

This is a repository copy of *Co-Design Goes Large*.

White Rose Research Online URL for this paper:

<https://eprints.whiterose.ac.uk/154315/>

Version: Accepted Version

Article:

Roberts, Deborah orcid.org/0000-0002-5115-3459, spedale, simona, Petrelli, Daniela et al. (2 more authors) (2019) Co-Design Goes Large. *interactions*. pp. 59-63. ISSN 1072-5220

Reuse

Items deposited in White Rose Research Online are protected by copyright, with all rights reserved unless indicated otherwise. They may be downloaded and/or printed for private study, or other acts as permitted by national copyright laws. The publisher or other rights holders may allow further reproduction and re-use of the full text version. This is indicated by the licence information on the White Rose Research Online record for the item.

Takedown

If you consider content in White Rose Research Online to be in breach of UK law, please notify us by emailing eprints@whiterose.ac.uk including the URL of the record and the reason for the withdrawal request.

Co-design Goes Large

Gabriela Avram, University of Limerick

Luigina Ciolfi, Sheffield Hallam University

Simona Spedale, University of Nottingham

Deborah Roberts, University of York

Daniela Petrelli, Sheffield Hallam University

Within the cultural heritage sector, digital technology is evolving from something usually outsourced or commissioned to external experts to something more pervasively built into the skillset of heritage professionals. The do-it-yourself trend also enables heritage professionals to play a greater role, via tools and peer support for developing projects, while creating new demands and expectations. How are participatory and co-design approaches situated in this context? The variety among heritage institutions in terms of staff profiles and mission ethos means that participatory approaches are likely to be unique to each project and to each co-design team, and that whoever coordinates participation might do so in different ways. Issues of power and authority can also affect co-design strategies, particularly if institutions are wary of engaging with non-experts in shaping exhibitions or companion activities.

This radical shift raises some further questions. What is the actual impact that co-design can have? What legacy does it leave? Who benefits from it beyond project-specific endeavors? In other words, what value does technology co-design with and for the heritage domain generate? We must examine these issues in the longer term rather than on the basis of one-off, short-lived projects. Moreover, there is the need to be reflective about the co-design process in the heritage domain, rather than just examine its outcomes, by paying attention to how co-design unfolds and to what kinds of impact it has in terms of skills, concerns, and understandings. We shed light on these issues by reflecting on the meSch process, as co-design was our way of working for the full four years of the project. In meSch, co-design occurred in two ways:

- Throughout the entire duration of the project, with the heritage partners and collaborators fully contributing to developing the technology, the platform, and toolkit
- In three major case studies, lasting about six months each, where full-scale interactive exhibitions were designed, developed, and opened to the public in three different museums across Europe.

Both co-design threads followed the same process: starting with collocated intensive co-design events, followed by parallel activities split by expertise and later synchronized by in-person collaborations, and finally iterated. The co-design events were often open to external participants from the cultural heritage sector, in an effort to stay open to as many ideas and contributions as possible and to feed forward any design activity.

The co-design process, at every level, was carefully monitored and extensively documented throughout. This article is based on the data collected as part of that work carried out within the project [1,2], complemented by an external analysis of the project's co-design outcomes seen through the lens of open innovation across organizations [3,4]. Both perspectives see the work done in meSch as *value creation*, albeit from two different schools—participatory

design and organizational studies. Together they offer a rich tapestry of interpretations for the individuals taking part, as well as for the organizations and the consortium as a whole. We outline the project development, highlighting how co-design unfolded.

The meSch Project Lifecycle: A Brief Overview

The project workflow was unusual: although the final goal was to build a hardware and software platform, the first year was spent exploring what types of tangible interactions the cultural heritage partners would like to propose to their visitors. To capture as many ideas as possible, several external organizations were invited to join the consortium in creative sessions. This resulted in sets of exploratory prototypes and in scenarios describing how the hypothetical meSch platform could be used by cultural heritage professionals to implement the imagined interactive interventions. These exercises pointed out a number of unanticipated features that the platform should include, such as the reuse and repurposing of previous installations and the strong role for a community of practice using the platform (see Marshall et al. in this section). In the second year, the scenarios were developed into a concrete design of both technical infrastructure and user interface. The last two years of the project were spent implementing the platform while developing the three major case studies. The case studies were instrumental in advancing the design and implementation of the platform, as they continuously uncovered new needs and new challenges. The development was iterative, and a number of formative user evaluations were carried out to surface and address issues at an early stage. At the project's completion, we were confident that the platform was useful and usable; it was further assessed in four different co-creation events (each lasting two days) where more than 40 cultural heritage professionals (all external to the project) used the meSch platform to create interactive installations from scratch [5].

Building a Common Language and Building Trust

Co-design shaped the working relationships among team members in complex ways. During the first two years, activities such as goal-setting workshops and subsequent creative workshops formed and strengthened the basis for common understanding and for a common language. This took time but was crucial: the team had to bridge the gap between proposing an ambitious vision for meSch and realizing it against very real constraints. The need to collaborate across different communities of practice—that is, across organizational and knowledge boundaries—to develop the platform entailed a significant challenge. Perhaps the wide difference in the knowledge held by the various parties separated the curators and museum professionals, on the one side, from the more technology-oriented partners on the other. Co-design and co-creation activities proved challenging for many:

...classicists and historians like us to interact and engage with technology experts.... Even if we have been working in collaboration as a network with others—I mean, with other museums—for over 10 years, they are very similar to us. Here the network is very different, because of the complexity of the activity, but also because of the cultural differences and the importance of establishing a productive dialogue with others.... The first year has been really difficult and tiring.... Simply understanding what they were talking about, even before translating what that meant in terms of our own reality as a small provincial museum, was a challenge. It meant overcoming differences in language and culture. (A., cultural heritage professional)

The early creative events were the most challenging, not only for the need to create a shared vocabulary, but also for the need to negotiate one's way of working against the approach taken in other disciplines:

The point was to put together people of different specializations, and in my group this became difficult because, for example, the way that the technical person would approach a situation is completely different to how a museum professional would approach the same situation ... It feels that sometimes teams of mixed expertise ... lead to confused outcomes (B., cultural heritage professional).

An interesting exception was D., a software engineer from the commercial technical partner, who described the co-creation of the scenarios as: “*the most useful and interesting user requirements analysis I've ever done*”.

The cultural heritage professionals were not alone in struggling with understanding technology. Here, a designer expresses frustration with the curators at the outcome of one of the first creative workshops:

It was a paper prototype [a tangible replica of a Greek helmet housed at the museum]—if you looked at the helmet it would tell a general war story and if you put it on, you would hear the individual soldier's story ... But because a smart replica is never the real thing, [the archaeological museum] was opposed to the idea ... it drove us to create stuff that you put between the object and the visitor rather than letting the object talk [see the Loupe in Demo Hour for the outcome of this workshop]. ... In retrospect, it doesn't feel like they got something out of it. (E., designer)

The engagement in practical activities sidestepped the language barriers that existed at the start of the project between the different communities of practice in the consortium, prevented the entrenchment of early misunderstandings, and defused future potential conflict. These activities were followed by *exploratory labs* where designers, technologists, and cultural heritage professionals (from both inside and outside the consortium) used the concepts and prototypes and repurposed them to be used in their own heritage institutions. This *prototyping together* focused the heterogeneous team on a shared goal and showed how co-design activities using technological artifacts could impact curatorial practices. It also created the basis for the “bottom up” development of a shared, organic language facilitating interactions between individuals with different specialized knowledge domains:

It's not just about putting a designer and a curator into one space to come up with a solution; it's a relationship. It's about recognizing opportunities; it's about appreciating creativity, maybe thinking out of the box?... You need to invest in it. (Z., cultural heritage professional)

Hands-on activities allowed heritage professionals to develop an initial understanding of the potential of pervasive computing for heritage applications and to acquire familiarity with key technical terms and vocabulary to support future interactions. It also allowed designers and technology experts to understand the needs, constraints, and requirements of heritage and visitors alike. Indeed, designers and technologists became acutely aware that the design of new exhibitions, tours, or learning experiences does not revolve around technologies and that the content must come first:

It's only when you see [the installation] in situ that you realize how it will work, the effect it can have. It all starts to come together and you see the importance of all the pieces: the setting, the content, the technology, the design. (M., computer scientist)

In essence, the collaboration moved beyond building a common language into building a shared understanding to develop across the knowledge boundaries between the communities of practice within meSch, and for innovation activities (in this case, co-design and co-creation) to be effectively coordinated across inter-organizational boundaries.

Creating Value

Midway through the project, there was mutual trust, evidence of good teamwork, and knowledge that the desired visitor experiences were within reach. All of this allowed us to go through the implementation and delivery of the case studies and the platform with ease. But seeing the value of such an extended experimentation phase to achieve a straightforward implementation was not easy for all. At this point, in a 2014 interview, I.(cultural heritage professional), stated that there had been enough work done in workshops and that it was time to “*focus on real cases and on real stuff that we're going to implement*”. This comment highlights the fact that the reasons for the interconnection between an extended experimentation and a straightforward implementation need continuous reinforcement:

The co-design workshops were not only a means of getting the scenarios fixed or drawn, but also a means to have a conversation about all of the things that we have learnt and that you could bring to the table. Which is kind of implicit in the whole process. I'm not sure how many people felt it was goal oriented or knowledge-sharing oriented [sic]. Maybe in that sense, it would've been clearer if we had discussed those things and made them explicit beforehand. (E., designer, 2014)

While the design process and its dynamics of a lengthy initial exploration to speed up the subsequent implementation were discussed at the start of the project, clearly, after two years, the rationale was lost to many, as illustrated in the quote above. This called us to periodically re-establish the co-design spirit and to keep the common goals in sight. Indeed, by the end of the project all the participants said they would use co-design again if the situation allowed, and almost everybody agreed that co-design takes more time but can produce better results, especially in long-term collaborations.

Studies both on co-design [1] and on open innovation [2,3] identified a set of values generated by the collaborative practices that can occur at personal, institutional, and systemic levels as part of the process. Participants emphasized that they gained new skills akin to professional training (“*During the process I learnt to code*” N., cultural heritage professional), gained new knowledge and understanding, advanced their career or embarked on a different path:

At the end of the project I started my own company advising museums ... that often don't have experience in using technology.... I have started to introduce the idea of design thinking in museums (N., cultural heritage professional).

Heritage professionals in particular were positive and confident that the experience acquired would allow them to involve other colleagues and/or external collaborators in the future:

At a personal level, it has been a privilege to have the time for thinking and reflecting more strategically on what the museum does, and to experiment with processes that would not necessarily bring immediate and concrete outcomes but might have more longer-term impact. (A., cultural heritage professional)

The perceived value of an increased reputation occurred at the institutional level, too:

Being part of the meSch project made us more visible. People began to recognize what [an art and science organization] can do. (E., designer)

Organizations also expanded their skills and consequently their business:

For us what matters is commercialization, and this means thinking about a business model that allows the meSch technology to go to the market in the future.... In the final year we became involved in hardware development so that we could make progress in terms of commercialization of the technology...[for this] we had to develop an area of technological competence that was completely new to us, but this now allows us to go to the market ourselves. (C., technology SME)

The acquisition of new knowledge about hardware was enabled by participation in meSch, and this form of mutual learning and understanding among partners was one of the most acknowledged forms of value co-creation. This points to the power of team building and to the forging of relationships that helped with occasional tensions and conflicts. Importantly, while many views expressed in the 2014 interviews were quite critical and even skeptical of what the co-design process would achieve, the 2016 interviews (in light of the project's success) offered a significantly more positive perception of roles and contributions. This illustrates the key importance of the co-design's extended time frame and of highlighting intermediate achievements to sustain a challenging process. A number of unplanned and small collaborations among participants were carried out after the end of meSch, demonstrating value creation at a systemic level and beyond the project's life.

Conclusion

By monitoring and assessing the effectiveness of the co-design process throughout the project lifecycle, we were able to see that, overall, the participants valued co-creation more when examining the phases of the project retrospectively. The technical partners, the SME in particular, benefited the most from co-design, as the outcome of the different phases fed into their agile software development process. However, while we did not implement any formal reflection phase within the project plan, pauses for synchronization and reflection across disciplines would have been important for diffusing a sense of progression and achievement that, instead, emerged only at project completion. Indeed, during the mid-project interviews in 2014, the perceived meanderings of the process made some participants anxious. In 2016, closer to the end of the project, they valued the whole co-creation process as an important enabler of mutual learning and of the concrete outcomes of the project. The lack of perceived progress, as previously remarked by the designer, was an issue mostly for the cultural heritage professionals. This suggests the need for more structured creative practices within the cultural

heritage sector to provide more tangible evidence of the value of the ongoing activities. As a matter of fact, while the co-design sessions were very successful in providing a better understanding and fed the progress of the project as a whole, not everyone was aware of this.

Participants attribute co-design and co-creation a higher value as time goes by—after mutual understandings emerge, shared goals are negotiated, and results begin to materialize—compared with the initial phases, when the level of required effort is high and results are uncertain. There was a real tension between choosing co-creation as the core approach for a new collaborative project, and the need to convince partners early in the process that the project was on track. Indeed, those familiar with design or agile software development were able to absorb the new knowledge produced by co-design in their own practice throughout the project lifecycle. Some heritage colleagues, however, used to a tender system that delivers complete installations, found it hard to see the value of the intermediate knowledge created through co-design that was later instrumental in delivering the interactive exhibitions.

meSch's extensive process was challenging in terms of establishing, maintaining, and rewarding good relationships, but we also saw the extent of what was gained, in terms of co-design outcomes (prototypes, exhibitions), as well as experience, knowledge, and skill:

Often in these types of projects everyone works for themselves ... It is very difficult to understand how one partner contributes to what the others do. With meSch, there has been a substantial effort in developing a common, shared vision and to put the individual in the service of the collective. It's fundamentally about ethics and wider cultural change (E., technology).

Endnotes

1. Avram, G., Ciolfi, L., and Maye, L. Creating tangible interactions with cultural heritage: Lessons learned from a large-scale, long-term co-design project. *CoDesign, International Journal of CoCreation in Design and the Arts* (Apr. 2019).
2. Petrelli, D., Dulake, N., Marshall, M., Hockelkorn, H., and Pisetti, A. Do it together: The effect of curators, designers, and technologists sharing the making of new interactive visitors' experiences. *Proc. of MW 2016: Museums and the Web 2016*; <https://mw2016.museumsandtheweb.com/paper/do-it-together-the-effect-of-curators-designers-and-technologists-sharing-the-making-of-new-interactive-visitors-experiences/>
3. Spedale, S. and Roberts, D. Towards a relational model of interorganizational collaboration: The emergence of knowledge boundaries practices in open service innovation. *Proc. of 34th EGOS Colloquium - European Group of Organizational Studies*. 2018.
4. Roberts, D. and Spedale, S. Co-creating and capturing value in service innovation. *Proc. of 25th Innovation and Product Development Management Conference*. 2018.
5. These videos document and summarize two of the events: <https://www.mesch-project.eu/new-video-mesch-a-short-introduction-2/> and <https://www.mesch-project.eu/making-interactive-exhibitions-meschfriends/>

Gabriela Avram is lecturer in interaction design at the University of Limerick, Ireland. Her research includes the design and development of interactive technologies for cultural heritage settings, with an emphasis on co-design. In parallel, she is working with urban communities interested in technologies for civic engagement. She coordinated the co-design work package within meSch. Gabriela.Avram@ul.ie

Luigina Ciolfi is professor of human centered computing at Sheffield Hallam University, UK. She was deputy coordinator of meSch. She is interested in how digital interactive technologies mediate collaboration and participation, particularly in the heritage domain. Her most recent book (with Eva Hornecker) is *Human-Computer Interactions in Museums*. L.Ciolfi@shu.ac.uk

Simona Spedale is associate professor of organizational behavior and human resource management at Nottingham University Business School, UK. She has a Ph.D. in organizational behavior from CASS (City University Business School), London. Her research interests include: interorganizational relationships and embeddedness, organizational decision making and sensemaking, identity and identity change, and entrepreneurial action. Simona.Spedale-Latimer@nottingham.ac.uk

Deborah Roberts is professor in innovation and marketing management, and is the joint head of the People, Operations and Marketing Group at York University, UK. Her research interests and expertise lie at the nexus of marketing and innovation management, which is practitioner relevant and is driven in the context of an application. Deborah.Roberts@york.ac.uk

Daniela Petrelli is professor in interaction design at Sheffield Hallam University, UK. She started researching technology for heritage in 1996. Her other research interests include personal memories, multilingual and multimedia information access, and visual analytics. Throughout her career so far she has received 12 international awards. She was the meSch project director. D.Petrelli@shu.ac.uk

Insights

- A long-term (four years), large-scale (more than 50 people) co-design and co-creation project, meSch generated value for individuals and institutions alike.
- Although the slow process but fruitful outcome of co-design was established at the start, only at completion did those unfamiliar with it acknowledge its full potential. This calls for periodic reflection and process support throughout.

Image captions:

Figure 1a-d. One of the early creative sessions: a Whale Tooth is the inspiration for an interactive plinth.