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Using the crowd:

An exploration of conditions for crowdsourcing
in the idea generation process

HayGroup



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Preface

This master thesis is the final master assignment of the study business administration. It is the result of a research study which was carried out for Hay Group. The primary objective of this master thesis is exploring conditions that are influencing the success of crowdsourcing in the idea generation process.

Crowdsourcing is a hot topic at the moment and that made it interesting to learn more about it. As little is written about this topic, the study started with a long search period in order to find applicable literature. After a lot of reading and discussions about the topic, I was able to develop a more complete view on crowdsourcing. At the end it was possible to develop a theoretical model by combining literature of lead user method and creativity. During the research processes, I was supported by several people and I would like to thank them.

I would like to thank Jan de Leede and Rik van Reekum for supervising my final master assignment. Their advice, support and critical notes were invaluable. I really appreciated the amount of time they spent on supervising me.

I also want to thank Jeroen Hinfelaar for offering me the opportunity to conduct this research at Hay Group and for supporting me during the first stage of my research study. Next to that I want to thank Justine Blanken for replacing Jeroen when he left. Despite her busy schedule she always made time to discuss the research project, read my thesis and make critical notes. She also gave me advice, which was not related to the research, but which helped me a lot in my career.

Finally, I want to thank all those people who enabled me to conduct this research and provided me with the data which was needed for this master assignment, especially the interviewees of Rabobank, Toplossing, Battle of Concepts and their participants.

Last, but not least, I want to thank my colleagues of the 'Organisational Effectiveness' team of Hay Group for the nice time!

Anneke Westhoff,
Zeist, August 2009

Management Summary

The motive for this research is the wish of Hay Group to help their clients to improve their innovative capability. A Global Survey, carried out by McKinsey, showed that 70 percent of corporate leaders list innovation in their top three priorities for driving growth. However only 25 percent of them think their innovative capability is adequate. Hay Group wants to help her clients to narrow this gap. As idea generation is the first step in any innovation process, Hay Group wants to gain more insight in ways to structure and improve this step.

In the past only a few employees with a lot of expertise were involved in the innovation process. Surowiecki (2004) found that under the right circumstances, groups are remarkably intelligent, and are often smarter than the smartest people in the group. According to Surowiecki (2004) organisations must involve a large group of people to solve a problem. Crowdsourcing describes a new work method that outsources the task of finding creative solutions to an undefined, generally large group of people or community. The organisation posts a problem online and everybody can offer solutions to the problem, which is also called an open call for proposals.

Hay Group wants to know how crowdsourcing can be used in an effective way for generating new ideas. This leads to the main research question:

Which conditions make crowdsourcing an effective idea generation process?

As little is written about crowdsourcing it is not possible to find conditions for crowdsourcing in the literature (Howe, 2008; Brabham, 2008b), therefore this study is explorative. However, there is much written about another type of external idea generation, namely the lead user method (Von Hippel 1994, Lüthje, 2004). In order to derive the conditions for crowdsourcing, the first step of this study was identifying the important aspects of the lead user method. Since crowdsourcing is related to idea generation, for which creativity is needed, also literature of creativity was used. By combining literature of the lead user method and creativity a theoretical model for crowdsourcing was developed. The next step was the set-up and execution of the case studies on crowdsourcing participants, intermediaries and assigning companies. In total eighteen interviews were held with people from Battle of Concepts, Toplossing, Rabobank, (potential) participants of Battle of concepts and participants of Toplossing. The interviews and the documentation of the organisations made it possible to develop an empirical model. A comparison of the theoretical and empirical model resulted in conditions that seem worth pursuing for the success of crowdsourcing.

The results of this study showed that there are two types of conditions relevant for the output of crowdsourcing, necessary and 'nice to have'-conditions. First the necessary conditions will be discussed. For generating ideas of high quality it is necessary to start with a clearly defined problem. This means that the problems should be defined specifically and to the point and the problem should be clear for everyone. In addition it is a necessary condition to have participants with creative-thinking skills, expertise and people who are intrinsically motivated. Finally an organisation must have sufficient resources. Crowdsourcing requires significant time, so the organisation must be able to provide that. Furthermore the website should be user friendly and working properly. If one of these conditions is absent, ideas of high quality cannot be generated.

Besides the necessary conditions there are some conditions which are not required to get ideas of high quality, but which can have a positive influence on the quality. While intrinsic motivation is a necessary condition, this study showed that extrinsic motivation is a 'nice to have'-condition. When participants get a monetary reward or recognition they are willing to put more effort in working out the solution. Additionally when the assigning company gives some information about the problem and the context of the organisation the ideas will be of higher quality than when an

assigning company does not give background information. Hereby it is important that the background information does not include guiding instructions.

Clearly formulated selection criteria will help participants understand what kind of solution the organisation is looking for. Next to that an organisation should evaluate the ideas according to selection criteria, since otherwise motivation of the participants can decrease, which can lead to less ideas of high quality. Therefore a fair evaluation process with good selection criteria can improve the quality of ideas and can be seen as a 'nice to have'-condition.

A project team that consists of people with expertise on the topic and knowledge of the organisation and industry are also a 'nice-to-have'-condition as the selected ideas will better fit the organisation.

Finally, when an organisation is not only looking for a good idea, but also for a solution that will be integrated in the organisation, it has to be sure that there is support of the management during the process and that the mindset of employees is changed from not-invented-here to proudly-found-elsewhere. Finally the problem owner should be involved during the process. These conditions will not influence the quality of ideas, but influence the integration of the idea in the organisation. Therefore they are 'nice to have'-conditions.

Apart from the conditions there are some considerations concerning the appropriateness for crowdsourcing problems. Problems for which organisation specific information is necessary to solve are not suited.

Despite the fact that this research was focused on the generation of high quality ideas, it was possible to find other benefits of crowdsourcing for organisations. For example, to provide insights in customers and trends and crowdsourcing can be used for labour market communication and PR.

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1. Introduction

A miracle was needed to save the organisation GoldCorp. The small Toronto-based gold-mining firm was struggling, besieged by strikes, lingering debts, and an exceedingly high cost of production, which had caused them to cease mining operations. Conditions in the marketplace were hardly favourable. The gold market was contracting, and most analysts assumed that the company's fifty-year-old mine in Red Lake, Ontario, was dying. Without evidence of substantial new gold deposits, the mine seemed destined for closure, and GoldCorp was likely to go down with it.

GoldCorp was almost bankrupt, but with help of external people they created a value of over \$3 billion

The former CEO Rob Mc Ewen was frustrated that his own geologist and analysts could not find the exact location of new gold deposits. He did something what is very unusual in the mine industry. He published every scrap of information about the 55,000-acre property, while geological data is the most precious and carefully guarded resource. And he offered a total of \$575,000 in prize money to participants with the best methods and estimates. Within weeks, submissions from geologists, graduate students, consultants, mathematicians and military officers around the world came flooding in to GoldCorp headquarters. When Rob McEwen saw the computer graphics he was completely surprised. The participants had identified 110 targets and over 80 percent of the new targets yielded substantial quantities of gold. In fact, since the challenge an astounding eight million ounces of gold had been found, which had a value of over 3 billion dollar.

Another successful and profitable case of crowdsourcing is that of Threadless. Threadless.com is a web-based t-shirt company that crowdsources the design process for their shirts through an ongoing online competition.

How to achieve a 30% profit margin with no risk, no PH.D., no capital investment, no R&D, and (almost) no employees?

Anyone may join the Threadless community free with a valid email address, and membership in the community – in the crowd – grants access to vote on designs or to submit them. Designs are scored on a zero-to-five scale, with an option to check an 'I'd buy it!' box. Designs remain available for voting for two weeks, and the highest scoring designs are selected by the Threadless staff to be printed and made available for sale on the website. Threadless was selling 60000 T-shirts a month, had a profit margin of 35 percent and was on track to gross \$18 million in 2006, all with fewer than twenty employees (Howe, 2008).

There are many more successful and profitable cases in a variety of industries. How organisations can use 'the crowd' in the idea generation process will be the focus of this thesis. In the first section the growing need for innovation will be explained. Section 1.2 will provide some information about Hay Group. In section 1.3 the problem statement and the research questions will be discussed. The relevance of this study can be found in section 1.4 and the research design in section 1.5.

1.1. The need for innovation

The market requirements and therefore the performance criteria for organisations have been changed the last few decades. After World War II barriers to international trade have been considerably lowered which resulted in an intensified competition on prices. At the end of the

1960's the customers started to be more critical and they paid more attention to product quality. Ten years later the production capacity exceeded demand and to win the intensified international competition organisations should offer a larger assortment of new products. Today not only price, quality and product line are important, but products should also be unique. This means that organisations should have innovative capability to stay ahead of competition (Bolwijn & Kumpe, 1990).

The term innovation has its roots in the Latin word 'novus', which means 'new' and is derived into the verb 'in+novare', which means 'to make new'. In the broad sense innovation can be seen as 'the act of introducing something new' (The free dictionary)'.

Creativity plays an important role in the innovation process. Without good ideas there is no innovation. But innovation is more than simply coming up with good ideas; it is the process of bringing a good idea to widespread and effective use (Tidd, Bessant and Pavitt, 1997). And it must also add economic, social or organisational value for the organisation. Therefore the next definition is chosen: 'innovation is the embodiment, combination and/or synthesis of knowledge in novel, relevant, valued new products, processes or services' (Leonard and Swap, 1999).

Different types of innovations can be distinguished (Boer en Duing, 2001); (1) *product innovation*, which is the development of new products and/or services. (2) *process innovation*, the implementation of new elements in a production process or service operation. (3) *organisational innovation*, which refers to innovations related to new organisational forms and/or management practices. Since this research is explorative and product and service innovations are the most common of the three, this thesis will only focus on product and service innovations.

Innovation is a process and consists of several stages. In the innovation literature much attention is given to the stages or phases of the innovation process. In some older literature innovations are seen as a linear process in which innovation is a sequence of stages, starting from either R&D or some perception of demand and ending with a product sold on the market (Coombs, Saviotti and Walsh, 1987). The linear model is challenged with an interactive model of the innovation process. The main critique on the linear model is that it is too simple to describe the innovation process as a linear model as it is a complex and interconnected development.

During the process there is a continuously need for interaction and feedback. Cooper (1994) developed a Stage-Gate system (figure 1). In this model the new product development process is structured and divided in different stages which are separated by the decision gates. Each stage is cross-functional and consists of a set of parallel activities undertaken by people from different functional areas within the firm. At the end of each stage is a gate, gates serve as quality-control, go/no go and prioritization check points. At these points the path forward for the next stage of the project is agreed to (Cooper 2008).

This study focuses on the first step of the innovation funnel, namely idea generation and the evaluation of ideas, see figure 1.

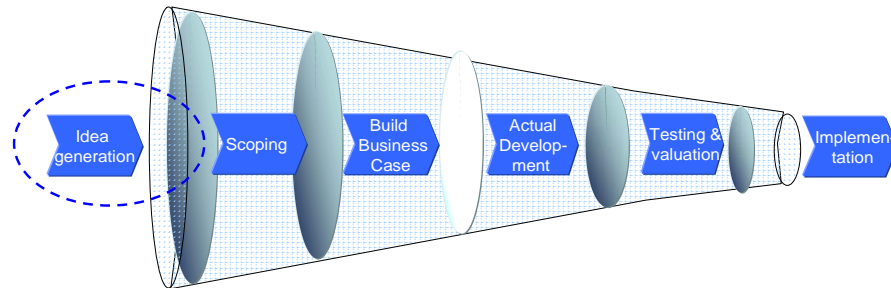


Figure 1: Innovation funnel of the NPD process

When discussing the concept innovation it is important to pay attention to the different approaches of the innovation process. Recently there is a growing attention to closed and open innovation.

Closed innovation emphasises that *successful innovation requires control*. The organisation has to do everything internally, it has to generate its own ideas, develop the product, bring it to market, distribute it, service it, and finance it, without collaboration with other companies. Organisations should control their intellectual property, so their competitors cannot profit from their ideas.

In the last years some factors undermine the logic of closed innovation. First, there is a growing mobility of highly experienced and skilled people, which results in the situation that the best people do not work in your company anymore (which was one of the rules of closed innovation). Secondly there are more external research firms as there is a growing presence of private venture capital. Thirdly the knowledge of customers and suppliers is increasing. According to Chesbrough (2004) closed innovation will be replaced by open innovation.

Open innovation can be defined as *'a paradigm that assumes that firms can and should use external ideas as well as internal ideas and internal and external paths to market, as the firms look to advance their technology'*.

An organisation that deals with open innovation is open to competitors, sellers, buyers, etcetera in order to exchange ideas, knowledge and resources. For example they make use of internal as well as external ideas and have internal as well as external paths to the market. Organisations can collaborate with knowledge institutes, suppliers, competitors, customers: this in order to generate additional value to the company (figure 2).

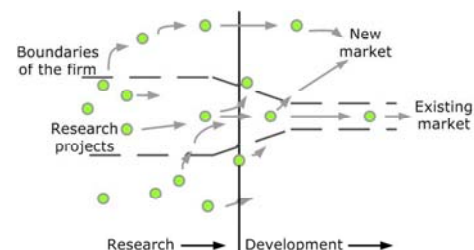


Figure 2: Open innovation model (Chesbrough, 2003)

This study will focus on how organisations can collaborate with external people and especially on how external ideas can be used.

1.2. The relevance for Hay Group

This study is carried out for Hay Group. Hay Group is an international consulting organisation with 88 offices in 47 countries of the world with about 3000 employees working there. The Dutch office of Hay Group exists since 1973 and is located in Zeist. It belongs to the top-20 consultancy companies of the Netherlands and is one of the few consultancy companies that specialize on the

whole area of HR. Hay Group is one of the leaders in this field, providing consulting services on issues of HR, management and organisational performance.

A Global Survey, carried out by McKinsey, showed that 70 percent of corporate leaders list innovation in their top three priorities for driving growth. However only 25 percent of them think their innovative capability is adequate. Hay Group wants to help her clients to narrow this gap. Therefore an innovation management model was developed to understand the problems of her clients. Hay Group states that an organisation has an adequate innovation capability if they have:

- Creativity: The implementation of a good idea generation process.
- Effective structure and processes: Which stimulate creativity and flexibility and also support the implementation of the innovative ideas. It is divided into three basic elements; organisational design, the innovation process and other general management processes (like planning, recruitment). These three elements need to be matched and balanced in order to achieve sustainable innovation.
- An innovative work climate: A good work climate is needed to motivate employees.

In addition, it is important to take in account the strategic context of the organisation as it influences the need for and direction of innovation (figure 3).



Figure 3: Innovation management model Hay Group

As idea generation is the first step in any innovation process, Hay Group wants to gain more insight in ways to structure and improve this step, especially about the involvement of external people in this process. According to Chesbrough (2004) an organisation can and should also use external ideas. There are several ways to collaborate with external parties, like suppliers, knowledge institutes, competitors and customers.

In the past only a few employees with a lot of expertise were involved in the innovation process. Surowiecki (2004) found that under the right circumstances, groups are remarkably intelligent, and are often smarter than the smartest people in the group. According to Surowiecki (2004) organisations must involve a large group of people to solve a problem. Crowdsourcing describes a new work method that outsources the task of finding creative solutions to an undefined, generally large group of people or community. The organisation posts a problem online and everybody can offer solutions to the problem, which is also called an open call for proposals.

Hay Group wants to know how crowdsourcing can be used in an effective way for generating new ideas.

1.3. Research questions and method

It would be interesting for organisations to know how to use crowdsourcing in an effective way. This study aims to find conditions that influence the success of crowdsourcing. Therefore the main research question will be:

Which **conditions** make **crowdsourcing** an **effective idea generation process**?

As mentioned before this study focuses on the first step of the innovation funnel; idea generation. Therefore it has to be clear what the process of idea generation is and what the differences are between internal and external idea generation (question 1). Also the concept 'condition' has to be explained (question 2). As shown in figure 1 after idea generation there is gate one, which means that the organisation has to decide which ideas will be selected to go into the funnel and which ideas will not. Therefore it has to be clear when ideas are of high quality (question 3). Subsequently the chosen type of external idea generation, crowdsourcing, has to be explained (question 4).

Before the idea generation can start, there must be a question or an unsolved problem of which people can think about. This study aims to answer which problems are appropriate for crowdsourcing and how these problems should be formulated (question 5). Furthermore the people who participate in crowdsourcing do this voluntarily. Because individuals decide for themselves to participate (or not), the crowd selects itself. It would be interesting to know why people participate and why not. What is their ability and motivation (question 6)? Finally attention must be paid to the organisation, as the organisation deals with the innovation funnel. For that reason this study will focus on what the internal organisation should look like (question 7). Last, but not least, it should be clear which conditions play a role during the process of crowdsourcing (question 8).

By combining the findings of these supporting research questions it is possible to answer the main research question.

The supporting research questions are:

1. What is the process of idea generation?
2. What are the conditions?
3. What are ideas of high quality?
4. What is crowdsourcing?
5. How should the problem for crowdsourcing be formulated?
6. What are the characteristics of 'the crowd' who participate in crowdsourcing?
7. How does the internal organisation look like in the process of crowdsourcing?
8. Which conditions play a role in the process part of crowdsourcing?

1.4. Relevance of research study

Academic relevance

In the last years there is a growing interest for the concept of (open) innovation. Chesbrough (2003) emphasized that organisations have to collaborate with people outside the organisation. However he did not pay much attention on how to bring open innovation in practice. A few other authors came up with specific examples of how organisations can involve customers (Von Hippel, 1986) and the crowd (Howe, 2008). Not much is written about crowdsourcing (Howe 2008; Brabham 2008b) and a model for crowdsourcing does not exist. As it will be a valuable contribution to the academic literature, this thesis aims to build theory and an exploratory model for crowdsourcing.

Practical relevance

At the moment innovation is a hot item for many organisations. As mentioned before 70 percent of corporate leaders list innovation in their top three priorities for driving growth, though only 25 percent of them think their innovation capability is adequate. Therefore it is important to give Hay Group and other companies insight in the innovation process. Since this process starts with idea generation it is a logic choice to focus on the first step of the innovation process, namely idea generation. With the current emphasis on open innovation it will be interesting for companies to know more about involving external people in the idea generation process.

1.5. Research design

As little is written about crowdsourcing it is not possible to find conditions for crowdsourcing in the literature (Howe, 2008; Brabham, 2008b), therefore this study was explorative. The goal of an explorative research design is to provide new insights into a topic for research and to identify relevant variables (Babbie, 2004). However, there is much written about another type of external idea generation, namely the lead user method (Von Hippel 1994, Lüthje, 2004). As crowdsourcing and the lead user method are both types of external idea generation processes, it is likely that they have some similarities. In order to derive the conditions for crowdsourcing, the first step is identifying the important aspects of the lead user method.

Since crowdsourcing is related to idea generation, for which creativity is needed, it is also possible to use literature of creativity. When combining literature of the lead user method and creativity it is possible to develop a theoretical model for crowdsourcing. This is done in chapter two.

When the theoretical model is developed, it will be tested in practice by designing a case study approach. As mentioned before the goal of an explorative research design is to identify all relevant variables. Important to note is that within crowdsourcing three different players can be involved. First there is a company that is having a problem (called assigning companies). Second there is the crowd who wants to solve a problem by coming up with new ideas. And third there is an intermediary by which organisations can post their problems and where the crowd can react (Figure 4).



Figure 4: Crowdsourcing

To identify all relevant variables it is important to involve all these three players in this study. Therefore the following organisations have been selected:

- One organisation which has positive experience with crowdsourcing
- One organisation which has negative experience with crowdsourcing
- One intermediary which has positive experience with crowdsourcing
- One intermediary which has a negative experience with crowdsourcing

Additionally interviews are held with some participants of crowdsourcing in order to get more insight in their motivation.

- Participants of Battle of concepts
- Participants of Toplossing

- Potential participants of Battle of concepts (participants who subscribed at Battle of concepts, but never participate in a battle)

In chapter three more information can be found about the set up of the case studies. Chapter four will give an overview of the results of the case studies and will end with an empirical model for crowdsourcing. In chapter five the theoretical model will be compared with the empirical model and the results will be analyzed in order to find the conditions for crowdsourcing. The research strategy is visualised in figure 5.

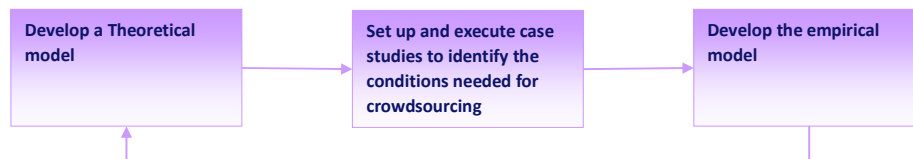


Figure 5: Research strategy

2. Theoretical Framework

Before developing a theoretical model for relevant conditions for crowdsourcing, first some concepts will be explained. This study focuses on crowdsourcing as an effective idea generation process. Therefore this chapter will start with a general explanation of the idea generation process and what is meant with an effective idea generation process (section 2.1). Section 2.2 will give a definition and a short introduction of crowdsourcing. What is meant by conditions and what kind of conditions can be distinguished will be discussed in section 2.3.

As little is written about crowdsourcing it is not possible to find conditions for crowdsourcing in the literature (Howe, 2008; Brabham, 2008b). However, there is much written about another type of external idea generation, namely the lead user method (Von Hippel 1994, Lüthje, 2004). As crowdsourcing and the lead user method are both types of external idea generation processes, it is likely that they have some similarities. In order to derive the conditions for crowdsourcing, the first step is identifying the important aspects of the lead user method, which is done in section 2.4. Since crowdsourcing is related to idea generation, for which creativity is needed, it is also possible to use literature about creativity. When combining literature of the lead user method and creativity (section 2.5) it is possible to develop a theoretical model for crowdsourcing, which is done in chapter 2.6.

2.1. An effective idea generation process

Idea generation is a creative process and consists of several stages (figure 6).

Evans & Russell (1989) state that creativity starts with *preparation*. In this phase all the information that already exists has to be brought to light and all the resources have to be gathered. Most of the time the solution is not yet there and so the phase of *frustration* will start. To explore new territories, people need to get beyond their current beliefs and mind sets. But our rational mind wants to stay with what it knows and tries to hold us back from moving into the unknown. This feeling of frustration is actually the feeling of the conscious mind recognizing that it does not

know the answer and begins to let go control to our unconscious mind. During the *Incubation-phase* people try to put the conscious problem-solving on hold and hand it over to the unconscious mind. The next phase is *insight*, which is also called the 'aha' moment. Most of the time the new idea comes from nowhere, but the creative person knows that it is a result of everything that has happened before. Finally the idea has to be worked out in a concept.

One important feature of the creative process is that divergent thinking as well as convergent thinking is involved. First people have to come up with as much ideas as they can, but at the end they also have to be critical to select potential successful ideas. Therefore it is important to define criteria to determine 'success'. In this study an effective idea generation process refers to ideas of high quality and not to the quantity of ideas.

To analyze the output of brainstorming, novelty and feasibility are often used for operationalizing quality of ideas. Feasibility refers to the extent to which an idea can be implemented and novelty refers to an idea that is out of the ordinary (Helquist, Santanen and Kruse, 2007). This study will focus on the two facets novelty and feasibility to analyse ideas of high quality.

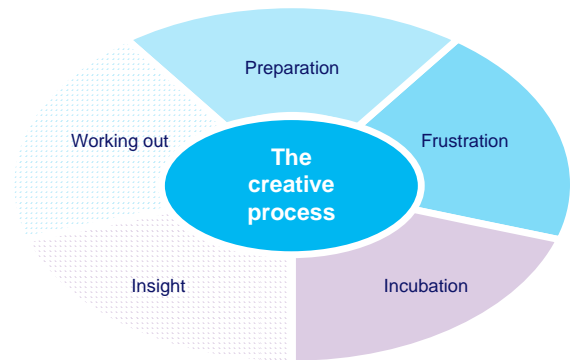


Figure 6: Idea generation process

According to Chesbrough (2004) an organisation can and should use external as well as internal ideas. The advantage of internal idea generation is that employees in an organisation know the values and believes of the organisation and therefore it is more likely that they come up with ideas that fit the organisation. When an organisation wants their own employees to come up with new ideas, it is important that the culture of the organisation will support this. Values as risk taking, openness in communication and teamwork have to be shared and rewarded. However it might be that the organisation needs a different point of view or that they do not have sufficient expertise in a specific area and therefore external people can be used (Kessler, Bierly and Gopalakrishnan, 2000).

For generating ideas, differences in the background of people have a positive influence on the novelty of ideas generated. However external idea generation also has a disadvantage. The political resistance to the new external generated ideas may be high, especially if it challenges the accepted status quo. This phenomenon is called the not-invented-here syndrome. When an organisation wants to make use of external ideas, the mindset of employees should be changed from not-invented-here to proudly-found-elsewhere (Katz & Allen, 1992).

Another critical point in external idea generation is that the organisation must already have a nominal level of expertise in that area. Organisations should be aware of the different approaches to generate ideas, each with their own consequences.

As there are also highly experienced and skilled people outside the organisation, with a different point of view and who have a positive influence on the novelty of ideas, this study will focus on external idea generation (Kessler, Bierly and Gopalakrishnan, 2000).

There are several ways for organisations to collaborate with external people. Organisations can involve customers in their innovation process (Ogawa and Piller, 2006), but also suppliers, knowledge institutes, etc (Chesbrough, 2004). Due to the Internet it is possible to involve an undefined, large group of individuals, which is called crowdsourcing. Surowiecki (2004) showed that a diverse collection of independently-deciding individuals is likely to make certain types of decisions and predictions better than individuals or even experts. Therefore this study will focus on crowdsourcing as an effective idea generation process. The next section will explain the concept of crowdsourcing in more detail.

2.2. Introduction of crowdsourcing

Many people believe that valuable knowledge is concentrated in a very few heads and only experts have the right answer to solve a problem. Surowiecki (2004) examined several cases where the group's decision was superior to the isolated individual, no matter how smart or well-informed the individual was:

A submarine disappeared on its way back to Newport News in an area with a circle of twenty miles wide and many thousands of feet deep. A team of men with a wide range of knowledge was assembled and each of them was asked to come up with an answer where the submarine was. At the end all the guesses were put together and Craven made a group's collective estimate of the location. This location was not a spot that any individual member of the group had picked, though the submarine was found only 220 yards from the group's estimate.

Surowiecki (2004) found that under the right circumstances, groups are remarkably intelligent, and are often smarter than the smartest people in them. This can also be used in business. In the past only a few employees with a lot of expertise were involved in the innovation process. Following Surowiecki it is important to involve a large group of people to solve a problem.

The term crowdsourcing describes a new work method in which the organisation outsources the task to solve a problem to an undefined, generally large group of people or a community. The organisation posts a problem online and everybody can offer solutions to the problem, which is also called an open call for proposals.

Howe (2008) offers the following definition:

“Crowdsourcing represents the act of a company or institution taking a function once performed by employees and outsourcing it to an undefined (and generally large) network of people in the form of an open call. This can take the form of peer-production (when the job is performed collaboratively), but is also often undertaken by sole individuals. The crucial prerequisite is the use of the open call format and the large network of potential labourers.”

The best ideas to (potentially) solve the posted problem are awarded with some form of a price and the company uses the idea for its own gain. Two important characteristics of crowdsourcing are a company outsourcing a task which was performed internally before and outsourcing it to an undefined group of people. The term crowdsourcing is very broad as it can consist of all tasks which are carried out by an organisation. For example, Threadless is a company where the crowd can submit t-shirt designs online. The design is then put to a public vote and the best designs will be sold. The winning participants get money for every t-shirt that will be sold. The example of Threadless is a nice example of crowdsourcing. However it does not focus on innovation. This study will only focus on crowdsourcing processes in which the crowd is used to generate new ideas.

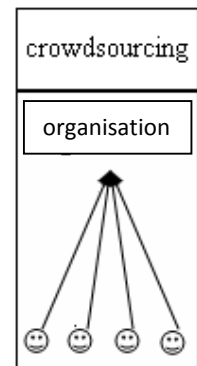


Fig 7: Crowdsourcing

It is not new to involve a large group of people to solve a problem. Open source already did that before. Open source, is a form of mass collaboration, which means that a large number of people work independently on a single project (Tapscott and Williams, 2007) with a lot of contact between players via continuously updates of improvements, so that others can build further on the presented ideas. In both, crowdsourcing and open source, people work independently on a single project. However crowdsourcing is not the same as open source and the similarities and differences will be discussed now.

Important to note is that open source is always related to software, so besides a process it is a product as well. Open source means that the source code is made freely available to everyone. This means that the source code is public and non-proprietary. The license grants everyone permission to adapt or improve the source code and to copy and distribute freely, even in modified form. There are no licence fees associated with open source software and there are no limitations on number of users or type or number of machines that may have the software installed.

An open source software project starts with an initiator (an individual or a small group) who develops a first, rough version of the code. The initiator generally becomes the project owner or maintainer. Everyone (“the crowd”) can download the initial version from the Internet. In the virtual community, which consists of product developers and users, people can share their thoughts and

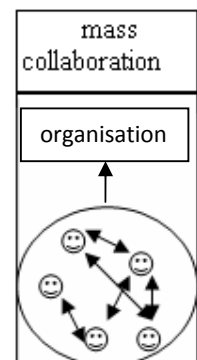


Fig 8: Mass collaboration

solutions and post the suggested changes on the Internet. So others can use this new version and give their reaction, ideas and solutions. When the changes are of sufficient quality and of general interest the project maintainer can add it to the authorized version of the code.

Open source and crowdsourcing have some similarities and some differences. Both have no limitations on number of participants involved in the open network. The members participate voluntarily and both processes are Internet-based. In addition both processes are hierarchical, as the initiator of the open source project decides which changes will be implemented and in crowdsourcing the company will decide that.

However in crowdsourcing the individuals cannot exchange information and ideas, so they cannot build upon each other's ideas. While an important characteristic of open source is exactly this interaction.

The crowd gets rewarded and the intellectual property belongs to the organisation posting the problem. In open source projects there is no monetary reward and the intellectual property is made public. Finally open source is only related to software, while crowdsourcing is related to all tasks which are performed by the organisation.

Table 1 shows the similarities and differences between open source and crowdsourcing.

Table 1: Similarities and differences open source projects and crowdsourcing

	Crowdsourcing	Open source
# Participants	Unrestrained	Unrestrained
Network	Open	Open
Governance	Hierarchical	Hierarchical
Collaboration	No, there is no interaction between the participants	Yes, there is a lot of contact between the players
Incentives	Money, recognition	Recognition, self-development
Process	Internet based	Internet based
Resources	Internet (Intermediary)	Community Source code
Owner IP	Intellectual property and copyright to organisation	The license grants everyone permission to adapt or improve the source code and to copy and distribute freely, even in modified form. The author does not charge for this.

2.3. Definition of conditions

Conditions are related to causality, which is the process of making something happen. A general definition of condition is: 'a necessary requirement for something else to happen (the free dictionary). Conditions are used to explain the different kind of connections between concepts (Babbie, 2004). Babbie (2004) distinguishes two different types of conditions, sufficient and necessary conditions:

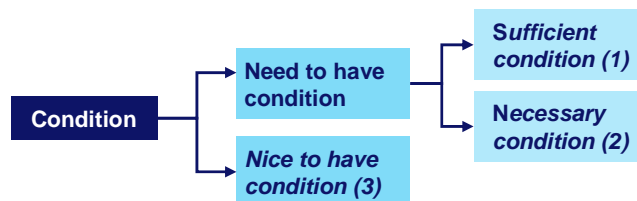
- A sufficient condition represents a condition that, if it is present, guarantees the effect in question. This does not mean that a sufficient cause is the only possible cause of a particular effect. For example: skipping an exam in a course would be a sufficient cause for failing it, though students could fail it other ways as well (Babbie, page 93). When X is a sufficient condition for Y, the presence of X guarantees the presence of Y. So it is impossible to have X without Y.
- A necessary condition represents a condition that must be present for the effect to follow. For example, being female is a necessary condition to become pregnant, but being female is not a sufficient cause (Babbie, page 92). This means that when X is a necessary condition for Y, the absence of X guarantees the absence of Y. Necessary conditions are similar to 'condition sine

qua non', this was originally a Latin legal term for 'a condition without which it could not be' (Wikipedia).

The similarity between necessary and sufficient conditions is that both conditions are requirements for something else to happen. However a sufficient condition has more impact than a necessary condition, because a sufficient condition, X, guarantees the presence of Y.

Finally there are also conditions that are not required for something else to happen, but which can have a positive influence on success. For example, coffee creamer is not required for getting coffee, but it has a positive influence on the quality of coffee. In this study, this condition will be named 'nice to have'-condition.

To conclude in this study three different types of conditions will be distinguished:



2.4. The lead user method as basis for the crowdsourcing model

As little is written about crowdsourcing it is not possible to find conditions for crowdsourcing in the literature. Therefore literature about the lead user method and creativity will be used. In order to derive the conditions for crowdsourcing, the first step is identifying the important aspects of the lead user method. The lead user method is just like crowdsourcing a way to generate ideas with external people. For that reason it is likely that several aspects found in the lead user method, are also of importance in crowdsourcing.

This section will start with an introduction of the lead user method (2.4.1). To describe the conditions for the lead user method the classic input-process-output model developed by Miller and Rice (1967) will be used. Variables which play an important role in the lead user method will be identified and classified to the corresponding stage. 'Input' refers to the entry requirements, such as resources (money, time) and human effort. 'Process' refers to the things and procedures that are needed during the process part of the lead user method. 'Output' refers to the desired output, which in this study are ideas of high quality. Section 2.4.2 will provide information about the input of the lead user method. Section 2.4.3 will discuss the process part of the lead user method and 2.4.4 the output. In section 2.5 the theoretical model of lead users will be combined with literature of creativity in order to develop the model for crowdsourcing.

2.4.1. Introduction of the lead user method

The lead user method can be used to systematically learn about user innovation in order to apply it in new product development. Innovations often fail, because there is a misunderstanding of customer needs (Ogawa and Piller, 2006). The role of the consumer has changed from isolated to connected, from unaware to informed, from passive to active and organisations can gain advantages when they interact with them. Customers should not only provide information about their needs and preferences but they should be integrated in the innovation process, so the organisation can learn more about consumers and get new ideas for design, engineering and manufacturing. According to Von Hippel, Thomke and Sonnack (1999) not all users can contribute equally to new product development: user-developed innovations tend to be concentrated among lead users (Lilien, Morrison, Searls, Sonnack and von Hippel, 2002).

Lead users are users who have a lot of experience with the product and are ahead of other customers. They experience a need for a certain product earlier than other customers and are therefore thinking about new product innovations. The lead user method is a process of identifying new market trends, identifying needs of users and trying to find solutions for them.

Several studies provide strong evidence to support lead user theory empirically. An overview of the literature is given in Appendix C.

2.4.2. The input of the lead user method

Below the different variables of the conceptual research model will be discussed.

The task as input for the lead user method

At the start of the lead user method the organisation should generate an accurate definition of the search field for which an innovation has to be developed. This search field can be a market, but also a product field or service area (Lüthje and Herstatt, 2004). After that the project team has to specify the goals they hope to achieve with the project (Olson & Bakke, 2004). According to Von Hippel (1986) it turned out not to be critical to specify the project focus or goal, because lead users deal with the unexpected. However it is important to carefully select a trend as this is the central focus of the project (Olsen and Bakke, 2004). This can be done by an analysis of academic publications, data banks or the Internet. Additionally interviews with experts are also very valuable. The trend has to be formulated broadly with a few restrictions (Lilien et al., 2002), because lead users have a certain need and an organisation should be open minded to the fact that lead users can take them to a different place (Von Hippel 1986).

Furthermore the domain of the task plays a role. The lead user method is appropriate for certain domains. This is the case when the development of new products requires a high amount of 'sticky' information about the users' needs. This means that the information is deeply rooted in the personal experience of individuals and can hardly be encoded in explicit terms (tacit knowledge). That is why it might be hard and costly to transfer this information from users to manufacturers. For example, transferring the glimpse of a perfect perfume (Lüthje and Herstatt, 2004). For this type of information lead users can be involved as they are thinking about and testing a lot of different ideas. Therefore they do not only obtain data about their needs, but also about their solutions (Von Hippel, 1994). Additionally the lead user method is very useful in fields characterized by rapid change, for example fields strongly affected by high technology. When fields can change rapidly the related real world experience of the ordinary user is often not up-to-date by the time a product is developed. A person's real world experience blocks him from finding new ideas, therefore inputs of lead users are essential in such a fields (Von Hippel and Riggs, 1996).

Lead user as input for the lead user method

One critical success factor in the lead user method is the identification of lead users. Therefore it is important to know what the characteristics of these people are and how they can be identified. Lead users are users or customers at the leading edge of important trends and are dissatisfied with the current market offerings, therefore they experience needs for a given innovation earlier than the majority of the target market (Von Hippel, 1986). Because lead users experience needs for a given innovation earlier, they can come up with breakthroughs. Additionally, Hienerth, Pötz and Von Hippel (2007) found that lead users from analogous markets, particularly those reflecting high market distances, contribute to concepts that are more novel than lead users from the target market. Lilien et al. (2002) supported this. Important to note is that the market distance should be large, while the technical distance should be small (Hienerth et al., 2007; Franke, von Hippel and Schreier, 2006; Lüthje, Herstatt and Von Hippel, 2005). They also found that lead users with a high

level of direct use experience, contribute solutions that are significantly more novel than lead users without such experience. Besides use-experience, Schreier & Prügl (2006) also found that lead users tend to have the following characteristics:

- Consumer knowledge: the body of knowledge a consumer can draw on when facing consumption problems.
- Innovative personality: likely to cope with uncertain usage situations, critical to current products, pay attention to improvements. Furthermore they commit to risky innovative and difficult tasks and put much effort into mastering situations (high locus of control).

Now it is clear what the characteristics of lead users are, attention should be paid to the identification of these people. There are two basic process types for this search. A rather quantitative, standardized screening approach or a qualitative, non-standardized networking search process. The screening approach is suitable if the number of customers in the market is manageable and a more or less complete screening of all users seems to be possible. Most of the time the data for contacting users is freely available, so the project team can conduct telephone interviews or written questionnaires (Lüthje and Herstatt, 2004).

The pyramid networking approach relies on the fact that people with a strong interest in a topic or field tend to know people more expert than themselves (Lilien et al. 2002, p.1045). So the project team asks a few experts and through a process of recommendation and referral several lead users should be identified as a result. Von Hippel, Franke and Prügl (2005) carried out a study of pyramiding versus screening networking approach. In four experiments (chorus, football team, teaching staff, and students' association) they found that the pyramiding networking process in each case identifies the best solution within the search space, using an average of only 30% of the effort required by mass screening. Von Hippel and Riggs (1996) and Olsen and Bakke (2004) supported that. The advantage of this approach is that the organisation might be guided to analogous fields in which similar challenges are present as in the search field under consideration. Finally screening is too costly, while pyramiding is less expensive.

Project team as input for the lead user method

At the start of the lead user method the organisation needs to set up a project team of four or five people (Olson & Bakke, 2004), who can be involved during the whole process. This means that project members need to spend twelve to twenty hours per week during four to six months (Lilien et al, 2002). According to Lüthje and Herstatt (2004) the team composition plays a critical role. Depending on the project topic, the project team need to have knowledge and expertise in each area critical to the topic. Besides that they need to have expertise in the business and the industry of the organisation (Von Hippel, 1986). This is of importance to make sure the new product concepts, generated by lead users, will fit the organisation.

Organisational context as input for the lead user method

For a proper reward system, it is important to make a distinction between two types of motivations, intrinsic and extrinsic motivation. Intrinsic motivation is related to a person's internal desire to do something, like passion and interest, whereas extrinsic motivation comes from outside the person, so a person finishes a task in order to get something desirable or avoid something painful. The most common extrinsic motivator is money (Hars and Ou, 2001).

Looking at the motivation of lead users, they are intrinsically motivated and want to solve their unserved need. An important conclusion Jeppesen and Freeriksen (2006) made was that lead users are hobbyists. They participate primarily for the joy of challenging intellectual work with peers (Von Hippel et al., 1999) and are therefore intrinsically motivated. Additionally they honour the product,

firm and developers and lead users are looking for recognition for their innovative behaviour by the organisation. A simple way to allocate a firm-recognition in return for user innovation is to openly acknowledge their contributions in visible fashion. A useful way to do this may be to host examples of the best user innovations in the firm domain and to credit innovators openly in order to demonstrate that the firm appreciates their innovative efforts (Jeppesen and Freeriksen, 2006). Next to that Von Hippel (1992) found that a monetary reward did not play a role. He wanted to compensate lead users for their time with 150 dollar, though they did not accept that money.

Besides the reward system, sufficient resources also play a role. The lead user method requires significant time. The organisation has to be sure there is enough time and money to carry out the project. The members of their project team must spend, about 12 to 20 hours per week during four to six months.

2.4.3. The process of the lead user method

Support of management in the process of the lead user method

Another key success factor of the lead user method is the support (both financially and internal resource allocations) of the senior management from the start of the project to the end (Olson and Bakke, 2004). There is a need for strong and active support of senior managers, because the lead user project might have some outcomes which could require some major changes or even commotion in the organisation. Therefore it is of importance that early in the stage the key managers will be involved. They keep the business goals and priority in mind and make sure that everybody's interest is taken into account. Then this has to be outlined in a project plan, which will give the project team a clear direction of what the study should accomplish.

Furthermore the organisation should appoint a senior level manager to take the role of idea champion. This person works the idea through the organisation to a successful outcome through tenacity, belief and commitment (Smith and Ainsworth, 1989). In addition the organisation should appoint a team sponsor who works with the team and who is the essential communication link with the upper management.

Interaction in the process of the lead user method

Once lead users are identified the project team has to organise a two or three-day workshop in which they invite lead users to work together with the project team on the development of new product concepts (Hienerth et al., 2007). Before inviting the identified lead users, the organisation tests in an interview if the users can describe their experience and ideas clearly and if they have a strong personal interest in the development of the innovation. According to Lilien et al. (2002) the most efficient number of people for the workshop is maximum 10 to 15 people.

The best method for the workshop is that the lead users first have to work in small groups (Olson and Bakke, 2004). The subgroups have to try to identify independent problem areas and have to work on each. Next to that each of the subgroups should be assisted by technicians from the company and the subgroups should change over time. A success factor of the lead user workshop is that the discussions have to start very broadly with a few restrictions (Olson and Bakke, 2004), but during the workshop it has to be narrowed down in order to get product innovations that are more useful for the organisation.

Finally, before starting the workshop the issue of Intellectual Property Rights need to be addressed. It might be that not every user wants to freely reveal their ideas.

Idea evaluation in the process of the lead user method

During the workshop the subgroups have to generate different ideas. Olson and Bakke (2004) found that when an organisation makes use of a structured approach for their workshop, this will lead to product concepts that are well defined and usable. When an organisation makes use of a less structured approach, the concepts are less marketable or doable by management.

Each subgroup has to present their ideas to the entire group for evaluation and suggestions. The lead user method evaluates the ideas on two criteria: Originality (how revolutionary and novel is the solution) and feasibility (how quickly can the solution be realized employing currently available technology). Finally the subgroups should be mixed and they have to work on the most promising concept. After that, the most promising concepts have to be discussed and modified by the entire group and then have to be merged into one joint concept

2.4.4. Output of the lead user method

The goal of the lead user method is to generate ideas for new products. The lead user method does not stop when there is a good idea, but they work it out into a new product concept. The quality of these concepts depends on novelty but also on feasibility. The definitions of these concepts are just mentioned above.

2.4.5. Theoretical model for the lead user method

The findings of the above sections are summarized in figure 9 below.

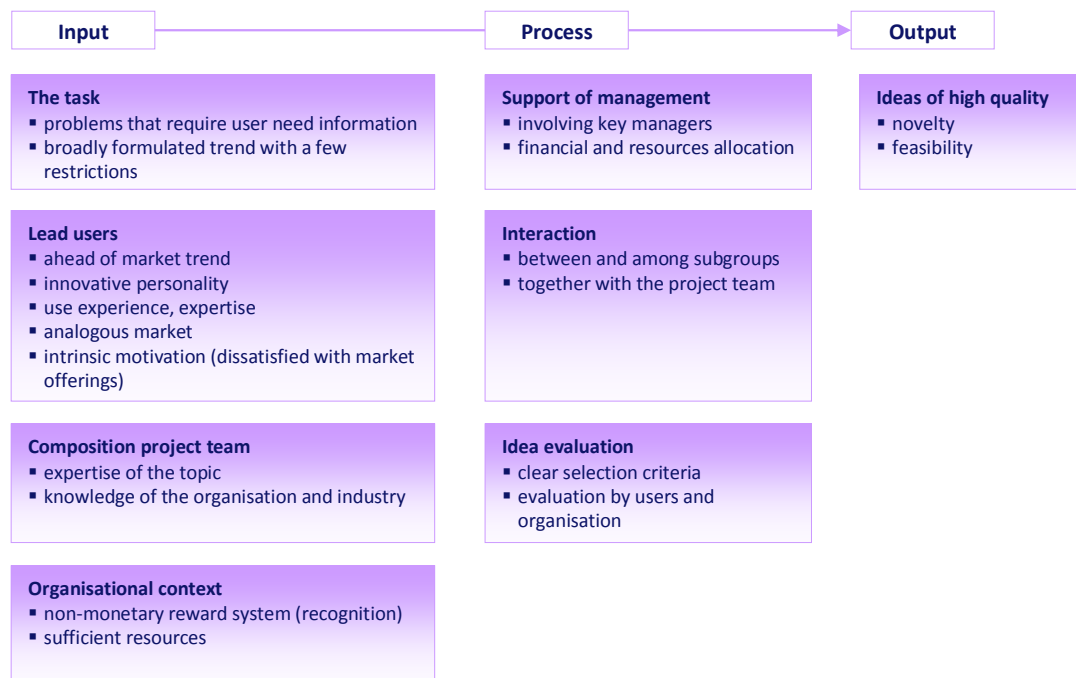


Figure 9: Conditions for the lead user method

2.5. Theoretical model crowdsourcing

In the previous section the variables and conditions of the lead user method are discussed. As mentioned before crowdsourcing and the lead user method are both types of external idea generation processes and it should be likely that there are a lot of similarities. However there are also differences as crowdsourcing does not have to deal with e.g. trend research and a workshop. Therefore the conditions of the lead user method will be combined with literature about creativity to develop a theoretical model for crowdsourcing. In this section the input (2.5.1), process (2.5.2) and the output (2.5.3) of crowdsourcing will be discussed. This section will end with a theoretical model for crowdsourcing (2.5.4).

2.5.1. The input of crowdsourcing

The task as input for crowdsourcing

For the lead user method it is found that the formulation and the domain of the task play a role. The task should not be defined very specifically, because lead users deal with the unexpected. As a result the task should be formulated broadly with a few restrictions.

In the literature about creativity it is also found that the ability to identify important, unresolved problems plays a vital role in the process of generating new ideas (Couger, 1995, from Amabile, 1983). A problem well stated is half solved. A well stated problem does not only clarify the target, but also helps to put it in relation with other known facts. If an organisation wants to make crowdsourcing successful they need to identify the problem clearly. The problem definition plays an important role in this, because Badly-formulated problems might result in solutions being ineffective or even meaningless (Osborn, 1963). Organisations should pay attention to the scope of the problem. When a problem is defined too narrowly the problem will be seen as one-dimensional and only a single aspect of the problem will be solved. Most problems are multidimensional and therefore they need a 'set of solutions' rather than a single solution to resolve (Couger, 1995, from Amabile, 1983). When a problem is stated broadly, people are not challenged to think differently than habitual thinking. In brainstorming, Osborn (1963) recommended to use specific, rather than vaguely defined problems, so a brainstorming problem has to be divided into more specific sub problems. This is quite the opposite as for the lead user method.

Regarding the domain of the task, it is likely that crowdsourcing is appropriate for other domains than the lead user method. The distinctive characteristic of lead users is that they are ahead of a target market and therefore experience the need for a certain innovation earlier than other customers. This makes it possible to outsource a problem with a high amount of sticky information about users' needs to lead users. For crowdsourcing it is likely that this type of problem is not appropriate since the crowd can consists of everybody. Furthermore, as crowdsourcing is publically available, only problems that do not require competition sensitive information to solve, are appropriate.

In the literature about creativity it is found that the task should be intrinsically motivating, as intrinsic motivation plays a more essential role than extrinsic motivation. Oldham and Cummings (1996) found five core task characteristics which play a role. These characteristics are skill variety and challenge, task identity, task significance, task feedback and autonomy. Now these characteristics will be explained. Skill variety is the degree to which a job requires different activities in order for the work to be carried out and the degree to which the range of skills and talents of the person working within the role is used. Task identity refers to the degree to which the job represents a whole piece of work, so being involved throughout the whole process. Task

significance refers to the impact of task completion within the organisation. Task feedback is related to the performance and a person is more likely to become aware of performance gaps. Finally autonomy is the freedom, independence and discretion of employees in how and when they perform the task. So organisations should pay attention to these characteristics when they are formulating the problem.

The crowd as input for crowdsourcing

One of the success factors for lead user innovation is the need for people with specific skills. Literature of creativity confirms that people need innovative personality and must have expertise on the topic. According to Amabile (1998) creativity is a function of three components: creative-thinking skills, expertise and motivation. Creative-thinking skills refer to how people approach problems and solutions to put existing ideas together in new combination. It depends a bit on personality as well as on how people think and work. Literature lists several personality traits that can characterize creative people. They have a high tolerance of ambiguity and unpredictability and are taking sensible risks (Schuler & Jackson, 1987). In addition they have substantial self-confidence, display an interest in learning, show flexibility and have openness to experience and an active imagination (Mumford, 2000).

Creative thinking skills are not sufficient to generate good ideas. People should also have expertise. Expertise refers to knowledge and encompasses everything that people know and can do in the broad domain of their work. When people have creative thinking skills and the right expertise, motivation will also influence the generation of good ideas (Amabile, 1996). There are two types of motivation, extrinsic and intrinsic. Extrinsic motivation comes from outside the person, so a person finishes a task in order to get something desirable or avoid something painful. The most common extrinsic motivator is money. Intrinsic motivation refers to a person's internal desire to do something, like passion and interest. The work itself is motivating as the work is challenging and the person enjoys it. For creativity intrinsic motivation is more essential than extrinsic motivation. In the lead user method it is also found that intrinsic motivation plays an important role.

However Brabham (2008a, 2009) studied the primary motivators for moving the crowd at Threadless and iStockphoto in which participating was voluntary. At both companies the main reason for the crowd to participate is the monetary reward. The second motivator was to develop their own creative skills in a supportive, creative environment as they see problem solving as a hobby. Hereby some people explicitly mentioned that they enjoyed receiving feedback from their peers. Participants of the iStockphoto study mentioned that this hobby might develop into serious freelance opportunities or even full-time work, so this is a motivation for them to participate. Both examples are not the same as the topic of this thesis, as Threadless and iStockphoto do not deal with idea generation. Still these companies also have to deal with the crowd who participate voluntary, so therefore the assumption is made that also in the process of idea generation extrinsic rewards are important to compensate keeping the intellectual property the organisation get.

One step in the lead user method is that the organisation has to identify lead users. On the contrary, in crowdsourcing everyone is allowed to participate, so the organisation does not select the participants, but the participants select themselves. Therefore the important topic of self-selection should be discussed. Self-selection refers to any situation in which individuals select themselves into a group. For crowdsourcing it is interesting to find out what the characteristics of people are who select themselves in the group and what the characteristics are of people who do not select themselves in a group.

Composition project team

The previous section showed that the project team must consist of people with knowledge and expertise on the topic and expertise in the business and industry of the organisation in order to make sure that the idea will fit the organisation. As crowdsourcing is an external idea generation process as well, it is likely that crowdsourcing needs a same project team too.

Organisational context as input for crowdsourcing

Topics related to the organisational context are reward system and sufficient resources. It is important to select a proper reward system carefully as it can influence the motivation of people.

The expectancy theory of Vroom (1995) deals with motivation and managing the reward system, therefore this model will be discussed. According to Vroom (1995) effort, performance and motivation are linked with each other. These concepts are translated into three variables: expectancy, instrumentality and valence. Expectancy is a person's belief that he is able to perform a certain task. So the person thinks that when more effort is put into a task this will result in an increased performance. Instrumentality is the perception of an individual that if the performance is good there is some kind of outcome (reward) in it for him. The last variable, valence, refers to the actual satisfaction someone expect to get from the reward. According to Vroom individuals will be motivated only if an organisation achieves to satisfy all these three variables (fig. 10).

How can an organisation influence these variables?

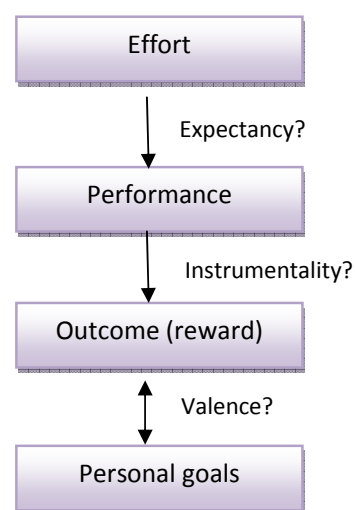


Figure 10: Reward system

Expectancy depends on the availability of the right resources; if the person has the right skills to do the job and if the person gets the necessary support to get the job done. In the process of crowdsourcing organisations cannot influence the right resources and skills as everybody can participate.

The variable instrumentality is related to a clear understanding of the relationship between performance and outcomes, trust in people who will take the decisions on who gets what outcome and transparency of the process that decides who get what outcome. Clear selection criteria are needed to screen ideas, though these criteria are not only important for the organisation herself, but have also impact on the motivation of participants.

A clear understanding of the link between performance and the related reward and clear appraisal criteria will have a positive impact on motivation. Instrumentality is an element to which an organisation or the intermediary has to pay attention.

- They have to give the crowd insight in: which performance is related to which reward (for example only the best idea gets a reward)
- the selection criteria which they use for screening ideas

The lead user method showed that the organisation needs to have sufficient resources, like time and money. As time and money will play a role in the lead user method it is likely that it will also play a role in the process of crowdsourcing. Especially the evaluation of all the concepts might take a lot of time for the organisation. In addition crowdsourcing is internet based; therefore it is likely that the IT-tool for crowdsourcing will play a crucial role. An easily accessible website is needed in which the organisation can outsource the problem can participants can upload their idea.

2.5.2. The process of crowdsourcing

Support of management as process of crowdsourcing

In the lead user method a key success factor was the support of the senior management. For the lead user study key managers should be involved and one of them should have the role of a champion in order to realise a successful outcome. It is likely that for crowdsourcing also management must be involved in order to make sure that the ideas will be integrated in the organisation.

Interaction in the process of crowdsourcing

As mentioned before idea generation consists of several stages: Preparation, frustration, incubation, insight and working out the idea. It is important that there is some interaction between the crowd and the organisation. The organisation has to communicate the problem and the crowd has to communicate their ideas and there has to be a possibility for asking questions if something is unclear.

According to Osborn (1963) an important step in the creativity stage is gathering information about the problem. This is of importance as it gives someone a better insight into the problem. Two kinds of knowledge are related to this step. Knowledge which is already stored in the minds of people and knowledge which has to be gathered a new to come up with new ideas. Therefore the organisation should provide the crowd some background information of the problem, but also the crowd has to gather information itself.

Idea evaluation in the process of crowdsourcing

After the idea generation it is time for a convergent phase in which only the most promising ideas are selected. The selection phase calls for two preparatory steps. A typewritten list of all suggested ideas has to be prepared. Secondly the ideas have to be classified in logical categories. Most of the ideas can be placed in five to ten categories (Osborn, 1963)

The selection of ideas is an important phase, though many organisations are screening ideas by an intuitive approach rather than completing a formal analysis. Organisations can use a number of normative approaches to structure the screening process, which can be divided into four general categories (Baker and Albaum, 1986):

- Ranking models
- Scoring models
- Economic models
- Optimization models

Another question is who has to select the ideas. As mentioned before the crowd is diverse and therefore it might be that crowdsourcing result in many solutions of which not all of them are relevant. For organisations it is time consuming to make a selection. Therefore it might be an option to let the crowd or intermediary decide. This can be done by nominal group voting. However it is likely that ideas evaluated by the organisation will fit better to the organisation.

2.5.3. The output of crowdsourcing

A distinction should be made between quantity and quality. In idea generation, quantity can be defined as the number of ideas that are generated. According to Fleming (2004) a diverse group can generate a lot of ideas, but with a lot of failures. Therefore it is not important to focus on the number of ideas, but on the quality of ideas.

To analyze the output of brainstorming, novelty and feasibility are often used for operationalizing quality of ideas. Feasibility refers to the extent to which an idea can be implemented and novelty

refers to an idea that is out of the ordinary (Helquist, Santanen and Kruse, 2007). Regarding novelty a distinction can be made between radical en incremental ideas. Radical innovations, also called breakthroughs or discontinuous innovations, create a dramatic change in products, while incremental innovations are small improvements in existing products.

It is unknown what the purpose of an organisation is which uses crowdsourcing. It might be that the organisation is looking for a good idea which they can implement. Or they can use different ideas of the crowd which they combine to the best solution. The case studies should give more insight in this.

2.5.4. Theoretical model for crowdsourcing

The findings of the above sections are summarized in figure 9 below.

Table 2 provides an overview of these topics and based on this table the questions for the interviews are made (see appendix A).

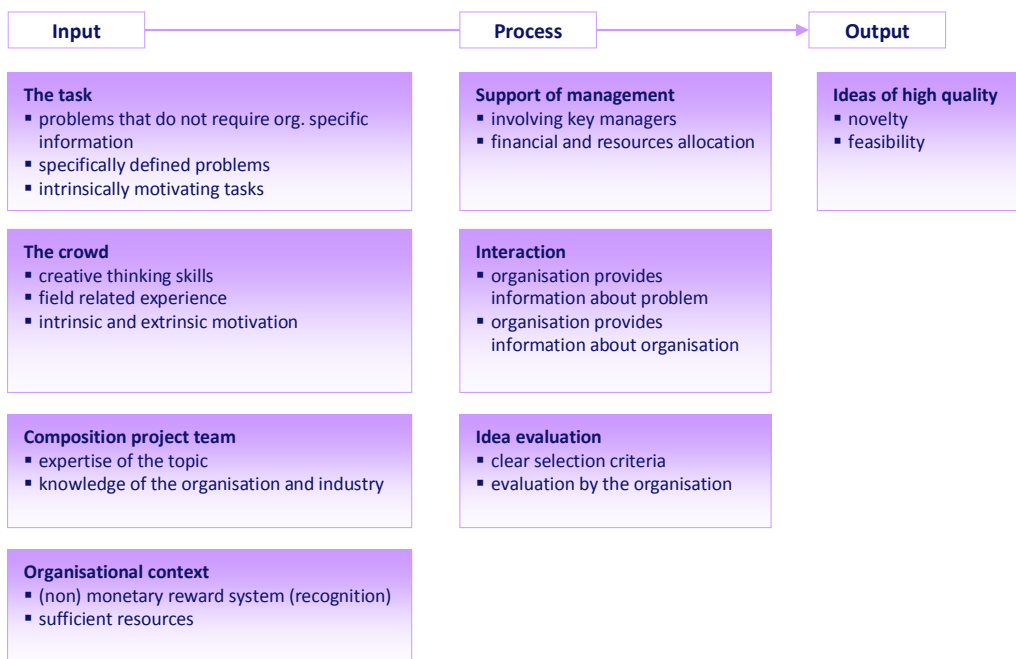


Figure 11: Theoretical model for crowdsourcing

Table 2: Overview of topics which are related to crowdsourcing

	Variable	Condition	Operationalisation
INPUT	The task	Narrowly defined problem Intrinsically motivating	A decomposition in sub problems Task significance, identification, feedback, challenging, autonomy
	The crowd	Creative thinking skills	Creativity, self confidence, etc.
		Expertise	Domain relevant knowledge
		Motivation	Extrinsic reward: monetary, recognition Intrinsic reward: personal satisfaction
	Composition project team	Expertise of the topic Knowledge of the organisation and industry	Domain specific knowledge Knowledge of the organisation and industry
	Organisational context	Fair reward system	Relationship performance and outcome Clear appraisal criteria Transparency who gets what outcome
Sufficient resources		Significant time and money to execute the project, user-friendly website	
PROCESS	Support	Support management	Key managers are involved Managers provide enough resources and money
	Interaction	Interaction between the crowd and the organisation	Information about the problem Information about the organisation Participants can ask questions if something is unclear
		Interaction between the crowd	Duration, frequency
Idea evaluation	Normative approach Evaluation criteria	The use of selection criteria for selecting ideas Clear selection criteria	
OUTPUT	Ideas of high quality	Novelty Feasibility	Radical or incremental idea Time and costs to implement the idea

3. Methodology

Research design

In this chapter an outline will be given on how conditions for the success of crowdsourcing will be explored. When the research model of section 1.5 is recalled (figure 5) it becomes clear that, as the theoretical analysis was carried out in the previous chapter, the next step is to set up and execute the case studies. This step is necessary since little is written about crowdsourcing and therefore it was not possible to find conditions in the literature. By combining the literature of lead users and creativity, which was done in the previous model, it was possible to make a relative general theoretical model.

The purpose of the case studies is to provide a more complete view on the variables that are relevant for crowdsourcing. To identify conditions that make crowdsourcing an effective idea generation process, the variables of different intermediaries and assigning companies will be compared. In the next sections an explanation is given on how data is gathered and why the intermediaries, assigning companies and participants were selected for this study.

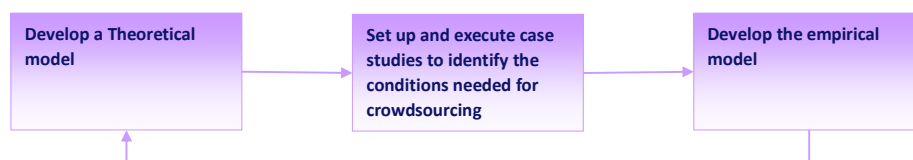


Figure 5: Research strategy

Data collection

There are two types of data gathering; a quantitative or a qualitative approach can be used. Quantitative data is usually presented as numerical data and can be collected through questionnaires or surveys. The advantage of this method is that the analysis can be done easily and fast and it is for a large group of people. The disadvantage is that only closed type of questions can be asked, so it will not provide extra information as there is no interaction. The qualitative method does not involve measurement or statistics. The advantage of qualitative methods is that respondents have the possibility to give a good argumentation of their opinion and there is more space to achieve a deeper understanding of the issues (Gramsbergen & Van Der Molen, 2002).

For this study the qualitative research approach will be used as there is not much literature available about this topic. Furthermore it is important to get a deeper understanding of crowdsourcing in the process of idea generation.

Case study

There are different methods for the qualitative research approach, but for this study case studies are an appropriate way for data gathering. Because important questions in this thesis are: What does the process of idea generation look like? Under what conditions is crowdsourcing effective in the process of idea generation? How can the crowd be motivated? Why- and How-questions are typically questions that can be answered by a case-study (Yin, 1989).

Case studies can be single or multiple. Single case studies are often used to confirm or challenge a theory, or to represent a unique or extreme case (Yin, 1994). Single-case studies are also ideal for revelatory cases where an observer may have access to a phenomenon that was previously inaccessible. Multiple designs must follow a replication rather than sampling logic. For this study there are cases available for replication, so therefore this study will make use of a multiple case study as it will strengthen the results.

In The Netherlands only companies can be found that are using crowdsourcing in collaboration with an intermediary. This makes it necessary to select assigning companies as well as intermediaries. A key criterion which played a role in the selection of organisations was the following: To make a good comparison, an organisation with positive and an organisation with negative experience had to be found. Of course the access to data also played a role in the selection of organisation.

Battle of concepts, Toplossing and Rabobank were contacted for this study. Battle of concepts is an intermediary that has positive experience with crowdsourcing, while Toplossing is an intermediary that has negative experience with crowdsourcing. It is interesting to compare these two organisations in order to get more insight about the successes and failures of crowdsourcing. Additionally the intermediaries have much experience with crowdsourcing as they support several assigning companies to outsource their problems to the crowd. This is of high value for the study.

At both companies interviews are held with the founder of the organisation, because they carry out all the tasks related to crowdsourcing. They have contact with the assigning companies, with the participants and they can tell about their experience from the start of the company till now.

The intermediaries can answer part of the sub-questions, but they do not know how the assigning company evaluates the ideas and how useful the ideas are. Therefore an assigning company, Rabobank, was selected. Rabobank outsourced two problems of which the first one was less successful than the second one. Therefore Rabobank can give insight in the improvements it made in the second battle. Two innovation managers of the Rabobank were interviewed for this study. Both were involved in the crowdsourcing process, but one of them was responsible for the crowdsourcing process, while the other had contact with Battle of concepts and evaluated the ideas.

Finally participants of Battle of concepts and Toplossing were contacted to get more information about the skills and motivation of participants and their experience with crowdsourcing. Four participants of Battle of concepts and three of Toplossing were interviewed (see case study protocol, table 3). Next to that, potential participants were interviewed to get more insight in the self-selection process. Potential participants are people who subscribed as a member of Battle of concepts, but who never participate in a battle.

Interviews

As this is an explorative study most of the information can be gathered by interviews. Fielding (1994) distinguishes four types of interviews: structured, semi-structured, unstructured and focus group interviews. For this study semi-structured interviews were chosen. On the one hand the theoretical model will give some structure to the interview. On the other hand it is an explorative research; therefore the interviewee needs some space to give extra information about the process of crowdsourcing.

It is important to take in mind that the skills of the interviewer might influence the validity of the results (Brinkman, 1994). It is important to not only react on the answers of the interviewee, but also on their behaviour. It might be that the interviewees gave some social desirable answers or that I have influenced the interviewees. It leads to a possible bias in the results of the interviews. However I tried to gain more validity on these results by doing the interviews face-to-face, as this gives advantage in interpreting the answers. Besides that the interviews were tape-recorded and after the interview the interview was send to the interviewees to give them the opportunity to correct things if something was misinterpreted or forgotten.

Additionally to the interviews, documents can be used, so the interviewer has some extra information before the interview starts. Therefore documents about the kind of problem and

background information of the problem were studied, but also written papers about the reward system (see case study protocol, table 3. A more detailed case study protocol can be found in Appendix B).

Table 3: Case study protocol

Case study protocol	Method interview/docs	Battle of concepts founders	Toplossing founders	Rabobank managers	Participants Battle of concepts	Participants Toplossing
The task/problem						
▪ kind of problem (not) appropriate for crowdsourcing	I/D	√	√	√	√	√
▪ problem definition	I	√	√	√		
▪ intrinsically motivating problem	I			√		
The crowd						
▪ skills	I/D	√	√	√		
▪ expertise	I	√	√	√		
▪ motivation (intrinsic/extrinsic)	I	√	√		√	√
Composition project team						
▪ expertise of the topic	I	√	√	√		
▪ knowledge of the organisation and industry	I	√	√	√		
Organisational context						
▪ reward system (intrinsic/extrinsic; long term/short term)	I/D	√	√	√		
▪ link between evaluation criteria and the reward	I/D	√	√	√		
▪ needed resources for crowdsourcing	I	√	√	√	√	√
▪ project team						
Support management						
▪ Key managers are involved	I		√	√		
▪ Managers provide enough resources and money	I		√	√		
Interaction						
▪ interaction with the crowd	I/D	√	√	√	√	√
▪ background information about the problem	I/D		√	√	√	√
▪ background information about the organisation	I/D	√	√	√	√	√
▪ interaction between the crowd	I/D	√	√	√	√	√
Idea evaluation						
▪ process	I		√	√		
▪ selection criteria	I/D		√	√		
Output						
▪ quantity versus quality	I/D	√	√	√		
▪ feasibility	I	√	√	√		
▪ novelty	I	√	√	√		
▪ What happened with the ideas?	I		√	√		

4. Results of the case studies

Between March 25th and April 20th interviews were held with Battle of concepts, Toplossing, Rabobank and participants of Battle of concepts and Toplossing. Appendix D provides information about the intermediary Battle of Concepts, which has a positive experience with crowdsourcing. Appendix E gives an overview of the results of the intermediary Toplossing, which has a negative experience with crowdsourcing. Appendix F discusses the experiences of Rabobank in crowdsourcing and their experience with Battle of concepts. Appendix G elaborates on the experience of participants of Battle of concepts of which two of them joined a battle of Rabobank and appendix H on the experience of participants Toplossing. Finally appendix I shows the results of the interviews with the potential participants of Battle of concepts

This chapter starts with an overview of the answers given by the organisations and participants, section 4.1. In section 4.2 a practice-based model will be developed on basis of the case studies and the theoretical model.

4.1. The identified variables

In this section an overview will be given of the different answers given by the interviewed organisations and participants.

The task as input for crowdsourcing

The case studies showed that for generating ideas of high quality the problem definition played an important role. Rabobank, Battle of concepts and Toplossing all experienced that broadly and vaguely defined problems results in divergent solutions, which do not solve the problem of the assigning company. The problems should be formulated specifically, to the point and clearly. However the formulation of the question should not include guiding instructions. Last but not least the question must fit the interests of the crowd, because participants select problems on basis of their interest.

Regarding the domain of the task, Toplossing, Battle of concepts and Rabobank mentioned that most of the problems are appropriate for crowdsourcing. However, Rabobank and Battle of concepts state that organisations should keep in mind that the crowdsourcing process is public. When competition sensitive information is needed to solve the problem, the competitive position can be exposed. Next to that Rabobank mentioned that for some problems thorough knowledge of the values and working methods within an organisation are necessary. Since these aspects are rooted in employees and are not easy to transfer, these problems are not suited for crowdsourcing.

For participants the task has to be intrinsically motivating. Participants chose problems that were challenging and urgent and they liked it when the solution had a large impact on the organisation. In addition all the participants appreciated to receive feedback. However this feedback has to be content related and not feedback that is applicable to everyone.

A summary can be found in table 4.

Table 4: An overview of the answers of the case studies related to the task

The task	Battle of concepts	Toplossing	Rabobank 'Gaming'	Rabobank 'Youth'	Participant Battle of concepts	Participant Toplossing
Specifically defined problem	√			√	√ (3x)	√ (3x)
Broadly			√		√ (2x)	

<i>The task</i>	Battle of concepts	Toplossing	Rabobank 'Gaming'	Rabobank 'Youth'	Participant Battle of concepts	Participant Toplossing
defined problem						
Clear problem	√	√		√	√ (3x)	√ (2x)
Fits the target group	√			√		
Making sub questions		√				
No guiding instructions	√	√		√	√ (1x)	
Challenging problem	√	√	√	√	√ (3x)	√ (2x)
Significant problem	√				√ (2x)	
Interesting problem	√		√	√	√ (3x)	√ (1x)
Task feedback	√		√	√	√ (4x)	√ (2x)

The crowd as input for crowdsourcing

The interviewed participants believed that they came up with winning solutions, because they have the ability to be innovative and creative. They said that they are scanning their environment for things that can be improved and that they know how to translate an idea into a good and prominent concept. Additionally the interviewed participants of Battle of concepts and Toplossing mentioned that they have some knowledge and experience with the subject of the question and that they recognized the relevance of the problem.

The interviewed potential participants mentioned that they did not have enough time, the problems were not interesting or they could not come up with a good idea.

The skills that Battle of concepts mentioned to be of importance for crowdsourcing were very similar to the skills that participants mentioned. At Battle of concepts only highly educated people up to 30 years old can join, so Battle of concepts focuses on a certain group of people and does not allow everyone to participate. Battle of concepts thinks that their focus group should have the skills which are needed for crowdsourcing. Toplossing did not have a clear overview of skills needed for crowdsourcing. Everybody could participate at Toplossing (Table 5).

Table 5: An overview of the answers of the case studies related to skills

<i>Skills</i>	Battle of concepts	Toplossing	Rabobank 'Gaming'	Rabobank 'Youth'	Participant Battle of concepts	Participant Toplossing
Creative	√	√			√ (4x)	√ (3x)
Innovative	√	√			√ (4x)	
Delivery of a good concept	√				√ (2x)	
Want to improve things	√				√ (3x)	√ (2x)
Expertise					√ (4x)	√ (2x)
Focus thinking					√ (3x)	
Coming up with solutions	√				√ (3x)	
Advocate their	√				√ (2x)	

ideas						
Imagination					√ (1x)	

There are many different factors influencing the motivation of participants in the process of crowdsourcing. Some people are more motivated by extrinsic rewards (for example money), others are more intrinsically motivated and want to develop their own skills or want to test themselves if their solution reaches the top ten of best ideas (Table 6).

Table 6: An overview of the answers of the case studies related to motivation

<i>Motivation</i>	<i>Battle of concepts</i>	<i>Toplossing</i>	<i>Rabobank 'Gaming'</i>	<i>Rabobank 'Youth'</i>	<i>Participant Battle of concepts</i>	<i>Participant Toplossing</i>
Money	√	√	√	√	√ (4x)	√ (2x)
recognition	√	√	√	√	√ (4x)	√ (2x)
Chance to win	√				√ (2x)	√ (1x)
Job offer			√	√	√ (1x)	
Develop own skills					√ (3x)	
Test your own skills		√			√ (3x)	√ (1x)

Composition project team

Battle of concepts always forms a project team together with employees from the assigning companies. According to them this is of importance as the people from the assigning company know what is happening in the organisation and industry and they can provide information about it to the participants.

Rabobank mentioned that the team must consist of people with knowledge of the organisation and who know what is happening in the market, but they should also have expertise on the topic. In the first assignment about 'serious gaming' employees who would be affected by the ideas were not involved. While in the second assignment they were. Rabobank stated that involving employees, who have to work with the ideas in the crowdsourcing process, resulted in more commitment within the organisation. Toplossing did not work with a project team from the assigning company at all (Table 7).

Table 7: An overview of the answers of the case studies related to composition project team

<i>Composition project team</i>	<i>Battle of concepts</i>	<i>Toplossing</i>	<i>Rabobank 'Gaming'</i>	<i>Rabobank 'Youth'</i>	<i>Participant Battle of concepts</i>	<i>Participant Toplossing</i>
Expertise on the topic				√		
Knowledge of the organisation industry	√		√	√		

Organisational context as input for crowdsourcing

Battle of concepts and Toplossing both had a monetary reward system. Toplossing only had a small monetary reward for the best three ideas, while Battle of concepts had a monetary reward for the best twenty concepts. The prizing money from Battle of concepts was ten times higher than the

prizing money of Toplossing. At both companies the winners were published, but participants who did not win, like to know how their idea was graded.

In addition, at Battle of concepts the winning participants also got battle points, which are used for the overall ranking list. This is a long-term competition across all battles. Battle of concepts experienced that participants view a place in this list as a form of recognition and are extra motivated to keep continuing to participate in other battles in order to rise in the list. For the other participants the overall ranking did not play a role.

Finally, participants feel treated unfairly when they notice that the assigning company does not apply their own rules to everyone. A participant noticed that the winning concept had much more pages than was allowed in the assignment.

Intermediaries and the assigning companies said that one of the most essential resources for crowdsourcing is time. Not only the evaluation of ideas takes time, but also developing a website, attracting participants and developing the PR for the assigning company. Rabobank appreciated the help of Battle of concepts in all these things. Also the experience and advice of Battle of concepts was very helpful for Rabobank in order to develop better solutions. Battle of concept had a lot of experience with the formulation of the problems and could advice Rabobank about this. Another valuable resource of intermediaries was the group of participants, as they had already a network of people who like to solve problems. The difference between Toplossing and Battle of concepts was that Battle of concepts focused on students and young professionals, while Toplossing did not focus on a specific target group. Therefore it was easier for Battle of concepts to find assigning companies, because these companies are not only interested in solving a problem but also in the target group itself (Table 8).

Table 8: An overview of the answers of the case studies related to organisational context

Reward & resources	Battle of concepts	Toplossing	Rabobank 'Gaming'	Rabobank 'Youth'	Participant Battle of concepts	Participant Toplossing
Monetary reward	√	√	√	√	√ (2x)	√ (3x)
Invitation assigning company	√		√	√	√ (4x)	
Overall Ranking	√				√ (2x)	
Winners know what happened with their ideas					√ (2x)	
Winners published	√	√			√ (4x)	√ (3x)
Time	√	√	√	√		
Experience/advice intermediary	√		√	√		
Website	√	√				√ (3x)
Network of members	√	√	√	√		
PR	√		√	√		

Support of management in the process of crowdsourcing

Rabobank had support of the management, tried to change the mindset of employees from not-invented-here to proudly-found-elsewhere and also involved the problem owner in their second

battle. Rabobank experienced that the support of management is a driver for the process and a great help in changing the mindset of employees. They furthermore stated that the solutions of the second battle fitted better to the problem and indicated that the credit for this should go to the involvement of the problem owners. The problem owner is the person who experiences the problem and who needs a solution for it. On the contrary, Toplossing did not have any of this. The assigning companies in the case of Toplossing did not pay attention to the solutions and generated ideas were not used or implemented. Rabobank continued with the best ideas of the crowdsourcing process, they acknowledged that the change in the mindset of employees played an important part in this process.

Table 9: An overview of the answers of the case studies related to support

<i>Support</i>	<i>Battle of concepts</i>	<i>Toplossing</i>	<i>Rabobank 'Gaming'</i>	<i>Rabobank 'Youth'</i>	<i>Participant Battle of concepts</i>	<i>Participant Toplossing</i>
Support management			√	√		
Change Mindset of employees (proudly-found-elsewhere)			√	√		
Problem owner is involved	√			√		

Interaction in the process for crowdsourcing

In all problem definitions some information was added. The assigning companies provided the participants with some background information and Rabobank gave the participants also some information about their own organisation. For participants it was useful to get some extra information. Furthermore they all agreed that the assigning company needs to give some pre-limiting conditions that prevent solutions that already exist rather than stating solutions the assigning company already found themselves (Table 10).

Table 10: An overview of the answers of the case studies related to information exchange

<i>Information exchange</i>	<i>Battle of concepts</i>	<i>Toplossing</i>	<i>Rabobank 'Gaming'</i>	<i>Rabobank 'Youth'</i>	<i>Participant Battle of concepts</i>	<i>Participant Toplossing</i>
Organisation tells what they already know	√	√	√	√	√ (1x)	
Info about the organisation	√		√		√ (3x)	√ (3)
Using conditions	√	√		√	√ (2x)	√ (1)

Idea evaluation in process of crowdsourcing

Toplossing evaluated the solutions for the assigning company, while Rabobank did it on their own instead of Battle of concepts. The evaluation of ideas took a lot of time, so assigning companies must take this into account. According to the participants the assigning company should evaluate the ideas, because only the company knows which solutions fit best to their problem. The assigning companies of Toplossing were not involved in the evaluation process, which might be a reason why the assigning companies did not use the ideas for implementation.

For participants, clear selection criteria are very helpful in order to come up with good solutions. In the first battle of the Rabobank (about serious gaming) there were no clear selection criteria and Rabobank was also not satisfied about the quality of the solutions of the first battle. In the second battle Rabobank formulated some criteria, which might be a reason that the solutions were of higher quality (Table 11).

Table 11: An overview of the answers of the case studies related to idea evaluation

Idea evaluation	Battle of concepts	Toplossing	Rabobank 'Gaming'	Rabobank 'Youth'	Participant Battle of concepts	Participant Toplossing
Clear selection criteria	√	√		√	√ (4x)	√
Assigning company evaluates ideas	√		√		√	
Intermediary evaluates ideas		√				√
Participants knows who evaluates	√		√	√	√ (4x)	
Subjective evaluation process		√	√	√		

Ideas of high quality in output for crowdsourcing

The quality of ideas depends on the problem definition. In the first case of Rabobank, about serious gaming, the question was defined too broadly and that resulted in divergent ideas that did not solve the problem. The second case of Rabobank, about 'committing youth', was more concrete and was defined more specifically which resulted in ideas of higher quality. However, participants were more enthusiastic about the first question, because in their perception they could be more creative.

Both Rabobank, Battle of concepts and Toplossing said that the output of crowdsourcing is not one best idea which they can implement, but it is often a mix of different solutions. Additionally many sponsors using crowdsourcing had some additional goals besides problem solving. For example, brand recognition, labour market communication, gaining insights in trends, market information and insight in the needs of consumers play a substantial role in using crowdsourcing as well.

Finally the assigning companies in the case of Toplossing did not pay a lot of attention to the solutions. The reason for this might be that the assigning companies just send a problem to Toplossing as they could participate for free. It might be that the problem was not a real problem for them and they did not really looking for a solution. Besides that they were not involved during the process of crowdsourcing (Table 12).

Table 12: An overview of the answers of the case studies related to the output of crowdsourcing

Output	Battle of concepts	Top-lossing	Rabobank 'Gaming'	Rabobank 'Youth'	Participant Battle of concepts	Participant Toplossing
Concept	√		√	√	√	
Idea		√				√
Solution fitted well to the				√		

question						
Mix of concepts	√	√	√	√		
Insight in trends, customers	√		√	√		
PR			√	√		
Labour market communication			√	√		

4.2. Practice-based model: a summary of the outcomes

Now that the results of the case studies have been discussed, it is possible to make a practice-based model. In chapter two, a theoretical model was developed and this model was tested in practice by using case studies. After the case studies it is clear how the task for the crowd has to look like. More information was gathered about the characteristics of the crowd and about the organisational context. Additionally the interviews and documentation gave insight in the conditions which are needed during the process part and in the output of crowdsourcing.

With this information it is possible to make a similar model as done in chapter two, the theoretical model, but now based on empirical data, see figure 12. The practice-based model has the same characteristics as the theoretical model (task, crowd, organisational context, process, ideas of high quality), though the practice-based model has some extra conditions. The main differences between the two models are related to the process and the output of crowdsourcing. The case studies showed that involving the problem owner during the process has a positive effect on the usefulness of ideas. The mindset of employees should be changed from unwillingly to adopt ideas that originate from someone else to an open and welcoming attitude in order to assure that generated ideas are actually embraced by the organisation. Remarkably, the output of crowdsourcing is not only ideas of high quality, as mentioned in the theoretical model, but also PR, labour market communication and getting insight into customers and market information.

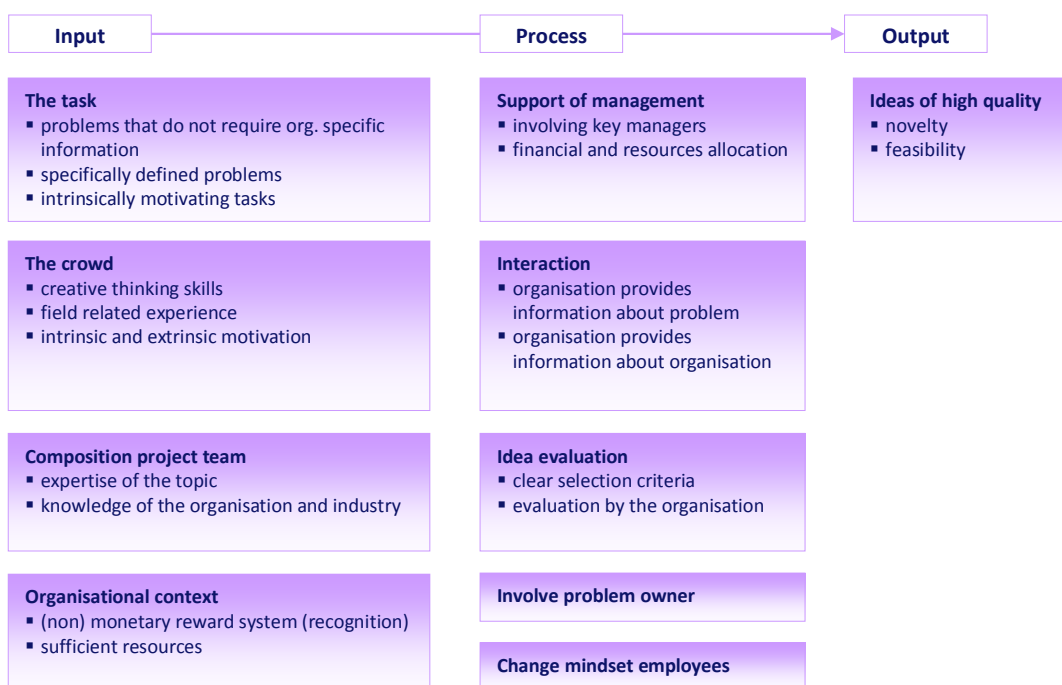


Figure 12: Practice based model for crowdsourcing

5. Analysis of the case study results

The previous chapter provided an overview of the outcomes of the case studies and concluded with the practice-based model. In this chapter the model will be compared with the theoretical model in order to find differences and similarities. The second part of this chapter will elaborate on the differences between the case studies and the different cases will be analyzed in order to find conditions for the success of crowdsourcing.

5.1. Comparing the theoretical model with the practice-based model

In this section the theoretical model (figure 13) and the practice-based model (figure 14) of crowdsourcing are compared. The differences and similarities will be discussed.

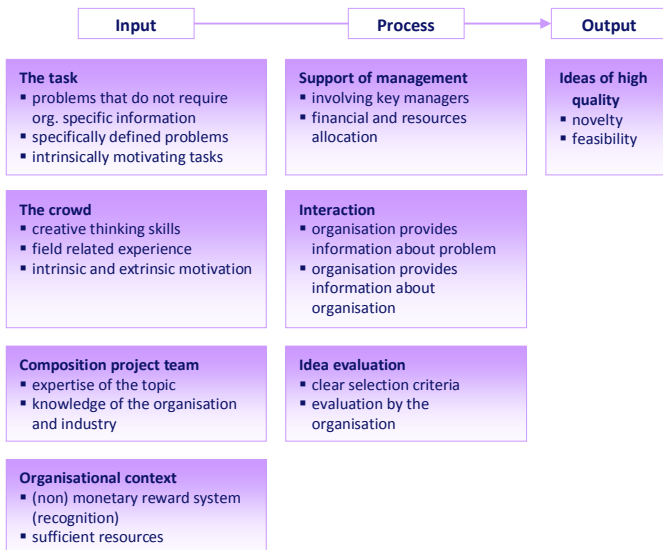


Figure 13: Theoretical model

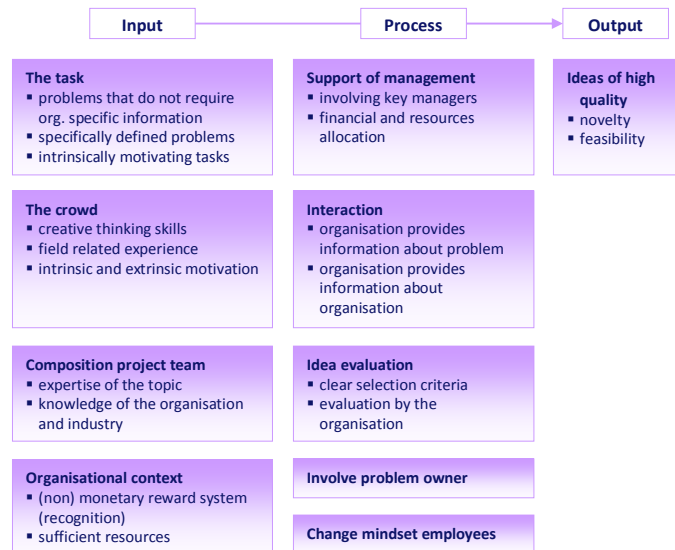


Figure 14: Practice-based model

When comparing the practice-based model with the theoretical model most of the variables are similar, though the content of the identified conditions differs for some conditions. The main differences between the two models are related to the process and the output of crowdsourcing. Below all the conditions will be discussed separately.

The task as input for crowdsourcing

In both models, theoretical and practice-based, the problem definition seems to have a large influence on the quality of ideas generated. Rabobank, Battle of concepts and Toplossing all experienced that broadly and vaguely defined problems result in divergent solutions, while some participants argued that broadly defined problems are more exciting. The problems should be specifically formulated in order to receive the best results for an organisation. It is important that the problem is clear to everyone, but the formulation of the question should not include guiding instructions.

Furthermore also the exceptions of problems which are not suitable for crowdsourcing, and for which organisational specific information is needed to solve, (e.g. competition sensitive- or organisational rooted information) are confirmed in both models.

As mentioned in the theoretical model of chapter two, the task should be intrinsically motivating. This can be achieved by the following job characteristics: skill variety and challenge, task identity,

task significance, task feedback and autonomy (Oldham and Cummings, 1996). These characteristics were also found in the interviews of the participants (table 4). The participants prefer problems which are challenging and some of them said that they like problems of which the solution can have a large impact on the organisation (task significance). Many of them like it to receive feedback that is content related. Only the degree of autonomy is not mentioned, but a reason for this might be that in crowdsourcing everybody has a high degree of autonomy.

The crowd as input for crowdsourcing

According to the literature individuals can generate new ideas if they have creative thinking skills expertise and intrinsic motivation (Amabile, 1998). The practice-based model confirms that a creative personality, expertise and intrinsic motivation play a role.

While in literature specific personality traits were identified, which characterize creative people, participants of Battle of concepts and Toplossing did not. While they did emphasize the importance of creativity, it was difficult for them to specify the personality traits needed for this skill. While the specification made in literature seems appropriate, further empirical research it is necessary to validate this.

As mentioned in the literature intrinsic motivation plays an essential role in coming up with good ideas (Amabile, 1996), but also extrinsic motivation (Brabham, 2008a, 2009). The interviews with the participants show that they are intrinsically motivated, because they want to develop their own skills and it is challenging to solve a problem. However extrinsic motivation should not be underestimated. Several participants said that money played a role in their motivation and according to Battle of concepts the number of people who participated in a battle decreased with 75% when there was no monetary reward. Next to that it was found that long term rewards (for example receiving battle points for the overall ranking list) had a positive influence on the motivation of people. Participants in the top ten of the overall ranking list were extra motivated to keep continuing to participate in other battles in order to rise in the list.

Composition project team as input for crowdsourcing

The practice based model confirms that the composition of the project team plays a role, which was mentioned in the literature (Olson & Bakke, 2004). The project team needs to have expertise on the topic and it needs to have knowledge of the business and industry in order to make sure that the idea will fit the organisation.

Organisational context as input for crowdsourcing

According to the theory a clear link between performance and reward will have a positive influence in people's motivation. This was also found in the case studies. For participants it was important that they knew what the appraisal criteria were and how many people were rewarded. Some participants mentioned that the evaluation of ideas was not always fair. Participants feel treated unfairly when they noticed that the assigning company treat participants differently. For the motivation it is important that participants get a sense of fairness in the process

Both, the theoretical model and practice-based model, show that an organisation needs sufficient resources in the process of crowdsourcing. Assigning companies and intermediaries emphasize that crowdsourcing requires significant time, so the organisation must be able to provide that. But according to Rabobank also the network of Battle of concepts and their advice is an important resource in order to reach many participants.

Support of management in the process of crowdsourcing

The support of the management in the theoretical model is derived from the lead user method in which support of management was a key success factor for integrating the solution in the organisation (Olson and Bakke, 2004). The practice-based model confirmed that support of management plays a role in crowdsourcing. When there is support of management it is more likely that the project team gets enough resources to execute the project and that there is more commitment for the project.

Information exchange in the process of crowdsourcing

According to Osborn (1963) information gathering is an important step in defining and solving a problem. The interviewed participants as well as the assigning companies and intermediaries state that background information about the problem is needed for participants to solve a problem. Information about the organisation should be given, but the assigning companies should also give some pre-limiting conditions that prevent solutions that already exist rather than stating solutions the assigning company already found themselves, since this will block creative thinking of people.

Idea evaluation in the process of crowdsourcing

As mentioned in the theoretical model organisations should make use of a fair evaluation system with clear selection criteria and they should use a normative approach to structure the evaluation process (Baker and Albaum, 1997). The practice-based model confirms that clear selection criteria are important. In the first battle of the Rabobank no clear selection criteria were used and therefore it was harder for participants to come up with a solution that solved the problem of the Rabobank. In the second battle selection criteria were used and the participants could take these into account when writing down the solution, which resulted in ideas of higher quality. However Rabobank and Toplossing, both used a rather subjective approach for selecting the winning ideas instead of a normative approach.

Ownership of problem in the process of crowdsourcing

While in the theoretical model the involvement of the problem owner was not mentioned, the case studies showed this might be of importance. At Battle of concepts, the problem owner of Rabobank was involved and committed in the process of crowdsourcing, while at Toplossing (the problem owner of) the assigning companies were not involved. The assigning companies at Toplossing did not pay attention to the solutions of their problem, while at Rabobank some solutions got a follow up. Rabobank further experienced that involving the problem owner can have a positive influence on the usefulness of the generated ideas. In their first battle they did not involve the problem owner while in the second battle they did. This led to ideas that better fit the organisation. Therefore it seems relevant to involve the problem owner, who experience the problem as a real problem and is really looking for a solution.

The mind set of employees in the process of crowdsourcing

Rabobank experienced that it is new for people to work with people outside the organisation. Employees are unwilling to accept ideas from outside the organisation, because it originates from someone else. According to Rabobank crowdsourcing requires a different organisational culture when ideas come from outside the organisation, therefore the mindset of employees should be changed so they will accept ideas from outsiders.

Changing the mindset of employees seems to be important for implementing ideas from outsiders, though this condition was not mentioned in the theoretical framework.

Ideas of high quality as the output of crowdsourcing

According to the theory the output of creativity should be ideas of high quality. While important for the assigning companies, this was not the only output of crowdsourcing. They also had some sub goals, like brand recognition, labour market communication, gaining insight in trends, market information and insight in the need of customers. A reason for this might be that the theory used focused on the idea generation within a company, while crowdsourcing focuses on people outside the company. For organisations crowdsourcing is a way to get in contact with people outside the organisations and to get information from and about them.

5.2. Finding conditions for effective crowdsourcing

In chapter two three types of conditions were distinguished; sufficient, necessary and 'nice-to-have' conditions. The first two conditions are essential conditions, while the last one is a condition That is not required for something else to happen, but which can have a positive influence on the quality of ideas generated by crowdsourcing.

In this section the different intermediaries and assigning companies will be compared in order to find the conditions that make crowdsourcing successful. The differences between Battle of concepts, who had positive experience with crowdsourcing, and Toplossing, who had negative experience with crowdsourcing, will be discussed. And the two battles of Rabobank will be compared of which one was successful and the other one not.

5.2.1. Conditions and the input of crowdsourcing

The task as input for crowdsourcing

For gaining ideas of high quality the problem definition seems to be essential. Rabobank, Battle of concepts and Toplossing all experienced that broadly and vaguely defined problems result in divergent solutions. Therefore it is a necessary condition that the problem should be concretely formulated. It is important that the problem is clear to everyone.

As mentioned before intrinsic motivation plays a crucial role, therefore the task must also be intrinsically motivating. The formulation has to be challenging and the assigning company must give content related feedback. A specifically defined problem and a problem that is intrinsically motivating are necessary conditions.

The crowd as input for crowdsourcing

At Battle of concepts only highly educated people up to 30 years old can join, so Battle of concepts focuses on a certain group of people and did not let everyone participate. Battle of concepts thought that their focus group should have the skills which are needed for crowdsourcing. But it is likely that there are also people with the right skills and expertise outside this target group. In contrary to Battle of concepts, Toplossing had a less complete overview of skills that are needed for crowdsourcing and everybody could participate. It was sure that no one with the right skills and expertise was excluded, but the main question is if they reached the right people. People with creative thinking skills and expertise are essential for the success of crowdsourcing. Therefore a necessary condition for crowdsourcing is selecting people with creative thinking skills and the right expertise.

There are many different factors which influence the motivation of participants in the process of crowdsourcing. Some people are more motivated by extrinsic rewards (for example money), others are more intrinsically motivated and want to develop themselves or want to test themselves if their solution reach the top ten of best ideas.

It seems to be that an intrinsically motivating task is essential for the success of crowdsourcing, because intrinsic motivation is needed for creativity. But it also seems to be that there is a relation between the prize money and the related effort of participants. The monetary reward at Battle of concepts is ten times higher than the reward at Toplossing and participants at Battle of concepts were willing to put more effort in working out the solution. Participants of Toplossing wrote half a page about their idea and they did not want to work out their idea into a whole concept, while participants of Battle of concepts worked their idea out in at least four pages. It might be that a higher amount of money will motivate people to put more effort in working out their solution. Next to that Toplossing only had short term rewards (publishing the winners, monetary reward), while Battle of concepts also had a long term reward, namely the overall ranking list. Participants in the top ten views a place in this list as a form of recognition and were extra motivated to keep continuing to participate in other battles in order to rise in the list. When comparing Toplossing with Battle of concepts a conclusion can be made that the members at Battle of concepts participate much more than participants of Toplossing.

Extrinsic motivation is not essential for creativity but it can improve the quality of ideas, because participants want to put more effort in their work and they want to solve problems more than once. So it is likely that extrinsic motivation is a 'nice to have condition', while people with intrinsic motivation is a necessary condition.

Composition project team

Rabobank set up a project at the start of crowdsourcing. The first time the project team consisted of two people from business development and someone of Battle of concepts. The employees who had to work with the ideas were not involved. The second time the project team at Rabobank consisted of people with knowledge of the industry as well as employees who had to work with the idea and someone of Battle of concepts. The ideas of the second assignment were better fitted to the actual problem than in the first one. It is likely that the presence of the employees who had to work with the ideas, led to this improvement. Therefore a project team that consists of people with expertise on the topic and knowledge of the organisation and industry is a nice-to-have condition.

Organisational context as input for crowdsourcing

Reward played an important role in the motivation of people. Participants keep in mind the chance to win and therefore it should be clear what the link is between performance and outcome. At Battle of concepts the best twenty concepts were rewarded, so the chance to win is relatively high. Some participants mentioned that the evaluation of ideas was not always fair. A participant noticed that the winning concept had much more pages than was allowed in the selection criteria. According to the participant this had a negative influence on his motivation. He mentioned that when this happens often, he does not want to participate anymore. A fair reward system with clear appraisal criteria influences the motivation of people and therefore the quality of ideas and can be seen as a 'nice to have'-condition.

According to the intermediaries and the assigning company crowdsourcing requires significant time. It is not only the evaluation of ideas that takes time, but also developing a website, attracting participants and developing the PR for the assigning company. According to Rabobank the experience and advice of Battle of concepts was very helpful in order to develop better solutions. Another valuable resource is the group of participants. The intermediaries had a network of people and the assigning company could use this network. Some of the resources can improve the quality of ideas, like the help of Battle of concepts. But some resources are essential for the success of crowdsourcing, like sufficient time for the execution, a well working website and a network of

members. Therefore sufficient resources are a necessary condition for the success of crowdsourcing.

5.2.2. Conditions and the process of crowdsourcing

Support of management in the process of crowdsourcing

During the process of crowdsourcing Rabobank had support of their management, in contrary to the assigning companies of Toplossing. The assigning companies did not pay any attention to the solutions, while some ideas at Rabobank were worked out. Support of the management will not influence the quality of ideas, but how well the ideas are integrated in the organisation and if the project team has enough resources (e.g. time and money) for the execution. Therefore support of management seems to be a 'nice to have'-condition.

Information exchange in the process of crowdsourcing

After comparing the two battles of the Rabobank it is clear what kind of role the background information about the problem plays. The first battle of the Rabobank gave three examples of serious games, which pushed the participants too much in one direction for a certain type of game. This might be a reason that the solutions were not very new and they were all related to one type of game. In the second battle Rabobank did not tell the participants about the kind of solutions she found herself, because this will limit people in their thinking. Therefore Rabobank gave some pre-limiting conditions that prevent old solutions rather than stating solutions they already found themselves. The solutions of the second battle were of higher quality than the first one. This shows that it is important to provide participants with some background information about the problem. Background information might improve the quality of ideas and is therefore a 'nice to have'-condition.

Idea evaluation in the process of crowdsourcing

Toplossing and Rabobank (second battle) communicated the criteria for the evaluation process to the participants. It is easier for the participants to come up with a good idea when they know the criteria and they feel treated fairly when the ideas are evaluated according the criteria. While Rabobank and Toplossing tried to evaluate according the selection criteria, the process was still subjective. The interviewed participants mentioned that sometimes a winning concept was not in line with the criteria. This had a negative influence on their motivation. Clear criteria can help in getting a fair evaluation, but the organisation has to act according the selection criteria, otherwise participants feel treated unfairly. Therefore a fair evaluation process with good criteria can improve the quality of ideas and is a 'nice to have'- condition.

Ownership of problem in the process of crowdsourcing

Toplossing tried to involve the assigning companies during the process of crowdsourcing, but that did not work. Therefore Toplossing defined the problem and background information on their own and did also the evaluation of ideas without the help of the assigning company. Not surprisingly, the assigning companies did nothing with the generated solutions. The situation at Rabobank was very different with several people from the organisation involved. However they still experienced that involving the problem owner can have a positive influence on the usefulness of the generated ideas. In their first battle they did not involve the problem owner while in the second battle they did. This led to better fitted ideas.

The increased usefulness of the ideas can maybe be explained by the fact that involving a problem owner in the process has a positive influence on the exact definition and background information of a problem, since the problem owner is the person who experiences the problems as a real

problem and is really looking for a solution. Also questions from participants can be answered more specifically by a problem owner and in the process of selecting the winning ideas the practical knowledge of the problem owner is very valuable.

Altogether it seems to be that involving the problem owner has a positive influence on the usefulness of ideas and is therefore identified as a 'nice to have' condition.

Changing the mind set of employees in the process of crowdsourcing

Since the assigning companies of Toplossing did not pay attention to the generated ideas it was hard for them to report on the importance of changing the mindset of employees. Rabobank experienced that it is new for people to work with ideas from people outside the organisation and this can lead to resistance when trying to implement them. Especially when they are generated by 'a crowd' instead of an expert. According to Rabobank crowdsourcing requires a different organisational culture when an organisation aims at continuing with the best ideas. Since changing the mindset of employees can improve the follow up of ideas, but does not influence the idea generation process itself, it can be seen as a 'nice to have' condition.

5.2.3. Conditions and the output of crowdsourcing

The goal of crowdsourcing is obtaining ideas of high quality. For Toplossing this was the only goal, but Battle of concepts and Rabobank had some sub goals. Like brand recognition, labour market communication, gaining insight in trends, market information and insight in the needs of customers. Sometimes the quality of ideas was low, but they still were satisfied, because they reached their sub goals.

Summary

In table 13 an overview is given of the conditions and the possible fulfilments related to these conditions. This overview can be used for a survey to test the conditions in a quantitative way.

Table 13: Overview of the conditions and the answers for crowdsourcing

	Condition	Fulfilment
Task	Intrinsically motivating (necessary)	<ul style="list-style-type: none"> ▪ Challenging problem ▪ Interesting problem ▪ Significant problem ▪ Task feedback
	Clearly defined problem (necessary)	<ul style="list-style-type: none"> ▪ Specifically defined problem ▪ Broadly defined problem ▪ Problem that consists of sub question ▪ No guiding instructions embedded ▪ Clear problem
The crowd	Creative-thinking skills (necessary)	<ul style="list-style-type: none"> ▪ Wish to improve things ▪ Focus thinking ▪ Delivery a good concept ▪ Able to advocate their ideas ▪ Tolerance of ambiguity ▪ Risk-taking attitude ▪ Self-confidence ▪ Eager to learn ▪ Show flexibility ▪ Openness to experience ▪ Active imagination
	Expertise (necessary)	<ul style="list-style-type: none"> ▪ Field related knowledge and experience
	Intrinsic motivation (necessary)	<ul style="list-style-type: none"> ▪ Develop own skills ▪ Testing own skills
	Extrinsic motivation (nice to have)	<ul style="list-style-type: none"> ▪ Money ▪ Job offer ▪ Recognition
Composition project team	Expertise on the topic (nice to have)	<ul style="list-style-type: none"> ▪ Domain related knowledge
	Knowledge of the organisation and industry (nice to have)	<ul style="list-style-type: none"> ▪ People know what is happening in the market and the organisation
Organisational context	Reward system (nice to have)	<ul style="list-style-type: none"> ▪ Monetary reward ▪ Invitation to present to assigning company ▪ Overall ranking ▪ Winners published ▪ Clear appraisal criteria ▪ Clear link between performance and appraisal
	Sufficient resources (necessary condition)	<ul style="list-style-type: none"> ▪ Time / money ▪ Network of members ▪ Website ▪ Advice/experience intermediary ▪ PR
Process	Support management (nice to have)	<ul style="list-style-type: none"> ▪ Key managers are involved ▪ Managers provide enough resources

	Condition	Fulfilment
	Background information (nice to have condition)	<ul style="list-style-type: none"> ▪ Information about the organisation ▪ Information about the problem ▪ Organisations tell what they already know ▪ Pre-limiting conditions
	Fair evaluation process (nice to have)	<ul style="list-style-type: none"> ▪ Clear criteria ▪ Assigning company evaluates ▪ Intermediary evaluates ▪ Participants know who evaluates ▪ Structured evaluation ▪ Subject evaluation
	Involving problem owner (nice to have)	<ul style="list-style-type: none"> ▪ The persons experience involved, experiences the problem as a real problem and really want a solution ▪ The problem owner is involved from the beginning up to the end
	Change mindset of employees (nice to have)	<ul style="list-style-type: none"> ▪ Employees have an open and welcoming attitude to externally generated ideas.
Output	<p>Ideas of high quality</p> <p>Other output</p>	<ul style="list-style-type: none"> ▪ Worked out concept ▪ Idea ▪ Mix of concepts ▪ Novelty ▪ Feasibility ▪ Insight in trends ▪ Labour market communication ▪ PR

6. Conclusion and recommendations

In this section, conclusion regarding the research findings and research model will be presented. Section 6.1 focuses on the findings in face of the research question. In section 6.2 the findings and limitations of the research will be discussed and recommendations for further research will be given. Finally, section 6.3 will go into the practical implications of this research.

6.1. Conclusion on the research findings

This research is conducted in order to find out under what conditions crowdsourcing can be used for effective idea generation. The following research question was established:

Which conditions make crowdsourcing an effective idea generation process?

Three different kinds of conditions were distinguished (figure 15):

- A *Sufficient condition* represents a condition that, if it is present, guarantees the effect in question. However, this does not mean that a sufficient cause is the only possible cause of a particular effect. (Babbie, page 93).
- A *Necessary condition* represents a condition that must be present for the effect to follow (Babbie, page 92).

The similarity between necessary and sufficient conditions is that both conditions are requirements for something else to happen. However a sufficient condition has more impact than a necessary condition, because a sufficient condition, X, guarantees the presence of Y.

Finally there are also conditions that are not required for something else to happen, but which can have a positive influence on success:

- *'Nice to have'-conditions*: When X is a 'nice to have'-condition, this means that it is possible to have Y without X, but X will have a positive influence on the quality of Y

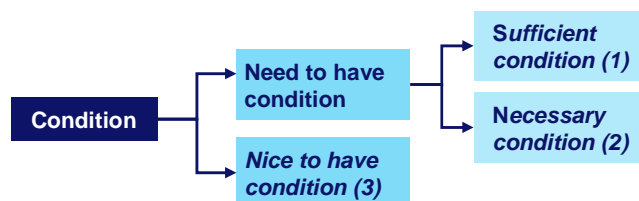


Figure 15: Conditions

The results of this study show that there are two types of conditions relevant for the output of crowdsourcing, necessary and 'nice to have'-conditions. Since there could not one condition be identified which guaranteed ideas of high quality, there is no sufficient condition for crowdsourcing.

First the necessary conditions will be discussed. For generating ideas of high quality it is necessary to start with a clearly defined problem. This means that the problems should be defined specifically and the problem should be clear for everyone. In addition it is a necessary condition to have participants with creative-thinking skills, expertise and people who are intrinsically motivated. An organisation must also have sufficient resources. Crowdsourcing requires significant time, so the organisation must be able to provide that. Finally the used website should be user friendly and working properly. If one of these conditions is absent, ideas of high quality cannot be generated.

Besides the necessary conditions there are some conditions which are not required to get ideas of high quality, but which can have a positive influence on the quality. While intrinsic motivation is a necessary condition, this study showed that extrinsic motivation is a 'nice to have'-condition. When participants get a monetary reward or recognition they are willing to put more effort in working out the solution. Next to that 'long term rewards' had a positive influence on the motivation and can stimulate people to participate more than once.

Additionally when the assigning company provides information about the problem and the context of the organisation, the ideas will be of higher quality than an assigning company which does not give background information. It is important that the background information should not include guiding instructions. The assigning company should not tell the participants what kind of solutions did not work out, but they should give some pre-limiting conditions that prevent old solutions rather than stating solutions they already found themselves.

Clearly formulated selection criteria will help participants understand what kind of solution the organisation is looking for. Next to that an organisation should evaluate the ideas according to the selection criteria, since otherwise the motivation of the participants can decrease, which can lead to less ideas of high quality. Therefore a fair evaluation process with good selection criteria can be identified as a 'nice to have'-condition.

Furthermore the results of this study showed that the composition of the project team played an important role in the crowdsourcing process. When the project team consists of people with expertise on the topic and knowledge of the organisation and industry it is likely that the selected ideas will better fit the organisation. Therefore this is a 'nice-to-have'-condition.

When an organisation is not only looking for a good idea, but also for a real solution that will be integrated in the organisation, it has to be sure that there is support of the management during the process. Additionally, the mindset of employees should be changed from not-invented-here to proudly-found-elsewhere. Finally the problem owner should be involved during the process. These conditions will not influence the quality of ideas, but influence the integration of the idea in the organisation. Therefore they are 'nice to have'-conditions.

Apart from the conditions there are some considerations concerning the appropriateness of problems for crowdsourcing. These were also mentioned in the theoretical and practice based model under the header task. Problems for which organisation specific information is necessary to solve are not suited. This is the case when thorough knowledge of the values and working methods within an organisation are needed. When competition sensitive information is needed to solve the problem, the competitive position can be exposed. The organisation should be aware of this dilemma and make the trade-off between the need to solve the problem and the danger of sharing competitive sensitive information.

Despite the fact that this research was focused on the generation of high quality ideas, other benefits of crowdsourcing for organisations were also found. Companies turned out to use crowdsourcing for labour market communication and PR and to gain insight in customers and trends.

6.2. Discussion of research findings

This section starts with a reflection of the research findings in 6.2.1. In 6.2.2. the limitations of this study will be discussed and recommendations for further research will be given.

6.2.1. Reflection on the research findings

The goal of this study was to provide insights into the conditions of success for crowdsourcing. As there is little written about crowdsourcing, this study was explorative. The goal of an explorative research design is to provide new insights into a topic for research and to identify relevant variables (Babbie, 2004). In this study variables have been identified that seem worth pursuing. In the empirical research most of the identified variables of the theoretical model were confirmed: The task, crowd, project team, reward system, resources, support management, interaction and idea evaluation were all related to the output of crowdsourcing. Additionally two extra conditions were found compared to the theoretical model, namely, involving the problem owner and changing the mindset of employees.

In the literature of change management it is found that problem ownership is clearly an important factor associated with effective and successful change management. The problem owner must be directly involved in the change process and must see clear linkages between their future success and the effective implementation of the change (Paton & McCalman, 2008). No matter how good an idea is, it is necessary to make sure the problem owner believes in it and makes it his own solution in order to make things happen. Regarding innovation it is necessary to take everybody's wishes and perceptions into account from the beginning, in order to make things happen (van Nuland & Estepa, 2007). This shows that problem ownership plays a key role in change management, for that reason it is not so surprising that problem ownership also makes sense in crowdsourcing as the new idea requires change to implement it.

The fact that employees are not willing to accept ideas from the crowd is not uncommon. Katz and Allen (1982) found that R&D professionals do not consider very seriously the possibility that outsiders might produce important new ideas or information relevant for them. This has come to be known in the R&D community as the 'Not Invented Here' syndrome. The R&D specialists see themselves as a group of engineers whose membership has been relatively stable for several years and they may begin to believe that they possess a monopoly on knowledge in their area of specialization. According to this syndrome, stable project teams become increasingly cohesive over time and begin to separate themselves from external sources of technical information and influence by communicating less frequently with professional colleagues outside their teams. It is likely that the employees of the assigning company, who normally come up with ideas, see themselves as professionals and are not willing to accept ideas from outsiders.

6.2.2. Limitations and recommendations for further research

As this study was explorative no empirical relationships between the variables are given. In order to do so more empirical research is needed. The outcomes of this study can be used to set-up a survey and test the conditions of crowdsourcing in a quantitative way.

Another limitation is the fact that some questions were hard for the interviewees to answer, especially questions about the characteristics of the crowd. It was hard for the interviewed participants to analyze the characteristics of their own personality. It should be better to develop a psychological survey to get a better overview of the personality of people who participate in crowdsourcing processes.

In all the cases of this study the participants worked independently and in competition with each other and there was no interaction between them. However different theories exist about the effectiveness of individuals versus groups and nominal versus interacting group processes for idea generation. Supporters of Osborn believe that "the average person can think up twice as many ideas when working with the group than working alone" (Osborn, 1963, page 228-229). They state that

brainstorming groups are superior to an equal number of individuals who were brainstorming independently. However some other authors state that brainstorming is not effective in enhancing either quality or quantity of ideas as there are some inhibitors, for example; 1) There is only one person that speaks at a time, so group members cannot always express their ideas the moment they come to mind, which is called production blocking. 2) It might be that individuals withhold their ideas out of concern that others may not approve them, which is called evaluation apprehension (Taylor, Berry and Block, 1958). When Hay group wants to advice clients on how to use crowdsourcing in the process of idea generation, it would be interesting to carry out a research that will focus on the differences between individuals and groups. A research question can be: *“How does the interaction between and among participants (e.g. collaborative, competitive, or cooperative task design) influence quality of ideas within crowdsourcing?”*

The purpose of idea generation is to generate a large number of ideas. Some authors suggest using a diverse group. If a group consists of members with different information, different time horizons, different attitudes toward risks they will come up with very different ideas rather than minor variations on the same concept (e.g. Surowicki, 2004). This study showed that the assigning company gets many ideas, which can be very divergent. It took the assigning company significant time to evaluate these ideas. Fleming (2004) state that diversity might harm the potential for innovations. According to Fleming (2004) there is a double effect of diversity on innovation outcomes. An innovation team with people from diverse disciplines are more likely to achieve breakthroughs of unusually high value, but the team also produces more failures compared to homogenous teams (figure 16).

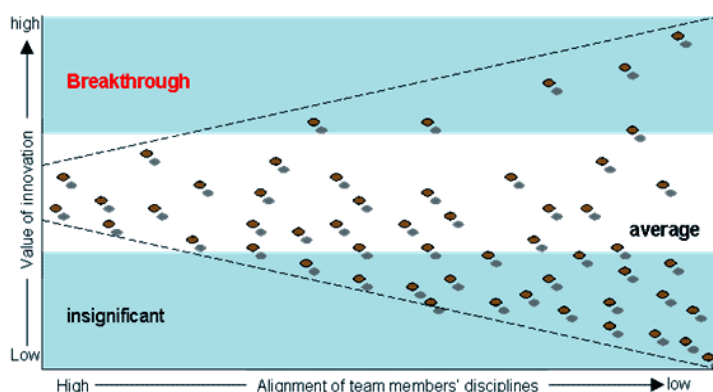


Figure 16: Diversity

An organisation that uses crowdsourcing is looking for an innovation of high value and they have to deal with the problem that the crowd is diverse and might produce a lot of innovations of low value. The results of this study showed that winning concepts are developed by people with specific skills.

Therefore a relevant question will be, should crowdsourcing be open to all potential participants or should organisations only allow certain people to participate?

Next to that, in this study no attention was paid to approaches of identifying the ‘right crowd’. For the lead user method the pyramiding networking approach tends to be an appropriate approach. Also for crowdsourcing it would be interesting to know if there is a way to identify the right people in the crowd.

Finally not all suitable candidates are willing to participate and there are even persons who applied for a problem but who did not turn in a concept-solution. For example it might be that people who

think they can make money with their idea do not submit their idea, because the intellectual property goes to the organisation and they get only a small prize for it. In other to determine if this influences the quality of the generated ideas, more research is needed on motives for self selection of participants.

When Hay group wants to advice her clients on how to use crowdsourcing it is of importance that it carries out further research to get insight in the skills and motivation for self selection, as this has a large impact on the quality of ideas.

6.3. Practical implementation

As mentioned in the practical relevance section in chapter one, innovation is a hot item for many organisations and it is likely that besides the internal innovation process, the open innovation process will become more important too. The motive for this research was the wish of Hay Group to help their clients to improve their innovative capability.

Hay group developed an innovation management model in which a good idea generation process was identified as vital for a company's innovative capability. In order to asses a company's score on the important elements of the model, and hereby a company's readiness for successful innovation, Hay Group developed an innovation scan. When the results of the innovation scan show that the idea generation process of an organisation is insufficient, Hay Group can now advice her clients to use crowdsourcing as a fresh external alternative.

When a company is interested Hay Group can use the stage model displayed in figure 17 in advising the client. In this model the results of this study are combined in a step to step plan which can directly be executed.

Before starting with this practical model, Hay Group must found out if the employees in the organisation are willing to adopt ideas from external people. Otherwise the mindset (not-invented-here to proudly-found-elsewhere) and therefore the culture of the organisation has to be changed.



Figure 17: Crowdsourcing

Step 1: Identification

In the first step the organisation should check if the problems of the organisation are appropriate for crowdsourcing. As explained before problems for which competition sensitive information or extensive understanding of the values and believes of the organisation is necessary

to solve, are not suited. When the organisation judges that the problem can be outsourced to the crowd, it still has to evaluate if the organisation has enough capacity to ensure its execution. Crowdsourcing is time-consuming and can imply significant costs, so the organisation has to be sure that they have enough resources to make it successful.

The last step of the identification process is the composition of a project team. The project team must consist of people who have enough knowledge of the organisation and expertise on the topic in order to make sure that the new ideas generated will fit the organisation. Next to that the problem owner and management should be involved. Involving the problem owner is of importance to make sure that there is someone, who experiences the problem as a real problem, who wants to implement the solution. Involving the management is necessary to get the resources needed for crowdsourcing (e.g. sufficient money and time to execute the project)

Step 2: Approach

An organisation can choose two types of approaches for crowdsourcing. It can decide to carry out the whole process on their own or it can collaborate with an intermediary.

If the organisation chooses the first approach important steps in the beginning are identifying the crowd and starting advertisements in which the organisation tells that it will involve external people in their idea generation process.

In addition a website has to be developed in which the organisation can outsource the problem, participants can upload their idea and the organisation can exchange information about the problem and the whole process. Finally the organisation must decide how the crowd will get rewarded. The results of this study showed that the participants like to know on which place they ended. Therefore a list should be published with all the participants and not only the winners. As it is time-consuming to do this, the organisation can decide to make a category ranking list (30th – 40th, 40th – 50th, etc). Next to that the reward system should not only consist of short term rewards, but also of long-term rewards to stimulate people to keep continuing in solving problems (only when the organisation want to use crowdsourcing more often).

If the organisation chooses for the second approach, collaborating with an intermediary, the intermediary can take care of the website, identifying and rewarding the crowd. The organisation can add some extra rewards, for example inviting the best three participants to present their idea to the management and project team.

This study showed that developing a website and getting a network of participants is time-consuming. The organisation must take this into account when it decides to choose for the first or second approach. When the organisation chooses the first approach, it must form a corresponding project team, which means that the project team formed in step 1 has to be extended.

Step 3: Preparation

When the approach is clear, the organisation can start with the preparation of outsourcing the problem. First the problem needs to be formulated specifically and the problem needs to be clear to everyone. This study showed that this is a very important condition, so the organisation should pay sufficient time to define the problem specifically and to the point.

When the problem is clear, the organisation needs to think about the selection criteria for handing in the ideas and the evaluation method. The selection criteria and deadlines should be communicated to the participants by writing them down in the assignment. When the organisation communicates this clearly and acts accordingly the participants get a sense of fairness in the process.

Finally information about the problem and organisation should be gathered, which will increase the chance that the ideas fit to the organisation. It is important that the background information is not

guiding. The assigning company should not tell the participants what kind of solutions did not work out, but they should give some pre-limiting conditions that prevent old solutions rather than stating solutions they already found themselves.

Step 4: Execution

When all the previous steps are finished the organisation can put the problem and background information on the website. The participants should have about four to six weeks to come up with an idea. During the idea generation, the organisation does not have to spend much time on it. They only have to make sure that they answer questions of participants if something is unclear.

After four to six weeks the organisation has to evaluate the ideas. This usually requires much time, so it would be good to plan four to six weeks for this process. When the ideas are evaluated the organisation should publish a ranking list of all the concepts. Finally the organisation should invite the winners to present their concepts and to involve them in the follow up.

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Appendix A: Interview questions

Inleiding

Mijzelf introduceren.

Doel: meer inzicht krijgen in crowdsourcing (wat werkt goed / wat niet).

Duur: 2 uur

Is het goed dat dit interview wordt opgenomen?

Als u wilt kan ik uw informatie vertrouwelijk behandelen, door uw naam/naam van het bedrijf anoniem te laten.

Beginvraag: Kunt u iets vertellen over de ervaring die u heeft met crowdsourcing?

Interviewvragen	Reden van de vraag
<p>The taak/probleem</p> <ul style="list-style-type: none"> Wat waren de problemen/vraagstukken die u hebt gebruikt voor crowdsourcing? Hebt u andere problemen in uw organisatie die u bewust niet aan de crowd zou voorleggen? Waarom hebt u er voor gekozen om dit probleem/vraagstuk door de crowd te laten oplossen en niet intern? Waar moet een probleem in uw ogen aan voldoen om voor crowdsourcing succesvol te zijn? En specifiek kijkend naar het soort probleem, de scope en de achtergrond? Was het een probleem dat in meerdere sub problemen kon worden opgedeeld? Hebt u dit ook gedaan? De oplossingen die terug kwamen waren die heel uiteenlopend? Had u hier juist iets aan of juist niet? 	<p>Soort probleem</p> <p>Voorwaarden waaraan een probleem moet voldoen</p> <p>Specifiek probleem</p>
<p>De crowd</p> <ul style="list-style-type: none"> Welke mensen konden deelnemen aan crowdsourcing (beperkingen leeftijd, achtergrond, nationaliteit etc.)? Waarom deze mensen? Hebt u het gevoel dat u goede ideeën bent misgelopen door alleen op deze groep mensen te richten? Welke vaardigheden bepalen dat jij een aantal battles hebt gewonnen? Hadden de battles die je hebt uitgekozen ook verband met je kennis/achtergrond? Wat was voor jou de reden om deel te nemen aan de battle? (geld, interesse, ontwikkelen, leren, winnen, etc.) 	<p>Divers / bepaalde kennis en vaardigheden</p> <p>Vaardigheden Expertise</p> <p>Motivatie</p>
<p>Compositie project team</p> <ul style="list-style-type: none"> Waren dezelfde mensen betrokken gedurende het hele proces. Zoja, uit hoeveel en welke mensen bestond het project team Hadden deze mensen genoeg kennis van het onderwerp en zijn zij ook diegene die met het idee aan de slag gaan Zaten er mensen in het projectteam die voldoende kennis hadden over wat er in de markt speelt? 	<p>Kennis onderwerp</p> <p>Kennis industrie</p>
<p>Interne organisatie</p> <ul style="list-style-type: none"> Op welke manier beloont u de crowd voor het vrijwillig meedoen aan het oplossen van problemen? Geld? erkenning? Etc.? Is er een duidelijke link tussen de evaluatie criteria en de beloning? Hebt u wel eens de beloning veranderd en wat voor effect had dit? Op welke manier ben je beloond voor je deelname? Zijn er beloningen die je gemist hebt? Welke middelen zijn volgens u belangrijk om crowdsourcing succesvol te laten zijn 	<p>Beloning</p> <p>Relatie beloning / uitkomsten Beloning</p>

Zijn er nog punten, waarnaar ik niet heb gevraagd, en die volgens u wel van belang zijn voor het onderzoek?

***Slot**

- Hartelijk bedankt voor uw tijd!
- Ik zal uiterlijk binnen een week de uitwerking van het interview naar u opsturen. Mocht ik zaken anders hebben geïnterpreteerd dan kunt u dat vervolgens telefonisch of via de mail aangeven.

Appendix B: Case study protocol

<i>Case study protocol</i>	Method interview/docs	Battle of concepts founders	Toplossing founders	Rabobank managers	Participants Battle of concepts	Participants Toplossing
The taak/probleem						
<ul style="list-style-type: none"> Wat waren de problemen/vraagstukken die u hebt uitgezet/aan deelgenomen? 	I/D	√	√	√	√	√
<ul style="list-style-type: none"> Welke problemen zou u bewust niet aan de crowd voorleggen? 	I	√	√	√		
<ul style="list-style-type: none"> Waarom hebt u er voor gekozen om dit probleem/vraagstuk door de crowd te laten oplossen en niet intern? 	I			√		
<ul style="list-style-type: none"> Waar moet een probleem in uw ogen aan voldoen om voor crowdsourcing succesvol te zijn? En specifiek kijkend naar het soort probleem, de scope en de achtergrond? 	I	√	√	√	√	√
<ul style="list-style-type: none"> Was het een probleem dat in meerdere sub problemen kon worden opgedeeld? Hebt u dit ook gedaan? 	I/D	√	√	√		
<ul style="list-style-type: none"> De oplossingen die terug kwamen waren die heel uiteenlopend? Had u hier juist iets aan of juist niet? 	I		√	√		
De crowd						
<ul style="list-style-type: none"> Welke mensen konden deelnemen aan crowdsourcing. Waarom deze mensen? 	I/D	√	√	√		
<ul style="list-style-type: none"> Hebt u het gevoel dat u goede ideeën bent misgelopen door alleen op deze groep mensen te richten? 	I	√	√	√		
<ul style="list-style-type: none"> Welke vaardigheden bepalen dat jij een aantal battles hebt gewonnen? 	I	√	√		√	√
<ul style="list-style-type: none"> Hadden de battles die je hebt uitgekozen ook verband met je kennis/achtergrond? 	I	√	√		√	√
<ul style="list-style-type: none"> Wat was voor jou de reden om deel te nemen aan de battle? 	I	√	√	√	√	√
Compositie project team						
<ul style="list-style-type: none"> expertise of the topic 	I	√	√	√		
<ul style="list-style-type: none"> knowledge of the organisation and industry 	I	√	√	√		
Interne organisatie						
<ul style="list-style-type: none"> Op welke manier beloont u de crowd voor het vrijwillig meedoen aan het oplossen van problemen? 	I/D	√	√	√		
<ul style="list-style-type: none"> Is er een duidelijke link tussen de evaluatie criteria en de beloning? 	I/D	√	√	√		
<ul style="list-style-type: none"> Hebt u wel eens de beloning veranderd en wat voor effect had dit? 	I	√	√			
<ul style="list-style-type: none"> Op welke manier ben je beloond voor je deelname? 	I/D				√	√
<ul style="list-style-type: none"> Zijn er beloningen die je gemist hebt? 	I				√	√
<ul style="list-style-type: none"> Welke middelen zijn volgens u belangrijk om crowdsourcing succesvol te laten zijn? 	I	√	√	√	√	√
Support management						
<ul style="list-style-type: none"> Is het management betrokken geweest bij het crowdsourcing proces? Waarom wel/niet? 	I		√	√		
Interactie						
<ul style="list-style-type: none"> Hebt u tijdens de ideegeneratie op enige wijze interactie 	I/D	√	√	√	√	√

<i>Case study protocol</i>	Method interview/docs	Battle of concepts founders	Toplossing founders	Rabobank managers	Participants Battle of concepts	Participants Toplossing
gehad met de crowd? Waarom wel / niet?						
▪ Op welke manier communiceert u over het probleem en hoe kan de crowd aan u de oplossing communiceren?	I/D	√	√	√	√	√
▪ Kan de crowd inzien welk idee heeft gewonnen?Waarom?	I/D	√	√	√	√	√
▪ Zijn er nog andere momenten waarop u met de crowd communiceert?	I		√	√	√	√
▪ Kan de crowd onderling met elkaar? Zo ja, hoe?	I	√	√	√	√	√
▪ Is het een meerwaarde als de crowd onderling kan samenwerken om zo tot een betere oplossing te komen?	I	√	√	√	√	√
▪ Wat voor achtergrondinformatie over het probleem, context, doelgroep heeft u aan de crowd gegeven?	I/D		√	√	√	√
▪ Was het mogelijk om voor de crowd vragen te stellen als iets onduidelijk was?	I/D	√	√	√	√	√
▪ Had u het idee dat deze informatie ervoor heeft gezorgd dat het probleem volledig duidelijk was?	I		√	√	√	√
Idee evaluatie						
▪ Hoe zijn jullie tot een lijst met winnaars gekomen?	I		√	√		
▪ Zijn de ideeën aan de hand van criteria geselecteerd? Welke criteria?	I/D		√	√		
▪ Waren deze criteria bij de crowd bekend?	I/D		√	√	√	√
▪ Door wie werden de ideeën gescreend?	I		√	√		
▪ Was het bij de crowd bekend door wie de ideeën werden gescreend? Waarom wel/niet?	I				√	√
Output						
▪ Hoeveel ideeën zijn er in totaal aangeleverd?	I/D		√	√		
▪ Waren dit er meer of minder dan verwacht? Hoe bent u hiermee omgegaan?	I		√	√		
▪ Wat vond u van de kwaliteit van de ideeën? Wanneer is een idee volgens u kwalitatief goed?	I		√	√		
▪ Wat is er vervolgens met de ideeën gedaan?	I		√	√		
▪ Hoe zouden de ideeën verbeterd kunnen worden?	I	√	√	√	√	√

Appendix C: Evidence of the Lead user Method

Source	Field	Key findings
Urban and Von Hippel (1998)	PC-CAD software CAD users (n=136)	<ul style="list-style-type: none"> 87% of lead users had already innovated (as opposed to 1% of non-lead users) the concept developed by lead users was preferred over competing cad systems
Morrison et al. (2004)	Library information systems Libraries (n=102)	<ul style="list-style-type: none"> lead usersness explains likelihood of user innovation 70% of innovations provided functionality improvements of at least 'medium' importance to commercial vendors
Lüthje (2003)	Surgery Surgeons (n=262)	<ul style="list-style-type: none"> lead usersness explains likelihood of user innovation 48% of innovations were or soon would be marketed by manufacturers of medical equipment
Franke and Shah (2003)	Canyoning, boarder cross, handicapped cycling, sailplaning Members (n=197)	<ul style="list-style-type: none"> innovators demonstrated higher lead usersness than non-innovators
Franke and Von Hippel (2003)	Web server software Apache webmaster (n=138)	<ul style="list-style-type: none"> lead usersness explains likelihood of user innovation lead usersness explains likelihood of attractive user innovation being ahead of trend explains attractiveness of user innovation
Lüthje (2004)	Consumer outdoor products Customers (=153)	<ul style="list-style-type: none"> lead usersness explains likelihood of user innovation
Franke et al. (2006)	Kite surfing Kite surfers (n=414)	<ul style="list-style-type: none"> lead usersness explains likelihood of user innovation lead usersness explains likelihood of attractive user innovation being ahead of trend explains likelihood of attractive user innovation being ahead of trend explains attractiveness of user innovation

Appendix D: Case study Battle of Concepts

Battle of concepts started two years ago as an intermediary to whom profit- and non-profit-companies can outsource problems which ask for innovative ideas and creative solutions. Battle of Concepts is exclusive for students (HBO & university) and Young professionals (graduated HBO/university) till 30 years old (who can read in Dutch). Everybody in this category can participate for free. They only need a battle account (without any costs). Battle of concepts has 4000 members and this number is still growing. Most of the members are joining more than one battle. There are also several assigning companies who join more than one time. After the battle has ended, the intellectual property goes to the organisation that outsourced the problem.

For some battles it is allowed to participate in a group. The assigning company decides if this is possible or not.

The information below is based on the experience Battle of concepts has with crowdsourcing. In total Battle of concepts executed 67 battles from December 2006 till April 2009.

The task as input for crowdsourcing

According to Battle of concepts most problems are appropriate for crowdsourcing, though the question and problem have to be formulated well. For organisations which has a lot of competition sensitive information crowdsourcing might be less useful as the question and problem are visible to everyone.

Battle of concepts gives assigning companies advice on how to formulate their problems. With their experience they found out that broadly formulated problems, in which participants can come up with every idea that they want, result in divergent and solutions that are not useful.

These are often solutions an organisation already knew, so it is more a confirmation rather than something new. Her advice to assigning companies is to formulate their questions sharply, so it will result in concrete solutions that can be very new.

Finally Battle of concepts state that the participants have a personal interest in the question of the assigning company and they like to solve a problem of which they think it is really relevant. Therefore the question and problem have to be formulated challenging.

The crowd as input for crowdsourcing

At the moment Battle of concepts has 4000 members and this number is still growing. Battle of concepts has spoken to many participants about their skills and motivation. Battle of concepts concluded that the participants in the top ten of the ranking list are creative, innovative and know how to write a concept. They are scanning their environment for things that can be improved, so when they read a question they already have an idea for the solution. In addition they are excellent in translating an idea into a good concept and they know how to make it visual attractive. Because participating is voluntary, Battle of concepts thinks that only very ambitious people participate.

According to Battle of concepts participants are intrinsically motivated. They like to improve things and they want to develop their own skills. However Battle of concepts also found that people are extrinsically motivated. Battle of concepts had two battles (War Child and One man) in which participants could only win points for the battle ranking and there was no prizing money. These two battles only got ten uploaded solutions, while the battles with prizing money and battle points as a reward had at least forty uploaded concepts.

Composition project team

Battle of concepts always work together with people from the assigning company. Battle of concepts mentioned that it is important to do this as the project team has knowledge of the organisation and know what is happening in the market. This has to be communicated to the participants to make sure that the idea will better fit the organisation.

Organisational context as input for crowdsourcing

Participants of the twenty best concepts are rewarded with a sum of money and win some points for the overall ranking on the website, which is called the ‘battle ranking’. The total amount for the prizes for one battle is most of the time 5000 euro. For distributing the money and the ‘battle points’ a distribution code (%) is used by Battle of concepts (figure 13).

Uitslag v/d Battle	Verdeel-sleutel	Totale Prijzengeld (€)	Prijzengeld (€)	Punten Battle Ranking
1	30 %	5.000,-	1.500,-	1500
2	15 %	5.000,-	750,-	750
3	7 %	5.000,-	350,-	350
4 t/m 10	4 %	5.000,-	200,-	200
11 t/m 20	2 %	5.000,-	100,-	100

Figure: 13 Distribution code of Battle of concepts

Furthermore the assigning company can offer participants a job or an internship. The Battle CV (personal and study related information of the individual who won a battle of concept) will be sent to the organisation that outsources that problem. Participants can upload their CV and companies can contact them.

Battle of concepts has experience with crowdsourcing for more than two years and found out that the monetary reward does play an important role. According to Battle of concepts most participants say that they do not upload solutions for money. However Battle of concepts had two battles (War Child and One man) in which participants could only win points for the battle ranking and there was no prize money. These two battles only got ten uploaded solutions, while the battles with prize money and battle points as a reward had at least forty uploaded concepts.

According to Battle of concepts crowdsourcing several resources are needed for crowdsourcing. First solving a problem via crowdsourcing is very time-consuming: A website has to be developed, in the beginning much attention has to be paid to PR for assigning companies, PR for participants and there are a lot of administrative and logistic tasks. Second for crowdsourcing a large group of people has to be reached. The 4000 members Battle of concepts has, is a valuable resource, because it is hard for the assigning company to reach so many people by themselves. Thirdly Battle of concepts has the opinion that their experience in crowdsourcing is a valuable resource. Through their experience they know how to formulate a question well in order to get good solutions. Battle of concepts uses this experience to give assigning companies advice in formulating the problem en giving background information.

Interaction in the process of crowdsourcing

Battle of concepts has contact with the assigning companies and also some contact with the participants. Members of Battle of concepts get a newsletter (max once per two weeks) and Battle alerts with actual battles and the deadline (max once per two weeks). If participants have some questions about the battle they can put the question on the website.

Active participants get an email when Battle of concepts received their uploaded concept and an email with the results and invitations for brainstorm sessions and awards.

Participants can ask questions about the battle if something is unclear. The assigning company will answer these questions.

The crowd has no direct contact with the assigning company. The participants can upload their ideas or solutions on battleofconcepts.nl and Battle of concepts sent the concepts anonymously to the organisation that has outsourced the problem. Participants are not allowed to enclose any personal information in their concept which can influence their anonymity.

According to Battle of concepts background information about the problem plays an important role. Battle of concepts advised assigning companies to tell the participants what they already know and which solution they already tried. For example Kennisnet had a lot of expectations; they thought that the ideas from the crowd should be of very high quality. However almost all the solutions the participants handed in, Kennisnet already knew. The problem here was that Kennisnet dealt with the subject for more than five to ten years and they did not tell the crowd what they already knew. Additionally it is important that the assigning company gives some information about their own organisation, so the solution will better fit the organisation.

Idea evaluation in the process of crowdsourcing

In the beginning organisations had two weeks to evaluate the concepts. Since a year the winning concepts will be published within four weeks. In the beginning about forty concepts were uploaded, but now an assigning company gets eighty and sometimes over a hundred concepts. According to Battle of concepts that is perfect, though it is too much for the assigning companies to evaluate all these ideas within four weeks. Battle of concepts wants to make a pre-selection of the best concepts in which they use the criteria of the assigning company as a basis. This will save the assigning company much time.

Ideas of high quality and the output of crowdsourcing

The regular output of crowdsourcing is not just one solution which the assigning company can use. Often it is a mix of concepts, so it is a unique inspiration source. As mentioned before the quality depends on the formulation of the question and the provided background information. According to Battle of concepts the quality of solutions is better since they provided advice about the formulation of the question. Furthermore the competition in the battle ranking has a positive influence on the quality as it stimulates people with a high ranking to keep continuing to participate in new battles.

According to Battle of concepts, good solutions are not the only purpose of crowdsourcing for many assigning organisations. Assigning companies are also using crowdsourcing for PR, 'labour market communication' en for gaining new insight in trends, market information and customers.

Appendix E: Case study Toplossing

In 2005 the founder of Toplossing had the idea to start a crowdsourcing platform in which a group of independent people could solve a problem. Toplossing focused on companies in the public sector. In 2006 the founder approached an IT company and they started Toplossing. Toplossing had 900 members. At the end of 2007 the founder decided to quit with the crowdsourcing platform as it did not achieve what he thought Toplossing would achieve.

The task as input for crowdsourcing

Toplossing contacted hundred municipalities and asked if they had some unsolved problems. Toplossing wanted to solve these for free. In total fifty problems were sent to Toplossing and at the end fifteen questions with the associated problem were selected for the first battle, for example: How can we attract people for the voluntary fire-brigade? What can we do with the former castle in Buren?

According to Toplossing most problems are appropriate for crowdsourcing as long as it is an interesting subject and the question is formulated well. Toplossing asked the assigning companies to formulate the problem together. However it took too much time to collaborate with the assigning companies and therefore Toplossing decided to do it themselves. According to Toplossing a subject is interesting when the question is challenging, everybody can imagine the problem and when it asks for a creative solution.

In the beginning the solution of the ideas were very divergent, Toplossing thought that the reason of this was that the problem was defined to broadly. Therefore Toplossing decided in the third challenge to make the question more specifically by splitting the question into five sub questions, in which each sub question showed another point of view. This resulted in more ideas of high quality.

The crowd as input for crowdsourcing

Toplossing had 900 members of which 300 participated in the first battle. According to Toplossing people participated because they wanted to prove themselves. They thought that they could solve innovative problems and they wanted to know if their ideas were better than others. Finally some of the participants were motivated as there was a chance to win something and they saw it as a challenge to solve a problem.

Composition project team

Toplossing tried to work together with the assigning company. However the assigning company delayed the process and therefore Toplossing decided to do everything on their own. This means that there was no project team of the assigning company involved.

Organisational context as input for crowdsourcing

Toplossing rewarded the best three solutions with prizing money. The winner got 150 euro, the participant on the second place 100 and the participant on the third place 50 euro. There were no other rewards for the participants.

All the participants got an email in which the winners and solutions were published. For the winners this was a form of recognition. Toplossing wanted to invite the winners at the municipality and also tried to ask J.P. Balkenende to publish the winners. However Toplossing could not realize this, so they sent an email with the winning concepts to all the participants and sent the winners their prizing money.

According to Toplossing the most important resources needed for crowdsourcing are the website and enough time. The website has to work well, because that is the only communication tool with the crowd. Finally crowdsourcing requires much time. Toplossing got thousand mails in three weeks from people who signed in, submitted a solution and asked questions.

Interaction in the process of crowdsourcing

Toplossing expected that the whole process of crowdsourcing (signing in, idea generation, selection and publishing the winners) should take three weeks. However this was too optimistic. In total it took them seven weeks in which participants had three weeks the time to come up with a solution. All the contact Toplossing had with the participants was by email. They sent emails about new challenges, the deadlines, the number of concepts, the date when the jury started with their evaluation, etc. According to Toplossing all the communication has to be clear and transparent to avoid miscommunication about the solutions or about the winners. When participants had a question they put it on the website and Toplossing tried to answer each question within 24 hours.

The background information about the problem provided the following information: Who experiences the problem, what is the problem exactly, why do you want to solve it? How did you try to solve it and why did it not work? It took Toplossing one week to find sufficient background information.

Idea evaluation in the process for crowdsourcing

Toplossing used three criteria for the evaluation of the concepts, namely creativity, feasibility and applicability. Furthermore they told the participants that the solution had to cost less than 10.000 euro and it should be possible to implement the solution with less than 3 fte.'s. The idea was that Toplossing should evaluate the ideas with the assigning companies. But when it was time to evaluate the assigning companies did not have time to help, so Toplossing evaluated the ideas on their own. They had an evaluation committee of five people, some people from a municipality (which the founder of Toplossing knew) and some entrepreneurs.

Ideas of high quality and the output of crowdsourcing

The solutions Toplossing got back in the first two challenges were very divergent. Some of the solutions were feasible in 2050, others did already exist. And all the solutions went in different directions. According to Toplossing the output of crowdsourcing should be finding the right direction of the solution and not the end solution. When the right direction is found, a new challenge can be started up to find the right solution of that direction.

After the selection Toplossing sent the solutions to the assigning companies, but they did not give any reaction on the solution.

Appendix F: Case study Rabobank

Rabobank Nederland is the supporting business for the independent local Rabobanks, facilitating and advising its associated banks on matters of strategy and policy, marketing and product development, and information technology. Around 6,100 staff works at Rabobank Nederland.

Rabobank wanted to create a more open way of innovation. Rabobank was contacted by Battle of concepts to participate in a kind of 'pilot battle'. This fitted well to Rabobank's opinion to be more open, so Rabobank decided to participate. Rabobank had put two battles on Battle of concepts and is planning another one. The first battle did not result in good solutions, but the second one did. Therefore these two experiences will be compared.

The task as input for crowdsourcing

The first battle of the Rabobank was about serious gaming. The participants were asked to come up with a(n) (interactive) serious game in which employees get more insight in the needs of the clients of the Rabobank in order to help their clients more efficiently and effectively. In the first battle Rabobank did not think much about which question should be appropriate for crowdsourcing. Afterwards they concluded that their question was defined too broadly and vaguely. Rabobank learned from the first battle that it is very important, but also very hard to give a good definition of the problem.

In the second battle Rabobank formulated her question more specifically and the problem was better fitted to the members. The main question was: How can Rabobank prevent that youth switch to another bank? In this battle it was clear what the problem was and Rabobank was more satisfied with the solutions.

Battle of concepts helped Rabobank with the formulation of the problem, showed some examples of other battles and they had a lot of experience what works and what does not work. Additionally they had some students who were screening the question, problem definition and background information and who were giving feedback. According to Rabobank this help was very useful. In addition Battle of concepts told the Rabobank to add a question like 'what is your experience with the bank'. This gave Rabobank new insights in their focus group.

The crowd as input for crowdsourcing

According to Rabobank participants want to solve a problem if they have some knowledge and some experience in the subject. Money played the most important role and in the second place recognition will have a positive influence on their motivation and is for many people a real reward. Finally the chance on a job offer might play a role.

Composition project team as input for crowdsourcing

In the first battle the project team of Rabobank consisted of 2 persons of business and development. As they focus on innovation they know what is happening in the market. However the people who had to work with the idea and how know a lot of this topic were not involved. The second time Rabobank did involve this people. They mentioned that it is important to involve the people who have to work with the ideas as they select idea that will fit better to the organisation.

Internal organisation as input for crowdsourcing

Besides the reward system of Battle of concepts, in which the top twenty was rewarded with money battle points, Rabobank also had some extra rewards. After the battle Rabobank gave all the participants feedback, though that was a lot of work, because eighty people participated in the second battle. However Rabobank thinks it is important to give everyone feedback, because the

participants put a lot of effort in their work. So it is a kind of recognition of their work. Besides that the top three was invited to present their solutions to a larger group of people of the Rabobank. In the second battle the innovation manager of the Rabobank told the department who has to work with the ideas that they have to involve the participants in working out the solution. As this is a good form of recognition.

Regarding resources, Rabobank state that organisations should not expect that crowdsourcing is a cheap, easy and fast way of generating ideas. Crowdsourcing costed Rabobank more money than when they should solve a problem internally or by an external bureau. For the first battle Rabobank spent, only at internal hours, 200 hours (at an hourly rate of 150 euro). Especially the evaluation of ideas and giving everybody feedback is time consuming. Applying crowdsourcing with the help of Battle of concepts saved Rabobank a lot of time. Battle of concepts answered questions of participants, accepted new participants, did the promotion, etc. Furthermore, Battle of concepts helped Rabobank to make the crowdsourcing process more professional as Battle of concepts gave good advice and checked if the battle was formulated well and if it should fit the target group. Rabobank therefore perceived the help of Battle of concepts as very valuable.

Support management in the process of crowdsourcing

According to Rabobank it is hard to make people aware of open innovation. The organisation thinks that generating new ideas in collaboration with people from outside the organisation is a good way. But it is sometimes hard, because there is a chance that that the employees will not accept idea from outside the organisation. People are unwilling to adopt an idea because it originates from someone else. According to Rabobank the mindset of employees should be changed, so they will adopt ideas from people from outside the organisation.

Support of management is needed for this and to integrate the ideas in the organisation.

Interaction in the process of crowdsourcing

When the problem definition was approved, Battle of concepts put the question on their Internet site and the participants had about a month to upload their solutions. A week before the deadline only five concepts were uploaded, but in the last twenty-four hours almost 60% of the solutions were handed in. In total almost forty solutions were uploaded for the first battle. In the second battle this was almost eighty concepts. During the process there was hardly any interaction between Rabobank and the crowd. Sometimes participants asked a question about the problem and Rabobank tried to answer this.

Battle of concepts gave Rabobank advice to provide the participants of some information. Rabobank should give information about the organisation and the problem. In the first battle the background information was as follow:

- What is a serious game?
- Examples of serious games
- Information about the Rabobank (organisation, core values, strategy)
- Their expectations (the components of the concepts)
- The selection criteria
- Extra sites about serious gaming

After the battle Rabobank concluded that their information was to general. They did not think about 'Waar moet de serious game voor dienen? Voor welke kennisoverdracht willen we een

oplossingsrichting hebben?' On the other hand they pushed the participants too much in one direction for a certain type of game. The reason for this might be that they gave three examples of serious games that already exist. So the solutions were not very spectacular and were all related to one type of game.

According to Rabobank it is necessary to find a right balance between getting useful solutions and getting new solutions. When Rabobank writes down what kind of solutions she already found by herself, she will prevent that participants come up with 'old' solutions, but it will also limit people in their thinking. Therefore Rabobank learned that she had to give some constraints that prevent old solutions rather than stating solutions they already found themselves.

In the second battle Rabobank tried to not push the participants and gave the following background information was provided.

- Information about the Rabobank
- Inducement of the battle
- Examples of what Rabobank already does for youth
- The battle (for what is the Rabobank looking & constraints)
- Expectations
- Selection criteria

Rabobank wrote down what kind of solutions they were looking for and they gave some pre-limiting conditions instead of giving some examples of possible solutions. The solutions for this battle were of higher quality than in the first battle.

For Rabobank it was sometimes hard to decide if they gave less or too much information as they know everything about their own organisation. Therefore the feedback of Battle of concepts about the background information was very helpful.

Idea evaluation in the process of crowdsourcing

The next step was the evaluation of the solutions. This was completely underestimated by Rabobank. Rabobank had four weeks to select the ideas, but that was too short. At the end she spent six weeks at the evaluation of ideas. The organisation was surprised that participants put so much effort in their work, only one or two people wrote less than one A4. Most of them wrote four to six pages and two people of Rabobank had to read it all. In the first battle it was not clear from the beginning on what criteria participants could score points. Later on they thought about the criteria. The two people made a ranking of the best ideas and they discussed this ranking with some other persons of the Rabobank who had to work with the game. Then the final ranking list was made. Rabobank gave all the forty participants some feedback.

In the second battle more people were involved in the evaluation phase and the selection criteria were clear from the beginning. That saved a lot of time, though the turnaround time was larger as two people can work faster than a group.

Change mindset of employees in the process of crowdsourcing

Rabobank experienced in other innovation projects, in which they involved external people, that there is a chance that nothing will happen with the ideas. According to Rabobank people do not want to adopt ideas from others. They are not used to the fact that external people can also come up with good ideas. Therefore it is very important that the mindset of employees will be changed.

That is hard, because the culture in the organisation has to be changed. But it is of importance to make sure that ideas from external people will be implemented.

Ideas of high quality and the output of crowdsourcing

In the first battle the solutions were not very spectacular and they did not fit very well to the question, but as mentioned before this might be because of the problem definition. However Rabobank was not very dissatisfied as they got a lot of new insights about their target group. In the second battle the solutions were much better. Rabobank thought that the reason for this might be that the problem definition was more specific. Besides that Rabobank thought that the second battle was better related to the target group, because everybody has a bank account. The battle about 'serious gaming' was more specific for a certain type of people, so therefore less people participated in this one.

According to Rabobank the success of crowdsourcing is not only related to the solutions the Rabobank got back, but it is also related to the PR Battle of concepts made for the Rabobank, the network of students it got access to, new insights about the opinion of students on banks and proving the value of external ideas to their employees.

Appendix G: Case study participants of Battle of concepts

Four participants of Battle of concepts have been interviewed of which two are ranked in the top ten. Two participants are students and the other two are young professionals. This section will give an overview of their motivation, their skills and their experience with crowdsourcing.

The task as input for crowdsourcing

All the participants preferred open questions, so they could put their creativity in it. However, the problem behind the question needs to be very clear. Participants are more motivated to solve the problem when the question is related to a real problem where the organisation deals with. Then the participants feel that they can add real value and their solution will have more impact. Furthermore it is extra challenging if the question is defined by an interesting organisation (larger, known brand), but the question and problem definition has more influence on the motivation to participate.

The crowd as input for crowdsourcing

Participants of Battle of Concepts like to come up with new ideas and they want to solve problems. That is why they participate. All of them think that it is important that you are creative and that you know how to communicate your message. The message has to be exciting. During crowdsourcing three out of four participants read the question and the problem of the organisation and are thinking about it for a couple of days. One of the participants called this focus thinking; you read the problem and keep it with you for a couple of days and relate everything what you see to it. He thinks this makes him a winner.

Additionally candidates participate when the question is related to their expertise. The participants with technical studies solve technical solutions and participants with alpha studies solve non technical studies. The participants thought that there was a higher chance if they had some knowledge of the related subject.

According to the motivation, for one of the participants the monetary reward was the main reason to join Battle of concepts. For others money was not the main reason, but it did play a role. When they knew they could win some money they wanted to put some extra effort in working out the solution. All of the participants thought that they could develop themselves or their team's problem solving skills by taking part in a battle.

For the two participants in the top three of the ranking list of Battle of concepts, the battle ranking played an important role in their motivation to keep participating in battles. In the beginning they did not pay much attention to it, but when they went up in the ranking list it motivated them to keep continuing to participate in new battles. Especially when they reached the top ten, they paid constantly attention to the fact if someone should pass them. And if someone did, they wanted to subscribe for another battle to win new battle points. Finally participants did not participate in the hope for a job offer or to put their attempt on their resume.

Organisational context as the input for crowdsourcing

For all the participants money has a positive influence on motivation. Three out of four participants keep in mind the chance to win. One participant has the opinion that the chance is too small to win, though two others think there is a fair chance as twenty people are rewarded. When participants win a battle they are motivated to subscribe for a new one.

Feedback is for all the participants of high value as they can learn from it. They all share the opinion that the feedback has to be content-related. The participants did not get much feedback, often three to five sentences. The top ten got feedback that was related to the content, but after the top ten it was often more general (thank you for participating, some solutions were better than yours,

etc). Three out of four participants share the opinion that everybody should get feedback and not only the top ten as they see feedback as a kind of recognition. The other one would like to get feedback, but thinks it is impossible for the assigning company to give everyone feedback as it takes too much time.

Another point which is related to feedback is that the organisation only shows which solutions are in the top 20. After that is not clear if your solution is 21 or 100.

The participants would also like to know what the ranking is after the 20th place. Also here they realise that it is hard for organisations to evaluate all the solutions. However the participants are also satisfied with a category ranking. For example these solutions are in the '20th to 30th best solutions', the next ten are in the '30th to 40th best solutions', etc. This can also motivate people who always end between the 20th and 30th place to work a little bit harder.

Finally all the participants see it as a form of recognition when the organisation invites them to present their solution in the organisation or to attend a workshop.

According to the participants time is an important resource since evaluating the ideas and giving everybody feedback is a time consuming process. Furthermore the website is a crucial resource.

Interaction in the process of crowdsourcing

The process of idea generation is done by the participants on their own. They did not have much contact with Battle of concepts or the assigning company. Only the appointments and deadlines were communicated by Battle of concepts and if the participants had a question they could ask it on the website.

Almost all the participants read the question and the problem and thought about it for a couple of days. They searched on the Internet for some extra information about the subject and some of them tried to relate it to solutions in other field. Most of the participants work out their solution in the last weekend and upload it.

For the participants is useful to get some information about the organisation and about the background of the problem. They thought that this information was needed to come up with a solution that fits to the organisation. Additionally the participants prefer that the organisation give some pre-limiting conditions for the solution instead of restrictions, as restrictions limit their creative thinking. With clear pre-limiting conditions, organisations can prevent that participants come up with solutions that are not new or solutions in wrong directions.

Idea evaluation in the process of crowdsourcing

All the participants knew that the assigning company evaluated the concepts, but they did not know which people in the organisation evaluated it. According to the participants it would be a deception when the concepts were evaluated by Battle of concepts. They did not care that it is not clear who in the organisation evaluated the ideas, though it might be useful as they could write the text for that person.

Before starting the battle the selection criteria were clear for the participants. This was very important for them, because they knew how they had to develop their concepts. However three out of four participants had negative feelings about promises which are not being fulfilled. Battle of concepts and the assigning company set up some criteria, for example the solution had to be maximum five pages and then the participants found out that the winner has a solution of ten pages.

Ideas of high quality and the output of crowdsourcing

Two participants solved both problems of the Rabobank. Both preferred the battle of serious gaming, because the question was more open and they could put all their creativity in the battle. However according to Rabobank the solutions in the battle of serious gaming were of less quality. According to the participants the formulation can result in better ideas when pre-limiting conditions are mentioned.

Appendix H: Case study participants of Toplossing

Three participants of Battle of concepts have been interviewed. One of them was a student en the two others were working people. Here the results of their interviews will be discussed.

The task as input for crowdsourcing

According to the interviewed participants it is important that the question and problem is formulated clearly. The participants thought that they can come up with a better idea if they know the real problem behind the question. When questions were formulated unclearly, participants were not motivated to solve that question.

In addition participants selected problems which were challenging and problems which they could imagine (which they saw as a real problem).

The crowd as input for crowdsourcing

Participants of Toplossing participated as they like to come up with new ideas and they want to solve problems. They selected questions which were related to their knowledge and expertise, because they thought this makes it easier to win. Furthermore they think that they are creative and they are looking around for things that can be improved.

For some of the interviewed participants of Toplossing the monetary reward was not a reason for them to participate, for others it did play a role. Besides that the game element also played a role, they wanted to know if their idea was better than others and wanted to test their own skills. Finally all the participants wanted to get some recognition. They like it when everybody can see that their name is put in the list of the winning concepts.

Organisational context as input for crowdsourcing

For some of the interviewed participants money had a positive influence on their motivation to participate. However the winners never got their money from Toplossing. This had a negative influence on their motivation. The participants like it when their name was published in a list of winners, because they see this as a kind of recognition. Finally they should like it to get feedback on their solution. The assigning company never communicated their opinion about the solution. Feedback is seen as a kind of reward by the participants and they can learn from the feedback of the organisation.

Regarding the resources, some of the participants mentioned that the website of Toplossing did not work well and was very slow. According to the participants a well working website is an important resource in the process of crowdsourcing as this influence their motivation. When the website did not work well a few times, the participants were less motivated to participate.

Interaction as process of crowdsourcing

During the process the participants did not have any contact with the assigning company. The intermediary, Toplossing, keep them informed about the process. Emails were sent with a reminder of the deadline, the number of ideas handed in and Toplossing informed them about the evaluation process. According to the participants, Toplossing communicated all the appointments and deadlines well. Everything was clear for the members.

The generation of ideas was done by the participants on their own, but they had the opportunity the ask question when something was unclear about the problem definition.

Information exchange as process of crowdsourcing

The participants got some background information of the problem and there was good communication about the criteria of the problems. In addition also some information was giving about the assigning company.

According to the participants it is important that organisation do not tell for what kind of solutions they are not looking for, because this limits their thinking. Instead of restrictions they should give some pre-limiting conditions for the solution.

Idea evaluation in the process of crowdsourcing

Toplossing communicated that the ideas were evaluated by a professional jury. Therefore the participants thought that the assigning company evaluated the ideas. According to them this is the best way, because the assigning company experiences the problem and they know better what kind of solution fits to their organisation.

Finally, at the start of the crowdsourcing process the evaluation criteria were communicated well. According to the participants this was useful, because it helped them to find a good solution.

Ideas of high quality and the output of crowdsourcing

According to the participants the output of crowdsourcing is an idea, which is worked out in one page. Most of the participants did not want to work out the idea into a concept of, for example, five pages. According to the participants an interesting problem, which is formulated clearly should result in better ideas.

Appendix I: Case study potential participants of Battle of concepts

As mentioned in section 2.6.1 self-selection plays a role in crowdsourcing. The interviews with participants of Battle of concepts and Toplossing gave more insight in the motives for people to participate. However it is also interesting to find out why people do not select themselves in the group, to participate in crowdsourcing. There are some people at Battle of concepts who made a battle account, but never handed in an idea. Seven of these people were contacted and questions were asked about their motives not to participate, while they made a battle account.

Three out of seven mentioned that they were curious about crowdsourcing, so that is why they subscribed. Three others made a battle account, because they wanted to get some experience in solving problems and wanted to extend their knowledge. Another potential participant wanted to win some money.

All of the interviewed people were enthusiastic about crowdsourcing and they still get and read the emails of Battle of concepts with the problems. However they still did not hand in a solution. Five out of seven participants mentioned that they did not participate as they were very busy and did not have enough time to solve a problem. According to two others they did not hand in a solution, because they did not have a good idea and one of them also mentioned that the problems were not related to his expertise.