Sharing is caring. Sharing and documenting complex participatory projects to enable generative participation
Peer-reviewed author version

Sharing is caring. Sharing and documenting complex participatory projects to enable generative participation

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Abstract. This article reflects on how sharing documentation of subjective viewpoints on complex participatory projects can contribute to end-user development in or generativity of projects. We will discuss the documentation approaches of some participatory projects that combine the development of software and hardware in a cultural, social or health context with groups of participants with an eye on generating ongoing participation. We will also describe how we, inspired by these projects, developed 1. a "thick documentation" approach, based on a collaborative mapping method called MAP-it 2. that provides a dynamic view, revealing the diverse subjective perspectives on the project; 3. that motivates different types of makers and participants to participate in documenting; 4. that aims for generativity. We evaluated our approach on these 4 goals and propose future challenges.

1. Introduction to core concepts and methodological framework

In this paper we reflect on how we developed an approach to documentation that can stimulate end-user development in the participatory design projects where our research group Social Spaces is involved in. The participatory projects we engage in are not only defined by the objects they produce, e.g. a specific technology, but as socio-material assemblies where people and objects, mutually shape each other and of which the outcomes are always uncertain [20]. For instance, we will discuss the documentation of a project wherein a multitouch table is developed, together with art professionals, engineers and designers, with the aim to enable other people to continue to rebuild and adapt the multitouch table in the future. The way the multitouch table will take shape thus depends on many people and objects and their mutual interactions.

In our working context, the term end-user development is thus too limited, since it does not only involve end-users, but also participants from different working fields, such as software and hardware design, culture or health care. Moreover, the strict boundaries between professionals and users regularly blur. For this reason we will not talk about professionals and users, but about the initial 'makers' of a project and

'participants' who create for (and by) themselves, even independent from the original makers [1]. Also, we talk about the generativity of projects, instead of about end-user development, referring to the project's ability to generate ongoing participation by possibly everyone: end-users, designers, developers, and so on. With the term 'generativity' we describe projects wherein participants can continue to participate even without a lot of support from makers. Literature associates the term with the interest of makers to establish and guide a next generation [11, p. 231] to participate in a project, but also with distributed communities, on the internet, at home or in (small) organisations, that engage in bottom-up and little structured processes of creativity and change [32]. In participatory design projects specifically, generativity can be explained by distinguishing project and use time [10]. In project time a project is developed in a participatory way between makers and participants. In this time frame makers still play a key role (e.g. the collaborative development of the multitouch table). Generativity concerns use time, wherein participants – more or less self-organised – continue participating after the formal project is finished and makers have a less central role. However, previous research shows that makers can still play a role in enabling generativity by engaging in three forms of exchange – or trade-offs - with participants [19]: sharing a project (e.g. sharing the making process of the table on an online platform so other people can rework it for their own purposes), making it modular and allowing deviations on a project.

In this article, we present a literature and empirical study [19] wherein we focus on makers and participants who generate participation by engaging in the first trade-off, namely by sharing documentation of projects, e.g. on platforms like Wikis. We take a closer look at documentation theoretically, providing insight in the fact that it is - more than sharing facts - an inherently subjective endeavour. With this knowledge, we investigate a series of case studies of documentation approaches, using **4 criteria**: (1) how projects are currently documented on online platforms (media used, e.g. websites, texts, blueprints), (2) what kind of generativity they aim for (reuse, collaborative development, inspiration, reinterpretation), (3) how they approach subjective documentation (how they share the philosophy, visions, goals related to a project) and (4) how they motivate makers and participants to document. We limited the amount of cases we studied to six, since they represent the different domains we want to discuss: Open Source (Open Exhibits), Open Hardware (Fabrication Laboratories[1], Open Source Ecology), Open Innovation (Open IDEO) and (Media) Design and Art (the Variable Media Questionnaire and Design Documentaries). We selected precisely these cases because they are a. related to our working field, b. already used by us (to include our experience with actually sharing on it), c. more mature platforms, meaning that they have more experience in documentation and d. targeted to makers and lay as well as expert participants (e.g. with specific design skills). We saw that documentation of subjective viewpoints on projects is little explored and often lacks a motivational context that stimulates people to document their view on a project. Therefore, we introduce an experiment with a motivational documentation approach to share subjective viewpoints on a project, aiming for generative participation. Finally, we propose challenges to develop an improved

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[1] We only included the Benelux network that we are also involved in and not considering maker labs that aren't associated with the FAB charter.

documentation approach to support design teams to document their projects.

2. Sharing documentation is caring

Literature in HCI, design, open source and hacking shows that sharing documentation about a project is caring for (future) participants, since it can enable them to learn from it, comment on it or appropriate it for other goals and groups [3], [30] or even create new versions of it that they would not have been able to produce from scratch [14], [21]. An in depth exploration by the 'documentation movement' provides more insight into what forms documentation can take.

While traditionally documentation was being restricted to text-bearing objects in specific physical media (e.g. paper) the documentation movement thrived to get it out of this narrow approach. It defined documentation's core role as the storing and retrieving of information and thus proposed to extend it to any or all objects that are potentially informative (e.g. models or art works) [25, p.217]. In his essay on information Buckland [7] - elaborating on the ideas of Briet's influential work 'What is documentation?' [6] - states that documentation's main function is making information tangible, approaching it as information-as-thing (next to information-as-knowledge and information-as-process) and as 'representation'. It represents something else, e.g. a text, an animal, an event, etcetera, and stores and shares its information. Buckland relates documentation to scholarship and the activity of sharing and elaborating on former information (e.g. books, evidence), since it is rooted in the latin 'docere', pointing to its goal of informing, being a lesson, an experience or a text. This function as informing about something points to the fact that documenting includes more than presenting facts; information also needs to be *shared by someone* who gives his or her own perspective on it. Palmer [26, p.262] and Buckland [7] make clear that documentation presents a certain model of something that is limited to meaningful features that are expected to be most significant by the person who documents. Since documentation always involves a subjective viewpoint, emphasising a certain (series of) characteristic(s), different documentations of the same thing are different and could all be consulted to fully understand a project. This also implies that not every kind of documentation is relevant for everybody.

If we link this literature review to our goal, namely to develop a documentation approach for projects with an eye on generativity, we learned that a documentation approach (1) can use any type of media; 2) generally aims for other people to build further on a project (generativity), (3) is subjective and thus ideally reveals multiple views on a project and 4) depends on personal motivation to document a specific view on a project. Although documentation practices in software, hardware and knowledge focus more on the sharing of facts, such as the code of a multitouch table (see [19]), several authors emphasise the importance of sharing subjective viewpoints on projects to generate participation or end-user development. Dix [9] states if makers want others to appropriate their project, both its functionality and intent need to be visible and allow interpretation by others. Similarly, Bardzell [2] stressed an artefact should disclose how it interacts with a subject, and Avital [1] pleads for engaging and evocative forms of sharing, including meanings and interpretations. We do not see

this personal and partial character of documentation as a limitation. We see it as a challenge for documentation approaches to provide a more subjective, multiple and dynamic view on a project, which offers participants many possibilities to build further upon it. This relates to our view on how to document participatory projects - based on e.g. Latour – which we intend to document, as dynamic processes wherein people and objects interact in many trade-offs, with outcomes that are uncertain. Although these trade-offs determine a project, they are mostly hidden. Similar to 'thick descriptions' that are used to describe both obvious and hidden interactions in field studies and findings in social and cultural sciences [13], we approach the documentation of projects as 'thick documentations', documenting both the software, hardware or art, the different participants and their subjective interactions.

3. Current "careful" documentation practices

We will investigate how concrete approaches to documentation "carefully" invest in sharing subjective documentation, instead of limiting it only to sharing facts. By looking at the domains of open-source, open hardware, open innovation, design and arts, we try to cover the whole range of domains in which our research group operates. For each domain we will uncover one or two cases, evaluating them on the 4 criteria mentioned in the introduction.

In *open source software* *contexts* developers share software projects' source material with a distributed network of people to develop new features or fix problems, making software at lower cost, but also with better quality, reliability, flexibility [21]. Since this source material is not always easy to understand, some makers invest in translating this material into design patterns, a type of "schemes" that can be applied to software in response to specific problems [12], aiming to make it understandable: *"[…] facilitating designers to communicate, document, and explore design alternatives"* [12, p. 395]. Because these patterns also demand expertise and thus exclude potential participants [22], experiments have been done to invite contributions by other participants, e.g. through a bug-report button when using software or via online gatherings in which everyone can share ideas. **Open Exhibits** [33], for instance, tries to reach a wider group of participants, paying attention to the subjective character of documentation. It is an online sharing platform of open source software for the development of multi-touch interfaces for cultural contexts, on which tutorials are shared with an eye on **reuse or –development**. Makers and participants are motivated to share on this platform because it is **highly frequented**. This platform documents source codes for modules and features to build with on clearly structured **Wiki pages**. The website also contains a **blog** to share and download new developments and applications by Open Exhibits or by others. While the website mainly contains factual information targeted at skilled developers, Open Exhibits also targets content editors (cultural institutions without explicit programming skills). Therefore specific attention is given to **subjective documentation** in order to provide understandable guidance. This can take the form of descriptions of the features of new developments and motivations for creating them. For instance, for the 'Flickr Collection Viewer' the following motivation is documented: "The exhibit is fully

configured in CML to support easy customization of features like search term assignment, placeholder layout, number of query dials, text field attributes, and so on." It documents a demonstrational video, textual step-by-step guidance, illustrating photos for specific steps to take, source codes, and trouble shooting information.

Open hardware projects range from analogue, mechanical designs to digital, interactive designs, e.g. cars, prostheses, robots [24]. These projects predominantly share (digital) blueprints of the hardware construction [1] to enable both consumers and makers of hardware (e.g. diy hobbyists, companies) to download them, (collaboratively) modify them with software and/or use them to produce via computer-mediated machines, which are freely accessible in e.g. fabrication laboratories [24]. While open hardware is being put forward as the new industrial revolution enabling everybody to make things themselves, one has to know how to use the software to alter a blueprint or redirect it to a 3d-printer. Therefore, we will explore two case studies (Fablabs and Open Source Ecology) that try to make the documentation more usable for different types of participants [4], providing different (subjective) viewpoints on the project.

FabLabs offer free production machinery and know-how to everybody, given that they share what they make, aiming for **reuse and (collaborative) redevelopment**. Fab moments are **show-and-tells** where makers can share their designs via documenting. Most of the time these moments only take place on the website, but because some Fablabs struggle with the fact that people are not always motivated to document their designs, they organise live presentation nights. Some also explicitly support documentation by offering **documentation guidelines**. Most often these stimulate factual step-by-step instructions, photos, or descriptions, but some FabLabs also encourage makers to document why they make something, enabling participants to understand viewpoints on the project. On most platforms we also observed exchange of **subjective documentation in the reaction-section** of a documentation post, in the margins of the website.

Open Source Ecology (OSE) [34] shares very complete and understandable documentation with an eye on developing their Global Village Construction set: "an open source, low-cost, high performance technological platform that allows for the easy, DIY fabrication of the 50 different Industrial Machines that it takes to build a sustainable civilization with modern comforts". OSE even **attracts people to document fulltime**. On a **wiki page**, they share factual documentation to make a machine: e.g. sharing the CAD files and an assembly video for the development of a tractor. These enable participants to **reuse** it and to embed their own documentation about their **redevelopments**. On their **blog** contextual information about a project is shared. Inspired by the first large-scale documentation jam in April 2013 [38] OSE indicated to use the **'omanual' documentation mode**l [39]. This standard model facilitates flexible documentation (of mainly factual information, such as code, blueprints etc.), meaning that manuals can be adapted from one platform to another (allowing cross-fertilisation between projects), chaining and semantic linking are allowed and different media can be used. Subjective perspectives on the project are not documented in the same structured manner. Information about OSE's background, philosophy and goals are documented as **introduction letters** or **videos**, but no explicit space is provided for viewpoints of the other participants on the project.

Open innovation *projects* [23] can focus on the sharing of knowledge within or between organisations and 'users' or among users independently from organisations (e.g. everybody who is interested in contributing to the development of ideas or users of a specific product, e.g. LEGO). They often take the form of an online platform, allowing them to exchange ideas and support their implementation. *Open IDEO* [41], for example, aims to support **collaborative idea development, action and reinterpretation of ideas** for projects concerning 'social good', paying great attention to the subjective and motivational aspects of documentation. On the Open IDEO **website** makers document a challenge using existing stories, tools or examples and others can participate in developing the outline of the challenge by documenting inspirational ideas, concepts and solutions. For instance, for a local food challenge 612 concepts were proposed, which are then evaluated with a predefined questionnaire. Winning concepts are prototyped and implemented. Open IDEO uses **game principles** to encourage documentation and feedback, such as voting for the level of innovation of the concepts. The platform also **enables the tracking of processes** (from challenges to realisations), which provides participants with more insight. **Guidelines** on how to document are given (e.g. visual and text), but people also have the freedom to **document according to their own perspective** on the project. This openness sometimes impedes coherent documentation (e.g. providing extensive versus short project descriptions).

In *the cultural field of design and art*, subjective perspectives on projects (opinions, beliefs or viewpoints) are important. Culture can be defined as an interpretative activity that searches for meaning and – as Geertz states - by "*which men communicate, perpetuate, and develop their knowledge about and attitudes toward life*" [13, p.89]. The *Variable Media Questionnaire* (**VMQ**) [36], for instance, is explicitly developed for the documentation of multiple subjective interpretations of (interactive) art works with an eye on generativity. It gathers viewpoints from makers and participants (the artist, the curator, friends or technicians) via a **questionnaire**. To stimulate people to participate in documenting, the questionnaire is sometimes used in live interview settings. The questionnaire wants to empower people to (**re**)**interpret** the meaning of an artwork [8] over time and (**re**)**develop** it in other settings, e.g. by using other, newer technologies or new insights. Also, in the *Design Documentaries* [27] the subjective medium of documentary film [29], [31] is used to document subjective views on user lives (instead of artefacts) to gain understanding of how new technological applications or services can play a role in these lives. The films are imaginative communication tools to **inspire** maker teams to design and (**re**)**interpret** important information for the design. In a design documentary on heart patients' lives, one patient responds in a video letter to a letter from another (fictive) patient. These multiple perspectives on heart diseases inspire future technologies or services: the user researchers (part of the maker team) exchange viewpoints with patients in personal conversations, patients exchange with each other via the video letters, the user researchers make the documentaries and share them with the designers of the maker team. This type of subjective documentations of user perspectives that inform future projects is also used in other participatory design methods, e.g. design games [5], and rich experience communication [28].

Let us give a brief overview of what we have learned about our 4 proposed criteria in the 6 cases, in the scheme below.

	Documentation form	Type of generativity	Subjective approach	Motivational character
Open Exhibits	Website, wiki, blog including textual descriptions source code, demo-videos	Reuse, (collaborative) redevelopment	Subjective contextual documentation on blog	Highly frequented
Fablab	Shows-and-tells on website and physical gatherings, documentation guidelines	Reuse, (collaborative) redevelopment	Subjective documentation in reaction-section; documentation guidelines stimulating to share subjective viewpoints	Live gatherings, guidelines
OSE	Wiki sharing blueprints, blogposts on working progress, Omanual standards support flexible documentation	Reuse, (collaborative) redevelopment	Subjective documentation in introduction letter of OSE and videos	Participation in live documentation jam, documentation standards, people who document full time
Open IDEO	Website, mainly textual sharing of ideas, tracking processes, guidelines	Collaborative idea development and (re)interpretation	Guidelines and "open" fields invite subjective viewpoints	Game principles to playfully trigger sharing of ideas
VMQ	Mainly textual questionnaire, with some images	(Re)interpretation and (re)development	Questionnaire guides people to share their subjective viewpoints on an artwork	Live interview settings
Design Doc.	Inspiring and engaging video-documentation	Inspiration, (re)interpretation	Subjective responses are asked on other people's viewpoints in documentary form	Motivational conversations

Open Exhibits, FabLabs and OSE mainly document factual aspects of a project, i.e. instructions and technicalities in the form of source codes, blueprints, design patterns, manuals. However, all of these platforms - but especially Open IDEO, the VMQ and Design Documentaries - illustrate how to document multiple viewpoints of makers and participants on a project and how to motivate people to share their viewpoints. They show that this results in a dynamic, interpretative and a more complete view on a project and can inspire others to work further on it. We learned that subjective perspectives were invited on the platforms via guidelines, such as manuals or

questionnaires (e.g. Fablabs or VMQ) to guide people in giving their viewpoint; in reactions sections, being the "margins" of the website (e.g. Open Exhibits) or via film (Design Documentaries). People were explicitly motivated to give their subjective perspectives on a project via live gatherings (e.g. Open IDEO, design documentaries, VMQ) and game rules (Open IDEO). It is this question of how to document subjective viewpoints with an eye on generativity in projects that we want to explore further, since this question is underexplored in current documentation formats. In this same line of thought, we also want to research how we can motivate makers and participants to invest in documenting their subjective view points on a project, since this appears to be a challenge for many projects. This conclusion brought us to the idea to transform MAP-it, a motivational tool for collaborative idea development, in a motivational documentation approach for "thick documentation".

4.   A "thick documentation" approach: MAP-it

We explored 'how to document and share multiple subjective perspectives of a complex participatory design project with an eye on generativity of the project' empirically by using *MAP-it* [40] to document the design project *Creating* Spaces and evaluating it afterwards. Learning from our 4 foci in literature and case studies, we specifically want to develop 1. an approach to "thick documentation" 2. that enables generativity of (aspects of) the project; 3. that is more than factual, providing a dynamic view revealing the diverse subjective perspectives on the project; 4. that motivates different types of makers and participants to document their views. In this empirical documentation and evaluation session 8 of 18 original makers and participants of Creating Spaces were able to join: a mix of designers, researchers, engineers and a representative of the art centre were involved.

In *Creating Spaces* an open source multi-touch table is designed with different participants to enhance participation within a cultural context (between institution, audience, partners, etc.). The table has been developed in three versions in which different makers and participants were involved[2]: a small one-person exhibition and for several editions of a large 'art in public space'-project. Documentation was necessary, since these different versions of the table required transfer of knowledge and material between different makers and participants (researchers and designers of Social Spaces, engineers of the Centre for Digital Media UHasselt, Z33 house for contemporary art and the art audience) who were involved in the different versions. Sharing documentation was also necessary with the online open source community of potential participants to work further on the material and knowledge developed in making the table. Thus, the aim of sharing documentation in Creating Spaces is to enable and inspire makers or (new) participants to redevelop or reinterpret the table in new development phases. After using MAP-it to document (or 'map') Creating Spaces, we evaluated it on our 4 goals and relate our findings to our desk research.

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[2] After this documentation session took place, the table was redeveloped for a local library in Genk. For this, Social Spaces and EDM collaborated with the cell of expertise in heritage and the local library in Genk.

1. Although initially developed by our research group for idea generation, *MAP-it* shows relevance for a **"thick documentation approach"** to the Creating Spaces project that fits our 4 goals. MAP-it enables a group of people to map a project collaboratively, documenting its values (e.g. meanings, viewpoints, ambitions), objects (e.g. methods, media, material), people (e.g. developer, 'users', public) and contexts (e.g. public space, a FabLab). In this way it allows a visualisation of the making process and viewpoints of the diverse makers and participants on a project. It makes use of a background map - mostly in paper - representing the project that is mapped, re-usable stickers representing specific elements (e.g. source code or a person) related to the project and also empty stickers that people could fill in, e.g. by drawing or writing upon them. It applies game rules to facilitate diverse participants to give their view on a project, e.g. step-by-step instructions for developing the documentation via mapping, specific time frames to fulfil these steps or the obligation to evaluate each other's viewpoints on the documentation using 'bombs' and 'likes'. MAP-it includes a website where documentation of mapping sessions of projects can be shared and can be commented on by other participants who were not involved in the live mapping.

2. MAP-it aims for **generativity** (in the sense of redevelopment, reuse, but also inspiration and (re)interpretation**)** of a project by documenting the diverse materials, steps and viewpoints that were involved in a project on a map and on the MAP-it website. The documentation session visualised the different facts, namely the documentations that were generated during project time: photos of the use of the table during exhibitions; a filmed lecture about the goals and developments in the project; documentation of the used codes and hardware, blogposts about sources of inspiration for the project. The mapping shows how source codes of the multi-touch table were shared on specific platforms to enable collaborative development and reuse. The v1.0 beta-template of the software is shared on the platform of Open Exhibits [33], and was downloaded 300 times, and is also shown through a video demonstrating the interface. Later, codes were shared on GitHub too [37]. The mapping session also visualised the viewpoints of the participants on the documentation. By using the bombs and the likes the participants evaluated the documentation as less interesting in terms of accessibility. Therefore the team proposed improvements for documentation, like a manual for 'using' codes, design patterns, and sharing developments iteratively instead of sharing large steps of coding.

To reflect on the potential of documenting with MAP-it to generate reuse, collaborative development, inspiration and re-interpretation, the mapping that was developed during this session was used as a reference point. The question was asked: *'Try to think of this map as the documentation to communicate/open up the project. Is the map legible and inspiring in its current form?'* An immediate answer was that '*it depends on who your audience is'*. The participants in this evaluation made clear that MAP-it – the visual form and the supporting of collaboration through game rules - is a good tool for documenting in a playful way; to stimulate people to document the complexity of a project; to overview what was documented and to inspire others to continue the discussion about the project. They also said that the MAP-it website[3], where all mappings are documented publicly, allows to communicate the documented

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[3] www.map-it.be

project to a larger group of participants and keep the discussion going. However, they made a critical remark, namely that the dynamic form of the resulting maps does not sufficiently succeed in communicating to new potential participants in a very legible way. For instance, the representative of Z33 made clear that he would find an organised and detailed description of the project easier to read, which MAP-it does not provide, because of its dynamic form.

   3. To enable generativity, MAP-it strives for a dynamic documentation of a project, since it literally **visualises a collage of viewpoints of makers and participants on a project**. Following the step-by-step game rules, the participants documented their values and goals related to the project, their specific role, the methods, tools, material and technology they used and mutual connections between these elements. They marked aspects they evaluated as positive or negative (via 'bombs', 'warning signs' or 'likes') and solutions they wanted to propose. For instance, they mentioned issues like the difficulty of doing experimental research in a project that has to deliver stable end-results[4], or how working with open source software is important but also difficult when stable designs are expected. Each participant is visible on the map via using a specific colour. This resulted in a visual overview of the project and viewpoints of the maker team members and the participants, reflecting differences in goals and working methods.

   The evaluation session, after documenting, triggered a discussion about how it is important to pay attention to the individual perspectives of makers and participants on the documentation. The participants emphasised that MAP-it allows this by matching the pieces of documentation with indications of what they found positive, difficult or an opportunity for the project, e.g. organisational difficulties, recommendations about collaboration between makers and participants or clarity of roles. Furthermore, they indicated that important shifts and motivations behind changes they made to the table design should be shared. When placing these things together in a mapping, a dynamic view appears in which the evolution and specific bottlenecks become visible. This validates the similarity with scholarship (see Buckland [7]), and the function of sharing and documentation to build upon each other's works and insights. The participants noticed that they shared different aspects of the project and that by making these individual views and contributions transparent, potential participants can trace these and elaborate upon them.
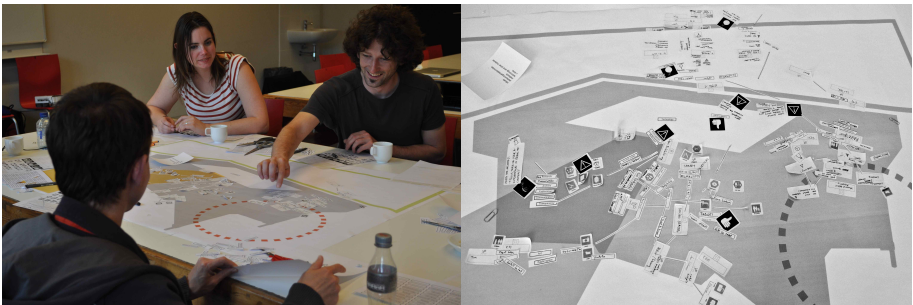
Images. Documenting the Creating Spaces project using MAP-it

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[4] Iterative experimental research interferes with delivering ready-to-use product.

4. MAP-it was evaluated as a **motivating documentation tool**. It is made easy to use in live settings (people can use it by themselves in an easy paper/sticker format), evocative and challenging (to trigger interpretation and confrontation via the bombs and the likes), and playfully motivating (documentation is guided via using game rules). MAP-it helped the participants to structure and visualise the available documentation in a few hours time. This motivation for documentation appeared important, since the participants indicated that they ceased sharing via the blog because of lack of time and because they felt there was little 'return' from an interested audience. However, they also noted that rewarding responses were given when sharing on more populated platforms, such as Open Exhibits and GitHub.

5.   Discussion: a "thick documentation" approach for generative projects

In this paper we reflected on sharing documentation to enable participants to elaborate on projects and project ideas. While this elaboration on projects is often called 'end-user development', we propose to use 'generativity', referring to the potential of projects to generate participation by various types of participants, being end-users, but also designers, engineers, cultural organisations and so on. We learn from literature that documentation, next to documenting facts (e.g. referring to the construction of how something is made), can focus more on the subjective viewpoints on a project since they represent 'hidden' exchanges that are essential for understanding a project and – thus - generating participation [31], [9], [1]. We called this "thick documentation". We concluded that - in contrast to the growing attention and knowledge about documenting factual information - a consistent view on how to document subjective viewpoints on a project is lacking in literature, as well as in the case studies. We learned that we can contribute to this discourse by 1. developing a thick documentation approach 2. that is more than factual, but also provides a dynamic view revealing the diverse subjective perspectives on the project; 3. that motivates different types of makers and participants to invest time in documentation, 4. that enables (a broad idea of) generativity of (aspects of) the project. We translated these insights to the usage of MAP-it as a documentation tool and evaluated it on the mentioned 4 aspects. This helped us to formulate some challenges in relation to developing a documentation approach that allows motivating people to share subjective viewpoints, which can contribute to the generativity of participatory projects.

First, case studies like Open IDEO, design documentaries and the VMQ, illustrate how documentation that is open for **interpretation of and multiple viewpoints** on projects can give a more complete view on a project. It can contribute to its **generativity** by inspiring others to re-interpret the documentation, instead of merely reusing or redeveloping (as stimulated by more factual documentation platforms). MAP-it works further on the knowledge that documentation is a subjective endeavour by structuring the documentation of multiple subjective viewpoints on a project in a live session. Every participant in a session visualises his/her contributions and ideas in

a personal colour. However, after evaluating, we saw that except for the colour, little information about the maker/participant is revealed on the map. Nevertheless, this could be useful information for future participants who want to use this documentation to work further upon it. Also, the evaluation shows that the live mapping session – wherein only 8 out of 18 original makers and participants of the Creating Spaces project participated - is ideally combined with a platform that allows cross-fertilisation of viewpoints between even more participants and projects. The current MAP-it website could serve as such a platform [40], which we plan to investigate further in a following research phase.

Second, Open IDEO, for instance, showed that **documenting multiple viewpoints can be confusing** for participants who have to be able to "read" this documentation. Documenting viewpoints can therefore benefit from more tight guidelines and standards (e.g. Fablabs or the VMQ). MAP-it structures the activity of visualising multiple subjective viewpoints on a project, via using a **guided documentation approach**. MAP-it offers *some standards* or a language between makers and participants by documenting objects, people and relations in a step-by-step way. But more research is still needed on how to combine the desired *dynamic view*, wherein different subjective viewpoints on a project are shared, without compromising the *readability* of documentation. Obviously, MAP-it focused more on motivating people to document their viewpoints, instead of focusing on the accuracy and the readability of the documentation itself.

Third, while a guided or standardised approach can aid to share documentation between makers and participants in a structured way, it can never do without **motivational human support, collaboration and fun** in physical and online environments. Highly frequented platforms or live documentation sessions that stimulate cross-fertilization and allow feedback and recognition between participants appeared to be motivational for people to contribute. The great pitfall in current documentation approaches appears to be exactly that, namely to motivate people to give their perspectives on a project. Therefore MAP-it especially focuses on this motivational aspect. It experimented with how **collaborative documentation in live sessions and game principles** can be stimulating to invest time and energy in documenting. This appeared to work well, but should have been applied much earlier in the development of Creating Spaces and not only in the end. Also here, at the same time, documenting in a playful way, on very populated platforms and in live sessions can make documentation management more chaotic and can obstruct the possibility to grasp the project in its whole afterwards.

This last critical remark leads us to our final conclusion. Sharing "thick documentation" is indeed caring: it asks a continuous and very structured investment of makers and participants in motivating each other to document their viewpoints on a project. MAP-it answers to the concern of creating a motivating approach to documenting multiple subjective viewpoints on projects, inspiring future reuse, redevelopment or reinterpretation. However, its motivating format and the resulting dynamic documentation "map" sometimes lacks structure, which obstructs its readability for people who were not involved. Readability is obviously a crucial quality of documentation. This experiment with MAP-it is therefore only a first step in researching how a documentation approach can facilitate the discussed "careful"

process of motivating people to share their view on projects, without obstructing the structured form.

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