Combining User Needs and Stakeholder Requirements: The Value Design Method

Pelin Gultekin, Tilde Bekker, Yuan Lu, Aarnout Brombacher, and Berry Eggen

Abstract In the emerging design landscape, knowledge integration and collaboration with external partners are being valued in the design process due to the increasing scale and complexity of the design problems. It becomes important for designers to be in close contact with stakeholders, such as the people, communities and organizations who are affecting, or being affected by, the problem or the solution from the early stages of the design process. The majority of the methods that are utilized in design practice have until now been user-focused, aiming at understanding the users and designing for the user experience. Stakeholder involvement in the design process is a new topic of study in the design field. Approaches and methods that guide the designers in developing design solutions by considering diverse stakeholder perspectives are limited.

With the purpose of assisting the designers in considering the stakeholder perspectives in the design process, we present the Value Design Method that aims to integrate the user insights, business insights, and stakeholder expectations and roles at the early stages of the design process. We introduce the method alongside the Value Design Canvas. The Value Design Canvas is a visual probe that can be applied in collaborative multi-stakeholder design workshops. We provide advice on how to apply the method and on aspects that should be attended to while organizing multi-stakeholder workshops.

Introduction

Design is a creative activity. It is also a part of an interdisciplinary process of product development, which requires people/organizations with different skills and knowledge to collaborate through stages typically composed of concept generation, design, prototype development, testing, production and market introduction (Ulrich and Eppinger 2004). When a single company carries out the product development process, the decisions are usually taken within that company and collaboration

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occurs between the different departments of the same organization throughout the process. However, the emerging technological and economic changes, challenge this more or less closed and linear process, and require a more collaborative and flexible approach to innovation (Gardien et al. 2014).

Four economic stages have been identified from the beginning of the industrial revolution until today, to set the context for design practice; as industrial economy, experience economy, knowledge economy and the currently emerging transformational economy (Brand and Rocchi 2011; Gardien et al. 2014; based on Pine and Gilmore 1999; Drucker 1981). These stages differ in terms of what constitutes value, who is involved in value creation and how economic value is created and distributed (Brand and Rocchi 2011). Furthermore, the character and processes of design have been continuously evolved in parallel with these stages. The initial focus of designing products to fulfill functional needs, first evolved into designing for experiences, then into designing for knowledge and services, followed by an emerging focus on designing for social change (Sanders and Stappers 2008) and co-production (Drucker 1981). In this regard, it is suggested that different stages require different design processes, methods, tools and different design skills and competencies. Although companies may use the approaches and methods from earlier stages, adapting to a new stage will allow companies to extract more value through innovation (Gardien et al. 2014).

The main drivers of the emergent knowledge and transformational economy are, to a large extent, information exchange and collaboration in the product development and service delivery processes (Drucker 1981). For instance as products are being integrated with services, transactions between many service providers become an integral part of sustained product development (Basole and Rouse 2008). Also, societal issues which need joint intervention from diverse organizations and user groups receive attention and provide underexplored market opportunities. Many solutions involve consumers and consumer groups in the product development process as joint problem solvers, and value co-creation is receiving attention as an innovation approach. Consequently businesses increasingly leave the single company perspective and choose to engage in many inter-organizational relationships rather than handling all the aspects of the new product development process (Prahalad and Ramaswamy 2004; Binder et al. 2008). They adopt a more open approach to innovation, in which they share and gather information with/from external partners (i.e. other companies, competitors, non-profit organizations and users/user communities) through innovation networks. Products and services are developed and delivered to their users via complex processes, exchanges and relationships (Basole and Rouse 2008; Gardien et al. 2014).

In networked innovation, the value is created for the users through direct and indirect relationships with many partners at the network level. The design proposal and how to realize the solution are defined in relation with the input of the stakeholders based on their knowledge, resources and expectations (Basole and Rouse 2008; den Ouden and Valkenburg 2011; Tomico et al. 2010). Therefore defining the complementary knowledge and resources to generate value (how), and bringing the right collaborators together (with whom) becomes as equally important as determining the solution (what) (Brand and Rocchi 2011).

In this context designers are faced with some challenges, which require new approaches in practice. Firstly, the complexity of design problems requires designers to consider a broader technological and social context in the design process. Secondly, designing in this new domain requires consideration and inclusion of stakeholders – i.e. the people, communities and organizations who are affecting or getting affected by the problem or the solution- in the design process (Gardien et al. 2014). The focus of the design research methods has been to understand the user and the use situation (Sanders and Stappers 2014). However dealing with the challenges in the new design context requires a design perspective beyond the user centered focus. Design methods that assist the designers in gathering and integrating external knowledge into the design solution and in considering stakeholder expectations and roles while dealing with the design problems are needed.

The emerging research focus both within and outside the design discipline is on inclusive and integrative approaches in line with this need. Table 1 demonstrates how the foci of the design research and business and stakeholder management fields are evolving to support the value co-creation and networked innovation practices.

Table 1 Overview of the trends within the fields of design research, and business and strategic management fields to support the value co-creation and networked innovation practices

Field	Focus of study and methods	
	From . . .	Towards . . .
Design research	Aim for developing deep understanding of users and context variables in a holistic way	Aim for exploring design requirements and the nature of the problem by direct involvement of users and stakeholders
	Users as subjects of study	Users as partners and experts of their own experiences
	Designers and researchers have an expert mindset and they design for the users	Designers and researchers have participatory mindset, they design with the users
	Methods e.g. Ethnographic research, contextual research (Ireland 2003), personas (Pruitt and Adlin 2010), scenarios and stories (Carroll 1995; van der Bijl-Brouwer and van der Voort 2013)	Methods e.g. Cultural probes (Gaver et al. 1999), generative toolkits (Sanders 2000; Sanders and Stappers 2012), concept mapping (Visser et al. 2005)
		Emerging approaches: participatory innovation and co-design
Business and strategic management	Focus on company transactions	Focus on value exchange in innovation networks
	Analysis of business activities based on company transactions (Osterwalder and Pigneur 2010)	Integrative approach through design thinking (Brown 2009)
	Stakeholder management from company perspective (Bryson 2004)	Stakeholder management in innovation networks (Roloff 2008)

In the design research field, complex design problems for hard to empathize user groups require a more explorative approach at the early stages of the design process to understand the nature of the problem. This requires direct involvement of users in the design process, therefore a shift from an understanding of users *as a subject of study* towards an understanding of users *as experts of their own experience* is taking place (Sanders and Stappers 2014). The emerging approaches within the design field such as participatory innovation and co-design are looking for ways to support active user involvement in the design process, through collaborative ways (Buur and Matthews 2008; Mattelmäki and Visser 2011).

The business and strategic management fields are similarly calling for approaches to support networked innovation processes. While most research have been focused at the company transactions (Osterwalder and Pigneur 2010), the recent studies suggest taking a network perspective (Mason and Spring 2011). Networked innovation approach requires the design and business aspects of a design proposal to be considered in an integrated manner. Therefore exploring alternative solutions with a design-led approach is suggested to the design of strategies and business models, for instance by applying design thinking or prototyping (Osterwalder and Pigneur 2013).

Integrating business insights in the concept development stage and involving the stakeholders early in the design process are useful approaches for design problems with many stakeholders. There is a growing research direction towards more participative, integrative and design-led approaches to support the value co-creation and networked innovation practices, and methods that aid designers for these purposes are needed. To support the designers in enriching a design concept by considering stakeholder roles in the proposal, we developed the Value Design Method. The following section presents the method and an example case to explain method application.

Value Design Method

Value Design Method is developed to support making design proposals with the consideration of stakeholder expectations and relations. It aims at identifying, on the one hand, the factors that influence the design proposal to suggest the involvement of stakeholders, on the other hand, those that motivate the stakeholder participation. These insights are then utilized to enrich the design proposal and identify business aspects of the solution. The method is suitable to be applied at the early stages of design, when there is an initial design concept and a need to integrate knowledge from the experts and related stakeholders.

The method supports stakeholders to iteratively develop a design proposal by conducting pairwise comparisons between (1) design considerations (such as user and use characteristics), (2) stakeholder considerations (such as what their motivations are and what they contribute to the design proposal) and (3) business
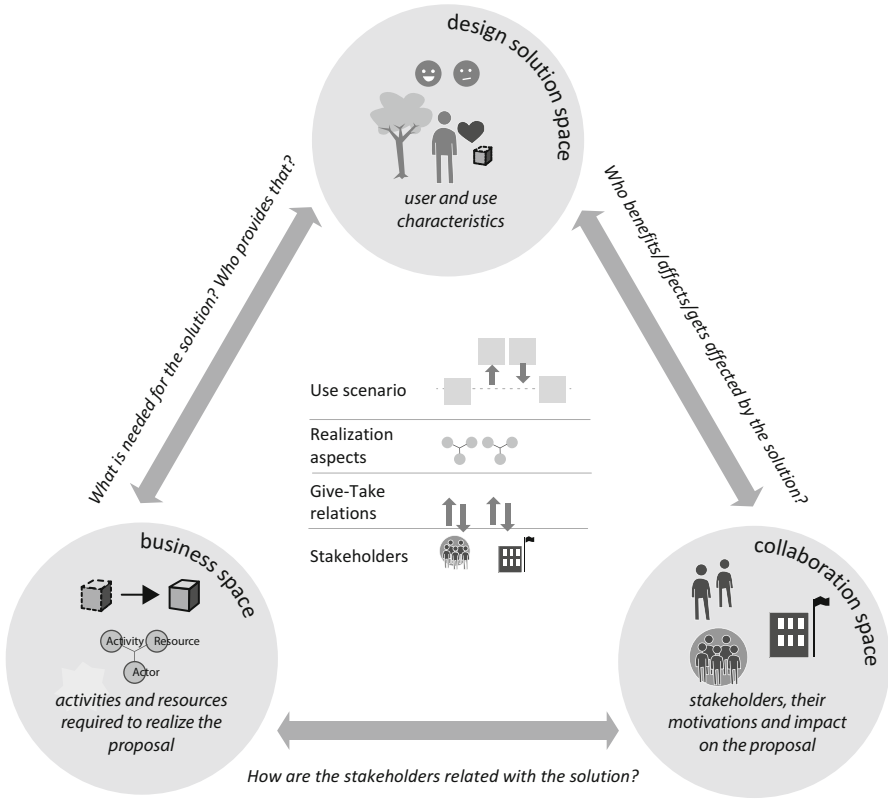
Fig. 1 The Value Design Method supports pairwise comparison between the design considerations, stakeholder considerations and business considerations based on evolving use scenarios, as shown in the diagram

considerations (such as what is needed to realize the proposal) (see Fig. 1). These considerations are brought together through use scenarios. The method utilizes scenarios as a dynamic thinking tool rather than to communicate a finalized design proposal: they evolve and become more detailed in the process with evaluations from different perspectives.

The output of the process is a refined concept consisting of: a. a user experience concept with use scenarios, b. identification of stakeholder perspectives and the conditions for their involvement in the proposal, c. insights on business considerations to realize the design solution, regarding the stakeholder roles.

The method consists of four stages:

1. Briefing & Analysing
2. Identifying values
3. Synthesizing
4. Consolidating & Evaluating

The core stage of the method is the synthesizing stage, where the three types of considerations are integrated in the design proposal. The first two stages, similar to other design processes, prepare the participants for this stage and the final stage describes and optimizes the output.

We followed a research through design approach (Gultekin-Atasoy et al. 2015) to apply this method in stakeholder ideation workshops and to gather insights for iterative method improvement. The steps of the Value Design Method are presented visually using a paper-based probe called the Value Design Canvas (see Fig. 4). This paper-based probe can also help to record the discussion. A facilitator can make notes using post-its during the discussion and place them on the relevant fields on the probe. The related spaces and considerations are placed on the probe next to each other to support the discussion. The probe layout can be adjusted according to the session requirements, i.e. level of detail of the scenarios or duration of the session.

The Value Design Method proposed here is very much related to two existing methods, namely the Value Flow Model (Den Ouden and Brankaert 2013) and the Business Model Canvas (Osterwalder and Pigneur 2010).

The Value Flow Model is a method to identify the relevant stakeholders and important values to them. It helps to create positive balance between the input and output of each stakeholder in the collaboration and commitment for their participation. It is a visualization tool that demonstrates the value exchanges between different stakeholders. The Value Design Method here is closely related to this method, yet different. The Value Design method iteratively support the creation of shared values for different stakeholders through proposals based on user insights. In this way it paves a path for designers to jump between designing user experiences and co-creating shared values with the stakeholders. It is a process approach that is particularly suitable for wicked problems in which the user insights and stakeholder insights cannot be known completely upfront. Value Flow Model can be used in combination with the Value Design Method to visualize the resulted value exchanges among stakeholders along the value design process.

The Business Model Canvas has been widely recognized as a useful tool to describe and design business models. Its strength lies in its simplicity and ease of use. Using 9 elements: customer segment, distribution channel, customer relation, value proposition, key partners, key resources, key activities, cost and revenue, it describes how a value proposition can be created and delivered to end users and how financial benefits can be created. The Value Design Method makes use of some of these components throughout the process. It creates a process towards new business models for network collaboration with specific target user groups in mind. Different elements of business model canvas can be therefore found at different moments in the approach. Consequently, the business model elements can be used as inputs to describe the resulted business model using business model canvas.

In other words, Value Design Method was designed partly based on existing innovation approaches and the aim is to create a process for designing user experience proposals with many stakeholders.

Fig. 2 Lusio prototype (Hooft van Huysduynen 2014)

The Value Design Method has been used in various contexts with different combinations of participants, including design (research) projects with professional designers (see e.g. Gultekin-Atasoy et al. 2013, 2014). To illustrate how it can be used by interaction design students, the case used in this chapter presents how a design student utilized the method in her design process to develop her design concept with the feedback from experts.

Value Design Method Application

The Value Design Method was applied to improve a design concept developed by a graduate student designer during her final Master's project. The design concept, Lusio, is an interactive decentralized platform consisting of multiple objects (Hooft van Huysduynen 2014, see Fig. 2). It is designed for primary school children with the aim to support social physical play in settings like schoolyards or gym classes. The goal of the design was to support the open ended play by using different modalities of feedback within play. Each object has the same set of fixed rules and communicates with the other objects in the set. A user can influence the color of the lights on the objects through different movements like tilting, rolling or shaking, making it possible for children to engage in social play.

The designer followed a research through design approach during her design process. She developed an interactive prototype through several iterations and conducted user observation studies which took place both at the school and outside the school context (see Fig. 3).

These iterations provided the designer with insights on how the play behavior can be shaped by the interactive properties of the play platform through different movements. However, the designer's considerations mainly focused on how children interact with the design. Other factors, such as how other stakeholders would

Fig. 3 Screenshots from the user observation studies in a gym class context, through diverse movements of tilting, shaking or rolling (Hooft van Huysduynen 2014)

benefit from the design and their roles were not considered. For instance, in a school context, the actual "users" of the product will be the children themselves, but the teachers may decide on the timing and content of play, or the school may decide on whether or not to invest in the product. How these stakeholders utilize and benefit from the solution defines a wider context for the product, and may hence affect the proposed experience and eventually the market success.

The designer wanted to evaluate the product concept with experts to improve the concept. A Value Design Workshop was organized to enrich the product concept with business and stakeholder perspectives. The participants of the session were the designer herself, two employees of a company which develops play solutions to children, one being an expert on physical education and the other being an industrial designer who specializes in play systems. A facilitator who was responsible for organizing and recording the discussion was also present during the session. The session took 4 h. In the following part, we introduce the method stages, first by explaining how to apply the method, then by providing examples from the case to clarify the discussion content and the insights gathered. Figure 4 presents the layout prompt used during the session. The layout is tailored for the needs of a specific session, in this case by limiting the number of post-its and linking the related comments at separate stages with each in order to inspire the discussion, for a session of 4 h. We present the layout along the related stages.

Briefing and Analysing

The process started with the design brief, in which the design problem and concept were introduced. This information consisted of a description the user, the design context, the design challenge, the description of the concept developed so far and whether there are any stakeholders involved in the solution. It should be noted that the information provided does not have to be complete and the method can be applied to have a deeper understanding of the various aspects of the problem. Visual materials and/or models are useful to include at this stage.
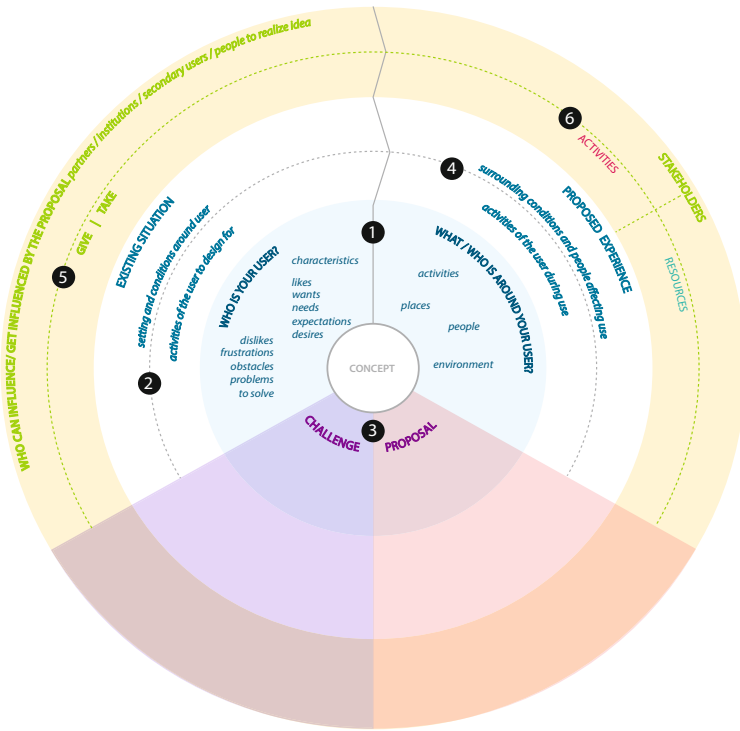
Fig. 4 The Value Design Canvas which is used as a visual prompt in the session. Numbers correspond to the discussion topics along the analysis and synthesis stages of the session, *1*: Analysis of user and use context, *2*: Analysis of the activities in the use context, *3*: Design challenges and proposals in response to the challenges in each stage, *4*: Basic use scenario, *5*: Stakeholder give and take relations, *6*: Stakeholder roles in the realization aspects

This is followed by the Analysing step. At this stage, the design problem is decomposed using a user-centered approach. The decomposition is made by defining the user characteristics, user context with surrounding conditions, available solutions on the market and people and organizations around the users as possible stakeholders (Fig. 4, area 1). In this step, a basic use context was defined, typical user activities in the use context are identified (Fig. 4, area 2), and the use scenario is structured. The challenges (Fig. 4, area 3), such as problem areas, unmet needs or conflicting interests between stakeholders are also identified. These challenges provided starting points to look for design opportunities.

In the design case, the session started with an introduction given by the facilitator about the purpose of the session and the stages of the method. Then the designer

introduced the design motivations and the design concept to the other participants, using the interactive model and drawings. She gave a brief description of her design process, highlights from the user research and the design challenges that she was faced with, to make her design considerations clear. Giving information about these aspects helped the group to start the session with a shared understanding. Two user groups were identified in the brief: primary school children aged 4–6 and 10–12 years. No other stakeholders were considered in the proposal, so this information was mentioned but not detailed further at this stage.

In the analysis stage the group identified the play preferences of the two user groups from the earlier research and their own experiences and defined the context characteristics that can affect the proposed user experience: while younger children prefer individual play with basic rules, the older children prefer social play with more complex rules around cooperation or competition.

Although the designer addressed various play preferences during the design cycles to a certain extent, the experts provided a more detailed evaluation from their own expertise (in this case the cognitive point of view) about possible use situations. For instance, since the sensorial systems of the 4–6 years old children are not developed at the same time, providing different feedback modes (sound, visual, tactile) can be important. Also supporting both social and motor skill development can be an important focus of consideration while designing for play.

Analysis on the context dynamics also led to an insight: the schoolyard and gym class settings have contrasting characteristics which brings a design challenge. The schoolyard is an outside environment with a larger space and the children are involved in free play with no supervision. On the other hand, the gym class is an indoor environment with a more compact space, the pedagogical aspect is considered and children are involved in structured play with supervision. These discussions led to identification of design challenges: how to support the play preferences for different age groups? How to support supervised and unsupervised play? Another design challenge was discovered while considering the activities in the gym classes and schoolyards. The duration of play differs for two age groups: while a play session in a schoolyard is 1.30 h for younger children, it is limited to 15 min for the older group. The spotted challenge was: how to facilitate an open-ended play in a short amount of time? (Fig. 5)

Identifying Values

The identifying values stage is a sub-stage that links the analysing and synthesing stages. The most important challenges that can be solved with the design proposal are selected and transformed into the initial description of values at different levels defined by the Value Framework (Den Ouden 2012) namely: Value for the User (why the design is meaningful for the users), Value for the Market (why the design is better compared to the existing solutions), and Value for the Stakeholders (why the design is attractive to the stakeholders). These values are used as evaluation criteria for the use scenario. The A1 size layout prompt can be used (Fig. 6) to

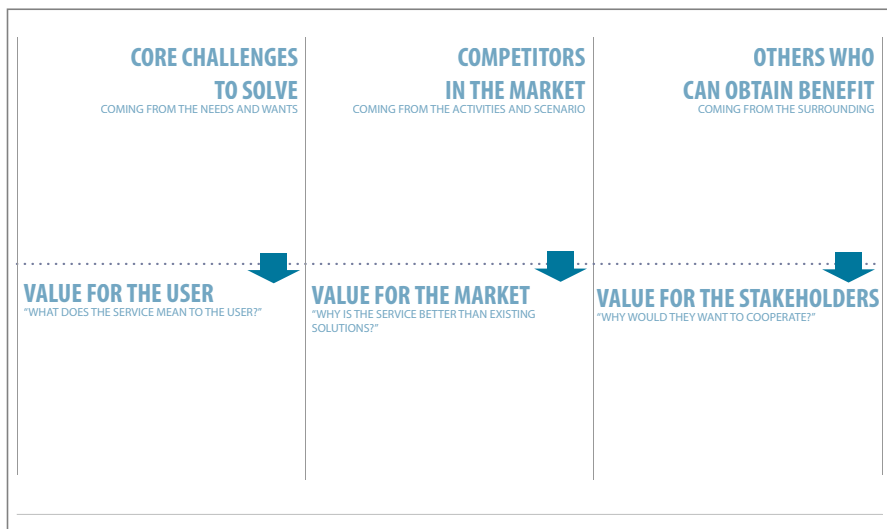**Fig. 5** The session configuration, with the prototypes and the layout

Fig. 6 A1 size template for the value identification stage, taking the user, the market and the stakeholder values into account

specify the insights gathered from the analyzing stage, at different levels. As the session proceeds, new values are identified along the process.

In the design case, at this stage, the participants discussed which design challenge was more crucial to solve and what the added value would be. Table 2 gives an overview of the values that were uncovered in the session. For instance, the group identified that meeting the varied requirements of different age groups is valuable in the gym class context. The value for the market was then identified as supporting the development of both motor and social skills of two different

Table 2 Example values identified during the session, on three different levels: value for the user, value for the market, value for the stakeholders

Value for the user (why the design is meaningful for the users)	Value for the market (why the design is better compared to the existing solutions)	Value for the stakeholders (why the design is attractive to the stakeholders)
Fun to play	Combining functions social play + fun + physically active	Educational value for schools
	Added value to play: developing motor skills	Guidelines on games to the teachers
Challenging	Trigger physical activity	Flexible play solution to the schools: possible to use indoors and outdoors
Suitable for both genders	Supporting the development of both motor and social skills of two different age groups through playful interaction	
Different levels of interaction		
Freedom of creating own game according to interests		
Building on game learned during gym class		
Develop motor skills		

age groups through playful interaction, which distinguishes the product from the existing gym equipment and education equipment.

Synthesizing

The synthesizing stage is the core of the method. At this stage, the design concept is detailed by considering the aspects in the design space, collaboration space and business space, in four steps.

Step 1: Define the (Dynamic) Use Scenario

As an initial step, a use scenario is developed by combining the value for the user and the value for the market, as specified in the identifying values stage. This initial use scenario can describe the main usage steps (scenario frames) with user actions in a typical use situation. It can be developed in a more extensive way by using available scenario development methods and techniques. If there are previously developed personas and use scenarios, they can be adopted in the process. The use scenario functions as the backbone of the discussion, to examine the consequences of pairwise comparisons between the three design perspectives. The scenario evolves as

a part of the process, by adding or subtracting steps in the scenario gradually. It is possible that some steps are replaced by others, or new ones are added, as the use scenario gets more detailed through the process.

The Value Design Canvas provided in the design case included a basic use scenario (Fig. 4, area 4). The adjacent sections of the layout were provided to get the scenario developed through the paired comparisons of the two different age groups. First they evaluated which usage steps would constitute a typical play setting scenario and concluded that the scenarios for the two age groups and supervised versus unsupervised settings differ. Then they identified the product's interactive qualities by considering the differences between different types of play. Following this initial discussion, a general use scenario was made by identifying the user (children), the goal (physical play), the use context (gym class, outdoor/indoor), and the beginning (coming to the class) and ending moments (finalizing the play with the design) of the scenario. Then, a use scenario of 5–6 steps was constructed. In the evaluation stage, this scenario was detailed into two separate scenarios representing two conditions to examine the differences.

Step 2: Paired Consideration: Design and Collaboration Space

In the second step, the collaboration space is defined by identifying the possible stakeholders which can participate in the proposal. Based on the Value for the Stakeholders content in the Identifying Values stage, an initial set of stakeholders is defined. Following this step, based on the use context described in the use scenario, the stakeholders that are related with the use context are added to this initial set. This is done by identifying whether there are stakeholders that can influence the context of use or whether they can be affected by the solution.

In the design case, for instance, the role of the teachers regarding product use in the school setting was clarified. The experts pointed out that there could be two types of teachers depending on the school type: with and without a physical education background. They can both influence another stakeholder, the school director, on his/her decision on investing in the solution. Therefore the group identified that it is necessary to create a guide to support the teachers on the possible ways of using the product and benefits for the children. Some of the other identified stakeholders were the council that decides what can be installed/used in the schoolyard, and the educational equipment company who can be a knowledge partner in developing games.

Step 3: Paired Consideration: Collaboration and Business Space

After identifying the stakeholders, the motivations of these stakeholders to join in the proposal are evaluated by identifying relations. The stakeholder's involvement as a solution partner is elaborated based on defining the give and take relationships, in other words what a stakeholder can provide to the solution and what a stakeholder

can obtain from the solution, respectively. These give and take relationships can be material (e.g. investment) or immaterial (e.g. exposure). If a stakeholder's give and take relations are not balanced, in other words the benefits do not meet their contribution, the commitment from that stakeholder can be considered weak or unrealistic. Based on the roles of the stakeholders in the proposal, some of the stakeholders can be considered to be left out of the proposal based on the imbalance of give-take relationships. By identifying the give and take relationships on a concrete level, new design challenges are discovered. The design concept is enriched based on the design opportunities by considering the stakeholders and what they can bring to the proposal. Attempting to balance the give and take relationships may also trigger hidden conflicting views to surface or may result in innovative ideas to emerge.

In the design case, the possible stakeholders that were defined in the earlier stages were placed on the related part of the canvas. For each stakeholder, give and take relations were identified. For instance, the teachers' motivation for providing expertise and feedback on the play types were evaluated. The experts gave insights based on their past experience in involving teachers in the design process, clarifying that the teachers are motivated to give input if there is a social benefit, if their input is acknowledged publicly in the solution.

Step 4: Paired Consideration: Business and Design Space

As the third step, the use scenario is detailed by considering possible roles of the stakeholders in realizing the proposal, by linking the give and take relations to the business model components, namely activities to realize the design and resources needed (Hakansson 1992; Osterwalder and Pigneur 2010). This step allows the participants to communicate what actions need to be taken, what resources are needed and which partners can contribute in the related steps. It also allows them to evaluate whether or not certain design features are necessary. The scenario parts are then detailed or changed based on the limitations and possibilities identified.

In the design case, the participants highlighted the fact that (1) creating new game opportunities can enrich the play experience of the children; (2) pedagogical advice is needed to develop the open-ended play concepts further.

The guidelines and play scenarios could possibly be created in collaboration with physical education teachers and the design company. So developing play rules was identified as one of the key activities to realize the design proposal. Teachers could be involved in this activity by providing physical activity knowledge as a key resource. In this activity, a game database would be developed, and the teachers could also give feedback about which games are more preferred by children.

Discussing the actions required to realize the concept also helped the group to spot the missing actions and challenging steps. For instance, to place the concept in the market, a certification needs to be obtained for school environments. This was an issue that the designer did not consider previously. In addition, the group also discussed the realization aspects based on the specific features of the product, such

as the financial investment that would be needed at the initial stage and on which terms the company would invest in the idea, as well as the university's role as a shared idea owner in the case if the designer's idea would be commercialized.

Consolidating and Evaluating

At this last stage, the considerations discussed in the synthesing stage are brought together and evaluated. The finalized use scenario is combined with the discussions on how to realize the idea. The use scenario, the design challenges and important points of consideration for the next steps are documented on the layout and the concept is evaluated by considering the links between the decisions at different stages, through joint reflection.

The Consolidation and Evaluation layout (see Fig. 7) identifies the scenario with parallel layers that link the product specifications, use scenario, the business model concept and the roles of the stakeholders. Bringing the different aspects of the discussion together enables the participants to have the overview of the design decisions.

In the design case, the participants jointly defined the use scenarios in their final form. Due to the two types of users and differences in the supervised and unsupervised use context, the use scenario was detailed to form two scenarios, and

Fig. 7 A0 size consolidation and evaluation template of the value design canvas. The use scenario and the realization actions are brought together for final overview

the participants discussed the differences between the two cases to see whether the design decisions could meet the requirements of the two cases. In the final step, the use scenarios were brought together with the realization scenario, in which the roles of the stakeholders to realize the design proposal were also evaluated. Identifying the links between the design and realization decisions also clarified how the teachers would be involved in giving feedback on the design. Some unknown issues and challenges were also documented for the next stages of the design process.

Evaluation of the Value Design Method with the Designer

Following the design case we evaluated how the designer benefitted from applying the Value Design Method in her design process, with a semi-structured interview. She reported that the method helped the designer in aligning her understanding with the experts, in detailing some aspects of the design and in defining the company's role for introducing her design in the market. More specifically she reported that:

- The discussion process made her understanding of the design context more concrete with expert feedback; such as by differentiating the characteristics between two age groups and between the two use situations in supervised, indoors gym-class settings and in non-supervised, outdoors schoolyard settings.
- Use scenarios helped her to link this knowledge with what happens in the actual use situation, so that they gave the designer handles to evaluate whether some interaction rules would work or not. For instance, not only with a focus on how the children play with the product, but also by considering the classroom environment with the role of the teachers.
- The discussions on the business insights and stakeholder roles made her understand what the company and other stakeholders' expectations would be, if they take a role. For instance, the session made it clear for her that the company doesn't have an interest in developing the electronic components, but they have an access to market, so they could be interested if the design fits their portfolio. Therefore a third party for developing electronic components would be required. Also, the designer had an understanding over how far she should define the design specifications, so that the other stakeholders could participate in developing the concept.
- The structured process helped them to discuss on the subjects that were relevant, which they would have skipped without using the method, for example additional stakeholders were needed since they would affect the use and realisation of the proposal.

Following the session the designer integrated the insights that she obtained from the session into her final design iteration. She improved her design by adjusting the interaction rules based on the two scenarios developed duringthe session and used
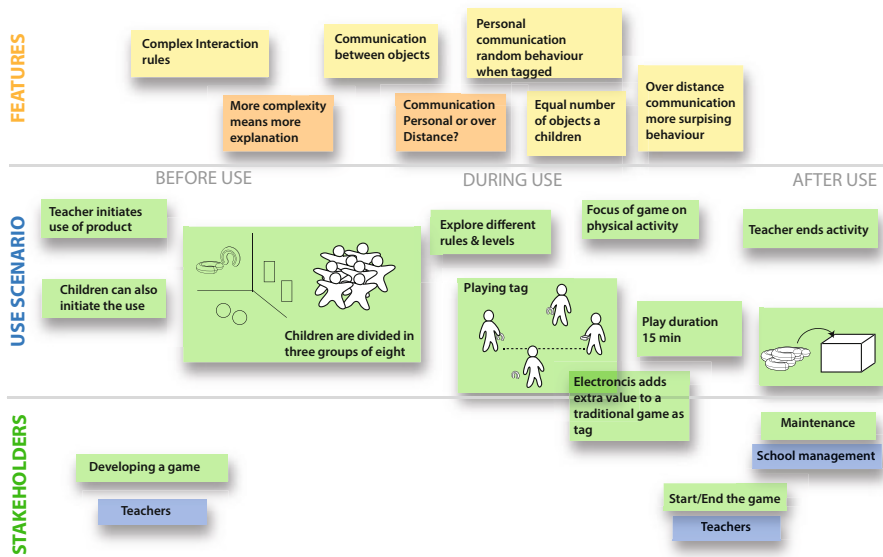
SCENARIO _2_ | Gym Class | Age 10-12

Fig. 8 The scenario template that the designer used in her final design report. The contents of the scenario were obtained during the session. The designer used the layout to digitize the post-its, in a scenario flow format with parallel rows of product-system features, use scenario and the stakeholders in relation to use instances
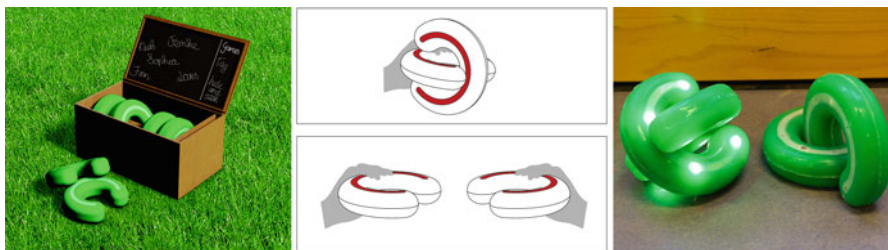

Fig. 9 Final concept of Lusio, with a storage box including Lusio set and game instructions on cards that the gym teacher can use during the classes. Two objects that can be separated or engaged together for different complexity levels in interaction

the scenarios to communicate about her design (see Fig. 8). She also chose to design a package in which all pieces of a play set were present and visible to the teacher. The package also contained practical guidelines to the teacher to use (see Fig. 9).

In the following part, we will evaluate the benefits and limitations of the method referring to the case presented above.

Discussion

The Value Design Method presented in this chapter is a method for designers to examine their design decisions with stakeholders, both to enable knowledge gathering and to integrate insights from several perspectives of the design concept.

The case presented in this chapter demonstrates how the method is applied. It represents a situation in which a designer (final year graduate student) evaluated her design with expert feedback and improved the design solution by considering the business and stakeholder perspectives. We discuss the benefits and limitations of the method and clarify the guidelines for method application in the following section.

Benefits and Limitations

The designer found the method useful as an instrument that supports her knowledge gathering action. In the case presented here, the concept did not diverge to a great extent from the beginning of the process, but rather got detailed with new interaction rules and expanded with service integration. This is partly due to the design concept being concrete with a concept prototype that was presented at the beginning of the workshop and how much this concept already fulfilled the user needs. It can be therefore expected that the resulted design concept can diverge from the original proposal to a larger extent if it is at a less mature state at the beginning of the session, or with less concrete user insights.

The method is also suitable to be applied to facilitate the involvement of stakeholders with different backgrounds and interests in the ideation. In the case presented here, the session was organized with experts from a company in the related market. These experts had a relevant understanding of the users and the market, therefore helped the designer to gather deeper knowledge regarding the business and market aspects, as requested by the designer herself. The session could also be organized by inviting school representatives or possible stakeholders who would be interested in solutions for social design challenges, such as motivating children to be physically active. Then the session would be useful for clarifying the requirements for involving schools as solution partners, or for evaluating the design solution based on the social impact.

As discussed in the previous paragraph, this case involved only one stakeholder in the earlier stage of the design (the company), although it was learned that there are additional stakeholders of importance. If the Value Design Method is applied with the direct involvement of all the identified stakeholders, the process can result in more conflicting views surfacing due to different perspectives on the solution. In those cases, the conflicting views can provide valuable insights, if handled in a constructive way. Therefore, while applying the method with direct involvement of the stakeholders, enough time should be provided for discussing the stakeholder

roles. Alternative solutions can be developed with a deeper knowledge exchange, by elaborating on the balance between give and take relations or by considering other design solutions by with alternative actors, activities and resources. This also aligns stakeholders' understanding over each other's position.

Like many other participatory methods, Value Design Method has an open and participatory approach in which ideas are proposed and discussed openly and developed through joint reflection. It is important for the participants to share this mindset as well, and be ready for constructive discussions around challenging design issues.

The method process does not result in a fully verified business model, however it does support establishing the links between the design decisions with the business decisions and stakeholder roles, which will inspire the business model generation step for proposals with many actors. The Value Design Workshop can be applied as part of a series of workshops where the design decisions are developed into a more concrete business model.

We have already applied the earlier versions of the method in design and innovation workshops in which professional designers, experts and stakeholders came together for a social design challenge, for instance, motivating children to be active or designing Livinglab concepts to engage citizens in a more active lifestyle (Gultekin-Atasoy et al. 2013, 2014). These sessions were in the context of projects which aimed to bring universities, public sector and companies together to develop solutions with a commercial value. The participants reported that the method provided a useful process for discovering new design opportunities with the contribution of different stakeholders, and understanding each other's perspective towards the solution.

Integration with Existing Methods

The method utilizes use scenarios as a backbone of the discussion. Although it proposes basic steps of establishing and adjusting a use scenario, the process does not fully define how to develop a detailed use scenario. Detailed user personas and use scenarios are accepted as valuable tools for developing deep insights in the design process. We recommend the readers to refer to existing methods for scenario development (Carroll 1995; van der Bijl-Brouwer and van der Voort 2013) and story thinking, such as Co-constructing Stories (Ozcelik-Buskermolen and Terken Ch. 8) or Storyply (Atasoy and Martens Ch. 9) for developing scenarios and stories with a more focused approach. Value Design Method works in a compatible way with such scenario and story-based approaches, and will be a useful complementary method for further evaluation of the design concept.

The case presented in this chapter utilized the expert knowledge to clarify the business aspects and stakeholder expectations and possible roles, to support a compact session. More complex design problems may require focused studies to gather insights on stakeholder involvement and business aspects. For instance,

stakeholder analysis methods (Bryson 2004) would be useful for the projects with many stakeholders, such as in the healthcare sector. Den Ouden's (2012) Value Flow Model provides a useful approach for identifying stakeholder relations in an innovation ecosystem. It can be utilized as a useful visualization tool defining stakeholder relations on the network level. The Business Model Generation approach (Osterwalder and Pigneur 2010) is a useful model in defining business aspects for a proposal, and can be useful when applied after the Value Design Method for further detailing the business model of the proposal.

Finally, readers are invited to focus on the required facilitation skills. The Value Design Workshop format lowers the facilitation requirements; however basic facilitation skills to organize the workshop and to manage the group process are required for the session to run smoothly. The effect of time pressure on ideation should be considered in the method application. More invested time will result in a more detailed concept and discussions; on the other hand more invested time is an obstacle for the participants to attend. In the previous applications of the method, it was observed that a minimum of 3 h is necessary for a compact session, while an extended session can easily take a full day. The time requirements of meeting with the other participants, warming-up, applying the method and evaluation, including breaks should all be considered in the session planning. The longest session segment is advised to be 45–50 min long to keep the participants motivated to contribute. Time pressure can be applied in the divergence stages. However, decision-making stages require sufficient time for discussion and reflection on the generated ideas. In the cases where challenging issues or conflicts surface, giving enough time for discussions may be necessary to explore alternative solutions or to resolve the issues.

Future Development of the Method

The layout prompts introduced in this chapter support the method application in a flexible way, by the use of post-its on the assigned parts of the layout. The layout informs the participants on the expected process and limits the number of comments with the space provided for each stage. Therefore it also communicates to what extent a topic is discussed. Although this approach has some advantages in easing up the facilitation, it also has some limitations. Firstly, the entries on the sticky notes can vary in depth, eventually giving less limitation and guidance. Secondly, the opportunities are only explored to a certain extent. The current version of the method is planned to be developed into a card-based toolkit with an integrated layout to support a flexible evaluation of existing opportunities, while motivating the participants to give more direct input with prompts on the cards. This is expected to support the creative discussion process to a higher extent. Another valuable direction for further development is to apply the method principles on a digital platform. This would allow taking more dimensions into consideration on the use scenario, and a more dynamic way of adding/subtracting scenario frames based on these

considerations. It is also valuable for documentation, during and after the session, which allows sharing output of the session with other participants and for using the outcome in multiple sessions.

Conclusion

In complex design projects there are many interrelated components that should be taken into account during concept development. Therefore designers need to gather domain and expert knowledge at the early stages of the design process. It may be difficult for designers to envision all of the information that may be relevant. The challenges that are faced by designers in the design context at present can be answered by developing contemporary design methods that help evaluating design considerations in relation to the stakeholder expectations and how they can contribute to the proposal, by taking into account the tangible and intangible value exchange through the proposed concept. The design solution, business model and the roles of the stakeholders are advised to be designed together, through an explorative process of negotiation and participation.

The Value Design Method presented in this chapter helps designers to gather such information from experts early in the process, and hence to obtain an overview of the design problem at hand. This is likely to increase the designer's awareness when approaching a complex design problem. The method is observed to be especially useful for designers to consider design issues that may otherwise be missed in the ideation, such as business dimensions or stakeholder roles. It enables the designer to consider design concept in a broader context, beyond the typical focus on the user-product interaction.

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