



## **ReInHerit**

**Redefining the Future of Cultural Heritage, through a disruptive model of sustainability**



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## Project

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## Acronyms and abbreviations

European Commission	EC
Research Executive Agency	REA
Grant Agreement	GA
Consortium Agreement	CA
Description of Action	DoA
Project Coordinator	PC
Steering Committee	SC
Project Management Team	PMT
Work Package	WP
Cultural Heritage	CH
Cultural Heritage Site	CHS

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## **Executive Summary**

According to the Grant Agreement of the ReInHerit project, the first specific task (T2.1) in WP2 is to conduct primary research in the form of focus group interviews and tailor made questionnaires to develop a Needs Analysis Report based on mapping of the current state of the affairs in the management of the Cultural Heritage (CH) sector. This component of the project is essential as the consortium needs to define the current state-of-the-art in the sector, examining specifically the communication mode between museums and cultural heritage sites, thus identifying bottlenecks and opportunities at the same time. A specific aim is to reveal the challenges in the current mode of communication between museums and cultural heritage sites, as well as the current needs for new technologies, materials, management tools, legal solutions, IPR management, financing instruments and visitors' and community involvement, to cover these needs with tools developed later on in the ReInHerit project. The leader of WP2 is the University of Nicosia and the leader of task one (T2.1) is Arcada University of Applied Sciences. In the first phase of this process, primary data collection was conducted using qualitative research tools, in the form of focus group interviews with relevant stakeholders, which resulted in a phase 1 focus group interview report (D2.1). The primary research phase of WP2 was initiated with focus group interviews because they provided in-depth information on the challenges and support needs of museum and Cultural heritage Site (CHS) professionals. This was followed by the development and distribution of two tailor made questionnaires (D2.3), one for visitors and one for cultural heritage professionals, as well as a second round of focus group interviews and a round of expert interviews. The final stage of the primary research looks at how the ReInHerit project can enable museums, focusing specifically on small- and medium-sized, to become active agents in digital innovation.

This report examines the activities in the innovation process currently taking place in the heritage sector in Europe and the related management challenges and makes recommendations on how this innovation process can be enabled. The focus groups are utilized as an open design space for collaboratively developing the ReInHerit project with external and internal stakeholders.

## 1. Introduction

This deliverable (D2.4 Focus Groups Phase II Report) reports on the final stage of the primary research in WP2, which consists of the second phase of focus groups. The aim of this set of focus groups is to examine the conditions of adopting and leveraging digital tools in the heritage sector within the context of innovation. The European Commission sees innovation as the introduction within a firm or market of a new or significantly improved<sup>1</sup>:

- product (good or service)
- process
- marketing method
- organisational method (business practices, workplace organisation or external relations)

In the same line, the Oslo Manual defines innovation as ‘a new or improved product or process (or combination thereof) that differs significantly from the unit’s previous products or processes and that has been made available to potential users (product) or brought into use by the unit (process)’.<sup>2</sup> In the context of 4.0 Industry, digital innovation has become a necessity across sectors and organizations. However, the actual implementation of innovation is quite complex as it suggests that organizations have reached a certain level of digital transformation without considering the various activities and challenges that condition innovation (Arrigoni et al, 2021; Bogers et al, 2022; Urbinati et al, 2022).<sup>3</sup> In recent years, an increasing focus has been placed on innovation as “a process of discovery of better ways to arrange productive resources in order to address individual or social needs”.<sup>4</sup> As a result of an extensive literature review, Vial (2019) creates a working framework for understanding digital transformation as “a process that aims to improve an entity by triggering significant changes to its properties through combinations of information, computing, communication, and connectivity technologies”. In accordance with OECD, many activities are included in the process of innovation such as “research and experimental development (R&D) activities, engineering, design and other creative work activities, marketing and brand equity activities, intellectual property (IP) related activities, employee training activities, software development and database activities, activities related to the acquisition or lease of tangible assets and innovation management activities”.<sup>5</sup>

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<sup>1</sup> For more information see: [https://ec.europa.eu/growth/industry/strategy/innovation\\_en](https://ec.europa.eu/growth/industry/strategy/innovation_en)

<sup>2</sup> OECD/Eurostat 2018, p. 20

<sup>3</sup> See D3.1 National Surveys Report on the current level of digital transformation in cultural heritage organizations in Europe.

<sup>4</sup> UNCTAD, 2019, p.5

<sup>5</sup> OECD/Eurostat2018, p. 20

This emergent conceptualization of innovation as an ongoing process that creates new products, methods and/or processes is applied in this second phase of the ReInHerit focus groups. This report examines the activities in the innovation process currently taking place in the heritage sector in Europe and the related management challenges and makes recommendations on how this innovation process can be enabled. This is an essential step for the ReInHerit project as it will inform the strategy development of WP3, WP4 and WP6 for ensuring the implementation of digital innovation (see Fig.1)

**Fig. 1 Digital Transformation and Innovation Process in ReInHerit**



## 2. Research Framework & Focus Group Design

Currently, digital innovation has become a prevalent concept that crosses different sectors. The focus, by both academia and industry, is on the “final result of adopting digital technologies, such as new products, processes, services, or business models” (Nambisan et al., 2017 cited in Urbinati et al, 2022 p.66). Urbinati et al (2022 p.66) note that this focus on digital innovation as an outcome looks only at the end-product, which is “the technical thing that begins and ends within the walls of R&D laboratories or flows linearly within the new product development (NPD) process”. There is an emergent body of academic research that looks at digital innovation as a complex, multi-party and contingent process linked with digital transformation, organizational structures, context, skills and management (see for example Bogers et al, 2022; Urbinati et al, 2022). As shown by this literature, in the process of digital innovation new forms of governance emerge, which include collaboration between stakeholders, sharing, managing, and learning. Following this work, in this stage of the primary research, we will examine digital innovation as a process and as an outcome to derive valuable insights that will support the strategies for implementing innovation in the ReInHerit Toolkit (WP3), Digital Hub (WP4), ReInHerit Pilot Phase (WP6).

The adoption of digital technologies (that integrate physical and digital interactions) in museums and heritage sites has been aligned with the democratic and inclusive approach to heritage management that has been taking place in recent decades (Arrigoni et al, 2019; Mason and Vavoula, 2021; Royston and Parry, 2019; Petrelli et al, 2016).<sup>6</sup> The importance of collaborations in these endeavours has long been recognized; identified as a core activity of co-creation between museum professionals, between museums professionals and relevant audiences, and between museum professionals and external design experts (Knudsen and Olesen, 2019; Tanackovic and Badurina 2009). There is an extensive literature on collaborations in the heritage sector, focusing mostly on audience engagement in participatory activities and showing the processes of collaboration (the focus is mostly placed on exhibition design – considered a team effort in the first place – and educational programmes through ideation workshops and evaluations) (Claisse et al, 2017; Olesen et al, 2020). Recent literature has also drawn attention to how collaborations between museums and source communities can contribute to the current efforts of decolonizing museum collections (Driver et al, 2021).

In collaborations with commercial technology firms, museums are presented with more finalized prototypes than in research-led projects where a design process exists (which makes them riskier and messier) (Arrigoni, 2019). Another issue raised in this type of collaborations is that museums take the role of receivers as they outsource the work (for developing digital heritage) to commercial technology firms or rely on research-led initiatives. This work is

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<sup>6</sup> This includes increasing access and use of digitized cultural content;  
<https://mw2016.museumsandtheweb.com/paper/do-it-together-the-effect-of-curators-designers-and-technologists-sharing-the-making-of-new-interactive-visitors-experiences/>

intersected with debates surrounding participation and digital technologies, but the focus is often placed on outcomes than on how collaboration is implemented and on the process of using digital technologies (Arrigoni et al, 2019; Knudsen and Olesen et al, 2020; Mason and Vavoula, 2021).

Few methods have been proposed for implementing collaboration within digital heritage projects, which advocate for the involvement of all relevant parties (including users) from the start of the design process (even before the formulation of any conception of the system to be developed); in this way, users are transformed into producers (see for example Olesen et al, 2020). Building on this work and as Arrigoni et al (2019, p.2-6) argue, the new modes of collaboration based on digital technologies (between museum professionals, and between museum professionals and external parties) require new knowledge and strategies to enable museums to autonomously design digital tools (including upskilling and collaboration); this can lead to sustainability. Along this line, Mason and Vavoula (2021, p.4), propose a new research agenda for “digital heritage design that refocuses attention from the outcome (what is being designed) to the process (how it is designed)” and how this is embedded in the organizational culture of the institution and digital innovation. Crucially, the practice of “designing” (innovation as a process) and the effect it can have on the success of a digital tool (innovation as an outcome) has not received a sustained analytical focus.

This new research agenda is being adopted by the ReInHerit project to identify the motivations, bottlenecks, and opportunities of the innovation process contingent to the heritage sector with a clear focus on the outcome of innovation. Importantly, this stage of primary research has been aligned with “T3.1 National Surveys on current state-of-the-art tools” to gather qualitative data from academic and scientific institutions/companies active in ICT on the available tools and the ways they are applied to museums/heritage sites. At this stage, it was most crucial to involve members of the ReInHerit consortium, as experts in the field, to lay solid foundations for the:

1. Co-creation of the ReInHerit outputs in WP3 (Toolkit), WP4 (Digital Hub) and WP6 (Pilot Phase) through active dialogue with stakeholders of the sector in the form of focus groups.
2. Establish the digital ecosystem of heritage stakeholders, initiated in the first phase of focus groups.

This mode of working has allowed us to:

- Develop cross- and multi-professional teams that enable learning and getting new perspectives for developing digital tools
- Explore tangible ways for enabling the innovation process in smaller museums
- Ensure cooperation between ICT professionals (the technical experts) and content producers (museum and CHS professionals)

In other words, the focus groups are utilized as an open design space for collaboratively developing the ReInHerit project with external and internal stakeholders.

### 3. Methodology & Implementation of the Focus Groups

The methodology used in the primary research phase of the project can be characterized as applied qualitative policy research (Ervin, 2005; Hakim, 2000; Patton, 2002). The purpose of the research is, thus, primarily exploratory, with an aim to develop explanations at the level of meaning and descriptions which are based on the perspectives of the research participants. The utilization of an applied qualitative research approach is also in line with promoting an active participation of all relevant project stakeholders and contributing to the creation of bottom-up solutions, an aim stated in the grant agreement.

This qualitative approach produced detailed, information rich and extensive data. This type of research approach is ideal when the aim is to address research questions that require explanation or understanding of social phenomena and their contexts (Denzin & Lincoln, 2000). In selecting research participants, the researcher utilized information-oriented sampling in which informants are deliberately selected based on pre-defined criteria or because they are a rich source of data for the phenomenon being studied and are particularly knowledgeable about or experienced with the phenomenon. This type of sampling is especially appropriate for exploratory studies and situations where depth of information is valued over breadth (Cresswell & Plano Clark, 2011). In addition, participants were selected on the basis of availability and willingness to participate, and the ability to communicate experiences and opinions in an articulate, expressive and reflective manner (Bernard, 2002).

Depending on how the discussion goes in a focus group interview it may mean that all questions listed in the protocol will not be able to be handled during the interview. The facilitator moderated the discussion, but because interview situations are dynamic, they cannot always be fully controlled. Each interview situation is unique in terms of the dynamic between the participants and how they influence each other's outputs in the interview situation.

#### 3.1. The Focus Group Interview Questions

An interview protocol was used (see appendix 1) that defined the role of the moderator, as well as the role of other consortium members that participated in the interviews in a supporting role. In each focus group interview session, there was one person from UNIFI (WP3 Leader) and one person from BoCFF (Task Leader of T3.1) present as this stage of focus groups were aligned with requirements of T3.1. For developing the basic structure of the questions, the model of "innovation as a process" and "innovation as an outcome" with their respective requirements, as proposed by Urbinati (2021), was used. The questions for the focus group interviews were developed through a collaborative process involving BoCFF, UNIFI and Arcada. As the subject of the interview dealt with digital tools and needs, the input and subject area expertise of UNIFI was essential. The final product was an interview protocol with open-ended and semi-structured interview process that functioned as a guideline for how the focus group interviews were to be conducted.

### 3.2 Focus Group Implementation, Protocol and Moderator Role

The focus group interviews (lasting 1,5 hours each) were conducted online, using a Zoom connection, during the month of March 2022 (interview dates: 18, 21, 22, 23 & 31.3). The total number of focus group interviews conducted in this second phase of task 2.1 was 5 with 5-8 participants attending each interview (for exact number of attendees in each focus group interview please refer to the table in section 3.3).

**The total number of respondents in all five focus group interviews was 38 representing 10 European countries (Austria, Croatia, Cyprus, Finland, Greece, Italy, Spain, Sweden, Switzerland, The Netherlands).**

All the interviews were conducted in English. Before the interviews started the participants were, once again, informed about the confidentiality of the interview process, that the interview would be recorded and that the recordings would be destroyed after they have been transcribed and anonymized.

An interview protocol was produced for the focus group interviews (see Appendix 1). It outlined the process of the focus group interview, roles of the participants and a time schedule framework for the duration of the interview. A notable difference, compared to the first round of interviews, was that the interview time was reduced to 1,5 hours. In the first focus group interviews the interviews were too long (2 hours), which places high demands on concentration, particularly when it comes to online group interviews. In addition to the moderator, who is the researcher in charge of this task in Work Package 2, there were two interview assistants present, one from BOCCF and one from UNIFI. The interview assistants wrote notes of the session and moderated the chat function.

#### Protocol and Moderator Role

The focus group interviews followed this structure:

- Welcome and presentation of ReInherit by the moderator
- Participants introduce themselves briefly, first name, title and organization
- Interviewer tells the participants about the process and the instructions for Zoom communication
- Discussing questions 1-2
- Concluding the discussion

The moderator oversaw the facilitation of the discussions, ensuring that all participants got to speak, controlling dominance in the discussions, summarizing themes, and probing. Although an interview protocol is in use, it is impossible to fully control how the interviews proceed – it is a dynamic process that varies depending on the composition and dynamics of the groups interviewed.

### 3.3. Participant Recruitment

Participants were recruited with the help of the partner organizations. Project partners were given a set of instructions on the selection criteria per the grant agreement and were asked to send a shortlist of candidates based on selection criteria outlined below. In selecting candidates for the shortlist, the partners were requested to make sure to provide a selection of persons of diverse professional backgrounds. The selection criteria were as follows:

1. Participants must be directly related to the CH sector and be from the stakeholders that officially manage cultural heritage i.e. museum and heritage site professionals, officers from public authorities, non-governmental entities and researchers. They must work in different types of museums and heritage sites (e.g. archeological, science, art, history, etc.), public authorities and NGOs or companies offering digital services and products to museums and cultural heritage sites (ICT professionals).
2. The participants must cover different geographical contexts (local, national, European) of the partner institutions.
3. Consortium members
4. Professionals from ICT companies active in the heritage sector

**Table 1. Composition of participants in the focus group interviews**

Focus group 1	Focus group 2	Focus group 3	Focus group 4	Focus group 5
Academic researcher, Austria	Academic researcher in ICT, Italy	CH professional, Austria	Public authority/ NGO Officer, Greece	Academic researcher, Italy
ICT professional, Cyprus	Academic researcher, Greece	Academic researcher, Cyprus	Public authority/ NGO officer, Greece	CH professional, Netherlands
CH professional, Spain	Academic researcher, Italy	Academic researcher, Italy	Academic researcher in ICT, Italy	ICT professional, Greece
Academic researcher, Italy	ICT Professional, Greece	Academic researcher, Finland	Academic researcher in ICT, Cyprus	Academic researcher, Greece
ICT professional, Italy	Public authority/ NGO officer, Italy	ICT professional, Cyprus	ICT professional, Cyprus	CH professional, Croatia
Academic researcher, Sweden	CH professional, Cyprus	ICT professional, Italy	CH professional, Netherlands/ Italy	

ICT professional, Finland	Academic researcher in ICT, Switzerland	ICT professional, Greece	CH professional, Spain	
Academic researcher, Greece	CH professional, Greece		CH professional, Spain	
ICT professional, Cyprus	ICT Professional, Netherlands			
Academic Researcher, Cyprus				
<b>10 persons</b>	<b>9 persons</b>	<b>7 persons</b>	<b>8 persons</b>	<b>5 persons</b>

### 3.4. Risk Mitigation

Proper buffer time for this WP was taken into account but, as the recruitment of participants is a time-consuming process, the actual implementation of the starting of the focus group interviews took longer than expected. The transcribed material amounted to 78 typed pages of material, which also posed a challenge timewise to go through and analyse in order to report on the outcomes of this research phase. The risk was mitigated by the BoCFF by employing a research assistant to transcribe the material and by conducting the analysis of the results of the focus group interviews.

### 3.5. Ethics Compliance and Data Management

The information sheets, the procedures of obtaining informed consent from participants, and the anonymization of data was carefully planned beforehand, following the instructions of the Ethics and Data Management Plan and the Ethics Requirements of the project. An additional central aim was to ensure that GDPR standards were diligently followed. The interviews were recorded via Zoom and stored onto the local drive of the computer of the facilitator (Arcada) and have been sent via secure transfer and stored, in their anonymised format, in the BOCCF secure server for the duration of the project. Also, the consent forms that participants filled out prior to the interview are stored on the safe server. The anonymised interview transcriptions have been made available to all partners.

Participants were asked to fill out and sign a consent form, along with an information sheet, that was distributed to them with the initial invitation letter sent out to them. The invitation letter and consent form described the overall objectives of the ReInherit project, information on the consortium members, a brief outline of the challenges facing the cultural heritage sector and why the project wishes to collect the perspectives of professionals working in the sector, as well as information on the process of the focus group interview (who is moderating, duration of the interview, that it will be recorded and transcribed, that it will be conducted through the means of a digital platform and what types of issues will be discussed in the focus group interview). They were also sent the data processing and retention policy, a description

of how the interview material would be used, how it would be stored and that the data derived from the interviews would be anonymised. The moderator and focus group interview assistants were required to sign a non-disclosure agreement.

To ensure anonymity of the focus group participants, the latter are referred to only in terms of their affiliation (public authority, museum, heritage site, ICT industry etc) and the country they work. Additionally, any mention of names or specific institutes will be removed in the transcripts. Country references will be preserved as they have a bearing on our understanding of the geographical similarities or differences on what is happening in the museum and cultural heritage sector in the whole of Europe.

## 4. Results and Analysis

### 4.1 Analytical Strategy

The analytical strategy used was driven by the practical concern of identifying the contingent activities during the process of implementing digital tools (innovation as a process) and of how to valorize digital tools (innovation as output). The main themes identified/chosen are, thus, in line with the interview questions posed.

Whole group analysis, which treats the data produced by a group as a whole in each focus group without delineating individual contributions, was employed by using the narrative content of the focus groups (no disputes arose, and participants agreed with each other). Kinesthetic movements could not be analyzed due to the online format of the focus groups (many times the cameras were turned off due to technical issues). First, the data from each focus group were categorized to assess whether saturation has been reached and, second, all the focus group data were combined to become the unit of analysis. The data was analysed using thematic manual content analysis using cross-sectional code and retrieve methods. This method entails that the researcher devises a common system of categories, which is applied manually across the whole data set and is used as a means of searching for and retrieving chunks of labeled data (Mason 2002). Thematic content analysis enables the researcher to investigate relationships, meanings and consequences found in the material. The content analysis was conducted with a data driven approach and using an inductive strategy, which means that the main categories of analysis identified were derived from the material itself (Strauss & Corbin 1998). Following Spiggle's (1994) approach, for the researcher, analysis is performing specific actions on the data, categorizing the beliefs of the participants in the focus group interviews. The researcher has followed the three-step approach proposed by Miles, Huberman and Saldana (2014), which involves reducing the data, visualizing it and drawing conclusions with the data.

The data has been analysed in relation to identifying recurring themes, comparison of themes and by considering the themes and issues presented in the grant proposal based on current literature. In the interviews many of the themes blended into each other and it is difficult to strictly categorise the information into just one of the analytical categories that were used when going through the transcripts. The degree of stress placed on certain themes varied from interview to interview. This resulted in a variation in terms of the stress placed on some issues above others and difficulty in quantifying the degree of importance assigned to various

themes. It is not, however, the goal of qualitative research to create numerical values, but to provide depth of description and show variation and particularity of themes in the material. It will bring cultural insight, reshape perspectives and make sense of the human complexity inherent in the field of cultural heritage management (Hasbrouck, 2018).

The information presented in this section of the report is a direct reflection and description of thoughts that the focus group interview participants expressed during the interviews. The leader of the deliverable and the Project Researchers at BoCFF worked with the material to categorise it thematically, combining similar viewpoints presented by participants. When it comes to recommendations and suggestions, the leader of the deliverable and the Project Researchers at BoCFF have drawn these from the discussions.

## 4.2 Results

In this section the categorization of data in each focus group will be presented showing the themes and, the emerged subthemes, from this process:

### 4.2.1. Question 1 – Innovation as a Process



**Fig. 2 Question 1 Themes and Subthemes**

The subtheme of **front-end management** relates to the mechanisms of the innovation process, i.e. the adoption of digital technologies, and the **back-end**, i.e. the leveraging of digital technologies for the users based on current heritage values (for these definitions see Urbinati et al , 2022). As it will be seen, the mechanisms of developing digital capabilities and managing boundaries during innovation transverse the whole process.

**Table 2 Focus Group 1, Innovation as a Process**

<b>Digital Innovation as a Process</b>	<b>Theme 1 Motivations</b>	<b>Theme 2 Barriers</b>	<b>Theme 3 Enablers</b>
<b>Subtheme 1 Front-end:</b>	<p><b>Digitalization of collections</b></p> <p><b>Increase of revenues</b></p>	<p><b>Digital Tools Development and Maintenance Resources</b> (cost, aim, ownership and expertise)</p> <ul style="list-style-type: none"> <li>- Knowledge gap on business requirements between ICT and CH professionals</li> </ul>	<p><b>Digital Tools Development and Maintenance Resources</b></p> <ul style="list-style-type: none"> <li>- Training</li> <li>- Open-source platforms</li> <li>- Active dialogue between ICT and CH professionals</li> <li>- Set aims for developing apps</li> </ul>
<b>Subtheme 2 Back-end</b>	<p><b>Enhance Heritage Experience</b></p> <ul style="list-style-type: none"> <li>- Provide personalized visitor experience</li> </ul> <p><b>Marketing Tool</b></p> <ul style="list-style-type: none"> <li>- Increase visitors</li> <li>- Digital Communication</li> </ul> <p><b>Access</b></p> <ul style="list-style-type: none"> <li>- Provide remote access</li> </ul>	<p><b>Heritage Interpretation</b></p> <ul style="list-style-type: none"> <li>- Gap between professionals and visitors on how to experience heritage</li> </ul> <p><b>Multitude of audiences</b></p> <ul style="list-style-type: none"> <li>- Variety of digital competencies and learning styles</li> </ul>	<p><b>Digital Tool Design for enhancing User Experience</b></p> <p>immersive experience that is memorable and triggers emotions</p> <p>new layers made possible only digitally</p>

**Table 4 Focus Group 2, Innovation as a Process**

Digital Innovation as a Process	Theme 1 Motivations	Theme 2 Barriers	Theme 3 Enablers
<b>Subtheme 1 Front-end</b>	<p><b>Collection Management</b> - Visibility of objects that are not displayed</p> <p><b>Analytics &amp; Feedback</b></p> <p><b>Collaboration with other CH professionals</b></p>	<p><b>Development and Maintenance Resources</b> - High cost related to the content and innovative technologies that create personalized experiences - Apps become obsolete soon and no museum can maintain them - Apps are not one-time solution to be developed and used without supervision or maintenance</p>	<p><b>Development and Maintenance Resources</b> - Collaboration with CH professionals - Automize curating tasks that reduce costs</p>
<b>Subtheme 2 Back-end</b>	<p><b>Enhance Visitor Experience</b> Examples: - Create personalized visitor experience - Create multisensory experience that triggers emotions - Digital learning activities - Different Interpretations</p> <p><b>Marketing Tool</b> Increase Visitors</p> <p><b>Access</b> - Inclusive - Easy - Providing remote access - Increasing visibility</p>	<p><b>Digital Tool Design</b> - Readymade and static Apps that are not linked to what users are used to</p>	<p><b>Digital Tool Design for enhancing User Experience</b> - Accessibility - Interoperability - Memorable - Dialogue with artefacts and audiences - Interactive</p>

**Table 5 Focus Group 3, Innovation as a Process**

Digital Innovation as a Process	Theme 1 Motivations	Theme 2 Barriers	Theme 3 Enablers
<b>Subtheme 1 Front-end Management</b>	<p><b>Collection Management</b> - Digitalization of Collections for preservation, provide context and connect with other artefacts that enhance research</p> <p><b>Analytics &amp; Feedback</b> - Data strategies</p> <p><b>Increase revenues</b></p>	<p><b>Development and Maintenance Resources</b> - High cost related to encoding, training and preparing for an AI system - Manage expectations of heritage professionals - Apps become obsolete soon and small-/medium-sized museums cannot maintain them - Images and videos produced by digitalization of collections with older technologies are not reusable because devices that used to keep them are not working</p>	<p><b>Development and Maintenance Resources</b> - Develop reusable tools with minor costs to different users - Develop a business model - Open Source-use existing platforms , work process - Create modular systems or templates that only content changes</p> <p><b>Analytics &amp; Feedback</b> - New data infrastructures from sensors to create new accountabilities and relations</p> <p><b>Small Digital Teams</b> - UI/UX designers - Heritage professional with basic IT skills to know exactly what is needed for outsourcing - Heritage professional to evaluate audience feedback</p> <p><b>Training-Digital Literacy</b> - Communication Skills - Development Skills (UI/UX, coding)</p> <p><b>Change mindset of the organization</b> <b>Share knowledge from larger museums</b></p>

<p><b>Subtheme 2 Back-end Management</b></p>	<p><b>Enhance Visitor Experience</b>  Examples:  - Digital learning activities through gamification  - Different Interpretations of object  - Create experience that wouldn't be possible with traditional media  Interact with artefacts on different levels</p> <p><b>Access to Collections</b>  - Visibility of artefacts that are in storage and would be otherwise hidden  Inclusive</p> <p><b>Crowdsourcing for knowledge production</b></p>	<p><b>Heritage Experience</b>  - Static</p>	<p><b>Digital Tool Design for enhancing User Experience</b>  - Immersive  - Interactive</p>
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**Table 6 Focus Group 4, Innovation as a Process**

Digital Innovation as a Process	Theme 1 Motivations	Theme 2 Barriers	Theme 3 Enablers
<p><b>Subtheme 1 Front-end</b></p>	<p><b>Collection Management</b>                      - Digitalization of Collections for preservation and for displaying objects that are in storage, provide context to looted artefacts and connect with other artefacts that enhance research</p> <p><b>Interdisciplinary Approach</b>                      - Collaborative remote research                      International partnerships</p>	<p><b>Development and Maintenance Resources</b>                      - Small and local museums are intimidated by the development process                      - Collection databases are not standardized and each one requires different information which is time-consuming and requires resources from museums                      - Property rights (IPR) which prevents museums from sharing                      - Applications become obsolete soon after development</p>	<p><b>Development and Maintenance Resources</b>                      - Interoperability -use and reuse data with verification of the fairness of the metadata so they can't be moved/used in another platform/device                      - Define the minimum viable product                      - Develop a long-term strategy based on modular design that can be expanded slowly and sustainably in context                      - Standardize database information, common agreement/checklist of what this should be</p> <p><b>Training-Digital Literacy</b>                      - Digital strategy management skills                      - Market research skills                      - Develop a university-level curriculum to train heritage students</p>
<p><b>Subtheme 2 Back-end</b></p>	<p><b>Enhance Visitor Experience</b>                      Examples:                      - Recreate the story of the object (tangible and intangible features) at the heritage site and museum --                      &gt; the visitor is inspired to go visit</p>		<p><b>Digital Tool Design for enhancing User Experience</b>                      - Recombine data (interoperability) to create new stories and narratives and community-driven exhibitions (visitors can recombine data)</p>

the respective site or museum

- Create stronger emotional connections
- Cultural mediation for reflection
- Create adventures for locals
- Make learning material more memorable with a creative story-telling approach to inspire children to learn more/pick up an interest

**Access to Collections**

- Visibility of artefacts that are in storage and would be otherwise hidden
- Inclusive

**Marketing Tool**

- Increase audiences

**Communication**

- Through visual means and images deriving from 3D imaging (fast images and broader scope)
- Promote inclusion representing many different voices (incl. professionals)
- Share narratives on social media about the different parts of the museum visit journey

**Table 7 Focus Group 5, Innovation as a Process**

Digital Innovation as a Process	Theme 1 Motivations	Theme 2 Bottlenecks	Theme 3 Enablers
<b>Subtheme 1 Front-end</b>	<p><b>Increase of revenue</b></p> <p><b>Interdisciplinary Approach</b></p> <ul style="list-style-type: none"> <li>- Collaborative remote research</li> <li>International partnerships</li> </ul>	<p><b>Development and Maintenance Resources</b></p> <ul style="list-style-type: none"> <li>- Lack of knowledge by heritage professionals on the development process</li> <li>- Communication barrier between different types of experts due to the lack of knowledge</li> <li>- High cost and time-consumption for developing and maintaining digital tools</li> <li>- Lack of digital strategy and implement tools that professionals can't control</li> </ul>	<p><b>Development and Maintenance Resources</b></p> <ul style="list-style-type: none"> <li>- Develop digital applications that can be used for different purposes for minor costs</li> <li>- Invest time and resources to evaluate existing apps before proceeding to the next steps</li> <li>- Set realistic goal with simple means but powerful impact</li> <li>- Set a maintenance approach</li> <li>- Understand the monetary value of digital apps for increasing revenues</li> </ul> <p><b>Analytics &amp; Feedback</b></p> <ul style="list-style-type: none"> <li>- Apps that can collect data from users similar to market research</li> </ul> <p><b>Training-Digital Literacy</b></p> <ul style="list-style-type: none"> <li>- Development Process</li> </ul> <p><b>Collaboration</b></p> <p><b>Green Technology</b></p> <ul style="list-style-type: none"> <li>- Consider impact on and protection of environment</li> </ul>

<p><b>Subtheme 2 Back-end</b></p>	<p><b>Enhance Visitor Experience</b>  Examples:  - Different layers of information with appropriate and more visual language (new language for younger audiences)  - Deepen knowledge and understanding of collections  - Experience objects in different ways and closer that wouldn't be possible physically through the glass (like a magnifying glass)  - Create alternative spaces for interaction with the artefacts and create many different layers of realities that couldn't be done physically  - Develop different methods of learning for different types of users</p> <p><b>Democratizing Tool for Access to Collections</b>  - Easy access to the collections for different age-groups and across the globe  - Transition of focus from developing technologies for internal use to design for the</p>	<p><b>Access to Internet</b>  - There is not equal access to good and fast internet connectivity</p>	<p><b>Digital Tool Design for enhancing User Experience</b>  - Multilingual, shorter, faster content  - Bring your own device model so that visitors have choice  - For young audiences who consume fast, digital and have the freedom to choose, format the content to what they are used to (e.g. Tik Tok, Instagram)  - Simple and Visual  - Learn from younger generations (e.g. YouTubers) how to make it appealing, understandable and easy to access</p> <p><b>Open Design Space</b>  - Create digital open design spaces where schools can visit remotely museums and interact with them (not through pre-recorded material)</p>
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public

**Marketing Tool**

- Increase of different types of audiences
- Make visitors of the heritage site to come and visit the museum

**Communication**

- Through visual means and images
- Promote inclusion representing many different voices (incl. professionals)

Overall Focus Group Phase 2 Innovation as a Process

Digital Innovation as a Process	Theme 1 Motivations	Theme 2 Barriers	Theme 3 Enablers
Subtheme 1 Front-end	<p><b>Collection Management</b> (preservation and visibility)</p> <p><b>Interdisciplinary &amp; Collaborative Approach</b></p> <p><b>Increase of Revenues</b></p> <p><b>Analytics &amp; Feedback</b></p>	<p><b>Digital Tools Development and Maintenance Resources</b></p> <ul style="list-style-type: none"> <li>- Cost to develop/maintain/train, maintenance, apps become obsolete quickly, property rights, lack of knowledge on business requirements from both ICT and CH professionals, not reusable data created from older technologies, communication barrier between experts, adoption of tools that small museums cannot control</li> </ul>	<p><b>Digital Tools Development and Maintenance Resources</b></p> <ul style="list-style-type: none"> <li>- Digital strategy implementation, define minimum viable product, interoperability, open-source approach, modular template, reusable tools, develop business models, standardize language for databases</li> </ul> <p><b>Training-Digital Literacy</b></p> <ul style="list-style-type: none"> <li>- Digital strategy management skills</li> <li>- Market research skills</li> <li>- Develop a university-level curriculum to train heritage students</li> <li>- App development skills</li> <li>- Communication skills</li> <li>- IPR</li> </ul> <p><b>Analytics &amp; Feedback</b></p> <p><b>Change mindset of the organization</b></p> <p><b>Collaboration</b></p> <p><b>Green Technology</b></p>

<p><b>Subtheme 2 Back-end Management</b></p>	<p><b>Enhance Visitor Experience</b> (multisensory, immersive, layers of interaction and information, new realities) <b>Access to Collections</b> (inclusive and remote) <b>Marketing Tool</b> <b>Communication, Crowdsourcing for knowledge production</b></p>	<p><b>Heritage Experience</b> - Static, gap between visitors and professionals, variety of digital competencies <b>Access to Internet</b> - There is not equal access to good and fast internet connectivity</p>	<p><b>Digital Tool Design for enhancing User Experience</b> - Recombine data (interoperability) to create new stories, immersive, create emotional relationships, accessible, interactive, multilingual, simple, visual <b>Open Design Space</b> - Create digital open design spaces where schools can visit remotely museums and interact with them (not through pre-recorded material)</p>
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#### 4.2.2. Question 2-Innovation as an Output



**Fig. 3 Question 2, Innovation as an Output**

The subthemes of Organizational Structure & Development and Audiences as active participants in heritages refers to the valorization of digital innovation in heritage sites and museums that address specific needs of the sector. These subthemes clearly show the current human-centered and multistakeholder approach to heritage and the different levels of interactions that must be achieved through agile and flexible organizations in order to realize the active participation of different types of audiences.

**Table 8 Focus Group 1, Innovation as an Outcome**

<b>Innovation as an Outcome</b>	<b>Theme 1 Values</b>	<b>Theme 2 Practices to attract visitors</b>
<b>Subtheme 1 Organizational Structure &amp; Development</b>	<p><b>Multidisciplinary collaboration</b> for digital design</p> <p><b>Improvement of collection management</b> through good digital systems (e.g. risk analysis)</p>	<b>Multidisciplinary collaboration</b>
<b>Subtheme 2 Audiences as Active Participants in Heritage</b>	<b>Democratic approach that focuses more on people than objects</b>	<b>Digital Tool Design</b> <b>Interactive Heritage Environments</b> through reinterpretation and gamification

**Table 9 Focus Group 2, Innovation as an Outcome**

<b>Innovation as an Outcome</b>	<b>Theme 1 Values</b>	<b>Theme 2 Practices to attract visitors</b>
<b>Subtheme 1 Organizational Structure &amp; Development</b>	<p><b>Professional Upskilling</b></p> <p><b>Changing organization mindset and structure that enables co-creation</b></p> <p><b>Collaboration</b></p> <ul style="list-style-type: none"> <li>- Efficient collaboration between heritage professionals</li> <li>- Multidisciplinary collaboration</li> </ul>	<b>Multidisciplinary collaboration</b>
<b>Subtheme 2 Audiences as Active Participants in Heritage</b>	<p><b>Democratization and co-creation</b></p> <ul style="list-style-type: none"> <li>- Increase visibility</li> <li>- Opening up the dialogue with audiences</li> <li>- Changing visitors' mindset that can become co-creators</li> </ul>	<b>Digital Tools Design</b>

**Table 10 Focus Group 3, Innovation as an Outcome**

Innovation as an Outcome	Theme 1 Values	Theme 2 Practices to attract visitors
<b>Subtheme 1 Organizational Structure &amp; Development</b>	<p><b>Optimize internal processes</b></p> <p><b>Collaboration</b></p> <ul style="list-style-type: none"> <li>- Efficient collaboration between heritage professionals</li> <li>- Multidisciplinary collaboration</li> </ul>	<p><b>Business model that automatically learns from its users</b></p>
<b>Subtheme 2 Audiences as Active Participants in Heritage</b>	<p><b>Democratization and co-creation</b></p> <ul style="list-style-type: none"> <li>- Inclusivity</li> </ul>	<p><b>Digital Tools Design</b></p> <ul style="list-style-type: none"> <li>- Learning through play</li> <li>- New experiences</li> <li>- Remote access to collections and learning</li> <li>- New language of communication (visual, through art)</li> </ul>

**Table 11 Focus Group 4, Innovation as an Outcome**

Innovation as an Outcome	Theme 1 Values	Theme 2 Practices to attract visitors
<b>Subtheme 1 Organizational Structure &amp; Development</b>	<b>Multidisciplinary Collaboration</b>	<p><b>Collaborations with creative people and technological professionals to develop an open experiences and the communication guidelines to be reused by other museums.</b></p> <p><b>Sharing resources</b></p>
<b>Subtheme 2 Audiences as Active Participants in Heritage</b>	<p><b>Democratization and co-creation</b></p> <ul style="list-style-type: none"> <li>- Inclusivity</li> <li>- Sense of belonging</li> <li>- Relevant to local audiences</li> </ul>	<p><b>Collaborations with Museum Associations &amp; public authorities for raising awareness</b></p> <p><b>Digital Tools Design</b></p> <ul style="list-style-type: none"> <li>- Redesign space to create emotional connections and memorable events</li> <li>- Creative story-telling</li> <li>- Travelling program outside of the museum walls to attract visitors</li> </ul>

**Table 12 Focus Group 5 Innovation as an Outcome**

Innovation as an Outcome	Theme 1 Values	Theme 2 Practices to attract visitors
<b>Subtheme 1 Organizational Structure &amp; Development</b>	<b>Collaboration</b> - Sharing resources with other professionals	<b>Feedback and Analytics</b> - Big data to engage audiences
<b>Subtheme 2 Audiences as Active Participants in Heritage</b>	<b>5-tier value process</b> collections value (enhance the value of objects), the experience value (see objects from different values), the connecting value (connect collections with different audiences and ensure inclusion), the educational value (layering information to have returning audiences), and the economic value (make revenue).  <b>Create loyalty</b>	<b>Digital Tools Design</b> - Personalized visits to inspire visitors to become loyal customers - Connect heritage sites and museums for engaging tourists - Use AI to adjust learning material to different needs

**Table 13 Overall Focus Group Phase 2 Innovation as an Outcome**

Innovation as an Outcome	Theme 1 Values	Theme 2 Practices to attract visitors
<b>Subtheme 1 Organizational Structure &amp; Development</b>	<ul style="list-style-type: none"> <li>- Multidisciplinary collaboration</li> <li>- Improvement of collection management</li> <li>- Professional Upskilling</li> <li>- Changing organization mindset and structure that enables co-creation</li> <li>- Optimize Internal Processes</li> </ul>	<ul style="list-style-type: none"> <li>- Multidisciplinary collaboration</li> <li>- Analytics and Feedback</li> <li>- Sharing resources</li> </ul>
<b>Subtheme 2 Audiences as Active Participants in Heritage</b>	<ul style="list-style-type: none"> <li>- Democratization and co-creation</li> <li>- Loyalty</li> <li>- Inclusion</li> <li>- Relevant to local people</li> <li>- Financial</li> <li>- Educational</li> </ul>	<p>Digital Tool Design Interactive Heritage Environments through reinterpretation, immersion, interactivity, new language of communication, personalized visits and gamification</p>

## 5. Discussion & Recommendations

The respondents in the interviews represented a small cross section of professionals working in the cultural heritage sector and the views presented are particular to the contexts they have been working in and the educational background and life experience each of them has. With a different set up of individuals we would have received slightly different kinds of answers. Nevertheless, they presented views that are an indication of the emerging trends in the sector. The pandemic situation has affected the sector in a drastic manner in terms of resources, ways of working and overall philosophical questions related to the role, mission and meaning of museums and cultural heritage (Nemo 2021; ICOM 2021). Many of these are also long-term issues that have been present in the sector for years and have now been accentuated during the pandemic. Breaking silos and seeking out new, diverse and unconventional partners is needed in the sector. In the current situation, and particularly in the post-COVID era, museums and CHS have come to realize the importance and potential of using innovative models and means of connecting to potential partners and to publics. This insight has also been mentioned in recently published articles and reports (Debono, 2022; Zuanni, 2020; ICOM 2021).

In this section the focus groups results are discussed in relation to the research framework of WP2, that being four questions that correspond to key aspects of digital heritage management. By aligning the results with these questions, valuable conclusions and recommendations can be drawn, which are crucial for the development of the strategies in WP3 (ReInHerit Toolkit), WP4 (Digital Hub) and WP6 (Travelling and Digital Exhibitions Pilot Phase). The alignment of the results in WP2 with the ReInHerit outputs in WP3, WP4 and WP6 will ensure the implementation of the innovation process and outputs.

The four questions that act as the WP2 research framework are:

Question 1 Who is the audience? What bottlenecks have been identified for engaging them?
Question 2 How can we successfully reach these audiences?
Question 3 Through which means can emerging technologies enable active participation?
Question 4 What types of emerging technologies are needed for management and planning?

The results of this stage of the focus groups provide a map of the activities, challenges and motivations for adopting (innovation as a process) and leveraging digital tools (innovation as an output) which **give insights for the third and fourth question** with references to the first two. The third question is directly linked to the back-end of heritage management and the fourth question to the front-end of heritage management.

## Back-end of Heritage Management -Through which means can emerging technologies enable active participation?

The outputs of innovation have a dual value for the back-end heritage management, which is directly linked to heritage professionals' motivations:

- 1) For heritage organizations: digitally transform them into agile and flexible organizations that have the means and resources through collaboration and sharing resources to address their needs. This requires a change of organizational mindset.
- 2) For the democratization of heritage, develop: loyalty, inclusive access, connect sites, educational, relevant to local people, younger generations and tourists, access to objects in storage, personalization of visits.

**For the heritage professionals that participated in the focus groups there are two important aspects of back-end management: digital tool design for enhancing user experience through different levels of interaction and open design spaces for collaboration.** This focus is aligned with a human-centred approach to heritage management and requires a reconceptualization of the relationship between heritage and audiences.

### 1. Digital Tool Design for enhancing User experience (Features of digital tools)

#### Format of Content

- Simple but powerfully designed ideas taken out of real-life challenges in a visual format.
- Introduce a new language: using sentences the digital format of new channels such as Tik Tok and of Instagram for the younger audiences (teenagers and in their 20s) who are used to these. This is very important for the new generation who consume digitally.

#### Narrative Content

- Multilingual
- Different layers of information so that visitors can choose how deep they want their learning to be and when
- Different layers of perspectives for including more voices.
- Creative story-telling approach that can make content memorable and not overwhelming.
- Compliment learning experience on site to make more abstract concepts concrete and to make learning more fun.

## Device

- Bring your own device model so that people have the freedom to choose their content; this is particularly relevant for the new generation (teenagers and young people in their 20s) consume digitally.
- Also, use more traditional technologies such as audio tours to appeal to older generations.

## Applications

- Bring visitors eyes closer to the objects than physical eyes can (like a magnifying glass) to deepen knowledge and understanding of collections
- Provide experiences that are not possible with traditional media. Simulate the true environment and they create alternative spaces for interaction with the collections or with the themes that the collections carry with them.
- Connect objects in museums with their context in heritage sites and recreate the story behind this (history, community, traditions). This also touches the issue of illicit trafficking and difficult heritage. Visitors at the museums learn about the heritage site and would like to visit it and vice versa.
- Community-driven exhibitions by allowing visitors to combine and recombine artifacts with their context and their stories into new narratives. This will allow space for more interpretation (also in relation to contested heritage for locals).
- Gamification-develop applications that ask you to play with something instead of only looking at it (look at it from multiple perspectives and points of view). For example, the player makes decisions based on dilemmas and this can prompt discussions and create a community. Commercial gamification is useful in this approach (e.g. Minecraft and escape rooms).
- Provide some form of attentional focus and guidance for the visitor and adapt information to visitors using AI
- Expand the visitor experience and put the museum into a wider journey and experience by integrating with other digital or other experiences that visitors might have.
- Eliminate the distance between visitors and museums ("like the story behind the statue, you could just read about it") by interacting with the stories (e.g scan a QR code, objects talk to visitors) so that visitors return to the museum?

## 2. Open Design Space

- Collaboration between heritage professionals and younger generations, who have developed interesting ways to communicate different subjects, for example YouTubers, for learning how to make content appealing, understandable and easy to access.
- Create online spaces where heritage professionals can get in touch with schools or other types of audiences not only through pre-recorded sessions or digitized content.
- Change visitors' mindsets. Make audiences aware that they can contribute and actively participate in heritage interpretation, they can express their opinions and they are important.
- Rely on reusing, like blocks of interaction with the data and the metadata in order to create new narratives and stories

A quote of an ICT professional in Cyprus is quite useful in understanding how to create an immersive and memorable experience:

“What are the touch points that we will be using with the aim to create an omni channel type of experience?

a) a completely virtual experience or an augmented experience on the spot?

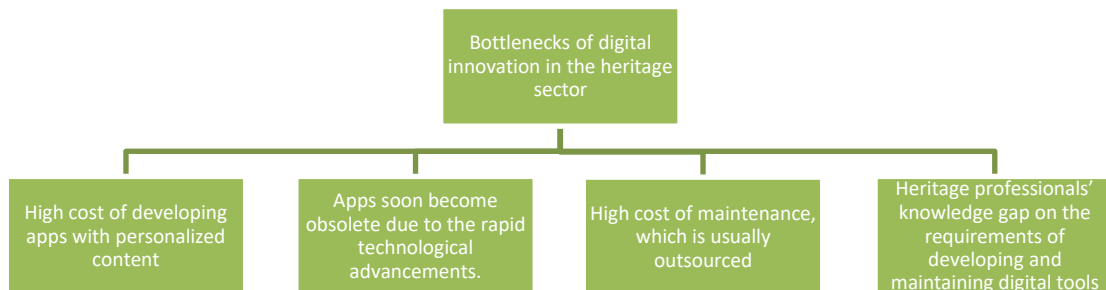
b) how do we contextualize the content and how we interact with it?

c) what is the level of engagement we want for the different end users?

d) what's the unique experience so that visitors get positive emotions from that experience, from that engagement, so that it's memorable.”

**Front-end heritage management- What types of emerging technologies are needed for management and planning?**

Through this co-creation **process 3 parameters for sustainable front-end management have been formulated**, which can be utilized in the ReInHerit project and can be targeted to small- and medium-sized museums/heritage sites. These 3 parameters will enable small- and medium-sized museums/heritage sites to address their current bottlenecks and facilitate the innovation process. **Fig. 4 below outlines the key bottlenecks in the development of digital applications, which the heritage sector does not consider when it jumps into the digital transformation activities.** Digital applications are seen as one-time solutions that have been developed and put to work for the rest of time without any supervision or maintenance. Digital tools development and maintenance are usually outsourced (see D3.1 National Surveys Report). Due to these specific bottlenecks, applications are abandoned either because they have become obsolete or because their maintenance is expensive. As a result, new apps need to be developed and this process requires further use of resources for redeveloping and launching new apps from zero; hindering, thus, the process of digital innovation and its sustainability in the sector.



**Fig. 4 Bottlenecks of Digital Innovation**

**The three parameters for sustainable front-end heritage management and their requirements are: future-oriented digital strategy, collaborations, digital literacy training.** This is supported by surveys conducted as a response to the pandemic situation, which have shown the lack of digital strategy in museums in quantitative data (see Nemo, 2021). Going a step further, the second phase of the ReInHerit focus groups provides valuable qualitative data on the components of a digital strategy or support that could effectively help the museums and make them active agents in digital transformation and innovation. The **horizontal line** that links these three parameters **is the concern for the future and the ability of organizations to use their resources sustainably.** This **future-oriented perspective with a focus on adaptation, education, collaboration, maintenance and reuse, with the aim to maximize the use of existing resources is aligned with a sustainable model of management** (see Morfaw, 2014) and **is crucial for adopting and leveraging digital tools in small- and medium-sized museums/heritage sites.**

## 1. Future-oriented Digital Strategy

### Develop business models

- Understand the business requirements
- Set realistic goals and targets
- Market Research/Identify target audience
- IPR

### Applications Sustainability

- Consider the sustainability of these applications by building apps that can be adapted to various situations.
- Long-term vision of the applications: how they can be reused in different exhibitions and situations
- Develop a maintenance strategy (commercial platforms or open-source platforms)
- Understand the monetary value of digital tools, the worth of the work that was put and how can they increase revenues
- Training requirements for heritage professionals

### Define minimum viable product-Modular design

- Architecture: start small and build on it slowly as funds roll in by creating modular templates
- Be selective and be as impactful with less information
- Easy to learn and handle appropriate for different age groups of professionals (see D2.3 Questionnaires Report for demographics of heritage professionals).
- Modular templates that can be used for different topics and aims (from educational programs to exhibitions) without changing the mechanisms only the content.

### Interoperability

- Not be attached to particular technologies that are available in certain countries only.
- Be able to run on different devices, which is also something that can turn out being very useful. Usability of interfaces

- Verification of the fairness of the metadata, so that everything is reused and can be moved to another collection, platform or tool and become accessible.

#### **Open-source approach**

- Open-source platforms on which developing things, so the further upgrade could be done with a little amount of expenses from museums/heritage sites
- Provide some tutorials, examples, and the sections of the applications that are created by large museums, in order to ease the recreation for the smaller ones. Then open source the work process.

#### **Analytics and Feedback**

- Assessment tools to evaluate if the different digital tools were in a way useful but also followed certain values
- Data infrastructures to understand visitors that can create relations, new relations and new accountabilities. For example, when different sensors produce data the content of the museum can be synchronized with the interest of the people and as such transform it.

#### **Green Technology**

- The use of technology to be sustainable for the environment.

## **2. Training-Digital Literacy**

- Key required skills to close the communication gap between ICT, audiences and heritage professionals: Digital strategy management, Market research, app development, communication, IPR
- Develop a university-level curriculum to train heritage students

## **3. Collaboration between heritage and ICT professionals**

- Involve all stakeholders from the beginning of the design to understand the technical and business requirements of digital tools.
- Collaborations from the early stage of the design process can give heritage professionals as much control in updating and using digital tools as possible.
- Build common digital tools in partnerships so that financial and human resources can be shared.
- Share knowledge by professionals who have experience (problems, mistakes, successes) in the form of guidelines
- Multidisciplinary and transnational collaborations

Three parameters for managing digital innovation emerged through the co-creation process that took place in this second phase of the ReInHerit Focus Groups. The three parameters of future-oriented digital strategy, collaborations and digital literacy training can be formulated into the requirements of a sustainable model of heritage management. The three parameters and their core premises of reusing, educating, and sharing as co-created by heritage stakeholders have the potential of forming:

- front-end management by which museums/heritage sites become active agents and autonomous in their digital transformation so that digital innovation can be sustainable.
- back-end heritage management by which different levels of interactions are created through digital tools for different audiences so that they can become dynamic and loyal stakeholders of the sector in active dialogue with professionals.

**These results will inform the strategies of WP3, WP4 and WP6 of the sector's requirements for the ReInHerit outputs (design, development and maintenance) with the aim ensure the implementation and leveraging of the innovation process during and after the project's lifecycle and promote a sustainable use of digital technologies.**

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## Appendix 1

### **Script: Focus Group Interviews Phase 2**

#### **Roles:**

Susanne Ådahl, Interviewer/facilitator of discussions:

- Provide instructions on the process of the interview, will pose the questions and guide the interview process, keep the discussion on track, ensure focus group participants get to talk in equal measure.
- Presents briefly the ReInherit project and aims of the focus groups, and then leaves the meeting.

Polina Nicolaou/Monika Asimenou, secretary of the focus group process,

- Sit in on the meeting as silent member,
- Make the interviewer aware of who has raised a hand to speak,
- Take notes on the discussions, try to solve any technical problems should they arise, moderate the chat if any questions appear in the chat, keep track of the time (eg. inform when it is time for the break).

#### **Aim of focus group interviews:**

The ReInHerit project will develop a set of innovative tools & practices that will disrupt the current status quo of museums-cultural heritage sites communication and collaboration. The core element of ReInHerit is digital innovation: cooperation is taking place within an open ended design space in the form of a Digital Hub that will sustain a digital ecosystem of cultural heritage stakeholders.

Digital innovation has become pervasive and spans across communities of practice and organizations. The concept of digital innovation as a contingent process of adopting and using digital technologies has emerged.

The digital transformation of the innovation process allows for the implementation of new modes of sharing, creating and applying knowledge and this facilitates new ways of collaboration. Research on this has paid attention to the mechanisms of sustained collaboration between an organization and other stakeholders (such as customers and technology providers). This includes the governance mechanisms within digital innovation, as they change through the process of collaboration and coordination with other stakeholders.

Per the GA and in the context of digital innovation, the primary research collects data on the:

- communication mode between museums and cultural heritage sites, thus identifying bottlenecks and opportunities, and engagement methods, and exchange of good practices
- current needs for new technologies, materials, management tools, legal solutions, IPR management, financing instruments and visitors' and community involvement, to cover these needs with tools developed consequently in the ReInHerit project.

- Current tools employed in the CH sector: gather an up-to-date analysis of technologies that involve AI, computer vision, IoT, cloud-, fog-, edge- and mobile application development, availability of open-source frameworks and tools and commercial tools that have been proved to be commercially and technologically viable. The aim is to select tools that allow to create personalized visits, allow user interaction and learning-by-doing or by gamification.

#### **Schedule:**

11-11:15

Welcome and presentation of ReInherit by Susanne Ådahl, 5 min. (ReInHerit Video)  
 Participants introduce themselves briefly, first name, title and organisation, 5 min.  
 Interviewer tells the participants about the process and the instructions for how to communicate in Zoom and repeats information about their rights (confidentiality, recording of interview, right to answer questions, right to withdraw), 5 min.

11:15-11:45

Discussing question 1

***Digital Innovation as a Process – What are the underlying motivations, bottlenecks and enabling factors of collaboration in digital innovation between small- to medium-sized museums?***

1. What are the main reasons and motivations in applying and using digital tools in a museum or CH site?
2. How to design digital apps and tools in a sustainable way for small/medium sized museums? By design we mean the type of functionalities tools and app should have in the coming (post-pandemic) years ?
3. What type of support is needed for the technological aspects when developing digital tools (and apps) and strategies (in terms of needs and skills) in small/medium sized museums?

Supporting comment:

The ReInHerit project will develop, among other, digital tools (prototypes, apps, and training) for immersive performances, digital educational game, digital exhibitions.  
 Collaboration in the context of digital innovation processes can be the core of sustainable cultural heritage management. A key aspect here is to find a common language that facilitates cooperation.

11:45-12:15

Discussing question 2

***Digital Innovation as an Outcome – How Digital Tools can be transformed into a relational medium between museums/heritage sites and visitors that can lead to co-creation in cultural heritage?***

1. What values can ICT (AI, CV, IoT, etc.) bring to museums and CH sites, considering both visitors and workers?
2. How can museums rethink their relationships with visitors (locals or tourists) through digital technologies to enhance the active role of the visitor?
3. What practices (based on digital tools) can be used to attract and develop communities of visitors and personnel ?

#### Supporting comments

Digital Tools conceptualized as a value co-creation process, which considers the interactions between artifacts, persons, processes and interfaces

A way to enable cross-cultural institution is through the development of cultural tourism, which is in the increase.

12:15-12:30

Concluding the discussion, asking if the participants have anything else to add.