

Designing IT support for co-located synchronous innovation workshops

Sabine Schön, Michael Koch

Orange Hills GmbH, Universität der Bundeswehr München

schoen@orangehills.de, michael.koch@unibw.de

Abstract. *The main goal of our research is to capture usage barriers and benefits of supporting synchronous innovation workshops, and then to design and evaluate a solution that addresses the barriers and raises the benefits. For capturing perceived usage barriers and benefits we conducted an interview study with meeting facilitators. The solution we designed from these requirements is based on a mobile phone app to capture results from paper posters and post-its, and to import these in an electronic workspace for presentation and further work. An evaluation of the solution in a real-world setting shows that the chosen balance of IT support and work with physical artefacts can provide a robust solution providing benefit to all.*

Introduction

For two decades, the field of Computer-Supported Cooperative Work has been dealing with the electronic support of meetings (Herrmann & Nolte, 2010; Nunamaker, Dennis, Valacich, Vogel, & George, 1991). In contrast to established video conference and presentation solutions, systems used for the mutual editing of artefacts in synchronized, collocated cooperation could not assert themselves in the field. In our research, we address the question of how a support system for the mutual editing of artefacts should be designed in order to facilitate existing work practices, prevent operational barriers, and fully exploit the potential of IT support. Innovation workshops serve as practice-oriented usage scenarios which are characterized by varying degrees of interaction intensity using several physical aids for the visualization of contributions (e.g. written post-its).

Requirements Analysis – Interviews with Facilitators

For requirement analysis, we concentrated on capturing the perspective of workshop facilitators - since we found that their perspective often was neglected in related work, though they decide on the use of a support system.

From a series of interviews conducted with professional workshop facilitators, we learned that IT support could really help – by avoiding media breaks during workshops and for documentation of workshops. However, barriers of use nonetheless outweigh the benefits, and led the facilitators to a negative usage decision. All the barriers that have been mentioned by the facilitators allude to the fear that the IT support disturbs their workshops, due to (a) **external influences**, (b) **complexity** and (c) **parallelism**. Additionally, facilitators fear to (d) **change their way of designing workshops**. See (Schön, Richter, Koch, & Schwabe, 2014) for a detailed description of the interview questions and the complete results of this step including quotes from the interviews.

From all the input about work practices, potential benefits and barriers of IT support we have derived the following requirements for a successful support system:

Flexible number of participants: The support system should work with up to 50 participants, but also support smaller groups.

Portability: The support system has to be portable to provide the facilitators an independency of existing infrastructure. The system has to be installable in short time without asking for long introduction phases for the participants.

Agility: In innovation workshops, we have a frequent change between information and interaction phases. The support system has to be agile in the change between the different group constellations.

Work in sub groups: The work in small groups with high interactivity has to be supported. Every small group needs a large common work space that is portable in the available rooms.

Modular use / Calm technology: The support system should be flexible to be integrated in traditional work practices. That means, the use of the support system should be able punctually on demand. It should not force the participants (or facilitator) to use a fixed process or to replace existing tools completely. It should step into the background especially in the interactive phases – so that the focus stays on the interaction between the participants. The support system should be as boring as possible to avoid distraction.

Solution – As boring as possible

In the following we present the support concept we derived from the requirements analysis – providing support for different phases in innovation workshops.



Figure 1. Collaboration in small groups (left) and presentation in the plenum (right)

During **work in small groups** (Figure 1, left) the advantages of analogous artefacts should be maintained. Because of that, existing tools like poster, poster templates and post-its will be preserved. Participants can work on post-its on their own or in subgroups and share the result in the small group on the poster(s) as collaborative work spaces.

The basic idea of unobtrusive IT support is to use a smartphone (on a tripod) to capture the template poster(s). The group then works as usual on the physical poster with physical post-its. By image recognition the images captured by the smartphone are analyzed and the post-its are cut out and transferred to a cloud-based collaboration software, and placed there as digital post-its on a digital version of the poster template. The image captures are automatic but also can be triggered by the participants explicitly.

It is possible to add photos of prototypes and other artefacts that have been created in the workshop. The smartphone also offers the possibility to project an earlier version of the work if needed via pico-projector.

When the **groups come together in the plenum** to present and discuss the concepts they have developed, the groups do not have to move their posters with the post-its to the plenum room, but can use the captured version of the posters. The team may even present the evolution or zoom in to details. It is also possible to present multimedia content added in the digital representation of the posters.

When it is time for the next sub group to present, there is no need to move physical posters, but the facilitator can simply switch to the digital poster of the next group.

Since the posters are stored in a digital collaboration software, the team members can work on these even **afterwards** – using tablets or laptop computers.

Prototype Development and Evaluation

We implemented the support system in the form of a smartphone app (Rapid Scanner – see <https://www.youtube.com/watch?v=lufKOAlLec8>) that interfaces with an existing cloud-based collaboration solution (Rapid Modeler – see <https://www.rapidmodeler.de/>).

After finishing the iterative design and development of the support system, we wanted to try if the system really works better than other systems before. The evaluation should check if the identified work practices can be supported, if usage barriers appear and if support potentials are exploited. This evaluation took place during a real-world innovation workshop that lasted several days with asynchronous phases in between. In the evaluation, we found that the system worked and was not perceived as disturbing or risky by the facilitators. Furthermore, they did not have to change their traditional way of designing workshops. The facilitators did not perceive the system as a risk and were willing to use it in future workshops. Additional benefits were identified, particularly in the much shorter time needed to start plenum sessions, and the additional flexibility generated for moderation through this fact.

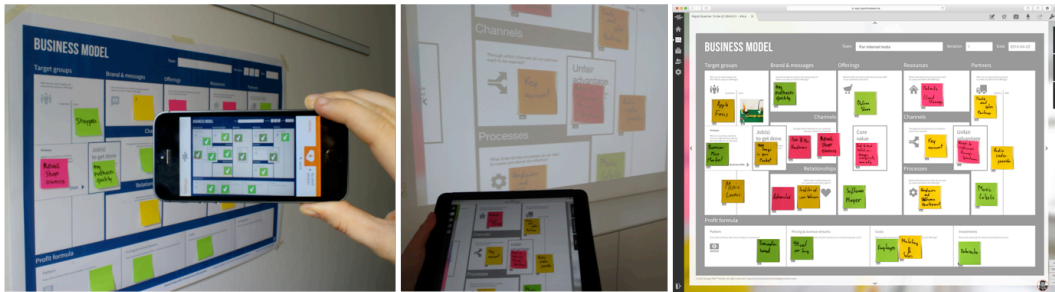


Figure 2. System prototype in action (left/middle) and cloud-based collaboration tool (right).

Summary and Conclusion

In our work, we re-examined the feasibility of designing a support system for synchronous co-located creative processes – taking tablets, smartphones or large screens in “Collaborative Interactive Spaces” as well as new concepts using paper interfaces and tangible interfaces into account. We designed and evaluated a simple support system using a mobile app to import post-its from physical posters to a digital workspace, showing the feasibility of the concept.

References

- Herrmann, T., & Nolte, A. (2010). The Integration of Collaborative Process Modeling and Electronic Brainstorming in Co-located Meetings. In G. Kolfschoten, T. Herrmann, & S. Lukosch (Eds.), *Collaboration and Technology, Proceedings of the 16th International Conference, CRIWG 2010, Maastricht, The Netherlands, September 20-23, 2010* (Vol. 6257, pp. 145–160). Maastricht, NL: Springer. <http://doi.org/10.1007/978-3-642-15714-1>
- Nunamaker, J. F., Dennis, A. R., Valacich, J. S., Vogel, D., & George, J. F. (1991). Electronic Meeting Systems to Support Group Work. *Communications of the ACM*, 34(7), 40–61. <http://doi.org/10.1145/105783.105793>
- Schön, S., Richter, A., Koch, M., & Schwabe, G. (2014). The facilitator’s perspective on IT support in innovation workshops. In M. Koch, A. Butz, & J. H. Schlichter (Eds.), *Mensch und Computer 2014 Tagungsband* (pp. 55–64). München: de Gruyter Oldenbourg.