

Co-creation in Computational Social Science: Lessons learned

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Extended Abstract

In computational social science, experts from different disciplines come together to answer research questions from the social sciences with technological solutions. Such interdisciplinary collaboration can be a challenging task, where a shared understanding of the problem at hand needs to be developed. We propose using co-creation [5] as a design method to empower social science researchers, so that their expertise can underpin the implemented technological solutions. In the context of human-computer interaction, co-creation is a design method characterized by a participatory mindset, in which users are considered co-creators [4]. They are encouraged to have an active role in the design process, because they are recognized as experts of the domain where the product will be used. This work describes the process and the lessons learned from ongoing research on applying co-creation to build an information system for social science research. The reflections on this case study contribute to the exploration of strategies and best practices in computational social science.

We have applied co-creation in a large interdisciplinary project to design an information system that supports the researchers in data collection, data analysis, and data visualization. So far, we have conducted nine co-creation workshops in two phases. In the first phase, we organized five workshops to meet with the different project sub-teams that focus on a particular topic. We introduced the concept of co-creation, talked about each other's expertise, brought in data examples, and discussed the tools that social scientists use in their workflow. We discussed what they find useful, and potential options for improvement and innovation.

In the second phase, the focus was on co-designing concrete solutions. We planned the workshops according to the most relevant computational topics of the first phase: data input and output, interface design, digitalization, text mining, and data visualization. We conducted surveys to learn about the researchers' tasks, and used multiple methods, such as creativity guidelines [3], wishful thinking [2], card sorting, and paper prototyping. Such activities help people to put ideas into concrete statements, and to develop a shared understanding of the task. According to the double diamond design process model [1], we guided participants on first thinking about the problem space, and then thinking about the solution space. Furthermore, we incorporated introductory talks on the computational topics by computer scientists. This allowed us to set a common vocabulary for the discussions of design ideas.

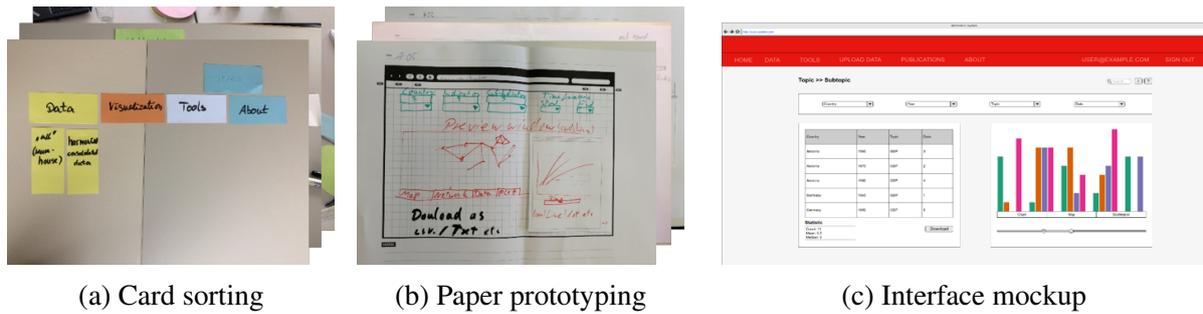


Figure 1: Participants expressed their ideas through card sorting (a) and paper prototyping (b). Then, these were translated into interface mockups (c).

We analyzed each workshop to recognize the advantages and disadvantages of each method. As an example, in the data input workshop, it became clear that although card sorting is a good method to discuss the information architecture of the system, the cards felt too abstract to discuss the main features of the information system. This is why, paper prototyping later substituted card sorting to discuss the features through sketches of the interface. Based on the input of the participants, we created mockups of the interface that combined the ideas discussed, such as it is shown in Figure 1, to later discuss them in the feedback sessions.

From the experience of nine co-creation workshops, we derive the following lessons learned. *Have a clear goal in each workshop.* Understanding co-creation without having any experience with software design can be challenging. Having a clear goal coupled with specific workshop methods is important to develop a shared understanding. *Use a creativity technique such as wishful thinking, at the beginning of the workshop.* Starting the discussion with the social science topics helps to first focus on the problem, to later brainstorm on the solution. This is key to avoid looking for solutions to the wrong problem. *Lead by example.* In the interactive methods, participants feel more comfortable if the facilitator leads by example. This makes the expectations clear, and helps to further shape the shared understanding. *Incorporate introductory talks on the computational topics.* They were especially welcomed by the social scientists, who expressed their interest in learning more to further develop their skills.

We also came across several limitations while applying co-creation. First of all, in this interdisciplinary context, asking social scientists to co-create was challenging from the beginning, because they expected computer scientists to provide existing tools, and they were unsure about co-designing due to the different levels of technical expertise. Furthermore, when people were asked to design collaboratively, they often stayed close to what they already knew. Therefore, the co-creation output may lack innovation. Finally, not all researchers can attend the workshops due to scheduling conflicts, and this limits the possibility of involving everyone.

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