Evaluating Value Design Workshop at Collaborative Design Sessions

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Abstract
Setting up collaboration is getting increasingly important in design practice. It is also valuable to involve the stakeholders early in the design process for gathering deeper insights and arriving at innovative ideas. However, high level of uncertainty in the early stages of the process can be an obstacle to initiate collaboration.
We are developing a method to support the initiation of multi-stakeholder collaboration, which aims to develop a design concept by integrating user insight with business insight in a single design process. We incorporated our assumptions in a workshop format, which is a combination of a tool and a process, named Value Design Workshop. To identify the opportunities for improvement, we evaluated how the participants experienced the workshop format in a multi-stakeholder session. We gathered participant evaluations based on quality in use criteria by using a post-session questionnaire. The paper presents our findings on the requirements of multi-stakeholder sessions and design improvements for our method.

Keywords: co-design, co-creation, trans-disciplinary design, integrating user and business insight

1 Introduction

Design is an activity which requires interdisciplinary collaboration [1]. As the design problems get more complex by the integration of different products, technologies and services, or because of the social challenges that we are faced with [2-3], developing a design proposal requires diverse parties to contribute to the solution with different skill-sets and resources. Therefore collaboration is getting more important not only between different disciplines, but also between different organizations and stakeholders. However, initiating collaboration with stakeholders in the early design stages is challenging, due to the

uncertainties regarding the scope and dimensions of the (complex) problem, unknown resources and expectations of stakeholders, *fuzziness* of the design proposition and instability of partner network [4].

Collaborative innovation process is different from traditional innovation models. A solution is shaped with the knowledge, resources and expectations of the collaborating partners. Therefore, the solution (value proposition), and the way to the solution (realization) should be designed together. However, more studies on multi-stakeholder collaboration are needed on how to support the concept and design decisions [4] and how to facilitate the collaborative discussion process [5] while addressing the complexity of networked innovation.

We are interested in how to organize the collaboration process in the initiation phase to make it clear to the stakeholders 1) that value is created through the designed proposal and 2) that the proposal can be realizable with specified input from each stakeholder, so that it is feasible to participate. Therefore we are developing a method that combines user insights with business insights to support the multi-stakeholder discussions.

We are using a research through design approach, in which we incorporate our assumptions into a workshop format. We use workshop settings to observe the nature of multi-stakeholder discussions and to test our method. In previous work we examined facilitation aspect in the sessions [8]. In this paper, we present a part of our research in which we evaluated the participants' evaluations of the workshop format based on quality in use criteria. We applied a semi-structured post-session questionnaire in a session with different stakeholders, with an aim to learn how this format supports the co-creation process and whether it was satisfactory.

In the following part, we will present related work and our design motivations. Then we will explain the case study setup and the structure of the evaluation method. We will discuss how several qualities of the workshop format may have affected the resulting experience, our insights on organizing collaborative design sessions and implications for next version design.

2   Related work

Various approaches and tools to mediate collaborative work are proposed by the studies in the fields of Co-design, Participatory Design [7], and in the newly emerging Participatory Innovation field [6]. Two main approaches of organizing participation studies can be can be spotted in these fields [8].

One approach is creating empathy with end-users and let them have a say in the design decisions [9]. The goal of this approach is usually to generate a deep understanding of the user's perspective and to envision how the resulting experience will be. Card-based tools [10-11], scenario/story based techniques [12-13-14], generative co-design tools and make-tools [9] can be given as examples. Another approach is to visually represent the complex structure of a business model, to communicate and discuss it with other stakeholders [15]. "Tangible business model sketches"- [16] are aimed to stimulate discussions concerning how businesses create and capture value between different stakeholders. Improvised theatre [17] can be referred to as a more open-ended and unstructured approach for the same purpose.

The methods and tools described above either address the user angle, to integrate user insights into the design process, or address the business angle to communicate the business structure. Recent studies on networked innovation address the importance of constantly switching between the user values and total value of the proposition to support networked innovation,

however studies on a pragmatic level which support concept and design decisions are lacking [4]. We would like to contribute to the research and practice in the field by developing a combined approach, to support the initiation of multi-stakeholder innovation process.

3   Design Motivations

3.1   Collaborative design process to support a shared understanding and commitment

In the design process the definition of the problem and the design solution evolve in parallel through iterative cycles, composed of proposal, evaluation and learning stages [18]. Shaping of the solution helps to refine the understanding of the design problem. In multi-stakeholder settings, a collaborative design process among stakeholders contributes to developing a collective understanding of the design problem at hand [19], while developing a shared solution. It also enables the participants to contribute to the idea from the very early stage, which inspires the designer to integrate the stakeholder's perspectives into design [20], and creates a sense of ownership on the stakeholder's side, which eventually supports commitment to carry out the collaborative process [19-21].

3.2   Combining user insight with business insight in a single process

In collaborative innovation, the solution of the problem is largely shaped with the knowledge, resources and expectations of the collaborating partners. However, since both the solution (proposition) and the way to the solution (realization) are unknown, the commitment from the stakeholders can be obstructed by this uncertainty.

Typically, in a product development process, the design ideation and the business aspects regarding how to develop the product are not considered simultaneously, but rather handled linearly. The design discipline has a focus on the user; therefore during the ideation phase of a product, designing the user-product interaction is the main focus. This usually isolates the business aspect from the ideation, which is typically understood as placing the product in the market, and most of the time considered after the clarification of the concept [22]. However, as products are being more integrated with services and networks, the overall user experience needs to be taken into account, including access to services and maintenance. This requires understanding of the user requirements from both the design and business disciplines [22]. Therefore To support the multi-stakeholder collaboration initiation, the design space and the solution space need to be clarified together to define the value proposition [4-22]. Combining user experience insights and business model insights enables the stakeholders to define both the value definition and the collaboration space together.

3.3   Structured approach for the workshop settings

During the collaboration initiation phase, workshops are commonly used for discussion for collaboration purposes. A typical workshop process combines information and brainstorming/creativity techniques that enable the participants to work together and create a shared output. Usually a facilitator is responsible for selecting the techniques and defining a process [23]. Studies in Group Support Systems report that facilitators mention preparation i.e. meeting design as being their most important task [24]. Because poor preparation can be a cause for the failure of the meetings [25], the design of the collaboration processes is an important aspect for facilitation [23].

Although several frameworks, models and guidelines are available [23] these methods do not necessarily provide an optimized format for multi-stakeholder collaboration. New practices and toolkits to mediate collaborative work for multi-stakeholder discussions are needed [5]. A

structured workshop approach which addresses the challenges of multi-stakeholder collaboration can be useful in initiating the collaboration process, without requiring much effort from an experienced facilitator [8].

4 Developing Value Design Workshop

To support the collaboration initiation between diverse stakeholders by addressing the aforementioned challenges, we aim to develop a method that can be applied in multi-stakeholder discussions. We defined our initial design objectives for the method as follows:

- Support the stakeholders to contribute to the idea with their knowledge and perspective by bringing a design concept at the focus of discussion and make them follow a joint design process. Enable the group to develop the idea and uncover the unknown aspects of the design problem trough shared knowledge.
- Provide a discussion process that leads to an aligned understanding and concretized outcome at the end, to demonstrate the stakeholders the value that is created through their collaboration through a balanced discussion process which addresses both user and business insights.
- Provide the facilitator and the participants with an easily applicable and understandable workshop process by allowing the participants to record the discussion by a visual layout and to build on earlier comments and on each other's ideas. Structure in the discussion by proposed topics can provide a focused and efficient process, step by step development by relatively easy moderation.

Based on these design objectives, we developed Value Design Workshop, which combines a paper-based tool and a workshop process. Our proposed process aims to gradually refine the design concept from different perspectives through a cyclic design-thinking process. Shifts in the focus of discussion, between user experience and business model design, aims to help the group to communicate about the value proposition and the means of realizing the innovation. It proposes specific steps in the discussion, starting from a concise description of a design idea and ending in a description of the evolved concept at the end of the session. To document the discussion, we developed the Value Design Canvas, an A0 size paper–based layout, which represents the proposed process with dedicated fields and is used with sticky notes [8]. (Figure 1).

1. User-centred analysis of the design problem and domain

2. Design exploration by envisioning the user experience

3. Business process concept definition with stakeholder roles

4. Concept concretization with scenarios and product features

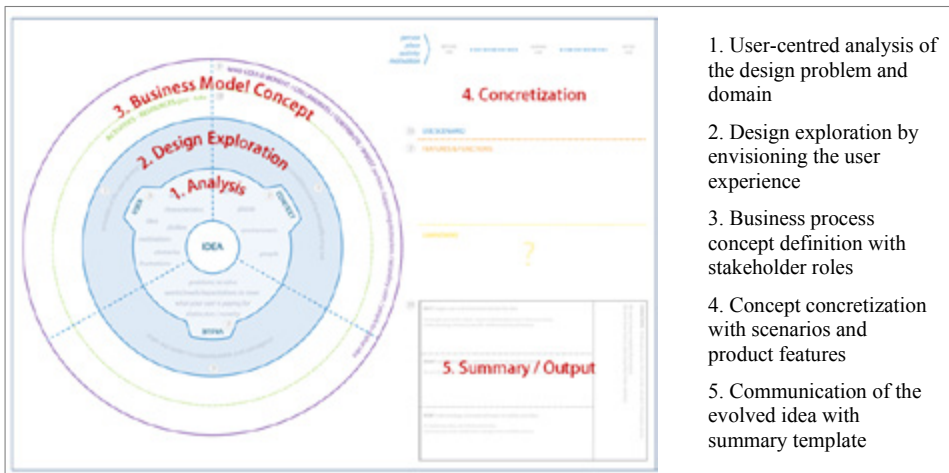5. Communication of the evolved idea with summary template

Figure 1 Value Design Canvas and the proposed process

We follow a research-through design approach to develop our method by applying our method in workshops to test the boundaries of communication and collaboration between the diverse sets of stakeholders, and to develop our understanding of how the method can be put into practice. At this stage we are particularly interested in understanding to what extent our initial intervention with the Value Design Workshop was perceived to be successful by the workshop participants, to uncover possible directions of further development.

The comments during the discussion are summarized on sticky notes placed on the canvas to document the discussion. Keywords and instructions are provided on the layout to inform and inspire the group. Time stamps that are placed in each dedicated field guide the process with time rules to make the group move forward in the process by balancing the time invested on the discussing a specific topic. In this way, the group is steered through a simple structured discussion process from several angles.

5   Case study of Value Design Canvas use

At the initial stages of developing our method we are mainly interested in user evaluations of our proposed format to refine our approach in relation to our design criteria. The Value Design Workshop format was applied in a multi-stakeholder collaborative design workshop, named Information and Inspiration Session. The session was organized in the context of the EU project ProFit Innovation for Sports Motivation, in 2012, Eindhoven, The Netherlands. The aim of the workshop was to match complementary stakeholders to generate design concepts for the ProFit Sports Innovation Competition. The invited participants consisted of designers, sports and movement experts, researchers, user representatives and technology developers/companies in the sports and play industry. At the beginning of the workshop, 8 groups of 3 to 5 people with complementary profiles were formed out of 32 participants. In each group there were one or two company representative.

The complete session was planned to be 5 hours long. The workshop started with an informative session about the design challenge. Then the groups followed an ideation session of 1-hour using the 6-3-5 Brainwriting technique [26]. Then they selected 1 potential idea to develop further. The groups then used the Value Design Workshop format for 1 hour 20 minutes to develop the selected design idea and clarify the output at the end of the session.
The instructions of how to apply the Value Design Canvas process was provided at the beginning of the creative part, by a 15 minute slide presentation. The presentation included the basic principles behind the process, the layout (canvas) and a stepwise explanation with an example. On each table, a facilitator was assigned to make sure to document the discussion on sticky notes and keep time.

We applied a semi-structured questionnaire on how the participants experienced the workshop and whether they found it useful, to collect insights on the relationship between the tool characteristics and our design intentions. We conducted follow-up interviews with a smaller group of participants in the following days after the workshop, for an in-depth investigation. In this paper, only the results based on the post-session responses are presented.

The questionnaire was handed out to workshop participants right after the session, and before they presented the concepts to each other in groups, to have their immediate evaluations. The questionnaire took approximately 5 minutes to fill in. The participants were asked to evaluate the workshop experience based on the criteria of quality in use [27] (Table 1).

Table 1. User experience and quality in use criteria and how it is implemented in the evaluative study design

Quality in Use Criteria	Implementation of the Criteria in the Evaluative Study Design
Satisfaction	Whether the participants were satisfied with the overall workshop process
Efficiency	Whether there was a fit between the proposed discussion topics and the discussion flow Whether there was a fit between the proposed process and discussion flow
Effectiveness	Whether the output of the session was clear and developed enough
Ease of use	Whether the proposed format was easy to apply and understandable
Context conformity	Whether the proposed format supported the group discussions for the specified purpose

The responses of the participants were analyzed with a combined quantitative and qualitative approach. First, comments per person were documented to determine whether the participant found the session successful or unsuccessful in general. Then the whole set of comments were grouped in themes that relate to the specified criteria. This grouping also provided the tension points/relationships between different design decisions.

6 Results

In total 24 out of 32 participants responded. The questionnaire items and the number of satisfactory and unsatisfactory comments provided by the 24 respondents of the post-session questionnaire are presented in Table 2.

Table 2. Post-session questionnaire format with semi-structured questions and the distribution of responses

Questions of the post-session questionnaire	Number of participants that responded (n=24)		Number of participants commented both positive and negative
	It was successful because…	It was not so successful because…	
What are your opinions about the Value Design Canvas in general?	23 (%93)	12(%50)	10 (%42)
Did the set of topics covered by the tool support your discussions?	21 (%87)	8 (%33)	5 (%21)
Did the proposed process fit into your discussion flow?	20 (%83)	9 (%38)	4 (%17)
Was the output of the group discussion satisfactory?	18 (%75)	7 (%29)	4 (%17)
Did the co-creation canvas support your group discussions?	22 (%92)	4 (%17)	3 (%13)
Was the process easy to apply?	22 (%92)	8 (%33)	6 (%25)
Other dimensions that you want to mention	6 (%25)	4 (%17)	1 (%0,5)

Some participants stated comments on both why they found the session successful and why they found it unsuccessful, while the majority mentioned reasons for one category. Since our data collection method was a semi-structured questionnaire, it is not possible to conduct a statistical analysis. The participants' comments provide more insights, as presented below.

There were some very positive *overall comments*, such as: "I liked making the links between the outer ring and the inner ring", "Intense! - works well with untrained participants" and "I like it when will this be available?". Some participants mentioned that they liked it because the tool supported the group to "evaluate the idea from important angles that they would otherwise not think of"; "different disciplines caused new ideas", "guides thinking process from different perspectives", "covers both end-user values as well as stakeholder values" and "enabled to clarify the idea throughout the process". On the other hand, some participants found time pressure stressful, suggesting that the tool would work better when the idea is clearer to all group members at the beginning. According to two comments an informed facilitator may be needed to make the process more clear. Using more visual cues and better support for the use of drawings/visuals were suggested.

Regarding the *efficiency* criteria, 88% participants mentioned positive remarks on the *discussion topics* as they "provided a frame to test the idea through the process", and "helped the idea to put in the context". Causes for not being satisfied (33% of participants) included having a sense of repetition because of some overlapping topics. Some topics, (e.g. *value)* was found unclear. One participant (designer) stated that he hesitated to contribute because some topics were outside his area of expertise.

The guidance from the process was found useful in terms of "giving the group a direction in the discussion without getting lost", and "proposed logical steps in the discussion", which "provided a good flow which went quite smoothly after deciding on the specific idea". Some found it successful because the process allowed them to "first broaden then focus". While one participant mentioned that the timings made the process easy to follow, some other participnats (38%) were unsatisfied, either because the time pressure was stressful at the beginning, or it was too much steered which caused unnatural feel. The ordering of the proposed steps was not found as expected by 2 participants.

On *effectiveness*, the positive comments on the *quality of output* was at a lower rate compared to other topics (75% participants). Many participants stated that they achieved clarity: "being at the same level eventually as a group", "ending up with a clear focus and concept", "having a developed and thoroughly discussed good idea", and "arriving to a first concept within an hour" mentioned as reasons. 20% participants evaluated the session unsuccessful on this criteria, while also having positive remarks: Two responses related to the "time being not sufficient to clarify the outcome", or "there were some loose-hanging elements, but eventually it was an effective process". Using the scenarios in a stronger way with more time was suggested as a way of obtaining clarity. One participant mentioned that the output was not developed enough, because the direction was vague from the beginning and the group members did not had an intention to have a concrete concept.

Most participants (92%) gave positive comments regarding *ease of use*. However, the importance of the clear instructions and the role of the facilitator to clarify the process were emphasized. Another set of comments were related with the visual layout provided, mentioning that it helped the process to be clear. Suggestions were made to make the process transparent, by presenting the process with timeline, using more visual cues and "giving more time and details for instructions" or by "making it more clear when to move to the next step".

In terms of *context conformity/support in group discussion*, 92% participants stated that the format supports idea evaluation, "concretizing/detailing the concept", "developing the idea by filling in the gaps and commenting on each other's ideas". 4 participants reported porblems as

the group "struggled to concretize" the concept because the idea being vague at the beginning was the reason. Another comment mentioned that not everybody in the group was actively participating in the session.

7   Discussion - Lessons learned

Our design intentions with the Value Design Workshop was to provide a format that 1) supports the different stakeholders to contribute to the content with their expertise, 2) develop a shared understanding with a concretized outcome 3) is easy to facilitate and understandable. We gathered insights to support the multi-stakeholder collaboative design processes and design improvements for our method.

7.1   Insights on the Requirements of the Multi-Stakeholder Design Sessions

According to the responses of the participant responses, being on the same level of understanding as a group can already be satisfactory at the beginning of collaboration. However they also expected to have a developed concept, integration of separate ideas into a coherent whole, and some concrete plans for what to do next at the end of the session.

Concreteness in the discussion and the clarity of the concept to all participants at the beginning of the process seem to be related. In overall, the session output was found satisfactory but some participants perceived the session as too short to sufficiently detail a concept. In our case, the total amount of workshop time for the groups was 80 Minutes. Some groups were satisfied whereas some were dissatisfied. This may relate to which extent the concept is clear to the group members at the beginning of the discussion. The *time pressure* may be stressful if the idea is not clear enough within the group to proceed flawlessly and having a somewhat clear focus at the beginning is important for effective outcome.

In creative sessions, the general practice is that the facilitators track the discussions and guide the group through the discussion [23]. In the cases where less-experienced facilitators are utilized, the group may be provided with some milestones on deciding whether or not moving to the next step.

7.2   Evaluation of the Value Design Workshop and Ideas for Design Improvements

It is difficult to calculate the success of the method in initiating multi-stakeholder collaboration with our study, since it was a single-step intervention for the preparation of innovation competition. We know that, two companies among the participants applied to the competition, but it is difficult to derive the conclusion that the applied format was the trigger. On the other hand, the initial version is evaluated as supportive to discuss the designed concept from several perspectives, to combine user values and stakeholder values and to comment on each other's ideas. Some of the participants mentioned that they liked the tool and wanted to use it further. Although we did not explicitly ask whether the tool supported combining user and business insights, there were positive comments which stated that the format supported the evaluation of an idea from different perspectives, allowed to combine user values and stakeholder values.

In terms of the *efficiency* criteria, the participants evaluated the proposed *process* as giving guidance. The proposed *topics and the framework* were found useful in elaborating and concretizing the idea by evaluating from different angles. However there seems to be room for improvement. The abstractness of some topics that we proposed can be an obstacle for a shared understanding, as the topics can be interpreted differently by the participants from different disciplines.

In terms of *effectiveness*, the participants evaluated the method as supproting the alignment of understanding. However especially when the idea was not clear to all members of the group, the session was not long enough to clarify the output and some groups experienced time pressure. The conflicting comments on time pressure show that while our process pushes the whole discussion towards a clarified outcome by visiting many topics in a given time, it may also feel unnatural if the discussion is not settled. It was evaluated as efficient, if the group did not struggle to specify the concept at certain steps.

With our method, we would like to use the collaborative design process as a way of reducing uncertainty through joint discussion at the initial stages of design. The challenge is to initiate the discussion process with limited knowledge. We observed that the process can work better when the idea is better defined at the beginning of the session. It is argued that design idea generation under time ressure is likely to be productive but not very creative [28]. For our method more time can be assigned. The time pressure can be reduced when the idea is more abstract. Guidelines to specify the concept dimensions at the beginning can be integrated in the process.

The difficulty at the beginning of the session to warm up, as experienced by some groups, could be resulted from the start-up task was not simple enough. At the beginning of the workshop participants try to get used to some new information: the concept, the disciplinary background of the people at the table and the "rules" of interacting with the tool/process, while they may have different expectations or mental models regarding the objectives of the session [29]. Therefore the process can be started with a simple warm-up task with high time-prssure [28]. Also, the process can be made explicit by supporting the facilitator to inform the group at the beginning of the session and at the interim steps [30]. More visual cues to support this information will reduce the facilitator's load and make the session easier to follow. The flexibility of the process can be increased to fit different discussion settings by introducing moments/steps in the discussion to let the group members consolidate on which direction to go and help the group to align their understanding.

8   Conclusion

We are developing a method to address the challenges of initiating multi-stakeholder collaboration initiation. We evaluated our method based on the quality in use criteria as experienced by the multi-stakeholder groups. Our evaluation focused on gathering insights to improve the way that our method is put in practice. Therefore our data is not sufficient to evaluate all our design assumptions, but our findings disclose the dimensions that need attention, and should be further investigated with in-depth evaluation of the group discussions in the session.

Our process and tool design can be improved by making the overall process more transparent by utilizing more visual cues to represent the process, using less abstract terms to support inter-disciplinary discussion, improving the information given at the beginning of the session and providing longer time to support the collaborative design process. Although a structured approach can ease the facilitation process by providing stepwise approach, the facilitator's role is still important to track the group process and provide a balance between the proposed process and the discussion content. We expect that the structured design processes can work better with a more clear design concept. Although our insights are focused on improving the design of our workshop format, they can be considered by practitioners while organizing multi-stakeholder collaborative design sessions.

Responses from the participants give a qualitative indication that the method can be useful for multi-stakeholder discussions and worthy of further development. In the next steps we would like to make an in-depth analysis of the group discussions with video analysis to evaluate whether the proposed method meets the design criteria. In the later stages, we would like to explore on how the tool can support the inter-disciplinary collaborative design process in the later phases of multi-stakeholder collaboration and product development stages. We find the iterative design process by applying a research through design approach useful in gathering context-related requirements in such settings while developing hands-on solutions that is needed in the design practice.

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