meSch
Material Encounters with digital Cultural Heritage

Material EncounterS with digital Cultural Heritage

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– Report –

Co-Design and Collaborative Learning

SEVENTH FRAMEWORK PROGRAMME

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1 EXECUTIVE SUMMARY

The “Co-Design and Collaborative Learning” report is part of the D1.1 deliverable and is the core outcome for task T1.1 Co-Design for Cultural Heritage. The report documents and reflects upon the co-design strategy underpinning meSch and its realisation. It presents the results of substantial work conducted within the project over the course of 32 months on shaping, coordinating and implementing participatory activities to connect cultural heritage settings and stakeholders to technical and prototype development.

The report is accompanied by a set of peer-reviewed publications and by a booklet and companion website where the meSch co-design strategies, techniques and lessons learned are documented and made available to other practitioners and researchers.

The results of this work provide a substantial contribution to existing research on and practice of co-design for cultural heritage technologies, and co-design overall. Several previous research projects have adopted participatory approaches to technology design, however co-design in meSch has involved a significantly larger team and range of stakeholders working towards several design outcomes: the team has included three partner heritage institutions and numerous external collaborators contributing to the design of exploratory prototypes, the three meSch case studies (in WP6), and the meSch authoring tool and visualisation strategy. This makes for significantly complex, challenging and extensive co-design practice within the same focused research programme, on a scale that has not been realised before. Furthermore, co-design work in meSch has employed a large variety of participatory techniques within various phases of co-design, and these have been also comparatively reflected upon and successively adapted. Overall the meSch co-design strategy makes for a significant research contribution on participatory approaches to design and represents a case study in participatory methods of unprecedented breadth.

2 INTRODUCTION

This report, "Co-Design and Collaborative Learning", the concluding outcome for the Co-Design for Cultural Heritage task, documents and reflects upon the overarching co-design strategy underpinning meSch and its realisation. It therefore presents the results of substantial work conducted over the course of 32 months on shaping, coordinating and implementing participatory activities to connect cultural heritage settings and stakeholders to technical and prototype development.
this introductory report, followed by a set of peer-reviewed publications, and by a booklet and companion website where the meSch co-design strategies, techniques and lessons learned are documented and made available to other practitioners and researchers.
The co-design approach that meSch has deployed and sustained was motivated by the desire to solidly ground technical design on the needs, knowledge and expertise of heritage stakeholders, and, conversely, to inform the design of meSch case studies through a hands-on, design-driven approach. Our ambition for meSch's co-design was not simply to draw heritage participants into a technology-led project, but to create a collaborative environment where all participants could contribute equally and develop a joint understanding of the problem space.
The results of this work provide a substantial contribution to existing research on and practice of co-design for cultural heritage technologies, and co-design overall. Several previous research projects have adopted participatory approaches to technology design, however co-design in meSch has involved a significantly larger team and range of stakeholders working towards several design outcomes: the team has included three partner heritage institutions and numerous external collaborators contributing to the design of exploratory prototypes (in WP2), the three meSch case studies (in WP6), and the meSch authoring tool and visualisation strategy (in WP3). This makes for significantly complex, challenging and extensive co-design practice within the same focused research programme, on a scale that has not been realised before. Furthermore, co-design work in meSch has employed a large variety of participatory techniques within various phases of co-design, and these have been also comparatively reflected upon and successively adapted. Overall the meSch co-design strategy makes for a significant research contribution on participatory approaches to design and represents a case study in participatory methods of unprecedented breadth.
The work conducted on T1.1.1[1] and on the overall WP1 will continue to produce outcomes well beyond the completion of WP1, and of meSch, not only in the forms of additional publications, but also by virtue of the release of the booklet and companion website, in connection to evaluation activities for the case studies in WP7, and to dissemination activities in WP8.
As well as the booklet and companion website, in this Deliverable, we present a set of already released high-impact outcomes representing the key contributions to research and practice made by T1.1.1 to co-design and collaborative learning.
This document is organised as follows: following this introduction, Section 3 outlines the challenges of running, coordinating, documenting and reflecting on the co-design process; Section 4 details the full list of co-design activities conducted within meSch, to fully illustrate the effort and complexity of the co-design strategy. Section 5 briefly discusses the relationship between T1.1.1 and other Work Packages and Tasks, highlighting how the outcomes from T1.1.1 have contributed to other project results. Section 6 presents the main novel contributions that T1.1.1 has made to co-design; these are extracted from a series of peer-reviewed publications which were completed and published during T1.1.1, and which are then included in full in section 7.2. Finally, section 7.1 introduces yet another outcome of T1.1.1: an illustrative booklet and companion website which will be available for free download/access and which document the methodologies, practicalities and lessons learned from co-

[1] Task 1.1. – Co-design for Cultural Heritage (involving UL, UoS, UC3M, WAAG, SHU) ended in September 2015, and had two subtasks: T.1.1.1 Co-design activities , coordinated by UL, and T.1.1.2 Co-design supporting tool coordinated by UC3M. The current deliverable refers to T.1.1.1 only.

design within meSch for the benefit of other researchers and practitioners. Finally, we include links and references to the full documentation regarding the meSch co-design process.

3 CHALLENGES

3.1 Understanding the practices of cultural heritage professionals

At the beginning of the project, a number of WP1 partners (UL, WAAG and UoS) have conducted in-depth interviews with cultural heritage professionals (CHPs), in an effort to better understand the existing working practices and needs of a wide range of cultural heritage professionals. The WP1 researchers had realised that existing data that could be gleaned from previous research was limited, and that a substantial new amount of knowledge on CHPs practice would be needed to inform the co-design in meSch. The interview material answered specific user-related questions and became an important source of information to be fed into various related WPs. It relayed information concerning the technical abilities of the meSch users to WP2, provided a basis for creating templates for the authoring tool as part of WP3, and aided the formation of design requirements of interfacing personalised data to end-users as part of WP4.

The interviews with 22 cultural heritage professionals from different institutions in the UK, Netherlands, Ireland, Italy and Germany (including the 3 museum project partners) were transcribed and analysed. The data collected through this study has provided solid grounding for understanding the complexity and intricacy of cultural heritage professional practice.

3.2 Documenting the co-design process

Due to the scale and complexity of the co-design process, documentation was a key task to ensure that activities would be monitored, described in full and analysed both individually and comparatively.

Detailed analysis of the ongoing co-design workshops and evaluation of the various co-design methods used has been conducted by UL. Co-design events and activities such as workshops and other exercises with stakeholders have been documented using text, sketches, photographs and video recordings and are available on the project's Sharepoint repository. A number of blog posts about different aspects of the co-design process and our approach were contributed to the meSch website troughout the duration of WP1 (32 months).

Documenting the process fully and consistently was also key to ensure that collaborative learning arising from it can continue further during the project. Therefore it has been crucial to identify strategies for the consistent reporting of activities, which would also help highlighting analytical categories for reflection on the material.

As the members of the UL team responsible for co-design in meSch cannot be present for all the co-design activities taking place between partners, we have developed a documentation template and reporting strategy which was shared with all the partners at the Consortium meeting in Sheffield in November 2014. Privately hosted Wordpress blogs were created for Museo Storico della Guerra Museon and Allard Pierson Museum.

Each of the websites has a public front page, but the diary content- brief notes, sketches, photos and videos recorded during co-design sessions- is private. The cultural heritage professionals and designers used the blogs to describe and document the design process of each of the case study exhibitions (WP6). The designers and CHPs posted short blog posts including sketches, pictures and videos that were taken during each design session. Periodically, the UL team monitored the blogs and offered assistance to the designers and cultural heritage professionals. Some of the posts in the co-design diaries were in English, some others in Italian or Dutch.

In parallel to these activities (that were undertaken under task T1.1.1), there has been a complementary research strand lead by UC3M on a more articulated tool to support the documentation and a certain degree of guidance in the process of co-designing digitally augmented physical objects (D1.2- A software application to support co-design activities- CoDICE- and D1.3 Evaluation of the tool).

3.3 Feedback and Adjustments

A second key challenge also linked to documentation was that of timely gathering feedback and adjusting strategy as we progressed work: identifying the composition of each sub-team, designing feedback tools/frameworks, revising practical strategies.

Communication and coordination

In the first 18 months of the project, we had regular WP1 Skype calls, sharing the progress done with local activities and planning for the consortium activities. Starting with August 2014, we agreed with WP6 and WP7 leaders to have joint calls, as most of the issues under discussion involved the same participants. We used the WP1 mailing list for day-to-day communication and Sharepoint for exchanging documents.

Feedback on the co-design strategy; Reflection on the process by various participants

In order to receive feedback on the consortium co-design activities, interviews have been conducted by UL, with support from UoS with a number of the co-design workshop participants in May-June 2014 (M16-M17). The interviewees included museum professionals, designers and facilitators so as to capture their different perspectives of the consortium co-design activities so far. The interviews were transcribed and annotated. A qualitative software application tool, Dedoose, was used for extracting topics of relevance from the interviews.

In July 2014 (M18), a co-design focus group was held at the Stuttgart consortium meeting; the meeting provided a group discussion forum for sharing the feedback obtained from the interviews. Designers, museum professionals and facilitators who had been involved in the co-design activities all shared their thoughts on the co-design process in the focus group. Some of the participants had taken part in the interviews whilst others had not; however, all of the participants had actively participated in the co-design activities.

13 participants from 8 partner institutions (APM, Museon, MdG, SHU, UoS, UStutt, UL and WAAG) were involved in the focus group, which was led by Gabriela Avram and Laura Maye from UL. The focus group was video recorded.
The material from the post-workshops interviews and focus group complements the continuous documentation of the co-design strategy. It was used to inform the next co-design activities in the meSch project.

3.4 Making the findings available

Documented key lessons learned were consolidated and made available in the form of peer-reviewed publications focusing on specific parts of the co-design process, as well as through a series of blog posts published on the meSch website. Regarding publication venues, we targeted a number of peer-reviewed venues of international reputation, both in the human-centred computing and interaction design field, as well as in the heritage technologies field.

3.5 Dealing with Complexity

A variety of activities were organised to realise co-design as envisioned since the very beginning of meSch: this was achieved in practice, however it led to the major challenge of coordinating and managing such complexity. The range of activities and of participants was difficult to integrate, as they were run in different places with different participants by different facilitators – often applying different styles of work, based on their expertise. In order to ensure coordination, the UL team documented all activities through regular discussions with all WP1 participants facilitating events, and interviewed facilitators on a regular basis.

4 List of Activities[2]

4.1 Consortium co-design activities

M1: At the **project kick-off meeting** in Sheffield on 27-28 February 2013, meSch partners were involved in an **initial co-design workshop**. This workshop, which took place during the general consortium meeting, was facilitated by Waag and SHU and involved initial exploratory activities including appreciative inquiry, brainstorming and concept generation activities. The session began with explorations of heritage experiences from the visitors' perspective so as to be able to distil different factors from the experiences, as a requirement for the designs. The group of participants was asked to find and collect aspects of 'living heritage' around the city of Sheffield and to share their experiences. In order to gain a better understanding of various audiences, visitor personas were created so as to serve as a reference for the conceptual development. In addition, narrative scenarios for the three participating museums (Museo della Guerra, Museon and the Allard Pierson) were explored in small groups in order to establish the 'design space' for technological development.

M5. Co-Design workshop, Amsterdam, June 2013

These activities were further expanded in the co-design workshop 1, a 3-day session which was held in Amsterdam and the Hague on June 5-7 2013. Alongside visits to two of the partner museums – the Allard Pierson at the University of Amsterdam and Museon, the co-design sessions involved the showcasing and testing of prototypes developed by the partners in WP2 and a discussion of all the different design concepts between the project technical and design partners and heritage professionals.

The evaluation and discussion around the prototypes provided input for the brainstorming and concept development work that was done in groups on the second day of the workshop. Six groups were put together comprising of at least one person from one of the three museums, one person with a design background and one person with a more technical orientation. On the third day each of these groups had to choose an idea and work it out to a full scenario, working on a storyboard and presenting it finally as an animated movie.

The co-design workshop in the Hague also featured an exercise, initiated by SHU whereby the entire group was encouraged to map the possibilities for the project in terms of context, contents and interactions. This led to a group discussion as to what contexts should we plan to adapt to and what are the ultimate expectations from the system.

M10 Co-Design workshop, Trentino, Italy, October 2013.

The theme chosen for the next co-design workshop held in Trento and Rovereto in October 2013 was to explore possible interactions and narratives in connection with various existing museum artefacts. The participants at the workshop were divided into four groups; each group included at least one museum professional from our partner institutions. The challenge was to think about the type of interactions and narratives that could be constructed around existing museum objects. The museum partners provided visual and textual representations of an object from their collections for the exercise. Groups were invited to reflect on questions such as 'What would I like the object to do?' and 'What would I like the interactions to tell?' Participants shared their ideas on what kind of interactions an object could have and what sort of narrative they could portray.

M12 Co-Design workshop, Limerick, Ireland, January 2014.

The final co-design workshop planned for Year 1 took place in Limerick in January 2014 and involved representatives from the museum, design, technical and research aspects of the project. This workshop was primarily concerned with defining the user and system requirements of the meSch

[2] The current list of activities focuses on T1.1.1 only. The co-design activities using CoDICE are covered in D1.3.

platform. Through the medium of storyboarding, the participants were challenged to devise scenarios of use and to generate requirements for the meSch platform taking into account different types of potential users from a novice to an expert user.

M25 Redesign workshop 1, **WAAG, Amsterdam, The Netherlands, February 2015**.
Redesign workshop 1 analysed the results of a pilot study (the ECSITE cases at Museon whose co-design is described below) and reconsidered the design choices in light of the findings.
As the pilot study happened earlier than planned and didn't use the authoring tool, which was still under development, the meSch Sheffield Hallam designers' team had to circumvent the authoring platform by uploading the media content directly. Based on this experience and on the conclusions of the WP3 work session organized in Sheffield in November 2014, SHU alongside WAAG and ECRTL ran a walk-through of the storyboards and interface templates created in previous workshops for the meSch authoring platform and analysed them through the lens of the pilot's result.
Outcome: the amended description of the authoring platform and its interface to be implemented by ECTRL.

4.2. Exploratory Labs

Two 'lab settings' co-design activities have been organised with consortium partners, cultural heritage professionals and users/visitors in order to:

- Explore conceptual and design directions
- Develop user scenarios
- Making and re-making of demonstrators through co-design

The first Exploratory Lab was split in multiple sessions as it was important to really grasp the questions of the individual heritage organization. In May 2013 WAAG, APM and Museon worked together on conceptual and design directions and initial scenarios, which formed input for the June co-design session in Amsterdam and the basis for interviews by WAAG with Dutch CHP.
The second Exploratory Lab was held in November 2013 with Dutch curators, from the Dordrecht Museum, Museon, Allard Pierson Museum, the Maritime Museum among others, to link content of their choice to the interaction possibilities of meSch prototypes, and to test and refine this combination.
For the second Exploratory Lab several meSch partners met in Amsterdam to showcase and test the developed prototypes of smart objects. Museum and heritage professionals from inside and outside the consortium were invited to join the workshop and to test and think about these smart objects for their own exhibits and museums. The focus of the workshop revolved around smart prototypes that help curators to easily create interactive exhibitions for themselves and the techniques that turn an object into a real experience for the museum visitor. The museum professionals linked content of their choice to the interaction possibilities of meSch prototypes and this combination was then tested and refined.

4.3 Other co-design activities within the consortium

M15 In April 2014, a two-day co-creation session involving partners from SHU and Museon was held in Sheffield. The purpose of the session was to create a concept for a meSch installation at the ECSITE (European network of science centres and museums) annual conference that was organised by the Museon and would feature around a thousand participants in May 2014. A specialist in novel interfaces, an interaction designer, content specialists and some students participated. The showcases (meSchcases v1) were subsequently exhibited during the ECSITE conference from 22nd – 24th of May 2014 at the Museon in Den Haag.

M17 For a separate installation, MdG have collaborated with SHU and FBK on the adaption of the Companion Novel for the trenches of the Nagià Grom. The SHU design team created an alternative companion device – the belt – more suitable to be carried by visitors in the trenches. MdG worked on the preparation of the content for a new version of the Companion Novel Book and for the Companion Novel Belt. Both devices were evaluated in a field trial in the trenches of Nagià Grom from the 21st to the 25th of July 2014.

M24 A technical integration session took place between the 13th - 16th of January 2015 in Trento, where FBK, SHU, ECTRL, MdG, UoA, and USTUTT were involved in the set-up of a demonstration for the meSch augmented experience, including both the curator-led authoring phase and the visitor experience.
In particular, a special co-design effort shared between MdG and FBK was devoted to the co-design of the narratives used in the demonstration.

M29 On 22 -23 June 2015, a co-design workshop was held at Sheffield Hallam University in order to establish concepts for exhibits to be potentially used at the Forte Pozzacchio as part of the first case study for the Museo Storico della Guerra. The workshop straddled both WP1 (co-design) and WP6 (case studies) and brought together museum professionals, co-design, design and technical partners. The 2-day workshop was attended by cultural heritage professionals from Museo della Guerra, technical specialists from FBK, designers and technical staff from Sheffield-Hallam and from UL.
The co-design workshop resulted in the production of a set of 3 static and 1 mobile exhibition concepts to be installed and configured at a WWI historical fortified site in caverns, like Forte Pozzacchio or the air-raid shelters in Rovereto.

4.4 Co-design activities including other organisations

In order to identify and assess the specific requirements of cultural heritage professionals in different contexts and to provide design inspiration and information to ongoing work, a number of local co-design activities have been running in parallel to the scheduled meSch consortium co-design activities.

WAAG In July 2014, the eCultValue European project has issued a call for concept validation experiments at European museums based on technologies developed within FP7 projects for Cultural Heritage. WAAG was invited to work with the National History Museum in Sofia, Bulgaria, and adapt the Loupe for their specific purposes.

The team at Sheffield-Hallam worked with the Sheffield General Cemetery Trust; they have completed interviews with the cemetery volunteers, field walks and observation exercises in relation to the cemetery tours and organised workshops with the volunteers in testing various concepts and working prototypes for use at the cemetery. In addition, UL and SHU worked on a bodystorming exercise in-situ at the cemetery site so as to test out techniques that could be applied to larger outdoor cultural heritage sites.

The team at the University of Limerick has built strong relationships with two local museums - **the Hunt Museum and the Limerick City Museum** - in devising local workshops around cultural heritage and DIY technologies. UL organised a DesignJam in April 2013 with museum professionals and digital media students around the theme of materiality and cultural heritage. A successful workshop introducing interns at the Hunt Museum to DIY technologies and sketching with hardware took place in August 2013. Another public workshop with 30 participants (museum professionals, enthusiasts, students) on the theme of Museum Engagement and Digital Technologies was held in the Hunt Museum in January 2014. The workshop took the form of an introduction to digital technologies in

Museums and also featured a hands-on session. A series of hands-on 3D printing workshops took place between June – July 2014, in collaboration with Fab lab Limerick, exploring ways in which emerging digital fabrication technologies could be used to enhance physical museum objects.
During the spring and summer of 2015, Laura Maye has been working with cultural heritage professionals (CHPs) at the Hunt Museum in order to co-design the "Alternative Perspectives" tours (using The Loupe) launched in September 2015. The initiative was part of the "2015- A Year of Irish Design" series of events.

The team at the University of Strathclyde has collaborated with the Glasgow Riverside Transport Museum and with the **Weimar historical cemetery**. A strong work relationship was built with the Riverside museum, based on a previous collaboration (evaluation of interactive installations in the museum). On completion of the case study work at the Glasgow Riverside Museum, the case study conclusions and remarks will be compared with those of the three meSch partner museums - Museo della Guerra, Museon and APM. UoS furthermore conducted a preliminary study of the Weimar Historical Cemetery, mirroring SHU's study for the Sheffield General Cemetery, with the aim of identifying local socio-contextual factors that influence requirements for the adaptation of prototypes (Weimar Cemetery is still in use for burials, whereas Sheffield General Cemetery is no longer in use).

The University Carlos 3 Madrid team organised 2 workshops in co-operation with **cultural centres in Madrid** in order to involve cultural heritage managers, students, curators and visitors of exhibitions in co-design processes and in this way have a wider perspective on the needs of users as co-designers. The first of these workshops was held at **Centro de Arte 2 de Mayo (CA2M)** in April 2013 and the aim of the workshop amongst other things was to understand what an 'encounter' mean for different levels of cultural heritage users - from common public to diverse profiles of professionals and experts. The second workshop organized by UC3M was held at **MediaLAB-Prado** in September 2013 and was aimed at understanding how users would like to augment cultural heritage resources with digital capabilities for which a prototype using a transparent window was built.