The role of 'openness' in participatory design research

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This paper investigates the role of 'openness' in participatory design research projects and environments of our research group Social Spaces. It discusses a definition of openness – inspired by the open source philosophy – which makes the exchange of knowledge and practices possible, as well as the participation of people and interaction with different disciplines and domains. Also, it will define openness in different phases of the design process: in 'project time' (i.e. open exchange during the participatory design process) and 'use time' (i.e. open exchange after the participatory design process). In addition to that, we distinguish two forms of openness, being open access to functionality and to meaning.

Next, we refer to three case studies that provide insights in the opportunities and difficulties of working in open ways in design research. First, we discuss "MAP-it": an 'open source method' developed to enable people to 'map' their ideas and ways of working transparently for others and come to new collaborative solutions. Second, "Creating Spaces" is a project wherein an open source multitouch table is being developed, enabling more flexibility in design for small social and cultural organisations. We conclude with a reflection on our start-up of a FabLab, wherein open source researching and designing allows us to collaborate with the local multicultural community and the social and cultural field.

KEYWORDS: formatting instruction, template, full papers

Openness in a participatory design context

The research group Social Spaces (www.socialspacescuo.be) is a cross-disciplinary research group of the Media, Arts and Design faculty (KHLim), part of the LUCA, School of Arts of the University of Leuven (Belgium). Social Spaces consists of about fifteen researchers, designers, engineers and artists and operates within a context of research in design and art with strong roots in digital design and art, audio-visual and product design. Its goal is to create social, participatory but also imaginative and functional designs for various (often neglected) groups and contexts within society. Therefore, Social Spaces' philosophy and projects can be framed within the field of Participatory Design (PD): a set of theories and practices related to the concept of involving end-users as full participants in the design process. PD stimulates designing with (instead of for) people, (potentially) leading to a feeling of shared ownership of the final product (Ehn & Badham, 2002).

Besides that, Social Spaces investigates the role of openness as a principle to allow and stimulate an open exchange of knowledge and experience between various participants in a participatory design process. This open exchange can occur during the participatory design process, while engaging the participants in the creation of a new concept, design or service. Additionally, it can also be important in the phase after creation, when future participants are allowed to comment on, change or adapt the concept, design or service that was created. We will explain this later, by illustrating the difference between 'project time' (i.e. open exchange during the participatory design process) and 'use time' (i.e. open exchange after the participatory design process).

To research the role of open exchange in participatory design processes, this paper first focuses on defining the concept of openness, which – for us – is inspired by the open source philosophy. Second, we dig deeper into its value for participatory design processes. Afterwards, we exemplify our theoretical explorations with past experiments on openness in three case studies: "MAP-it", "Creating Spaces" and FabLab Genk. These cases involve projects that provide insights in the opportunities and difficulties of the use of open exchange for our research group. We end by drawing some conclusions from the case studies and by pointing out some elements for discussion.

Defining openness

Our concept of openness is loosely derived from the open source philosophy. We say loosely, since we play with what open source means in more technical concepts and translate it to a design research context. To understand how we define openness, we will first explain what open source entails.

Open source is a philosophy, but also a pragmatic method of creation via which organisations or individuals provide free access to source materials of a thing to a distributed network of people (Bauwens, 2007) (Tribe & Jana, 2006) (Open source initiative, 2010). The open source development model has especially been adopted by computer programmers around the world since the early 1980s. In the 1990s this model gained recognition in commercial contexts. The LINUX open source operating system – named after the founding father of the LINUX kernel, i.e. Linus Torvalds – must be the most well known example of this (Vallance, Kiani & Nayfeh, 2001). Although the terms free and open source are often used interchangeably, they are not synonyms. Free software is software of which the source code is open sourced and, additionally, can be used for any desired purpose without monetary or other restrictions. These purposes include: "*making as many copies as desired, installing on as many computers as desired, modifying (including extending) in any desired way, and redistributing in its original or modified form"* (The Linux Information Project, 2007) (Stallman, 2009). Free software supporters – aiming to make software as free as possible – tend to critique open source movements' focus on the technical aspects and their neglect of the political and social aspects of openness (Stallman, 2008). These supporters believe that, besides being open source, software should grant its users the additional freedoms that free software guarantees (The Linux Information Project, 2007).

The open source development model works via continuous improvement of concepts, products and services by sharing. Sharing means that the source code is made publicly available to anyone who wishes to use or modify it for his or her own purpose. For example, Richard Stallman – to whom the free software movement is often attributed – proposed that open source software should provide specific qualities to developers and users, namely *"the freedom to run the software, for any purpose, the freedom to modify the software, the freedom to redistribute copies of the original software and the freedom to distribute modified versions of the software"* (Vallance, Kiani & Nayfeh, 2001, p. 2) (Stallman, 1999). Next to sharing source codes also hardware can be shared in the form of (digital) blueprints of how the hardware is constructed (Avital, 2011). Additionally, the social and political processes in a design project can be shared (Dreessen et al., 2011). For example in an urban design project with local youth, exchanging information on the discrepancy between the political agenda of the city and the needs of the youth – and thus gaining insights in these complex interactions – is essential for understanding the project.

Sharing software, hardware or processes is comparable to sharing scientific information, during which it is necessary to build on existing knowledge. It allows working further on each other's artefacts. Sharing in the field of art and design research entails also – among other things – sharing knowledge on how artefacts are created. In this respect, the open source development model was a great inspiration for finding ways to share these different kinds of information. We will now focus on how this model can play a role in sharing in participatory design projects.

The role of open source in participatory design research projects

As we mentioned earlier, we work in participatory design contexts and adopted the open source development model to share knowledge in these contexts. Open source and participatory design have in common that both require an active participation of various participants: "*open source invites passive consumers to become active contributors*" (Fischer, 2003, p. 91). Involving end-users as full participants in the design process, participatory design mainly refers to the professional design process. During this design process, makers can make their knowledge insightful to allow others to participate. As mentioned above, we refer to this participation *during* the design process as **'**project time' (or 'design time') (Fischer, 2003) (Fischer & Giaccardi, 2005) (A.telier, 2011).

Furthermore, in recent participatory design literature another phase of the design process is addressed, being designing for participation *after* the professional design process. Ehn and colleagues call this metadesign (Ehn, 2008) (A.telier, 2011). In this 'after-design phase' – which is also called 'use time' – makers can share knowledge to allow on-going participation in their products, works, systems or services. This can happen via collaborative annotation, editing over distance, via blogs, discussion forums, newsgroups, videos, MUDs or mailing lists (Huybrechts, 2011).

In both phases of the participatory design process – in 'project time' and in 'use time' – sharing is allowed via the open access to design products and processes. This enables designers, artists and users to learn from each other's knowledge, comment on and improve it. Furthermore, they permit the appropriation or reproduction of the knowledge and practices for other goals and groups (Bauwens, 2007) (Tribe & Jana, 2006). Open source literature states that this may lead to better quality, reliability, flexibility and lower costs. The open and flexible form of works may also open up new creative categories of things, since people are able to experiment freely and might create things that they would not have been able to produce from scratch (Huybrechts, 2011) (Open source initiative, 2010).

Then, the question is what open access entails. In open source environments, driven by a technological logic, open access most often refers to making the functionality of a product 'accessible'. Dix (2007) states that if a designer wants her/his product or work to be participated in and even appropriated for other ends, both the functionality and the intent of the product or work has to be made visible. He argues that for appropriation to take place, things should allow interpretation by others, provide visibility of how they function, expose how they are intended by their makers, support people in designing new elements, be 'pluggable' and 'configurable' and provide a platform where the modified works and the related experiences can be shared. Therefore, next to functionality, a second form of access is needed: one that reveals the meaning of the design product or work. This form of providing access to meaning is in dialogue with how Clifford Geertz (1973) wanted to access culture, that is as an interpretative activity that searches for meaning. He defines culture as: "*a system of inherited conceptions expressed in symbolic forms by means*

of which men communicate, perpetuate, and develop their knowledge about and attitudes toward life" (Geertz, 1973, p. 89).

Open access in Social Spaces' projects: three case studies

Exploring this open access to both function and meaning of knowledge in participatory design research projects, we will discuss three case studies that use(d) open source as a guiding principle. In discussing these cases, we are especially interested in how different forms of open access were approached, how they related to each other and to the ways people participated in them. We will present a qualitative analysis of these questions, based on ethnographical analysis via three case studies. These cases provide insights in the opportunities and difficulties of 'open sourcing' our research for the research group and 'stakeholders'. The ethnographical analysis took place via live and video taped observations of how the projects were used in participatory set-ups, in physical and online settings.

(1) MAP-it

"MAP-it" is an open source method developed to enable people to map their ideas and ways of working with and for others and come to new collaborative solutions while doing so. Specifically, MAP-it is a mapping method to mediate participatory design processes. It is also a toolkit – or MAP-(k)it – that is designed to address the fact that people from different profiles, backgrounds and expertise do not necessarily share the same 'language'. The MAP-(k)it contains stickers and background maps that are open and adjustable, intending to construct a common language among participants. This language – which is new to all participants – aims to create a dialogue different from the one every participant is used to in her/his own context. MAP-it's 'unfamiliar' – and visual – character enables everybody to join the conversation on an equal level (See: figure 1) (Dreessen et al., 2011).

MAP-it encourages participants to take the risk to explore the rich potential of their mutual differences and deal with the resulting uncertainty in a playful and constructive way. A review of risk-related literature shows that this type of risk-taking is often underexposed in the description of participatory methods (Schepers, Huybrechts & Dreessen, 2011) (Huybrechts, Dreessen & Schepers, 2012). Generally, (the descriptions of) these methods – and certainly when used in commercial contexts – focus on reaching consensus between participants as efficient as possible (Gold, 2007) (Brickwood, et al., 2006). However, risk is an integral and necessary part of the participatory process. A form of such risk-taking in participatory design processes is openness. This can include open access to materials and thus taking the risk to hand over part of the control over the design process to (other) participants (Huybrechts et al., 2009) (Huybrechts, Dreessen & Schepers, 2012).

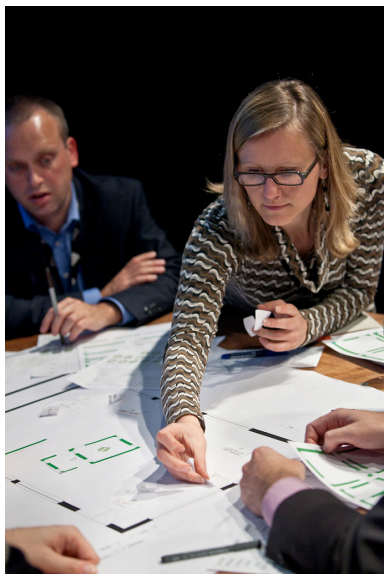


Figure 1: MAP-it aims to create a dialogue different from the one every participant is used to in her/his own context.

In 'project time', openness entails the fact that MAP-it aids the designer to put all – or her/his selection of – ideas on the table in the form of a background map and stickers, that are then open for remixing, changing or critiquing. They can be transformed and personalised by the participants for new, unexpected contexts. Many 'makers' (terminology derived from Liz Sanders (2001, p.1) *who states that: ""Makers" include all the members of development teams from disciplines such as marketing, engineering and design)* are not used to release control over their creation process and products in this way. Therefore, a good moderator appeared to be crucial in translating ideas for participants. Also, to make the ideas of the participating people accessible (to others), readable icons needed to be provided. At the same time, to allow open source development, these icons needed to be adaptable. Therefore, blank, empty stickers were integrated in the toolkit, enabling people to create their own common language: a strategy often used in Participatory Design (Sanders, 2000) (Muller, 2001) (Murray, 2004).

To allow participation in 'use time', MAP-it makes the creative re-use of its components possible (Open Source Initiative, 2010). Here, the difference between open access to functionality and meaning became important. On the one hand, MAP-it 'open sources' its functional components: adapted versions of the MAP-(k)it and their uses in real-life contexts are visually and textually documented online. On the website (www.map-it.be), mapping kits can be adapted to the specific needs of participants, guided by clear guidelines (see: www.map-it.be: "How to organise a Mapping Session") and then downloaded. Participants are furthermore stimulated to upload a report on the particular changes that they made to the mapping toolkit. At the same time, participants expressed a great need for examples on how the MAP-(k)it was used in specific contexts. Here, the documentation of meaning was essential. Participants are asked to reflect on the workshops they organised with MAP-it. Via documenting functionality and meaning of the MAP-it kit on the website, MAP-it (and its website) can grow as a space for exchange, frequently

renewed by its members. This could allow the mapping method to 'escape' the boundaries of the research group and lead a long life of adaptations in diverse contexts (Dreessen et al., 2011).

(2) Creating Spaces

"Creating Spaces" is a project wherein an open source multitouch table is being developed; enabling more flexibility, lower costs and more possibilities for creative re-adaptation in the design of multitouch tables for small social and cultural organisations. The goal of the design research project is (1) to design an attractive meeting point between cultural and social institutions and their stakeholders (audience, partners, etc.) in the form of a table, (2) to metaphorically and literally open up multitouch technology for the cultural and social field and (3) to create a usable, but at the same time creatively challenging, user-interface for navigating the multitouch table.

In the 'project time' or the development phase of the table interface, MAP-it was used in an adapted form. The MAP-it icons were placed on a plexiglass plate with a light source positioned underneath it, as a prototype of the future multitouch interface (See: figure 2) (Huybrechts et al., 2009). This prototype set-up, using MAP-it's icons, allowed the participants to place, move and reposition interface design components in order to collaboratively design the multitouch interface. Again, like described earlier, a good moderator was essential to explain the intention of the project and allow participants from various backgrounds to 'communicate' with each other. Furthermore, a good readability of the future interface components but also a large adaptability of these components was important.

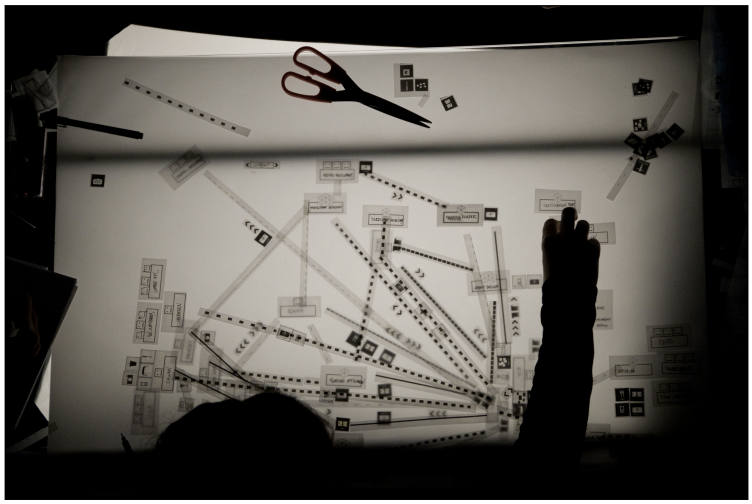


Figure 2: a prototype of the future multitouch interface.

In order to make participation possible in 'use time' – when the first version of the multitouch table was developed in the form of a working model – reflection on how to allow open access was again required. The project open sourced the code and the blueprint of the table's hardware so that other designers or software engineers could develop their own version of it. In making the multitouch application open source, it was important that other people – independent of the

programming platform – could use or alter the application. First of all, a choice was made for an open source programming platform: first JavaFx and later Open Exhibit. Second, for the design of the user interface – based on a map of the exhibition space, i.e. the open space of the province of Limburg (BE) – the open source environment 'Open Street Map' was used. Next to this open access to the functions or workings of the map, code and the hardware of the table, a project blog was created to reveal the stories – and thus the meaning of the making process – of what took place around the multitouch table, while developing and using it.

The function and the meaning of the multitouch project were made transparent on two different platforms. First, Social Spaces communicated the redevelopment of the code via the Open Exhibit online community, where a positive response was given to the adaptations of the code while developing the table. Second, the experiences with the use of the table, its meaning and intentions were communicated via a blog, which triggered attention from the art and design community. The separation of these two types of information had both advantages and disadvantages. Two very separate communities were addressed, that each reacted to very specific aspects of the development of the table. However, the totality of the table, integrating function *and* meaning, was not taken up for comments and adaptations. This is an issue that needs to be worked out in the current, and last, stage of the project.

(3) FabLab Genk

We conclude with a reflection on our start-up of a FabLab, wherein open source researching and designing allows us to collaborate with the local (multicultural) community and the socio-cultural field. A FabLab is a workplace that is open to everyone, following the example of MIT's Neil Gershenfeld (Van Abel & Evers, 2010). FabLabs can be placed within the context of personal fabrication. According to Gershenfeld (2005), the digital revolution lies behind us and we have now entered an era of personal fabrication. This era goes beyond personal computation and thinks of fabrication in the broadest terms and in terms of its impact on the broadest range of audiences (Mikhak, Lyon, Gorton, et al., 2002). Personal fabrication means that we no longer have to shop for and order products, but that we can download or develop its description and supply the fabricator with designs and raw materials. In short, personal fabrication means that we can make (almost) everything ourselves (Gershenfeld, 2005).

With this idea in mind, Gershenfeld launched a project to create FabLabs: fabrication – or fabulous – laboratories which aim to explore the implications and applications of personal fabrication. These labs, according to Gershenfeld, are "*a collection of commercially available machines and parts linked by software and processes we developed for making things*" (2005, p. 12). A FabLab allows people to develop and perfect a prototype of almost any imaginable product.

Social Spaces' project "Fablabs in the border region" (funded by the European Interreg IV-programma for the border region Flanders/the Netherlands) (2011-2014) wants to stimulate the collaboration between students and researchers from universities and university colleges with industry and social economy. Furthermore, it wants to encourage entrepreneurship among young

people by giving them a chance in realising a first small series of products. The set-up of a FabLab in Genk (BE) is an important part of the project. Currently, FabLab Genk is already open and fully operational for students, researchers, external designers and amateurs.

During 'project time', the set-up process of the FabLab, several MAP-it mappings were organised to engage all relevant participants. Open access to the concept was provided during a first session, where an open brainstorm was carried out about what the final lab should look like. We provided a good moderator and fairly open icons to allow and stimulate people to share their ideas. Later, when the project became more specific, a second Fablab mapping was done, which stimulated open exchange of the functions and workings of the Fablab. This mapping contained more specific icons of machines, walls and people that would be involved in the FabLab we had in mind.

In 'use time', now that the Fablab has started, open access to functions of the lab is provided. In line of the FabLab philosophy, the access to the lab and its cutting edge equipment is absolutely free, including the training one can follow to get acquainted with the hard- and software in the laboratory (Milanese, 2006). Sharing, more or less, the same set of basic equipment, allows FabLabs to easily share designs. Usually, the public is granted free access to the lab, provided that they share their designs with others (via the internet). Documentation and digitally sharing designs with every other FabLab in the world are thus essential (Mikhak, Lyon, Gorton, et al., 2002). Therefore, FabLabs can be placed in the context of open source.

Social Spaces is now developing an additional documentation system that could augment the functional sharing of information with sharing of meaning. We feel that this is an aspect that has been neglected by the FabLab community. However, there are some organisations – like the Amsterdam FabLab (http://fablab.waag.org/) – who have put an effort in working with more than codes and blueprints alone and also use videos, images and texts as documentation means to provide more meaningful contexts. We are thus currently investigating how to provide access to both function and meaning in the use time of participatory research projects. We frame this in the research trajectory of one Phd student ('Configuring hybrid objects as design spaces' by Jessica Schoffelen) in particular and, more generally, in the context of FabLab Genk itself.

Conclusion/discussion

This paper had the intention to investigate the role of 'openness' in participatory design research projects and environments of our research group Social Spaces. After a theoretical exploration it became clear that openness, as defined in open source contexts, is a very valuable model for sharing the very specific kind of knowledge in the contexts of art and design research. The cases helped us to specify *how* the open source model is used to share this knowledge. We also discussed that in the two phases of providing open access to a participatory design research process – being 'project time' and 'use time' – different aspects of knowledge exchange are important. From this, we can draw some conclusions.

In the first phase, 'project time', we believe that open access is provided by stimulating open exchange between participants. This requires a good translator or moderator who 'translates' the visions among participants, as is the case in – for instance – MAP-it. This is in dialogue with what we find in literature on open source, like the work of Poderi (2012). Poderi states that open source development requires good moderators, next to good developers and clear guidelines for people who want to participate in use time (Poderi, 2012) (Scacchi, 2007) (Ye, Nakakoji, Yamamoto & Kishida, 2005). Furthermore, there appeared to be a need for communication means that are readable and endlessly adaptable as incentive for an open exchange of knowledge and experiences (such as MAP-it's stickers that can be overwritten or repositioned).

In the second phase, 'use time', open access to both function and meaning became very important. In MAP-it, Creating Spaces and FabLab Genk, we work with clear guidelines for functional redevelopment (see the second criterion by Poderi, 2012). Additionally, there were spaces developed for the exchange of meaning, like the Creating Spaces blog or MAP-it website on which the documentation of MAP-it sessions is made available. In some of the projects, the two types of access were addressed separately on different platforms. This can attract attention from very specific – and thus different – communities. However, we think it would be advisable to create one platform that connects both aspects, allowing the totality of a project to be discussed, improved and adapted. For this we refer to Daston (2004), who states that things become most self-explanatory – meaning that they 'talk for themselves' – when their materials and meanings mesh.

The challenge for us now is to research ways in which existing participatory design initiatives provide access to both function and meaning in use time. To do this we are now researching existing documentation strategies, explicitly aiming at combining both aspects. Next, we will test some set-ups of documentation strategies. One set-up has already been created and is based on MAP-it. It uses the MAP-it stickers to enable a project group to document the function and meaning of a finished project. While evaluating MAP-it's capacity to document, participants remarked that the stickers should be made more specific and could be used in a more structured scenario than was the case with previous mappings (mainly focused on the *creation* of new projects). These two aspects could increase the readability of the maps resulting from a MAP-it mapping session. The flexibility, hands-on and game-like character of MAP-it was evaluated as positive for documentation ends, since it motivates project makers in doing something they always postpone: properly documenting their work.

Based on these evaluations, new set-ups are now tested, paying close attention to participatory interpretation and meaning (Huybrechts & Schoffelen, 2012). By doing so, Social Spaces hopes to find new and interesting ways of providing access to both function and meaning in its – past, present and future – research projects and environments. This will allow us to explore open access to design products and processes in an on-going, iterative manner and take openness a step further.

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