate, seemingly casual acts can replicate colonial practices, where ownership of memory itself becomes a form of privilege. The privilege lies in being able to carry away and keep fragments of a place's history as private mementos, while for the local community these same images constitute scarce and invaluable traces of collective memory. In this way, colonialism can appear not only as overt domination, but also as the quiet imbalance between public and private memory, where personal keepsakes for some translate into cultural loss for others.

Below are visualisations summarising the distribution of the total participants and coordinators of the Community Workshops, providing a broad insight into the ages of the participants, their Group (G1 students, researchers and university academics, G2 artists, G3 CCIs), and their level of familiarity and expertise with XR technology. A complete list of Community Workshop participants is in Annexe 4.

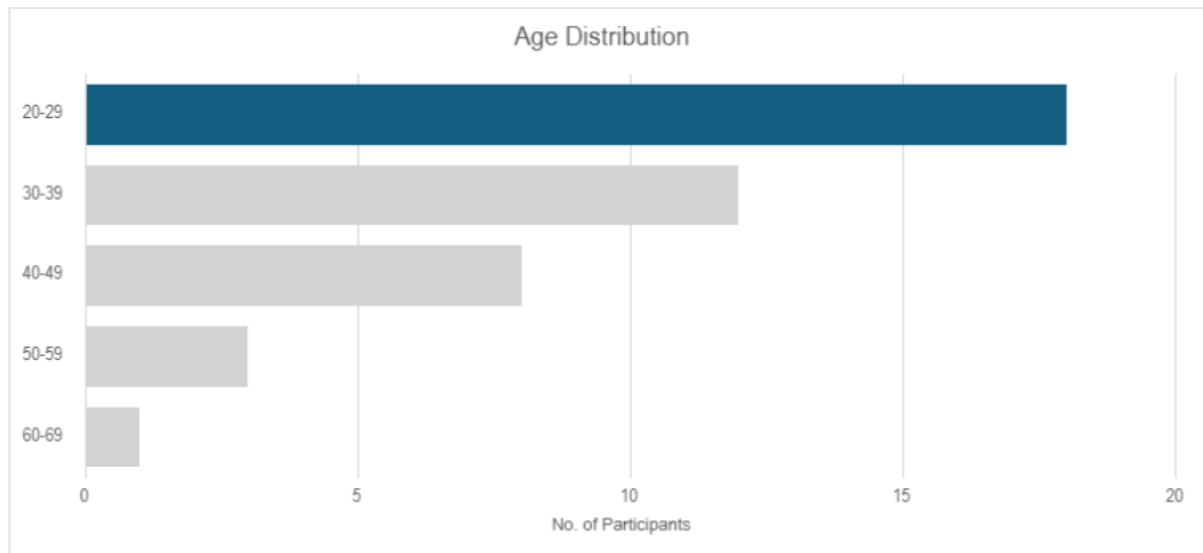


Fig. 2. Age distribution of all Community Workshop participants.

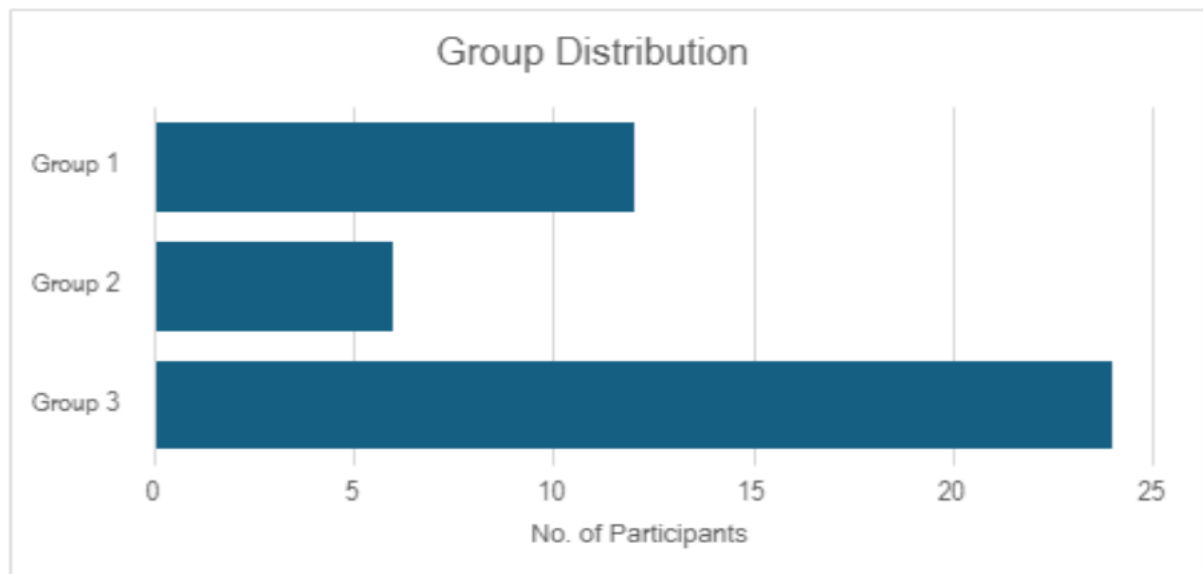


Fig. 3. Group distribution of all Community Workshop participants. Group 1 (educators and students), Group 2 (artists), Group 3 (CCIs).

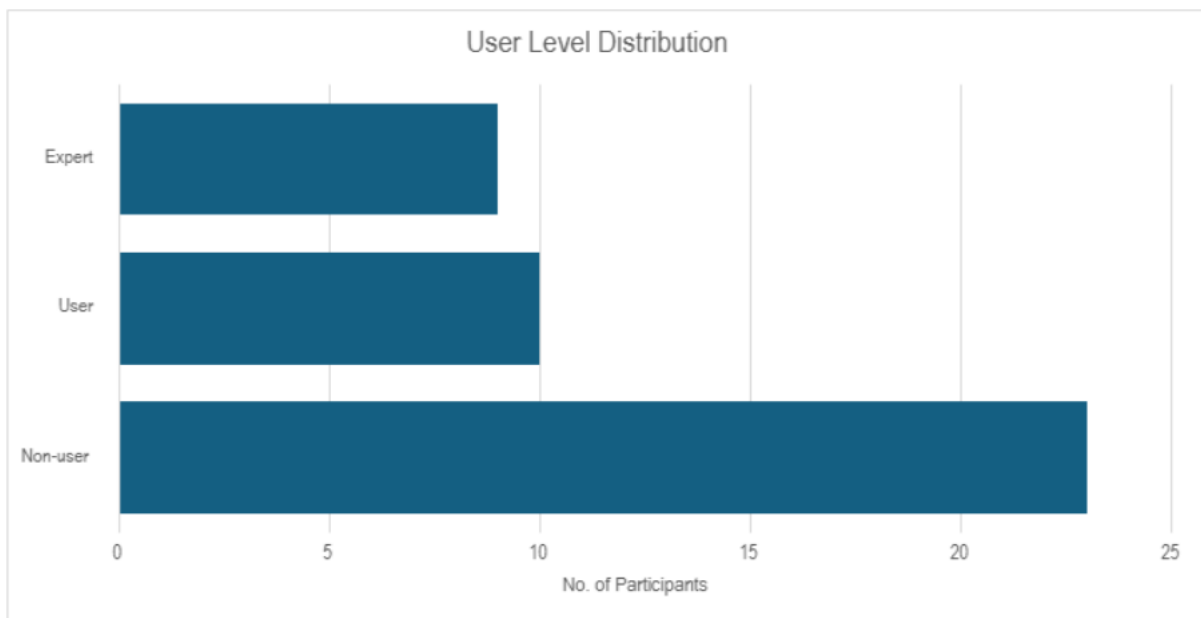


Fig. 4. User level distribution of all Community Workshop participants.

Throughout the recruitment and implementation of the Community Workshops, the external participants of the IMCo were informed about the project's purpose, their specific role, and how their data would be used. They were also made aware that their participation was completely voluntary and that they had the right to withdraw at any time. Participants were clearly informed about how their contributions would be used to guide the project's development, in particular feeding the prototype XR world being developed by Work Package 2. All participants signed consent forms that outlined our GDPR responsibilities and use of images for documentation and promotional purposes (see Annexe 2).

All participant data, including feedback and personal information, was handled with strict privacy protocols in line with Heritage Malta's Privacy Policy, which was also checked by members of Work Package 1. It was decided to anonymise the participants in this deliverable (and future reports and deliverables that draw on it) to ensure feedback could be more freely given, since the deliverable is to be made public. However, where particularly important points were delivered by a participant, we have noted their anonymised participant number to allow cross-referencing of their Group, User level, background expertise, and other information that may be relevant to interpreting their statement or position. This allows for a deeper analysis of feedback without compromising individual privacy.

An initial pool of 38 participants external to the IMPULSE consortium's own institutions was compiled, consisting mainly of individuals active within academic and professional cultural heritage contexts in Malta. Of these, 14 were available to attend the Community

Workshops and were placed into Community Workshops 1 and 2. These participants represent users in Groups 1, 2 and 3. A second pool of 23 members of staff from Heritage Malta took part in three further Community Workshops. These participants were mostly identified as belonging to Group 3, specifically cultural heritage professionals. They were recruited via an internal call for interest and organised into three smaller workshop groups. In addition to these external participants was a group of 5 coordinators from among the IMPULSE consortium who led the workshops.

For this stage of our research, we specifically chose people with interdisciplinary and overlapping expertise that would fit into our target audiences in more than one category.

7.2.2 Community Workshops 1 and 2: Mixed Groups

The first pair of workshops were targeted toward a mix of User Levels and Groups, drawn from the professional networks available to the Maltese partners. We aimed to arrange a mix of User Levels and Groups, who were at different levels of technological awareness. Due to these broader demographics, these two workshops were intended to enable dialogue between different Groups of users of different disciplines to identify points of overlap and disagreement.

In the first of these workshops, tabulated below, there were six external participants. Three were members of Group 1 (students, researchers and university academics), one was a member of Group 2 (artists), and two were members of Group 3 (creative industries). Within these participants were a range of user levels and expertise. The first group's participants were all familiar with the technologies being discussed and their potential applications, including two experts.

Community Workshop 1 (Annexe A3.5)					
Participant	Professional Expertise	Group	Expert / User / Non-user	Workshop Role	Age
1	Cultural heritage (digital collections)	3	User	Leader	30-39
2	Cultural heritage (research)	3	Non-user	Leader	20-29
3	Cultural heritage (game research)	3	Expert	Leader	30-39
4	Cultural heritage (curatorial)	1	Non-user	Leader	40-49

5	Game design student	1	User	External	20-29
6	University professor (Institute of Digital Games) Games & AI	1	Expert	External	30-39
7	Visual Artist	2	User	External	40-49
8	Game design student	1	User	External	20-29
9	Cultural heritage (management)	3	User	External	20-29
10	Game Designer / Artist	3	Expert	External	30-39

Tab. 4. Summary of participants of Community Workshop 1.

In the second workshop, tabulated below, there were eight external participants. Five were members of Group 1 (students, researchers and university academics), and three were members of Group 2 (artists). Again, among these were a range of user levels and expertise. The participants were balanced between Expert users and Non-users, presenting less overlap regarding knowledge of the application of these technologies. Of note is that the artists had all passed through the University of Malta's Digital Arts department. This grouping enabled different types of conversations compared to the first workshop, as the Digital Arts and Digital Games departments at the University do not tend to overlap.

Community Workshop 2 (Annexe A3.6)					
Participant	Professional Expertise	Group	Expert / User / Non-user	Workshop Role	Age
1	Cultural heritage (digital collections)	3	Expert	Leader	30-39
2	Cultural heritage (research)	3	Non-user	Leader	20-29
3	Cultural heritage (game research)	3	Expert	Leader	30-39
4	Cultural heritage (curatorial)	1	Non-user	Leader	40-49
11	Digital artist	2	Expert	External	20-29
12	Artist	2	User	External	30-39

13	PhD researcher (digital humanities)	1	Expert	External	30-39
14	Game design student	1	Non-user	External	20-29
15	ICT student	1	Non-user	External	20-29
16	University professor (Institute of Digital Games) Game narrative	1	Expert	External	40-49
17	Game design student	1	Non-user	External	20-29
18	Digital artist	2	Expert	External	20-29

Tab. 5. Summary of participants of Community Workshop 2.

7.2.3 Community Workshops 3, 4 and 5

The next series of three workshops were held for Heritage Malta staff (not involved with the IMPULSE consortium). As such, most of the participants were from Group 3, cultural heritage professionals, including curators, conservation staff, digitisation technicians, architects, and marketing. Some of the participants were students and so can be classed within Group 1 but are all within a career pathway leading to museum studies or digital innovation within the applied cultural heritage sector. Of the 17 participants not part of the coordination team, only one was considered an Expert user of the technology, and only three with some level of familiarity. The majority of the participants, 13, were not aware of XR technology or its application in the cultural heritage sector beyond that of an interested viewer. This context led the conversations towards more fundamental concerns of communicating museum collections to visitors in educational contexts, rather than delving deeper into the potential of technology and game design to deliver this.

Community Workshop 3 (Annexe A3.7)					
Participant	Professional Expertise	Group	Expert / User / Non-user	Workshop Role	Age
1	Cultural heritage (digital collections)	3	Expert	Leader	30-39
3	Cultural heritage (game research)	3	Expert	Leader	30-39

19	Multimedia Innovation	2	Expert	Leader	20-29
4	Cultural heritage (curatorial)	1	Non-user	Leader	40-49
2	Cultural heritage (research)	3	Non-user	Leader	20-29
20	Roman / Phoenician Curator	3	Non-user	External	20-29
21	Conservator	3	Non-user	External	40-49
22	Videography	3	Non-user	External	30-39
23	Videography / Photography student	1	Non-user	External	20-29
24	Exhibition Design	3	User	External	40-49
25	Architect	3	User	External	20-29
26	Projects Manager	3	Non-user	External	30-39

Tab. 6. Summary of participants of Community Workshop 3.

Community Workshop 4 (Annexe A3.8)					
Participant	Professional Expertise	Group	Expert / User / Non-user	Workshop Role	Age
1	Cultural heritage (digital collections)	3	Expert	Leader	30-39
3	Cultural heritage (game research)	3	Expert	Leader	30-39
19	Multimedia Innovation	3	Expert	Leader	20-29
2	Cultural heritage (research)	3	Non-user	Leader	20-29
33	Conservator	3	Non-user	External	30-39
34	Archaeology Curator /Anthropology	3	Non-user	External	20-29
35	Conservation	3	Non-user	External	50-59
36	Archaeology Curator	3	Non-user	External	50-59
37	Digital Acquisition	2	Expert	External	20-29

Tab. 7. Summary of participants of Community Workshop 4.

Community Workshop 5 (Annexe A3.9)					
Participant	Professional Expertise	Group	Expert / User / Non-user	Workshop Role	Age
1	Cultural heritage (digital collections)	3	Expert	Leader	30-39
3	Cultural heritage (game research)	3	Expert	Leader	30-39
19	Multimedia Innovation	3	Expert	Leader	20-29
38	Natural History Curator	3	Non-user	External	30-39
39	Marketing	3	Non-user	External	40-49
40	Digital Design student	1	User	External	20-29
41	Digital Design student	1	Non-user	External	20-29
42	Roman Curator	3	Non-user	External	30-39

Tab. 8. Summary of participants of Community Workshop 5.

An analysis of the methodologies applied in the Community Workshops is undertaken in Section 8, and an analysis of the findings are in Section 9. More complete observations taken during each workshop are found in Annexe 3 of this deliverable, indicated by the title of each workshop.

7.3 Consortium Workshops

Consortium Workshops occur across a range of formats that take place primarily between IMPULSE consortium members (and in some cases with IMCo members, namely during the Pre-hackathon). Unlike the Community Workshops, these workshops have taken online, offline and hybrid forms, and occur more frequently, more intensively, and with repeat participants from the IMPULSE consortium. These workshops include Consortium Discussions, Ideation Sessions, Institutional Deep Dives, Live Visits, and a Pre-hackathon. As implied by the Research through Design methodology, the results and feedback from each of these workshops fed into the design of subsequent ones.

Title	Location	Date	Format	Participants
Consortium Discussions	Online	15 sessions March – October 2024	Online	15-20
Ideation Sessions	Online	76 sessions October 2024 - September 2025	Online	20-25
Institutional Deep Dives	Online	7 sessions March - July 2025	Online	20-30
Live Visit (Jagiellonian University Museum Collegium Maius)	Krakow, Poland	14 May 2024	Offline	30
Live Visit (KU Leuven Libraries)	Leuven, Belgium	20 February 2025	Offline	20
Live Visit (Malta Maritime Museum)	Birgu, Malta	19 December 2024	Offline	7
Live Visits (Magna Żmien)	Valletta, Malta	2 sessions 20 December 2024, 19 January 2025	Offline	6
Pre-hackathon 1 IMCo Workshop	Leuven, Belgium	18-19 Feb 2025	Hybrid	39 (consortium) 10 (IMCo offline) 14 (IMCo online)

Tab. 9. Summary of workshops undertaken through Work Package 1.

7.3.1 Consortium Discussions and Ideation Sessions

At the beginning of IMPULSE, bi-weekly online sessions were held for Work Package 1 consortium members to explore the objectives of IMPULSE, define target groups and users, and determine the collections that would be available to the project. 15-20 IMPULSE consortium participants were engaged across 16 sessions. These loosely structured workshops set the framework for the Ideation Sessions that would follow on.

The two-hour, bi-weekly online Ideation Session workshops, brought together the key stakeholders within the consortium in speculative conversations about how the collections can be explored through digital tools, and how places of learning and experimentation can look in virtual spaces. The IMPULSE consortium members explored the available collections in more formal ways, discussed the technical progress of the MUVE with the development team from Work Package 2, and with the Standards and IPR teams of Work Packages 3 and 4, respectively. 20-25 IMPULSE consortium members were engaged over 76 sessions.

The workshops were divided into three separate subgroups that focused on different topics target audiences. Each of these subgroups were led by a different coordinator.

- 1.2a is led by Aikaterini Antonopoulou (NKUA), researching artistic experimentation on visual aspects of MUVES, focusing on designing multispecies entangled worlds and challenging anthropocentric design.
- 1.2b is led by Luka Prinčič (UM), researching artistic experimentation through exploring performing heritage, queering the archives, gender representations/identities and mythmaking, designing memories, live coding, democratising heritage through LLM, and highlighting structures of power.
- 1.3 research teaching and learning methods, exploring collections in virtual spaces in an education context. The 1.3 Ideation Sessions contained the core team of Task 1.3, led by Margerita Pule (UM), Afroditi Andreou (HM), Andrew Pace (MŽ), Kris Polidano (MŽ), and Jacob Saliba (HM).

The purpose of these sessions was to learn more of each collection from a technical standpoint (i.e. format, assets catalogued, time period, previous interpretations) while also exploring the implied questions behind every cultural heritage artefact represented. Another key point was to better comprehend the relation between the institution owning/representing the collection and what they envision for these digital assets, or what difficulties they have encountered in presenting them so far.

The first phase of these sessions was very 'curated', since presentations of the artefacts were made by the institutions that owned them. However, free dialogue was encouraged, with institutions engaging in open ended discussions with the other IMPULSE consortium participants to try to identify the emergent questions and themes in each collection. The outcomes of these sessions provided Work Package 1 with a clearer sense of how to proceed. For example, it became evident that live visits to the collections were necessary, where possible, to deepen our understanding of the collections and inform subsequent design choices. The discussions moved fluidly between technical considerations, such as mechanics, requirements, and affordances, and more speculative reflections, where we explored personal and thematic connections across and within collections.

Most participants tried to identify personal connections with the collection objects, or create parallels between the different collections, or find emerging themes from

the same collection that could be built upon theoretically. This process helped us recognise the collaborative potential of the virtual platform and reaffirmed the role of design as a tool for co-creation.

One of the first themes that emerged in these initial exploratory sessions as a narrative thread were navigational tools and equipment, which were present in many of the collections (most prominently at Jagiellonian University Museum and the Malta Maritime Musuem). Such objects were being considered literally and in abstraction: navigation through collections and as geographic navigation; tools as mechanical equipment, personal totems, intimate objects, personal sculptures of experiences, affordances and extensions of the body, etc.

During the online Ideation Sessions with the IMPULSE consortium partners, we sought to explore what forms education can take within the context of cultural heritage and immersive environments, asking what we are trying to teach and learn, and through which modes of engagement.

Several thematic directions were identified:

1. Historical information drawn from Heritage Malta's collections provided a foundation for contextual understanding.
2. Design teaching offers opportunities to engage with the morphology of three-dimensional objects studying their form, structure, scale, and proportion, while enabling participants to modify, play with, and experience these objects in space.
3. Curatorial methodologies come into play, as narratives are developed and connections between objects and themes are constructed.
4. Archival practices and structures such as taxonomy encourage the classification and interpretation of heritage materials through systems of naming and categorisation.
5. Visual culture provides a space for storytelling, especially when working with 'mysterious' or narratively rich images. These materials also prompt critical engagement with questions of representation and power dynamics.
6. Finally, the dated nature of some material offers opportunities for critical reflection, allowing participants to interrogate historical portrayals and to consider how meaning, representation, and interpretation shift over time.

The feedback generated through these online ideation session workshops directly informed the next steps of the project by opening a dialogue between educational and artistic approaches to cultural heritage.

7.3.2 Institutional Deep Dives

In the online Institutional Deep Dive sessions, consortium partners have had the opportunity to learn more about the collections that are available to IMPULSE. During the Deep Dive sessions, collection holders each delivered a detailed presentation about the specific collections, their context and history, followed by open discussions and an exploration of the themes that emerged from each. During these Deep Dives and during the Ideation sessions that ran in parallel with them, these discussions provided insights into participants' reactions and assisted in identifying how certain artefacts were triggering reactions and interpretations. These collections included those from Heritage Malta, Magna Żmien, Film University Babelsberg, Thessaloniki Film Festival, Jagiellonian University Museum Collegium Maius, and KU Leuven Libraries.

Besides learning about the collections, these Institutional Deep Dives also give participants an opportunity to learn about the work of the cultural heritage professionals that work with these collections in different capacities. Structurally, each Deep Dive focused on a specific theme or area of expertise, with partners leading discussions based on their unique contributions to the project. For example, workshop-style presentations were held by 2D digitisation experts at KU Leuven Library, the 3D digitisation team of Heritage Malta, the project team behind the volumetric testimonies of Holocaust survivors project at Film University Babelsberg, and IPR and copyright implications from the University of Jagiellonian copyright team of Work Package 4. These technical sessions created an online space where consortium members could ask direct questions about the work conducted by each partner when dealing with the acquisition of digital artefacts, about digitisation practices, and the collection and cataloguing of metadata and paradata, all of which fed into an ideation session strand on presenting the professional work of cultural heritage staff within the MUVE.

The Deep Dives ran simultaneous to the Ideation Sessions, thereby feeding them directly. 20-30 consortium participants were engaged over 7 Deep Dive sessions, as summarised below.

Title	Date	Partner Lead
Deep Dive 1: What is 2D Digitisation?	28 March 2025	KU Leuven
Deep Dive 2: What comes first: the data or the story?	25 April 2025	UM and NKUA
Deep Dive 3: Making data available on the platform	23 May 2025	NKUA and KUL
Deep Dive 4: UX Design, 1.1. Who are our Users?	17 June 2025	Jagiellonian University
Deep Dive 5: 3D Digitisation	20 June 2025	Heritage Malta
Deep Dive 6: 3D Digitisation	11 July 2025	FBKW
Deep Dive 7: Copyright / Legal	18 July 2025	Jagiellonian University

Tab. 10. Summary of Institutional Deep Dive workshops undertaken through Work Package 1.

The Deep Dive sessions have played a crucial role in the IMPULSE project by encouraging interdisciplinary dialogue and enabling consortium partners to learn from one another's expertise. These meetings are not only about presenting research but also about educating and learning across different domains, making the work more approachable for all members of the consortium. Given that the cultural heritage professionals that participated in the Deep Dives come from diverse backgrounds (curatorial, legal team, technologists, artistic research, and design), the Deep Dives create the necessary space to negotiate how different areas of the project are being framed and understood, and encourage participants from different backgrounds to present their nuanced ideas about these collections. They highlight the different levels of digital literacy and expertise present across partners and allow stakeholders to adopt and reflect on multiple roles within the project. Through these conversations, issues of standardisation, documentation, and process comparison became visible, with marked differences between institutions. All of these elements contributed to the development of the MUVE.

7.3.3 Live Visits

Several offline events have taken place for IMPULSE consortium members that have contributed to the effectiveness of the workshops of Work Package 1. These include a series of five Live Visits, including to Jagiellonian University Museum Collegium Maius, KU Leuven Library and its digitisation labs, the Malta Maritime Museum, and Magna Żmien's archive. In total, 30 IMPULSE consortium members engaged in these visits. Whilst these are not considered as workshops or formal feedback sessions, they are nevertheless important encounters between IMPULSE partners and the physical collections that are being worked with. The tangibility of these collections is a significant

factor that should be embodied within their digitised counterparts placed into the MUVE. Three main objectives of the Live Visits were established:

- First, to allow participants to experience the artefacts directly and tangibly within their material and spatial context, fostering discussions that emerged organically between the visitors to the space and the curators;
- Second, to identify areas of interest for the different teams involved in IMPULSE based on these spatial interactions, aligning institutional priorities with the exploratory directions of the project;
- Thirdly, an opportunity to observe and reflect on alternative approaches to interpretation, preservation, and engagement, drawing inspiration for future prototypes and design iterations.

Title	Location	Date	Format	Participants
Live Visit (Jagiellonian University Museum Collegium Maius)	Krakow, Poland	14 May 2024	Offline	30
Live Visit (KU Leuven Libraries)	Leuven, Belgium	20 February 2025	Offline	20
Live Visit (Malta Maritime Museum)	Birgu, Malta	19 December 2024	Offline	7
Live Visits (Magna Żmien)	Valletta, Malta	2 sessions 20 December 2024, 19 January 2025	Offline	6

Tab. 11. Summary of Live Visit workshops undertaken through Work Package 1.

The purpose of the in-person visits between consortium members was to explore collections in-situ, to understand how they were currently being displayed and contextualised. These can be considered comparable to the Deep Dives sessions but taking place physically with smaller groups of participants. These visits necessarily focused on one collection at a time, but as the discussions took place within the curated spaces of each institution the direction of conversations would differ as the physical setting and arrangement dictated. Particularly interesting discussions and feedback emerged from visits to the Malta Maritime Museum and to Magna Żmien (MŻ) that guided

the progression and design of the ensuing workshops, which can be explored in the attached reports (A3.10).

7.3.4 Pre-hackathon IMCo Workshop (Leuven)

The pre-hackathon format – a time-bound, intensive event where participants from diverse backgrounds collaboratively design, prototype, and test innovative solutions to specific challenges – was conceived as a creative and exploratory exercise focusing on academia and the teaching and learning prototype, following Task 5.3.1, the first IMCo workshop. Pre-hackathons are public-facing events formed within the framework of the IMPULSE Community of Practice (IMCo), a wider network of participants engaging with IMPULSE consortium members, managed by Work Package 5 ‘Dissemination, communication and mentoring’. Pre-hackathons take the form of hybrid events over the course of two days’ workshoping and prototyping with the MUVE, involving consortium members and IMCo members.

In this type of workshop, participants engaged in storyboard prototyping, speculative co-design, and narrative ideation exercises, using tools such as Miro boards and collaborative flowcharts. Each team developed storytelling scenarios around themes such as ancient architecture, anatomical knowledge, or intercultural encounters, adopting narrative roles such as archaeologist, medical student, local resident, or ritual practitioner to explore how heritage could be experienced and interpreted in an immersive space.

This pre-hackathon engaged 29 IMPULSE consortium members and 10 IMCo participants external to the Consortium in physical, offline participation, plus 14 IMCo participants via the online Discord platform. The participants of this two-day workshop were drawn from three target groups: Group 1 (educators, researchers, and students), Group 2 (artists, art teachers, and creative practitioners), and Group 3 (cultural heritage professionals and representatives from the creative and cultural industries), but with a focus on education. The 4 teams included students from KU Leuven from associated disciplines gathered through an open call within the University, alongside the consortium partner participants. The Pre-hackathon was held primarily offline, but with a hybrid element to enable participants from abroad to contribute through the IMCo IMPULSE community of practice. More information can be found at the corresponding report in Annexe A.3.4.

To create a productive and inclusive environment, participants were divided with attention to gender balance, institutional diversity, and fields of expertise. No single

institution was overrepresented in a team, and external participants and students were distributed across teams to bring fresh perspectives. It was however important to include a member of KUL in each team to act as a source of information about the collections that were available to the pre-hackathon.

The focus of this pre-hackathon was to engage with students and academics and explore possible interactions and interpretations that could inform the teaching and learning prototype(s) and its implementation within the MUVE prototype. It therefore foregrounded academic collections, such as those noted above, and educational interpretations of them. Participants were organised into four interdisciplinary teams and worked with digitised assets from KU Leuven Libraries, including Vesalius' annotated *Fabrica folios* and glass slides of historic archaeological artefacts and excavations. Their diversity – from archaeological sites to anatomical drawings – allowed the teams to engage with objects that reflected both scientific progress and cultural heritage.

Key findings showed a number of distinct orientations. Some participants valued clarity and educational logic, proposing object-based learning and interdisciplinary teaching scenarios; others prioritised expressivity and embodiment, imagining ritual reactivation, memory walls, and performative narratives despite technical instability; and others stressed curatorial fidelity and ethics in the MUVE world, highlighting needs for metadata integration, multi-user collaboration, and provenance tracking.

Cross-cutting recommendations for the MUVE by the authors of Deliverable 1.2 included improving onboarding and interface clarity, enabling multi-user functionality, offering avatar customisation, and supporting branching, non-linear storytelling. One of the main challenges and opportunities for Work Package 2 here was finding meaningful ways to reimagine flat archival materials as dynamic 3D environments, requiring participants to think not only about content but also about how users would move through and interact with the story spatially. Overall, the Leuven workshop produced both concrete design recommendations and conceptual explorations of immersive storytelling.

This first pre-hackathon workshop, held in Leuven in February 2025, has been described in more detail in Deliverable 1.2, section 8, so will not be elaborated on in this deliverable beyond a summary (Krakowska, 2025, pp.28-46).

7.3.5 Pre-hackathon IMCo Workshop (Malta)

Another Pre-Hackathon took place in Malta in September 2025 (Task 5.3.2). All of the workshops created the foundation for the Pre-Hackathon in Malta, (Task 5.3.2), with main focus was artistic practices and artists. Building on the conceptual and practical discussions, the three teams (1.2a, 1.2b, and 1.3) were able to experiment within the IMPULSE platform, testing interaction models and translating workshop-generated ideas into early prototypes. In particular, the concept of the “virtual loan box,” first proposed during the Community Workshops, became a central strand of experimentation, as teams explored how layered narratives, personal stories, and institutional knowledge could be meaningfully embedded in digital containers. This continuity ensured that the pre-hackathon was not an isolated event, but a cumulative step that extended and operationalised earlier workshop debates, allowing participants to refine speculative concepts into tangible, testable formats. The Gozo event therefore marked a pivotal stage in Task 1.3, consolidating earlier conceptual discussions into tangible directions for development, while also setting a collaborative roadmap for the student workshops and long-term exhibition goals of IMPULSE.

World 1 | Witnesses to History

This world centres on sound, voice, and testimony. Participants encounter volumetric recordings of Holocaust survivors, dockyard oral histories, and għana singing, placed within an abstract white mist environment. The emphasis is on listening as witnessing how minimal design can highlight human voices as carriers of memory. It raises critical questions about ethics, care, and designing for sensitive materials.

World 2 | Fragility

Here the focus is on the deterioration of artefacts and the aesthetics of decay. Massive images (cinema posters, glass slides, manuscripts, home videos) gradually disintegrate in front of the user’s eyes, with the pace of decay tied to the user’s gaze. The world explores how fragility, time, and perception can be designed as experiences, highlighting the vulnerability of heritage and the layered temporality of preservation.

World 3 | Sky Travels

This world takes navigation instruments and places them in a surreal setting where a user begins in a small boat, able to travel both across the sea and up into the stars. The

navigational artefacts (sextants, telescopes, etc.) become touchpoints for layered stories about exploration, colonial encounters, survival, and memory. It links practical knowledge (astronomy, navigation, craftsmanship) with metaphorical journeys between past and present.

World 4 | Future Past

A speculative setting where future archaeologists uncover dusty computers in a rediscovered museum, revealing digitised artefacts (e.g. anatomy manuscripts, cinema posters). This world probes hyperreality and mediation, asking how future audiences might interpret heritage when the physical is gone but the digital remains. It plays with perception, power hierarchies, and how “digitisation” itself becomes the fragile artefact of tomorrow.

World 5 | Gift Box Chronicles

Inspired by the “virtual loan box” concept, this world asks users to curate their own digital box of heritage objects, choosing what to include, how to describe them, and who the box is for. The box may act as gift, archive, Pandora’s box, or time capsule, with each choice shaping meaning. This world critically explores power, ownership, and authorship, turning co-curation into a playful yet provocative exercise in redistribution of authority.

The five proposed worlds for the Malta Pre-Hackathon did not emerge in isolation, but were directly informed by the series of earlier workshops. The speculative exercises, debates, and prototyping sessions carried out in Leuven and during the Community Workshops seeded many of the ideas that now shape these environments. For example, Witnesses to History builds on discussions about how to handle sensitive and traumatic archives with care, while Fragility reflects the metaphor of “notes over notes” and the layering of guilts that participants used to describe heritage as a site of ongoing deterioration and interpretation. The navigational metaphors and embodied interactions in Sky Travels stem from earlier explorations of maritime collections and conversations about embodied learning, orientation, and scale. The speculative lens of Future Past was influenced by participants’ interest in reimagining archives and questioning what remains when physical artefacts disappear, echoing debates on hyperreality and the authority of digital preservation. Finally, Gift Box Chronicles directly develops the “virtual loan box” concept that emerged in the institutional workshops, translating it into a playful exercise in redistribution of ownership and agency. Together, these worlds embody a cumulative

research-through-design process, demonstrating how themes first articulated in dialogue were translated into interactive concepts ready to be tested within the IMPULSE platform.

The results and analysis of the Pre-hackathon will be included in an upcoming Deliverable 1.3, 1.4 and 1.8.

One more Pre-hackathon is planned, for February 2026 in Saarbrücken (Task 5.3.3). A final hackathon open to a broader community of practice with a fully operational MUVE is planned for May 2026 in Athens (Task 5.3.4).

8 Methodologies

The methodologies outlined and discussed throughout this research were actively adapted to the specific contexts of the IMPULSE workshops. Research through Design (RtD) provided the overarching methodological lens, enabling the workshop coordinators to iteratively update their models in response to feedback and reflection. Iteration and reflexivity were crucial for the workshop structure: each session did not aim to necessarily resolve questions, but to generate new ones while testing ideas and concepts which were then carried forward into subsequent workshops. Case studies, literature reviews, and internal discussions first informed a broad set of exploratory questions, which were then refined through practice, tested in fast-paced exercises, live collection visits, and speculative design tasks. They also informed the case studies that were shown as examples and as speculative props during the workshops to trigger meaningful discussions with the collections.

This methodological flexibility allowed us to balance between speculative exploration and pragmatic constraints. For example, elements of participatory design were used to bring in diverse voices from students, curators, and artists, while user experience (UX/UI) research informed how interactions and prototypes were shaped in relation to the needs and behaviours of participants. At the same time, speculative design methods encouraged participants to imagine alternative futures and playful reinterpretations of cultural heritage beyond traditional frameworks. The workshops became hybrid spaces of inquiry, where design practice acted simultaneously as method, outcome, and reflection.

The influence of game jam practices was particularly valuable in shaping the workshops as spaces where failure was not only allowed but actively encouraged as part of the design process. In game jams, unfinished, strange, or even “broken” prototypes often spark the most original conversations, and we carried this ideology into IMPULSE. By embracing this mindset, the workshops created a culture where participants could test bold ideas without being constrained by institutional hierarchies or the expectation of polished results. Importantly, this also introduced an element of productive friction: moments of disagreement, misunderstanding, or failure were not treated as obstacles but as critical points of reflection that could open up new directions for design. Such friction was key in challenging assumptions about cultural heritage, encouraging the participants to rethink what counts as meaningful engagement and how speculative approaches could sit alongside more traditional interpretations.

8.1 Workshop Methodologies and Frameworks

The approach to the workshops has drawn upon methodological frameworks that integrate established design approaches with experimental practices from game studies and interaction design. Building upon RtD methodologies, several frameworks were applied in developing the qualitative research informed by the workshops and are laid out below. These draw on work detailed in Deliverable 1.1, which identified several possible methodologies that were explored in that case study, including Agile Development, Design Thinking, Living Lab, User Centred Design, and User-centred Innovation Approach (Krakowska, 2024, p.9). Specifically, section 3.1.4 of Deliverable 1.1 explored methodologies for focus group interviews which highlighted the importance of iterative methods in this approach. We took direct action following one particular point from Krakowska's review:

"An interesting approach would be to combine users from G1, G2, G3, experts and nonusers in the focus groups interviews sessions. Bringing together these two groups, observing their communication processes, knowledge transfer, perceptions, and understanding of the metaverse and immersive vs. traditional worlds would provide significant dynamics in focus group interviews. Questions would be broad, and expectations would involve comments and references to insights gained during discussions, shaping or deepening the knowledge of users and non-users" (Krakowska, 2024, p.53).

This was the approach taken for the Community Workshops, most prominently in Community Workshops 1 and 2, and to a lesser extent in Community Workshops 3, 4, and 5. All of these workshops were directed by the conversations elicited from the participants, following their lead in the discussions rather than adhering too strictly to a set of prepared questions. Conversations were redirected if they were diverging too far from the main topics or were becoming too specific if non-experts were present, as the intention in these preliminary workshops was to sound out responses to broader questions and attitudes towards XR and cultural heritage collections. In some workshops we did not in fact demonstrate the XR platform developed by Work Package 2. As we were not trying to gather quantitative data from these workshops, the questions did not need to follow a particular pattern or be addressed across different sessions, and it was the participants themselves who ultimately shaped the trajectory of each session. However, we did attempt to drive the discussions toward five key points described in Deliverable 1.1 (Krakowska, 2024, p.64):

- Determining the participants' exposure and awareness of XR and VR technologies;
- Their perceived relevance of XR technology in academic and educational contexts;
- Any barriers to the adoption of XR technology, or lack of interest in using VR;
- Their perception of XR technology, and the potential for experimentation that it can offer;
- Exploring the collaborative potential of XR technology in educational contexts.

The following subsections 8.1.1, 8.1.2, 8.1.3 and 8.1.4 describe methods of conducting research and methodologies before explaining in detail in Section 8.2 how they were applied and how they informed the designing of the workshops, since the exploration of methodologies and approaches are crucial for the objectives of Task 1.3. These methods prioritise iteration, designing as a means of generating knowledge, and enable users to co-create and co-create in an inclusive and feedback-driven cycle of development. The methodologies that have been selected to be implemented in the workshops are believed to bridge the gap between academic theory and the practical application of XR technologies.

8.1.1 Research through Design

Research through Design (RtD) is the core methodology that was applied to the workshops. RtD is a practice-based research methodology that uses the processes of designing (making, prototyping, and iterating) as a means of generating knowledge. Unlike traditional scientific inquiry which emphasises hypothesis testing and controlled evaluation, RtD produces insights through creative practice and reflection on the artefacts, processes, and experiences that emerge. Zimmerman et al. argue that the act of designing is not merely about producing functional outcomes but is itself a form of inquiry that can reveal new perspectives, challenge assumptions, and articulate possibilities (Zimmerman et al., 2007, p.5).

RtD often takes the form of speculative or exploratory prototyping, where prototypes are understood not as final products but as research vehicles that provoke dialogue, uncover user perspectives, and open up new design spaces. This is the fundamental aim of IMPULSE. This approach is especially valuable in emerging technological contexts such as XR and interactive systems that are the focus of IMPULSE, where future applications are uncertain, and conventional evaluation methods may be insufficient. Importantly, RtD does not claim universality in its findings; instead, it produces provisional and

transferable forms of knowledge that can guide future design and inspire broader research agendas.

Methodologically, RtD is characterised by iteration, reflexivity, and the integration of practice with critical reflection. Outcomes are disseminated not only through its outputs but also through the documentation of design processes, reflective accounts, and analytical frameworks. This is key to how we have designed the workshops. Such outcomes should not be expected to provide definitive solutions, but rather to encourage critical engagement and improve design research (Zimmerman et al., 2007, p.5). As such, RtD as a methodology bridges the gap between practice and theory, enabling design to act as both a method of inquiry and a mode of knowledge production.

8.1.2 User-centred and participatory design

User-centred and participatory design emphasise the central role of users in shaping the design and development of systems and tools. In user-centred design, the process begins with a deep understanding of users' needs, contexts, and behaviours, and proceeds through iterative cycles of prototyping, testing, and refinement. The goal is to ensure that outcomes are intuitive, accessible, and meaningful to those who will ultimately use them. Participatory design extends this principle by involving users not just as subjects of research but as active contributors and co-designers. By engaging them directly in decision-making, participatory design values the lived expertise of users and enables more equitable collaboration between stakeholders, designers, and researchers. As Sanders and Stappers note, this co-creative approach expands the design process by recognising users as partners rather than passive informants (Sanders & Stappers, 2008). Both approaches rely heavily on iteration, feedback, and dialogue, recognising that the best solutions emerge through collective exploration. In combination, they promote inclusivity, responsiveness, and long-term sustainability in innovation and design practice.

Similarly, interaction and intuitive design methods focus on creating systems and experiences that align naturally with human behaviours, perceptions, and expectations, ensuring intuitive and meaningful outcomes to the prototyping. This approach prioritises usability and accessibility by ensuring that interfaces and interactions are immediately understandable without extensive training or instruction. Intuitive design builds on principles of affordances, feedback, and minimal cognitive load, allowing users to engage fluidly with technologies and concentrate

on tasks rather than interfaces. As a methodology, it is iterative and user-informed: prototypes are tested and refined through observation of how users interact, with attention to moments of ease, confusion, or frustration. This process foregrounds embodied and sensory engagement, recognising that interaction is not only cognitive but also physical and affective. As Don Norman emphasises, well-designed interactions make things visible and reduces complexity, enabling users to act with confidence (Norman, 2013). By bridging design theory with practical application, interaction and intuitive design ensures that technological systems are both functional and meaningful, enhancing the overall user experience.

8.1.3 Human-Computer Interaction, feedback loops and iteration

Human-Computer Interaction (HCI) provides a methodological framework that explores how people engage with digital systems, interfaces, and technologies. Rooted in interdisciplinary perspectives from computer science, psychology, and design, HCI workshops use participatory and user-centred methods to gather feedback, test prototypes, and evaluate usability. Key techniques include usability testing, scenario-based design, heuristic evaluation, and co-design activities, all of which rely on structured interaction between participants and prototypes. These kinds of workshops therefore emphasise capturing user experience data (such as ease of use, satisfaction, and engagement with the objects or platform) through observation and post-session reflection. Iteration is central: findings from one session are fed back into prototype refinement and then tested again, creating an evidence-based cycle of improvement.

Feedback loops and iterative structuring are central to Design Thinking and Agile development methodologies, both of which emphasise continuous refinement through cycles of testing, evaluation, and improvement. In design thinking, iteration is embedded in stages of ideation, prototyping, and testing, where feedback from users guides the redefinition of problems and the generation of new solutions. This non-linear process allows designers to learn from failure and adapt rapidly to user needs. Agile methodologies similarly implement iteration through short development cycles, or sprints, where stakeholder feedback is incorporated into subsequent increments. Agile practices such as sprint reviews and retrospectives formalise reflection, ensuring that feedback informs not only the product but also the team's collaborative processes (Schwaber, 2004).

8.1.4 Game-based approaches and playfulness

Playful and game-based approaches introduce methods inspired by game design to investigate alternative interfaces, interaction patterns, and user experiences. Central to this methodology is the Mechanics–Dynamics–Aesthetics (MDA) framework, which distinguishes between the formal rules of a system (mechanics), the emergent behaviours that arise from player interaction (dynamics), and the affective responses these interactions generate (aesthetics). By applying MDA analysis, designers and researchers can systematically evaluate how design choices shape user engagement, motivation, and interpretation (Hunicke et al., 2004). This structured perspective enables the testing of prototypes not only for functionality but also for their capacity to evoke meaningful and engaging experiences.

In addition to analytical tools, playful experimentation serves as a creative, low-stakes method of exploring new interaction patterns. Through playful activities, participants are encouraged to imagine and test unconventional scenarios, which can reveal insights that may not emerge through traditional evaluation methods. In this regard, game jams can be used as a playful methodology in our workshops. Game jams are intensive, time-constrained events where participants collaboratively design and prototype games, making them a valuable methodology for rapid prototyping and innovation. By compressing the design cycle into short time periods, game jams foster creativity, interdisciplinary teamwork, and experimentation, often leading to unexpected solutions. The methodology is inherently iterative: participants generate ideas, create quick prototypes, test them, and adapt based on immediate feedback from peers or playtesting. This cycle mirrors broader design research practices, where failure and revision are embraced as opportunities for learning (Fowler et al., 2013).

Beyond producing playable prototypes, game jams also function as experimental research environments, enabling the exploration of new interaction patterns, mechanics, or storytelling strategies. Importantly, they cultivate a low-stakes atmosphere where innovation is prioritised over perfection. As such, game jams exemplify how compressed feedback loops and collaborative iteration can drive rapid exploration in prototyping methodologies (Kultima, 2015). As a research methodology, game-based approaches highlight the value of play in uncovering design opportunities, fostering collaboration, and ensuring that systems are not only functional but also engaging, memorable, and enjoyable. Game-based approaches will feature prominently in future workshop iterations, specifically in the form of Game Jams.

The 2024 paper *Gamifying Cultural Heritage: Exploring the Potential of Immersive Virtual Exhibitions* (Wang et al., 2024) reviews over 70 papers that focus on gamified cultural heritage in immersive virtual exhibitions, identifying theoretical frameworks that guide such work: gamification theory, immersive experience theory, heritage interpretation, participatory heritage, and pedagogy. In it, the authors point out the need for more empirical evaluation of user experience and learning outcomes, remote collaboration, and balancing fun against pedagogical value (Wang et al., 2024). This evaluation connects to Task 1.1 (UX Research) and Task 2.4 (Pilot Development and Content Processing) of IMPULSE. IMPULSE explicitly addresses this gap by embedding mixed-methods user studies and iterative feedback loops into its workshop design, thereby providing the empirical evidence that the wider field is currently lacking.

Their review emphasises the need for cultural sensitivity and adapting experiences to user preferences when developing virtual exhibitions. These are key elements that are being addressed through the workshops, by including such questions as design criteria in workshops and prototypes, for example by selecting which narratives or assets are highlighted, allowing users to choose how they engage with collections to enhance inclusivity and relevance. Their findings highlight the importance of balancing entertainment and educational goals in developing sustainable gamified cultural heritage experiences, to ensure that playful elements enhance rather than overshadow heritage interpretation and learning (Wang et al., 2024). This point has also been echoed by workshop participants, who have recognised that often technology leads a digital interpretation, overshadowing the objects themselves.

Another gap identified through this literature review is the lack of quantitative and qualitative studies that measure learning outcomes and engagement with virtual exhibitions. It is therefore imperative that IMPULSE build in evaluation steps in its prototyping and testing phases in upcoming workshops that engage directly with the MUVE to include metrics for heritage understanding and interpretation, emotional engagement, and retention. The paper shows that gamified elements improve engagement but must be carefully balanced so that educational goals are not lost. This is especially relevant for IMPULSE's Task 1.3 teaching and learning prototypes, with its remit to design gameplay and interaction mechanics that support reciprocal learning models of pedagogy without trivialising or overshadowing heritage content.

8.2 Applying Methodologies to the Workshops

The approach to the workshops was designed to not enforce a singular vision of XR interaction or experimentation, but to act as spaces for co-creation. Participants, including artists, educators, students, game designers, and cultural heritage experts, were therefore invited to shape the direction of activities. Their contributions highlighted both the opportunities and limitations of existing approaches, and continually informed refinements to the methodological framework. It was important to approach the workshops from the point of view of what our target audiences are interested in, and how we can offer them interesting experiences that resonate with their wants and needs by using innovative tools while also creating meaningful engagements. Some of the core methodologies are detailed below in the context of their application within the design of the workshops.

Rather than focusing solely on technological optimisation, the workshop sessions have explored diverse modes of HCI, from embodied engagement to non-linear narrative sequencing. Discussions and prototyping have foreground affordances, meaningful mechanics, and speculative storytelling approaches, allowing participants to test how different design strategies either support or undermine audience engagement. By situating these practices within a RtD methodology, we create a feedback loop where speculative prototypes and participatory experiments can directly inform Task 1.1's UX research and Task 1.3's collections-based experimentation, while also preparing the ground for Tasks 2.3 and 2.4's pilot and prototype development. In this way, the integration of visual grammar from XR research, combined with workshop-based exploration of interaction models, enables us to identify viable ways forward for designing immersive cultural heritage experiences that balance agency with orientation, freedom with narrative coherence, and innovation with critical reflection.

Similarly, in *Co-Designing Interactive Technologies for Cultural Heritage Contexts – Creating and Evaluating Interactive Museum Experiences* (Paananen, 2024) Paananen's research underscores the methodological backbone of IMPULSE: participatory, iterative, and ethically sensitive co-design processes, that ensure cultural heritage technologies remain relevant, respectful, and transformative. Paananen emphasises user-centred and participatory design methodologies when developing interactive cultural heritage technologies, stressing that applications must provide meaningful, respectful, and engaging experiences rather than being technology for technology's sake. This aligns directly with how IMPULSE has structured its workshops: bringing together

multidisciplinary groups to iteratively explore the role of XR and interactive mechanics in heritage contexts. The focus on cultural sensitivities and ethical engagement in the paper is echoed in IMPULSE's discussions around representation, meaningful mechanics, agency in virtual spaces, and the challenges of Euro-centred preservation concepts. In both cases, design is framed as a dialogue between technology, heritage, and users, rather than a one-directional imposition of digital tools.

Design processes in cultural heritage experiences are shaped through the interplay of institutional values, the creative visions of designers, and the lived experiences of audiences. This perspective underscores that XR prototypes and co-creation sessions do not emerge from a neutral ground but are constantly mediated by competing priorities, strengthening the argument that the workshops are not only sites of collaboration but also of tension, mediation, and value-alignment. This is evident in two ways:

- Firstly, it highlights the politics of design, that XR and cultural heritage interactions are shaped by competing priorities (accessibility, institutional authority, creative freedom, user agency); and
- secondly, it provides a bridge to discussions about representation, inclusion, and power relations, which are central to IMPULSE but are reinforced with this framing.

Acknowledging this negotiation as a central part of the design process allows to critically reflect on how decisions are made, whose voices are foregrounded, and how cultural narratives are shaped through immersive technologies.

Another important element to consider is 'design friction', moments where collaboration between diverse elements produce tensions, misunderstandings, or competing expectations, which then become productive sites for innovation. Rather than seeing these frictions as obstacles, they can be framed as essential to uncovering implicit assumptions and generating more inclusive design outcomes. For IMPULSE, this concept can add depth to the analysis of co-creation workshops, where artists, cultural heritage professionals, technologists, and educators bring different priorities and vocabularies. Recognising and documenting these frictions, whether about representation, data accessibility, or the balance between creative expression and institutional constraints, can help the project refine its iterative design process. More importantly, it allows us to embrace conflict as a generative force.

A tension that emerged concerned the balance between education and artistic interpretation, and whether these are distinct domains or overlapping practices.

Discussions with Task 1.2 and Task 1.3 representatives, respectively, Luka Prinčič (UM) and Margerita Pulè (UM) highlighted questions of agency: who ultimately shapes the narrative, and to what extent does the project lean towards didactic objectives versus open-ended artistic expression? Who holds more responsibility and what are the faces that co-creation and participation take in art practices and educational practices respectively? Rather than seeking definitive answers, the workshops allowed us to juxtapose the emergent narratives and comments, positioning this tension as a productive space for experimentation.

In Paananen et al.'s paper, they argue that interactive storytelling approaches must be sensitive to local contexts and community voices, ensuring that technological interventions do not overwrite but rather amplify diverse perspectives (Paananen et al. 2024, p.549). This emphasis on contextual sensitivity and amplification of community voices is particularly significant for IMPULSE, where digitised cultural heritage risks being presented through uniform or institutional lenses. Paananen et al.'s reminder that interactive storytelling must not overwrite but rather amplify local perspectives adds an important ethical layer to the project's work. In practical terms, this aligns with the design of the workshops, where participants from different backgrounds collaboratively reinterpret collections, where speculative approaches allow underrepresented voices to surface and the reuse of digital assets both aligns with technological innovations while also being socially responsive.

In addition to recognising the role of negotiation and friction in co-creation, the IMPULSE workshops can also be understood through the lens of what Comber et al. describe as the "violence of inaction" (Comber et al., 2025, p.896). This adds depth by shifting the frame. Friction is not only about conflict between perspectives, but also about the tension between action and inaction, which is highly relevant when dealing with contested heritage and digital experimentation, highlighting that hesitation to intervene in digital heritage design out of fear of imposing bias can itself reproduce colonial dynamics. To act out of fear of misrepresentation or overstepping can inadvertently reproduce dominant narratives and power imbalances. By contrast, the IMPULSE project treats intervention itself as a necessary and generative act, one that allows participants to question inherited structures and propose alternative futures for engagement with digital heritage. Comber et al. explain in their paper how designing with decolonial intent means recognising archives as political spaces that both reflect and reproduce power relations, while also holding the potential to subvert them (Comber et al., 2025, p.896). This resonates with the project's iterative and participatory design ethos, where speculative experiments and user-centred feedback loops are not only methods of refinement but also forms of epistemic disobedience. In this way, the project

embraces creative interventions as essential to reimagining representation, access, and interpretation across both virtual and physical heritage contexts.

Another concept from Comber et al. that could enrich the IMPULSE framework is the idea of archives as sites of resistance. Rather than treating collections solely as sources of historical data, this framing positions them as active spaces where struggles over representation, power, and memory unfold. This perspective underscores the importance of viewing digitised cultural heritage not as neutral material but as contested terrain in which design choices, curatorial practices, and technological affordances all carry political weight. This is particularly present in the ‘friction’ between items in Heritage Malta’s care, such as the neolithic “temple” structures, and historic documentation of people’s tangible interaction with them that is now restricted, as evidenced in Magna Żmien’s audiovisual archive of those same sites.

Another paper that shaped our approach in the context of hackathons, was ‘Timbre Tools: Ethnographic Perspectives on Timbre and Sonic Cultures in Hackathon Designs’ (Saitis et al., 2024). The authors approached hackathons as a means to investigate how the subjective nature of sonic timbre is conceptually negotiated among creative practitioners, including instrument makers, audio developers and musicians, during a hybrid hackathon, combining workshops, pre-engagement, team formation, and open-ended creative prompts (Saitis et al. 2024, p. 229).

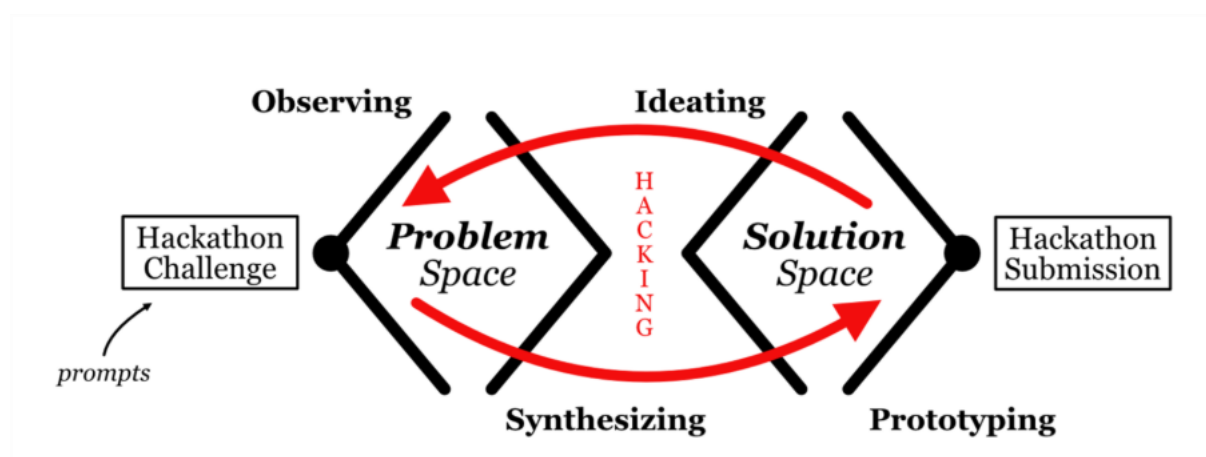


Fig. 5. Hackathons as observatories of design thinking: Exploring the problem space and solution space follows a pattern of divergent thinking followed by convergent thinking, visualised as two diamonds (Saitis et al. 2024, p.230)

This model uses a Double Diamond design thinking model that explores both the problem space (understanding what timbre means to people, how it is described, what metaphors are used) and the solution space (how people build tools, choose technologies and map features). IMPULSE workshop structure follows similar problem

and solution spaces and phases, in the form of an initial exploration of participant ideas (the problem space) followed by prototyping, experimentation, and refinement (the solution space). This alignment ensures that creative tension is leveraged first to understand what matters to participants then to provide tools and interactions that reflect those values. Another major theme derived from this work is the role of metaphor and embodied, multimodal interaction to help participants articulate subjective sonic qualities. For example, colour, imagery, bodily experience, or gestural mapping become ways to make timbre more intelligible. Just as 'Timbre Tools' found metaphor and embodied mapping helpful, the IMPULSE workshops explicitly explore how participants might describe heritage artefacts or experiences metaphorically, for example as "floating", "textures", or "movement", and how different types of interactions with objects, be they gestural, spatial, non-linear, can evoke a wide range of meaning through specific interactions (Saitis et al., 2024, p.230).

Spatial formation, posture, shared workspaces and nonverbal dynamics (such as how teams physically position themselves around tables and screens and their interaction styles) significantly influence collaboration, communication and creative decision-making (Saitis et al., 2024, p.234). Observations in 'Timbre Tools' regarding how posture, team formation, shared screens and face-to-face vs remote/online presence affect collaboration are being used in IMPULSE to shape how we decide on and mix online/offline/hybrid sessions. For example, limiting group sizes in physical workshops to ensure everyone can contribute; designing the online MUVE platform to allow meaningful remote collaboration; paying attention to how participants are placed or how interaction flows in physical spaces. Hybrid modes (on-site/hybrid/remote) introduce both opportunities in the form of wider reach and inclusivity, but also challenges such as differences in access, different interaction styles and less cohesion among remote participants.

A very relevant facet of the 'Timbre Tools' paper is in its successful application of Iterative Feedback Loops. The ethnographic observations, interviews and reflection on how teams negotiated timbre informs IMPULSE's approach whereby every workshop not only elicits feedback, but uses that feedback to adjust the next prototype, next workshop design, or interaction model. Moreover, another parallel with the Impulse Community Workshops was the authors' decision to include in the Timbre Hackathon both music practitioners and timbre makers. This ensures the project remains responsive and grounded in participants' lived experience and needs from the platform, not only in theoretical or technical possibilities.

Returning to gamification, Riccardo Fassone in his 2015 paper '*This is video game play: video games, authority and metacommunication*', addresses topics that directly influenced

the way that we decided to approach our workshop design research (Fassone, 2015). He explores how video games communicate the meta-message 'this is play', building on Gregory Bateson's theory of meta-communication); how video game rules, their computational and digital constraints, and the ways players interact with or against these rules, reflect authority and power; and how some games make players aware of the rules, limitations, and ethical implications embedded in the system, thereby highlighting their reflexive nature (Fassone, 2015).

Fassone argues that "playing a video game means confronting, acting against and reflecting upon the very notion of authority, thus playing with authoritarian systems and processes found in 'real' life", drawing parallels between game rules and authority (Fassone, 2015, p.49). This observation can help deepen discussions in IMPULSE about how virtual heritage environments should acknowledge their own rule-structures:

- What cannot be changed by the user?
- Which institutional or technical constraints are "hard-coded" into the experience?

Making these questions visible can increase transparency and allow participants to critique or reflect on them. Fassone also demonstrates that video games (virtual spaces) can be reflexive, in that they can expose their own rules and authority, revealing power dynamics which turn them into interactive systems of power. It was decided that incorporating this ideology into IMPULSE workshops might help participants think about how digital heritage platforms themselves including their metadata, UX and interface options can embody authority in what is presented, what is hidden, and who decides this. This reflection can tie into questions about curatorial voice, narrative framing, or metadata standardisation, which can feed how the MUVE worlds are developed. Fassone also highlights that player agency and designed constraints such as rules and computable limitations are not only restrictions but shape the gameplay and meaning. Constraints can produce creativity in solo and group gameplay to work with or against the limitations presented to the user or player. This links with IMPULSE's interest in meaningful mechanics and how enabling affordance within constraints can lead to richer interaction.

8.3 Methodology Evaluation

To ensure consistency and comparability across all sessions, the project developed a standardised template for collecting and synthesising outcomes from the workshops. This template was designed to capture not only participants' immediate feedback but also to trace the evolution of the research questions over time. By structuring inputs

in a systematic way, covering aspects such as themes discussed, emerging questions, participant reflections, and proposed prototypes, the template allowed us to monitor how the inquiry shifted across different contexts and participant groups. Importantly, this approach also creates a continuity of method, enabling us to identify recurring concerns and new directions while avoiding fragmentation in the documentation process. These templates are not only a record of past workshops but will continue to serve as a living tool throughout the project, supporting future workshops in maintaining coherence while allowing for adaptability to the needs of different groups.

To capture the workshop outcomes, we emphasise qualitative indicators that go beyond numerical participation data. These indicators allow us to trace how ideas evolve, how participants engage, and how knowledge is co-created across disciplines and contexts. Key areas of attention include:

Depth of reflection: How participants articulate new perspectives, challenge assumptions, or reframe their understanding of cultural heritage through discussion and feedback.

Emergence of new questions: The generation of novel or refined research questions during and after workshops, which signal intellectual and creative growth.

Collaborative dynamics: Observations of how participants interact across different levels of expertise (e.g., students, curators, artists), revealing patterns of co-creation, negotiation, or friction.

Relevance to practice: The extent to which participants connect workshop discussions to their own professional or creative practices, identifying possible applications or adaptations.

Narratives of change: Personal accounts or testimonies that demonstrate shifts in attitudes toward digital heritage, XR technologies, or participatory approaches.

Creative outputs: Prototypes, speculative scenarios, or conceptual frameworks generated during workshops, which reflect the participants' ability to translate dialogue into design.

Co-curation is how enabled these participants and users are to narrate their own stories through the MUVE and have a sense of interactivity and agency within it. Feedback from each workshop is feeding our evaluation of these concepts, which in turn is informing how we structure each subsequent workshop based on responses of the participants. This will continue to be an important feature in the next phase of workshops as we

iteratively alter the questions that we pose to each workshop, depending on its composition and expertise.

Impact measurement allows us to trace change across multiple dimensions: from participants' knowledge, attitudes, and skills to the evolution of research questions and design directions. It also helps identify which workshop formats (i.e. online, offline, or hybrid) produce more fruitful interactions, ensuring that future activities are grounded in evidence rather than assumptions. Moreover, systematic impact assessment highlights gaps and frictions in participation, pointing to areas where methods can be adjusted to be more inclusive or accessible.

Furthermore, measuring impact is about accountability while also capturing value beyond immediate outputs: the formation of networks, the emergence of new perspectives, and the shifts in institutional or artistic practices. By making these impacts visible, the project can refine its approach, strengthen co-creation, and demonstrate the long-term relevance of the research to its target groups.

In evaluating the impact of workshops within the IMPULSE project, we can draw on perspectives from Research through Design (RtD) as outlined in Godin and Zahedi (2014). For IMPULSE, this means that success is measured not only by the immediate outputs, such as ideas, prototypes, or design suggestions, but also by how discussions, feedback, and speculative engagements reshape research questions and expand collective understanding of cultural heritage interactions. Feedback emerging from discussions plays a central role here. It serves as both "reflection-in-action" and "reflection-on-action" (after Schön, 1984), where participants' spontaneous ideas during the sessions and their more considered responses afterward are captured as valid contributions. These insights are then iteratively fed back into the design of future workshops, embodying RtD's principles.

Importantly, evaluation is also tied to the rigour and validity of the process: whether conversations were inclusive, whether the workshop design allowed diverse participants to meaningfully engage with collections, and whether outcomes can be extended and built upon in future sessions. In this sense, success lies in how well workshops open pathways for future inquiry and design, not just in immediate deliverables.

The iterative nature of our workshops has allowed us to build upon the results of previous ones. This is especially the case for the Community Workshops which have grouped similar participants on multiple occasions to compound results, by either presenting ideas in different ways, or reacting to positive or negative / tangent discussions accordingly in the next iteration.

The 'rules' for measuring the impact of workshops that were described in Section 7.1.3 have been applied throughout this evaluation to understand the participants' experience and skill levels, ensure that engagement can take multiple forms, that any biases are recognised and factored into the evaluation where possible, and that goals and useful metrics are defined at the outset of each workshop.

9 Observations and Analysis

9.1 Workshop key findings and reflections

Across the different iterations of workshops conducted so far, several important outputs have been generated that both inform and advance the objectives of IMPULSE. These outputs can be grouped into the following categories:

Evolving Research Questions: One of the most significant outcomes has been the iterative development of research questions. Beginning with broad questions drawn from literature review and case studies, these were tested, refined, and expanded through each workshop, resulting in a dynamic catalogue that maps the shifting priorities of participants across disciplines.

Prototypes and Conceptual Designs: These prototypes were not final products but rather “thinking tools” that allowed participants to explore alternative interfaces, mechanics, and ways of engaging with heritage. A list of the most prominent ones can be found in Section 9.2

Methodological Frameworks: Through structured activities, templates, and reflection sessions, the workshops established methodological practices, such as standardised ways of collecting outcomes and mapping feedback, that will be carried forward into the next phases of the project. A significant output from the Workshops that have taken place so far is the creation and development of an initial Template to be used for the standardisation of feedback collected from all the upcoming workshops, that will eventually contribute to the objectives of 1.3 Task. The template was developed after attempts to categorise the feedback and all the valuable information collected from the 5 Community Workshops.

Cross-Disciplinary Dialogue: A major result has been the creation of spaces for dialogue among cultural heritage professionals, artists, educators, students, and technologists. These exchanges surfaced tensions and frictions (e.g., between authority and co-creation, or between fidelity and speculative storytelling) which in turn enriched the design space.

Identification of Challenges and Needs: Workshops revealed recurring challenges in areas such as accessibility, metadata standardisation, representation of “problematic” artefacts, and the role of XR in balancing education with affective engagement. These findings will guide the design of more targeted prototypes in future stages.

Community Insights: Particularly in Community Workshops, participants contributed perspectives on ownership, agency, and lived experiences of heritage, offering critical insights that counterbalance institutional narratives.

Together, these outputs demonstrate that the workshops were not isolated events but cumulative building blocks, shaping both the methodological direction of the project and the design of the IMPULSE prototypes. They also provided essential evidence of how participatory processes can generate knowledge that is directly relevant to the target groups of educators, artists, and cultural heritage professionals.

The evolution of the research questions can be grouped into six overlapping general 'clusters' that we can use to usefully explore the results of the workshops as the questions and methodologies applied evolved over time.

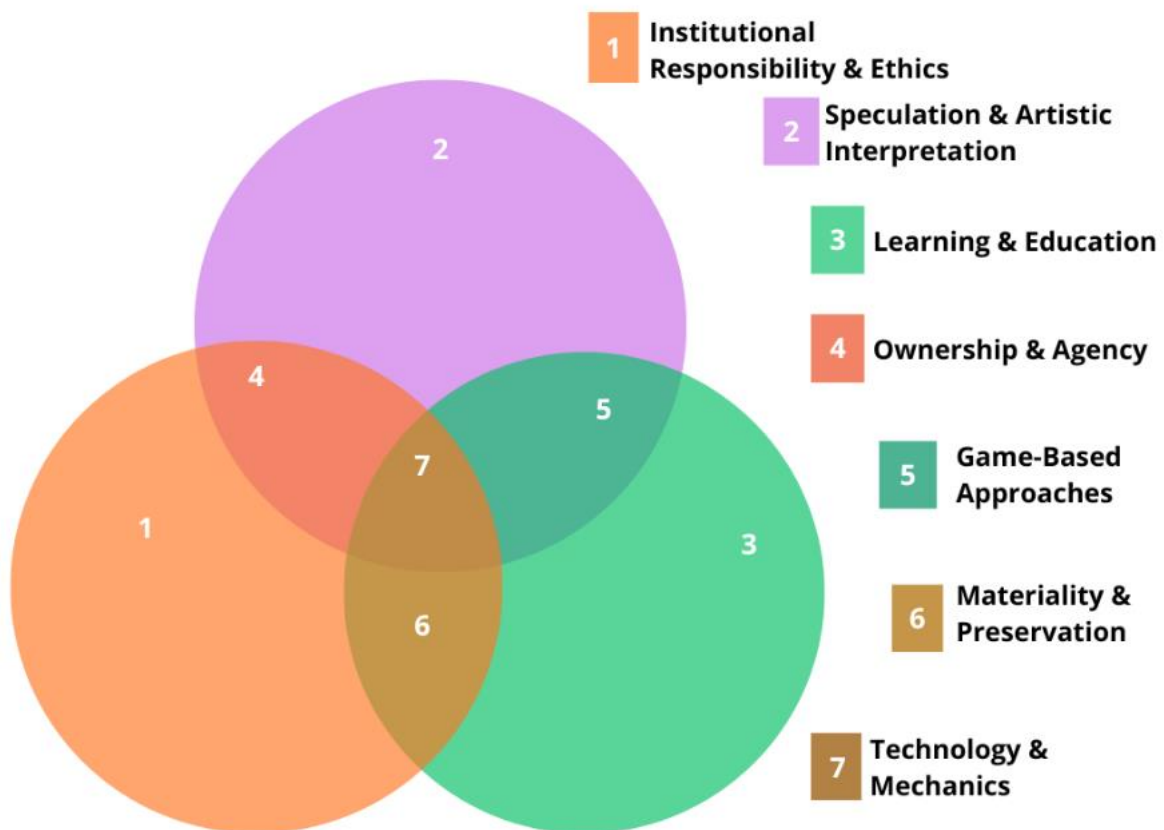


Fig. 6. Visualisation of the overlapping clusters of emergent questions.

Cluster	Representative Questions	Observed Evolution Over Time
Institutional Responsibility & Ethics	Should museums present contradictions? Can they ever be objective? How do we address problematic content?	Initially asked whether museums should adopt objective or critical positions. Evolved into discussions about fragmented or speculative interventions, decolonial practices, and designing with care while avoiding “edu-tainment” aesthetics.
Speculation & Artistic Interpretation	How do artists engage with XR to reinterpret heritage? Where is the line between education and art?	Early tension framed as <i>education vs art</i> . Later reframed as overlapping approaches, recognising that speculation, play, and care-based practices can enrich learning while challenging institutional hierarchies.
Learning & Education	What are we trying to teach/learn? How do museums function as spaces of education beyond the classroom?	Early questions emphasised redefining museum spaces for education. Later discussions stressed reciprocal learning, blurred boundaries between teacher/student roles, and the role of marketing/social media as part of educational practice. Comments on educational practices through the years were also made.
Ownership & Agency	Who owns cultural heritage and its digital versions? Who decides how artefacts are represented?	Initially framed as broad ethical provocations; later explored in relation to institutional authority, community participation, and curatorial responsibility. Added layers to the concept of <i>ownership</i> and expanded to <i>shared agency</i> and <i>co-creation</i> .
Game-based Approaches	How can play function as a vehicle for education and critique? What happens when you play games “wrong”?	Initial focus on edutainment and archaeogaming. Over time, questions evolved to game mechanics as storytelling, collective game jams as speculative co-creation, and friction as a productive design constraint.
Materiality & Preservation	What is considered “suboptimal”?	Early focus on low-resolution or repetitive artefacts as “problematic.” Later expanded

	How do we translate material qualities into digital form?	into ethical debates on omission, destruction of layers, and how preservation choices reshape narratives and future interpretations.
Technology & Mechanics	What should be augmented in XR? How do mechanics shape storytelling?	Began with questions of novelty and scepticism (<i>Is VR a gimmick?</i>). Progressed toward identifying meaningful mechanics, layered storytelling, agency, and the potential of XR to foster empathy and critical engagement.

Tab. 12. Table visualising the cluster of the emergent questions from the workshops, with some selected examples of questions and their progression.

In this next subsection the impact of the first Pre-hackathon in Leuven and some key discussions and quotes from each Community Workshop that shaped the trajectory of the workshops and contributed to the creation of the table above will be explored organically, in an attempt to demonstrate the overlapping nature of the aforementioned clusters.

9.1.1 How the Leuven Pre-hackathon affected our practice

While the initial intention for the Pre-hackathon in Leuven was to adopt a game jam format, it became clear during preparation that this approach would not be ideal. The participating teams did not include a sufficient number of technically skilled developers to support the creation of playable prototypes within the event's timeframe. Moreover, given that the primary audience consisted of academics and researchers, it was more appropriate to adopt a speculative and theoretical hackathon structure. By shifting toward a more conceptual format, the Leuven event allowed participants to critically explore themes of playfulness, cultural heritage, and speculative design, without the structural limitations of coding or asset production.

This approach also reflects on the flexibility of game jams as pedagogical tools, where the value lies not only in the final artefact but in the co-creation process. In this sense, the Leuven Pre-hackathon provided a space for academics to begin engaging with game-like structures of thought and participatory storytelling practices, gradually easing in concepts of play and co-creation. This establishes a foundation that can later evolve into more technical or production-oriented formats in subsequent workshops

and hackathons, ensuring continuity with IMPULSE's long-term goals of research-through-design and cross-sector collaboration.

Game jam outputs, whether complete games or speculative prototypes, can be understood as contemporary folklore artefacts, as they embody the ideologies, cultural frameworks, and social dynamics within which they were conceived. Much like traditional folklore, which reflects the practices and beliefs of a community, game jam creations represent the ephemeral yet situated knowledge of their participants. As Nørgård et al. argue, jams are not solely about producing polished artefacts, but rather about “bring[ing] together youth, cultural institutions, and creative professionals to reimagine cultural heritage through inclusive, pluriversal, and transversal design approaches” (Nørgård, R. T. et al., 2025, p.1) This process results in works that encode both the constraints of the jam (time, tools, themes) and the values and concerns of the participants.

Their potential within site-specific events is especially significant for cultural heritage. As Hirsch et al. emphasised in their work on multiperspectivity in HCI for heritage, playful and participatory methods allow institutions to move away from top-down representation toward more dialogic and situated forms of interpretation (Hirsch et al., 2024). In doing so, they produce artefacts that are not just 'about' heritage but are themselves extensions of it living documents of how contemporary communities relate to the past.

While the Leuven pre-hackathon was structured as a more speculative and theoretical exercise rather than a fully technical game jam, the insights generated remain highly relevant for the broader trajectory of the IMPULSE project. The research conducted during this event, particularly around the conceptual framing of playfulness, co-creation, and speculative engagement with cultural heritage, directly informed the following workshops: namely, Institutional Deep Dives, Community Workshops, and ensuing Pre-hackathon preparation in Malta. In this way, the Leuven session serves as an important conceptual foundation. It allowed academic participants to engage critically with heritage narratives, interfaces, and representational strategies, while laying the groundwork for more practice-based, game-oriented workshops to come.

The concepts and interactions produced in Leuven, such as the exploration of the materiality of Magic Lanterns (a concept that emerged through the Live Visit at MZ) and slideshows, and the ways in which physical representations and interactions can be translated into virtual spaces, have been particularly influential. These discussions not only guided but also expanded our existing research questions, encouraging us to think more deeply about issues of embodiment, performativity, and the layered nature of cultural heritage experiences in XR. The Leuven pre-hackathon thus acted as a catalyst

for refining our methodological framework, prompting us to integrate speculative approaches with practical design considerations. The concepts that emerged from this session were subsequently taken forward and actively shaped the structure and focus of the next series of workshops, ensuring continuity while also broadening the scope of inquiry to address the interplay between physical artefacts, digital affordances, and user interaction across diverse cultural heritage contexts. Not all heritage artifacts should be represented in the same way; rather, their materiality, speculative qualities, and modes of storytelling should guide their digital augmentation.

9.1.2 Case Studies Presented during the Community Workshops

The IMPULSE Community Workshops introduced the project to small interdisciplinary groups, surfacing practical and conceptual questions about how digitised cultural heritage can be represented and used in interactive environments. Participants included researchers, digital-games students, visual artists and heritage professionals.

The participants' disciplinary diversity was both an asset and a design constraint. Several participants introduced themselves as coming from distinct disciplinary backgrounds including game design, curatorial practice, visual art, and museum outreach, and used those positions to pose different practical questions about digitisation and public engagement (for example, "how can we actually get the collections [that are] mostly digitised into more interactive platforms for the public?"). These contributions made clear that design choices must accommodate heterogeneous workflows and expectations across stakeholder groups.

To address the wide range of disciplinary perspectives represented in the workshops, we introduced a series of carefully selected projects and visual examples. These served as provocations to spark discussion across different knowledge domains, helping participants move beyond their own disciplinary assumptions. By presenting case studies that blurred the boundaries between art, education, and technology, we created a shared reference point for dialogue.

A number of a variety of case studies and creative examples framed this discussion and were introduced to the participants during the presentational phase of the workshop.

In this section some key examples will be referenced: The website *Monuments to Guilt* (Torres, 2022) and Studio Oleomingus' game *Indifferent Wonder of an Edible Place* (Studio Oleomingus, 2020) exemplified how interactive and speculative formats can be used

to engage with collective memory, guilt, and contested histories, often by layering personal and political narratives.

Monuments to Guilt is “a short exhibition exploring exclusionary design. Acquaint yourself with the core principles of this harmful practice, re-evaluate the objects you see every day and let guilt sit with you, for just a little while” (Torres, 2022). Presenting examples of hostile public architecture in the form of a VR museum explores how intangible emotions can be spatialised, materialised, and shared within a digital environment, while highlighting that learning can take different shapes and forms. The project was relevant to our discussion as it demonstrates how difficult and abstract concepts, such as guilt or trauma, can be expressed through interaction and spatial design, offering parallels for how cultural heritage can engage audiences beyond factual narration.



Fig. 7. Promotional image of 'Monuments to Guilt' game (Torres, 2022).

Studio Oleomingus' *Indifferent Wonder of an Edible Place* is a narrative game that reflects on consumption, displacement, and the commodification of land. Framed as a surreal tale about houses being eaten, it provides a critical allegory of postcolonial exploitation and erasure. Within our session, it highlighted how speculative storytelling can reframe heritage not as static objects but as contested, living narratives, opening space for reflection on ownership, memory, and the politics of preservation. *The Indifferent Wonder of Edible Places* is described as “a study of the violence of completion. Of complete memory and perforated form. Of edible history and perforated reality” (Studio Oleomingus, 2020). In its single-player form, the game unfolds as a surreal tale of a municipal building-eater consuming a tower at the edge of an unnamed town.

It meditates on the violence of erasure and the grief of surviving on the margins of history, while inclusive and entangled records are effaced. The game demonstrates how speculative narrative can expose the precariousness of cultural memory. Within our workshops, it served as a critical example of how digital storytelling can confront histories of displacement and erasure, raising questions about whether respect in virtual heritage must take the form of accurate representation, or whether it can emerge through poetic, allegorical re-imaginings.

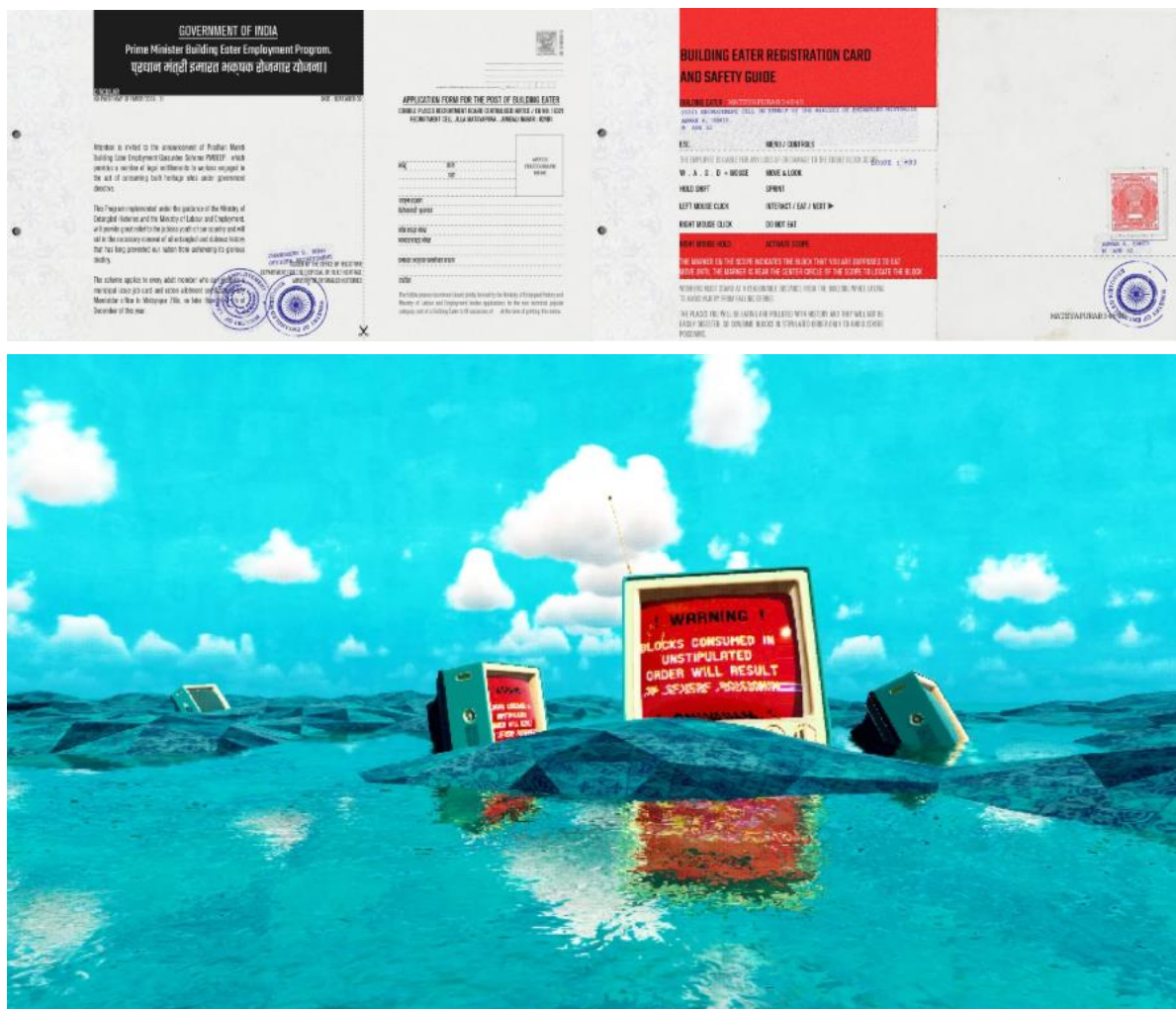


Fig. 8. Promotional images of 'The Indifferent Wonder of Edible Places' game (Studio Oleomingus, 2020)

Similarly, references were made to the cyclical destruction and reconstruction of the Ise Grand Shrine in Mie Prefecture, Japan. The shrine is ritually dismantled and rebuilt with new materials on an adjacent site every twenty years, ensuring the building is simultaneously ancient and modern, fostering the conservation of the means of construction over the preservation of the structure itself. This provides a striking

counterpoint to Western-centred notions of conservation, demonstrating how cultural values shape ideas of permanence, continuity, and decay. Other examples, such as social media reinterpretations of heritage on platforms like the British Museum's gamified Instagram posts (British Museum, 2025), Phillip Penix-Tadsen's reflections in *Video Games and the Global South* (Penix-Tadsen, 2024), and digital works such *Minecraft, Sandboxes, and Colonialism | Folding Ideas* by Dan Olson (Olson, 2019) highlighted how alternative geographies and how we interact with them, expand the interpretive scope of cultural heritage beyond institutionalised Western frameworks. This short video essay discusses how certain colonial narratives are being replicated unconsciously in virtual spaces, having as an example how players relocate villages and populations in Minecraft.

This tension between 'authoritative' narratives raised important questions about the role of narrative reinterpretation and decontextualisation in virtual worlds. Can immersive storytelling provide a means of engaging critically with painful histories, or does it risk trivialising and exploiting them? Such debates echo wider concerns in cultural heritage HCI, where scholars have cautioned that "multiperspectivity and inclusion demands a reevaluation of conventional research and design practices, focusing on empowering local communities and safeguarding diverse narratives and individual perspectives" (Hirsch et al., 2024).

What also became clear in this discussion is that respect is not monolithic. For some participants it meant safeguarding material from re-use altogether, while for others it meant framing it carefully within broader narratives to open up dialogue. These differences demonstrate that respect can take multiple shapes and forms, and that such plurality must be acknowledged when designing interactive and virtual experiences. The session therefore highlighted the need to develop storytelling practices that not only communicate historical trauma but also respect its gravity, ensuring that speculative or playful methods do not overwrite or diminish lived experiences.



Fig. 9. Promotional images of 'Queen Boat' game (Khalifa, 2023).

Another project that shaped the discussion was *Queen Boat* (Khalifa, 2023), which was introduced by its designer, also a lecturer at the Institute of Digital Games at the University of Malta. The game explores issues of persecution, identity, and queer histories in Egypt, foregrounding how digital experiences can act as speculative archives for voices often excluded from official records. The discussion it provoked underscored that respect does not necessarily require strict realism. Symbolic and metaphoric modes of representation can be equally powerful in addressing trauma and marginalised narratives. At the same time, participants stressed that censorship is not a viable solution; silencing difficult or contested stories risks repeating the exclusions they seek to critique. Instead, projects like *Queen Boat* demonstrate how interactive design can carefully

balance sensitivity with creative expression, offering players both affective engagement and critical reflection.

9.1.3 Community Workshop 1

The first workshop group critically interrogated representation and interaction. One prompt from the convenor summarised the immediate task for design: “we need to find a way to represent and not only [be] representative [...] how would you like to interact with different artefacts, how can this interaction be meaningful?” This question framed subsequent exchanges as participants explored what “meaningful” interaction would look like for conservators, curators, students and the public, and whether different user groups require bespoke interaction mechanics or shared affordances.

Attitudes toward technology were nuanced and pragmatically cautious. A practising visual artist who has traditionally been working with essay films and drawings and has recently been experimenting with AR admitted that the medium and XR in general poses certain restrictions. Another participant from the second Community Workshop noted that “We are making something with an expiration date, like we are already in the fold of irrelevance, and it doesn't have to be like that.” Together these remarks point to an important design imperative for IMPULSE, that prototypes must be demonstrably usable and pedagogically productive, not merely technologically novel.

Practical questions about digitisation, metadata and standardisation, and interface affordances were brought into immediate relation with live ideation. Participants asked for concrete demonstrations and for access to a platform that would allow them to iterate on modes of interaction. This aligns with the project's aim to pilot prototype UI/UX and to let stakeholder feedback shape successive versions of the MUVE.

The first workshop also explored how cultural heritage objects carry layers of meaning, responsibility, and even guilt, both in their preservation and their representation. Participants introduced the idea of a “history of guilts” and a “layering of guilts,” reflecting how each act of preservation, interpretation, or omission leaves behind traces that can never be entirely neutral. Activities such as working with and annotating “notes over notes over notes” were used as a metaphor to describe the layered, subjective interpretations that people project onto artefacts. Rather than fixed descriptions, these layers resemble personal tagging or forms of metadata and paradata, opening up ways of researching and engaging with heritage through more abstract, affective, or culturally situated frameworks; exploring how layers of responsibility and interpretation accumulate over time, shaping both personal and institutional engagement with heritage.

Material examples drawn from the consortium's collections highlighted these tensions. The unavoidable fate of many of the actual artefacts contrasted with the potential of digitisation to safeguard fragile heritage, while also depending on permissions and contested rights. In some cases, preservation itself becomes problematic, reproducing "Western-centred concepts of preservation" that may overwrite or distort local practices and voices. Indeed, the role of the museum as a controlling body for access, knowledge, and representation was prevalent throughout the conversations. Two of the participants' dialogue on decolonial practices for instance foregrounded how representation and aesthetics in virtual worlds often remain tethered to dominant frameworks. The critical question posed was: "What is more acceptable? Which Egyptian interpretation?", referring to the participants discussing the portrayal of Egypt in KU Leuven Slides and the Queen Boat Game, and do visual aesthetics affect the representation and interpretation of stories? (The designer who was also a participant of the workshop is from Egypt himself, adding more layers to the conversation, since he could also connect in a different way with the glass slides.) This opened reflection on authority, legitimacy, and whose perspectives are prioritised when cultural artefacts are reproduced digitally. Artefacts that have contested histories once excavated and removed from their country of origin were discussed in particular, driven by the images from KUL's archaeological excavations collection.

Speculative design interventions further engaged these tensions. Wrapping posters around buildings to "omit or hide problematic parts" of the posters (and / or the buildings themselves) or folding and refolding them until they "gradually wither at certain places" served as metaphors for the fragility and erasures inherent in preservation. Similarly, designing specific mechanics/affordances and imposed MUVE constraints like "walking as a time restriction" highlighted how digital and physical affordances shape interaction with heritage. One student, for example, reflected on how "walking and scale became a timed interaction," suggesting that embodied navigation can alter the perception of an object or collection.

These discussions revisited the difficulty of handling problematic or contested collections. Participants asked whether it is better to avoid using problematic artefacts altogether, or to confront their complexities openly. For instance, one participant reflected whether the Egyptian excavations documented in the 1920s glass slides collection were more or less problematic than the amateur films made in 1950s Malta that rendered its rural landscape and catacombs as a stand-in for Ancient Egyptian tombs, complete with 'Egyptian' hieroglyphics and grave robbing archaeology. The discussion underscored how site, context and institutional voice mediate the acceptability of engagement with such objects.

Overall, the first session foregrounded the importance of acknowledging preservation as a layered, often contradictory practice, shaped by guilt, omission, and cultural authority. It further demonstrated how experimental approaches to actions, such as folding, walking, wrapping, annotating, tagging, and the subjectivity of such actions, can make these tensions tangible, offering productive avenues to rethink how cultural heritage is represented and experienced in both physical and virtual spaces.

Ethical challenges emerged most vividly when participants reflected on the handling of sensitive materials such as Holocaust testimonies presented by FBKW and the glass slides from KU Leuven. These discussions revealed sharply contrasting positions: while some argued that such material should be carefully contextualised in order to preserve its historical significance, others felt that certain content should not be circulated at all, particularly within experimental or virtual environments. This divergence underscores the difficulty of working with collections where trauma, violence, or colonial appropriation form the core of the narrative.

9.1.4 Community Workshop 2a

The second Community Workshop had a similar demographic constitution. Discussions in this workshop foregrounded the intersections between language, memory, and speculative engagement with cultural heritage. One of the central conversations revolved around the accessibility of language and oral histories. Participants reflected on how meaning is conveyed beyond words, through tone, rhythm, and affective qualities of speech. As one comment highlighted, “everyone knows about the Holocaust, you don’t need the subtitles, you want to hear the quality of the voice, in order to understand that there is meaning.” This resonates with previous debates around the role of affect and presence in digital heritage, underscoring that accessibility is not solely about translation but also about recognising the embodied nature of communication.

A recurring theme was the imaginative reconstruction of the past, particularly through speculative artefacts. References were made to “imaginary ships, drawings of ships that never came to life, blueprints of things that never came to be,” which were seen as valuable precisely because they occupy the blurred line between fiction and history. This interest extended to prototypes proposed by participants, such as “forcing students to build narratives around non-entities,” or creating “a gossip column of the artefacts... something fun, maybe even something I can download as a keepsake.” These suggestions highlight a desire to move away from rigid factuality towards playful, layered modes of engagement.

The workshop also engaged with debates on the role of technology and media formats, questioning the rationale for advanced tools such as volumetric videos. One participant asked: “Why go for volumetric videos? What are volumetric videos? Why do we need that?” The ensuing discussion reframed such tools not as technological novelties but as potential vehicles for intimacy and presence, with another participant imagining “watching them from home, having them sitting next to you, telling you a story within your space.” This reflects an ongoing negotiation between functionality, affect, and technological affordances.

Institutional roles were also problematised, particularly the differences between Magna Żmien and Heritage Malta. While HM was seen as more authoritative and top-down, MŻ was perceived to foreground lived experiences and memories. “People used to have more interactions with the sites that now belong to Heritage Malta,” one participant noted, suggesting that access restrictions imposed by institutionalisation alter both memory and engagement. This fed into broader reflections on ownership, curatorship, and the political framing of heritage, with strong critiques of over-curation: “I am very anti over-curation. These assets should belong to the people, not just the government.”

Another strand of discussion focused on how learning takes shape across these speculative practices. Education was reframed not as the delivery of factual information, but as creating conditions for participation, speculation, and personal meaning-making. One participant noted that “the more accessible you make it, the more meaning will come out of it,” suggesting that broader access invites diverse interpretations and new forms of knowledge production.

Finally, several prototypes emerged from these exchanges, including scenarios where participants could embody roles, “the user could be a photographer, collecting his own version of artefacts”, or engage in communal storytelling exercises such as collectively guessing which artefact is being described. These speculative exercises reinforce IMPULSE’s commitment to co-creation and participatory design, while also raising critical questions about scalability, sustainability, and the long-term role of digital platforms in cultural heritage.

9.1.5 Community Workshop 2b

A recurring theme was the tension between fact-based presentation and narrative storytelling. While national institutions often privilege factual accuracy, this was seen as potentially limiting as it risks stripping artefacts of their lived context. Participants

emphasised the need to consider everyday interactions, minor histories, and personal commentaries as equally important layers of heritage interpretation. Artefacts were described as “triggers for discussion,” capable of connecting people through memory, narrative, and speculation.

Several concrete examples were raised: photographs of Maltese temples before protective installations, dockyard collections tied to living memories, or everyday objects like oil lamps and vessels. These artefacts revealed how interpretation shifts across time and disciplines, with architects, conservators, and archaeologists all approaching value differently. Storytelling was identified as essential. Artefacts are not just facts but puzzles of past lives, and their interpretation requires balancing conservation choices, contextual information, and imaginative engagement.

Technology was discussed as both a challenge and an opportunity. Participants agreed it should serve as a tool that supports the artefact, augmenting what cannot otherwise be experienced, and not used as a replacement for it. XR and virtual environments were seen as promising, but participants were wary of clunky prototypes, over-complex interfaces, and “Disneyfication.” Concerns emerged about commercialisation and emotional manipulation, with warnings against designing experiences that simply exploit affective responses. They called for simplicity, clarity, and careful integration of sensory elements. An example that was appreciated was the British Museum’s (now defunct) *The Museum of the World* online portal, an interactive timeline that mapped objects from the British Museum’s collections to a timeline that users can explore and make connections between the world’s cultures (Museum of the World, 2020). The subtle use of music and good sound design was cited as a positive example of effective, minimal design in this case.

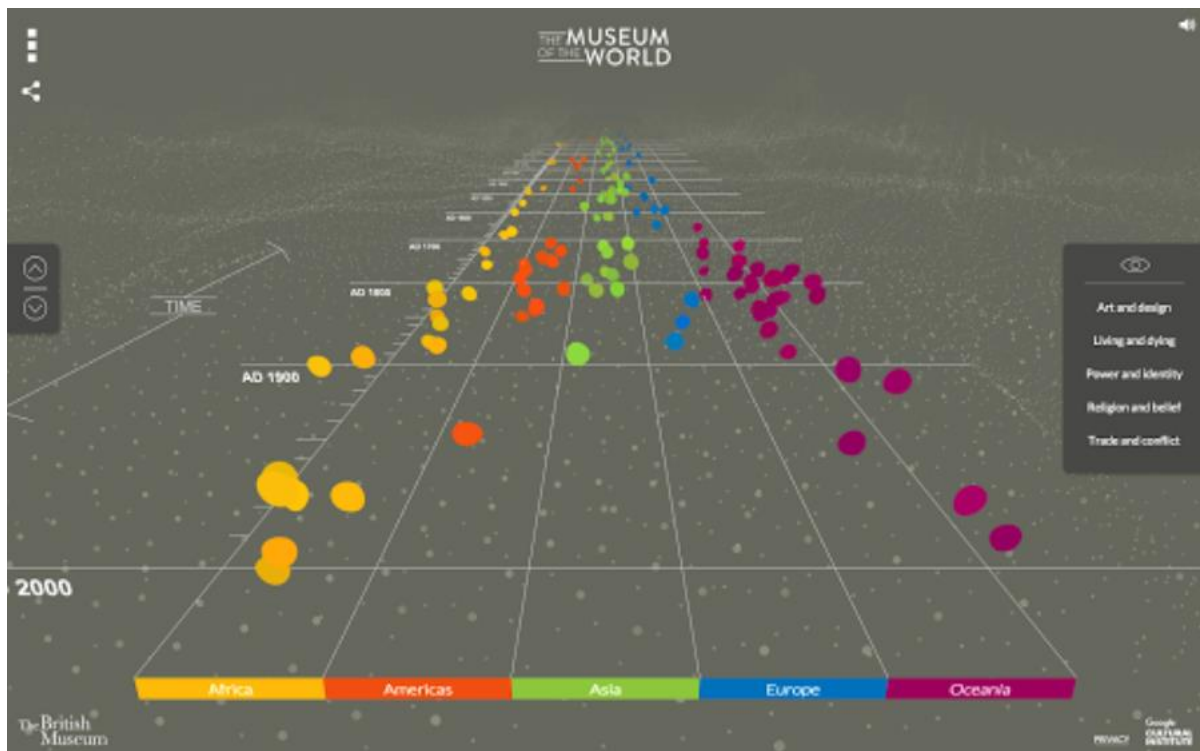


Fig. 10. Image of 'The Museum of the World' portal (Museum of the World, 2020).

Another important strand of discussion addressed provenance research and projects like *Digital Benin* (Digital Benin, 2025). Among curators in particular there was an awareness of the importance of highlighting the colonial histories of artefacts, rather than suppressing them. It was noted how that particular project's novel use of maps to trace where objects are currently held, rather than their origin, spotlights an extreme example of the cultural violence of colonialism that continues to resonate to the present day. Participants emphasised the importance of transparency, of exposing layers of interpretation rather than fixing a single authoritative voice, and of enabling audiences to explore omitted or contested aspects of history.

Participants reflected on the language used in captions and descriptions, noting how archaeological records often carry Western-centred assumptions. They stressed the importance of designing with care to avoid over-cautious or reductive representations, while also addressing sensitive issues such as looting, accidental censorship, and the colonial legacies of collections. The conversations highlighted how artefacts and images are time- and site-specific, and how this specificity must shape the way narratives are curated. It must also be noted here that Malta is a unique example in this respect, as (along with Poland) it is the only consortium partner country who were colonised, and not colonisers. Yet, Malta's museums do not reflect this difference, instead

largely copying the narrative and thematic structures of coloniser museums. This has (or should have) a profound effect on the presentation of objects and narratives.

Finally, the conversation turned toward the role of access and audience diversity. Participants stressed that technology must expand access, not restrict it, and allow for multilayered narratives that audiences can navigate according to their own interests. They called for digital tools that respect both artefacts and their contexts, while offering new ways of connecting across timelines and communities. At its core, the cultural heritage professionals' sessions underscored that technology should not dictate meaning, but open up space for co-creation, storytelling, and reflection, making artefacts not just preserved objects, but living prompts for dialogue.

9.1.6 Community Workshop 3

These series of Community Workshops focused on how cultural heritage artefacts can be represented and interacted with in both physical and digital contexts, exploring the balance between creative interpretation and professional functionality. Participants reflected on the types of interactions they would find meaningful. On one hand, interactions could be imaginative and speculative engagements; on the other, interactions could be led by tools that support the daily practices of cultural heritage professionals. As one participant posited, considering how virtual tools can be used in their professional work, "As an institution, what would you like to see when you interact with one artefact virtually? How is that helpful in your research and everyday workflow?"

The discussion raised broader questions about ownership, interpretation, and provenance. Who do collections ultimately belong to, the institutions that preserve them, the communities of origin, or the wider public? Who has the right to handle them? Participants highlighted how artefacts often embody "vast differences even within the same collections," revealing tensions between institutional categorisation and lived cultural meaning. Challenges around "problematic or difficult collections" were also addressed, with particular focus on language, captions, and the persistence of Western-centred points of view. As one participant asked, "Are we over-careful? How do you design with care in such occasions?"

Personal connections to specific artefacts were repeatedly emphasised. One participant noted, "My favourite site is Hagar Qim [...] the Bronze Age figurines, the dynamic change of form and structure is so evident in their design." At the same time, concerns were raised about how institutional framing can flatten narratives: "As a national agency

we have to offer the facts, but we lose the narrative of the sites, how people interact with the sites.”

Educational encounters with cultural heritage were also discussed as deeply personal and situated. One participant reflected: “My favourite [artefact] is the large ‘vaxxell’ [a highly detailed 18th century ship model]. It is the only artefact I remember from school. It was incredible how someone went to such extent to create an educational model.” For this participant, the educational purpose of a model created 300 years ago resonated with them, making them reflect on the loss of tangible, hands-on training, and consider how physicality can be reincorporated into digital interpretations. This tangibility was echoed by a comment by a conservator, who emphasised how learning takes form in lived experience: “When I restore, I need to know the story when conserving. This should start from the professional and then cascade to the visitor.”

The workshop also addressed broader issues of interpretation and conservation. Participants debated how layers of history should be preserved, asking, “Which layers do you preserve in wall paintings? Which do you destroy?” This was connected to the availability of visual documentation: “There are not enough photos to give us context when restoring.” Similarly, oral histories were stressed as vital resources, with one participant recalling a project he was involved in recording elderly ex-dockyard members, “We interview people and then they die! Oral histories are so important.” Valuable images and information exist beyond the museum. It is a fallacy to assume that museums already hold the most authoritative documents.

The role of technology was again framed not as a replacement for learning but as a tool for enhancing it: “Technology should always give something extra, it shouldn’t replace something but augment it, offer something that is not there.” At the same time, participants cautioned against overcomplication and digitisation without a specific purpose: “If the site is there, why replace it [digitally]? If I can hold it in my hand, I want to hold it, not see it on a monitor.” This again points to purpose in digitisation and digital interpretation, that simply creating a digital model has little impact unless there is a clear reuse case for it.

Extended reality (XR) was mentioned as a means of reconnecting artefacts to their contexts, principally through live-image overlaying, but participants emphasised that “technology is a tool, I want it when there is no alternative” and that it should “always give something extra, it shouldn’t replace something but augment.” Projects like the *Digital Benin* initiative were discussed as examples of using digital means not to erase but to explicitly highlight problematic histories, addressing colonial legacies and provenance gaps, in ways that displaying the objects themselves do not.

The workshops revealed how museums as educational spaces are also contested arenas of representation and cultural responsibility. Questions of ownership, provenance, and interpretation arose repeatedly: “How will the children of our children connect with an artefact that they don’t have memories of?” and “Instead of erasing, how do you highlight the problematic areas? How do you shed light on omitted parts of history?” Together, these discussions underscore the importance of approaching museums not only as repositories of knowledge, but as dynamic learning spaces where cultural heritage can be reinterpreted, co-created, and connected to contemporary life. Artefacts were seen not simply as factual objects but as “puzzles of another day,” embedded with stories, emotions, and multiple interpretations.

One recurring theme across the Community Workshops was the tension between educational objectives and artistic interpretation in the design of cultural heritage experiences. Participants questioned where the boundary lies between these two domains, or whether such a boundary exists at all. Some argued that cultural heritage institutions, as custodians of collections, have a responsibility to prioritise factual knowledge and accuracy in their educational narratives. Others stressed that artists bring alternative, often speculative interpretations that can generate new meanings, challenge assumptions, and open spaces for critical reflection. As one participant put it, this raised the question “Who has more agency - education or art? Where is the line? Is there a line?” These debates also engaged with the role of the audience: is the target group shaping the narrative and selection of assets, or are the assets themselves dictating the experience? In some cases, participants suggested that curatorial authority risked overshadowing co-creation, while others noted that artistic interventions might impose narratives that distance audiences from the material rather than drawing them closer. This became especially clear in relation to site-specific installations, where curators and cultural heritage professionals expressed ambivalence. While they appreciated the visibility and interest such projects brought, several remarked that the artistic interventions often felt fragmented and out of context, failing to elevate or deepen the narratives of the site. As one participant noted, they were “nice to have but not really adding value.” Others echoed that they were willing to “put up with them” or accept them, but they struggled to see meaningful connections between the artistic interventions and the historical or cultural essence of the sites themselves. In this light, it was felt that interventions and interpretations should reflect, enhance or critique a physical site in order to be deemed valuable, otherwise such creative projects risk reducing sites to backdrops. Another, reflecting on a visual art installation at a historic site, added, “They were beautiful drawings, but it [the historic site] was used more as a multipurpose place than a place of history.” For others, the connection between the intervention

and the cultural site simply was not there: “I was much more interested by the walls [of the building] than his work. The connection was not there.” As such, some professionals acknowledged that they were willing to accept or “put up with” these interventions for the sake of visibility and enabling the reuse of sites in ways that engage visitors, but sometimes they struggled to identify genuine connections and dialogues with the sites. Instead of enhancing the storytelling potential of the sites, the works sometimes seemed to distract from them, ultimately not serving either.

Yet, these discussions also highlighted that education and artistic interpretation are not mutually exclusive. In practice, they overlap and enrich one another. Educational projects benefit from the creativity and affective resonance of artistic approaches, while artistic interventions gain depth and legitimacy when informed by educational goals and historical accuracy. By juxtaposing these perspectives within co-creation workshops, IMPULSE allowed for a space where disciplinary differences become complementary rather than oppositional, pointing toward hybrid models of engagement that combine learning outcomes with playful, transformative encounters.

The workshops revealed how narratives can emerge from personal memories, institutional practices, or speculative reimaginations, and how technology can support, but also complicate, these layered engagements.

9.1.7 Community Workshop 4

In the series of three internal Community Workshops with cultural heritage professionals from Heritage Malta, discussions focused on the ways cultural heritage artefacts are represented and the kinds of interactions participants envisioned with them, both creatively and functionally. One of the central questions raised was how digital representations of artefacts could be useful for cultural heritage professionals in their research and daily workflow, and what institutions themselves would value when interacting with a collection in a virtual environment. This opened discussions about ownership, whether collections belong to institutions, their countries of origin, or the communities connected to them, and how grouping practices, provenance, and problematic collections influence interpretation.

Finally, reflections on earlier practical experiments by Heritage Malta with loan boxes offered insights into participation and authorship. When families were invited to place everyday Maltese items such as the local snack Twisties and soft drink Kinnie in a shared box, spontaneous exchanges and reinterpretations emerged, dissolving barriers between institution and visitor. One participant in the workshop described the moment:

"I placed them in the box and I encouraged people to taste them. I invited 10 families, and then I lost control – they were taking and replacing things and also passing them to each other with comments." This highlighted both the opportunities and challenges of participatory curation: while interactions can foster belonging and connection, the institutional role as an authority, even in speculative or playful settings, cannot be entirely removed.

The discussions around 'virtual loan boxes' as a possible prototype to experiment with emerged and highlighted how MR, VR, and AR can act as containers for layered narratives, personal stories, and ritualised interactions within museums. These speculative boxes become more than storage, they serve as spaces where meaning is assigned, reinterpreted, and contested. Institutions like Heritage Malta curate and guard artefacts, raising the question: to what extent can or should institutions let go of control over meaning? As one HM curator noted in referring to how artefacts are chosen to be presented, "Even if I don't want to be an institution I am still functioning as an institution and exerting power – I am the author."

The topic of looting, displacement, and accidental censorship was connected to the time- and site-specific nature of many objects. Malta's collections in particular were seen as layered sites of contestation and reinterpretation. For example, Magna Żmien's collections were positioned as a counter-narrative to Heritage Malta's, offering "tourist-like photos" or images of temples before protective structures were installed, thus allowing the sites to be "a backdrop to tell a different story." This was echoed in references to playful reuses of such neolithic sites, such as an "amateur film in Malta telling a Dracula story" that demonstrated how heritage spaces can be reframed in unexpected ways.

Participants also questioned how museums balance authority with participatory learning. Curatorial choices were described as both enabling and limiting: "Give me information and let me choose. The curator can limit the experience of the visitor," remarked one participant, highlighting the need for layered, open-ended interpretations that allow audiences to form their own connections. Similarly, the importance of acknowledging diverse perspectives was underscored: "Museums tend to have biased stories based on the curator and the time. What we need is multilayered narratives, especially in digital versions." These reflections underline the shifting expectations from institutions, not only to preserve and display, but also to mediate learning, dialogue, and even contestation.

9.1.8 Community Workshop 5

Participants examined the tension between standardisation of assets and terms and the diverse ways in which professionals and audiences approach cultural heritage. This revealed a critical question: are these practices and digital tools designed only for visitor experiences, or can they also serve as research instruments for conservators, curators, and educators? The idea of designing for both professionals and audiences was captured when a participant reflected: “If we help the professionals to use digital tools in their work, then visitors could also interact with it. Visitors always want to behave as conservators [...] putting pieces together, linking them to conservation principles.”

The conversation repeatedly returned to the role of museums as sites of knowledge production. Curators, by selecting and framing narratives, inevitably impose certain interpretations, yet visitors seek agency in shaping their own meanings. Digital and speculative interventions were discussed as tools to rebalance this dynamic, enabling multi-layered narratives where visitors can choose pathways while still grounded in factual knowledge. This tension was further underscored by debates on ‘Disneyfication’, where museums risk privileging entertainment over reality, and the consensus that while dialogue must evolve, museums should not abandon their educational responsibilities. As one participant expressed, “The museum should provide factual knowledge – it is an institution. It is the dialogue that needs to change, and we need to provide the tools for people to experience how they interact with them, instead of changing the dynamics.”

Across the Community Workshops, but particularly within the institutional ones, participants repeatedly emphasised the dual role of museums as custodians of factual knowledge and as spaces for education, interpretation, and storytelling. Rather than merely presenting artefacts, museums are seen as environments where learning takes shape through layered narratives, contextual framing, and opportunities for critical engagement.

A recurring theme was the distinction between “teaching facts” and “teaching stories”. As one participant noted, “as a national agency we have to offer the facts, but we lose the narrative of the sites, how people interact with the sites.” Others echoed this tension, stressing that storytelling is an essential educational tool: “Storytelling is essential, because an artefact is not just facts [...] the objects are puzzles of another day.”

Another crucial strand of discussion revolved around how museums can connect professional practices with accessible forms of public engagement. One conservator suggested that the most effective approach might begin with the needs of professionals themselves: “Make something for conservators that could also be used as a game. Visitors

always want to behave as conservators; they make parallels, ‘oh, I had a vase at home’, so why not give them a tool?” This notion highlights how professional workflows, transformed into simplified versions, can foster public understanding in ways similar to simulators, where audiences learn by adopting the expert’s perspective. At the same time, the workshops raised critical questions about the role of museum marketing departments in shaping educational experiences. Is their responsibility primarily to increase footfall, or can they actively contribute to learning? Examples such as the British Museum’s gamified social media campaign in early 2025, where historical weapons were presented with “stats” akin to video games, demonstrate how playful strategies can both attract attention and generate curiosity, but may also risk reducing complex heritage to entertainment (British Museum, 2025). These conversations stress the importance of carefully balancing professional knowledge, public engagement, and institutional strategies in creating meaningful educational experiences.

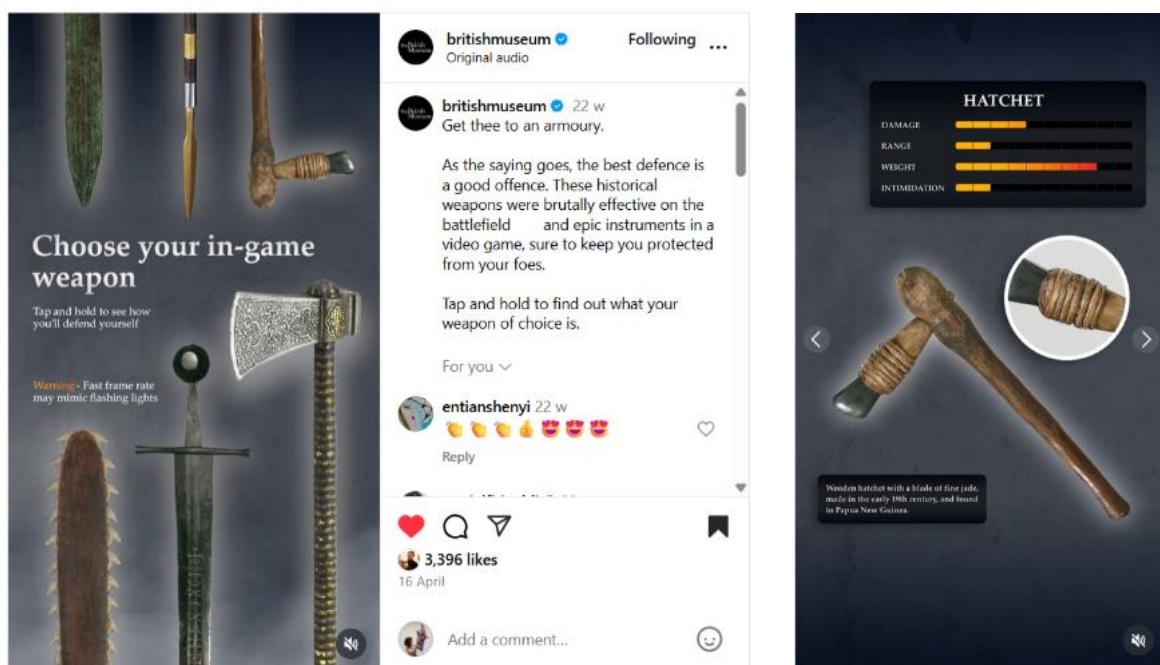


Fig. 11. Image of The British Museum’s Instagram post (British Museum, 2025).

It was considered crucial to try to include students and educators in every workshop, as their perspectives ensured that discussions around cultural heritage, technology, and storytelling remained grounded in pedagogical relevance and future applicability. A recurring concern regarding museums as learning environments was how to balance content delivery with experience design. For example, some participants noted

that “sometimes videos are better than something more interactive,” suggesting that duration, format, and intensity of engagement must be carefully tailored to the site, the artefacts, and the audience. This brought up question of experience length: “how long should a museum or site-specific interaction last, and what should be included or left out?”

Museums are also challenged by how to present contradictions within their narratives. Should museums strive to be objective, or can they explicitly highlight tensions, biases, and omissions? Participants questioned whether “problematic” is even the right term to use when describing sensitive or controversial aspects of collections. Instead, the challenge lies in framing such areas critically, without erasure or sensationalism.

This discussion extended into institutional structures. What role does the marketing department play in education? Is its function merely to bring audiences into the museum, or should it actively participate in shaping public learning? As one participant reflected, “behind the scenes videos that turned into a game” referring to how audiences often connect strongly with behind-the-scenes videos of conservators and cultural heritage professionals, as these provide a rare, intimate interaction with artefacts. Instead of encountering objects as static displays, viewers witness the care, decision-making, and human presence that shape their preservation. This glimpse into the “hidden” labour behind collections generates trust and empathy while making conservation practices more transparent. Replicating this type of interaction virtually could offer new ways to engage audiences, allowing them to experience conservation processes, understand the dilemmas professionals face, and even participate in simplified versions of these practices. This exemplifies how outreach and education can intersect, turning promotional content about professional conservation or digitisation work can be turned into playful and meaningful learning experiences.

The role of the curator, once described as “god-like,” was discussed in relation to how much authority they should hold in shaping educational narratives. Curators inevitably produce knowledge from their own perspective and within the limits of their contemporary environment, but this also risks constraining alternative voices and interpretations. At the same time, the discussions revealed the importance of artefacts as “lore”, objects that carry layered histories, meanings, and stories that extend beyond their factual descriptions. These layers invite audiences to imagine, speculate, and connect across timelines. Participants also stressed the importance of recognising museums as sites that produce knowledge, but not necessarily the only or ultimate truth. The “lore of artefacts”, such as the Mona Lisa or even everyday objects like dockyard tools, was in fact seen as a bridge for public engagement. Artefacts

are not only about their history but also about their resonance in the present, and the ways in which people project meaning onto them.

In terms of possible outputs, participants suggested a series of prototype concepts for future workshops and design testing. One idea was for an augmented reality game, similar to *Pokémon Go*, where visitors could collect fragments, stories, or even intangible traces from the museum experience (Niantic, Inc., 2016). The act of collecting becomes a form of storytelling, allowing knowledge to emerge playfully through personal engagement. Reference was made to the *Pokémon Fossil Museum* exhibition in Japan, which juxtaposed Pokémon fossil lore with real paleontological artefacts, showing how fiction and science can intersect to generate curiosity and deeper learning. In this context, participants emphasised that museums could use similar playful systems to highlight connections between myth, material culture, and lived histories (National Museum of Nature and Science, 2022).

9.2 Workshop Prototypes

These prototypes that emerged from the Community Workshops can act as critical tools: they allow participants and audiences to reflect on the affordances of digital storytelling, the role of meaningful mechanics, and the plasticity of games and playfulness as a medium to unsettle dominant narratives and invite multiple interpretations. This responds well to an important strand of IMPULSE that looks to redress hierarchical biases in institutional collections and in places of learning.

Narratives of Non-Entities: Encouraging students to build narratives around generated images or objects that do not exist. Encourages speculation, creativity, and reflection on how meaning is constructed. Having the player/user being the shoes of someone else within a specific scenario so that you can see how you will feel if you were there. (Community Workshop 2)

Gossip Column of Artefacts: Creating playful “gossip” around objects, enabling participants to anthropomorphise artefacts and engage with them in a lighter, social way. Potential to produce downloadable keepsakes or shareable outputs. (Community Workshop 2)

Collaborative Storytelling Games: Participants write a story about an artefact and others try to guess which object is being described. Encourages critical reflection on interpretation and multiplicity of perspectives. (Community Workshop 2)

Photographer Roleplay: Users take on the role of a photographer, collecting their own version of artefacts and building personal collections. Emphasises subjective seeing and recording, echoing historical practices of documentation. (Community Workshop 2)

(Ship)-Building Simulation: Participants build ships and navigate them into imaginary places designed by artists. Combines collaborative world-building with personal journeys, splitting the experience into collective and individual phases. Dividing the experiences into two phases. (Community Workshop 2)

Interactive Commentary & Voting Systems: Participants write interpretations of artefacts, which are then voted on by others. Introduces democratic and participatory dimensions to heritage interpretation. (Community Workshop 1&2)

Feelings and Objects: Matching artefacts with emotions, inviting participants to connect material culture with affective states. Encourages empathetic forms of engagement. (Community Workshop 1&2)

Box-Based Digital Repository - Loan Box: A digital platform where small 'boxes' of posters, videos, and other assets can be assembled, printed, or remixed by participants. Encourages playful creation of new collections and personal interpretations. The concept of a loan box was a recurring theme across the workshops, which was a reason why it was decided to be a main approach at the pre-hackathon in Malta. (Community Workshop 4-recurring).

Audio and Voice-Based Interfaces: Interactions centred on voice recordings, oral histories, or emotional tones, emphasising affect over literal translation. (Community Workshop 3).

Play as Experts: Interactions that reveal the work of conservators of collection artefacts, giving participants opportunities to learn about the behind-the-scenes work of museums. (Community Workshop 3 & 5).

Notes Over Notes Over Notes: Choose an artefact and write a layer of personal annotation on it, a "note over a note." Then pass it on. The next person can only see your note, not the original artefact, and must respond with their own. How does meaning shift with each layer? What kinds of cultural metadata emerge through this chain of subjective interpretation? (Community Workshop 1 - recurring).

Folded Truths-Posters and Degradation as Narrative Metaphor: Wrap a printed poster around a surface (object or building), partially obscuring problematic content. Let others fold, unfold, or manipulate it. Observe which parts wear down over time. What does this say about how society curates, preserves, or erases difficult histories? (Community Workshop 1).

Walking as Time-Based Interaction: Walk a path defined by text or objects. Your task is to "exit a word" or identify an unseen object through motion and time. How does embodied exploration change your understanding of time, scale, presence, or historical context? (Community Workshop 1).

You Are the Artefact: Stand or sit in a space. Others approach and comment on you as if you are a cultural object. They must guess what artefact you represent and annotate their assumptions. How does being "read" by others change your sense of identity or role? What does this say about interpretation and projection? (Community Workshop 1 - recurring).

Build-a-Box / Remixable Cultural Kits: Use small boxes containing modular posters, objects, or printed assets. Re-arrange or build your own "mini collection." Add personal metadata and publish it online. How can self-curation and remixing foster new, intimate interpretations of cultural heritage? Who is it for? (Community Workshop 2).

Alone Together / Designing for Intimacy and Interaction: Design an interaction where a user can either engage with others or retreat into a personal, solitary experience with a digital asset. What makes an interaction feel intimate? Can a digital experience allow for reflection, solitude, and connection simultaneously? (Community Workshop 1 & 3).

Exhibition of Speculation: Create a speculative future or alternate history based on a single artefact. How would its context, use, or meaning shift? Present it as an exhibit label, zine, or short video. How can speculative narratives open up alternative readings of heritage? An exhibition framed around speculation rather than factuality, blurring lines between artistic and institutional approaches. Can also include commercial or community-based outputs. (Community Workshop 2 & 5).

9.3 Workshop Reports

The workshop reports provided in Annexe 3 are a structured method of documentation that capture both logistical details and the deeper analytical insights of each co-creation session. By combining statistical data (e.g., type, date, number of participants, technologies used) with interpretative reflections (e.g., objectives, outcomes, dialogues, and design suggestions), these overview reports allow us to track the evolution of our methodologies across different contexts and user groups.

One of their key strengths is that they connect the practicalities of workshop organisation (duration, structure, location, repetition) with the research objectives of IMPULSE. For example, questions about whether sessions were guided or open-ended, or how curated our approach was, allow us to critically reflect on the role of facilitation versus participant agency in shaping interactions. Similarly, documenting which collections and assets were presented helps us map the relationship between material heritage and its digital translation in XR environments.

The outcomes section captures some of the most valuable insights: the interactions, questions, and dialogues that emerged, as well as the influence of participant backgrounds on their engagement. This enables us to understand how different groups, artists, educators, cultural heritage professionals, students, and CCIs, respond to the same material in distinct ways, and how these responses can inform the iterative design process. In this way, the templates directly support our RtD framework by feeding observations back into subsequent workshops and prototypes.

Finally, the emphasis on 1. technical requirements, 2. design suggestions, 3. meaningful mechanics, and 4. affordances ensures that each session contributes not only to theoretical reflection but also to the development of practical design knowledge. This dual focus on conceptual exploration and applied outcomes is essential for the project's ambition to bridge artistic research, cultural heritage practice, and technical development.

Beyond individual documentation, the workshop reports also serve as a comparative tool across the different formats of online, offline, and hybrid workshops. By using the same categories of analysis, they allow us to trace recurring themes, successes, and challenges across varied contexts and participant compositions. This consistency enables us to identify patterns: for example, how levels of engagement differ when participants work with physical versus virtual assets, or how interdisciplinary groups generate different types of dialogues compared to more homogeneous ones. Moreover, by mapping these differences over time, the templates help us understand how our methodology evolves and becomes more refined, ensuring that each workshop iteration builds on the insights of the previous ones. In this way, they are crucial not only for accountability and reporting but also for guiding the iterative development of prototypes and methodologies throughout the IMPULSE project.

Summary
Type of Workshop: Online
Date:
Duration:
Repetition:
Location:
Number of Participants:
Analysis of workshop group / user composition
Based on 1.1 Research
Technology Used
What hardware and software were used during the workshops? Did participants use VR headsets, tablets, or other devices?
Structure
How are they being divided? (What are they doing? How many workshops and of what length) How curated was our approach? Did we guide the conversation? If yes how? Which collections/ assets were presented? What were specific tasks or scenarios given to participants? For example, were they asked to explore a digital exhibit, collaborate on a project, or provide feedback on a specific feature?
Collections:
Objectives
What are the purposes of this session? What was our goal? What were the questions we wanted to address?
Outcomes
What were some interesting interactions that emerged through this session? Are they viable? What type of questions emerged from this session? What type of dialogues? Was their background evident in their approaches?
How are the information and data collected in this session going to affect the project/the following sessions? Technical Requirements/ Design Suggestions/Meaningful Mechanics/ Affordances
Observations / Valuable information
Feedback to potentially incorporate? Did you identify any recurring themes, challenges, or successes?
Recruitment Challenges: Did you encounter any challenges in recruiting participants from a specific user group or with a particular user type? If so, how did you address these challenges? Was there any conflict?
How were the participants engaging with the Collections? How were they engaging with each other?
Valuable quotes from the session:

Fig. 12. An empty Template developed for Task 1.3 featuring the guiding questions.

The reports from each workshop are arranged in Annexe 3 as follows:

- A3.1 Ideation Sessions (Task 1.2a and Task 1.2b)
- A3.2 Ideation Sessions (Task 1.3)
- A3.3 Institutional Deep Dives
- A3.4 Pre-Hackathon in Leuven
- A3.5 Community Workshop 1 (mixed)
- A3.6 Community Workshop 2 (mixed)
- A3.7 Community Workshop 3 (Heritage Malta)
- A3.8 Community Workshop 4 (Heritage Malta)
- A3.9 Community Workshop 5 (Heritage Malta)
- A3.10 Live visits
- A3.11 Online Interview with Professor of Digital Games

9.4 Next Steps

The research undertaken through the workshops discussed in this deliverable present a number of concrete directions to test in future workshops, as the focus of Work Package 1 now shifts to Task 1.3.2: Co-creation immediately upon completion of this deliverable. Across all of the workshops a recurring theme was the importance of moving beyond static displays towards participatory, speculative, and affect-driven engagements with cultural heritage. Participants repeatedly highlighted that storytelling, whether emerging from professional conservation tools, playful speculation, or oral histories, lies at the core of how audiences connect with artefacts.

The next phase of activity will focus on developing these points further, and consolidating, testing, and expanding the methodologies we have been developing. A central output will be the production of a playbook, a structured methodology that documents the interactions, design strategies, and workshop practices developed within IMPULSE. This playbook will function both as a toolkit for future sessions and as a transferable methodology for other institutions wishing to experiment with playful, participatory approaches to cultural heritage.

The proposed upcoming workshops can be divided into five main strands:

1. Prototyping and Testing Key Concepts. Some of the novel suggestions and themes emerging from the previous workshops will be explored in practical, play-based workshop exercises.

2. Game Jam-Inspired Sessions. While most of the workshops so far leaned on speculative and theoretical formats, future iterations will experiment more directly with game jam styles of co-creation, encouraging fast prototyping, collaborative design, and playful experimentation as a way to engage with collections.

3. Integration into Curricula. We will work with researchers and educators in game design, digital humanities, and related fields to incorporate IMPULSE workshop methods into teaching. By offering assets from the Dockyard, Malta Maritime Museum, and other partner collections, students and faculty will be invited to develop their own experimental approaches, ensuring a reciprocal exchange between academic learning and project development.

4. Further Interviews and Playtesting. Building on the valuable input from earlier expert interviews, we will conduct additional workshops with cultural heritage professionals, educators, and game designers. These will be combined with reference playtesting, exploring principles of meaningful mechanics, affordances, and interaction design to refine our methodology. The MUVE will feature strongly in this strand, as some of the workshops will take place within the prototypes that are being built.

5. Pre-Hackathon in Germany and Final Hackathon in Greece. Preparatory work will also begin for the next major co-creation pre-hackathon event in Saarbrücken (Task 5.3.3) with a main focus on engaging CCIs, while the final hackathon in Athens (Task 5.3.4) will bring together a wider range of participants to integrate insights from across the project into a collective prototype.

Through these steps, IMPULSE will continue to operate within a research-through-design framework, maintaining an iterative feedback loop where workshop findings feed directly into new prototypes, methods, and research questions.

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11 Annexe

A.1 Photos of workshops in Malta, 26-28 July & 4-5 September 2025







A.2 Template consent form for Community Workshops, Malta

 Immersive digitisation: uPcycling cULtural heritage towards new reviving StratEgies	 Immersive digitisation: uPcycling cULtural heritage towards new reviving StratEgies
CONSENT FORM Informed consent for participation in research and processing of personal data 1. I have been informed that the IMPULSE project is a research project currently run under EU Grant Agreement No. 101132704. I have read and understood the agenda of the IMPULSE Workshop dated in point 13 of this document, or it has been read to me. I have had all my questions answered to my satisfaction. IMPULSE is a HORIZON EUROPE project, coordinated by Uniwersytet Jagielloński (Poland), and developed in collaboration with Katholieke Universiteit Leuven (Belgium), Alma Mater Studiorum – Uniwersita di Bologna (Italy), Università ta Malta (Malta), Heritage Malta, Filmuniversität Babelsberg Konrad Wolf (Germany), Ethniko kai KAPODISTIRIAKO Panepistimio Athinon (Greece), Magna Zmien Foundation (Malta), Associazione Clust-ER Industrie Culturali e Creative (Italy), K8 Institut Fuer Strategische Aesthetik GGBMH (Germany), and Exploredview sp. z o.o. (Poland). 2. I have been informed about the nature and the purposes of the project, including the duration and the possible risks and benefits of my participation. 3. I understand that my participation in the research is fully voluntary and will include observations and conversation. I understand the agenda of the IMPULSE Workshop and I will not be paid for my participation. 4. I understand that personal data about me will be collected and processed on the basis of my consent. I understand that the information obtained about me will be used for the specific purpose as set out in the IMPULSE Workshop. 5. I understand that my personal data will be treated confidentially [I have been informed that my personal data collected during the research will be pseudonymized to the highest extent possible, i.e. all possible efforts will be made to prevent the identification and attribution of the personal data to myself,] and will be made available only to the IMPULSE consortium partners. I understand that my information may also be made available to authorized representatives of the regulatory authority in case of an inspection to evaluate the lawfulness of the pilot and the data processing. 6. I have been informed of my rights related to the use of my personal data in line with the General Data Protection Regulation (Regulation (EU) 2016/679) and relevant national law transposing Directive 2016/680/EU. 7. I have been informed that my personal data will be retained under the authority of the data controller for a period of at least five (5) years after the project has ended in a secure database to ensure the validity of the research. 8. I understand that my personal information will only be utilized within the IMPULSE project. 9. I have been informed that the Data Protection Authority in Malta is the Maltese Data Protection Act, who I have the right to submit a complaint to.	10. I, the undersigned, grant permission to Heritage Malta, as consortio member of the IMPULSE project, to: • Photograph me • Record my voice and/or image on audio and/or video • Use my name, likeness, voice, and appearance as such may be embodied in any photos, video recordings, audiotapes, digital images, and the like. 11. Use and Handling of Materials, I understand and agree that: • No public release or distribution shall occur without the express written consent of the undersigned. • All raw materials will be stored securely in Heritage Malta premises, and handled in accordance with applicable privacy and data protection laws. • These materials will be used for research, promotional, or informational purposes including publications, websites, social media, and promotional videos. • IMPULSE will not sell or share the recordings/photos with third parties for commercial gain without additional consent. • I will not receive any monetary compensation for the use of these materials. 12. Right to Withdraw I understand that I may withdraw my consent at any time by contacting Heritage Malta, Afroditi Andreou at afroditi.andreou@gov.mt. Such withdrawal will not affect any materials already produced or published. 13. I agree to my personal data being processed in the way explained to me and set out in this consent form as well as the agenda of the IMPULSE Workshop dated as below. Full Name: _____ Signature: _____ Date: _____
 Funded by the European Union Funded by the European Union. Views and opinions expressed are, however, those of the author(s) only and do not necessarily reflect those of the European Union or European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them. Horizon Europe Reference number: 101132704	 Funded by the European Union

A.3 Workshop Reports

A3.1 Ideation Sessions (Task 1.2a and Task 1.2b)
Summary
Type of Workshop: Online
Date(s): M1-M20 (Ongoing)
Duration: 1h
Repetition: Bi-weekly
Location: Online Teams and Discord
Number of Participants: 2-6
Analysis of workshop group / user composition
In these workshops, the participants were consortium members, mostly from WP1, apart from occasions that other representatives from the consortium partners wanted to participate. (link with groups and roles here)
Technology Used
Microsoft Teams / Discord
Structure
The workshops were divided into separate subgroups led by different participants: 1.2a and 1.2b. One was led by Aikaterini Antonopoulou (NKUA) and the other one was led by Luka Prinčič (UM). Both were coordinated by WP1 leader, Adnan Hadziselimovic (UM).
Links:
Performing Heritage Report: here
Artistic experimentation on visual aspects of MUVes: here
Artistic Research Collaborative Document- Performance Ideation: here
Objectives

The main objective is to fulfil the outcomes described within the grant agreement for WP1, Task 1.2. Artistic Research is being divided into two groups.

The one led by Aikaterini Antonopoulou (NKUA) is researching artistic experimentation on visual aspects of MUVes, focusing on designing multispecies entangled worlds and challenging anthropocentric design.

The one led by Luka Prinčič (artist / UM) is exploring performing heritage, queering the archives, gender representations/identities and mythmaking, designing memories, live coding, democratising heritage through LLM and highlighting structures of power.

The main objectives of these sessions will be described in Deliverable 1.5.

Collections

All of the consortium collections were available for experimentation.

Outcomes

Live Performance / Experimentation, Movement workshop.

Observations / Valuable information

Digital Culture and the Influence of Technology on Art and Memory

The intersections of digital culture and cultural heritage invite us to consider how technology reconfigures art, memory, and identity. One important area is *algorithmic folklore and vernacular creativity*, as described by Gabriele de Seta, which highlights how folklore, creativity, and automation mutually shape one another within digital spaces. Here, folklore is not a relic of the past but an ongoing, adaptive process that emerges through algorithms, memes, and networked practices.

A second strand concerns *artificial aesthetics and AI*, where generative models increasingly influence visual media and interface design. These technologies do not merely replicate existing aesthetics but actively participate in shaping the frameworks through which art and heritage are produced, circulated, and experienced. Related to this is the notion of *poetic engineering and embodied AI interfaces*, which foreground AI-enabled systems designed to augment creative thought and embodied interaction, pointing toward new forms of human-computer relationality.

Language and identity also provide a critical axis for exploration. *AI and gendered linguistics*, exemplified by experimental systems such as AI Nūshu, a reimagined women's script, show how computational tools can question normative gender roles

and linguistic histories. In parallel, projects such as *TransCoder* reframe programming itself as a queer, speculative practice, embedding myth, spellcasting, and the identity of the witch into software libraries that resist dominant technological paradigms.

Finally, *glitch art and glitch studies* expand our understanding of digital representation. Glitches, whether in games, interactive media, or virtual heritage environments, can be mobilized as critical artistic expressions that reveal the underlying structures and limitations of technological systems. By embracing the “error” as a creative act, glitch aesthetics open space for rethinking how digital artefacts can embody both fragility and critique.

A3.2 Ideation Sessions (Task 1.3)

Summary

Type of Workshop: Online

Date: M1-M20 (ongoing)

Duration: 2-3h each

Repetition: bi-weekly at first and then weekly

Location: online

Number of Participants: 1.3 members of WP1 link [here](#)

Analysis of workshop group / user composition

The bi-weekly participants were consortium members, drawn mostly from WP1, apart from occasions that other partner representatives wished to participate. In the weekly workshops the core team of Task 1.3 was present, led by Margerita Pule (UM), Afroditi Andreou (HM), Andrew Pace (MŽ), Kris Polidano (MŽ), Jacob Saliba (HM).

Technology Used

Microsoft Teams, Zoom

Structure

Initially speculative sessions and discussions took place during the first months, where the main topic was how education can be approached and how places of learning and experimentation can look like. During these meetings, the following months, every

institution had an allocated date when they presented their collections and then discussion followed among the participants. During every meeting a different collection was the main focus. After M15 the meeting became weekly, and mostly the core group of Task 1.3 was participating, since the preparations for the preliminary workshops started at that time.

The second part of these sessions was mostly exploring questions of:

placeness, time specificity, implied space

- Is Malta used as a stand-in for somewhere else? Questioning concepts of place and identity, and how Who owns the temples/assets?
- What is the existent narrative?
- Different point of views in videos/ spellcasting / Whose rituals are we witnessing?
- Who is watching? How changing point of view happens in the virtual realm?
- What are the chosen narratives that give context?
- Who chooses these narratives?
- How are the temples integrated to the landscape and are entangled with the lives of people around them?
- What are the boundaries we are allowed to move in? (whether they are conceptual or tangible)
- Where was this footage supposed to be seen in? What was the original context that these artefacts were designed for?
- Are we presenting snippets without context?
- How language should be approached? Many assets are in a different language (i.e. oral histories, voice messages, posters)
- How do we design for people who do not have the same experiences as us? (future generations who do not have a personal connection/memory of something?)
- How do you communicate a memory?
- How different demographics (ex. Women) were perceived and portrayed in cinema?

Collections: All of the available collections were used and discussed within these online interactions and iteration sessions. Most questions emerged from the sessions with the MZ and The Thessaloniki Film Festival Collection. A highlight of this session is how some of the MZ 2D/4D footage features neolithic temples that are now protected HM sites with restricted access, adding to their multifaceted identity.

Objectives

The main Objective is to fulfil the outcomes described within the grant agreement for WP1 Task 1.3.

The purpose of these sessions was to learn more of each collection from a technical standpoint (i.e. format, assets catalogued, time period, previous interpretations) while also exploring the implied questions behind every CH artefact represented. Additionally, another key point was to better comprehend the relation between the institution owning/representing the collection and what they envision for these digital assets, or what difficulties they have encountered so far. It was also explored how the audience/other participants connect with them.

The first part of these sessions were very curated since they were presentations of the artefacts, but in between free dialogue was encouraged, while they continued with open ended discussions while trying to identify the emergent questions/themes from each collection.

Outcomes

Some of the new questions that emerged were:

- Ownership, same artefacts from different timelines/ belonging to different collection, whose stories are we here to describe?
- What is the implied space?
- What are the embedded questions of the assets? What can we learn from what is not there?

The outcomes of this session provided our team with a clearer sense of how to proceed. It became evident that live visits to the collections are necessary to deepen our understanding of the material and inform subsequent design choices. At the same time, the team identified the need to strengthen technical knowledge, particularly in relation to Godot, which led to the decision to schedule an online follow-up session. The discussions moved fluidly between technical considerations, such as mechanics, requirements, and affordances, and more speculative reflections, where we explored personal and thematic connections across and within collections.

Both technical and speculative discussions emerged. Most participants were trying to find personal connections with the assets or create parallels between the different collections or find emerging themes from the same collection that could then built upon theoretically.

This process helped us recognize the collaborative potential of the virtual platform and reaffirmed the role of design as a tool for co-creation. Notes were kept online and live and then they were used to form questions who guided the next sessions.

Margherita Pule's (UM) who is also guiding the online sessions document:

Exhibitions as Playgrounds: link [here](#)

[WP1.3 Datasets for Ideation Sessions.xlsx](#)

Observations / Valuable information

Interesting Commentary:

A number of reflections emerged during the workshop that point to how cultural heritage assets operate as placeholders for broader identities and narratives. In the Maltese case, participants observed that the assets often serve as stand-ins for something else, allowing multiple and sometimes conflicting identities to be projected onto them. Similarly, the video recordings from MŽ were seen as having a ritualistic dimension, where the act of documentation itself becomes part of the process. The prehistoric temples, for example, were described in metaphorical terms, as if “bleeding humans” or “giving birth” to people, an image that illustrates how participants negotiate meaning beyond factual description.

Discussions also turned to the Thessaloniki Film Festival posters, which were striking for their lack of names, Greek-language dominance, and irregular shapes resulting from how they were originally placed and cut. These features underscored how collections not only embody implied spaces but also situate audiences in specific temporal frames. Participants noted that ambiguous or fragmented artefacts invite speculation and critical engagement, raising questions about what a collection “should be” versus what it actually is. Interestingly, more recent artefacts tended to spark stronger critical commentary compared to older ones, with participants more willing to discuss their implications openly. However, in early discussions, even difficult artefacts were approached with caution, particularly when representatives of the holding institutions were present, suggesting how authority and context shape the framing of critique.

A3.3 Institutional Deep Dives

Summary

Type of Workshop: Online
Date: Collaborative Workshop interlinking WP's Program March 2025 – July 2025 28th March 2025 25th April 2025 23rd May 2025 20th June 2025 18th July 2025
Duration: 1h30m each
Repetition: yes (ongoing series)
Location: Online
Number of Participants: 15-30
Analysis of workshop group / user composition
Partners from all of the consortium members, and the representatives within the institutions.
Technology Used
Microsoft Teams
Structure
Feedback from the pre-hackathon workshop (1 hour) • Joint preparation by team-leads and story-telling experts • Each team gets 10 min + 5 minutes discussion • Feedback towards the development of the platform • Lessons learned for future workshops Deep Dive 1: What is 2D Digitisation? (1 hour KU Leuven) Deep Dive 2: What comes first: the data or the story (1 hour) • Link with future ECCCH • prepared by storytelling experts, breakout session Deep Dive 3: Making data available on the platform (1 hour)

• Joint preparation by WP2 and WP3 • Link with future ECCCH Deep Dive 4: UX Design, 1.1. Who are our Users? (1 hour) Deep Dive 5: 3D Digitisation – HM Team explaining (1 hour) • Acquisition / Different Equipment Used • Post Processing • Metadata / Paradata • Development / Design of Interactive Experiences Deep Dive 6: 3D Digitisation FBKY (1 hour) Deep Dive 7: Copyright / Legal (1 hour) Deep Dive 8: Session on Metadata (1 hour) Deep Dive 9: Session on Metadata and Paradata (1 hour) More Topics will be identified and continue these successful sessions. Ideally experts from outside the project will be invited to share their knowledge with the IMPULSE team.
Collection: The institutions presenting focused primarily on their own collections, but references and parallels are drawn with all the collections participating in the project.
Objectives: The main objective of the Deep Dive sessions was to highlight the importance of educating and learning from each other. Making the research conducted more approachable. Understanding the CH Professionals come from many different backgrounds. It was also crucial to acknowledge and discuss the fact of how every member of the consortium represented different roles that the stakeholders targeted adopt, which affected the discussions emerged. Every partner in these sessions was invited to present their unique expertise and explore what they bring into this project and how they contribute, therefore weaving an interdisciplinary consortium.
Outcomes: Some of the Questions that emerged from these sessions: • What needs to be represented? What amount of information and what type? • What should be included and what not in the presented artefacts (in terms of metadata and paradata)?

- How do you identify and address that different institutions / organisation have different priorities?
- How do deal and how do you design not only with a number with very diverse collections with different artefacts but different agendas as well?
- How do you prioritise and create tangible solutions?
- How do you deal with the different legal approaches of each institution?
- Will things allowed to be exported, or not? Who owns CH assets? And their digital versions?

Observations/ Valuable information:

These sessions played an important role to the ongoing research for IMPULSE since they allowed for open discussion regarding the themes explored in this project furthering an attempt towards the standardisation of terms. Apart from creating an online space where the consortium members could exchange ideas and ask direct questions about the work conducted from each partner it was an opportunity to discuss and juxtapose different methodologies and approaches towards different topics and especially when dealing with acquisition of digital artefacts and digitisation practices and the collection and cataloguing of metadata and paradata.

i.e. How involved should the curators or people who are not directly involved with the project but belong within the same institution be?

How experienced each partner is with upcycling CH artefacts?

Should design be focused on the data that should be communicated within this project or the emergent stories?

A3.4 Pre-Hackathon in Leuven

T.5.3.1 IMCo Workshop in Leuven: Focus on Academia

Summary

Type of Workshop: Online

Date: 18-19 February 2025 and 20 February Reflection Session and presentations

Duration: 2 days

Repetition: No	
Location: Leuven, Belgium	
Number of Participants: Link here : 32	
Analysis of workshop group / user composition	
To create a productive and inclusive environment, participants were divided with attention to gender balance, institutional diversity, and fields of expertise. No single institution was overrepresented, and external participants and students were distributed across teams to bring fresh perspectives. This mix ensured dialogue between archaeologists, historians, technologists, artists, and others, promoting cross-pollination of ideas and a richer understanding of the collections.	
Technology Used	
Microsoft Teams Discord Mood Boards Miro Boards Laptops Printed Pictures Stationary/ Doodling Positioning AI – Claude – Visualisations / but also exploring Prompts	
Structure	
Day 1	Day 2
09:50 - 10:30: VR platform presentation	09:30 - 10:30: VR platform testing session
10:30 - 12:30: Storytelling exercise 1	10:30 - 11:00: Questionnaire
13:30 - 15:00: Storytelling exercise 2	11:00 - 12:00: Cross-team testing
15:30 - 16:30: Continuation of exercise 2	13:30 - 14:40: Final team session
	15:00 - 16:40: Roundtable presentations

16:30 - 17:00: How the VR platform works	
The participants were divided into 4 teams, each team throughout the workshop was visited by the allocated experts, who they were giving feedback and guidance to the participants. Team 1 – Ancient Places, Living Heritage Team 2 – Anatomy of Discovery Team 3 – Reimagining Storytelling Team 4 – Echoes of Encounters	
Collections: All from KUL, including folios from the Vesalius’ annotated ‘Fabrica’ manuscript; glass slides depicting archaeological artefacts, mural fragments and scientific visualisations	
Objectives	
This first workshop was conceived as a creative and exploratory exercise, setting the foundation for future work within the project. The materials used were carefully chosen from KU Leuven Libraries’ collections, focusing on a curated selection of historic glass slides and the Vesalius manuscript. These collections offered a balance of visual richness, cultural depth, and practical considerations: the slides and manuscript pages had reliable metadata, were well documented, were free of copyright and could be readily uploaded to the early-stage VR platform. Their diversity, from archaeological sites to anatomical drawings, allowed the teams to engage with objects that reflect both scientific progress and cultural heritage. The storytelling themes were developed to maximize the potential of these collections, highlighting their variety and narrative richness. By focusing on ancient sites, scientific discovery, cultural storytelling, and cross-cultural encounters, the themes encouraged participants to see beyond static objects, connecting them to broader questions: What stories can spaces tell? How can science be humanized? How do myths travel? What happens when traditions meet? This framing ensured that the collections were not merely displayed but became catalysts for narrative exploration. Questions explored: • What are the connotations of the material? Shape? Form? • How is this artefact making you feel? What parallels can you draw?	

- How are the artefacts presented connected? Through similarities or differences?
- How would they interact with each other?
- What is the implied story here?
- What would you like to communicate to someone?
- Can you find an item and create a dialogue with it?
- What are the physical aspects / physics of the object and how do they affect the object's identity? Is it heavy?
- How can we translate these things in a digital environment without taking away from the objects itself?
- How do we enhance the experience?
- Can we enhance every part of it? Or augment a specific one?
- What's augmented reality for you?
- What should be augmented? The object? the bond/connection? A speculative story?
- With which item do you feel more connected to?
- What does the curation / of objects say to you?

Outcomes

Team 1 – Ancient Places, Living Heritage

Team 1 reinterpreted historic sites by transforming archival glass slides and architectural floor plans into compelling visual narratives. Their work focused on spatial detail and atmosphere, highlighting the character of sites such as Palmyra and Dendera. Through layered compositions and thoughtful use of imagery, they presented ancient spaces as living environments rather than static remnants, offering their own insights into cultural memory and heritage interpretation.

Team 2 – Anatomy of Discovery

Team 2 examined the history of science through anatomical drawings, mummy slides, and related imagery. Their outcome blended precision with creativity, using layered visuals to highlight the technical skill and human curiosity behind early medical knowledge. By linking manuscript pages and scientific objects, they demonstrated how historical materials can be transformed into engaging narratives that bridge past and present approaches to understanding the human body.

Team 3 – Reimagining Storytelling

Team 3 explored new ways of engaging with cultural narratives by focusing on fragments, myths, and visual storytelling traditions. Their outcome combined creative

concept development with technical thinking, envisioning interactive approaches that allow users to manipulate light, perspective, and narrative flow. They drew on techniques such as shadow play and immersive interaction to show how cultural heritage can be experienced as a shared, participatory process, opening up stories to multiple interpretations.

Team 4 – Echoes of Encounters

Team 4 explored the theme of cultural encounters and creative exchanges. Their work combined visual references from the Vesalius manuscript with experimental ideas that show how different traditions and influences can intersect. They also created 3D avatars inspired by anatomical drawings, offering a fresh way to visualize these connections. Their work highlighted potential approaches for representing dialogue and exchange, pointing toward opportunities to develop more immersive and detailed experiences in the future.

See Discord and Miro boards

- TEAM 1:
https://miro.com/app/board/uXjVLk8_cuk=?share_link_id=400945238382
- TEAM 2: [Team2_AnatomyOfDiscovery - Miro](#)
- And Document [here](#) Luka and Julia Hartnik K8
- TEAM 3: <https://docs.google.com/document/d/106Jyg49YmmAzixn5R4GM-L61uygS4BIUpq1vL9qA7ys/edit?usp=sharing>
- TEAM 4: [Team4_EchoesOfEncounter - Miro](#)

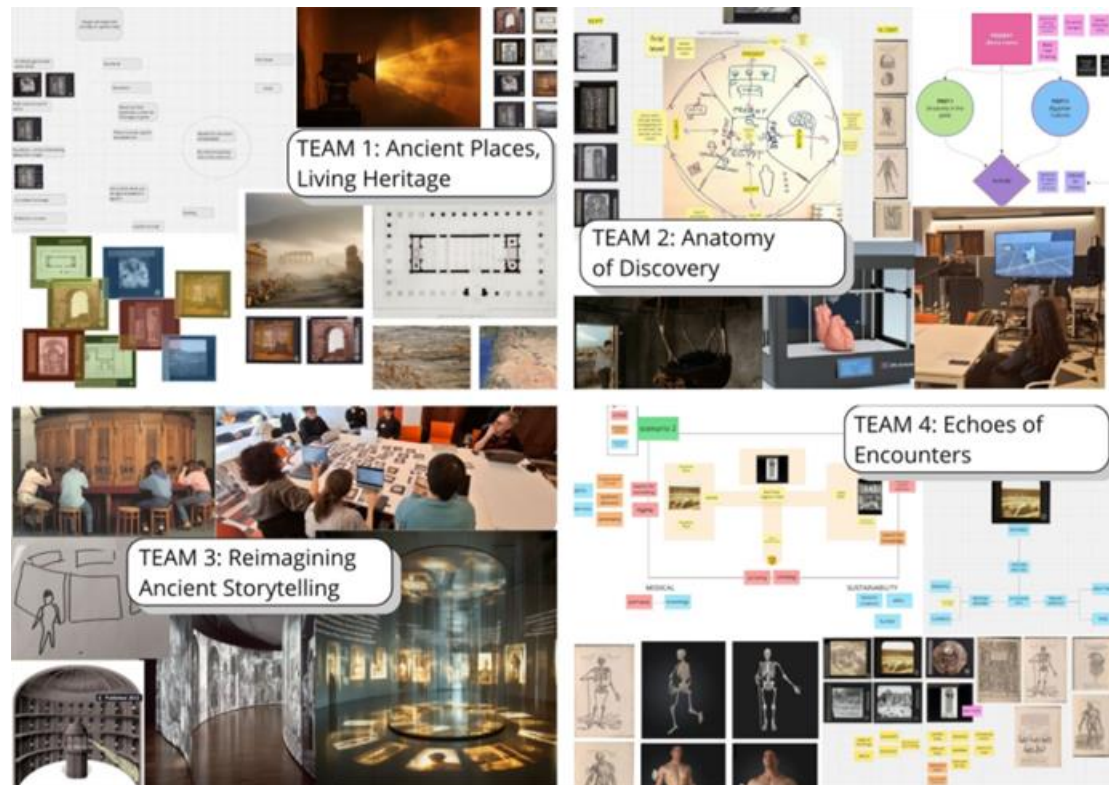
Post workshop:

The Europeana PRO blogpost Zoe and Theodora wrote on the workshop: <https://pro.europeana.eu/post/first-impulse-workshop-at-ku-leuven-reimagines-digital-heritage-through-vr>

Observations / Valuable information

A central element of the workshop was the exploration of digital storytelling, particularly the challenge of transforming 2D materials into immersive 3D experiences. Sessions were structured around open, guided ideation, where teams worked with storytelling prompts to enhance the educational value of 2D materials within a social, multi-user virtual reality environment. Across the sessions, participants developed imaginative approaches to spatial storytelling, using techniques such as juxtaposition, collage, and cut ups to convert static 2D content into interactive, engaging learning experiences. One of the key challenges – and opportunities – was finding meaningful

ways to reimagine flat archival materials as dynamic 3D environments, requiring participants to think not only about content but also about how users would move through and interact with the story spatially.



A number of technical suggestions, recommendations and potential requirements for the upcoming prototypes emerged from these sessions which were all collected via questionnaires that informed WP2. WP 2 Questionnaires

Questions emerged through these sessions:

- How were glass slides used? How do we translate this?
- What questions did we try to address?
- What should be augmented? The object? the bond/connection? A speculative story?
- What are the emerging patterns of the collections? How can these guide us?
- History & Patterns of Movement - Where is this coming from?
- Idea of placelessness intangibility of objects, replication and ownership
- How do you avoid/ surpass representation in VR/ AR/ MR environments?
- How do you experience Stories? The same story through dif mediums?

- designing for interactive immersive installation, there is no specific “frame”, the viewer/player picks their own frame
- Game agency/mechanics/restrictions as a form of art and storytelling
- Walking moving in space – experiencing alone or with others/ affecting others ‘experience
- Outcome doesn’t matter as much as the process
- Agree with what the user wants to do? How would you interact? What are the ways of interacting?
- What are the embedded questions?
- Grouping of the objects?
- What are the connotations of the material? Shape? Form?
- How is this artefact making you feel? What parallels can you draw?
- How are the artefacts presented connected? Through similarities or differences?
- How would they interact with each other?
- What is the implied story here?
- What would you like to communicate to someone?
- Can you find an item and create a dialogue with it?
- What are the physical aspects / physics of the object and how do they affect the object’s identity? Is it heavy?
- How can we translate these things in a digital environment without taking away from the objects itself?
- How do we enhance the experience?
- Can we enhance every part of it? Or augment a specific one?
- What’s augmented reality for you?
- What should be augmented? The object? the bond/connection? A speculative story?
- With which item do you feel more connected to?
- What does the curation / of objects say to you?
- How can we group different things and projects together?
- Who is visiting? What is our target audience vs the project’s target audience?
- Why do something digitally when you can create it as an actual installation? What does technology enhance?
- Is gamification gimmick? How does that work? pros and cons

A3.5 Community Workshops 1 (mixed)
Summary
Type of Workshop: Offline- live
Date: Saturday 26 July 2025
Duration: 2h 55min
Recording here: link
Repetition: This is the 1 st of 2 workshops with the same structure, approach, and research questions.
Location: Unfinished Art Space Studio, 203 Old Bakery Street, Valletta, Malta
Number of Participants: 9
Analysis of workshop group / user composition
The workshop brought together a deliberately interdisciplinary group of participants, including students and educators from game design, digital humanities, computer science, CH professionals and the visual arts. Participants included a lecturer specializing in procedural content generation game development and AI, students studying digital game analysis and design. They contributed alongside a visual artist, filmmaker, and curator working with archival fragments and nonlinear narratives, with experience in XR technologies and immersive storytelling. Transcript for 1 and 2 : here Report for 1 and 2: here
Technology Used
Laptops Screen /Monitor Audio Recording AI transcript

Cameras for photographs / Phone Cameras
Structure This workshop was deliberately designed as a fast-paced, high-pressure exercise to push participants out of their comfort zones. The “Fast Q&A” format encouraged immediate responses, preventing overthinking and surfacing instinctive reactions to complex cultural heritage scenarios. Participants were presented with a set of provocative case studies, chosen precisely for their diversity in scope, approach, and complexity. These included: • The Ise Grand Shrine (Shinto shrine in Mie Prefecture) and Hōryū-ji, which exemplify non-Western approaches to preservation, where sacred buildings are ritually torn down and rebuilt every 20 years, shifting the focus from material permanence to cyclical renewal. • Monuments to Guilt, a digital project that explores the weight of cultural guilt and layered histories through interactive environments. • Indifferent Wonder of Edible Places (Studio Oleomungus), a poetic videogame exploring erasure, edible history, and the violence of completion. • The British Museum (multiple case studies), particularly its experiments with gamified presentation of collections i.e. The Museum of The World • New Palmyra, a digital reconstruction project addressing destruction, memory, and contested narratives of heritage. The session concluded with an interactive demonstration of the existing IMPULSE prototype, giving participants a chance to apply their reflections directly onto the project’s framework.
Collections All of the available collections were presented and explored through speculative discussions throughout the workshop.
Objectives The sessions focused on the creative use of virtual spaces in heritage storytelling, touching on topics such as agency, layered narratives, speculative design, and the affordances of virtual versus physical environments, attempting to answer the questions:

- What are the interesting and creative restrictions that we can encounter, and how would restrictions influence storytelling and agency within the virtual environment?
- How do aesthetics influence storytelling and world-building within a virtual environment?
- How can we design non-linear, layered, and multi-sensory narratives, where audiences become co-authors?
- What should be augmented when representing a cultural heritage asset (tangible or intangible) in a virtual environment? (the object, the connection, or a speculative story)
- What level of agency should be granted to the virtual visitor?
- How can a virtual space be successfully curated using meaningful game mechanics?
- How do we experience the same story across different mediums, and what is gained or lost in translation?
- What is the role of movement, spatial navigation, and social interaction in shaping audience experience?
- What can virtual environments offer that physical spaces cannot, what are the unique affordances of the digital realm?

Outcomes

Questions that emerged from this session:

- How do you avoid/ surpass representation in XR environments?
- How do you create relevant encounters for audiences of different generations?
- We only look each other in the eyes in an emergency?
- Everything in A VR setting is intentional/made to be seen (or not?)
- Multiple lenses, how do you create multiple layers? How do we remove those layers between the creator and the audience? how do we co design?
- How does the creator lets go of control? Self expression within those realities is being curated/censored by the creators
- in games currencies
- How do you want to interact with these items?
- Where is the line between interpretation and misrepresentation? When is it acceptable for artistic or playful interventions to diverge from strict historical accuracy?

- How do you balance education and entertainment? Should cultural heritage experiences primarily aim to teach, or is there value in speculative, ambiguous, or playful engagements that prioritize affect and curiosity?
- Can a digital or playful representation ever capture the same sense of presence, authenticity, or reverence as the physical original?
- Who has the authority to decide how artefacts are represented?
- How do you communicate a time frame?
- How do you tag objects?
- How are people's interpretations and perceptions of the artefacts subjective yet relevant for the multilayered identity of an artefact?

Observations / Valuable information

The workshop explored a range of topics intersecting cultural heritage, digital preservation, and interactive storytelling, with a particular focus on decolonial practices and the subjective nature of engagement with artefacts.

The idea of "destroying everything" was explored metaphorically and literally, using examples such as Greek movie posters and glass slides of Palmyra. These were discussed in terms of how repeated use or concealment could gradually erode or obscure their content.

However, access often depends on institutional permissions and is shaped by underlying power structures. The discussion critiqued Western-centric ideas of preservation and raised questions about whose interpretation of heritage is privileged or considered "acceptable." A recurring theme was the ethical question of whether to avoid using problematic elements entirely, or to confront and critically engage with them.

Ethical considerations relating to "sensitive content" such as the Holocaust survivors' testimonies by University of Babelsberg and the representation of the glass slides by KU Leuven were often polarised. Whilst certain participants emphasised that such content is represented (particular in the case of the glass slides in the KU Leuven collection) by contextualising them, others insisted on them completely not being represented. This attests to the sensitive nature of the collections being presented and brings into question whether narrative reinterpretation and decontextualisation in virtual worlds is an appropriate approach to tackling metacultural issues such as postcolonial exploitation and the Holocaust. It also puts into question what type of

approaches to storytelling can be adopted in order to communicate these instances where trauma is at the centre of the content being used.

The workshop also addressed how aesthetics function in both physical and virtual spaces, particularly regarding representation in digital or reconstructed heritage environments and how storytelling can be affected by aesthetic choices.

A key concept was the idea of "notes over notes over notes", a metaphor for the subjective interpretations people project onto artefacts. This was likened to personal tagging or metadata that allows for research through more abstract, affective, or cultural frameworks.

The physical act of wrapping posters around buildings, selectively hiding problematic imagery or messages, served as a metaphor for how cultural narratives are curated. As these posters are repeatedly folded and unfolded by different people, they begin to degrade in specific areas, symbolizing how stories and artefacts can be worn down or altered through repeated handling or ideological manipulation.

Walking as Time-Based Interaction

Embodied Exploration: The act of walking was used both literally and metaphorically to represent a form of interaction with cultural heritage. For example, students were asked to walk while trying to exit a "word" or identify an object, illustrating how scale and motion can create a timed, immersive interaction and communicate a time frame.

Mechanics and restrictions within a game or interactive space were framed not just as technical features, but as narrative tools. This approach, influenced by immersive theatre and game design, positions agency and choice at the centre of the storytelling experience.

A3.6 Community Workshop 2 (mixed)

Summary

Type of Workshop: Offline - Live

Date: 28 July 2025

Duration: 2h 33m

Recording: [link here](#)

Repetition: Yes, this is the 2 nd out of 2 workshops of the same structure
Location: Unfinished Art Space Studio, 203 Old Bakery Street, Valletta, Malta
Number of Participants: 13
Analysis of workshop group / user composition
The second workshop included visual artists, cultural heritage professionals, and both board game and AAA game designers, alongside an ethnomusicologist and experts in digital humanities working at the intersection of philosophy and interactive virtual spaces. A senior university lecturer with expertise in game studies, phenomenology, narratology, aesthetics, literary theory, and the construction of experiences and identities in virtual worlds also contributed to the discussions. As with the previous workshop, the participant group included students from the arts, games, and IT and three participants had experience and had developed XR-based games specifically focused on exploring and representing site specific marginalised histories.
Technology Used
Laptops Screen /Monitor Audio Recording AI transcript Cameras for photographs / Phone Cameras
Structure
This workshop followed a similar structure to the first community workshop. It began with an introduction to the overall project, and a presentation of the different collections involved, followed by the sharing of specific case studies deemed particularly relevant to the themes of the session. The open discussion that followed was intentionally paced more slowly, creating space for participants to guide the conversation organically and bring forward topics of interest from their own disciplinary and professional perspectives.
Collections: All the available collections were presented and explored through speculative discussions throughout the workshop.

Objectives

(Remained same as the previous one) The sessions focused on the creative use of virtual spaces in heritage storytelling, touching on topics such as agency, layered narratives, speculative design, and the affordances of virtual versus physical environments, attempting to answer the questions:

- What are the interesting and creative restrictions that we can encounter, and how would restrictions influence storytelling and agency within the virtual environment?
- How do aesthetics influence storytelling and world-building within a virtual environment?
- How can we design non-linear, layered, and multi-sensory narratives, where audiences become co-authors?
- What should be augmented when representing a cultural heritage asset (tangible or intangible) in a virtual environment? (the object, the connection, or a speculative story)
- What level of agency should be granted to the virtual visitor?
- How can a virtual space be successfully curated using meaningful game mechanics?
- How do we experience the same story across different mediums, and what is gained or lost in translation?
- What is the role of movement, spatial navigation, and social interaction in shaping audience experience?
- What can virtual environments offer that physical spaces cannot, what are the unique affordances of the digital realm?

Outcomes

Questions that emerged through this session:

- How do we make language accessible in cultural heritage contexts?
- Is accessibility about translation, or about affective qualities such as tone, rhythm, and emotion?
- Can oral histories communicate meaning without traditional subtitles or textual support?
- What role do speculative or “imaginary” artefacts play in learning and interpretation?

- Can building narratives around non-existent or discarded objects help participants think more creatively?
- Whose truths or assumptions are being privileged when we invite imaginative reinterpretations?
- Why use advanced tools such as volumetric video, what added value do they bring?
- How can technology be used to foster presence, intimacy, or empathy (e.g. “watching them from home, having them sitting next to you”) rather than just novelty?
- How do we ensure accessibility of digital platforms across different devices, generations, and contexts?
- Who owns cultural heritage artefacts, the government, the institution, or the people?
- How do institutional differences (e.g. Heritage Malta’s top-down authority vs. MZ’s grassroots approach) shape engagement?
- What role should curation play in balancing factual authority with community participation?
- How do we seduce people into learning without falling into over-curation?
- What new forms of meaning emerge when access is made broader and more open?
- How do we design digital heritage spaces that encourage both collective and intimate encounters?
- Whose truth are you observing/ listening to?

The focus that was given to CH Institutions during this session is the main reason why the next Community Workshops were decided to be internal workshops with CH professionals from HM, since HM is the biggest CH entity in Malta.

Observations / Valuable information

Quotes:

How do you make language accessible? Is it just abstract sounds?

Imaginary ships, a reference to the HM drawings of ships that never came to life/ blueprints of things that never came to be- (Concept of how some artefacts have been not taken as seriously in the past or dismissed as speculations)

It weird to just refer to them as simply as “digital assets”

There is something about having someone tell you a story within your own space.

MZ goes against the top-down approach of HM, since people are using heritage in a more tangible way. The sites are being contextualised with people's memories, and contemporary moments.

What is the aim of the project? What is the final output? Is it meant to be considered a European wide collection to engage people with cultural heritage artefacts? [...]. So I think the biggest problem in the Cultural Industry right now is that you are limited from the curatorial side/point of view on what you can do with these artefacts, in some of your examples, like the one about eating history it is a very interesting concept but it is more of an artistic interpretation.

It is hard to understand how you can apply the same platform for all of these collections. The National Gallery for example runs different projects for different collections.

I don't think that no matter the target audience, that this is going to be financially viable if it only depends on the people it attracts and that's the reason why they stopped the British Museum case study website. Because to upkeep these websites in contradiction with the people visiting them that's the internal fault of these projects.

You are the artefact and people comment about you and which artefact you are

You mentioned VR and 3 years ago it was relevant now no one uses it, how does it state relevant?

Who is accessing this platform? You might need different types of devices to tackle that. Is it going to be publicly available? Or only in classrooms?

The only viable solution for this would be go to Fortnite or Roblox cause 3d parties like that can handle the infrastructure and you handle the interesting interactions.

Why upcycling? We are using existing material not digitising new for these. (suboptimal qualities)

The relevance of their suitability is only relevant if you take them out of context cause when they are representatives of a specific time and space it shouldn't be an issue. History of documentation itself

If you delete all the artefacts from British Museum, then you cannot blame them anymore

Graffiti on the temples/ buildings people having agency / saying that they were there, declaration of presence

Museums in general – current issues to attract newer younger audience / attempting discussions of colonialism

Careful when it comes to the political statements you make as an agency but for an artistic project you can do literally anything.

So if this is supposed to be something that institutions could actually use in the future is a very different approach than finding the ways an artist would use it. Especially when an institution is government owned.

We want to see how learning takes place not only learning in the classroom but also learning through interactions.

People are digitising more and more so in the near future we will be asked what's usable "junk" and what's not. What's the level of curatorship you want? Going towards something more specific or interesting to seduce them into learning more. So, with what artefacts do you connect the most?

All the assets shown are interested in different ways, MZ collections are so interested in local communities, and they are connected a lot with also the oral dockyard histories, they are about the living memory we are experiencing now because these are not usually things we see.

The photos can be indications of alternative histories, branches that never got to happen (prototype idea)

It is more interesting for me to see them videos because they are moving and they feel more real, or having the player being the shoes of someone else within a specific scenario so that you can see how you will feel if you were there.

I am very anti over curation, and this project could easily scream that, why these assets belong to the government they should belong to the people, I resonate with the idea of decontextualising contextual collections because then you can make non creative people think creatively. Tools were also very important for me, and the tools from HM connect with me because they are very sculptural i Wish i could touch them. [...]my first thought is in how many ways i can transform/ flip something.

We are making something with an expiration date, like we are already in the fold of irrelevance, and it doesn't have to be like that.

Once they get public people will use them as material, simple data to be used for something else, that's unavoidable and that should also be ok.

When you translate everything in UX – UI it loses something especially if it is not done carefully, for me you should make them as accessible as possible. The more accessible you make it the more meaning will come out of it. Because more people will see them and actually interact with them in different ways,

I didn't like a specific artefact I liked the connections / relationships between the collections ex. Posters of films and then MZ's homemade videos/ Industry of navigation and then the industry, dockyard and the tools

A very nice website, that different formats of assets would link with each other you would have small boxes with posters and stuff that they could build stuff themselves, print them out, and then they would create new collections themselves, and they would be able to share online their interpretations.

Allowing them access digitally it is important because these sites cannot be open in the public in real life necessarily, but now you can give them a way to interact in a safe way. The monetisation of the place is another thing though.

The platform increases its value from the people's interactions and creations.

How can you appreciate the beauty of it if it is a model and not the real thing? How do you push people into looking these assets? Because the attention span of the people is not long enough.

I lost some people close to me and I would like to be able and hear their voices or something from them within a specific place.

To be able to interact with others but also to be alone with the assets. How do you make an interaction intimate?

You could build ships and then drive them into imaginary places designed by artists. So, you divide the experience in two parts (collaborative and then personal) (another prototype)

The user could be a photographer, collecting his own version of artefacts, and then you could collect those. you can make them walk and while you are listening around your stories.

An exhibition about speculation. It can also be more commercial. Connecting a community with our project. (prototype)

Forcing students to build a narrative on non-entities, you generate an image of something that does not exist, and you have to create a narrative out of it. Now start a story. (prototype)

And creating narratives between the different collections

Everybody writes a story about an artefact and then you try and guess which one it is. (prototype)

A gossip column of the artefacts, something fun, I want to engage more with it, maybe something that i can receive, download like a keepsake

People could write interpretations and people could vote on them. (prototype)

Try to match the objects with a feeling of something. (prototype)

How do you understand the rhythms/ tones of a language? - everyone knows about the holocaust you don't need the subtitles, you want to hear the quality of the voice, in order to understand that there is meaning, you can understand the feeling, in MZ collections with the voice messages. The feeling becomes tangible. You can hear the feeling. They speak to their mother in a specific way trying to calm her down and then the same person talks to their brother and they admit certain misfortunes.

You cannot hide stuff in the voice. The first minutes in the audio you cannot hide the emotion there.

Whose truth are you observing/ listening to? What are the truths?

A3.7 Community Workshop 3 (Heritage Malta)

Statistics

Type of Workshop: Offline - Live

Date: 4 September 2025

Duration: 2h 16min

Recording: [link here](#)

Repetition: This is the 1st out of 3 with the same structure

Location: Digitisation Training Room HM, Bighi, Training Room – Technology and Experience Development Unit – Bighi – HM main offices at the ex-naval royal hospital
Number of Participants: 18
Analysis of workshop group / user composition
The internal workshops at Heritage Malta were deliberately structured to bring together participants from across the institution’s many museums and sites and departments, creating a diverse mix of perspectives. With Heritage Malta overseeing more than 50 sites and collections, the workshops included voices ranging from senior curators with decades of experience to students and newer staff members still in training. This cross-generational and cross-departmental composition was key: it allowed senior curators to share their expertise on conservation and narrative authority, while younger participants introduced fresh perspectives and experimental approaches. The variety of professional backgrounds, from archaeology to conservation, education, digital strategy, and curation, ensured that the workshops became a platform for dialogue across different levels of knowledge and responsibility, reflecting the institutional complexity of Heritage Malta itself.
Technology Used
Monitor Screen Laptops Cameras for taking footage Audio recorder
Structure
This preliminary workshop was one of the largest held so far and served as a key moment in aligning internal perspectives at Heritage Malta. The session began with a presentation of the IMPULSE project, outlining its aims and potential for rethinking digital interactions with cultural heritage. This was followed by an introduction to the participant institutions’ diverse collections, setting the stage for reflection and discussion. Participants were then asked to consider which artefact or site from Heritage Malta’s collections they felt most connected to, encouraging personal identification and emotional engagement. The workshop concluded with participants exploring examples of case studies and alternative digital interactions, prompting them

to reflect on which of these approaches could be adapted or implemented within Heritage Malta's own sites.

The 1st prototype was not shown.

Collections: All of the collections were presented

Objectives

The workshops were less about producing immediate outputs and more about understanding institutional needs, professional insights, and possible directions for digital experimentation within the scope of IMPULSE.

By bringing together senior curators, conservators, educators, and even students, the workshops aimed to:

- Gauge professional perspectives on which artefacts and sites hold the strongest resonance or identity value within the collections.
- Identify priorities and challenges that different departments face in interpreting, preserving, and presenting heritage.
- Explore alternative models of interaction by presenting case studies and speculative digital practices, testing how these could be translated into Heritage Malta's own institutional framework.
- Bridge professional expertise with innovation, using the input of long-standing curators alongside fresh perspectives from younger participants to inform future design and workshop directions.
- Explore the forms that learning and education takes place in CH institutions

Outcomes

Questions that emerged from this session:

- What should be augmented when representing cultural heritage assets (tangible or intangible) in a virtual environment , the object, the bond/connection, or a speculative story?
- What level of agency should virtual visitors be granted, and how can meaningful game mechanics curate their experience?
- What emerging patterns in museum collections can guide design?
- How can VR/AR/MR experiences move beyond static representation?
- How do audiences experience the same story across different mediums, and what is gained or lost in translation?

- How might game mechanics, restrictions, and spatial storytelling function as forms of art and critique?
- In immersive installations without a fixed perspective, how do participants choose their own frames?
- What is the role of movement, navigation, and social interaction in shaping audience experience?
- How can we design non-linear, layered, and multi-sensory narratives, where audiences become co-authors?
- What unique affordances can virtual environments offer that physical spaces cannot?
- There are multiple ways we represent the artifacts, the interactions, that people want to have with these assets, both 1. creatively and 2. functionally; so what interactions would be useful for CH professionals?
- What would you like to see/ be available to you when you interact with one artefact virtually as a professional? How is that helpful in your research? And everyday workflow?
- Who do these collections belong to? The institutions that have them?
- How do you group them, and what is the language that local CH professionals use?
- How can artefacts be described accurately without relying on a Western-centred point of view? Are we sometimes over-careful in trying to avoid misrepresentation? How do we design with care in such occasions?
- When dealing with wall paintings, which layers should be preserved? How do you decide? Do you sometimes need to destroy one layer to preserve another?
- Who takes images of artefacts and sites, and what does it mean when soldiers or individuals take them back to their countries? Is this looting, or does it become a personal act of taking away? How do the children and grandchildren of those individuals connect with these photographs?
- Given the abundance of artefacts being found, how do we decide what to expose? How do we tell their stories in meaningful ways?
- How much pressure is there on curators and conservators to make assumptions? Where does responsibility lie?
- What does it mean in the long run when our interpretations today affect the future? Are all interpretations equally valuable, or does one interpretation make others obsolete?
- How do university systems sometimes fail us in connecting with heritage?

- What should be prioritised in an educational system, and how can misconceptions (such as the idea of “giants”) be challenged? How do assumptions and stories become embedded in heritage? How do we preserve the sense of wonder for younger audiences and create lines of connection across generations?
- What should be done with unprovenanced artefacts? How should they be approached digitally? Should they always be seen as artefacts, or could they also be treated as educational tools?
- How do extended or augmented reality experiences allow people to “play” with objects in ways that real life does not? Should this be encouraged?
- What is the role of virtual places in cultural heritage? How do you want to interact with them?
- What is allowed in a virtual space, and what is not? Should there be an expected behaviour?
- Do volumetric videos make us more empathetic, or are they just a way to elicit emotion? Should AI-generated stories be used if their main purpose is to provoke reactions or raise money through awareness campaigns?
- XR was mentioned many times – but what is truly needed from it? What do we consider “extended reality,” and what should its purpose be in the context of cultural heritage?

Observations / Valuable information

The main observations from this conversation were the importance of storytelling and the narrative of objects for curators and other cultural heritage professionals. It was also interesting to see how these professionals recognize the potential of digital tools but remain concerned when such tools become overpowering. Another concern mentioned was the level of digital literacy required for some digital projects. An additional observation was the use of layering and linking particular timelines and artifacts to build stories. It was highlighted that every object can have more than one link and storyline, which is particularly challenging to present in physical museums but can be implemented in virtual ones.

What stood out particularly was the need for alternative modes of storytelling to be adopted for different demographics.

This first workshop revolved around the ways artefacts are represented, and how audiences and professionals imagine their interactions with them. Two central threads

emerged: the tension between *creative* and *functional* uses of digitised heritage, and the need to rethink how museums frame learning.

Participants questioned ownership and belonging: *"Who do these collections belong to? The people who decide? Their origin? The institutions that have them?"* This opened up broader reflections on institutional authority and how different contexts produce different readings of the same object. The presence of problematic and difficult collections also prompted concerns about over-cautious language, with one participant asking, *"How do you design with care in such occasions?"* The issue of looting, colonial displacement, and what is omitted from narratives added further complexity.

Education and storytelling were recurring focal points. One student remarked, *"I hate history – I think from what you say you love stories. When I see things visually I remember them, I find them interesting."* This statement highlighted how the framing of artefacts within narratives can determine whether audiences connect or disengage. Similarly, another participant stressed the importance of storytelling in conservation practice: *"When I restore, I need to know the story when conserving – this should start from the professional and then cascade to the visitor."*

The dockyard collection surfaced as a particularly charged site of learning. A participant who had worked there shared his unease: *"You talked about the dockyard before – I worked there, so my connection is not the same as the one other people would have. A fear, a vulnerability, that others would not connect or understand some things."* His comment revealed how lived experience complicates curatorial narratives, and how exhibitions risk alienating visitors if they fail to convey personal histories.

Digital tools were seen as both an opportunity and a challenge. While extended reality (XR) was repeatedly mentioned, participants were cautious: *"I love technology and there are so many possibilities, but if the site is there, why replace it? If I can hold it in my hand, I want to hold it, not see it on a monitor."* This underlined that technology should be positioned as a tool for access and context, not a replacement for embodied experience.

Finally, questions of responsibility lingered throughout: How should museums balance facts and narratives? Which stories deserve to be highlighted? Are all interpretations equally valuable? These discussions positioned education not as a neutral transfer of knowledge but as a negotiation of voices, contexts, and identities.

This session brought forward several important reflections on the relationship between cultural heritage, interpretation, and technology. Participants began by identifying the artefacts and interactions to which they felt most connected,

underscoring the importance of personal resonance in shaping meaningful engagement. A recurring theme was the idea that technology should not be viewed as the solution in itself, but rather as a medium that can enable or enhance interpretation. Participants stressed the need to remain realistic and grounded in what cultural heritage sites and institutions actually require, rather than imposing unnecessary layers of technological intervention.

The discussion also touched on the role of curators and artists in relation to heritage sites, emphasizing that site-specific projects must establish a genuine connection with the objects they reference, rather than using them as mere background or decorative context. Some participants expressed a sense of disconnection, feeling that previous initiatives required them to "put up with" external impositions rather than encouraging meaningful dialogue.

Specific examples highlighted these dynamics: a dockyard worker and guide spoke about how installations risk removing heritage objects from their lived context, while discussions of storytelling raised questions about how narratives can be adjusted to suit different audiences. The "Main Guard" project was noted for its exploration of layered conservation practices, prompting reflections on what audiences might most want to experience, whether the act of conservation itself, the opportunity to step into the role of an expert, or other forms of interaction.

Concerns about the "Disneyfication" of museums also surfaced, pointing to the risk of oversimplification or entertainment-driven distortion. At the same time, participants expressed interest in approaches that create affective connections, feelings that can transcend and link across timelines, offering more than simple factual engagement. These insights highlight the importance of balancing authenticity, audience expectations, and innovative modes of storytelling in the design of future workshops and prototypes.

Quotes:

There are multiple ways we represent the artefacts.

The interactions, that people want to have with these assets, both 1. creatively and 2. functionally. What interactions would be useful for CH professionals?

As an institution? What would you like to see/ be available to you when you interact with one artefact virtually? How is that helpful in your research? And everyday workflow?

Who do these collections belong to? The people who decide? Their origin? The institutions that have them?

How do you group them? Vast differences even within the same collections

Things designed for someone else

What about problematic/ difficult collections?

Captions of local archaeologists/ what is the language that they use? And how do you describe them accurately / and western centred point of view-/ maybe are we over careful? How do you design with care in such occasions?

Looting/ where are the museums? Which countries? Where are the artefacts from?

Accidental censorship

They are very time specific and site specific.

What are we teaching? /Learning?

MŽ as a counternarrative to HM -

MŽ- Tourist like photos

Photos of the temples before the installations of the protective tents by HM,

Temples as a backdrop to tell a different story

Amateur film in malta / Dracula story / playful use of these spaces

MŽ- too many levels of abstractions? Instead of how MŽ catalogues the collections

Asset/ artefact as a trigger to discussion

-Which artefact /Site from our collections do you identify more?

My favourite site is Haġar Qim / bronze age figurines, the dynamic change of form and structure that is evident into the form

Oil lamps, to connect and catalogue all of them

As a national agency we have to offer the facts, but we lose the narrative of the sites, how people interact with the sites? I think digital tools, I think MŽ-HM can help a lot because these pics can give us better context on restoration approaches/ mindsets

I wouldn't call them temples I don't want to impose my interpretation

He used to work in the dockyard,

Mention to the reserve collections

What do you think of the contemporary exhibition there? "I was expecting something more, I wasn't challenged" "I was hoping the works would have been among the real artefacts" reluctance to express opinion

Main Guards – there is already a story within every painting, she is a conservator, **which layers do you preserve into wall paintings? Which layer? How do you decide? You need to destroy a layer? Or some layers?** "There are not enough photos to give us context when restoring" "it would be nice to expose every type of life /interaction that was in the site not just the important highlights, what about the everyday life?" "Who takes images? Soldiers take images and then taken them back to their country, it is not looting but it is taking away something, making it personal, removing it?" "It is the kids and grandkids who have these photos" "how will the children of our children connect with an artefact that they don't have memories of?"

What we architects consider as an artefact is very different. Some of our more valuable recourses are photos, we see a photo of a family, and I look into the background, the building.

Storytelling is essential, because an artefact is not just facts, we are finding a lot of artefacts so how do you expose them? How do you say their stories?

-fireworks/canons in the background-

Were the works of the biennale relevant for you? They were supposed to be site specific/ i was much more interested by the walls than his work, the connection was not there, they were beautiful drawings, but it was used more as a multipurposed place than a place of history. "What did you think of the performance there" "artists sometimes interpret for themselves instead of someone else and how can we reverse that? What makes it successful"

Artefacts give stories, we want to see the use. This is important information; the objects are puzzles of another day. "How would you tell a story?" "i would start by the site itself" "so you would return the artefact back to a place? The landscape is important?" "Yes, I would place it where it was last used, found and start the place there, we place things based on factual things and from the go to interpretations"

I love the concept of memory, the psychology of discovery and the archaeologists themselves, **how much is the pressure of making an assumption? There is so much**

responsibility? But it is also valuable to hear about the personal opinions and personal commentary of an archaeologist when they found something. The reverse collections and working on them makes you feel important. Each era would have different interpretation, **what does it mean in the long run? Our interpretations today affect the future. There are many layers of interpretation. One find can make something completely else obsolete. Or does it? Are all interpretations equally valuable?**

Student: I hate history – I think from what you say you love stories. - you always ask the people what is important to them/ why is she called to take photos? What do they want to see later in the pictures? When is see things visually I remember them, I find them interesting. How university systems sometimes fail us? Things happen across time periods; specific things tie things together. What do we prioritise in an educational system? How do we challenge that? What do they mean by giants? How misconception gets created? How is that interesting from an artistic point of view? How are the assumptions of people interesting? Why are those stories there? Younger audiences are not part of the project but the sense of wonder.. How do you find the lines of connection?

My favourite is the large vessel , **it is the only artefact i remember from school, it is incredible how someone would go in such extent to create an educational model, it is also extremely hard to digitise, we still haven't managed to digitise it (sense of ephemerality/ temporary) the tangible aspect of the educational value. It is an artefact but it was a tool, a tool that shows us that something has been lost.** A level of education no longer existing. I think the dockyard collection is interesting because it is a way for us to document contemporary history, how do we document efficiently? We need to record oral histories, because they are dying. When you record from a personal perspective you can say very different stories than when digitising for an agency. We interview people and then they die. Oral histories are so important.

What do you think of virtual places? How do you want to interact with them?

What is allowed in a virtual place and what not? Is there an expected behaviour?

Volumetric videos= someone asked us why? Does technology make us more empathetic? Do we use it as a way to illicit emotion? Do we want the highest possible way for usability? What about AI generated stories? Created only to exploit emotional reactions and raise money with the coverage of awareness?

-XR was mentioned a lot of times. But what do you need from this? What do you think extended reality is? / considered?

-we recently had research about Tarxien the theoretical part was exiting but in the actual prototype was so clanky, and difficult and complicated with so many buttons and confusion, I love technology and there are so many possibilities but if the site is there why replace it? If I can hold it on my hand I want to hold it not see it in a monitor.

Technology is a tool, i want technology when there is no alternative, want is as a solution

Extended reality means the merging of physical and digital / virtual, we can combine different elements, we want to see what it is needed and to identify gaps

-for us this is like a new language, i do remember in audio guides a good voice is the most important for me , and sometimes we overlook details, I would focus on the quality than innovation, the way we invade a space with virtual late, that's why sometimes it can be seen as clunky.

These technologies are based on how we perceive all of our senses and how all together they can create an experience

British museum music case study: how simplicity can be so effective / functional

Technology should always give something extra it shouldn't replace something but augment something, offer something that it is not there

Digital Benin project mentioned and explained

Instead of erasing how do you highlight the problematic/ issue areas? How do you shed light to omitted parts of history? They are looking into provenance research, tracking the traveling of the objects, where they are now, where they were installed and where they are now.

In malta it has never been addressed, the colonial aspect of the island. What do you do with unprovenanced artefacts? How do you tackle with digitally those artefacts? Why do we use them/see them as artefacts and we shouldn't we be able to handle them as educational tools? - lots of people would be reluctant to use it otherwise? - if it just sitting there? If there is no story behind it why put it on a pedestal? Extended or augmenting reality we allow people to play with these objects, can you do that in real life?

Show them a weird one

These were very website flat/ strong concept but not weird enough

Studio Olemingus

The poem was not even there

This shows us that you can have fun with the storytelling element and at the same time keeping the educational value high, and like that you can always target different people and audiences, so if you want to think without constraints we want to hear your suggestions

Sometime when we make something we take away of an object

You talked about the dockyard before- i worked there, so my connection is not the same as the one other people would have. A fear / vulnerability that others would not connect or understand some things,

You are presented artefacts and you are presented curated emotions / emotional states as well. Storytelling depends on what aspect you want to show to the people.

The advertising of these experiences is the problem/ commercialisation of feelings, Experiences

I loved the musical site, because it is easy to navigate and it shows connections that otherwise you wouldn't be able to portray. Why leave out certain generations who could even contribute more to the discussions

It is based on a poem, but the poem is not there/ an implied connections / people who designed the dockyard experience were not dockyard experiences, -there was a lot to read, too much, explaining takes time.

There is no link to the actual poem during the experience

With which parts of the exhibition did you connect more? - i saw all of it , i read all of it for me everything makes sense. But what about the people who are not into ships? It is not for everybody

Something else, that i don't hate but it should be mentioned, is access. In our sites the architecture is designed to restrict access. But if the people who designed they didn't want to offer access to a specific space to i grant it today or no? - i hate long text, i enjoyed a museum about costumes, triggering more senses, doing something digitally -how would you re-interpret a building?

-why malta hasn't kept up with VR like other countries? I think for some sites is ideally why some other not. We are currently working on the permanent collection, what we learned from the island of crossroads, when liam took people around the exhibition everyone made sense, when i took them it was just a bunch of objects, we want to give a visitor the experience of experiencing the collection with the curator, making it come to life, it is the storytelling

- can the actual architecture guide the storytelling?

If i go as a tourist to NMA I don't understand why it looks like this- but when i talked with an architecture and they explained to me I understood the different layers of what can happened or not

- I always thought that why would a 3D asset at an online site make me intrigued to go see it in real life

-the difference of our museums vs other ones is the connection with social media platforms

- i think everything should be access and available but for some this is very hard – that's why we have WP focused on copywrites – what if someone finds a picture online and do something with them? Let them – what will happen?

We need more self-reflection with virtual realities / digital spaces, we need to dismantle the curatorial authoritative voice – you give voice to a very colonial museum – maritime, sociopolitical aspect of museums, i get access and then it is taken back from me

XR helps us address existing questions in different ways

Artefacts were spaced and not loaded, you were not overwhelmed you could experience it, and space is limited especially at Maritime Museum, St Johns co-cathedral

When you explain, you don't explain everything

Imagine if you had the ability to create multilayered narratives within a platform, would that be useful? There is no limitation of time when you experience something digitally.

You can approach something from the scope of dark tourism to engage / but you need to be a storyteller yourself

Technology allows you to offer options, this is the potential of this technology. At the end of the day it is about choices, the visitor has to choose. - you always need to add something more, you could relate it even with modern music.

There is a room of something and maybe you cannot see it but with digital tools you can have access that otherwise you would not, but not overdo it. You should reach a balance, you need to respect the interaction.

- there is a disconnection between artefact and the place that it was found, with technology by placing it back into place already gives you more context, and you can do with XR.

- Project of placing offering to the place that were found

I want to be able to have more access/ transparency on what other collections have

A3.8 Community Workshop 4 (Heritage Malta)

Summary

Type of Workshop: Online

Date: 4 September 2025

Duration: 2h

Recording: [link here](#)

Repetition: This is the 2nd out of 3 sessions

Location: Training Room – Technology and Experience Development Unit – Bighi – HM main offices at the ex-naval royal hospital

Number of Participants: 9

Analysis of workshop group / user composition

Based on 1.1 Research

CH Professionals/ Students 2 Heritage Malta (HM)-INTERNAL

The participant composition also remained consistent across the Internal Community Workshops 3, 4, and 5.

Technology Used

Monitor Screen

Laptops

Cameras for taking footage
Audio recorder
Structure
The session began with a presentation of the IMPULSE project, outlining its aims and potential for rethinking digital interactions with cultural heritage. This was followed by an introduction to the participant institutions' diverse collections, setting the stage for reflection and discussion. Participants were then asked to consider which artefact or site from Heritage Malta's collections they felt most connected to, encouraging personal identification and emotional engagement. The workshop concluded with participants exploring examples of case studies and alternative digital interactions, prompting them to reflect on which of these approaches could be adapted or implemented within Heritage Malta's own sites.
Collections: All of the available collections were presented
Objectives
The objectives remained consistent across the Internal Community Workshops 3, 4, and 5. Each session continued to explore how cultural heritage assets could be represented, interpreted, and reimagined through both professional and public-facing lenses. The workshops aimed to interrogate issues of care, conservation, education, and storytelling, while also testing how digital and speculative tools might expand access and engagement. By maintaining the same objectives across multiple workshops, the process allowed for continuity, enabling participants from different departments and levels of expertise to revisit key questions, refine earlier insights, and contribute to a cumulative body of knowledge that will guide the design of future prototypes and interactions.
Outcomes
Questions Emerged: • How can artistic practices genuinely elevate or add value to the narratives of cultural heritage sites, rather than appearing fragmented or out of context? • What constitutes a meaningful connection between an artwork and a cultural site? • Who has the authority to decide which narratives are foregrounded, curators, artists, or audiences?

- How do we balance curatorial responsibility for factual accuracy with artistic freedom and interpretation?
- How do different audiences perceive and interpret site-specific works?
- To what extent do audiences benefit more from factual, educational approaches versus artistic, speculative ones?
- What forms of storytelling transcend disciplinary boundaries and create deeper connections?
- How do we ensure that interventions remain rooted in the site's history and cultural meaning, rather than turning it into a multipurpose backdrop?
- Can site-specificity be preserved in digital or hybrid environments?
- Where does education end and artistic interpretation begin, or do they overlap inherently?
- How can MR/XR models could combine educational value with playful, affective, or transformative experiences?
- Who decides what meanings are assigned to artefacts?

Observations / Valuable information

This workshop seemed to focus more on aspects of education. One interesting approach mentioned was the use of toolkits for professionals, which can then be translated into interpretation efforts. The workshop was also useful in highlighting stories and elements that continue to give value to the contemporary setting of certain artifacts, such as the altar in the NMA, used by minority groups for spiritual prayer.

Another important aspect of the conversation concerned the status of the museum and the curator as institutions, and their role in presenting the "truth" while also appreciating the importance of community integration and less popular narratives of artifacts in order to foster interest in them.

Another highlight of the workshop was the idea of using the virtual to experience something that cannot otherwise be done, such as looting. This approach not only increases the chances for engagement but also gives the institution an opportunity to show what is wrong or right in a playful manner.

Finally, the idea of "the box" was also mentioned, a great concept that could be developed further, particularly through integration with digital tools such as the use of RFID technology.

The workshop expanded these debates by focusing more explicitly on the agency of institutions, professionals, and visitors in shaping narratives. Participants reflected on

the museum as a site of ritual, speculation, and knowledge production, asking: *Who decides what meanings are assigned to artefacts?*

Conservation emerged as a key theme. One conservator noted: *"We should focus on creating something for professionals, and based on that interaction create something for the audience."* This highlights an important model: tools designed for specialists (e.g., simulators for piecing together broken artefacts) can be adapted to engage the public, allowing visitors to "behave like conservators" while learning through play.

The question of learning was not restricted to exhibitions alone. Marketing was also interrogated: is its role simply to attract visitors, or can it become part of education itself? The British Museum was mentioned as an example, where collections have been recontextualised for social media with gamified aesthetics, such as presenting weapons with stats like in video games. This demonstrates how playful, digitally native modes of communication can generate new forms of engagement, but also raises questions about trivialisation and spectacle.

Participants reflected on the imposition of narratives: *"The temple is an imposition from the museum... A person is always producing knowledge from their point of view."* This suggests that site-specific installations and artistic interventions, while often welcomed as signs of interest, were not always felt to "add value." Several professionals commented that such interventions were fragmented or out of context: they could be accepted, but they did not necessarily elevate or extend the site's stories.

Education was seen as relational and dialogic. Activities such as the "virtual box" exercise showed how families began exchanging and replacing objects spontaneously, linking them to personal memories. This created a parallel with the institution's own ownership of collections, raising questions of authority, authorship, and co-creation.

Underlying all discussions was the sense that museums are simultaneously institutions of authority and spaces of negotiation. They produce knowledge, but they also must recognise alternative modes of knowing, whether through speculative play, oral histories, or embodied interactions. As one participant put it: *"You won't appreciate an object by simply knowing its history – you need to know the connection, compare it with today. This way you kill certain conceptions, making the past more relevant makes you appreciate more."*

Quotes:

Standardisation of assets/ but also standardisation of terms

Is it only indeed for the visitor's experience?

How HM Malta enables education through our museums?

-they are not meant as a tool for the conservators-

How can the student/ help with producing language through these interactions?

What elements are we researching for this project?

Did professionals research in a different way how do we accommodate that?

Do you want to know how it works? Or you want to speculate how it works?

Do you navigate through time? Through collections?

Looting is part of the experience and the story of the object -

It is better to highlight the object than completely erasing it

Are these images of the murals or were these pictures that were taken? For the posters?

Museum Institutions / Research Institutions / Community Institutions

"Your bowl" "our bowl"

From conservation point of view these are a huge archive of stuff that they could further inform

He films the idea of her why she films him / changing perspectives

Make something for conservators that could also be used as a game.

Putting pieces together. If we help the professionals to use digital tools in their work, then visitors could also interact with it, visitors always want to behave as conservators, they make parallels, o I had a vase at home, what if such programs are available?

Putting pieces together/ linking them to conservation elements/ principles/

How the visitor creates parallels?

You are allowing them to touch something they cannot, you are giving them agency
54.0

Making museums accessible for neurodivergent people

If you are wearing headphones you lose 30 percent of the experience

Adding sounds to the headphones / instead of completely excluding them / isolating them from the experience

Allowing them to touch / in Gozo prisons they always want them to leave their name on limestone, something they want to leave behind

Carve a replica so that they can touch it

Costumes/ before cutting your hair you can see how you look

Putting things together like puzzles/ broken pieces

Retrieving objects from the sea bed

You educate people on certain rules/ conventions/ legislations /

Whoever designs these games/ interactions they could also be used at university level as examples

Give them the opportunity to learn even if it is not the conventional way

You won't appreciate an object by simply knowing its history you need to know the connection / compare it with today / this way you kill certain conceptions/ making past more relevant makes you appreciate more, you create a sense of belonging

I saw an exhibition about porcelain – I didn't appreciate it at all – for me that would be amazing – no no for me saw me a piece of a plate.

So you prefer the story – but in big collections it is very hard to find the link

When I restore / I need to know the story when conserving- this should start from the professional and then cascade it to the visitor

He chooses the narrative through the museum/ multilayered / in digital versions/ museums tend to have biased stories based on the curator and the time

Museum is a site that produces knowledge/ other versions of knowledge are related but not necessarily the stories the museum wants to say

Give me information and let me choose, the curator can limit the experience of the visitor

Aversion of knowledge from the curator/ curators pick the most suitable version according to them, ex. I think this is not correct I think it was used in ritual, the visitor interacts with that interpretation.

Disneyfication- museums are going that way but we shouldn't lose the actual reality / cause this makes them more inclusive

But I think the museum should provide factual knowledge / it is an institution, it is the dialogue that needs to change, and we need to provide the tools to the people/visitors to experience how they interact with them, instead of changing the dynamics

Loan boxes

We have boxes like that / NMA

-what would you put inside a virtual box? - think virtual you are more limited -

Twisties and Kinnie – I placed them in the box and I encouraged people to taste them, I invited 10 families, and then I lost control, they were taking and replacing things and also passing them to each other with comments

Families were communicating with each other without me knowing

They connected something they were seeing / they were linked to,

Parallel between her owning her box and the Institution owning the collections/

You are deconstructing the visiting barrier

Even if I don't want to be an institution I am still functioning as an institution and exerting power to an individual – I am the author/ so from that sense the museums cannot change that dynamic/

So who should curate these?

Hagar Qim – used for hunting- created constructions

Washing machines at the temples

If you separate the context from the physical it loses its meaning, experiencing it virtually it removes a boundary

The installation is made practical and not representationally

People visit the museums/ lay down/ praying / trinkets/ have them on my desk Hagar Qim and Mnajdra, they try and exhibit them, they are reinforcing a story that it is not necessarily true yes BUT these interactions are part of the future of the artefact

We allow them but they need to make it clear as HM that this is a speculation

The temple is an imposition from the museum - A person is always producing knowledge from their point of view

The only language he knew was reflected by his own views/ calling it altar

Obese statues/ anthropomorphic figurine /beast of a word/ accessibility

Painting vs temple / what you do in a site is controlled

They would leave stones and come back and get them in a month

The temple is an imposition from the museum

A3.9 Community Workshop 5 (Heritage Malta)

Summary

Type of Workshop: Online

Date: 5 September 2025

Duration: 2h 15min

Recording: [link here](#)

Repetition: This is the 3rd workshop out of 3 with the same structure.

Location: Training Room – Technology and Experience Development Unit – Bigli – HM main offices at the ex-naval royal hospital

Number of Participants: 8

Analysis of workshop group / user composition

Based on 1.1 Research CH Professionals/ Students 3 Heritage Malta (HM)-INTERNAL

The participant composition also remained consistent across the Internal Community Workshops 3, 4, and 5.

Technology Used

Monitor Screen

Laptops

Cameras for taking footage

Audio recorder
Structure
This preliminary workshop was one of the largest held so far and served as a key moment in aligning internal perspectives at Heritage Malta. The session began with a presentation of the IMPULSE project, outlining its aims and potential for rethinking digital interactions with cultural heritage. This was followed by an introduction to the participant institutions' diverse collections, setting the stage for reflection and discussion. Participants were then asked to consider which artefact or site from Heritage Malta's collections they felt most connected to, encouraging personal identification and emotional engagement. The workshop concluded with participants exploring examples of case studies and alternative digital interactions, prompting them to reflect on which of these approaches could be adapted or implemented within Heritage Malta's own sites. The 1st prototype was not shown
Collections: All of the available collections were presented
Objectives
The objectives remained consistent across the Internal Community Workshops 3, 4, and 5. Each session continued to explore how cultural heritage assets could be represented, interpreted, and reimagined through both professional and public-facing lenses. The workshops aimed to interrogate issues of care, conservation, education, and storytelling, while also testing how digital and speculative tools might expand access and engagement. By maintaining the same objectives across multiple workshops, the process allowed for continuity, enabling participants from different departments and levels of expertise to revisit key questions, refine earlier insights, and contribute to a cumulative body of knowledge that will guide the design of future prototypes and interactions.
Outcomes
Questions that emerged from this session: • What is the role of the museum today, as a space of authority, or as a facilitator of dialogue and co-creation? • Where does change in education within museums begin, from the curator, the educators, the audience, or external pressures like funding?

- What's the marketing /dissemination team and social media responsible and connected with education?
- How long should a museum or site-specific experience last, and how does duration affect learning and engagement?
- Should museums present contradictions and conflicting views, and if so, how?
- Can museums ever truly be "objective"?
- How should museums approach "problematic" content, should it be labelled as such, or reframed through critical storytelling?
- What is the role of the marketing department, strictly outreach, or also part of the educational mission?
- How do we balance promotional strategies (e.g., behind-the-scenes videos or gamified campaigns) with meaningful learning?
- What responsibilities do curators have in negotiating between institutional authority, audience agency, and the "lore" carried by artefacts?

Observations / Valuable information

The discussions raised fundamental questions about the *lore of artefacts*, whether iconic works such as the *Mona Lisa* or even prehistoric remains like *dinosaurs* become so mythologised that they transcend their materiality. Participants reflected on how curators, often positioned as the "guardians" or even "gods" of collections, can feel threatened by changing modes of interpretation and the redistribution of authority. This opened up broader questions: *What is the role of the museum today? How should education be approached within its walls? And where does institutional change truly begin?*

The conversation also examined the *focus of cultural heritage funding*, highlighting whether it should prioritise innovative interactivity or, at times, the simpler power of well-produced videos. Related to this, participants noted the importance of considering the *length of experiences*, what should be placed in an exhibition, how long such content should last, and how these design decisions shape audience engagement.

Another central theme was the *presentation of contradicting views*. Should museums strive to remain objective, or should they take an active stance in highlighting contested and problematic areas? Participants debated whether the term "problematic" itself is useful or limiting, and how institutions might instead frame such issues in more constructive ways.

The role of museum departments also came under scrutiny. Is it the responsibility of *marketing teams* to educate the public, or is their primary role simply to bring people

into museums? This tension between education and promotion was linked to discussions of *behind-the-scenes content*, with some suggesting that videos documenting conservation or exhibition-making could themselves be transformed into interactive experiences or even games, offering audiences new perspectives on institutional practices.

The main outcome of this workshop was the recognition that implementing virtual environments within cultural institutions can be challenging due to limited human resources and budgets. That said, when moving beyond these constraints, participants identified some interesting approaches for integrating different types of tools into museums. One of the best ideas was the concept of digital collectables, designed to instil a sense of play and education. This idea was envisioned through a model similar to *Pokémon Go*.

In addition, both curators present in the workshop emphasized that AR remains a valuable tool for museums and heritage sites, particularly for showcasing past histories and the multi-layered stories of such sites.

Another issue raised, which also emerged in the first workshop, was the importance of preserving and highlighting the context of the site from which an artifact was originally retrieved.

Quotes:

The importance of Videos / maybe sometimes videos are better than something more interactive/ how do you place someone in someone else's shoes?

What is the length of an experience / and what is placed in a museum / exhibition or the site/ how long it should last

How do you present contradicting views/ should museums be objective?

How can you highlight problematic areas

Can we really use the term problematic?

Is the marketing department's role to educate?

Or to bring people to the museums?

Behind the scenes videos – that turned into a game?

A3.10 Core Group Live Visits
Summary
Type of Workshop: Offline-Live
Date: 14 May 2024 (Jagiellonian) 19 December 2024 (Maritime Museum, with MŽ and HM) 20 December 2024 (MŽ, with HM) 19 January 2025 (MŽ, with UM) 20 February 2025 (Leuven)
Duration: 1h-5h
Repetition: yes
Location(s): Jagiellonian, KU Leuven Libraries, Maritime Museum of Malta, MŽ Collections, HM sites in Gozo
Number of Participants: 2-6
Analysis of workshop group / user composition
Based on 1.1 Research
Technology Used
Laptops, monitor screens
Structure
Visit, free discussion
Collections: The collections that were explored were the ones owned by the institutions/partners that were visited.
Objectives
The purposes of these visits was the need to familiarise ourselves better with the collections that we are asked to design with and experiencing them within the context that they are presented/exhibited.

The main objectives of the live visits to selected collections were three. First, to allow participants to experience the artefacts directly within their material and spatial context, fostering discussions that emerged organically among the collections themselves. Second, to identify areas of interest for the different teams involved in IMPULSE, aligning institutional priorities with the exploratory directions of the project. Finally, the visits provided an opportunity to observe and reflect on alternative approaches to interpretation, preservation, and engagement, drawing inspiration for future prototypes and design iterations.

Outcomes

Questions that emerged from these sessions:

- How should digital assets be presented grouped?
- Can I make specific searches? based on abstract concepts?
- How are the assets being tagged/catalogued?
- How should they be presented?
- How were they meant to be presented?
- Who is in control?
- How can we develop a better understanding of the affordances and plasticity of virtual spaces?
- How can we draw parallels between the different collections?
- How can we translate these concepts into meaningful mechanics?

Key concepts also emerged from these sessions that were later used in the pre-hackathon in Leuven like the example of Magic Lanterns, shadow and light and which aspects of the experience are getting lost when something turns digital?

Observations / Valuable information

The need of better understanding the affordances and also plasticity of virtual spaces.

The conversation revolved around game mechanics and how they can convey meaning in subtle and profound ways helped us to explore how games influence players' behaviour, values, and perceptions.

We discussed how digital culture and technological advancements, especially AI, are transforming creative processes and memory-making in the digital space. This led us to include activities that explore the intersection of memory, narrative, and technology, emphasizing how digital artifacts shape and are shaped by human interaction.

In the meeting, several key topics were raised that significantly shaped the direction of our upcoming workshops. These discussions provided important insights and helped us define the frameworks, questions, and paradigms we will address during the sessions. The following areas emerged as critical to our approach:

The concept of memory-making within digital worlds, such as in projects like the Sungrazer Project and Field Companions, was raised as an example of how the internet and gaming spaces function as collective archives. This inspired us to include exercises that explore how identity and collective memory are constructed and preserved in digital environments. Topics such as virtual tragedy, ecocriticism, and the ethical dimensions of AI were raised, particularly in how games can represent or address pressing social issues.

A3.11 Online Interview with Professor of Digital Games

Summary

Type of Workshop: Online Interview – Prof. Stefano Gualeni

Date: 17 April 2025

Duration: 49min

Repetition: No

Location: Online

Number of Participants: 3

Analysis of workshop group / user composition

Professor Stefano Gualeni is a philosopher and game designer at the University of Malta's Institute of Digital Games. His work intricately explores the intersections of continental philosophy, game design, and virtual worlds, viewing digital environments as interactive spaces to experience, manipulate, and critically reflect upon ideas and worldviews. Gualeni's academic oeuvre includes foundational texts such as *Virtual Worlds as Philosophical Tools* (2015), *Virtual Existentialism* (2020, with Daniel Vella), and *Fictional Games: A Philosophy of Worldbuilding and Imaginary Play* (2022). His research further extends to designing conceptual games, philosophical thought experiments embodied in interactive form, including "Something Something Soup Something," "HERE," and "Doors". Gualeni conceptualises virtual worlds not merely as

technologies but as experiential, philosophical instruments, capable of reshaping how we think, create, and inhabit digital spaces.

No direct recruitment challenges were encountered in this session, though the participant pointed out broader risks of exclusion: older educators, underfunded schools, or participants in the Global South may struggle to access XR due to technical, financial, or infrastructural limitations. This underlines the need for flexible platforms and inclusive design strategies.

Technology Used

Microsoft Teams

Structure

The interview followed the structure provided by 1.1 Task.

Link here:

[Impulse Interview Prof. Stefano Gualeni-20250417_110126-Meeting Recording.mp4](#)

Transcript: [IMPULSE Interview Prof. Stefano Gualeni transcript.docx](#)

Objectives

Interviews with experienced educators in the digital humanities were especially valuable, as they provided insights into effective uses of digital tools for pedagogical purposes. Their practical knowledge helped us better understand how to integrate these tools meaningfully in teaching and learning contexts. Additionally, gathering feedback on our own approach in the Impulse Project was crucial, not only to refine our strategies, but also to ensure that our methods aligned with real-world practices and addressed the needs of both educators and students in the digital space.

Outcomes

How are the information and data collected in this session going to affect the project and the following sessions?

The data from this session will directly inform the design and evaluation of IMPULSE prototypes by highlighting the importance of accessibility, digital literacy, and inclusivity in XR environments. It reinforces the need to balance skeuomorphic design (replicating real-world interaction) with experimental affordances unique to digital media, ensuring that both pedagogical and creative goals are addressed in subsequent workshops.

Insights will guide future sessions to explore not just technological feasibility, but also the ethical and social implications of XR in cultural heritage contexts.

Feedback to Potentially Incorporate

1. Ensure platforms remain lightweight, stable, and accessible, with web-based entry points to avoid excluding participants with limited resources.
2. Explore mechanics that allow user manipulation of heritage artefacts, while also enabling curators to “reset” or preserve originals.
3. Provide both collective and individual modes of engagement, recognising that different learning and creative outcomes emerge from each.
4. Prioritise inclusivity, making sure that XR environments are designed for broad audiences, not only technologically privileged groups.

Challenges: technical barriers (hardware/software instability, maintenance), unequal access (age, geography, financial capacity), and literacy gaps in using XR tools.

Opportunities: strong articulation of design opportunities, conceptual clarity on balancing replication and experimentation, and recognition of XR’s transformative potential in education and cultural heritage engagement.

Practical Comments that Emerged from the Session

- VR/XR often feels “clunky” and inaccessible; therefore, simpler, more universal solutions are needed.
- Online/web platforms may provide greater sustainability than fully immersive VR.
- XR should be designed to support both transformative educational moments and critical reflection, not just passive exhibition.

Observations / Valuable information

Insights from the discussion highlight the importance of accessibility and inclusivity in XR design, particularly regarding lightweight, web-based platforms that can reach diverse audiences, including those with limited technical literacy or resources.

Across all three tasks, recurring themes emerged:

- The tension between inclusivity and exclusivity in XR environments.
- The need to design meaningful mechanics that drive participation and reflection.
- The phenomenological role of XR in shaping embodied experiences.

IMPULSE

IMmersive digitisation: uPcycling cULTural
heritage towards new reviving StratEgies



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