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Paper

Social Innovation in value networks –  
reducing uncertainty by integrating knowledge

## Summary

Innovation is increasingly a collaborative activity. This is even more so for innovations that address societal issues, whose success relies on the involvement of many stakeholders outside corporate boundaries. There is a concurrent, interdependent and dynamic process going on: defining both a value proposition and a network of actors that combine their individual offerings into a coherent, customer facing solution. To better understand the occurring issues and distinguish successful approaches of designing new value propositions in such an evolving network, five case studies were performed. The findings were used to create a framework for reducing uncertainties through value networks.

Keywords: value networks; designerly approach; probing; dealing with uncertainty

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## 1. Introduction

Innovation is increasingly a collaborative activity. This is even more so for innovations that address societal issues, e.g. aiming at affordable healthcare for elderly or stimulating children into a more active lifestyle to prevent obesity. Innovation projects that aim to develop a solution for such societal challenges need to deal with high uncertainty levels, because the target customer is more diffuse, the market potential is unclear, and not one organization has all the knowledge needed to provide an adequate solution. Their success relies on the active involvement of many stakeholders outside corporate boundaries. Multiple organizations, both for-profit and non-profit, are needed to design a value proposition that integrates as much knowledge and experience as possible to address the needs of both end-users and other stakeholders. This paper aims to understand how such collaborative innovation projects reduce uncertainty in practice through the integration of knowledge from other parties.

This paper is structured as follows. Section 2 summarizes the results of a literature study about uncertainty reduction in the development of social innovations. Section 3 discusses the case study research design. In section 4 and 5 the cases are respectively described and analyzed. On the basis of these findings, a propositional framework on the uncertainties and the methods to reduce these is formulated in section 6. Finally, we discuss the managerial and research implications of this study in section 7.

## 2. Uncertainty reduction during the development of social innovations

A literature study was conducted to gain insight into the relevant topics in the areas of social innovation, new business development and uncertainty reduction from the perspectives of business management, innovation management and design research.

Social innovations are defined as innovative activities and services that are motivated by the goal of meeting a social need [Howalt & Schwartz (2010), Mulgan (2006)]. They aim to fill a gap between what there ought to be, between what people need and what they are currently offered by governments, private firms or non-governmental organizations [Mulgan (2007)]. They bring new ideas that improve quality of life, as opposed to business innovation that aim at profitable new ideas. These concepts are different, yet overlapping and provide opportunities for business to go hand in hand with improving quality of life [Pol and Ville (2009)]. Societal challenges are of interest for firms, not as a charitable favor to society, but because they provide a tremendous business potential [Porter and Kramer (2011)]. Social entrepreneurs are pioneering new product concepts with viable business models [Ellis (2010)], to find a way to enter new markets [Eyring et al. (2011), Thompson and MacMillan (2010), Ellis (2010), Yunus (2010)] or a way to make new proposition with high uncertainty scalable, so it can start small and without heavy investments [Eyring et al. (2011), Rappa (2004), Gunther McGrath (2010)].

The innovation process for social innovation received very little attention in research so far [e.g. Mulgan (2006)]. Innovation management literature distinguishes three levels of newness of innovations that differ in impact on the innovation process: incremental, which deals with existing technologies targeted towards existing markets; really new, which includes new technologies brought to existing markets, or existing technologies to new markets; and radical innovations, which are the class of rare innovations that result in discontinuities in both the existing market structure and the existing technology structure [Garcia and Callantone (2002)]. Following this classification most

social innovations are ‘really new’. Although some are dealing with both new technologies and new markets at the same time, but without the disrupting effect that is related to the radical innovations. Really new innovations are confronted with higher levels of uncertainties than incremental innovations, that deal with well-understood risks and therefore parallel activities can be planned ahead of time in a milestone driven process [Smith and Reinertsen (1998), Ulrich and Eppinger (2000)]. When projects are more innovative, the process becomes inherently messy: coincidence and fortuitousness play an important role, the process is recursive in nature [Veryzer (1998)] and requires more iterations [Bessant et al. (2005), Song and Montoya-Weiss (1998), De Brentani (2001), Leonard-Barton (1988), Skarzynski and Gibson (2008)]. Such iterative processes, are described in literature under many different terms, e.g.: discovery driven planning [Gunther McGrath (1995)], market-learning [Colarelli O’Connor (1998)], roadtesting [Mullins and Komisar (2009)], venturing process [Mason and Rohner (2002)], the probe and learn process [Lynn et al. (1996)], or spiral processes [Boehm (1986), Hauser et al. (2006)].

Discussions on uncertainty and risk in business and innovation management literature mainly focus on technological and market uncertainty from the perspective of the firm (existing market/technology versus new to the company) [McDermott and Colarelli O’Connor (2002)] and suggest that market risk is more important to tackle first, before the product or technology related risks [Day (2007)]. Moreover, in more innovative projects the market opportunities tend to be unspecified and first need to be created, and potential customers are often unable to envision the true potential [Veryzer (1998)]. Traditional market research is not enough to identify unarticulated needs or emerging trends [Teece (2010), Verganti (2009)]. To accumulate market understanding as rapidly as possible expeditionary marketing is suggested as a way to learn fast, through a series of low-cost, fast-paced market introductions [e.g. Hamel and Prahalad (1994)].

Design literature has dealt with uncertainties differently: design often starts with wicked problems that are ill-defined, unique in their causes, character and solution. Dealing with wicked problems demands that special attention is paid to understanding the nature of the problem itself, before working on the solution [Martin (2009)]. Since the problem cannot be fully understood in isolation from consideration of the solution, it is natural that solution conjectures should be used as a means to explore and understand the problem formulation [Cross (2006)]. The problem and the solution co-evolve. How much iteration is needed is not known upfront, neither are the problems and opportunities that will be found along the way. The challenge of design then becomes not a matter of getting rid of the emergent, but rather of including it and making it an opportunity for more creative and more adequate solutions [Fischer and Giaccardi (2006)]. Design aims to integrate what is desirable from a human point of view with what is technologically feasible and economically viable [Brown (2009)]. In the design process sketches, storyboards, scenarios, movies, scale models, dummies, or any other form of prototypes are used to represent the half-formed ideas and to share them with different stakeholders of the project. The reflections are used to reconsider, revise, develop, reject and reiterate the ideas. The process of design is not described as a linear process, but as three overlapping spaces: inspiration, the problem or opportunity that motivates to search for solutions; ideation, the process of generating, developing and testing ideas; and implementation: the path that leads from the project room to the market [Brown (2009)].

The ways of working that are common in design, seem interesting to explore on business level as well. The recently rapidly expanding literature on design thinking deals with applying design skills on this level [Brown (2008), Burns et al. (2006), Martin (2009), Miettinen and Koivisto (2009)]. This seems to be a very appropriate approach for social innovations, because such projects aim to find solutions to wicked problems beyond a product level solution. The solutions for societal challenges will often be socio-technical service systems that include not only the hardware functions, but also its environment and social context: the human agents and social institutions have to be taken as integral part of the system [Kroes et al. (2006)]. Unfortunately, not many practical cases of design thinking on the level of socio-technical systems have been described (yet).

Social innovations from their very nature, have to deal with a much wider range of stakeholders than regular products or services, because the group of people who influence or affect, or are influenced or affected by the innovation is much larger [Freeman et al. (2010), Clarkson (1995), Freeman (1984)] than in products that are targeted at a specific customer group for individual use. Literature differs in opinion on whether involvement of more stakeholders actually increases risk because of the higher complexity [e.g. Ward and Chapman (2008), Tatikonda and Rosenthal (2001)] or reduces risk because of the inclusion of more knowledge and experience in the team [e.g. Powell (1990), Ramirez, (1999), Ozer (1999)].

Companies are more and more embarking on open innovation to include ideas and technologies that are not invented by themselves in their offering [Chesbrough (2003), Chesbrough et al. (2006), Dahlander and Gann (2010)] and thereby can bring solutions that they could not have been able to create on their own [Adner and Kapoor (2010), Nieto and Santamaria (2007)]. Research indicates that the traditional static and linear supply chains will be replaced by more flexible value webs or value networks that collaborate in innovation by sharing value and knowledge [Allee, (2008), Stathel et al. (2008), Riedl et al. (2009), Tapscott et al. (2000)]. Such collaborations are between companies but also include non-profit and non-governmental organizations, especially in the case of social innovations [Porter and Kramer (2011)]. The critical issue is not to become dependent on the other party but to build and sustain mutual commitments, which enables both parties to engage in value creating coordination of interdependent activities [Blankenburg-Holm et al. (1999)]. Doing business in networks provides opportunities but also poses challenges, placing the companies in three intricate paradoxes: it provides opportunities and limitations at the same time; companies are influencing and being influenced; and controlling and being out of control [Hakanson et al. (2009)].

Concluding, one can say that the challenge in the process of developing a valid and successful value proposition for social innovation is a chicken-and-egg problem. Social innovation initiatives start with an ill-defined problem. On one hand the knowledge of different parties is needed to truly understand the needs and insights of stakeholders, but on the other hand without these needs and insights it is impossible to craft a list of parties that must be involved in the process. Through continuous knowledge exchange, insights are enhanced and new knowledge gaps are identified; this causes the need to invite new parties to contribute to the network along the way. It leads to a concurrent, interdependent and highly dynamic process: defining a value proposition as well as a network of economic and social actors to combine their individual offerings into a coherent, customer facing solution. A designerly approach to such projects seems appropriate, as designers are used to deal with ill-defined problems and integrate desirability, feasibility and viability in their solutions by applying a probe and learn process that involves frequent reflections with various stakeholders.

To better understand the issues of collaboratively developing new business with social innovations, an empirical case study is needed, to specifically analyze how uncertainty is reduced in practice and what role partners, other stakeholders, and probes play in this process. In this paper we use the term social innovations for socio-technical product/service systems that aim to create a positive impact on a societal issue by products and services that also bring economical value for the companies involved.

### 3. Case study research design

This study is of explorative nature, aiming to acquire more fundamental understanding of the ways to reduce uncertainties during really new product/service development. To this end a case study was conducted in order to provide insights into the nature of uncertainties, the contribution of various value network partners in reducing the uncertainties and the methods that were used to reduce these uncertainties. The case study data were used as a platform for framework development, following the process proposed by Eisenhardt (1989).

(1) Formulation of research question containing preliminary constructs:  
The added value of multiple partnerships in reducing uncertainties in really new social innovations during all phases of the innovation process.

(2) Theoretically useful cases were selected. Five different projects were selected on the basis of five criteria. The first criterion concerns the social relevance of the innovation; because of the focus of the study we selected innovations that are aiming for a positive societal impact. The second dimension relates to the newness of the innovation; this dimension was selected as we wanted to analyze how uncertainty about the actual effectiveness of a solution is addressed during the innovation process. The third factor relates to the number of stakeholders that are the target of the innovation. In social innovations, typically there are multiple stakeholders. E.g. to reduce children's obesity, both the parents, educators, practice nurses and others who take care of the children need to be involved. The individual end-user is not the only one to reap the benefits of a social innovation. An additional issue is that the end-user may not be able to judge the benefits (too young, too ill, too narrow expertise, too impaired). The fourth factor relates to the dynamics in the parties that come in and go out of the value network. This dimension was selected as we wanted to analyze the dynamics in parties involved, the rationale behind their involvement and the influence of these parties on uncertainties and value proposition. The fifth criterion is related to the availability of the project information and direct access to the decision-makers. This factor is important because of the explorative nature of the project. By having direct access to the decision makers, the researchers had the opportunity to have shorter and more frequent meetings with them to verify additional questions that were identified along the way.

As a result, five social innovation projects have been studied. A more detailed description of the cases is given in paragraph 4.

(3) For data gathering, the authors of this article had direct access to the key decision makers, key information and (confidential) company documents and guaranteed a continuous feedback for hypothesis formulation and validation of the findings across the five case study projects. In 4 of the 5 cases the authors assumed a role in the situation and got an inside view of the events. The idea for the research study only came to mind after the direct involvement of the authors came to an end, so the research activity had no influence on the projects.

(4) Moving from data to the development of the framework, the case study data were screened for content themes.

(5) Model building through an iterative process involving:

- a comparison with the relevant literature and
- a cross case comparison.

## 4. Description of the case studies

To better understand the occurring uncertainties and distinguish successful approaches of designing new value propositions in such an evolving network, five case studies were performed. All five cases are projects that aim to create new business in socio-economical context.

## 4.1 Project Alpha

Finding solutions that increase quality of life of patients with a chronic health problem and decrease costs of health care at the same time.

Project Alpha has been initiated jointly by a company that markets a.o. diagnostic devices and a health insurance company. The aim of this foundation is to pull down organizational barriers for innovative solutions in the healthcare market (focusing on chronic disease management) and to use existing technical solutions in a smarter way. In order to create solutions that are really solving patients and health practitioners' problems they installed several multi-stakeholder teams. The teams consist of representatives of medical expertise in primary and secondary care, health insurance companies, technology providers and patient organizations. These teams have the task to design feasible concepts and viable business models, which will be offered to interested businesses for further commercialization and to redesign the ecosystem needed to implement these concepts. Depending on the level of uncertainty, the resulting concepts are tested on their clinical evidence, market acceptance, technological feasibility and business viability.

## 4.2 Project Beta

Designing an intelligent lighting solution to help psychiatric patients to relax.

Project Beta started at an institution for psychiatric patients. Aim was to shorten the time that patients have to stay in the institution and to increase the quality of life during their stay. In this case it was difficult to make the desirability for the patients explicit as they are will-unable. Specific light settings were believed to decrease the stress in groups of patients and reduce the number of incidents. The institution involved lighting experts from university to discuss the idea. This discussion resulted in a redefinition of the initial value proposition. In the next phase, a business partner was asked to join the network. They proposed to create an experimental environment where they could test the actual effect of different, multiple light settings on the patients' behavior. An existing lighting system was used; the business model and the technical feasibility of the solution were already proven in other applications. A first user test with one dimension of light effects showed promising results. Next step is to test the effect of other light schemes. For the institution this offers a promising solution for their needs. The business partners got access to an additional market segment and knowledge about the light schemes and their effect of psychiatric patients. No contracts have been signed so far.

## 4.3 Project Gamma

Designing a product for children, that stimulates them into more active playing in order to support the prevention of children's obesity.

Project Gamma started as a graduation project at a university. The student identified the initial value proposition. The success of the proposition was highly uncertain because of lack of experience on how to motivate children to use the product. During an exhibition, the project drew a lot of attention. It was selected for further research by a foundation that aims to create new business out of the ideas generated at the university. Aim was to understand the factors that influence the desirability of the solution and to develop a viable business model for the concept. A center for children day care was contacted for expert input and act as user test bed. After the concept was proven, a business partner contracted the students and the product was successfully launched. The day care center is still being involved to develop product extensions and variations.

## 4.4 Project Delta

Designing a roadmap with new applications for a technology that measures the presence of biomarkers in body fluids;

Project Delta started as a corporate venture. The mentioned technology was seen as a promising solution to measure tracers for heart failure. Extensive effort was needed to proof technical feasibility and get clinical evidence. After presenting the technology at a conference, a business partner showed interest in the technology. This business was active in a non-medical market. The team decided to partner with this business partner and launch their solution in a non-medical test market. This offered them the opportunity to collect essential quantitative data on the systems reliability while at the same time exploring the feasibility of an innovative business model. During the development of the system, a demonstrator planning was used to explore (1) user, buyer and societal acceptance of this new to the world test method, (2) to demonstrate progress in the technical feasibility of the system and (3) to learn about the business model that was new to the company. The timing of the demos was designed in such a way that the tests were giving inputs for critical decision points (technology, user interface/workflow or business related)

The team explored several other market segments, where they partnered with companies for getting access to end-users, stakeholders as well as markets. From the beginning, a multi-application platform was used in order to quickly change directions whenever a certain route would turn to be unfeasible.

## 4.5 Project Epsilon

Finding appealing applications for a new technology.

A research institute wanted to valuate the technologies that it developed from research grants. Students were asked to participate in ideation workshops in order to conceive applications for a specific invented technologies. Functional concepts were further developed into business cases, and tested with the intended users. One of the concepts, a product/service combination to support prevention of children's obesity (same goal but different solution compared to project Gamma), received seed funding, a.o. from the research institute. The students involved started their own company. Initially, their main concern was to demonstrate the technical feasibility of the concept. In the meantime, a steering board consisting of both investors and context experts was set-up. Influenced by the context experts the target group for the innovation changed. When looking for interested customers the start-up got into contact with a local health insurance company. Both the concept of the value proposition and the business model have changed drastically. The company is still working on the technical feasibility.

## 5. Analysis of cases

The projects have been analyzed to understand the innovation process and the collaboration. Typical questions addressed are: How did the project start? Which parties were involved at the initial steps? What kind of uncertainties were identified? Which parties were approached to complement the projects knowledge? Did involvement of new parties influence the value proposition? How was the dynamic iterative process managed?

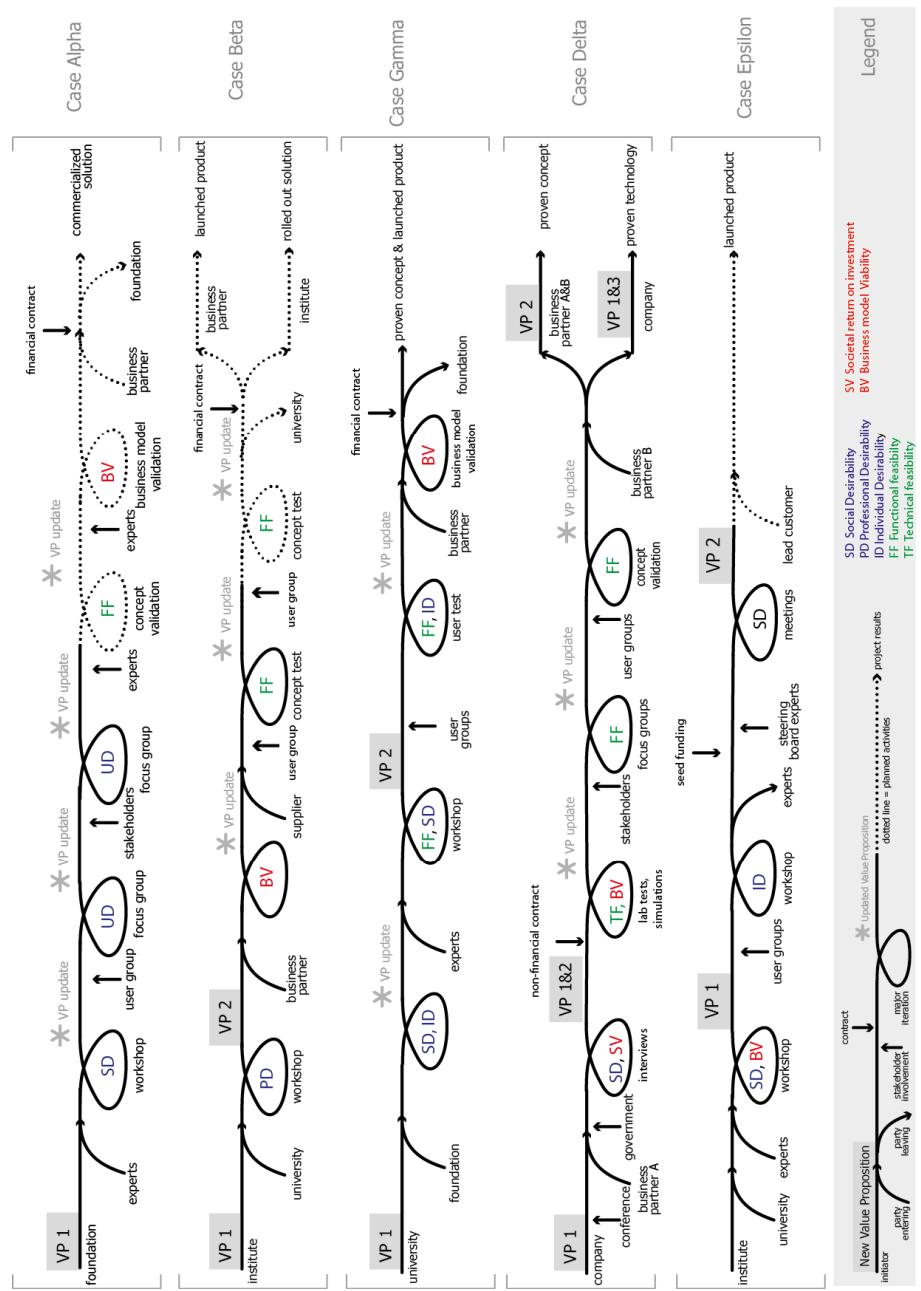


Figure 1: Graphical representation of the five cases.

Figure 1 shows the sequence of major events in the five projects. It indicates which party initiated the project, which parties became involved in the value network, and which stakeholders played a temporary role. The loops in the project represent major activities that were executed to reduce uncertainty levels in the project, and what specific type of uncertainty was addressed in this activity. Cross case analysis highlighted specific issues that will be discussed in the next sections.

## 5.1 Dynamics in the team composition

The collaborative process to define new value propositions with an evolving network of collaborating parties appeared to be highly iterative and very dynamic. Not only does the value proposition change due to advancing insights, the collaborative network itself is also dynamic and changes during the innovation project as goals develop and values for the actors become clearer and clearer every step. During the process different scenarios needed to be explored. This sometimes led to partners stepping out of the network, because the proposition did no longer bring sufficient value for them (as in Case Delta).

Others entered at a later stage, bringing in new insights and needs.

This process differs from 'Open innovation' approaches. Open innovation takes one firm as a point of departure and 'inbound' open innovation aims to bring in knowledge or solutions to enhance the offering to the customer [e.g. Dahlander and Gann, (2010)]. Such a company centered view strengthens the illusion that the company controls that network, or that it is their own network [Hakansson and Ford (2009)]. In our projects we found that the network parties involved did have an equal power-basis, even the smaller ones are regarded equal. The parties that were collaborating in the projects were not all for-profit businesses, and even if more business parties were involved the goals and ambitions of these parties were not explicitly aligned at the start. Each party could participate for its own reasons, and could influence the common goal by bringing in new viewpoints or knowledge.

## 5.2 Types of collaboration

All five projects were using a collaboration mode that was much less formal compared to common practice in more traditional innovation collaborations, where contractual agreements are usually made already early in the process [e.g. Hurmelinna et al. (2005)].

In the cases three types of collaboration modes have been identified:

- Foundation: a foundation (also a charitable foundation) is a legal categorization of nonprofit organizations that will typically either donate funds and support to other organizations, or provide the source of funding for its own charitable purposes. The foundations in our cases were funded by a combination of non-profit and commercial organizations.
- Non-contractual agreement: an informal cooperation between parties that have joint interest in learning from a specific situation. Non-disclosure agreements are used to share (company) confidential information in a safe setting.
- Joint development agreement, on basis of non-financial exchange: a more formal confirmation of the business intentions of partners. They agree to work together to bring the proposition to a more mature status. When the highest uncertainties are solved this can result in e.g. a joint venture.

In all cases the financial business contracts have been or will be established after the major uncertainties are reduced.

### 5.3 Effect of new parties on the Value Proposition

The knowledge that was needed in the projects was not limited to technical knowledge for the service proposition. Moreover, non-technical knowledge, such as insights into the markets or end-users, proved to be equally important to enrich the value proposition into viable business scenarios.

The cases reveal two types of actors, (1) temporary partners (indicated as “experts” in Figure 1) that are needed to bridge knowledge gaps and (2) business partners that are needed to complete the value network that will deliver the complete proposition.

The involvement of experts has a high impact on the value proposition (VP1). We found that in 4 of 5 cases, the VP changed completely either towards a solution that better fits to stakeholder needs or even towards a different market segment. The initial companies have limited knowledge of the application or the market. They start with an assumption (“Plan A”) that turns out to be either not feasible, unviable or undesirable. The expert or business partner brings in market knowledge and/or application knowledge, resulting in a redefinition of the Value Proposition (VP2) and a “Plan B”. This is in line with the approach as proposed by Mullins and Komisar (2009).

The involvement of user groups or stakeholder groups has a lower impact on the value proposition. Since the expert/business partner already has fine-tuned the proposition to the target group, the biggest misalignments are removed. The user/stakeholders bring in elements that enrich the value proposition (additional functionality, improvements in user interface). This is indicated as a “VP update” in Figure 1.

In general we experienced that the willingness to reconsider early concepts and ideas was high in all five case studies. Research has identified this to be an important factor to increase the project success and quality of the design [e.g. Cross (2006) or Smith and Tjandra (1998)].

### 5.4 Probing

The creation of demonstrators or prototypes enabled fast iterations: it made discussions between the various parties and presentation of the value proposition to stakeholders much more concrete. Project Delta even managed the dynamic iterative process through a planning of demonstrators. Overall, the processes applied in these five projects have more similarities with iterative design processes than with traditional new product development processes such as milestone driven stage-gate processes.

### 5.5 Types of uncertainty

The five cases all addressed uncertainties as described by Brown [2008] during the innovation process.

Desirability - what makes sense to people and for people

Feasibility - what is functionally possible within the foreseen future

Viability - what is likely to become a part of a sustainable business model

When using these definitions to classify the uncertainties that our cases were confronted with, we found that the definitions are ambiguous. Also we found that there is a need for a more fine-grained assessment of uncertainty when dealing with socio-economical innovations.

## *Desirability*

To bring about socio-economical innovations as pursued in the five cases, both individuals (e.g. car driver, obese child) and professionals (e.g. police, baby center nurse) need to adopt the solution. That implies that the desirability for both need to be addressed. This may lead to conflicting needs.

Four of the five cases were facing complications in assessing the needs of individuals that are not able to express their needs, because they are too young, too impaired or will-unable. It seems likely that social innovations will more often need to deal with this issue than traditional innovations.

Moreover, there is a difference between the direct perceived value for the individuals and professional stakeholders and indirect longer term value for society. An additional layer of stakeholders can be identified here e.g. governmental body, NGOs or patient organizations that express a higher level societal need.

## *Feasibility*

Feasibility is generally perceived as the technological feasibility of a certain solution (for example addressing the question if the measuring instrument actually does deliver the required reliability or if the product is robust enough to be used by children in their daily playing activities). For socio-economical innovations we additionally distinguish short term functional proof of mechanism (is the child losing weight, is the disturbed patient calming down) and a longer term proof of a sustainable effect (is the weight loss sustainable, are there actually less car accidents caused by drug-impaired drivers). The proof of the long-term effect is not within the scope of this research as most cases haven't been introduced in the market yet. Typically, long term longitudinal studies and clinical studies will be needed to get a better understanding of the (behavioral) mechanisms.

## *Viability*

When creating socio-economical innovations it is not sufficient to look at the viability of the business model with which the value proposition is offered to the customers. Where multiple parties have to cooperate in order to deliver a value proposition, the network itself needs to proof its viability as well. For delivering solutions to patients that are chronically ill, both health insurance companies and several health practitioners need to come to a sustainable working relationship. On top of the overall business model that is required to bring the complete value proposition to the patients, the business models of the participating companies need to be viable as well. As an extra complication, the longer term (financial and non-financial) benefits for society need to be balanced with the short term investments needed to develop these solutions, surely a challenge because the social pay-back time may outlive the cycle time of a government term.

Our five cases were initially confronted with various uncertainty elements, as show in Table 1. As different aspects played a role when discussing the uncertainties experienced in the project, a more fine-grained view was developed. This more fine-grained view provides a better insight in the real uncertainties the projects faced. For example the technical feasibility of the concept in project Beta was low, as it made use of a system that was already in use for another application. However, if this system would deliver the function of reducing stress levels with psychiatric patients was very uncertain. Looking at these different aspects of feasibility in detail gives a much better understanding of the actual uncertainties in a project.

Table 1: Initial areas of uncertainty per case

Case	Desirability			Feasibility				Viability	
	Individual	Professional	Societal	Technical	Functional	Effectiveness	Business model	Value network	Societal
Alpha	Low	Low	Low	High	High	High	High	High	High
Beta	High	Low	High	Low	High	High	High	Low	n/a
Gamma	High	Low	High	Low	High	High	Low	Low	High
Delta	High	Low	Low	High	High	High	High	High	High
Epsilon	High	Low	Low	Low	High	High	High	High	High

## 6. A propositional framework

When analyzing the types of uncertainties further and taking into account the societal impact of the innovations, we found that each of these 3 dimensions as proposed by Brown [2008] can be split into three elements

### Desirability

- Individual: for the individual consumer or end-user (ID)
- Professional: for the professional user delivering a service to the consumer (PD)
- Societal: for society as a whole (SD)

### Viability

- Business model: of the business model of the total proposition (BV)
- Value network: sustainable value for the members in the value network (VV)
- Social: benefits for society on longer term (SV)

### Feasibility

- Technical: proof of the technical solution (TF)
- Functional: proof of the solution's benefits (FF)
- Effectiveness: proof of the solution's effectiveness on the longer term (E)

This leads to an enhanced uncertainty framework for social innovations as visualized in Figure 2.

This framework can be used to reduce uncertainties in social innovation projects. The case study also provides rich information on the types of activities that can be planned to actually reduce the specific uncertainties. Depending on the uncertainty type, these activities are involving specific participants. Table 2 shows examples of activities derived from the cases and the typical participants involved in these activities.

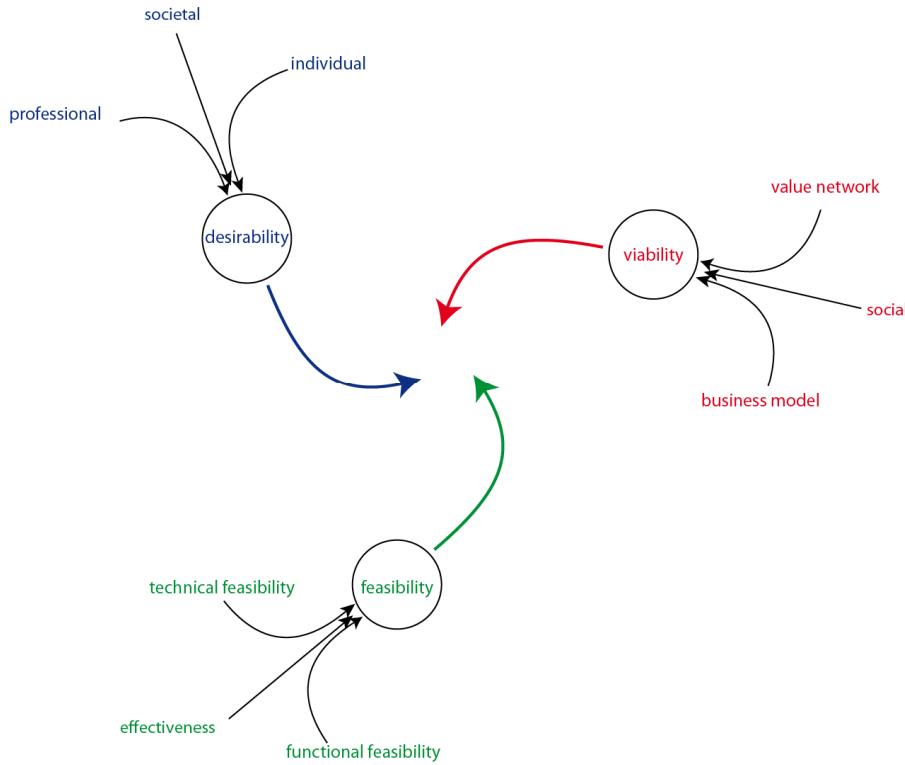


Figure 2: Enhanced framework for reducing uncertainties in socio-economical innovation projects.

Table 2: Uncertainty reducing activities and participants during social innovation projects.

Uncertainty dimension & type	Type of uncertainty reducing activity	Participants
Desirability		
• Individual	User tests with prototypes	Individuals
• Professional	Focus groups, user tests	Professionals
• Societal	Interviews, Focus groups	Interest groups, scientific institutes, governmental organization
Feasibility		
• Technical feasibility	Proof of concept studies	Business partner
• Functional feasibility	Proof of mechanism studies, marketing claim validation	Scientific institutes, expert review, laboratory tests
• Effectiveness	Claim validation (not applied in the cases)	
Viability		
• Business model	Business case scenarios, Test marketing	Business partner
• Value Network	Test marketing (not applied in the cases)	Business partner
• Social	Business case scenarios	Governmental organization

## 7. Discussion and managerial implications

Three management conclusions may be drawn from this research.

Social innovations have stakeholders on at least three levels (individual users, professional users, society as a whole). These stakeholders should all be considered when establishing the value proposition early in the innovation process. In addition to more traditional business-to-business innovation projects where in general multiple business related stakeholders are considered, parties that represent societal groups (government, NGOs, representing organizations such as e.g. patient

organizations) need to be involved as well. Early involvement of these parties leads to a better understanding of the wicked problem, screening of different solutions from various perspectives and a wider acceptance of the solution that is eventually realized.

We found that having a higher level common goal (e.g. to increase the quality of life of chronically ill patients) makes cooperation in early phases of the innovation process easier. In this way the partners get to know each other in a more informal way without having to put all their cards on the table yet. Discussions about the business interests and financial contracts can be postponed to a later phase, when there is a better understanding of the common value proposition, the possible contribution of the different parties in the realization of the solution, the cultures of the participating organizations and the way of working in the innovation process. Establishing a neutral foundation seems an effective way to separate innovation activities that require the tearing down of organizational barriers from the shorter term commercial business goals and create a breeding ground for really new innovations.

Accepting high uncertainties and ill-defined problems requires a different mindset within social innovation initiatives, when compared to new business development, and even more so when compared to incremental innovations. This also has its impact on the way of deciding to participate in such an initiative. The parties involved need to have an open mindset and be open to adopt a designerly approach, starting from the wicked problem and having to deal with changes of scope, proposition and partners on the way to the solution. A demonstrator planning (as seen in project Delta) supports the innovation team to address the uncertainties in a methodical way. The proposed framework can be used as a basis to create such a planning.

## 8. Limitations and directions for future research

In order to proof the validity of the propositional framework, quantitative research is needed, e.g. by performing more case studies. Moreover, several other areas of social innovations need to be covered to establish a wider scope of application (e.g. environmental innovations, innovations that increase public safety, innovations that improve the health system). The cases in this research haven't reached the end of their innovation process yet. Further insight may be achieved by means of e.g. an extended longitudinal study focusing on reducing uncertainties throughout the project life-cycle.

When analyzing the cases we came across several additional questions that are outside the scope of this case study research.

Further research in the dimension Viability concerns the value network: How to create business models for value networks? How does a new party in the value network affect the business model? How is value created and shared among the parties in the network and how does the network evolve over time? Which activities help to increase the viability of a value network; which actors need to be involved?

Further research in the dimension Desirability concerns the establishment of a coherent set of needs. Questions that the authors were confronted with are for example:

How to establish market segment(s) for a social innovation? How to deal with conflicting and/or inexpressible needs of stakeholders (individual, professional, societal)?

Concerning the dimension Feasibility, the authors propose to learn from approaches applied in the health care sector. To proof e.g. the effectiveness of medicines, feasibility studies on various levels

are common practice (proof of concept, proof of mechanism, clinical research). These approaches can be translated to the non-medical domain, but need to be validated for their usefulness.

A better understanding of these issues is certainly needed to enhance the propositional framework and to increase the chance of success of social innovations.

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