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SPICE

Social cohesion, Participation, and Inclusion through Cultural Engagement

D7.3 CASE STUDIES PROGRESS AND PLAN

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SPICE consortium

No.	Short name	Institution name	Country
1	UNIBO	ALMA MATER STUDIORUM - UNIVERSITÀ DI BOLOGNA	Italy
2	AALTO	AALTO KORKEAKOULUSAATIO SR	Finland
3	DMH	DESIGNMUSEON SAATIO - STIFTELSEN FOR DESIGNMUSEET SR	Finland
4	AAU	AALBORG UNIVERSITET	Denmark
5	OU	THE OPEN UNIVERSITY	United Kingdom
6	IMMA	IRISH MUSEUM OF MODERN ART COMPANY	Ireland
7	GVAM	GVAM GUIAS INTERACTIVAS SL	Spain
8	PG	PADAONE GAMES SL	Spain
9	UCM	UNIVERSIDAD COMPLUTENSE DE MADRID	Spain
10	UNITO	UNIVERSITA DEGLI STUDI DI TORINO	Italy
11	FTM	FONDAZIONE TORINO MUSEI	Italy
12	CELI	CELI SRL	Italy
13	UH	UNIVERSITY OF HAIFA	Israel
14	CNR	CONSIGLIO NAZIONALE DELLE RICERCHE	Italy

Executive summary

This document describes the development of the five (5) Case Studies in relation to the Design as well as the Research and Development Activities since the beginning of the SPICE project. It builds on a framework laid out for the Work Packages and Case Studies in the evaluation protocols (D7.1) and the socio-technical roadmap (D7.2). The co-designed activities conducted so far with the Work Packages targeting the Case Studies are analyzed and proposed activities to be held with the museums' mediators and end-user communities are outlined as well. Each Case Study is examined based on user-experience, human behavior, and heritage experiences towards its end-user communities. The Case Studies progress, plan, and proposed roadmap outlining future co-designed activities is presented.

Document History

Version	Release date	Summary of changes	Author(s) - Institution
V0.1	26/03/2021	First draft released	Aalto, DMH
V0.2	30/03/2021	Elaborated on the Research and Development activities and added more references.	Aalto, DMH
V0.3	23/04/2021	Incorporating feedback from the internal reviewers	Aalto, DMH, IMMA, UNITO, UNIBO
V1.0	28/04/2021	Final edits	Aalto, DMH

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1 – INTRODUCTION TO THE CASE STUDIES

The sites of the SPICE H2020 project cover diverse landscapes including geographic, cultural and linguistically distinct contexts. These are Finland in the Nordic region, Ireland and the United Kingdom in Northern Europe and Spain, Italy and Israel in Southern Europe and the Mediterranean respectively. There are five (5) Case Studies in the project and each one of them involves a museum in a different European or Associated country and they include:

- Design Museum, Helsinki (DMH), Finland
- Irish Museum of Modern Art (IMMA), Dublin, Ireland
- Hecht Museum (HECHT), Haifa, Israel
- Galleria D'arte Moderna (GAM), Turin, Italy
- Museo Nacional de Ciencias Naturales (MNCN), Madrid, Spain

In addition to heritage institutions, there are seven (7) research institutes located at universities of renown accompanied by three (3) business partners that play roles in the work being carried out.

Short name	Institution name	Country
DMH	DESIGNMUSEON SAATIO - STIFTELSEN FOR DESIGNMUSEET SR	Finland
GAM	GALLERIA D'ARTE MODERNA	Italy
HECHT	HECHT MUSEUM	Israel
IMMA	IRISH MUSEUM OF MODERN ART COMPANY	Ireland
MNCN	MUSEO NACIONAL DE CIENCIAS NATURALES	Spain

Table 1: Case studies with their short name.

WP7 coordinates with the Case Studies the course of their development in order to integrate exploration, development, use and testing of tools and methods for citizen curation. The timeline in Table 2 below illustrates the deliverables of WP7 and the case study activities; the current stage of the timeline is also highlighted in green.

DELIVERABLE NUMBER (WP7)	DELIVERABLE	DUE DATE (IN MONTHS)
D7.1	Evaluation methods and protocols.	6
D7.2	Socio-technical (STS) roadmap with project management (PM) tool integrating the Case Studies with **SPICE** systems.	9
D7.3	Case studies progress and plan.	12
D7.4	Review of Socio-technical roadmap with project management tool.	24
D7.5	Case studies progress and plan.	24
D7.6	Case studies are fully operational.	30
D7.7	Case studies final progress and plan - final version.	36

Table 2: WP7 list of deliverables.

Bonding and bridging capital

Case Study	Bonding capital	Bridging capital
DMH	Enable senior citizens and families living far from the museum to engage with culture and share among themselves or with their communities regarding how their personal artefacts and interpretations connect to Finnish culture and design heritage.	Make their artefacts and interpretations available in virtual and touring galleries to provoke understanding and contributions across generations and geographical communities.
GAM	Enable Deaf people and other visitors to actively participate in cultural interpretation and storytelling and connect and share their interpretations through social media functions.	Enable the contributions of Deaf people to be digitally accessible to others in the museum and online. Interconnect contributions using story features such as characters and emotions.
HECHT	Enable members of religious and secular communities, in particular minority populations, to express and share their viewpoints and appreciate the variety of opinions even within a community.	Provide support in the museum for accessing and exploring opinions across different communities to find similarities and also respect and understand differences.
IMMA	Support groups who are less able to visit the museum physically, such as asylum seekers and children with serious illnesses, to access collections and share their own perspectives.	Make their perspectives available online and in the museum. Encourage visitors to think about universal, personal themes such as family to make interconnections across groups.
MNCN	Actively engage children, including those from lower socio-economic groups who may not consider science interesting or a career option, through activities such as games and puzzles.	Make anonymized contributions available across groups to explore differences of opinion on biodiversity and what individuals can and should do to protect the environment.

Table 3: Bonding and bridging capital of the Case Studies.[1]

The current deliverable (D7.3) describes the progress of development of the Case Studies in the last months of Period 1 and early months of Period 2 (see Fig.15) as well as further elaborates future progress. These developments have also been reported in the previous two deliverables (D7.1 and D7.2) along with the evaluation protocols and the role in the socio-technical roadmap. The next chapter provides a summary of the case studies' progress reported in the previous WP7 deliverables.

[1] These descriptions about the bonding and bridging capital have been derived from the project's grant agreement.

2 – SUMMARY OF PREVIOUS DELIVERABLES INVOLVING THE CASE STUDIES

Evaluation Protocols (D7.1)

The Evaluation Protocols deliverable – D7.1 provided an elaborate description and recommendations of how the different aspects and components of SPICE project can be evaluated. This was the first time the complex organizational structures of SPICE were examined as a socio-technical system consisting of dynamic interactions occurring between people and technology within the entire system.
The social and cultural infrastructure(s) at SPICE consists of:

1. End-user communities
2. Communities of practice (CoP)
3. Communities of Interest (CoI)

Each of these communities were identified and categorized based on the actors involved in them, their types, and their relation to the relevant Case Studies. Metrics were also proposed to be used for evaluating these social and cultural infrastructure(s).
The technical infrastructure(s) at SPICE are the software and network systems aiding and enhancing the process for citizen curation by providing a technological foundation for the museums involved and they include:

1. Social recommender system
2. Linked Data Hub
3. Ontology specifications
4. Scripting devices
5. Interfaces for interpretation, reflection, and scripting
6. Content materials in museums, created by end-users and general public.
7. Additional data gathered such as demographic, location-based, textual and more.

There are several requirements from the Case Studies for each technical infrastructure that needs to be adhered to. Metric were also proposed to be used for evaluating these technical infrastructure(s).

A concise description of the requirements involving the processes and elements in the use of citizen curation methods were provided along with their considerations. These considerations included mechanisms for accessing, exploring, selecting, interpreting, sharing, saving/archiving content. Along with these considerations, specific regulatory concerns related to cultural and physical accessibility as well as privacy-oriented concerns such as GDPR were examined in the deliverable (D7.1). Finally, the chapter on the Case Studies delved into each Case Study based on their existing infrastructures, activity objectives, rules and discourses, and special considerations in relation to their context.

Socio-technical roadmap (D7.2)

Based on the view of complex organizational development through the interaction between people and technology, the socio-technical roadmap described the instantiation of the distributed co-design ecosystem. A network visualization was provided illustrating the overall state of the project

and the interconnected networks between the targeted communities (end-user, of practice, and of interest), case studies, work packages, and organizations and institutions. In addition to the distributed network, the overall pattern was gauged using activity models showing the different components such as actors/actants, tools, object of activity, activity outcome, rules, community, organization, and their structural relations under the weight of production, consumption, exchange, and distribution.

A literature review briefly examined the timeline of evolution in the discourse of socio-technical systems bearing a range of concerns. These are chiefly targeting the optimization of labor such as search for representations that afford an understanding of the technological and societal change to explorations regarding the situated nature of human knowledge and activities. This review also delved into the apertures in the late 20th century focusing on gender, race, and multicultural discourses. Based on these views, the socio-technical roadmap needed to accommodate the present social and environmental situation characterized by rampant disruptions that could easily lead to the erosion of complex organizational structures if not designed and retrofitted considering it. Therefore, the commitment of SPICE is towards co-design and inclusivity to broaden the scope to accommodate sustainable transitions that afford several constructive opportunities and innovative endeavors.

Timeline of Development (D7.2)

The Case Studies' timeline of development elaborated on the proposed activities planned by each between January 2021 and April 2023 (end of the project). Each Case Study was provided with a questionnaire wherein they described their plans for every six (6) month period and the final (4) month period, i.e., Jan-June 2021, July-Dec 2021, Jan-June 2022, July-Dec 2022, and Jan-April 2023. The Case Studies have proposed several online (considering COVID-19) and physical co-design workshops with their end-user communities and mediators. The questionnaire also sought to understand the hindrances in development due to COVID-19, strategies proposed to adapt to the current situation (temporal, societal, environmental), and the influence of the SPICE toolkit on the objectives of their museum. WP7 will track and monitor these planned activities and assistance will be provided to the Case Studies in case they are facing certain challenges.

Ultimately, to grapple with the complexities and create smooth communication as well as workflow, the PM Tool was created within SPICE SharePoint using Microsoft Planner. The objectives of the tool were to create project activities and enable task definition for the Case Studies and WPs. These provide a live view of development of all the SPICE systems, thereby making it easier to monitor, understand and carry out periodic analysis. Each Case Study and WP monitor their *board* containing *buckets* of activities and finer tasks. Several features in the tool allow task definition, delegation, setting deadlines, and descriptions/comments. Overall, the STS roadmap and the PM Tool play a crucial role in enabling the interaction and communication between the social and technical aspects that is inclusive of all actors in the system.

The deliverables mentioned in this chapter, i.e., D7.1, and D7.2 are accessible here to members of the SPICE consortium as well as the SPICE heritage institutions.

3 – DESIGN ACTIVITIES

3.1 – Scenario Design using Activity Theory

Activity Theory (AT) is a framework for consideration for an entire work/activity system beyond individual actors or users, wherein attributes such as the system's history, environment, complexity, user motivations, and roles of artefacts are also accounted for. As a framework of knowledge that seeks to inform and support the inseparability of doing and thinking, AT has been used in myriad of design situations. AT pioneer Yrjö Engeström (2015) has proposed three generations of AT. Whereas in the first-generation scholars were more concerned with examining the use of cultural tools – including signs and symbols – as mediational instruments, the second generation has focused on the analysis of interactions in terms of constraints and power relations. Among the third and current generation of AT, a key concern are the notions of dialogue and the negotiation and sharing of objects of activity across interacting activity systems, in order to achieve an expected outcome (Ash, 2014). This concern is of relevance to the SPICE project considering how the system is expected to transform input from museum visitors into interactive narrative and storytelling experiences that further promote cultural engagement and social cohesion.

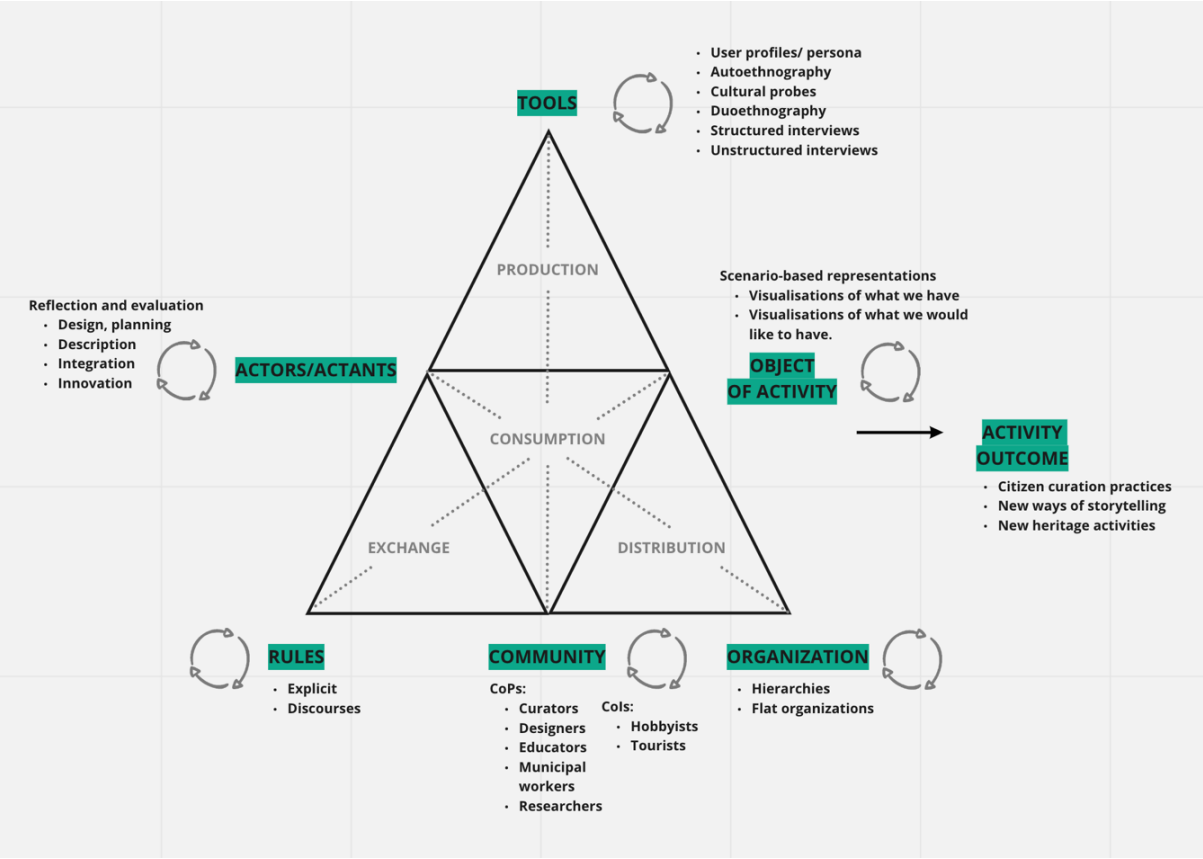

Fig. 1: Activity model shows the different components and their structural relations. Round arrows indicate iterative development cycles.

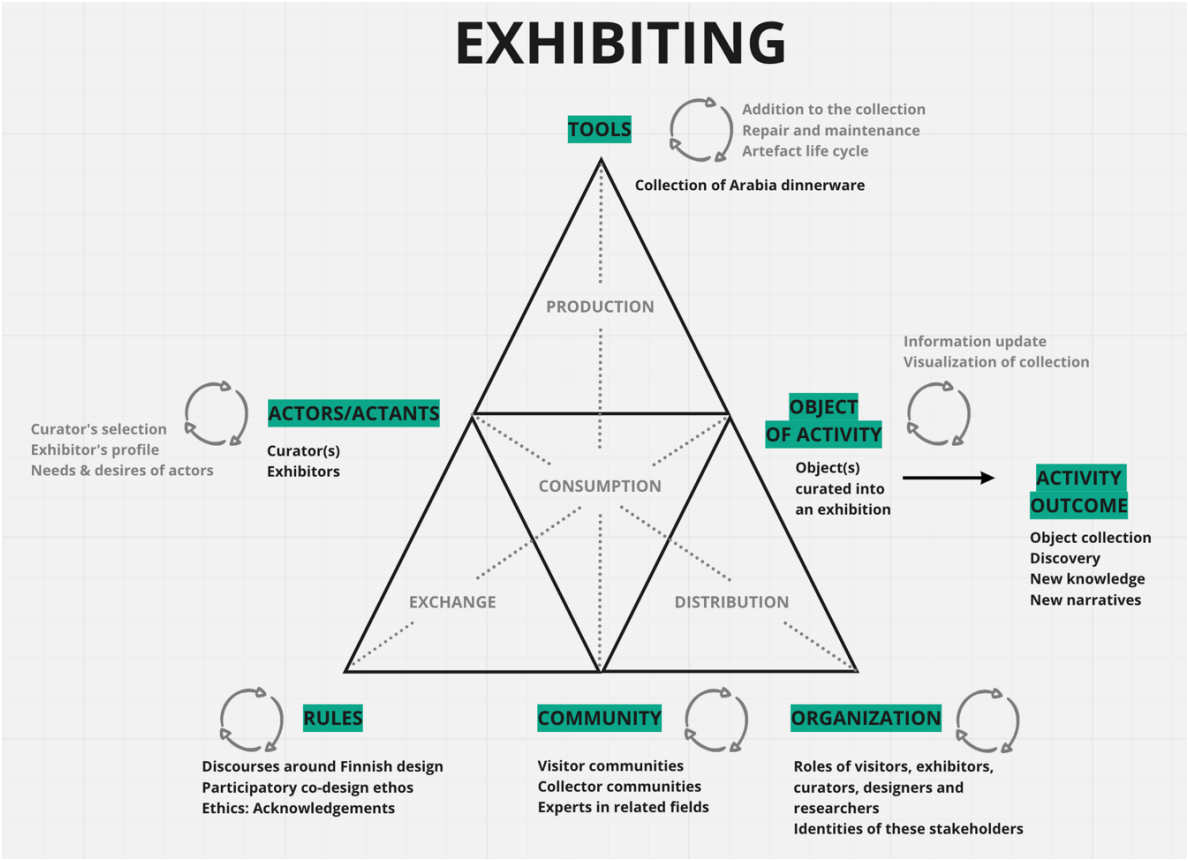

Fig. 2: A section of Matti's and Annikki's personal collecting and exhibiting scenario within DMH Case Study.

Design scenarios are ideal tools for providing an overview of user interaction with a system and understanding the potential breakdowns (Rosson & Caroll, 2009). In SPICE, AT has been used as an underlying framework to scenario design by identifying the key elements as well as mapping key points of interaction. To begin an examination of interaction points, design scenarios were created (and illustrated through diagrams) to show how visitors and citizens might achieve their goal during a hypothetical museum visit.

The Case Studies were provided with a template as shown in Fig.3. Each Case Study was asked to describe the elements in their own scenario(s) using a format inspired by and following the Engeström (2015) model as a starting point. The elements include the Actor(s) that provides a user perspective or view of the activity system. The activity system further comprises Actions that are also themselves composed of tasks and operations. The Goal(s), and the Outcome, which might consist of tagged artefact(s) as output are also included. And then, there are the Rules consisting of implicit and explicit system regulations, Communities that in our work we have initially identified as Communities of Interest (CoIs) and Communities of Practice (CoPs) as well as Organization that describes how the activity is distributed among community members. The scenarios developed by the Case Studies in July 2020 can be viewed here (accessible to the SPICE consortium and SPICE heritage institutions) by clicking on the respective links:

- DMH
- GAM
- HECHT
- IMMA
- MNCN

At WP7, we also created compared each scenario by categorizing them based on their attributes and specific concepts for evaluation, and the entirety of it available to the consortium here. ´

Based on new developments taking place in SPICE and work carried out by the museums with their end-user communities and mediators, the scenarios are bound to be iterated and new ones will be conceived and further developed as well.

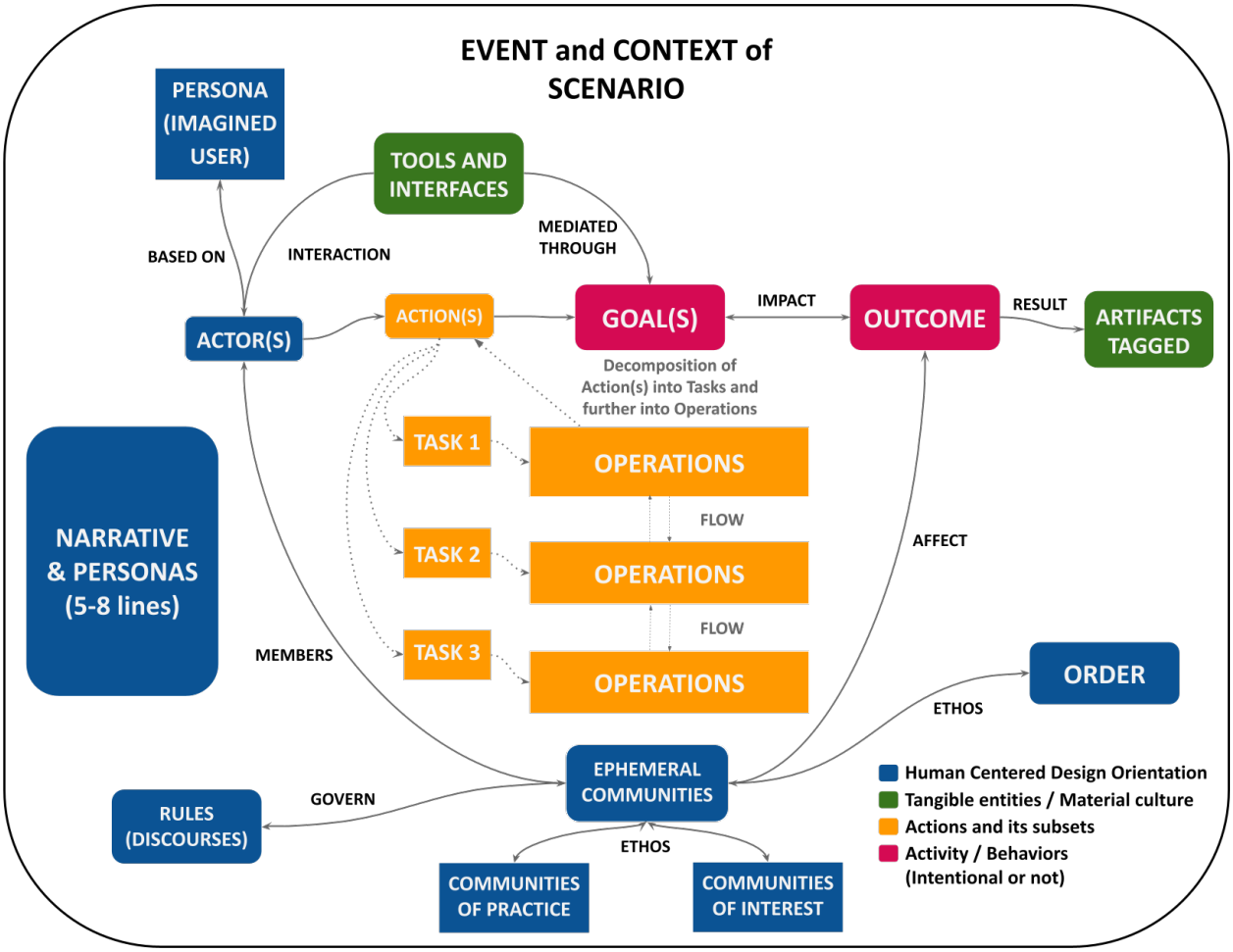

Fig. 3: Scenario Design template provided to the Case Studies and used to create their own scenarios.

3.2 – Co-Design Workshop Methods

Design and facilitation of SPICE mini-conference 1

Early on during the development of the SPICE project, an online conference was envisioned involving all the partners, i.e., the WPs and Case Studies. Based on the availability of most participants, the decision was made to conduct it as a day-long event between 09:00 to 16:00 CET on Oct 29th, 2020 and called “mini-conference”. At the mini-conference, WP7 aimed at concretizing the situation regarding the different Case Studies and establishing a set of evaluation protocols based on the outputs of participants in the workshops. The conference was co-hosted by WP2 and they aimed at creating and trying out a case study for an exemplary combination of methods that can be

implemented in the interpretation-reflection spiral. As a co-designed event consisting of multiple workshops, other members of the consortium were invited to co-host specific workshops.
The workshops planned and conducted along with their facilitators are mentioned in the Table 4 below.

Workshop (W)	Facilitators
W1 – Citizen curation methods	Luis Bruni (WP2) and Thomas Pederson (WP2)
W2 – Persona development along with users and communities	Alan Wecker (WP3) and Gautam Vishwanath (WP7)
W3 – Activities and contexts through pre-defined UX maps	Lily Diaz-Kommonen (WP7) and Rossana Damiano (WP6)
W4 – User interface design	Pedro González-Calero (WP5) and Trevor Collins (WP4)

Table 4: Workshops at the mini-conference 1 and the facilitators involved in conducting them.

In addition, we received assistance from Stefano De Giorgis, who helped us out extensively in each workshop by facilitating group activities during the breakout sessions.

Workshop (W)	Plan
W1 – Citizen curation methods	An exploration of how citizen curation can be linked to interconnected processes of interpretation and reflection. The workshop explored possible relationships between artefact analysis, narrative inquiry, and narrative identity, and how the innerworkings between them might inform the work of SPICE. The results were aimed at aiding the development of a “template” or “guideline” for other permutations of methods for interpretation and reflection, supporting the formulation of the interpretation/reflection loop.
W2 – Persona development along with users and communities	Based on the personas outlined by the Case Studies in their scenario designs, the attributes of each required further expansion. This is based on each persona’s background, skills, motivations, worldview, type of visitor, and their context of visit. Persona design is an essential aspect for understanding UX and aids in the development of categories of the user model to feed the social recommendation system. The session was geared towards the development of personas and the user model categories. Prior to the session, Case Studies were asked to complete a pre-requisite wherein they briefly elaborated on their personas.
W3 – Activities and contexts through pre-defined UX maps	During this session, the Case Studies made use of UX maps to engage in the activity of curation using Citizen Curation methods. The UX map brought the personas developed in the earlier session as well as new ones. The map contains: • Touchpoints: Contacts between the Museum and their visitors.

	• Emotions: Diversity of moods that might emerge through the journey. • Breakdowns: Obstacles that impede the journey. • Solutions: Participants provide alternatives or iterations.
W4 – User interface design	This workshop was about considerations of interfaces for a visit, for interpretation, and for reflection and scripting. Interfaces were introduced to all the participants and they were able to rate them in groups. Each group (Case Study) was asked to consider their likely user and community activities for their specific use cases. A set of interface components were identified that could be re-used across all the Case Studies. Based on this approach, WP5 examined how the interface components enable an initial prototype to be developed.

Table 5: A brief description of each workshop planned at the mini-conference 1.

During the activities in the mini-conference workshops, the participants were divided into groups according to their closeness to a Case Study. Some of the participants who were not working closely with any Case Study were randomly assigned to groups. These group activities took place in "breakout rooms" in Zoom wherein each group worked in a focused manner before the sessions ended and all the participants would re-enter the "main room".

Workshop (W)	**Activities (In separate groups – Breakout rooms)**
W1 – Citizen curation methods	Participants individually analyzed an artefact presented to them.
	Participants wrote a short fictional story based on how they interpreted the artefact in their preadolescent years.
	Participants wrote a short fictional story based on how they interpreted the artefact in their adolescent years.
	Participants took turns sharing their stories.
W2 – Persona development along with users and communities	Based on the presentation about method cards and personas, participants further elaborated on the aspects of their Case Study's persona designs.
	Amongst a fresh set of personas, each Case Study chose an unexpected or a "surprise" visitor to their museum and brainstorms their persona aspects. This activity was carried out to bring about thinking based on inclusivity and social cohesion.
	Each Case Study chose characteristics of the user model that is necessary for social recommendation and described how they would use them.

W3 – Activities and contexts through pre-defined UX maps	Using the cards in the UX map and the personas as references, participants engaged in the activity of curating by enacting the following processes: 1. Accessing, 2. Exploring, 3. Selecting, 4. Saving and 5. Sharing. Participants were encouraged to make use of a speaking out loud protocol throughout their engagement.
	A set of artefacts based on the Case Studies were provided to the participants. Working in groups, the participants selected in order to choose which ones they would wish to use in their imaginary exhibition.
	After gathering their artefact samples, participants organized them in a particular order.
	Finally, the participants shared their exhibitions in the main room and narrated a story about these exhibitions.
W4 – User interface design	Participants discussed together in groups and rated the interfaces for visits.
	Participants discussed together in groups and rated the interfaces for interpretation.
	Participants discussed together in groups and rated the interfaces for reflection and scripting.

Table 6: Activities planned and conducted in each workshop at the mini-conference 1.

The entire mini-conference 1 was video recorded and shared within the consortium in case any member needed to derive insights from it. All the outputs of the participants were collected, and an example of each workshop's output is shown in the following Fig.4-Fig.8.

"You know that this dinosaur was as big as an elephant. Do you think it had a trunk like them? It is impossible to know really... Don't you think? Imagine if in a thousand years someone would found your bones, it would impossible to tell how you really look.. I mean you now, today are really pretty and all. but... It makes you think, no?"

Fig. 4: A picture of an artefact shown to a participant in W1 – Citizen curation methods, and the response to "Narrative as a teenager" in the box below.

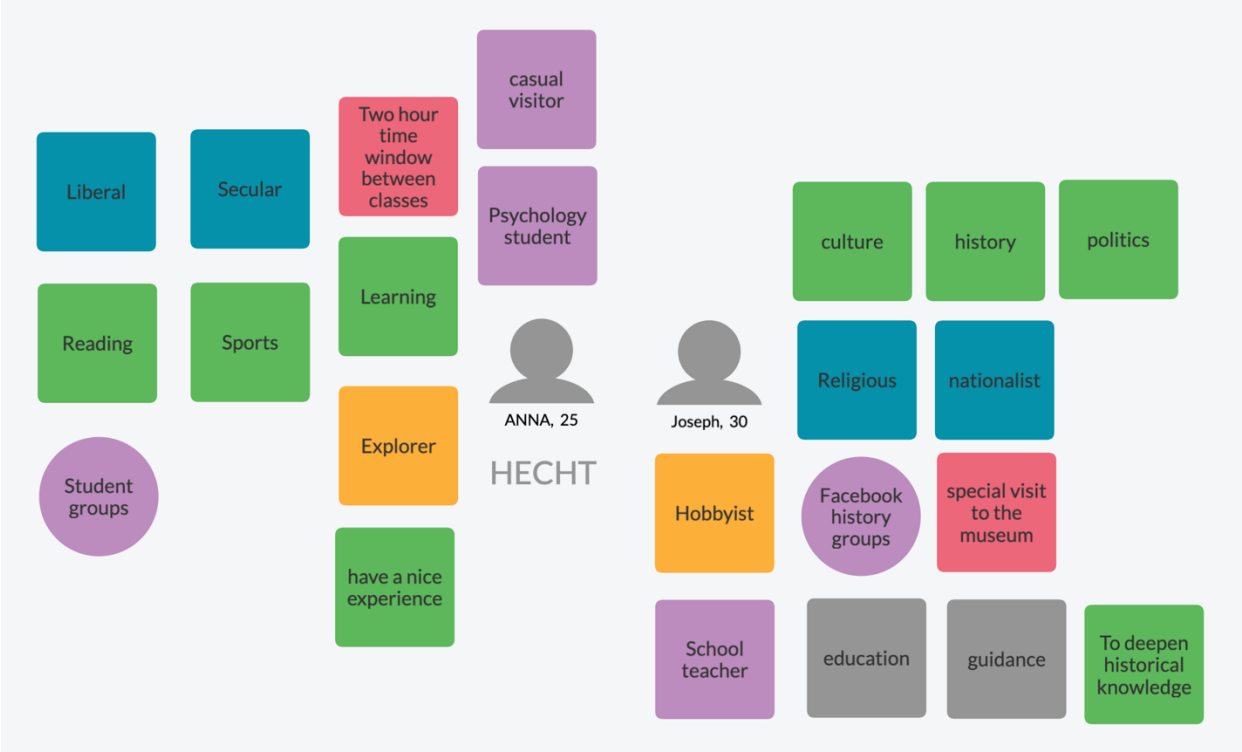

Fig. 5: An example of the older version of personas developed by Hecht Case Study in W2 – Persona development with users and communities in mini-conference 1. A legend for the colored attributes was provided to the participants and is shown in Fig. 6.

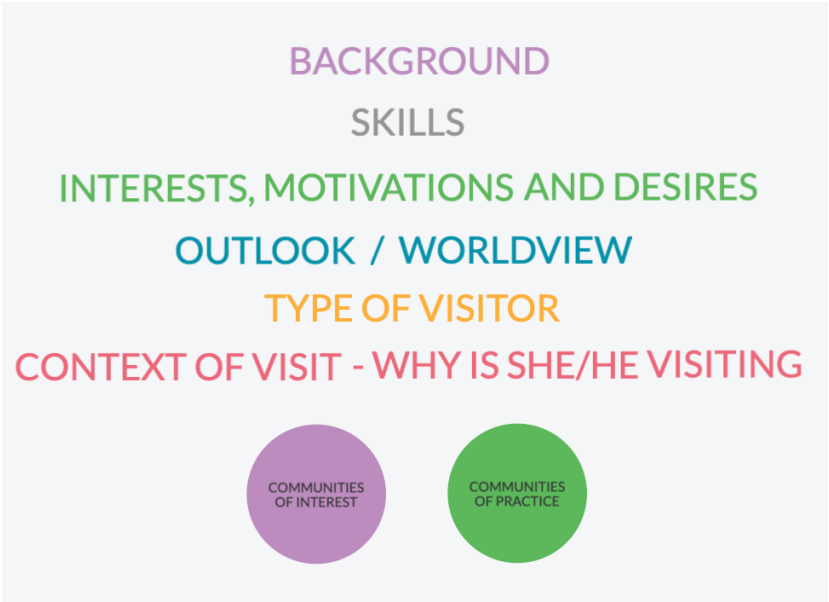

Fig. 6: Persona attributes

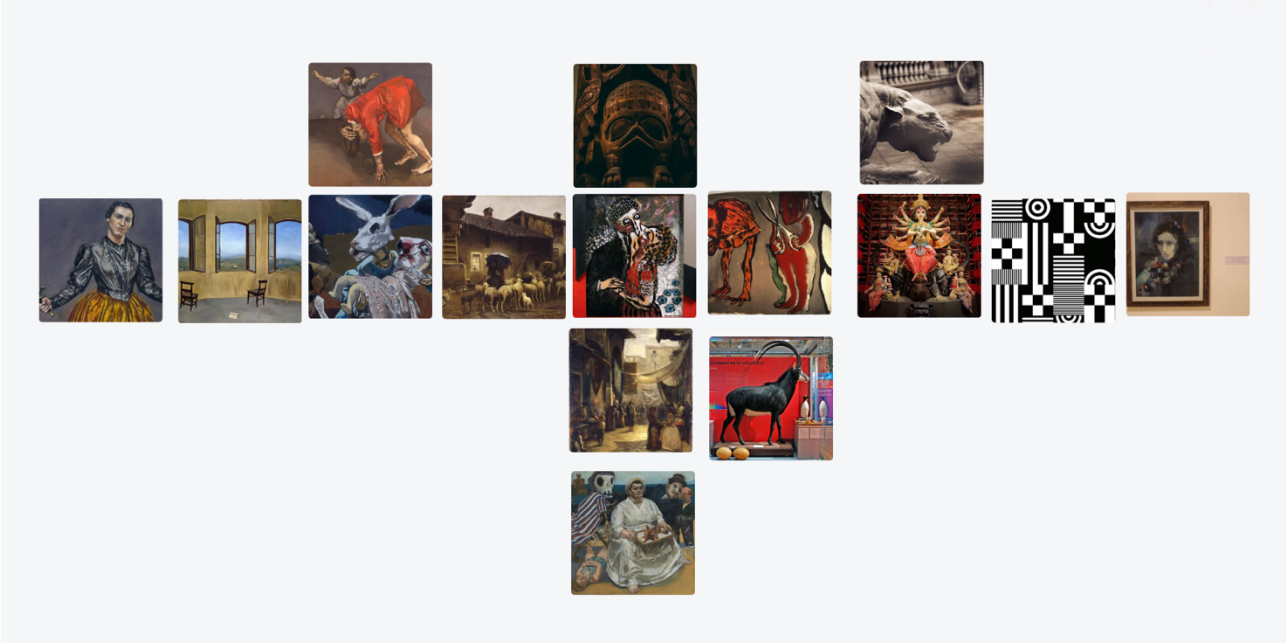

Fig. 7: An example from IMMA of a set of artefacts arranged for an imaginary exhibition during W3 – Activities and contexts through pre-defined UX maps in mini-conference 1.

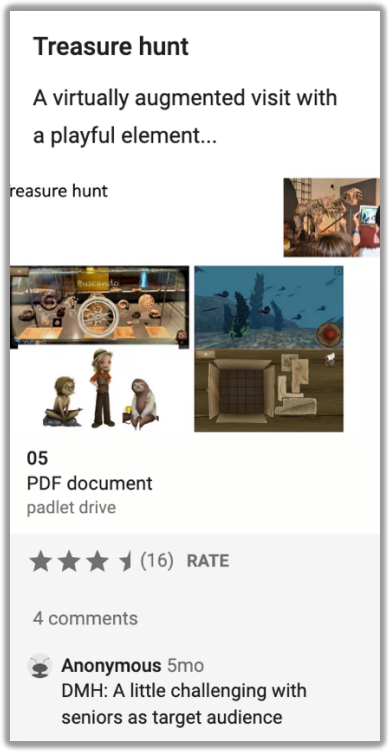

Fig. 8: Participants rating and commenting about “treasure hunt” as an interface in W4 – User Interface Design in mini-conference 1.

Along with the examples provided in the figures earlier, all of the outputs from the mini-conference 1 workshops are available for the members of SPICE consortium here.

A part of the results of mini-conference 1 were used to develop the Evaluation Protocols (D7.1) as guidelines for the Case Studies and WPs. Mini-conference 1 was beneficial to the Case Studies and

WPs because it proved to be an avenue for rapid prototyping and assisted in examining the SPICE systems from different perspectives thereby generating new ideas for future developments.

Design and facilitation of SPICE mini-conference 2

The first mini-conference was seen as very beneficial to SPICE and plans were made to host another one in the near future. Mini-conference 2 was primarily conducted by WP2 along with WP5 and WP7 played a role in co-designing the event. It was decided that the mini-conference 2 will be a smaller event between 09:00 to 13:00 CET on March 23rd, 2021.

WP2 sought to explore the ideal mechanisms for combining the interpretation and reflection methods, related activities, and mock-ups in a 'user-journey loop' that circles back and forth between citizens' produced interpretations of cultural objects and reflections on these contributions (See D2.1 & D2.2). WP5 on the other hand, assisted the Case studies in elaboration on the aspects of the citizen curation activities conducted with their end-user communities based on the mock-up scenarios provided to them earlier (See D5.1). WP7 played a crucial role in monitoring the development and progress of the Case Studies and situating these in the updated sociotechnical roadmap.

Although the "workshops" were not explicitly delineated in mini-conference 2, Table 6 below roughly outlines the facilitators of each one:

Workshop	Facilitators
Case Study presentation of mockups	Paul Mulholland (WP4/WP5) and Pedro González-Calero (WP5)
Visualizing citizen contributions (Talk and brief discussion)	Marilena Daquino (WP4)
Plenary session on the reflection process	Luis Bruni (WP2), Thomas Pederson (WP2), and Nele Kadastik (WP2)
Co-designing and moderating the event	Gautam Vishwanath (WP7), Lily Diaz-Kommonen (WP7) and Leena Svinhufvud (WP7)

Table 7: Workshops at the mini-conference 2 and the facilitators involved in conducting them.

Through several rounds of discussion between the facilitators prior to the mini-conference 2, an agenda was charted out, shown in Fig.9. As a pre-requisite WP5 provided templates for the Case Studies to develop their own mockups and present it. Similarly, WP2 created a card containing very short descriptions of the interpretation and reflection methods for citizen curation and the Case Studies were required to select the methods that they planned to engage with. These pre-requisites were completed by all the Case Studies and presented at the mini-conference 2. They will be described in further detail in the next section and in Chapter 4.

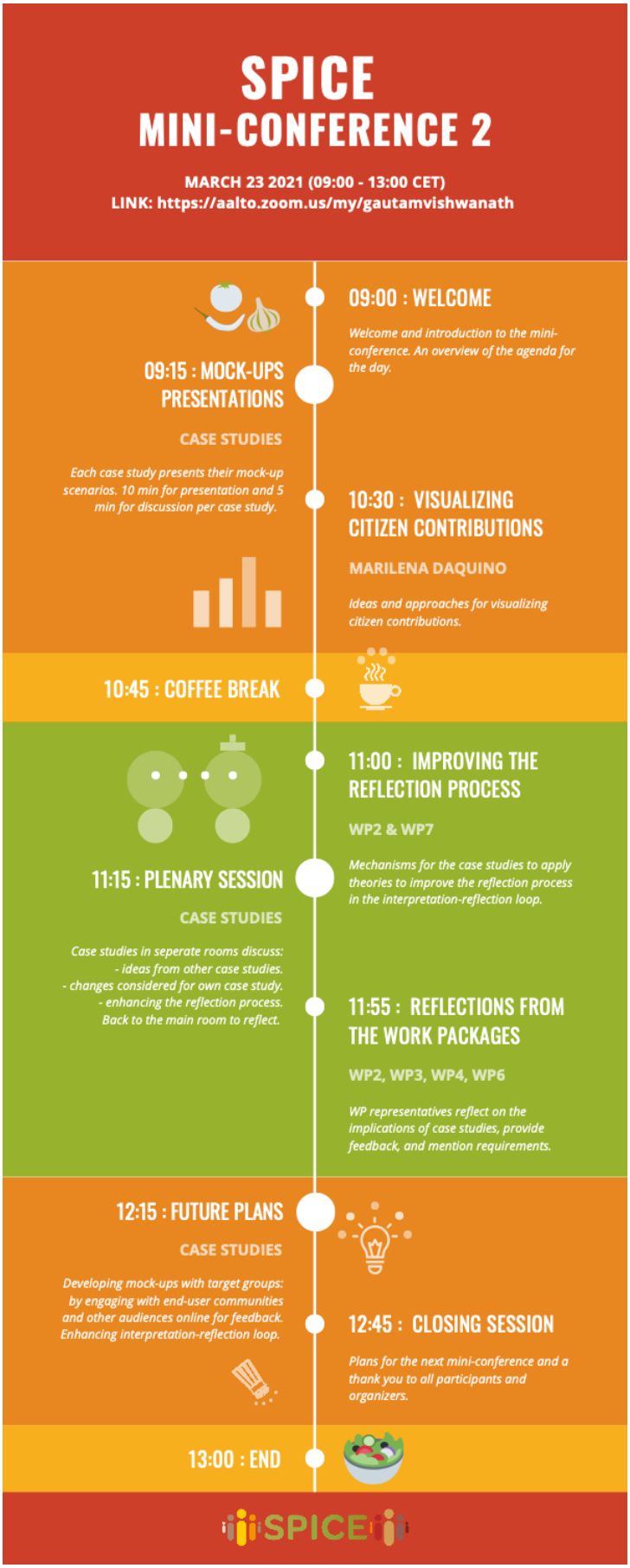

Fig. 9: Agenda for the SPICE Mini-conference 2.

3.3 – Mockups

The citizen curation mockups were originally conceived by Paul Mulholland (WP4+WP5) and Pedro González-Calero (WP5) as templates for the Case Studies to analyze the following:

- Customizable curatorially inspired activity types that museums plan to conduct and citizens can take part in.
- Customizable social structures around these activities that support both the museum and the citizens.
- Customizable user profiles associated with an activity wherein citizens may be able to login, contribute anonymously and choose an avatar if needed.
- Roles played by the user/community modeler and the recommender in supporting the museum to curate citizen responses and notify citizens about others' responses.

Case Studies were provided with the templates and had to create mockups for their museums. These were also presented by the Case Studies members at the mini-conference 2. The following figures (Fig.10 – Fig.14) illustrate the main dashboard and a prominent product being developed for citizen curation activities envisioned by each Case Study.

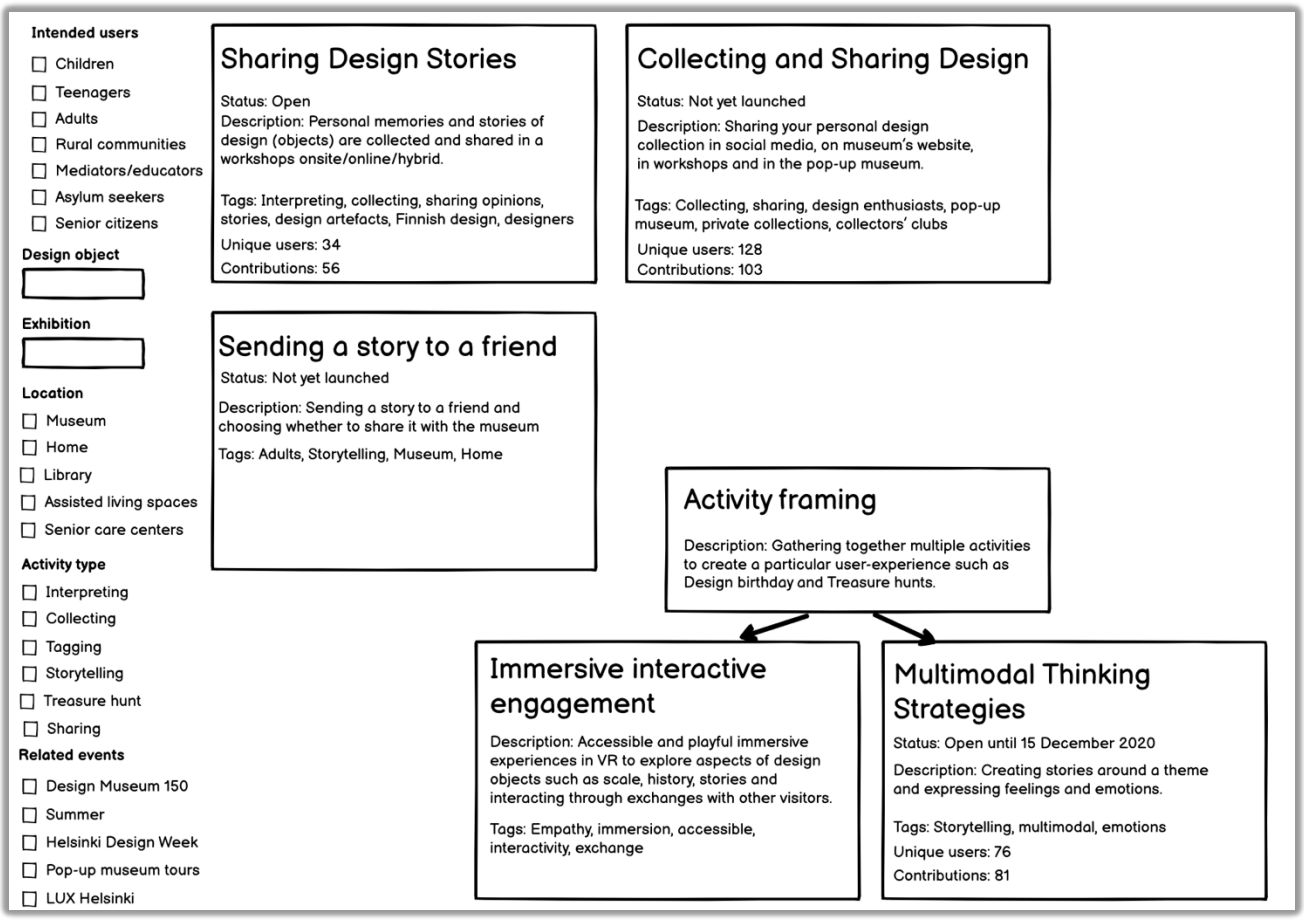

Fig. 10: DMH's citizen curation activities mockup interface presented at Mini-conference 2.

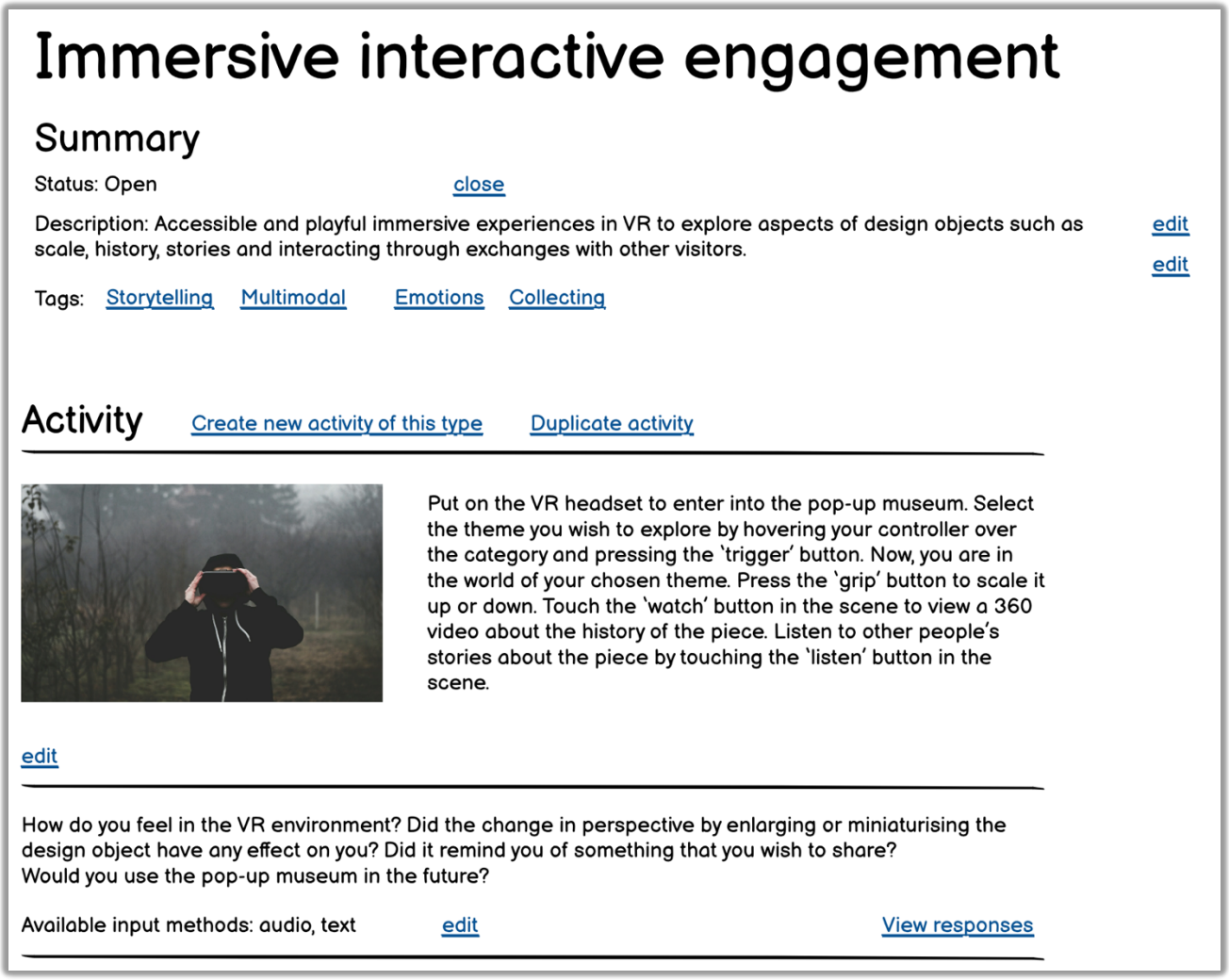

Fig. 11: Potential activities considered for immersive interactive engagement in DMH's VR *Pop-up Museum*.

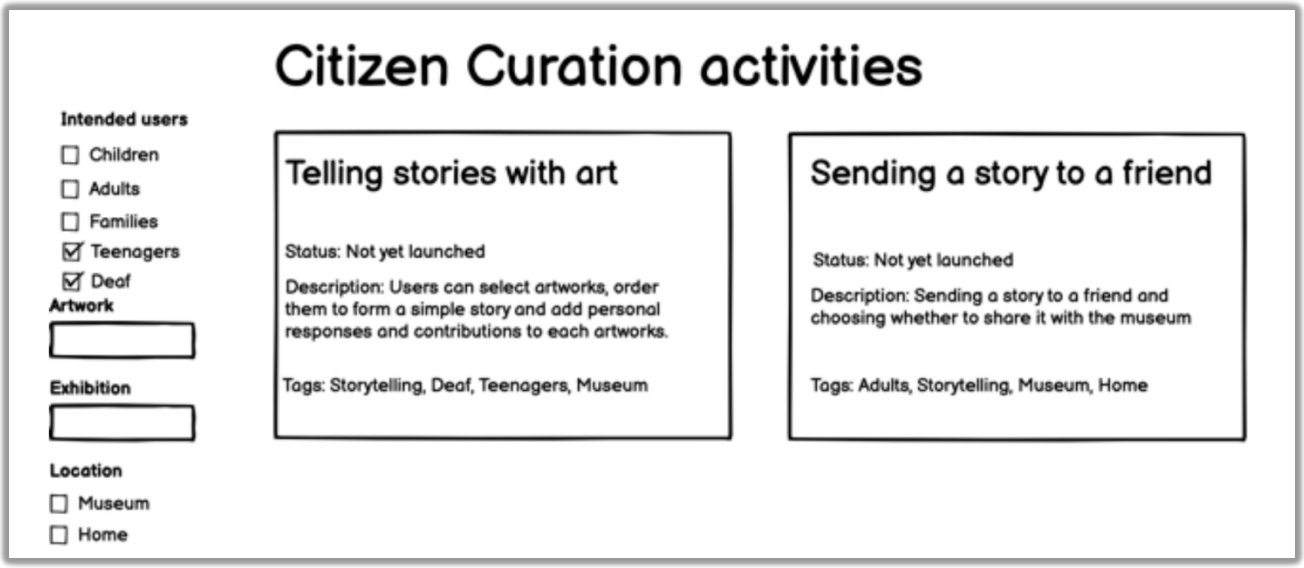

Fig. 12: GAM's citizen curation activities mockup interface presented at Mini-conference 2.

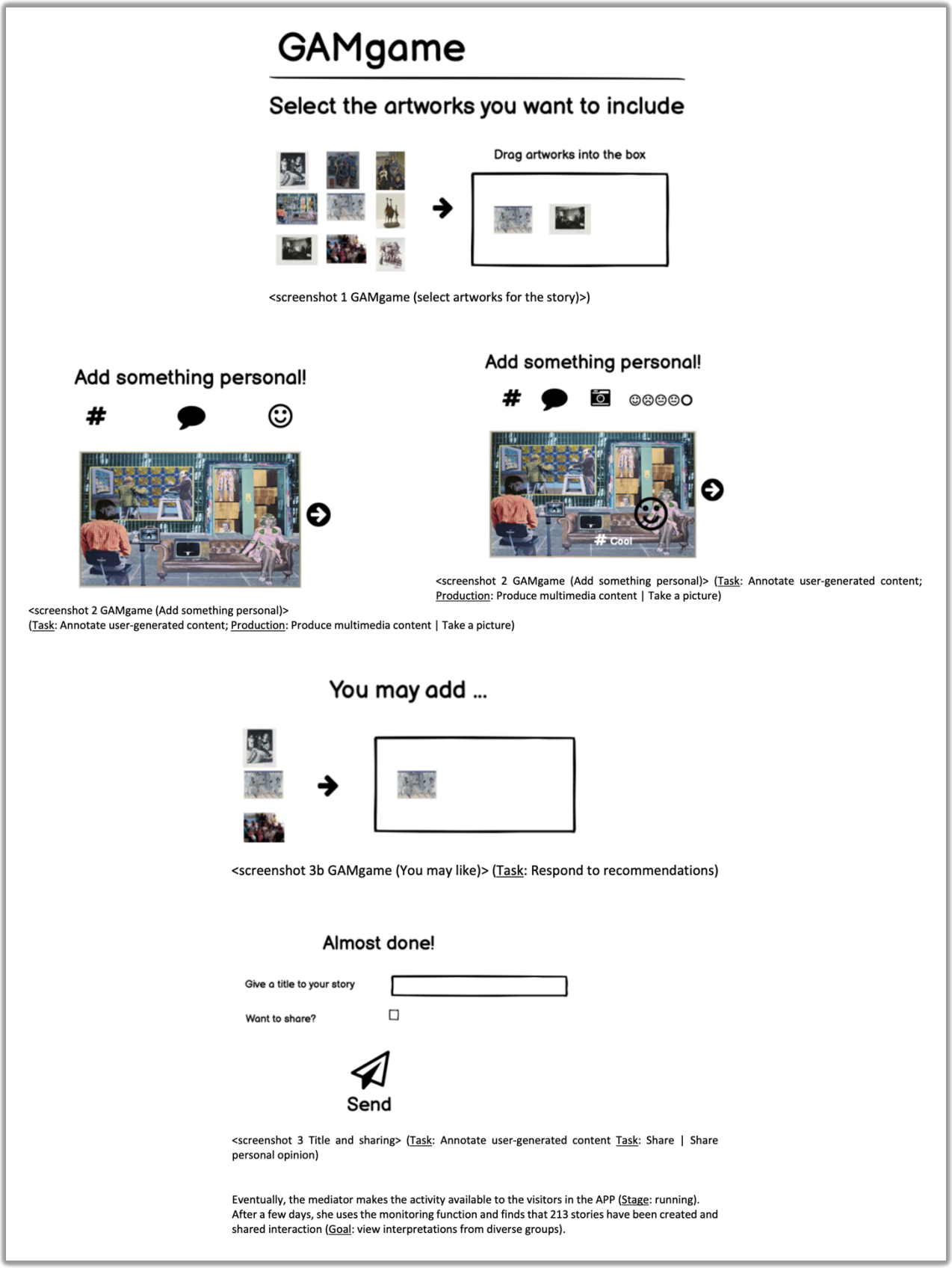

Fig. 13: *GAM Game* interface from the perspective of the mediator deciding the contents of the activity.

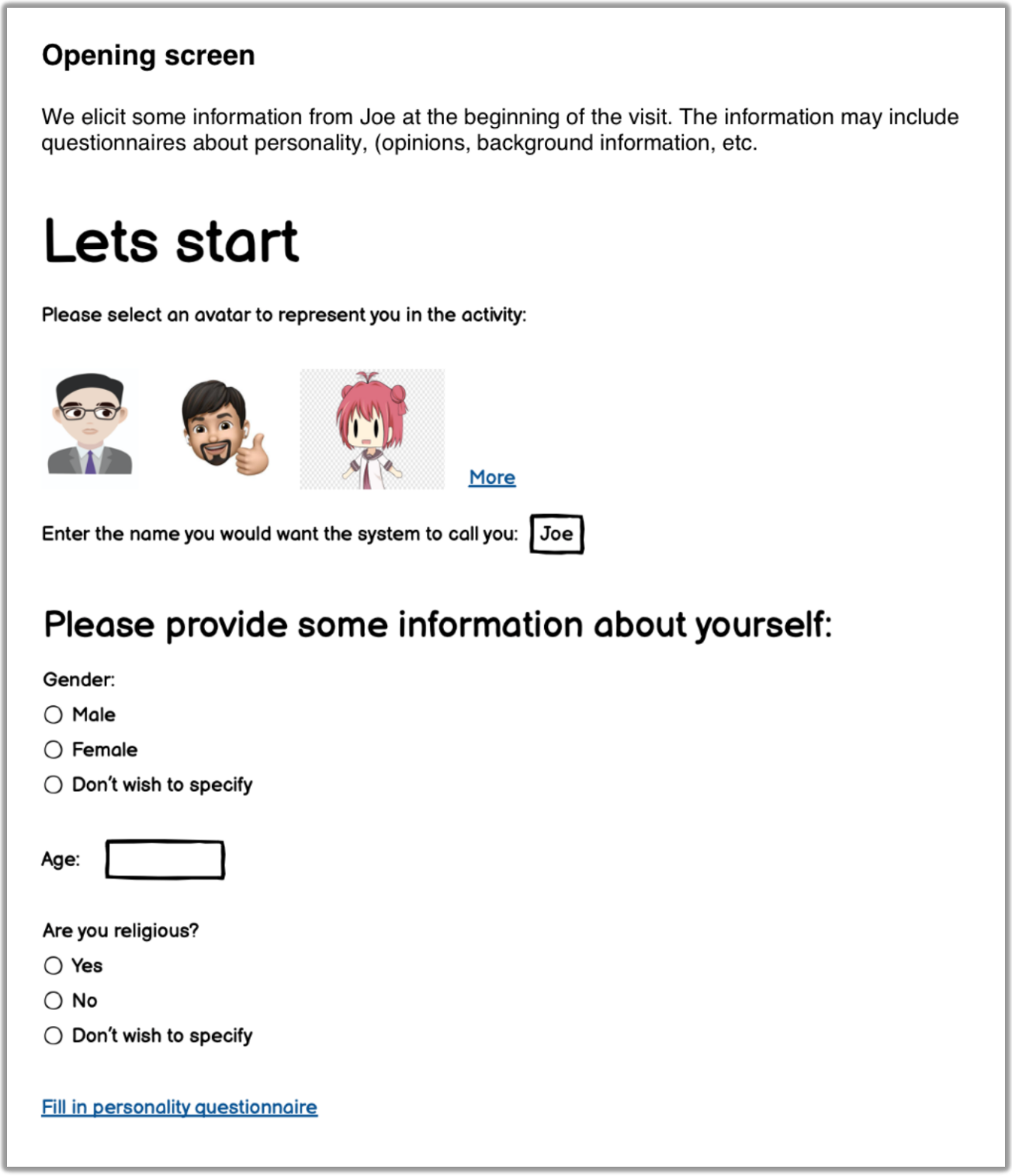

Fig. 14: HECHT's citizen curation activities mockup interface presented at Mini-conference 2.

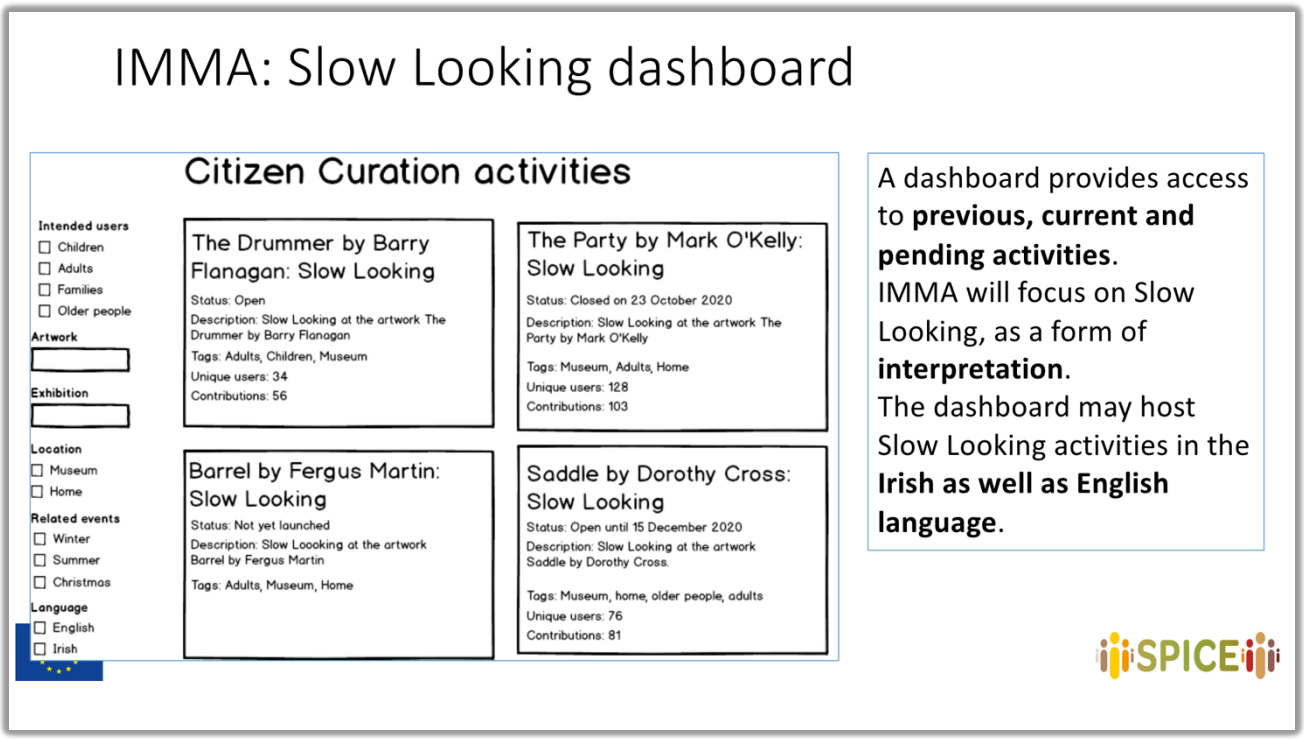

Fig. 15: IMMA's citizen curation activities mockup interface of the *Slow Looking dashboard* presented at Mini-conference 2.

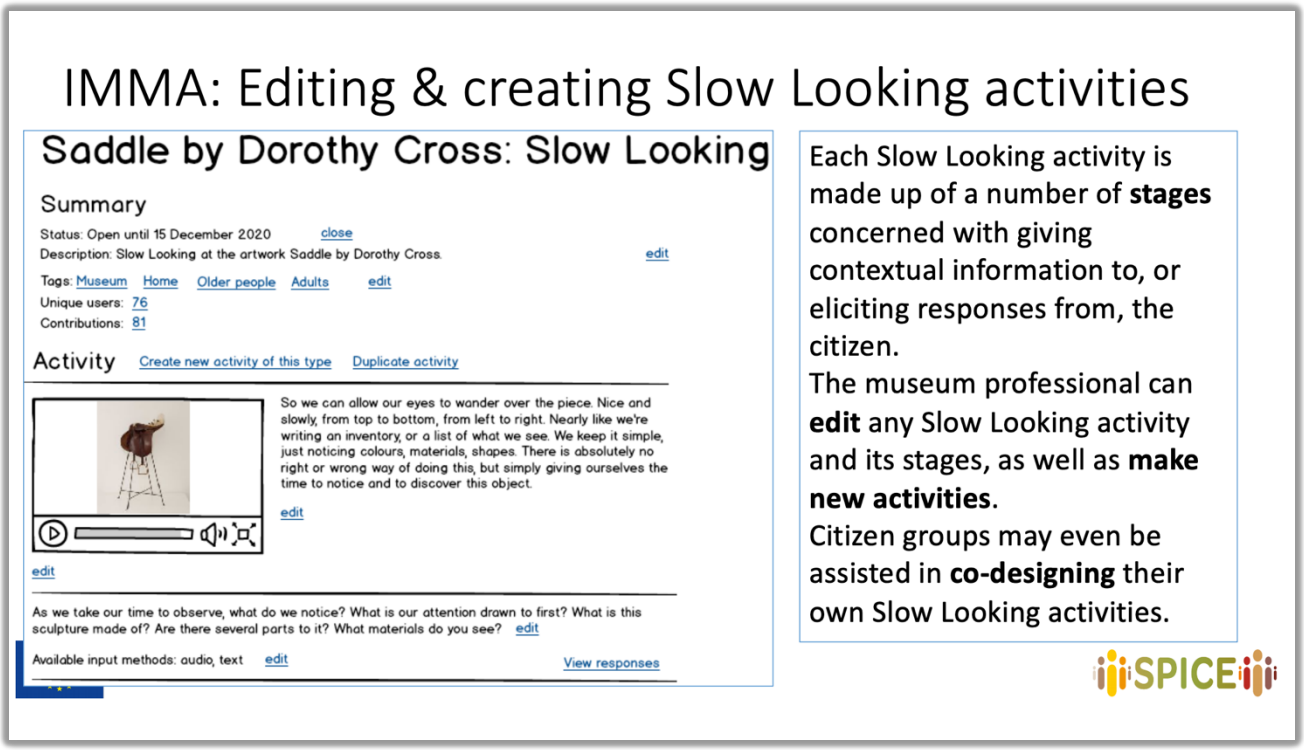

Fig. 16: An example of *Saddle by Dorothy Cross: Slow Looking* as a detailed activity that can be edited by museum professionals at IMMA.

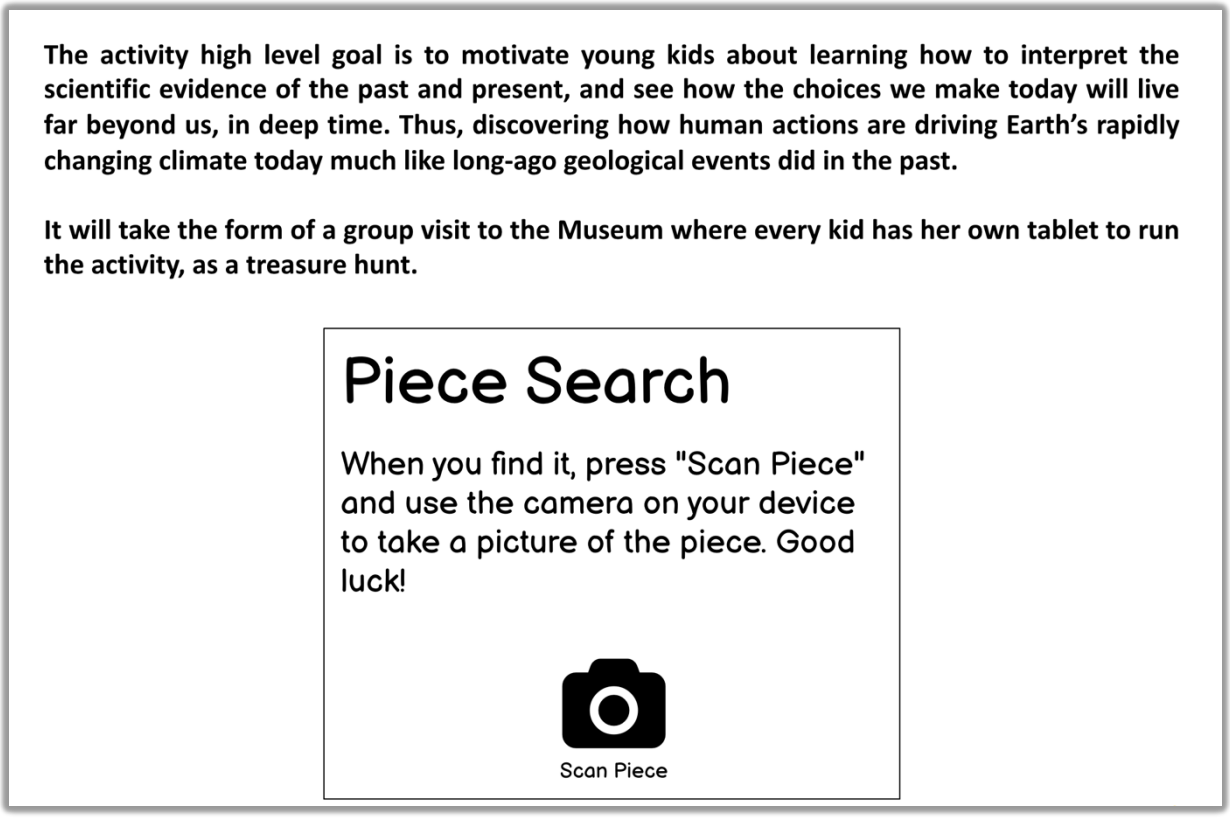

Fig. 17: MNCN's citizen curation activities mockup interface of the *Treasure hunt* presented at mini-conference 2.

All the mockups describing the citizen curation activities developed by the Case Studies are available to members of the SPICE consortium and can be seen in greater detail here.

3.4 – Mediator and end-user Case Studies workshops

Co-design is a key method for SPICE, aiming at fostering equal opportunities for different actors to participate in genuine co-operation and dialogue. The core purpose of co-design (also called co-creation) is to bring together the end-users and various professionals to develop a product or service. Co-design processes (that are often visualized) are tools to communicate practical steps to all the participants and guiding everyone to the same direction.

Co-design includes different roles. It always requires coordination to succeed and the actor responsible for coordination is often referred to as the orchestrator. The orchestrator is responsible for building the collaboration network and ensuring that the process is completed from start to finish. The orchestrator thus coordinates the planning, implementation, and evaluation of the co-development process.

In the SPICE Case Studies, the orchestrator is often the museum professional working with audiences – the educator or curator. In museums audience engagement context this role is referred to as mediator, describing the position between the museum content and the visitor. In co-design processes the mediator brings the participants to the process, supports participation, and takes care of the participants' well-being during the process.

In co-design processes, professionals often take on the role of end-user. In fact, sometimes the professional can be the primary user of the solution and the customer is the benefiter.
In the process, the professional can equally share his / her own professional knowledge and information (*Informant*), test the solution to be developed (*Tester*), participate in the development process as a designer either more limitedly (*Contributor*) or from the beginning to the end of the process (*Co-designer*). In addition to this, the professional often has an important role to play in enabling co-design. They act as mediators between organization and customers / end-users, take care of practical arrangements and communication within the organization and towards the customer. The professional participator / mediator from the organization is often the key person to ensure continuity and have greater impact.

3.5 – UX mapping for end-user communities in the Case Studies

Scenario-design method provides hypothetical 'what-if' arenas to consider different possibilities when conceptualizing a system design. Nevertheless, for a design to succeed, the gap between the idea in the mind and the reality on the ground needs to be progressively closed throughout the design and implementation phases. User experience, UX design and Service design tools assist clients, designers, and developers in doing this. For this reason, Co-design workshops in these areas for all Cases are scheduled for periods, 3, 4 and 5. (See Fig.18)

DESIGN MUSEUM HELSINKI

The Museum will carry on thematic co-design workshops with end-user communities, and mediators to create the following needed instruments:

- *User experience UX design map* that enables the Museum personnel, the developers, and the designers to envision the experience of using both citizen curation methods and the *Pop-Up Design Museum* in VR developed in SPICE from beginning to end. Some of the challenges for this Case relate to the creation of a museum experience that, despite being outside the official site and using virtual reality, still brings in the notions of authenticity, value and beauty associated with heritage artefacts and museums.
- A personalized *visitor (customer) journey map* that includes actions, motivations, questions, and barriers the user might encounter when engaging in the service process. The journey map will also show the touchpoint (contact) locations between the service provider and the visitors. Co-design of this tool with the museum personnel is key, given the need for accurate target audience descriptions.
- *Service blueprint map* which in addition to presenting the perceived touchpoints and interactions, emphasizes the service process and depicts the aspects of the service that the customer cannot see. This is needed to carry out a successful product implementation.

GALLERIA D'ARTE MODERNA

The Gallery will carry on thematic co-design workshops with end-user communities, and mediators to create the following needed instruments:

- *User experience UX design map* that enables the Museum personnel, the developers, and the designers to envision the experience of using both citizen curation methods and the *GAM Game App* developed in SPICE. Key issues for this Case, in terms of

experience design might include unifying gamification and knowledge acquisition strategies to promote understanding (e.g., sense-making).

- A personalized *visitor* (*customer) journey map* would include actions, motivations, questions, and barriers the user might encounter when engaging in the service process. The journey map will also show the touchpoint (contact) locations between the service provider and the customers.
- *Service blueprint map* which in addition to presenting the perceived touchpoints and interactions, emphasizes the service process and depicts the aspects of the service that the visitors cannot see.

HECHT MUSEUM

THE Museum will carry on thematic co-design workshops with end-user communities, and mediators to create the following needed instruments:

- *User experience UX design map* that enables the Museum personnel, the developers, and the designers to envision the experience of using both citizen curation methods and the *Hecht Museum Pilot* project developed in SPICE. In this case we see the challenge of cultivating both artefact and introspective experience that enables imagining another time or feeling a spiritual connection.
- A personalized visitor (*customer) journey map* that includes actions, motivations, questions, and barriers the user might encounter when engaging in a service process. The customer journey map will also show touchpoint (contact) locations between the service provider and the customers.
- *Service blueprint map* which in addition to presenting the perceived touchpoints and interactions, emphasizes the service process and depicts the aspects of the service that the customer cannot see.

IRISH MUSEUM OF MODERN ART

The Museum will carry on thematic co-design workshops with end-user communities, and mediators to create the following needed instruments:

- *User experience UX design map* that enables the Museum personnel, the developers and the designers to envision the experience of using both citizen curation methods and the *Slow-looking Dashboard App* project developed in SPICE. In terms of user experience this Case it might be important to work closely with finding ways to enrich the audience's understanding through reflection on the meaning of what is it that is being looked at or observed.
- A personalized *visitor (customer) journey map* that includes actions, motivations, questions, and barriers the user might encounter when engaging in a service process. The customer journey map also will also show touchpoint (contact) locations between the service provider and the visitors.
- *Service blueprint map* which in addition to presenting the perceived touchpoints and interactions, emphasizes the service process and depicts the aspects of the service that the customer cannot see.

MUSEO NACIONAL DE CIENCIAS NATURALES

The Museum will engage in thematic co-design workshops with end-user communities, and mediators in order to create the following needed instruments:

- *User experience UX design map* that enables the Museum personnel, the developers, and the designers to envision the experience of using both citizen curation methods and the *Treasure Hunt App* project developed in SPICE. From the perspective of user experience this Case seems to focus more on the social aspects of interacting with one's fellow students as well as the educator in charge. Here the preparation of the group for the visit might be of increased importance.
- A personalized *visitor (customer) journey map* that includes actions, motivations, questions, and barriers the user might encounter when engaging in a service process. The customer journey map will also show touchpoint (contact) locations between the service provider and the visitors.
- *Service blueprint map* which in addition to presenting the perceived touchpoints and interactions, emphasizes the service process and depicts the aspects of the service that the customer cannot see.

Note that current situation involving the closing of museums during the Covid-19 pandemic provides an incentive to further develop these UX design tools towards increased use and activities that take place in online environments.

4 – RESEARCH AND DEVELOPMENT ACTIVITIES RELATED TO THE CASE STUDIES

WP2 – Citizen curation methods and the reflection process

Since WP2 is working on the interpretation and reflection methods used for citizen curation, a set of initial methods were proposed to the Case Studies prior to mini-conference 2. The Case Studies were tasked with the selection of these methods and describing why they wish to use certain ones and omit the others. Their responses have been collected and are shown in the tables that follow.

Interpretation methods selected by the Case Studies:

METHOD	DMH	GAM	HECHT	IMMA	MNCN
Artefact analysis					
Visualization techniques					
Collecting methods					
Narrative methods					

Table 7: Interpretation methods selected by the Case Studies as a pre-requisite to mini-conference 2.

Reflection methods selected by the Case Studies:

METHOD	DMH	GAM	HECHT	IMMA	MNCN
Cultural semiotics					
Narrative identity					
Duoethnography					

Table 8: Reflection methods selected by the Case Studies as a pre-requisite to mini-conference 2.

This is an initial version of selection and the Case Studies are bound to change their decisions based on further developments in the project.

WP3 – Developing user model and community models for social recommendation

Several attributes within the persona designs are used in the development of user and community models for the social recommender system. Similarly, WP3 is also relying on the scenario designs of the Case Studies to develop aspects of the social recommender. The Case Studies need to work closely with WP3 and WP7 to create several scenarios accommodating the aspects of the recommender system.

WP4 – Activities and roles in the MANIFEST

The MANIFEST under the development of WP4 consists of datasets of settings, activities, roles, purposes, tools, contents, and workflow across all the Case Studies. The main idea behind it is to make the datasets detached and interchangeable thereby supporting the linked data infrastructure

envisioned by WP4. This is accessible to SPICE consortium as well as the heritage institutions and can be seen here.[2]

WP5 – Citizen curation activities for interface development

An initial selection of the interfaces for a visit, interpretation, reflection, and scripting were made by the Case Studies at the mini-conference 1. This provided an understanding of commonalities and differences across the Case Studies in relation to the tasks of user interaction and interface design. Further on, the mockups developed for the citizen curation activities have built bridges of understanding between curators, designers, and developers, since they open up specific challenges for each use case in the matter of interaction and user interface design.

WP6 – Scripting activities

In SPICE, the Scripts represent the citizen curation activities designed by researchers, curators, and/or mediators and conducted for the end-user communities. The objectives of these activities may vary, such as eliciting stories, collecting artefacts, etc. WP6 has developed a scripting ontology that enables elaboration of aspects related to design and execution of citizen curation activities. The design aspects within the Case Studies includes a collection of activities, roles, purposes, and much more as categorized in the MANIFEST. In addition to the mockups, more examples of the scripting activities can be seen here. To understand the mechanisms of the scripting ontology and its relevance to the Case Studies, details are described in *D6.2 – Initial Ontology Network* Specification developed by WP6. The Final Ontology Network Specification will be available in Period 4, i.e., Month 24 of the project.

WP7 – Co-design and progress with the PM Tool

Prior to Mini-conference 1, ethnographic semi-structured interviews were conducted by WP7 with the leaders of all the technical WPs (WP3, WP4, WP5, WP6) to discern their workflow, perspectives, and relationship with Case Studies.[3] Insight from these interviews provided a framework for understanding co-design with specific partners and collaborating with the WPs in designing and conducting activities for Case Studies. Further on, this approach is also bound to assist in designing workshops targeted to Case Studies' end-user communities and mediators.

The current deliverable (D7.3) describes the work carried out by WP7; these include co-designed workshop activities conducted with other WPs targeting the Case Studies. A live view of the ongoing work and completed tasks in the socio-technical system can be seen in the PM Tool. Even though COVID-19 has posed significant challenges to some Case Studies and WPs alike, these are countered through several new forms of collaboration and strategies proposed in this document. A timeline illustrating the roadmap for the Case Studies in relation to the scope of the SPICE project is shown in Fig.15.

[2] The MANIFEST sheet under the development of WP4 is currently accessible only to the SPICE consortium and the SPICE heritage institutions.

[3] D7.1 – Evaluation Methods Protocols, 2020, p.37 – Available to members of the SPICE consortium and heritage institutions.

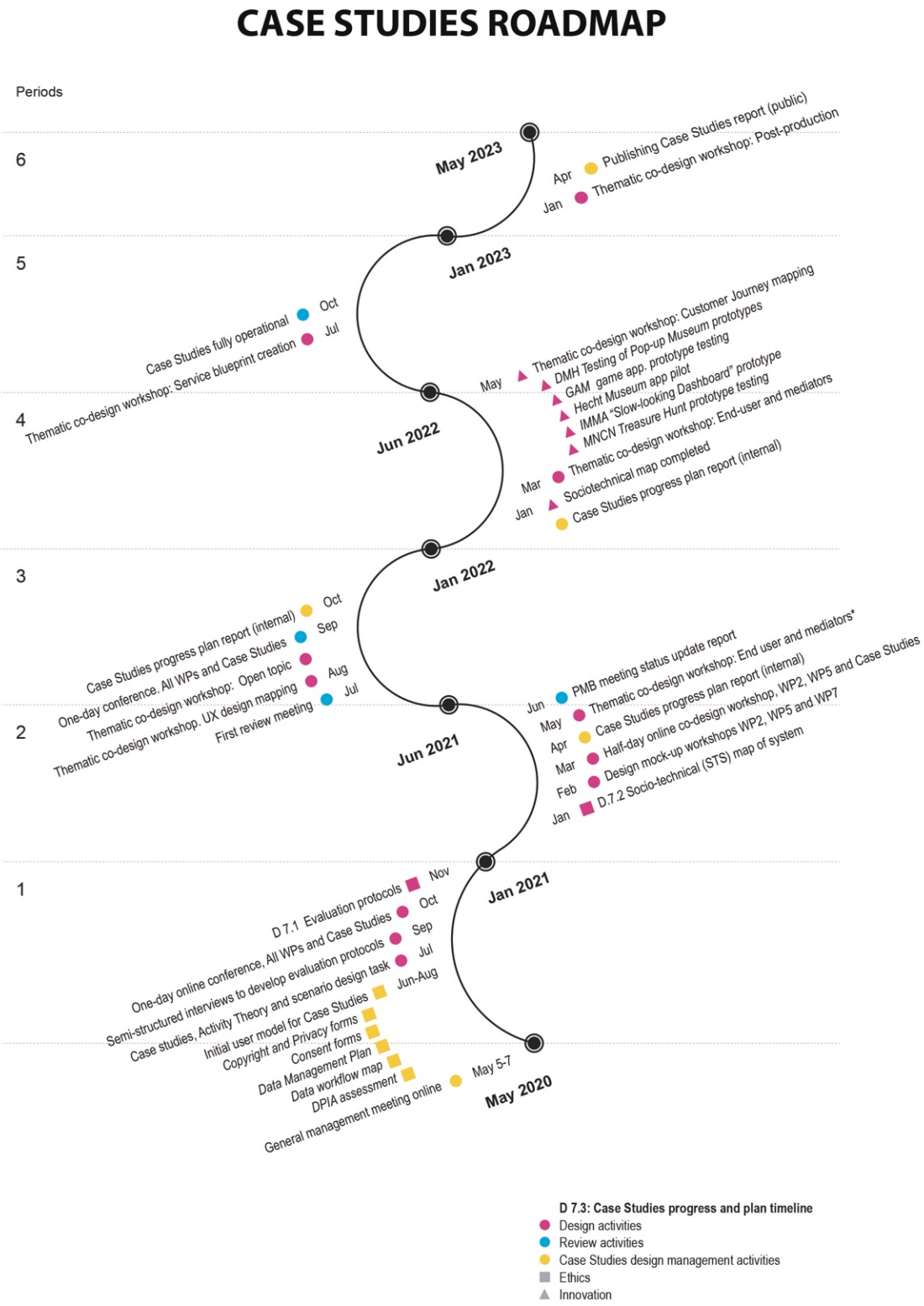

Fig. 18: **Case Studies** progress plan and roadmap outlining the timeline of development in all the SPICE periods.

5 – CONCLUSIONS AND DISCUSSION

It is understood that during the past twenty years a paradigmatic shift has occurred. From thinking about museum as arbiters and interpreters to institutions in the public sphere concerned with the visitor's well-being (Krichberg and Tröndle). From this has emerged an increased interest towards learning more about the museum's visitor experience.

The Case Studies presented in this document provide an opportunity to ground the research and development processes in the context of real-life situations. Each case shines light into different aspects of human behavior and the heritage experience as it undergoes augmentation using computer mediated communication systems. The Design Museum Helsinki VR *Pop-up Design Museum* enables us to examine use and visitor reception in relation to new generation digitally born heritage artefacts. Galleria D'arte Moderna's *GAM Game* allows for experimentation into the combined use of gamification strategies with heritage artefacts. Irish Museum of Modern Art, IMMA's *Slow-looking Dashboard* prototype demonstration facilitates extending an already known art-historical methodology into the digital domain so that we might better observe processes involved in the act of reflection. Both Hecht Museum's and Museo Nacional de Ciencias, MNCN Naturales pilot studies with school children aim to provide more introspective experience of imagining ancient times, or even different worlds that exist by looking at heritage artefacts using different scales. At the same time both cases include social dimensions since the experiencing of the museum heritage occurs in the context of school activities.

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