
Imagination as a driving force for inter- organizational innovation

The development of a
research framework

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Preface

Imagination is more important than knowledge.

-- Albert Einstein

Many thanks to my parents who always fed and never rejected my imaginative thoughts, Annalena with whom I like to imagine a future, and Udo, Eefje, Koen and the people at Alliander and Groene Netten who gave me the courage to use my imagination for this graduation project.

Summary

With the help of a qualitative case study and existing literature from scientific fields like social sciences, psychology, policy studies, and innovation studies a research framework was compiled for studying imagination as a driving force for innovation fueled by its social context. A try-out of this research framework suggested the result of this graduation project is a promising step towards the development of a tool that helps to identify and facilitate the imaginative needs of individuals to engage successfully in inter-organizational innovation projects, if it can be merged with work on organizational culture and personal decision styles. This research framework has four levels:

1. The description of the main concepts innovation, inter-organizational collaboration, and imagination. The innovation considered in this research is process innovation from existing companies (a category that fits most innovation projects driven by CSR-policies). Innovation in an inter-organizational network is described as a complex decision-making process, and imagination as a driving force for innovation is described as providing a mental image of the innovation at hand that is well-developed in a creativity dimension and an emotional dimension, which provides the flexibility, holism, and motivation for action that is needed to develop and implement and innovation successfully.
2. A conceptual framework that ties together these main concepts. This level is built upon a conceptual framework from social psychology that links stimuli from the social context to behavior from the individual via a black box of cognitive processes and a mental representation. Based on the empirical research, this conceptual framework is extended with an additional pathway between stimuli from the social environment and behavior, and with other 'destinations' for the results of the cognitive processes than just the mental representation of the current innovation project.
3. A layered operationalization of the four elements in the conceptual framework. To operationalize the stimuli from the social environment, the concepts arena games (from policy studies) and network structure (from group dynamic theory) are used. For the operationalization of the mental representation, five imaginative qualities are

determined. Three of them are creative and increase the flexibility of the individual's innovative action, and two of them are emotional and increase the motivation for action of the individual. The operationalization of the cognitive processes and the behavior of the arena attendees emerged from the empirical data, just like additional layers of operationalization for the other elements of the conceptual framework that are probably more specific for the specific research context of this graduation project. The cognitive processes are operationalized as a set of nested trade-offs that assess the quality and fitness of proposals concerning the innovation project that are done in the collaboration arena. If the final judgement of this assessment is positive, the proposal will become part of the mental representation. The differences and similarities perceived by an arena attendee between his own mental representation and the mental representations of his fellow arena attendees influence his behavior.

4. A description of how the operationalized constructs can be identified in the raw data.

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1 Introduction

Industrial Ecology is a normative science, since it propagates sustainability as a priority for all actors in society (Graedel and Allenby, 2010). As such, it is focused on the sustainability of systems rather than the sustainability of products. In this systems approach, the connection to the individuals involved in these systems is sometimes missing. In the end, it is these individuals that, with their decisions and actions, shape our world. This graduation project for Industrial Ecology starts from the premises that the imaginative power of the individual is an important driving force of innovation. This thesis proposes a way of studying the dynamics of this driving force in its social context.

The development of this framework from a literature study and a case study will be presented in this thesis, but first, the research topic will be introduced. In this introduction, the relevance of studying imagination in a social context aimed at developing new inter-organizational collaborations is shown, and the research aim and research questions of this thesis research project are presented. At the end of the introduction, a reading guide for this thesis is provided.

1.1 The power of imagination

If we want to make the transition to a sustainable society, fundamental change of the systems that support our lifestyles are needed in for example the energy, food, construction, and mobility domains of society to ensure the continued existence and livability of the Earth and its 7 billion inhabitants (Graedel and Allenby, 2010). What is an important capacity that the individuals working on these changes need to employ? Albert Einstein had an idea about this. *“Imagination is more important than knowledge”,* he said, *“for knowledge is limited, whereas imagination embraces the world, stimulating progress, giving birth to evolution”* (Einstein and Shaw, 2012).

Imagination is a strong driving force for innovation. It enables us to think of something new, and, maybe even more importantly, it helps us to grow expectations about the possibilities of the future. These expectations motivate us to invest time, money, and energy in working towards this future (Borup et al., 2006). In this way, imagination is the start of a new reality. From this, it can be concluded that being able to study the development of imagination use

and understanding its mechanisms holds the promise of increasing our abilities to purposefully facilitate imagination during the design and implementation of innovations.

1.2 Collaboration for innovation

From an Industrial Ecology viewpoint, true sustainability needs collaboration from different organizations of society. So, both public and private actors have to be involved in innovation towards sustainability, as well as entire supply chains from the local and global economy. Although innovation theories exist that attribute radical innovation to start-up companies (Schumpeter, 1976), also existing organizations work together on making their processes more sustainable under the flag of CSR-policies.

Existing organizations may theoretically not be the locus of radical innovation, it is, not easy to determine if the inter-organizational and inter-sectoral nature of collective innovation efforts makes it harder or easier for the representatives of these organizations to mobilize their imaginative forces than it would be during an intra-organizational innovation project. On the one hand, they could become easily inspired by the ideas or resources the other organizations have to offer. On the other hand, inter-personal relations are more complex, because the arena attendees have other goals than maximally supporting the collective innovation project. They also have to advocate the interests of their organization, and gain the trust of the other participants that they will not exploit the collaboration project.

1.3 Research aim

Little studies are available on the topic of imagination in an inter-organizational innovation context. This research aims to start closing the gap between social psychology and (innovation) network studies by developing a research framework that makes it possible to study both the dynamics of imagination itself and the dynamics between social context and imagination. A research framework has different levels. These levels are represented in Figure 1.1. This research attempts to propose a framework that covers all these levels.

The most abstract level of the envisioned research framework consists of the main concepts and their descriptions. The level below describes the relations between these main concepts with a conceptual framework. The third level of the research framework contains the operationalization of the elements in the conceptual framework. Suggestions on how these elements can be traced in the raw data can be found in the fourth level of the research

framework, the visibility level. Together, these levels form the research framework for imagination as a driving force for innovation fueled by its social context.

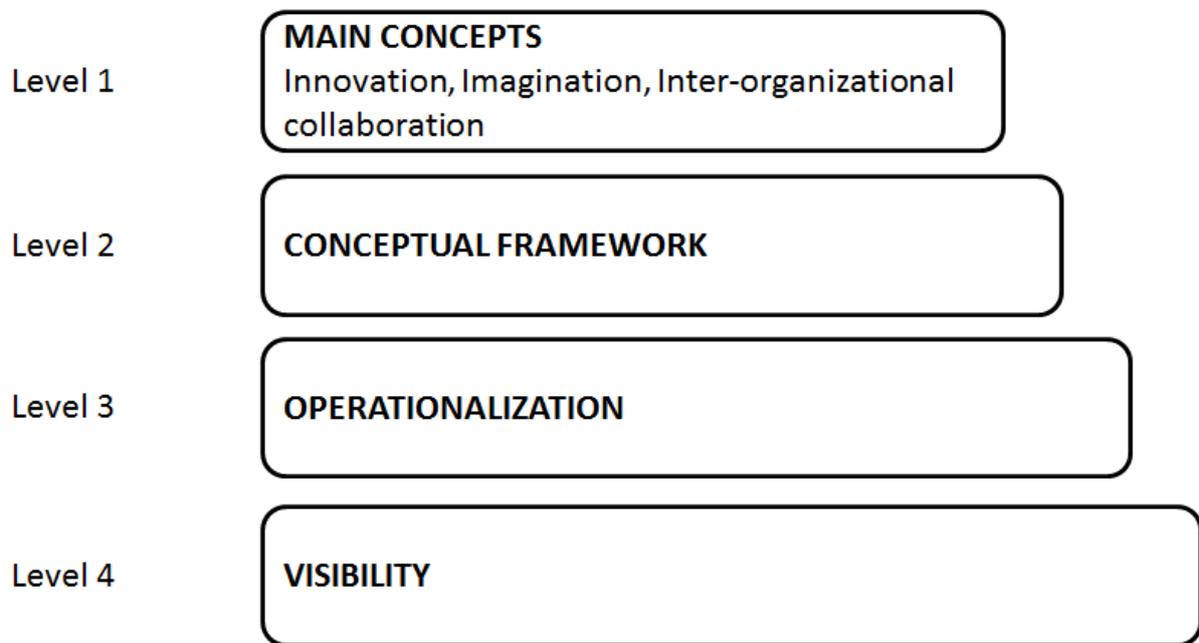


Figure 1.1: The four levels of the research framework hierarchy

Hopefully, this research framework will be the first step towards the development of a tool that helps to identify and facilitate the imaginative needs of individuals to engage successfully in inter-organizational innovation projects.

1.4 Research questions

Building on the problem statement and research aim presented above, the following main research question was compiled: *How can imagination be studied as a driving force for innovation in an inter-organizational context of established organizations?* This main research question can be split in five sub questions. The first four sub questions each refer to a level of the research framework as it was presented in Figure 1.1. The final sub question reflects on the value of the research framework for innovation. All sub questions are listed below.

1. How can the main concepts innovation, imagination, and inter-organizational collaboration be described?
2. How can the relations between the main concepts be summarized in a conceptual framework?
3. How can each part of this conceptual framework be operationalized with directions that are relevant for investigation?

4. How is the proposed operationalization visible in empirical data?
5. How can this research framework facilitate the development of a tool that helps the facilitation of the imaginative needs of arena attendees that work on inter-organizational innovation projects?

Partly, these sub questions could be answered in a so-called ‘top-down’ manner: By reading scientific theories. However, scientific literature could not compile a complete research framework for imagination in its social context. A ‘bottom-up’ approach, namely the empirical investigation of a particular inter-organizational innovation project, was used to fill the gaps in the research framework, and evaluate the part of the framework that was based on scientific literature. For some levels in the research framework, both approaches were used in a complementary way. In Table 1.1, an overview of the approaches per sub question is presented.

Level of the research framework	Top-down approach	Bottom-up approach
1: Main concepts	X	
2: Conceptual framework	X	
3: Operationalization	X	X
4: Visibility	X	X

Table 1.1: Use of top-down and bottom-up approaches for compiling each level of the research framework.

1.5 On this thesis

To answer the research questions, several steps were undertaken in this research of which the methods and results will be summarized in this thesis report. What can be expected from the following chapters is described below.

Chapter 2 describes the results of the literature review. From a top-down approach, suggestions are done to fill in the first, second, and third level of the research framework, and thereby (partly) answer the first three sub questions. The main concepts are described, a conceptual framework is proposed, and several parts of this conceptual framework are operationalized using literature from sociology, psychology, political studies, decision-making studies, and creativity studies.

Chapters 3 and 4 form the transition between the preparatory literature study and the empirical elaboration of the research framework of imagination in its social context. Chapter 3 sets the research context for this graduation project, and in Chapter 4 the research methods are presented. In Chapter 3, it is first explained why a case study suits this research. Secondly, the aim, timeline and coalition of participating organizations of the case study of this graduation project are described. Finally, the case study design is elaborated on. Chapter 4 describes how the data was collected and analyzed with a combination of qualitative methods. The risks that these methods pose for the quality of the research are also assessed for their relevance in this particular case.

Chapter 5 shows how the raw data from the empirical context was linked to the proposed conceptual framework. Why certain fragments of data were interpreted to refer to a concept is explained, and examples of these references are provided. This chapter answers the sub question on the visibility part of the research framework with complementary bottom-up and top-down approaches.

Chapter 6 and Chapter 7 deal with the bottom-up exploration of the operationalization level of the research framework. Both chapters propose updates to the second level (conceptual framework) and third level (operationalization) of the research framework as it was presented in Chapter 2.

Chapter 6 begins with a description of the social context as it is experienced by the interviewees. Then, the mechanisms that were found to mediate between the social context and the individual's resulting imaginative mental picture of the innovation project are presented in a big scheme. Further elaboration on these mechanisms fills the rest of this chapter.

Chapter 7 starts with a description of the mental images of the innovation project of the interviewees. Then, the link between these mental images and the behavior of the arena attendee is explored. The findings in this chapter finish the research framework for imagination as a driving force for innovation fueled by its social context.

In Chapter 8, the research framework is tried out to see if it can help the development of a tool that facilitates the imaginative needs of individuals that work on inter-organizational

innovation projects. For this purpose, it is checked if the framework can help to identify the development of the imaginative qualities of the arena attendees, and the events or circumstances in the innovation environment that boost or limit their imagination.

The main conclusions of this research are summarized in Chapter 9. Also, the credibility of the results of this research is evaluated.

2 Research framework based on literature study

In this chapter, a first version of the research framework is presented that is based on scientific literature from social psychology, sociology, psychology, innovation studies, and policy studies. This version of the research framework is a first attempt to answering the first three sub questions of this research:

- How can the main concepts innovation, imagination, and inter-organizational collaboration be described?
- How can the relations between the main concepts be summarized in a conceptual framework?
- How can each part of this conceptual framework be operationalized with directions that are relevant for investigation?

So, in this chapter, the three most abstract levels of the research framework for imagination in its social context will be filled in: The main concepts, the conceptual framework, and a theoretical operationalization (see Figure 2.1).

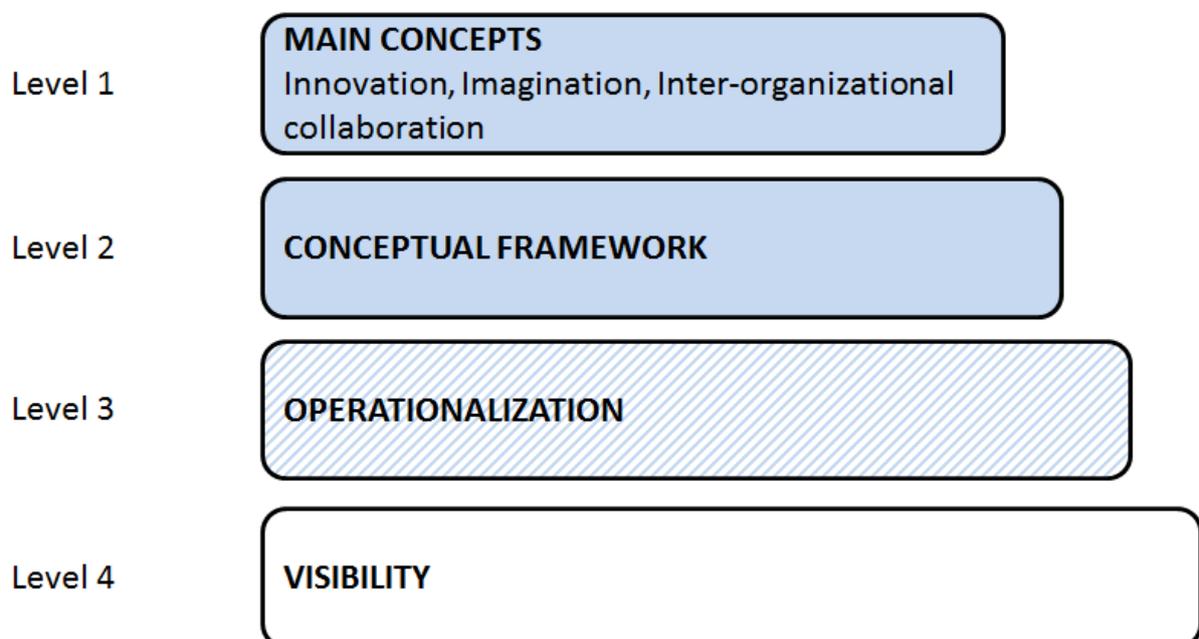


Figure 2.1: The levels of the research framework hierarchy that are reviewed in this chapter.

The contents of the most abstract hierarchy of this framework, the main concepts of innovation, inter-organizational collaboration, and imagination, are described in section 2.1. In the next level, these main concepts are tied together in a conceptual framework. The

cognitive process scheme that serves as conceptual framework and depicts how input from the environment influences an individual's behavior is presented in 2.2. The theoretical operationalization forms the third level of the hierarchy. It contains the categories that help to structure information that is gathered for each element of the conceptual framework. Which of these categories could be deducted from literature can be reviewed in section 2.3. This study of scientific literature left some gaps in the theoretical operationalization of the research framework. These gaps will be filled with the results of an empirical case study in Chapters 6 and 7. In section 2.4, the first version of the research framework that was compiled in this chapter is summarized visually.

2.1 Defining the main concepts of this research

In this section, the main concepts of this research are introduced: Innovation, inter-organizational collaboration, and imagination. This definition of the main concepts is the first level of the research framework for imagination in its social context that this graduation project aims to develop. The definition of the main concepts shows that the research framework is aimed to be applicable at inter-organizational innovation projects with specific characteristics given the kind of innovation aimed for, the development stage of the innovation project, and the kind of collaboration network that is formed by the actors, namely:

- The kind of innovation aimed for is process innovation, and this innovation is developed by changing the activities and external relations of participating organizations.
- The innovation project is in the first stage of development in which nothing is decided yet.
- The collaboration network is a complex network.

Apart from the main concepts innovation and inter-organizational collaboration, imagination is also defined more specifically as a driving force of innovation. Below, these characterizations of the main concepts are described in more detail.

2.1.1 Innovation

Innovation is a very broad concept that has been defined in many ways over the past few decades. A well-used characterization comes from an evolutionary economic perspective and

was called 'creative destruction' by Schumpeter (Schumpeter, 1976). He claims economic development depends on a variety of new entrepreneurs that enter the market, of which some are selected by the current market conditions. These start-ups can grow and destroy the position of established companies, thereby transforming the economic system.

Admittedly, innovation does not only come from new market entrants. Existing companies innovate as well. This is why a more general characterization of innovation is more appropriate. In the OECD's Oslo Manual, an example of such a description can be found. Summarizing their view, innovation is either the implementation of a new or improved product, being a good or a service, or the implementation of a new or improved process that contributes to the delivery of that product, like marketing methods, workplace organization or external relations (OECD, 2005).

Innovation initiatives that originate from the CSR-policy of existing organizations will usually be process innovations. The aim is to execute the same function, but in a more sustainable way (for example by using power from solar panels, increasing heat-efficiency, or using materials more sustainably). This often means the organization has to change the activities they are involved in (for example installing solar panels, researching heat losses, and engaging more with their supply chain), and the external relations with actors in society (for example quitting the relation with the electricity supplier and building a relation with a solar panel supplier, or by offering their product as a service to their customers).

2.1.2 Inter-organizational collaboration

In this section, the way inter-organizational collaboration for innovation is regarded in this research is described as a kind of decision-making process in a complex network.

1 - The innovation process as an inter-organizational decision-making process

Many of the sustainable innovation processes that are currently developing can be seen as an inter-organizational decision-making process. This has to do with the fact they start out as a brand-new project in which nothing is set in stone yet. There are no agreements on the activities of and collaborations between the actors. All parties involved are just exploring options both alone and collectively. The goal of these explorations is to determine if it is fruitful to invest in developing new activities and relations with the other actors. This is a

creative process, but also a negotiation. These interactions between actors end with a decision, and can be followed by another decision-making cycle if it is decided the project development should continue.

In itself, the scientific field that focusses on decision-making processes fits this research very well, since it consists of literature about both the individual and social dimension of decision-making processes. An additional benefit of using this perspective is that it enables the use of a large body of literature on inter-organizational policy-making in the remainder of this literature study. Why this is the case is explained in the next paragraph.

Although the theoretical bodies focused at inter-organizational decision-making and inter-organizational policy-making have different goals, several actors have described the processes involved to be similar. Klijn and Koppenjan, for example, see inter-organizational policy-making as a subcategory of inter-organizational decision-making (Klijn and Koppenjan, 2000). Similarly, Elg and Johansson frame decision-making in inter-firm networks as a political process (Elg and Johansson, 1997). These researcher couples characterize both inter-organizational policy-making processes and inter-organizational decision-making processes as interaction processes between many actors that are loaded with subtle moves aimed at influencing the perceptions and beliefs of other actors (Elg and Johansson, 1997; Klijn and Koppenjan, 2000).

II - The network of participating organizations

The individual actors in the decision-making process are the people that gather to explore possibilities for an inter-organizational sustainable innovation project. They represent their organization, but also bring their own values. During the exploration of possibilities, the actors are mutually dependent on each other. They have to exchange their resources and viewpoints to conclude what the project has to offer. While actors exchange something, being products, money, knowledge or other resources, they develop relations. The ensemble of relations and actors is called a network (Klijn and Koppenjan, 2000; Klijn et al., 1995).

In science, there are many ways of describing networks. For example, it is possible to describe networks by doing a mathematical analysis of relationship patterns within the network, or by explaining the business model of the network (see Costa and Da Cunha, 2010;

Hanneman and Riddle, 2005). For this research, a more qualitative description of actors and their interactions is used that is also employed by Klijn and Koppenjan.

Most inter-organizational decision-making networks for innovation would be characterized as a complex network by Klijn and Koppenjan. The complexity of a network is a result from the fact that the actors in the network all come from different organizations with different goals, interests, resources and perceptions of the problem (Klijn et al., 1995; Klijn and Koppenjan 2000; Koppenjan 1993). If a network ties a public and a private organization together, for example, the individual actors and organizations involved will probably have different core values, investment possibilities, and cultures of collaboration. These differences make the negotiations about the decision at hand more complex.

2.1.3 Imagination as driving force of innovation

In this section, the importance of imagination for innovation will be made clear with the help of a dictionary definition of imagination and a sociological theory. These descriptions show that imagination is important for both developing innovative ideas and fueling the motivation to undertake action aimed at implementing the innovation. This justifies finishing this section with a description of imagination as a driving force of innovation.

In Webster's dictionary, imagination is defined as follows: *"The act or power of forming a mental image of something not present to the senses or never before wholly perceived in reality"* (Merriam-Webster, n.d.). So, imagination has a relation with innovation, because imaginative powers can create new ideas in the head of an individual. The individuals that are imagining something that was not yet perceived in reality do not necessarily have to have developed this progressive idea themselves. They can also adopt someone else's idea. Still, every individual that imagines this future has to think beyond the present status of reality. This means imagination has a clear creativity component. Abundant use of this capacity will help to drive the innovation forward, because during implementation, a rich and diverse picture of implications of the innovation, and several back-up options are needed for two things. First of all, this helps to guarantee the flexibility that constantly changing circumstances ask for. And secondly, it helps the innovators deal with the multi-faceted environment in which the project has to be accommodated.

There is a social theory that claims that imaginative powers can have an influence that reaches much further than the mental space of imaginative individuals 'The sociology of expectations' is a widely acknowledged theory that recognizes the importance of imagination for innovation. It explains that, as soon as two conditions are fulfilled, namely imagining certain technological progress and connecting a positive expectation to that, this future becomes real in the sense that we start to act and think relative to these expectations. In this way, imagination influences actions, sometimes to the extent that the imagined future becomes a self-fulfilling prophecy (Borup et al., 2006; Brown & Michael, 2003). Usually, these motivations for action are coupled with emotions (Vonk, 2001).

These two elements lead to the following description of imagination as a driving force of innovation that will be used in this graduation project: Imagination is a driving force of innovation if it provides a mental image of the innovation at hand that is well-developed in a creativity dimension and an emotional dimension, since this provides the flexibility, holism, and motivation for action that is needed to develop and implement and innovation successfully.

2.2 Conceptual framework

The three main concepts introduced in section 2.1 are related to each other. Innovation is the desired outcome of the inter-organizational network. The individual that operates in this network has to use his imagination to act in a way that helps to realize innovation. The way this imagination is used is influenced by the input the individual receives from the inter-organizational context, like the content of the negotiations that form the decision-making process, and the characteristics of the other organizations in the complex network. These relations between the main concepts can be framed with a model that is frequently used in social psychology. This section presents the conceptual framework, and thereby the second level of the research framework for imagination in its social context, by introducing this model and linking its elements to the main concepts of this research.

2.2.1 A model for the influence of the social environment on individual behavior

Social psychology studies the relation between the social environment of an individual and the behavior of this individual (Vonk, 2001). A schematic representation of the process that

determines the relation between the behavior of individuals and their environment is represented in Figure 2.2. Underneath this figure, the processes will be further described.

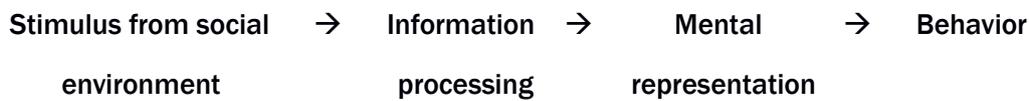


Figure 2.2 Process scheme of the relation between the social environment and individual behavior.

The process starts with the stimulus from the environment. A stimulus is a piece of information that reaches the individual. The first process inside the individual is that of information processing, in which the stimuli are interpreted and emotions are attributed to the information. The second process within the individual is the (re-)making of a mental representation in memory. A mental representation of a topic consists of all conscious and unconscious knowledge about the topic: Facts, emotions, and other mental representations the individual connected to it himself. The mental representation influences the individual's behavior (defined as his thoughts, actions, and feelings) (Vonk, 2001).

This process scheme incorporates the three basic assumptions of the science of social psychology. The first basic assumption is that people play an active role in perceiving their environment. People give meaning to what they see, feel, taste, smell, and hear. While they do so, they selectively take up the information in their environment, and supplement this information with their own knowledge. The second basic assumption of social psychology is that the behavior of people is determined by their cognitions about their environment. They react on their environment based on their interpretation of this environment. The third starting-point of social psychology is that the behavior of people is very heavily influenced by their social environment (Vonk, 2001).

2.2.2 Linking the cognitive model to the main concepts of this research

The three main concepts of this research (innovation, inter-organizational collaboration, and imagination) can all be linked to a part of the cognitive model presented above. The fact that the innovation projects that are the focus of this research are inter-organizational collaborations influences the stimuli that come from the social environment. Innovation is the possible result of the behavior the individual displays. The act of imagination is a

cognitive process that takes place during the information processing activities within the individual. The result of imagination is a mental representation with an important characteristic, namely that it is something new to the individual. This means that the use of imagination presents itself in the mental representation. The connections between main concepts and conceptual framework are illustrated in Figure 2.3.



Figure 2.3: Connections between main concepts and elements of conceptual framework

2.3 Operationalizing the four elements in the conceptual framework

For a long time, it was not deemed worthy of investigation by scientists how the processes within the individual worked. They looked at them as a black box that transformed an environmental input in a certain behavior. Now, it is acknowledged that these non-observable processes are of essential importance to understand behavior (Vonk, 2001). So, to come to complete a research framework that can be used to study imagination as a driving force of innovation that is fueled by its social context, some of these invisible cognitive processes of information processing will have to be unveiled and their effects on the mental representation of the individual have to be determined. In other words: The elements from the conceptual framework need to be operationalized. This operationalization will form the third level of the research framework for imagination as a driving force of innovation that is fueled by its social context. Below, this operationalization is started with the help of scientific literature. In later chapters of this thesis, empirical data will be used to fill in the operationalization level in further detail.

2.3.1 Stimuli from the social environment

The social environment is constituted by all stimuli that have social meaning (Vonk, 2001). The social context of an individual is at any time very layered and too complex to cover in a graduation project, so a selection had to be made. This selection was made with the help of Klijn and Koppenjan. They claim decision-making for collaboration in an inter-organizational context is not easy or spontaneous. It needs to be managed, and this management can be

targeted at two things: The content of the discussion and the rules that govern the interaction between arena attendees (Klijn et al., 1995; Koppenjan, 1993; Klijn and Koppenjan, 2000). In this project, these two directions are used to operationalize the stimuli from the social environment that influence the mental representation and the behavior of individuals. The first direction, the content of discussions, will be further filled in with the help of the arena model of Koppenjan. The second direction, the interaction rules, will be made more concrete by diving into group dynamics theory on group structure.

I – Arena games

The social context of decision-making in a complex network can be seen as an arena (Koppenjan, 1993). These arenas are “*places where specific groups of actors interact on an issue and make choices on specific aspects of the issue*” (Van Bueren et al., 2003: 195). Reconstructing a decision-making process in an arena is not possible without making assumptions about the appearance of decision-making (Teisman, 2000). Koppenjan’s arena model (1993) provides these assumptions for this research. This model is based on the streams model, or garbage can model, of organizational decision-making from Cohen, March and Olsen. According to the arena model, the arena constitution is the crucial variable that determines the development of the decision-making process. Each arena constitutes of four continuously changing elements: The problem statement, available solutions, participants and timing. Because the arena changes all the time, the range of possible decisions also changes over time. If the four arena elements align, it is possible to make a (intermediate) decision that furthers the development of a project (Koppenjan, 1993).

As can be seen in the summary of the arena model in Figure 2.4, the arena constitution is determined by contextual factors and actors and their strategies, that create, maintain, block or destruct links between the arena elements (Koppenjan, 1993). This means conflicting interests characterize decision-making processes, making the arena constitution and resulting decisions very unpredictable (Klijn and Koppenjan, 2000).

In attempts to influence the decision-making process directly (arrow A in Figure 2.4), participating actors employ what is called arena strategies or arena games (Koppenjan, 1993; Klijn and Koppenjan, 2000; Klijn et al., 1995, Van Bueren et al., 2003). “*Games are series of interactions between actors that focus on influencing problem formulations, solutions, and*

procedures regarding a specific decision-making issue” (Van Bueren et al., 2003:195). Essentially, arena games can have two goals: Using the opportunities that the arena constitution currently offers, or changing the arena constitution. Changing the arena constitution is possible by expanding or limiting the available problem statements, solutions, and participants, and by influencing the timing of a decision that makes a certain conclusion more or less likely (Koppenjan, 1993). Games aimed at these different arena elements can be played simultaneously in one arena (Van Bueren et al., 2003). How the arena games can be differentiated is described below. This description is the operationalization of the first group of stimuli from the social environment that is incorporated in the research framework of imagination as a driving force of innovation fueled by its social context.

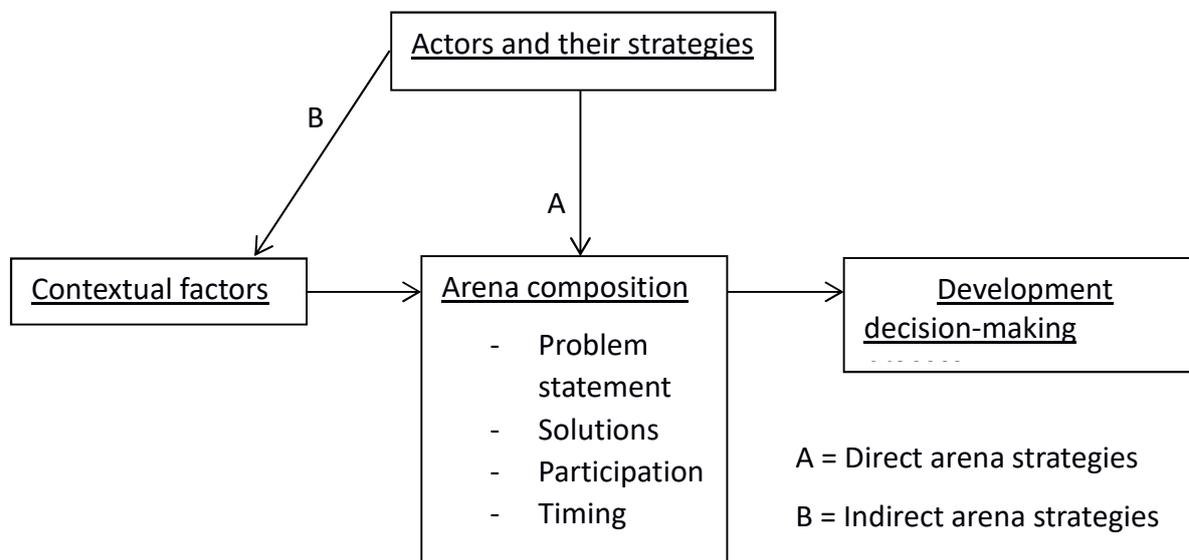


Figure 2.4: The arena model as presented by Koppenjan (1993).

Ia - Influencing the problem statement

The problem is the perceived gap between a current situation and the situation wished for. The problem statement summarizes both situations, describes their causes and effects, and evaluates them. So, the problem statement determines the framing of the problem and the level of ambition that a solution has to fulfil (Koppenjan, 1993). Influencing the problem statement can be done by introducing an entirely new problem definition, improving the mutual perception of the problem description, reframing the dominant problem definition, or proposing a new ambition level (Klijn and Koppenjan, 2000; Koppenjan, 1993). Also,

blocking any of these activities or supporting the current problem definition is an arena game in this category.

The first set of strategies that aim to change the problem statement, introducing an entirely new problem definition, happens when new goals are discovered that are perceived as more important than solving the current problem. Improving the mutual perception of the problem description is the second direction a problem statement related strategy might take. This might be necessary in complex decision-making networks. Concrete strategies that contribute to this are for example the exchange of information, suggesting a compromise, and decomposing the problem in partial problems. The third set of arena games that target the problem statement, reframes the dominant problem definition regarding the codification of the problem. Changing how technical the story of the problem definition is, introducing a powerful symbol to emphasize the framing, defining the causes and consequences of the problem more specific, or redefining what is the long term relevance or social impact of solving this problem are examples of this. Pushing for a higher or lower ambition is the final way in which arena attendees try to change the problem statement. This can be done by sharing the reactions of important outsiders to the current ambition level that the arena attendees observe (Koppenjan, 1993).

Ib - Influencing the available solutions

The available solutions are determined by the organizations that are present in the decision-making network: Organizations are carriers of methods and resources that can be (or lead to) a solution that contributes to closing the gap between the current and desired situation. There are six ways in which actors can influence the solutions that are available in the decision-making arena. Of course, this is done by promoting a solution by emphasizing its benefits. In the second place, an actor can activate other actors by pointing out that he thinks they have useful resources. Thirdly, actors can link the problem that is being discussed to a problem that is already solved, so the existing solution can be transferred to the current problem. Moreover, actors might decide to invest in finding a new solution by asking an advisor, researcher, or designer to help them. In the case an actor does not (yet) want a problem to be solved, he can decide to criticize all existing solutions, and thereby block or delay the selection of a solution. Finally, actors can also suggest placebo or temporary solutions to buy the network time (Koppenjan, 1993; Klijn and Koppenjan, 2000).

Ic - Influencing the participants

Participation in the arena refers to the actors that are present in the arena that try (or refuse) to contribute to the decision-making process. There are roughly three directions in which the participants of the arena can be influenced. Firstly, changing the collective of participants that is active in the decision-making network can be done by excluding or adding certain actors. New actors can be found outside the network, or by setting up a new (temporary) organization within the existing network. This new organization, for example a project group, can defend specific values or interests that are not yet present in the arena. The second way of changing the participant configuration in the arena, is by supporting a coalition that takes shape within the arena. Since none of the participating actors has the resources or the power to force a decision on the others, partnerships with other actors are vital to enable decision-making. Finally, this arena element can be changed by giving an existing actor in the network a new role. This does not change the actors that are physically active in the network, but it does change the functions the people in the network execute in a way that can be similar to introducing a new actor (Koppenjan, 1993; Klijn and Koppenjan, 2000).

Id - Influencing the timing of a decision

The timing element refers to the fact that the constitution of the arena at a given moment determines what is a possible decision at that moment. Actors might want to slow down or speed up decision-making processes based on opportunities they expect to arise at a certain moment in time that they either want to use or miss. Speeding up the decision-making process can be attempted by setting a deadline for certain activities, or by making more resources available. Slowing down the decision-making process can be done by retreating resources, or by bringing up that it might be more sensible to wait for certain developments. Another way to influence the timing of a decision is by proposing to change the procedures that are followed to come to a decision (Koppenjan, 1993; Klijn and Koppenjan, 2000).

II – Group structure

The cumulative effect from the games makes that certain patterns develop in this network (Klijn et al., 1995). These patterns are created in joint interaction from the actors and form the formal and informal rules of the network. In their turn, these rules “*regulate the separate games within the network without determining their outcome*” (Klijn et al., 1995:440). The rules are constantly affirmed or transformed in interaction (Klijn and

Koppenjan, 2000; Klijn and Koppenjan 2006). Klijn and Koppenjan do several proposals that could guide the operationalization of this group of stimuli from the social environment, but these are not unambiguous and not very detailed. The main function and the general description of the network rules bear resemblance to the concept of intra-group structure in the field of group dynamics. In this field, the rules are more clearly categorized and described. This is why group dynamics theory is used to operationalize the second group of stimuli.

Within the field of study of group dynamics, groups are defined in many ways. Interaction, interdependency, and a shared identity can all define a group (Remmerswaal, 2004; Forsyth, 1999). Another element that can define a group is structure, as this definition of Sherif and Sherif cited by both Forsyth and Remmerswaal illustrates: *“A group is a social unit which consists of a number of individuals who stand in (more or less) definite status and role relationships to one another and which possesses a set of values or norms of its own regulating the behavior of individual members, at least in matters of consequences to the group”* (Sherif and Sherif, 1956: 144 in Forsyth, 1999). Each group has three key structuring elements (norms, roles, and relations), which will be used as main categories for the operationalization of this second group of stimuli from the social environment. They are discussed below.

Ila - Structuring norms

Norms are usually consensual standards of behavior that count for every group member. A group norm is a rule that does not exist outside the surroundings of the group. These rules provide direction and motivation for action, organize social interactions, and make other's responses predictable and meaningful (Forsyth, 1999; Remmerswaal, 2004). There are two kinds of norms: Descriptive norms and prescriptive norms. Descriptive norms are about what people usually do. Prescriptive norms are about what people ought to do. Not conforming to norms will be noticed and corrected by the group (Forsyth, 1999). If a member is not adapting his behavior, he might be excluded from the group.

Norms usually emerge in interaction between group members. They gradually align their behaviors. The internalization of the norm in each group member makes the rule a social fact. The relevance of the rule is no longer dependent on the presence of actors that initiated

this rule, it is part of the group's structure and newcomers will usually assimilate it (Forsyth, 1999). Norms can be about things like decision-making procedures, conflict resolution, language use, transparency, and evaluation criteria (Remmerswaal, 2004; Forsyth, 1999).

IIb - Structuring roles

"A role is a set of behaviors that is characteristic of a person in a particular social context"

(Forsyth, 1999: 124). There are two kinds of roles that every group needs to function well:

Task or goal focused roles, and socio-emotional roles (Forsyth, 1999; Remmerswaal, 2004).

Task roles are occupied by the people that are most busy with fulfilling the reason for existence of the group. They are involved in the exchange of opinions and information, and the coordination of activities. Socio-emotional roles are also called group building and group maintenance roles. These roles are focused on supportive functions like lifting the morale, setting norms for group interaction, and expressing the feelings that are observed to be present in the group. There is a third type of roles, namely dysfunctional roles. These roles mostly evolve when a group member prioritizes his own needs over group needs. Example behaviors of this type of roles are being aggressive, blocking the negotiation process, and continuous interruption with jokes.

Two remarks about roles are made by Forsyth. First of all, he emphasizes that roles do not have to be formally agreed on to be of influence. Secondly, the role(s) someone has, does not completely structure his actions. As long as the group member does not deviate too much from the expectations that come with the role he has taken, different interpretations of the role behavior will be tolerated (Forsyth, 1999).

IIc - Structuring relations

Sociometric differentiation structures a group as well. This is the process in which group members determine if they like or dislike other group members. These personal preferences lead to group members becoming popular, rejected, neglected, or average group members (Forsyth, 1999). The perceived value of someone's ideas, and therefore the inspirational qualities of a certain person, are partially determined by these affectionate relations.

2.3.2 Information processing of stimuli

The second process in the scheme that depicts how stimuli from the social environment (characterized as a complex inter-organizational decision-making process for innovation) result in certain behavior from an individual, is that of information processing (see Figure 2.2). A first hint for the operationalization of this process is claims in social psychology hand books that this process consists of several phases. During the first phase, the information is encoded. Words and actions are interpreted for their meaning. This leads to basic understanding. The second phase is the elaboration phase, the individual thinks about the consequences of what he perceives or the relations it has with other experiences. Information processing is finished by an evaluation phase, in which emotional reactions can develop (Vonk, 2001).

Looking at what happens during these phases, several things that are of importance for the meaning of the research framework stand out. First of all, it becomes clear that it is not the actual social situation an individual reacts to. The individual needs to make an interpretation of what happens in the first phase. This means the research framework should be based on the individual's *perception of the environmental stimuli*. Secondly, it becomes clear that the different aspects of imagination that were found in section 2.1.3 are linked to different phases of information processing. The mind gets the opportunity to play and come up with new, innovative ideas during the second phase. The emotions that provide the motivation for action are attributed to the stimuli-induced image in the third phase.

As was mentioned in section 2.2, what this information processing looks like in more detail is still unknown for many situations. This is also the case for the use of imagination as a driving force for innovation. Consequently, suggestions for a more detailed operationalization of this part of the research framework will be based on the empirical part of this research, and can be found in Chapter 6.

2.3.3 Mental representation

A mental representation is formed in the third process of the chain of cognitive activity that determines how stimuli from the social environment result in certain behavior from an individual (see Figure 2.2). As was shown in section 2.2.2, the use of imagination concerning

an innovation project presents itself in the mental representation of that project. Therefore, the purpose now is to operationalize the imaginative quality of the mental representation of an inter-organizational innovation project.

The definition of imagination in section 2.1.3 claims that there are creative and emotional aspects of imagination. To operationalize these two dimensions, a total of five imaginative qualities of mental representations were defined. The creativity qualities refer to the quantity, diversity, and originality of possibilities that are collected in the mental representation. The emotional qualities refer to the trust and desire the involved individual experiences relative to his mental representation of the innovation project. Below, these five imaginative qualities will be described in more detail.

I - Creativity qualities

As stated in section 2.1.3, the creativity aspect of imagination contributes to its driving force for innovation, because it provides the flexibility and holism that are needed to increase the chances of success for the innovation project. A famous test that measures creativity in terms of the flexibility and holism of the mind is the Torrance Test of Creative Thinking from Paul Torrance (Buijs and Van der Meer, 2014). The measures of this test are used to operationalize the creativity dimension of imagination in the research framework.

The three measures of the Torrance Test of Creative Thinking are the fluency, flexibility and originality of ideas that are developed. The fluency, or quantity of ideas, is determined by just counting the amount of ideas. For example, if you ask someone ‘What shall we serve in the new restaurant?’ and he answers ‘coffee, and tea’, the quantity of ideas is two. The flexibility, or diversity of ideas, can be judged from the amount of different directions that is explored with these ideas. If your restaurant developer also adds soft drinks to the list, the offer becomes more diverse. The originality of ideas is determined based on the newness of ideas in either the context of development, or on a more general level like the sector of development, the country of development, or the entire world. Coming up with a new cocktail would make the restaurant developer score high on originality.

II - Emotional qualities

Like we saw in section 2.1.3, emotions very often provide the motivation for action (Vonk, 2001). This motivation for action contributes to the driving force of imagination concerning

innovation projects. What emotions can be looked at to operationalize this part of the research framework is based on the attention that both scholars and leaders of inter-organizational innovation projects give to vision development and mobilizing resources.

The first topic of attention of scholars and project leaders, vision development, is aimed at defining a certain end-point that is desired by the actors. Hence, the desire that an individual feels in respect to a mental image could be used to operationalize the imaginative quality of a mental representation. The second topic, the mobilization of resources, is only committed to by participating parties when they trust that it is possible to reach this end-point.

Therefore, the degree of trust, or how much an individual believes that it is possible the envisioned future becomes reality, is the other emotional quality that will help to determine the imaginativeness of a mental representation.

2.3.4 Behavior

Since the mental representation of an innovation project determines the behavior of an individual (see Figure 2.2), the more elements that fuel the innovative force are present in the mental representation, the more likely it is that an individual will act in a way that increases the chances for successful implementation. The creative quality of his mental representation helps him to have enough (alternative or parallel) options available to work towards, and the emotional quality of his mental representation gives him the willingness to invest energy in the innovation project. This behavior that results from the mental representation can be displayed both inside and outside the inter-organizational innovation arena.

When the behavior is displayed inside the arena, or when the behavior influences the proceedings in the arena indirectly, it provides stimuli for a new round of information processing and mental representation formation for all individuals present. These general options for behavior are taken up in the research framework to complete the interaction between the individual and the social context.

2.4 Summary of the research framework

Although all literature used in this chapter originally was not developed for this topic, a first version of the research framework for imagination as a driving force of innovation fueled by its social context is put together. This entails three things:

- More in depth descriptions of the main concepts innovation, inter-organizational collaboration and imagination
- A conceptual framework that links these main concepts
- A start for the operationalization of the elements in this conceptual framework

Concerning the main concepts, inter-organizational innovation is described as a complex decision-making process on the development and implementation of a new process by changing activities and external relations. Imagination as driving force of innovation is described as providing a mental image of the innovation that is well-developed in a creativity dimension and an emotional dimension, since this provides the flexibility, holism, and motivation for action that is needed to develop and implement and innovation successfully.

These three main concepts are tied together in a conceptual framework, and a first operationalization round of the elements of this conceptual framework can be summarized as follows. The inputs (stimuli) from the inter-organizational collaboration environment are limited to the study of the network structure within the innovation arena, and to strategic games employed in this arena. These stimuli trigger unknown cognitive processes of encoding, elaboration, and evaluation that lead to a more or less imaginative image (mental representation) of the inter-organizational innovation project. The potential innovative force of this mental representation will be determined based on its creative and emotional imaginative qualities. This mental representation is partly responsible for the actions of the individual, both inside and outside the arena. The interactions between the individuals in the innovation arena build the outcome of the decision-making process, and therefore the course of the innovation project. Also, these interactions are the stimuli of a new round of shaping the imaginative mental representation of the innovative future. A visualization of the conceptual framework with these first elements of operationalization is presented in Figure 2.5.

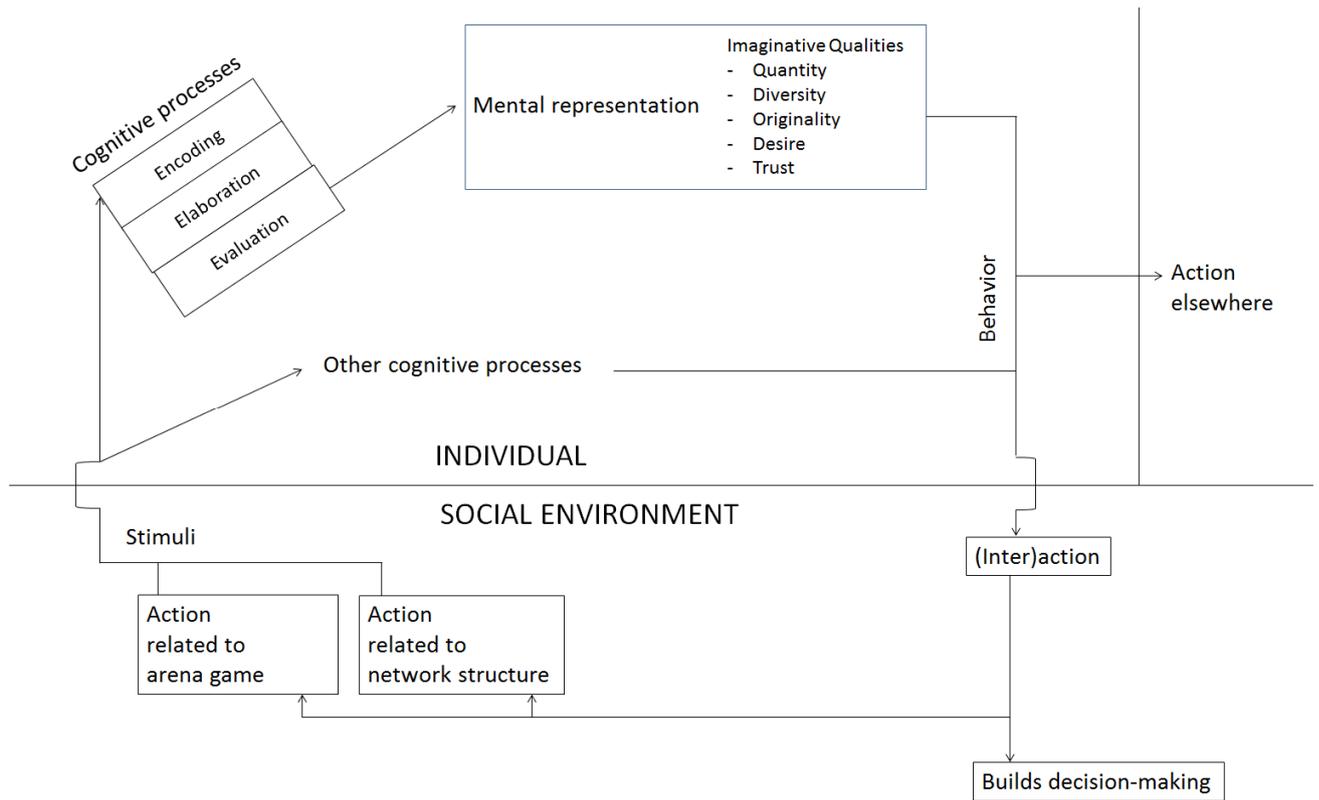


Figure 2.5: The theoretical research framework that resulted from the literature study.

For some elements of this conceptual framework, the literature offered more levels of operationalization already. These are listed in Table 2.1. The contents of Table 2.1 will be updated based on empirical research later in this thesis, to increase the validity of the research framework for imagination in its social context over several rounds of research.

Main concept	Connected to following element from conceptual framework	Theoretical operationalization of element in conceptual framework		
		Level 1	Level 2	Level 3
Inter-organizational collaboration	Stimuli from the social environment	- Arena games	- Problem statement, Solution(s), Participants, Timing	
		- Network structure	- Norms, Roles, Relations	<p>Norms: Decision-making procedures, Conflict resolution, Language use, Transparency, and Evaluation criteria</p> <p>Roles: Task roles, Socioemotional roles, Individual roles</p> <p>Relations:</p>
	Cognitive processing	- Encoding, Elaboration, Evaluation		
Imagination	Mental representation with imaginative qualities	- Creative qualities	- Diversity, Quantity, Originality	
		- Emotional qualities	- Trust, Desire	
Innovation	Behavior concerning decision-making process	- Inside arena - Outside arena		

Table 2.1: The first version of the research framework for imagination as a driving force of innovation

3 Research context

It became clear in Chapter 2 that not sufficient scientific literature could be found to fill all levels of the research framework, and that the literature that could be found was originally not developed to facilitate the study of imagination in its social context. So, the gaps in the third (operationalization), and fourth (visibility) level of the research framework, and the plausibility of the research framework elements that were taken from other fields of study have to be addressed by empirical research.

Conducting a case study is a common way of empirically exploring a research topic (Yin, 2014). In this chapter, it will first be demonstrated that doing a case study is a sensible research strategy for this graduation project too. Then, the inter-organizational collaboration project that served as a case study topic for this research will be presented: The Petaplan project. Finally, it will be explained what design choices were made to make this case study fit the scope of a graduation project.

3.1 Why a case study

To help other researchers decide if their explorative research is suitable for the use of case study methodologies, Yin assembled a list of characteristics of a research context in which a case study research design should be considered (Yin, 2014). These characteristics can be summarized as follows:

- It is not possible to manipulate proceedings in the context of study for the research, or recreate the complexity of such a context in a lab. As a result, a real-world phenomenon has to be studied.
- There is no one-way relationship between the elements of study.

In the complex context of inter-organizational innovation projects for CSR-purposes, the first criterion is met. There is too much at stake to intervene in the development process, and since little is known about the elements of the social context that are relevant, it is impossible to isolate these and test their effect in a lab. The second criterion is also met. As can be seen in the research framework, the relation between the social context and use of imagination is not a one-way relationship, since the use of imagination can influence the

actions of individuals. This in turn influences the social context. Since both criteria are met, it can be safely assumed that a case study design is a good idea for this research.

3.2 The Green Grids initiative and its Petaplan project

This graduation project was developed during an internship at an electricity and gas grid operator in The Netherlands: Alliander. This internship entailed involvement in the Green Grids initiative (Platform Groene Netten). This initiative is a joint effort of the CSR-managers of several infrastructure operators to make the Dutch infrastructure systems more sustainable. Five out of eight participants in the initiative are the electricity and gas grid operators Tennet, Alliander, Enexis, Stedin, and Gasunie. The other three participants are from the transportation and telecommunication domains: Rijkswaterstaat (RWS), ProRail, and KPN. The initiative is supported by MVO Nederland and Accenture.

The Green Grids Initiative serves to share knowledge gained from sustainability projects between participants, to formulate shared visions that can be communicated to their (common) suppliers, and to set up several large scale collaboration projects to learn about sustainability in the infrastructure domain by experiment. Examples of these large scale collaboration projects range from sharing assets like batteries and offices, to tracing material flows with resource passports, and attempting to make the operation of Dutch infrastructure systems energy neutral. This final project is the Petaplan project that was focused on during this research.

3.2.1 Aim of the Petaplan project

The wish that planted the seed for the Petaplan project is that the participating Dutch infrastructure operators want to reduce the carbon footprint of their electricity consumption. They do not believe the impact of their current strategy of buying CO₂ certificates to be very high. The alternative of directly buying green energy from a renewable energy project is not available to them, because too little green energy is available in The Netherlands to cover their needs. This made them decide to work together to organize large scale installation of renewable energy technology on grounds of RWS and ProRail, like plots surrounding high ways, train tracks, dykes, and locks.

In the part of the project's development that was studied in this graduation research, the project partners are exploring what this collaboration could entail. They are determining the

potential capacity of the renewable energy technology that can be installed, and exploring options to finance the project, to work with the existing regulations, and to set up the organizational links between participating organizations.

3.2.2 Organizations participating in the Petaplan project

Since the Green Grids Initiative works according to the principle ‘whoever is ready to join a project, joins it, whoever is not ready, can join later’ only five out of eight participants joined the Petaplan project. Three of them are distribution system operators of gas and electricity: Alliander, Enexis, and Stedin. The others are RWS and ProRail. RWS builds, maintains and operates the Dutch highways, waterways and flood barriers, while ProRail is responsible for the Dutch railways. This collection of organizations results in a complex decision-making context. To illustrate this point, some elements that contribute to this complexity are reviewed below, namely differences in main stakeholders, interests in the Petaplan project, and resources.

Concerning their stakeholders, all actors acknowledge ‘the Dutch society’ to be of main importance. Despite them all serving the same citizens, the grid operators report to the ministry of Economic Affairs, while RWS and ProRail report to the ministry of Infrastructure and the Environment. The grid operators do not only report to the national government, but also to the regional and local governments, since these parties are their shareholders.

The perception of the problem the Petaplan project should solve differs between participants. Some players are mainly interested in satisfying their own needs for renewable energy. Others see the project as a logical consequence of the fact that they are organizations that work for the common good. The latter participants consider becoming more green themselves ‘collateral damage’.

Regarding the participating organizations’ main resources, RWS and ProRail are the only organizations that own a considerable amount of land. Their grounds, however, often lie outside the parts of the country that already have a well-developed grid. Consequently, connecting these pieces of land to the main electricity grid of The Netherlands accounts for a large part of the investment costs of installing renewable energy projects on these plots. The grid operators have the knowledge and information resources to connect them to the grid cheaply. Additionally, the grid operators have large energy needs since they need to

compensate for the energy that gets lost during transportation. This means they can offer a project developer of a renewable energy project long-term purchase guarantee. This gives them the power to reduce the financial risks that come with such a project. The resource of legitimacy to install renewable energy generating units on a large scale is not abundant among participants of the Petaplan project. According to the current rules and regulations, none of them has currently permission to be directly involved in producing the large quantities of energy that the Petaplan project envisions. The financial resources of DSO's are quite vast and stable. They are private companies that operate in a strictly regulated market. RWS and ProRail are less independent in making decisions on large investments, since they are public bodies that get a yearly budget from the national government.

Although this comparison between organizations is not exhaustive, it can already be concluded that the complexity of this collaboration initiative both poses problems and offers opportunities. Differences views about the value of the Petaplan project and differences in the organizational processes from public and private organizations need to be overcome. On the other hand, the diverse mix of resources makes it possible to optimize and enlarge the scale of the Petaplan project.

3.2.3 Development of the Petaplan project

The Petaplan project was developed in collective meetings in which all organizations were represented, and in smaller meetings within each organization, or between two or three of the participating organizations. Here, a time line will be presented of the three sorts of collective meetings that were held: Core team meetings of the Green Grids initiative, captains' meetings of the Green Grids initiative and Petaplan project specific workshops.

Once every two weeks, the sustainability managers of the Green Grids initiative come together in the so-called core team meetings to share how their individual and collective sustainability projects are developing. The Petaplan project was a regularly returning topic of discussion at these meetings. The Captains' meetings of the Green Grids initiative are held a few times a year. During these meetings, the boards of directors of all participating organizations are called together so the plans can be presented and agreed upon. The workshops specifically organized for the Petaplan project were run by the consultants that

helped to explore the potential of the project. The date and aim of these meetings are listed in the time line below.

Date	Kind of meeting	Aim for the Petaplan project	Related decisions and discussions
August and September 2016	Green Grids meetings	Preparing the proposal for the captains meeting	RWS becomes part of Green Grids, ambition to install 20 PJ capacity, project is labeled Petaplan
23 rd of September 2016	Captains' meeting	Deciding that this collaboration idea is worth exploring	Ministry for Infrastructure and Environment is interested, deadline for exploration so that participation in energy agreement is possible
November 2016	Green Grids meetings	Preparing the consultant's brief	Goal of maximizing societal impact, regulatory uncertainties described, careful communication is essential to make the plan possible
8 th of December 2016	Workshop by consultants	Exploring potential capacity	Possible criteria to calculate capacity, smart design possibilities, barriers for implementation and their solution
13 th of December 2016	Workshop by consultants	Exploring financial models	Possible division of roles, calculating investment and electricity prices, choosing six pilots
20 th of December 2016	Workshop by consultants	Exploring pilots	Smart design and organizational collaboration options for pilots, list of risks
December 2016 and January 2017	Green Grids meetings	Preparing the proposal for the captains' meeting	What has to be summarized from the consultants' report, proposing to dedicate several employees to a Petaplan project team, turn down participation in energy

			agreement
19 th of January 2017	Captains' meeting	Deciding that several pilots can be started	Framing the Petaplan project as a wish from Cornelius Lely (the engineer from The Netherlands), pilots are started, a joint press release is prepared

Table 3.1: Time line of the Petaplan project's development

3.3 Designing the case study

Doing a case study means to conduct *"an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-world context"* (Yin, 2014:16). Below, with the help of the methodological knowledge on case study research of three well-cited authors, the choice for the Petaplan project as object of study will be defended, and the general design decisions of this research will be described.

3.3.1 Criteria for selection

When the case study method is selected as a general method of inquiry, a specific case needs to be found. There are several strategies for case selection, and according to Patton, the opportunistic, typical, and extreme selection strategies where used to select the Petaplan project for this study (Patton, 1990:182).

The Petaplan project was selected as a good opportunity. From my internship position at Alliander's CSR department, access to the meetings and participants was easily arranged since this department was involved in the project from the beginning. Furthermore, the timing of the development of the Petaplan project was such that it could be studied between December 2016 and May 2017, which fit my graduation time schedule.

Of course, just being an easy-access, well-timed project is not enough to become a relevant case study. Above all, the Petaplan project is a typical context for Industrial Ecology and fits well the characterizations of the research framework explicated in Chapter 2. It fits well the characterizations of the research framework, because it is an innovation project from existing organizations that form a complex network, and that aim for a process innovation by changing activities and external relations. The Petaplan project was in the first stages of its development and decision-making processes were still open as well. It fits well Industrial

Ecology, because it is a complex network that aims for innovation in the direction of system integration of processes.

Within this typical setting, the Petaplan held the promise of extreme occurrence of the phenomenon under study: Imagination use. This relatively extreme occurrence of imagination use was expected for three reasons. First of all, because the project was still in the first phase of its development, a phase that permits a lot of freedom of design, imagination use can be extreme. Additionally, there was no shared vision yet to fall back on, and the individuals involved were all CSR-managers in their organization, a role that requires imaginative powers.

This combination of being an easy-access, well-timed research opportunity in a setting that is both typical for Industrial Ecology and typical for the kind of innovation and innovation environment that the research framework is aimed at, with possible extreme occurrence of the phenomenon under study confirms that the Petaplan project is a nice case study for this thesis project.

3.3.2 Determining the boundaries of the case

A common pitfall in case study research is the tendency to attempt to answer a question that is too broad (Baxter and Jack, 2008: 546). This is why time and location boundaries were determined to limit the unit of analysis within the Petaplan project to the first development phase of the project, and the collective decision-making arena. In addition, it was decided to only study the imagination use of individuals that were physically present in this collective decision-making arena during most of the collective meetings. Why these boundaries were selected can be reviewed below.

To limit the 'time' aspect of the research to the very first development phase of the Petaplan project means looking at the decision-making dynamics from the first idea to the first decision on implementation. This time frame is relevant for this research, because the first design phase is the most open. It leaves most room for imagination efforts of the individuals. Roughly, this part of the decision-making process evolved from September 2016 to mid-January 2017. This period of the project's development was discussed in detail with the participants. The dynamics that followed this period until May 2017 were discussed when they were relevant for the participants.

As for the 'location' of the research, the decision-making arena of the Petaplan project during the events at which most participants were present was selected. It was decided to leave the smaller meetings between a few participants out of this research, because the outcomes of these meetings have to be shared in the larger arena to be of importance for the further development of the project. Although the imagination of the involved individuals on the Petaplan project will not only be influenced during the collective meetings, this choice gives the case study more focus and enables comparisons of the experiences of the same events between individuals.

Only the individuals that were closely involved in the development of the Petaplan project were selected as the object of this research. The six people (the five CSR-managers from each participating organization and a consultant) that were physically present during most meetings and workshops, and therefore directly experienced most of the dynamics in the decision-making process and the network structure. Of course, many more people were involved in the decision-making process, like the CEO's, and staff of the CSR-managers. However, their indirect connection to the arena makes it hard to compare their experience to those of the more directly involved individuals.

4 Methods

Designing research methods is something that needs to be done again for each research project, because data collection and analysis strategies cannot be chosen in a vacuum (Marshall and Rossman, 2006). Each method has his own strengths and weaknesses, and should be tweaked to fit the research question, context, and participants. Also, every researcher has his own skills that determine the available research methods. In this chapter, the research methods that were used to empirically develop the research framework for imagination in its social context are presented.

4.1 Qualitative research

The aim of this research is to propose a research framework for imagination in its social context. Since the literature study did not provide a complete and reliable framework, empirical studies will have to fill these gaps. The qualitative research perspective is suitable to explore new topics of science and generate theories on them, and will therefore be used to start filling the gaps in the research framework.

4.1.1 Principles of qualitative research

Unlike with most quantitative research methods, there are few fixed methodological protocols for qualitative research to guide the researcher (Yin, 2014). There are, however, some general principles that are often used in qualitative research. In this section, three characteristics of both qualitative data collection and qualitative data analysis are described. In qualitative research, iteration between data collection and data analysis is aimed for, so that the research methods can be adapted to the context and to previous findings.

1 - Data collection

The first characteristic of qualitative data collection is that the data is gathered in a natural setting with subjective research methods (Marshall and Rossman, 2006; Baxter and Jack, 2008). Research in a natural setting means that it is field-based. There is no control over circumstances or participants like with lab research.

The use of subjective research methods is also characteristic for qualitative research (Marshall and Rossman, 2006; Baxter and Jack, 2008). By calling the methods subjective, researchers emphasize the difference with the positivist approaches generally used by the

natural sciences: In qualitative research, the researcher is his own instrument, and he works in close collaboration with the participants. Common methods for data collection are document study, observation and in-depth interviews (Yin, 2014; Patton, 1990).

The third characteristic of data collection for qualitative research is that the methods employed generally generate data sets that are big, rich, and holistic. Because qualitative methods generate so much data, scholars emphasize the importance of setting up a good data management system that eases retrieval for analysis (Marshall and Rossman, 2006; Yin, 2014).

II - Data analysis

Qualitative analysis is mainly a process of data reduction. General patterns are sought for in the rich, holistic data. Qualitative analysis typically has seven phases that all enable meaningful data reduction: Organizing the data, immersion in the data, generating categories and themes by comparing the data, coding the data with these categories, offering interpretations through analytic memos, searching for alternative understandings in the data or by confronting the findings with formalized knowledge like constructs or theories, and writing the report (Miles and Huberman, 1994; Marshall and Rossman, 2006).

If the researcher shows that he attends to all the available evidence, addresses all plausible rival interpretations, and demonstrates awareness of his own subjectivity, qualitative analysis is believed to be a valuable perspective on social life (Yin, 2014; Miles and Huberman, 1994).

4.1.2 Approaches to qualitative research

There are two approaches to qualitative data analysis: The structured and the grounded approach. In this research, both approaches are used in a complementary way. What they entail, and when they are applied during this research is discussed below.

I - Structured approach

The structured approach to qualitative research uses a social theory as a starting point, and uses empirical evidence to conclude how this theory works out in the particular context of study. The way of working in this process is described below, and it is indicated when this approach is used in this research.

Ia – Way of working

Using a social theory as a starting-point, means that the descriptions of the core concepts and their relationships are predetermined. The data collection and analysis are structured according to the chosen social theory.

For data collection, this means the interest of the researcher is guided towards specific social domains and social constructs by the theory. The data is collected in a data management system, and prepared for interpretation. During this analysis phase, words, phrases and paragraphs in the data are labeled following the categories suggested by the theory. This coding limits the amount of data and facilitates easy data retrieval (Miles and Huberman, 1994). During coding, the researcher compares the findings to the theory, and reflects on the usefulness and sufficiency of the proposed categories in this context, asks questions about things that puzzle or surprise him, or proposes a hypothesis for the different working of this theory in this particular context. These reflections are at first captured in written memos. Aggregating these memos leads to a story on what the social theory that was applied can reveal about the context of study (Marshall and Rossman, 2006). The discussion of the usefulness of the social theory for the research activities, preferably by addressing negative instances of the theory, usually both reinforces parts of the social theory that was used, and proposes additions or changes to this theory (Yin, 2014).

Ib - Use in this research

The conceptual framework and suggestions for the operationalization that were found in the literature and presented in Chapter 2 were used to structure data collection and data analysis in this graduation project. This first version of the research framework, however, is not yet complete, so it was mainly used to bring some structure to the social context part of the research (by focusing at the four kinds of arena games, and the three kind of network structure elements), and the mental representation part of the research (by focusing at the five imaginative qualities of mental representations). The level of detail offered by the first version of the research framework differs per element. The roles that structure the network, for example, already have many categories, as well as the arena games that are played. For the relations that also structure the network, this is less the case.

II - Grounded approach

A grounded approach is an open way of looking at a social context. It aims to find out what the main issue is of people in a particular context and how they deal with this issue. How the open attitude towards the research context influences the activities during data collection and data analysis, and when this approach was used in this research is explained below.

IIa – Way of working

In qualitative research with a grounded approach, core concepts or relations are not known when the research starts. The researcher uses open questioning to gather data. While reading the data, the researcher compiles an initial coding scheme. Several rounds of re-reading the data, and comparing, adding and merging codes leads to an internally consistent, saturated, and unambiguous set of coding categories and increasing clarity of the theoretical properties of the codes (Glaser and Strauss, 1967; Miles and Huberman, 1994; Marshall and Rossman, 2006; Birks and Mills, 2011). Like in a structured approach to qualitative research, the researcher constantly writes memos about the theoretical and descriptive value of the data, codes, and relationships between coding categories.

The connections between codes and categories, and the memo-writing will gradually become more abstract. At some point, it becomes possible to identify one or several core categories. These categories encapsulate and explain the theory that is being built as a whole. The guiding principles of the theory should be that it takes precedence, allows for variation, limits gaps, and has grounded evidence (Birks and Mills, 2011).

IIb – Use in this research

In this graduation project, a grounded approach was used when no structure was found in the literature to operationalize an element of the conceptual framework, or when the structure that was found in the literature was of limited detail. The mechanisms that mediate between the social context and the mental representation, for example, were determined following a grounded approach. Also, the norms and relations that shape the network structure were determined using grounded principles, and the imaginative qualities were described with more detailed categories than were determined with help from the literature.

4.2 Research methods used

The conceptual framework of this research suggests four areas of focus: The social context of the arena, the mechanisms that mediate between this social context, the mental representation of the individual, and the individual's behavior. Looking at the social context of the arena serves as a preparation to research the other three areas. How this was done is discussed in section 4.2.1. The methods that were used to study the other areas of focus are described in sections 4.2.2 and 4.2.3. In each section, methods for data collection and data analysis are presented and the relevance of the weaknesses of these methods are discussed. The data were mostly stored and analyzed in a software package developed for qualitative research: Nvivo.

4.2.1 When looking at the social context

The data to determine the arena games and roles that were played during the development of the Petaplan project was collected in a very structured way. It was clear what kind of games and roles could be identified. The norms and base for the personal relations the participants have with each other were not known beforehand, and were therefore studied with a more grounded approach.

After analysis, these data resulted in a timeline of arena games that were played, and a list of moments the network structure became apparent. This timeline and list were used during the data collection about this study's other areas of interest: Mechanisms that mediate between social context and mental representation, and the mental representation itself.

1 - Data collection

To learn about the decision-making arena that formed the social context in this research, documents related to the Petaplan project were studied, and Petaplan meetings were observed.

Ia - Document study

Several documents that depict the development of the Petaplan project were collected from the participating organizations, support organizations and involved consultants. At the end, the following documents were saved in the fieldwork database: Minutes from Green Grids meetings between the 1st of August 2016 and the 20th of January 2017, the first presentation about generating renewable energy with Green Grids partners, the consultant brief for the

first exploration of the Petaplan project, minutes for the Petaplan workshops, the final exploration report from the consultants, minutes from the Green Grids board meetings in September 2016 and January 2017, and the press release about the Petaplan project from January 2017.

Additional to these documents, it was attempted to collect the different versions of these documents, but these proved impossible to retrieve. This is a common problem when doing a document study (Yin, 2014). Also, not all meeting minutes turned out to be complete, and the level of detail varied a lot depending on who made the minutes. The consequences of this reporting bias were limited, because observation notes were available from the events that were not (completely) covered in the minutes.

Ib - Observation

Observation is a fundamental and highly important method in all qualitative research, because it shapes the research and makes it possible to test hypotheses in a later stage (Marshall and Rossman, 2006). For these reasons, the Green Grids meetings were attended, as well as Petaplan workshops that took place between end of October 2016 and end of April 2017. The meetings that were observed are listed in Appendix B. During the meetings, notes were made about the topics discussed, and aspects of the social interaction that drew attention. Later, these notes were transcribed to a text file that could be added to the data management system Nvivo.

Although this is what Marshall and Rossman advice, it has to be acknowledged that the observations for this research were not executed in an in-depth and systematic way (Marshall and Rossman, 2006). Only 30 hours of meetings and workshops were observed, which is very little compared to the field work done by anthropologists that want to learn the rules of a community. Also, since most of the observations were done before the research question of this thesis research project was properly formulated, the field notes are subject of the researcher's bias in a way that is not possible to reconstruct anymore (Miles and Huberman, 1994). The result is that chances are big that the description of network rules and arena games is not 100% complete. This does not pose a problem, however, because enough material was found to use as examples during the interviews.

Using direct observation for data collection has the validity risk that the people observed are behaving differently because they are observed (DeWalt and DeWalt, 2011; Yin, 2014). This observer effect is probably small in this research. The group of people that meets during Green Grid meetings has a high level of comradeship and trust, and the researcher was introduced by a group member. They did not expect contributions from the observer in their discussions, but included her in their jokes and sometimes referred to her presence and research topic when they thought some imagination could help them. During the Petaplan workshops, the observer was just one of many people that did not know each other yet. When it was explained that an intern was present to do her graduation research, this proved a phenomenon that all participants seemed to be used to.

II – Data analysis

The observation notes and documents were coded and collected in two tools that facilitated the interviews: A timeline and a list of example events in which network structure elements were visible and games were played. The timeline and list of example events that resulted from this analytic effort are part of the interview guide that can be reviewed in Appendix C. The code list that resulted from these analytic efforts can be found in Appendix E.

Ia – Arena games

Identifying and categorizing arena games in the observation notes and collected documents meant determining the topics of discussion, and pinpointing moments at which discussions were changed direction. Questions that were helpful in interpreting the data were: This new topic that is introduced, is that a new strategy or a contribution to the same arena game? What does this arena attendee try to achieve by this contribution? The coding categories came from the arena model from Koppenjan: Problem statement, Solution, Participants, and Timing. As suggested by Koppenjan, each code contained references to proposals to expand, diminish, or maintain the arena element. A reference list of examples from each of these categories was compiled to use during the interviews. Instances that occurred during events at which most participants were present were prioritized in the list over instances that occurred during events that were poorly attended.

For each game reference in the fieldwork database, a separate post-it was made with a description of the game reference and the date this part of the game was played. Merging

these references into a timeline and placing them in a chronological sequence was not evident, because data from different sources and methods had to be integrated into one storyline. This data pooling is one of the challenges of constructing a timeline (Roberts, 1992). The post-its facilitated this data pooling: References to the same discussion could be clustered under one name referring to this particular game. For example, a set of game references to problems from December 8th like “Solar panels can hamper safety because they reflect light into the eyes of drivers”, “We cannot just cut all the trees next to the highway” was merged with each other and the solutions to these problems that were proposed. This set of game references was called *Discussing boundary conditions (like safety, and trees)*. The timeline was divided in periods of regular meetings and big events that were held in a special place. This strategy of, for example not referring to a specific meeting in September 2016, but to a period of meetings called *Preparing Board meeting at Springtij festival*, facilitated the participant’s memory retrieval.

There’s a risk in attributing the observed and document retrieved proceedings to an arena category as a researcher. In the end, for the influence on imagination as a driving force of innovation, it is most important to which arena category the negotiation belonged according to the perception of the arena attendee. To check the categorization made by the researcher, the interviewees were asked to retrieve certain extensive arena games from their memory. Their reaction was used to check if the games identified in the observation notes and documents were properly interpreted.

Ib – Network structure

The network structure elements were coded as well. The roles were coded according to the list of Forsyth that was presented on page 22. The norm and relation elements were coded in a more grounded manner: Reading and re-reading the references to these elements made it possible to distinguish several categories. References to relations were limited in this stage, but it was possible to compile a list of norms, and instances that either confirmed or challenged these norms. This list was used during interviewing.

Concerning all three network structure elements, their contents were revisited in a new round of analysis after the interviews that were held in a later stage of the research. For the norms this entailed a slightly different categorization, and for relations, this enabled the

making of coding categories to begin with. So, the description of the social context presented in Chapter 6 is the result of an iterative process. The use of different sources for this analytical process, namely observation, document study and interviews, is called triangulation and increases reliability (Yin, 2014).

4.2.2 When looking at information processing

The mechanisms that mediate between the social context and the mental representation of the individuals are explored with a grounded approach to qualitative research. Here, it is described how the data for this part of the research was collected and analyzed.

1 – Data collection

Interviews are one of the most important sources of case study evidence, because it provides a lot of detailed explanations and offers the possibility for immediate follow-up and clarification (Yin, 2014; Miles and Huberman, 1994). For this research, in-depth interviews were conducted with all six people that attended the meetings for the development of the Petaplan project from the beginning. The role of these people in their own company can best be described as CSR-manager. With two of the six participants, one interview of 1,5 hours was held. With the others, two meetings that took between 45 minutes and an hour were arranged. Below, it is described how the interview was conducted, and what risks this data collection method can pose for scientific research.

Ia – Interview proceedings

An in-depth interview ideally takes the form of a guided conversation: The interaction unfolds fluidly, but the researcher guides the participant along a consistent line of inquiry. Apart from keeping track of the data that already has been gathered, it is important to make sure that the interviewee feels his reflections are valuable and useful, and that he feels comfortable sharing his knowledge (Miles and Huberman, 1994; Yin, 2014). To guard the consistent line of inquiry, a research protocol was gradually developed, of which the end-result can be found in Appendix C. Eventually, the order in which the questions contained in the protocol were asked depended on the topics the conversation touched upon. For the part of the research that focuses on the information processing mechanisms, questions were asked about the processing of arena games and network structure elements.

Probing for the processing of arena games was done for example by asking why they took the suggestion other Petaplan project members were proposing seriously (or not). A phrasing that also worked well very often was: “What was your internal reaction to this event?” Apart from probing for the mechanisms behind the arena games that were part of the timeline, questions were also asked about a hypothetical or real action that (could) take place in the Petaplan project arena. For example, when discussing the uncertainty of RWS staying with the Petaplan project, a game about a participant possibly leaving, the reaction to a possible situation of a participant saying that he might leave the coalition, or new participants where suggested to be added to the project group. Like this, it could be checked if the same kind of mechanisms where mitigating the mental representation for the same kind of game.

Probing for the processing of network structure elements was more difficult. If the norms of the Petaplan project arena were touched upon when discussing the timeline, questions about their effect would be asked. Otherwise, a single question would be phrased like “I noticed you are all very open about conflicts that you have in your own organizations. How does it influence your feelings about the Petaplan project if, for example, [name of a project group member] mentions that it is hard for her to lay hands on the money needed to pay the consultants for their exploration job?” Getting concrete answers about the underlying mechanisms proved difficult, especially when discussing the influence of the roles the participants take. So, for the last two interviews, a table was drawn with all names of the people that were directly involved in the Petaplan’s development from the beginning, and cards were made with a reference to the five imaginative qualities of mental representations. These references where based on phrasings that were often used in earlier interviews when the interviewees were unconsciously referring to one of the imaginative qualities of their mental representation. The participants were asked to tell which card they would assign to which colleague(s) and why. This made it easier to talk about the members of the project group and their roles in depth. The phrasings on the cards and the imaginative quality they refer to are listed in Table 4.1.

Imaginative quality	Reference on card for role definition
Quantity	Making concrete
Diversity	Opening up new dimensions

Originality	Wanting new things
Desire	Desire
Trust	Trust

Table 4.1: Translation of imaginative qualities from the research framework to cards with which the participants could describe the roles of their colleagues.

Ib - Trouble during data collection

Interviews can deliver poor data for many reasons. These include poor questioning from the researcher, and several causes of imperfections in the answers of the participant like:

Response bias, poor recall, unawareness of the patterns that are relevant for the researcher, unwillingness or uncomfortableness about sharing of their thoughts, and giving the answer the participant expects the interviewer wants to hear (Yin, 2014; Miles and Huberman, 1994). It was already explained above how it was tried to come up with good questions. Below, it will be discussed how the five risks for data imperfections stemming from the participant's answers were dealt with.

Response bias is the risk of a participant reacting to something else than what the researcher focuses on. This seems to be less of a problem in open interviews than in structured interviews or questionnaires, because the researcher hears the reasoning the interviewees use to come to an answer. This makes it possible for the researcher to judge if they interpreted the questions as intended, and ask additional questions if this was not the case. Still, it is possible that an interviewee shares his reaction, and that the researcher attributes this reaction to a certain characteristic of the actions that preceded this reaction, while it actually is caused by another action or characteristic that was not incorporated in the question.

A recall error is an untrue answer given by participants resulting from the imperfectness of human memory. It could be that the participants do not have a memory of the event that the question was about, or that only a partial or reconstructed memory is activated based on the introduction of the event that was given and the question that was asked. This definitely happened, as is illustrated by interviewees telling that they do not really remember something, or asking for a more detailed description of the event. It was tried to influence them as little as possible by only describing the context in which this event took place (what

building, who was there, what was done before). Often, this helped the participant enough to answer the question. Another instance of recall errors occurring is if the 'original' memory is reinterpreted when it is recalled by the participants, based on his current interpretative filters. These filters are not necessarily the same as when the memory was stored, since they are dependent on personal, inter-personal, and contextual circumstances. The participants were asked how they experienced the events that influenced their mental representation of the Petaplan project back then, but it would have been better to interview the participants after or even during each event. Recall errors are common when events are studied that happened long ago. When the interviews for this research were done, the events took place between 4 and 9 months ago. Other researchers reported successful reconstructions after longer periods of up to five years, so it is possible to work with these data (Klein et al., 1986; Albrechts, 2003).

If participants are unaware of the patterns that are relevant for this research, this is not so much of a problem since interviews offer the opportunity to ask follow-up questions that guide them towards reflection on the influence of the social environment on their image of the Petaplan project. It also helped that most interviewees were interviewed twice. This offered them time to either consciously or unconsciously reflect a bit more on the development of the Petaplan project and the kind of questions that were asked about it.

The last two risks for validity of interview data, being that the participants are not willing to share their thoughts, or give the answers they think the researcher expects from them, can be limited by building rapport with the participants (Baxter and Jack, 2008). Judging from how much at ease the participants were with talking about the process and other participants, it is safe to say this trust was present.

II - Data analysis

Analysis started with the processing of the interview data. All participants agreed with their interview being recorded. A transcript of this audio file was made right after the interview and stored in Nvivo.

IIa – Analysis proceedings

The analysis started with coding the interview transcripts for the following coding categories from the research framework: Mechanisms, IQs (five sub-codes), Games (four sub-codes),

norms, roles (three sub-codes), and relations. To further analyze the data about cognitive processes, each reference in this category was written down on a post-it, of which the color indicated the imaginative quality it was related to, and a number in the right upper corner indicated the kind of element of the social context that triggered this mechanism. Per imaginative category, these post-its were clustered in mechanism categories. Ongoing abstractions like these eventually resulted in the emergence of three core categories. Why, in certain cases, some of these core categories were not deemed important in judging the influences from the social context, could also be explained, so the negative instances of the theory were accounted for.

The final list of codes and their descriptions can be found in Appendix E.

IIb – Trouble during analysis

Analysis following grounded theory principles is prone to researcher bias, tunnel vision and self-delusion (Yin, 2014; Miles and Huberman, 1994). Because the researcher is his own instrument in data gathering and analysis, the results are *“heavily influenced by the intellectual history, the type of theory read, absorbed and now used in daily life”* (Birks and Mills, 2011:11). These experiences make it possible for the researcher to induce theory, but it might also color the outcomes. To make it possible for other researchers to trace the (possibly biased) steps taken in this research, a well-documented chain of evidence was held up by keeping all data, coding, and methodological and theoretical reflections well organized in the fieldwork database or indicated on the post-its. Like this, all steps from research questions to conclusions can in principle be followed by other researchers.

4.2.3 When looking at the mental representation

The development of the imaginative qualities of the mental representation was the final focus area of this study. A large part of the interview was dedicated to this focus area. How the data gathering and analysis was done specifically is described below.

I – Data collection

The timeline from the development of the Petaplan project that was compiled was used to probe the interviewees about the dynamics in their mental representation of the Petaplan project. To question the interviewees about the dynamics in the emotions that were attributed to the Petaplan project, an additional tool was used in the final interviews.

Ia – Interview proceedings

After the introduction to the interview, the participants were first asked about their initial expectations. Then, the elements of the timeline were discussed one by one in chronological order (the timeline can be found in the interview protocol in Appendix C). The discussions or events that the timeline referred to would be introduced a bit, followed by a question like “How did this change *your idea* of the Petaplan project?” Follow-up questions could be: Did they discover new dimensions of the plan? Did it get more concrete? Was their trust that the project could become reality harmed or affirmed? If the interviewee only answered with a judgment like “It was helpful”, than they would be probed for a more detailed answer.

In describing their reactions to a discussion or event, the interviewees did not talk a lot about their feelings very much, so it was decided to ask them to retrieve this part of their memory as well. To help them, the two memos shown in Figure 4.1 were put on the table.

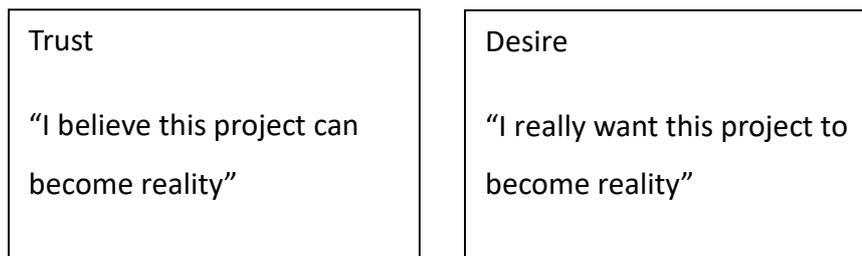


Figure 4.1: Memos Trust and Desire used during the second interview.

These memos were introduced, and it was announced that the interviewees would be regularly asked what an event did to these elements. Also, they were told that they were always free to refer to them themselves. Later in the interview, the most intense emotional reactions that the interviewee experienced during the development of the Petaplan project would be discussed. For example by asking “What moment inspired you the most in the development of the Petaplan project?”

Ib – Trouble during data collection

Since the same data collection method is used as for studying the cognitive processes, the same risks and attempts to avoid these risks from section 4.2.2 applied to this element of study.

II – Data analysis

The same interview transcripts were used to analyze the data. Below, the coding rounds that were applied will be briefly revisited.

IIa – Analysis proceedings

To know what the interviewees referred to regarding each imaginative quality, the references for each of the five imaginative qualities were looked at and categorized at one or more levels to facilitate their presentation in Chapter 7. To be able to say something about the development of the imaginative qualities over time, an extra coding round was done to assign all the references to a phase of the project's development. Then, an overview was made for each participant of the presence of imaginative qualities in each of the three phases of development, so the instances of that boosted or harmed certain imaginative qualities could be tracked down.

IIb – Trouble during analysis

Like with the risks during data collection for the study of this element, the same risks and attempts to avoid these risks apply as with the study of the cognitive processes since the same methods were used. So, review section 4.2.2 if needed.

5 Linking the data to the research framework

In this chapter, the fourth sub question is answered “How is the proposed operationalization visible in empirical data?”. This means the most concrete level of operationalization is presented: The link between the raw data and the theoretical operationalization (see Figure 5.1). This fourth level of the research framework is called visibility in this thesis.

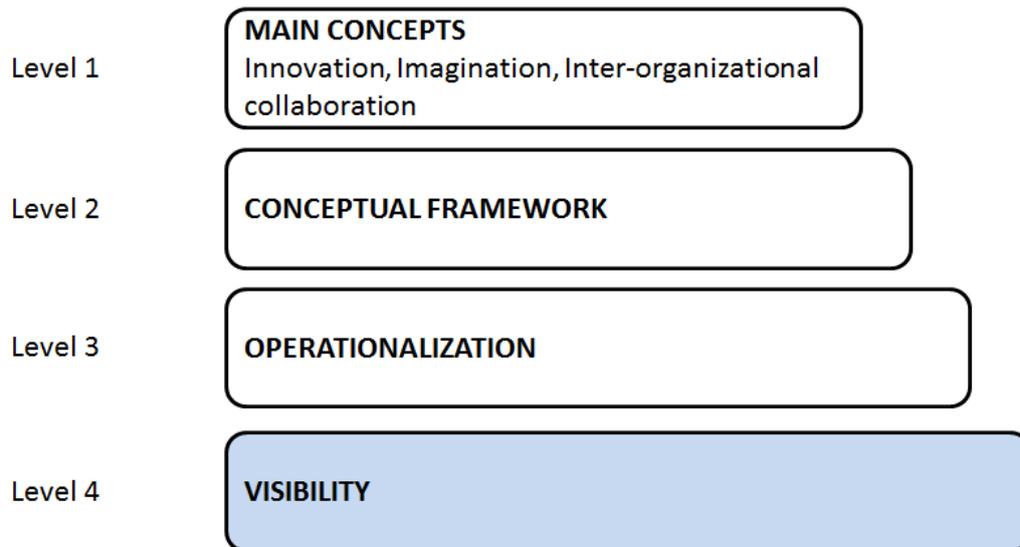


Figure 5.1: The level of the research framework hierarchy that is reviewed in this chapter.

The research framework needs this level, because neither of the elements in the first three levels of framework’s hierarchy can be observed directly. Instead, the elements are contained in the actions, heads, and hearts of the participants, and mainly indirect glimpses of them can be revealed during interviews. These real-life glimpses of the vital elements of the research framework (like cognitive processes that link the input from the social environment to the mental representation, social norms, and the level of desire attributed to the mental representation) are called references, and how these references were attributed to a certain element of the research framework is explained in the remainder of this chapter.

5.1 Recognizing social context elements

In this section, the origins of the stimuli from the social context are focused on. In this graduation project, this social context is limited to the arena games that are played and the norms, roles, and relations that define the inter-personal level of the arena. To give an idea

on how the raw data was analyzed, for each context element, it is first described what was understood as a reference to the social context from the interviewee.

5.1.1 Network structure

For each of the three network structure elements of norms, roles, and relations, it will be showed what kind of references were interpreted as revealing a glimpse of the network structure element, example phrasings will be given, and examples directly from the interview data. It is concluded that all references to network structure are *people references*.

Norms

All participants refer to norms that structure their (expectations of) behavior within the core team of the Petaplan project. Mostly, participants refer to these norms in one of the ways that are summarized in Table 5.1:

Kind of reference	Example phrasing	Examples from interview data
Group attribution	<p>“We have...”</p> <p>“There are...”</p> <p>“We do...”</p>	<p>- <i>“It is all very loose, not so strict”</i></p> <p>- <i>“We do not have a hierarchy”</i></p>
Assumed reaction of others to a certain event	<p>“If..., then...”</p>	<p>- <i>“If someone speaks with an influential person that is enthusiastic about the plan, he shares that”</i></p> <p>- <i>“Everyone should be transparent about problems he encounters within his organization.”</i></p>
Contrast with norms in other groups	<p>“...that’s the special thing”</p>	<p>- <i>“The nice thing about this group is that we start experimenting quickly.”</i></p> <p>- <i>“We often talk about implementation tactics, that is not the standard.”</i></p>

Table 5.1: Examples of references to norms that play a role in the social context

Three main norms could be identified in the interview data: The motivation of joint learning, working from an informal governance structure, attention for implementation tactics. These will be further described in Chapter 6.

Roles

Apart from them being asked to tell about the roles they attribute to the other members of the core team of the Petaplan project, most of the interviewees also referred to roles taken by the different arena attendees by themselves. What was interpreted as referring to someone’s role can be reviewed in Table 5.2.

Kind of reference	Example phrasing	Example from interview data
Characterizing someone	“he always does...” “I am the...”	- “[person] and [person] are the initiators” - “[person] wants to see results quickly [and organizes commitment for that]”
Important contributor to something	“he is very important for that”	- “That’s the value of letting [person]do his thing” - “Thanks to [person], our creative ideas do get a chance to become reality”
Missing role	“it would be nice if...”	- “In the near future, we need more entrepreneurial types [to join]” - “I do not think the effort will be made [by someone] to get me involved again”

Table 5.2: Examples of references to roles that play a role in the social context

The interviewees mentioned four different kinds of roles. These are content creating roles, tactical roles, social roles, and blocking roles. They will be discussed in more detail in Chapter 6.

Relations

Like with the references to role behaviors, the interviewees referred to their affectionate relations with the other members of the Petaplan core team when they were asked about it, but also by themselves. Actually, there are only two ways in which the interviewees referred to this element of the social context, which are summarized in Table 5.3

Kind of reference	Example formulation	Example from interview
To person	“He is ...” “I like... about him”	- <i>“I like it about [person]that we share the same dreams but use a different approach to work towards it. That is really nice.”</i>
To collective	“We ...” “It ...”	- <i>“It is also a personal thing. Meetings always have a very friendly atmosphere.”</i>

Table 5.3: Examples of references to relations that play a role in the social context

All participants talk happily about having the opportunity to work with the other members of the Petaplan core team. Their statements about this were not guided by political correctness, given the enthusiasm and renewed energy that was noticeable in their answers when the interview took this direction. This enthusiasm about their cross-organizational colleagues seems to have its roots in three different things: Fun, trust, and recognition. These findings will be further discussed in Chapter 6.

5.1.2 Games

Attributing the strategic actions undertaken by the arena attendees to an arena game category is an interpretative act from the researcher, too. Roughly, the actions related to each of the four arena elements can be placed in three strategic directions: Maintaining, limiting, or expanding the current arena composition (Koppenjan, 1993). So, it can be concluded all references to arena games are *project references*. The general result of these three directions in each of the four arena game categories can be reviewed in Table 5.4.

Target	Strategic options		
	<i>Using the current arena composition</i>	<i>Limiting the current arena composition</i>	<i>Expanding the current arena composition</i>
<i>Problem statement</i>	Accepting current problem statement	Making problem statement more precise	Redefining arena composition
<i>Direction of solution</i>	Selecting a solution from currently available solutions	Excluding certain solutions	Developing new solutions
<i>Participation</i>	Mobilizing a winning coalition	Excluding actors	Bringing new actors to the arena
<i>Timing</i>	Creating time pressure	Delaying the decision	Delaying the decision

Table 5.4: Basic options in choosing arena games (Koppenjan, 1993: 65)

Categorizing the games in these categories is pretty straightforward. Talking about problems or goals that are relevant to incorporate makes it a problem negotiation, talking about solutions or opportunities makes it a solution negotiation (and sometimes a problem negotiation if the solution solves a problem that was not yet agreed upon to be part of the Petaplan project), talking about participants, or who to involve, is a negotiation about participants, and talking about pressure to make a decision or the lack of speed of the project makes it a negotiation about timing.

5.2 Recognizing mechanisms that mediate between the social context and the mental representation

The mechanisms, or cognitive processes, that mediate between the social context and the mental representation were mostly probed for by asking what experiencing a certain arena game or a certain influence from network structure did to the interviewee. This resulted in stories about their train of thoughts, the feelings they noticed, connection they made with other experiences, how they judged about certain elements of the experience, etc. These references will be called *thought references*. They would be asked to provide more detail on these elements when they mentioned them in their stories, to dive deeper into the cognitive processes under study. To provide some idea of how this worked out, an example of asking for the reaction to an arena game, and an example of asking for the reaction to a network structure element are provided and analyzed below.

5.2.1 Example mechanisms triggered by an arena game

In Text box 5.1, an example of an interviewee sharing her reaction to an arena game that is being played is presented.

Q: At some point, it was suggested to educate new employees together. How did you perceive that option?

A: *I did save it somewhere. I acknowledge we have to little people with knowledge from this stuff. Lately, I had a talk with someone who was interested in this idea as well. But, I don't feel like I should be the one who jumps into this now. Even though I am aware that this is needed, and that maybe, as big organizations, we are the ones to do it. I just do not have to time right now, and I do not think my company is the best party to do this. It's far away from our core business. We'll solve this problem when it is there, but to start an academy... I would do that differently, by teaching people on the job. That also has to do with the fact that I once worked for an education institute, so I know how much work it is to start a program like that.*

Text box 5.1: Example of a description of mechanisms triggered by an arena game.

In this story, an interviewee shares many things that contribute to the final place of this suggestion in her mental representation. She acknowledges the problem that is targeted with this academy is a real and relevant problem. Also, she shares that she is not the only one who thinks so. In Chapter 6 these kind of deliberations will be called quality assessments. Then, she concludes that, although the kind of organizations that is involved in the Petaplan project could be considered responsible for solving this problem, she is not the right person to invest in this solution, because she does not have the time to do that, and her organization is not the logical one in this collaboration to take up this project. In Chapter 6, these elements will be categorized as part of the fitness assessment that arena attendees do when they are confronted with a new proposal. Finally, she shares that she sees a better option to solve the same problem, which is, again, a kind of quality assessment.

5.2.2 Example mechanisms triggered by an network structure element

In Text box 5.2, an example of an interviewee talking about her experience of a network structure element is shared.

Q: You define two kinds of people now, the quiet, observing people and the wild dreamers. Do you notice you need one of those more?

A: *No, we need them both. When there would just be observers, it would become a nice, well-thought out plan, but we will never get there. The dreamers provide me with new ideas. I think I need them both very much.*

Text box 5.2: Example of a description of mechanisms triggered by network structure.

This quote shows that the interviewee thinks about what kind of roles are needed to successfully complete the Petaplan project. Later, she also showed to have an idea on how the balance between these different necessary roles can be guarded during the development of the Petaplan project. This confirms the idea that will be shared in Chapter 6 that participants check if a project group is able to pull off an aspect of the project before it is made part of their mental representation of the Petaplan project.

5.3 Recognizing references to the imaginative qualities of mental representations

In this section will be described how the five imaginative qualities of mental representations are visible in the answers that the participants provided during the interviews. This will be done in four sections: Diversity and quantity, Originality, Desire, and Trust. In each section, it will be explained what cues in the interview data were interpreted as referring to these respective imaginative qualities.

5.3.1 Diversity and quantity

Here, it is presented what in the interview data was seen as a reference to the diversity and quantity qualities of the mental representations. These two imaginative qualities are linked, because the total amount of ideas about the Petaplan project is spread out over a smaller number of diversity categories. The quantity per diversity category is therefore a more interesting measure than the total quantity of ideas. The final diversity categories were grouped in three main categories (goal, instance, and overall), so that the quantity changes at two levels of diversity categories could be tracked.

In general, every mentioning of how the Petaplan project looks like, or a positive or negative judgment of a suggestion for a Petaplan component, was assumed to refer to the diversity and quantity qualities of the mental representation. These two imaginative qualities were linked in the process of analysis. In the raw data, sometimes only a direction would be mentioned of the suggestions in which the participant approved or disapproved. One of the participants for example only refers to 'the smart design story' in his interview, which shows the direction of ideas, but makes it difficult to determine the quantity of ideas he has in this category. In other instances, only a concrete option was referred to. Then, this option had to be assigned to a diversity category by the researcher. An example of this kind of reference, that was assigned to the smart design diversity category, is: *"We were talking about plugging in solar panels and wind mills at the same place"*. This means some of the diversity categories that were found are *emic* categories (categories as they were used by the participants themselves), others were constructed from the quantitative references and therefore are *etic* categories. The amount of ideas a participant has in each category is the score for the quantity quality of his mental representation.

5.3.2 Originality

Originality is the imaginative quality that refers to the newness of the ideas the participants made part of their mental representation of the Petaplan project. Newness, of course, is a very arbitrary measure that strongly depends on who judges the newness, and what context is used as a frame of reference. For this research, the participants themselves decide what counts as an original idea, since it is about their mental representation. Participants both referred to the originality of elements of the Petaplan project, as well as their unoriginality. Examples of phrases that were interpreted to say something about the perceived originality of the mental representation of the Petaplan project in the participant's mind are the following:

"We never thought about smart design before"

"A collective education program, smart design, that are the innovative parts of this plan"

"Spatial planners are not yet involved in the [Dutch] sustainable energy discussion"

"We are about to add a new kind of terrain to the market for sustainable energy, namely long stretches that are hard to develop renewable energy technology on"

“This is an iconic project for The Netherlands that could serve as an example for other countries”

“A department in our organization did look into smart design before”

“Other renewable energy projects also get subsidies from the Dutch government”

The different contexts in which originality can be judged, made it difficult to determine the originality level of the mental representation since the same suggestion can be original in one context, and at the same time unoriginal in another. The occasional references to originality in the raw interview data did not encompass all these contexts and are therefore insufficient to draw conclusions on this imaginative quality of mental representations. So, in future use of this framework, data on this aspect should either be collected more structurally, or judged on originality by the researcher instead of the participants.

5.3.3 Desire

That the participants felt a certain desire towards the Petaplan becoming reality, is evident from their interviews in explicit and implicit ways.

The explicit way of expressing desire, is to voice a positive judgment about the plan's impact or about their contribution to the plan. Examples of these positive judgments are *“It's a beautiful plan”, “it was a magical moment”, “it is cool to be part of this plan”, in principle it is a very good idea and this should be executed”*. Similar expressions were used to refer to moments in which the desire was negatively influenced. One participant voiced the question: *“How grand is the Petaplan project really?”*, when talking about how they experienced the limited response to their joint press release. And another mentioned that the coolness of the project was less prominent when he discovered the total amount of energy used in The Netherlands is the equivalent of 3000PJ, because it made their impact look a lot smaller.

The more implicit references to desire are explanations of certain behaviors or shifts in priority that illustrate that they want the Petaplan project to become reality. For example, some participants mentioned that they intentionally kept out (or would like to keep out) certain departments or people in their organization, because they have a bad influence on the likelihood of the project coming about: *“If I give it to them, they will fuck it up”, or “I am afraid that we do not make progress if we leave this project in the hands of a certain project manager”*. Another implicit way in which the participants referred to their desire

towards the Petaplan coming about is that they state that their own interest became inferior to the Petaplan being executed. *“It is not the main thing that we get the electricity from the projects”*, some of the distribution operators said. The third way in which the participants are taken to implicitly voice their increasing or decreasing desire for the project is that they refer to why they did or did not start their participation in the project. *“If that’s what this is gonna be about, then, leave it!”*, *“This is what triggered my interest in the project”*, or *“You can ask yourself if you agree that we are funding this project with SDE+”*.

5.3.4 Trust

Trust was assumed to be a process-related imaginative quality. This means references of participants were taken to refer to their trust in the project coming about when they perceive a dependence of something for the project to succeed. Their trust in the project is boosted when they notice this element they are dependent on develops well. Concrete examples of these references are:

- *“...can only be helpful”*
- *“...makes it real”*
- *“...really helps me to think: Yes, this is going to work out.”*
- *“...does not reassure me”*
- *“...is a good thing to write down goals and communicate about them”*

Similarly, they are explicitly referring to the likelihood of reaching the end-point of the Petaplan project. Examples of these references are: *“It’s a barrier, but not the end of it”* (about the opinion of the ministry that the project should not cost any money), *“This 28PJ, we are not going to make that, since many practical problems are going to pop up”*, *“This is going to happen, I am 100% sure of that”*.

Interview data that refers to trust can be difficult to distinguish from references to desire. For example, one interviewee told about her experience of the workshops: *“It became a hassle”*, which, if the researcher assumes this is a reference to the speed of the process, would be categorized as referring to trust. She did mean to refer to her expectation that the project’s way of working would be quick and efficient. This expectation had fired up her desire to work on the Petaplan project, so the hassle during the workshops affected her desire.

5.4 More than one version of the mental representation

When looking for the references to imaginative qualities, it is important to carefully assess if the reference concerns the mental representation of the Petaplan project that the participant had at that moment in time. Namely, several versions of this Petaplan project seem to be swarming around in the heads of the participants at the same time. These different versions emerge from two dimensions in which the Petaplan is viewed and related to: A time dimension and an inter-personal dimension. Below, these dimensions and versions of the participants' mental representation of the Petaplan project are described and illustrated by using the interview data.

5.4.1 Multiple versions along the time dimension

The first dimension in which the versions of the mental representation of the Petaplan project are differing, is related to time. The existence of two versions of the Petaplan project in this dimension, being a 'current' and a 'future' version, can be deduced from the reactions of participants to a proposed new element of the project.

When participants were asked about their reaction to a suggestion for a new element of the Petaplan project, they sometimes rejected this idea completely. However, when they considered this idea as a possible part of the Petaplan project, they regularly said things like: *"I think this is a valuable idea, but we should focus on something else first. Maybe we will incorporate this later."* Participants reacted like this for example when it comes to the PetaAcademy, an idea to educate people for the execution of the Petaplan, or negotiating with Staatsbosbeheer to compensate trees that might be cut in the execution of the Petaplan project. Other suggested elements were more readily incorporated as possible part of the plan, like the use of the SDE+ finance program of the Dutch government, or the kind of grounds that would be used to develop the Petaplan project.

These two different ways of approving of an idea for the Petaplan project suggests that the participants have two versions in their mental representation of the Petaplan project. The first version is the 'current' version. This is the Petaplan project as they want to work on right now. A first edition of the project that could be elaborated later on. The second version of the mental representation is the 'future' version. This version includes ideas the participant thinks could be added to the Petaplan project in a later stage, in which the 'current' version

of the Petaplan project requires less attention because it is either developing well, or given up.

5.4.2 Multiple versions along the inter-personal dimension

The second dimension is an inter-personal dimension that contains three versions: A version of the Petaplan project that is qualified as their own, one category of versions with the views of their fellow Petaplan project members, and one category of versions of other people or organizations that are not directly involved in the development of the Petaplan project. These (categories of) versions were called 'own', 'other in-group', and 'other out-group'. This will be elaborated on below.

During the interviews, discussions that took place during the Petaplan's development were described to the Petaplan project members. They were challenged to recall their judgments at that time. These judgments and other references to what they perceived to be part of the future or current Petaplan project can be classified as the version in their mental representation of their 'own' Petaplan project.

All interviewed members of the Petaplan project group are aware of at least certain elements of the image of the Petaplan project in the heads of other project members. They referred to the ideas others proposed in discussions, or the urgency others seemed to feel to take action. For example, one interviewee said that he thinks one of the participating companies wants the Petaplan members to take the role of project developer in the project, while he does not see that happen at all. Another example is an interviewee mentioning several times that he *"had to call someone back there"*, because this other person trusted it would be fine to go faster, but the interviewee did not. When talking about RWS becoming part of the Green Grids platform, another interviewee mentioned that *"the people from RWS had lights in their eyes when they talked about renewable energy on their grounds, so I was sure they knew something we did not"*. So, in these examples, the interviewees refer to the different (levels of) diversity, trust, and desire they perceive to be part of the mental representation of the other project members. Of course, there are also many instances in which the interviewees said things like *"We thought that..."* or *"According to our vision"*, in which the 'we' referred to the Petaplan project group as a whole.

The Petaplan project group also regularly negotiated how they would present the Petaplan project to others outside their group. Topics of these discussions were what could already be shared, and what was best to keep more secret a bit longer, as well as whom they were going to share certain elements of the plan with. One of the participants shared the outcome of such a discussion like this: *“We just gradually convince the bosses of our plan, we said. Every time, we make them take a small step, then we create a success with each of the pilots, and tie those together. They cannot go back then anymore.”* Apart from images of what their board members knew, participants had more images of what the Petaplan project involved for other parties. For example, they implied to have an image of what Dutch governmental bodies knew, and an image of what the press knew about the project. These versions of their mental representation of the Petaplan project were probably not only fed by the discussions during Petaplan project meetings, but also by feedback that the group members transferred, like *“I talked to the SER, and they were very enthusiastic about the plan”*.

So, a mental representation is not a single thing, it is more like a filing system in which every group member has been given a file, and people and groups of people outside the project group also have been given a file. On these files, the participants collect impressions of what they perceive these others know and think and feel about the Petaplan project. The files of group members together are called the ‘Others in-group’ version of the mental representation of the Petaplan project. This is probably also the version of the mental representation that feeds the idea of a shared vision. The files of others that do not belong to the Petaplan project group are called the ‘Others out-group’ version of the mental representation of the Petaplan project.

5.4.3 Differences between participants

Two versions in the time dimension and three versions in the inter-personal dimension make six possible versions of a participant’s mental representation of the Petaplan project. Even though the interview focused on their own image of the Petaplan project, four out of six participants referred to all six versions of their mental representation. One did not refer to a future vision of the Other out-group, another did not refer to a future vision of the Other in-group.

A reference to the same idea for the Petaplan project does not necessarily have to be placed in the same version of the mental representation by each arena attendee. Each individual decides for himself if he sees the idea of setting up a joint education program as part of his current version of the Petaplan program, or his future version. When placed in a certain category, this is still vulnerable to change. The element can move from the 'future' version to the 'current' version, or the other way around. It can even completely disappear from view and be discarded as an element of the Petaplan project altogether. The mechanisms that determine in which version a potential element of the Petaplan project ends up are studied in Chapter 6 of this thesis.

5.4.4 Consequences for this research

Since the interviews focused on the participants' personal vision on the Petaplan project at the moment in time that was discussed, data on the other versions of the Petaplan project was not collected in a structural way. The references to other versions of the mental representation are therefore mainly made relative to their 'own current' image of the Petaplan project. In this thesis, references to other versions of the mental representation of the Petaplan project are only incorporated in the analysis if they are used as an indirect reference to the 'own current' version of the plan. The role of the five other versions of the mental representation in the formation of the 'own current' version is a topic for future research.

5.4 Summary of the research framework

This chapter showed how the elements of the conceptual framework can be identified in the raw data. For all operationalization of these elements, several ways of referring to this could be found that, when considered closely, do not overlap between operationalization. Some ways of referring to the elements were suggested by scientific literature, others spilled from the descriptions and definitions of the operationalization of these elements. Of course, determining if a piece of raw data is a reference to a part of the conceptual framework is a highly interpretative act. So this is always open for updates and discussion with other researchers.

The references to the stimuli from the environment were identified based on the ideas of Koppenjan, namely that there are contributions to arena games that expand, diminish, and

keep the current possibilities for forming the innovation project in the arena. So, these are *project references*. References to the other set of stimuli from the environment, the network structure elements of norms, roles, and relations, are mainly judgments that interviewees do about themselves and other arena attendees. So, these are *people references*. The cognitive processes, or mechanisms that mediate between the social context and the mental representations, are identified in bits of raw data in which interviewees express their experiences and associations. In other words, these are *thought references*.

The references to the creative imaginative qualities of their mental representation come in a limited number of ways, while references to the emotional imaginative qualities come in numerous ways. Originality is referred to when the newness of an idea is indicated. Diversity is referred to as a category of ideas by the interviewee himself, or the diversity category is constructed by the researcher from loose ideas that the interviewees mentioned to have had for the Petaplan project. Each idea the interviewees mentioned is taken to be a reference to the imaginative quality quantity. Trust is taken to be a process-related issue, so implicit references to perceived dependencies for success and explicit statements about the likelihood of reaching the end-goal are grouped under this category. Desire is indicated when the interviewee reveals a judgement about the impact the project can have, or about their happiness that they can contribute to the project's realization. Judging an idea relative to the reason why they started their participation in the project is another way of expressing how this idea influenced the desire levels in the mental representation. These elements form the visibility level of the research framework for imagination as a driving force of innovation fueled by its social context. The total framework so far can be reviewed in Table 5.5.

Main concept	Connected to following element from conceptual	Theoretical operationalization of element in conceptual framework			Visibility	
		Level 1	Level 2	Level 3		
Inter-organizational collaboration	Stimuli from the social environment	Arena games	Problem statement Solution(s) Participants Timing	More, less, keep More, less, keep More, less, keep More, less, keep	Accepting, Précising, Redefining Selecting, Excluding, Developing Mobilizing, Excluding, Introducing Creating time pressure, Delaying	
		Network structure	Norms	Decision-making procedures, conflict resolution, language use, transparency, and evaluation criteria	Group attribution, Assumed reactions, Contrast with other groups	
		Encoding, Elaboration Evaluation	Roles	Task roles, socioemotional roles, individual roles	Characterizations, Contributions, Missing influence	
			Affectionate relations	Judgments about person, about collective		
	Innovation	Behavior concerning decision-making process	Inside arena			
			Outside arena			

Main concept	Connected to following element from conceptual	Theoretical operationalization of element in conceptual framework			Visibility
Imagination	Current mental representation of innovation project Other versions of mental representation of innovation project	Level 1	Level 2	Level 3	
		Creative qualities	Diversity		Number of emic or etic categories of proposals
		Emotional qualities	Quantity		Count of all judged or mentioned proposals
			Originality		Newness to a particular context
			Desire		Judgement about impact or contribution, priority of own interest, working around trouble makers
			Trust		Dependency relieved, likelihood of reaching the end-point
		Time	Current Future		
		Inter-personal	Own In-group Out-group		

Table 5.5: Research framework for imagination as a driving force for innovation

This chapter also revealed that the conceptual framework as it was presented in Chapter 2 needs an update. It became clear that there are several versions of the mental representation of the Petaplan project swarming around in the head of the individual. These versions differ from each other along a time-dimension and an inter-personal dimension. This results in an idea of what “I think the Petaplan that we are working on now should look like”, and an idea of elements to the plan we might be working on in the future. These urgency categories also return in the ideas that the interviewee has about other people’s idea of the Petaplan project, both within as outside the project group. To avoid confusion during analysis, it is important to keep the difference between these versions in mind during the interpretation of the data. So, these different versions of the mental representation need to be added in the conceptual framework, as is depicted in Figure 5.2.

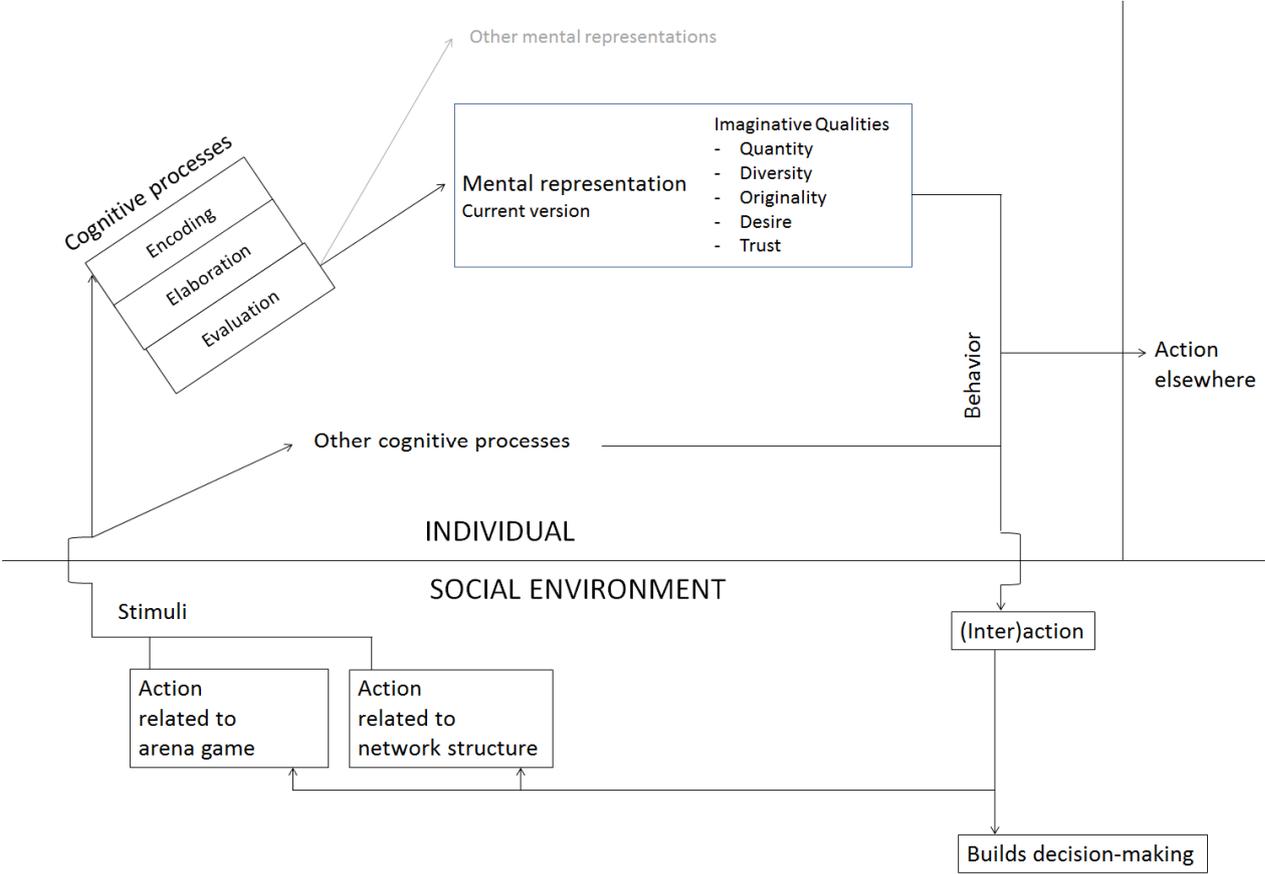


Figure 5.2: The updated research framework of imagination as a driving force of innovation

6 Perceiving the social context

The empirical foundations for the research framework of imagination in its social context are presented in the following two chapters. A complementary bottom-up and top-down approach helped to determine a more detailed theoretical operationalization of the stimuli from the social context, the cognitive processes that mediate between stimuli and mental representation, the mental representation itself, and the behavior of the arena attendees. All these efforts are aimed at answering the third research question “How can each part of this conceptual framework be operationalized with directions that are relevant for investigation?” in more detail. So, we return to the third level of the research hierarchy in the following two chapters (see Figure 6.1). This should result in a thorough operationalization level in the research framework for imagination as a driving force for innovation fueled by its social context.

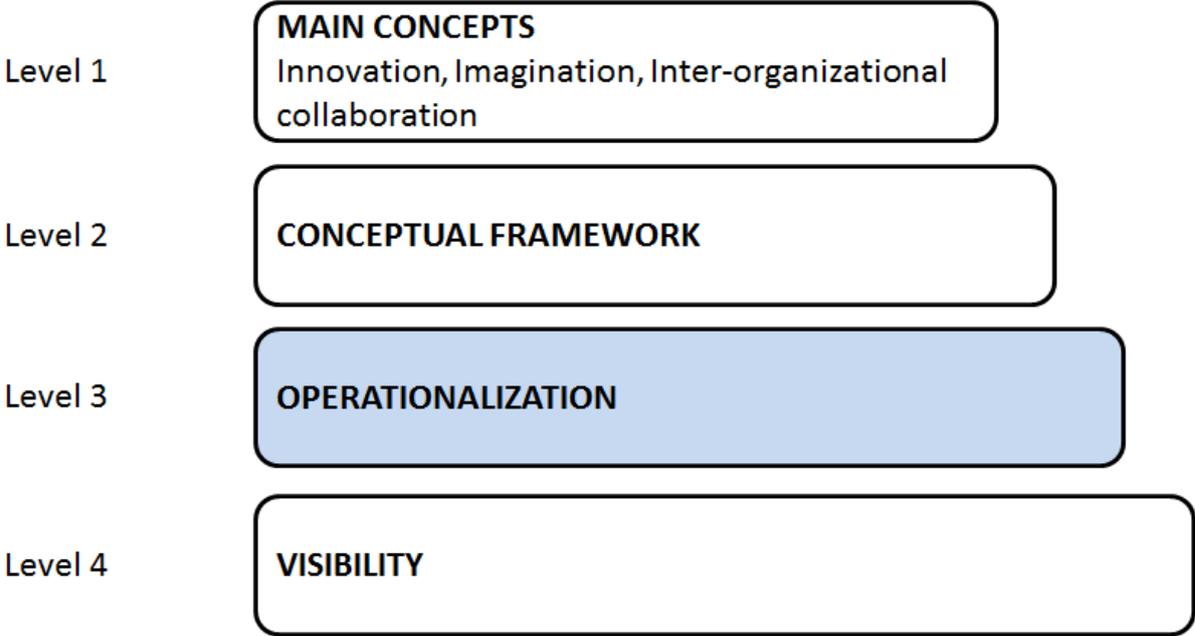


Figure 6.1: The level of focus from the research hierarchy during Chapter 6 and Chapter 7

In this chapter, the stimuli from the social context and the cognitive processes that mediate between stimuli and mental representation are further presented. This encompasses the highlighted part of the framework in Figure 6.2. Section 6.1 contains an inventory of social context elements. Roles and games are studied using a top-down approach, while norms and relations are approached more from the bottom-up. In section 6.2, the cognitive processes

are presented as an assessment framework of nested trade-offs. This framework was put together entirely with a bottom-up approach. In section 6.3, it is described how these cognitive processes change when the stimuli from the arena are perceived as a form of feedback on earlier assessments by the arena attendees. In the final section, the updates to the research framework for imagination as a driving force for innovation fueled by its social context are presented.

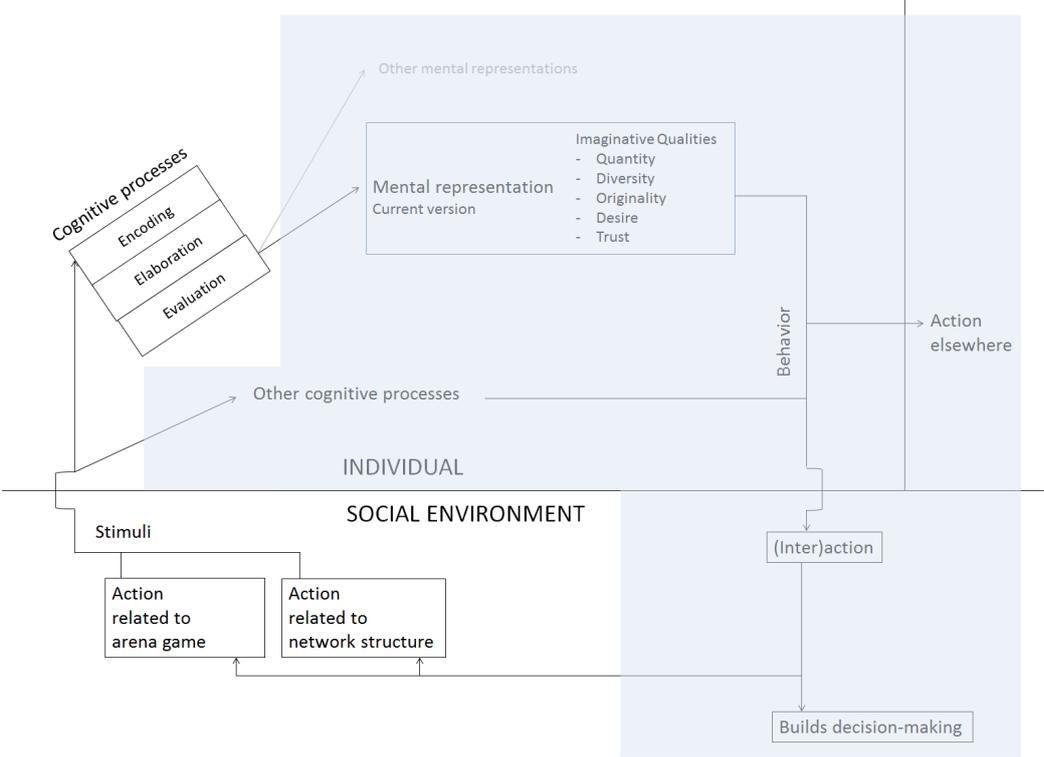


Figure 6.2: The white part of the research framework is operationalized in more detail in this chapter

6.1 Elements from the social context

What does the social context of the interviewees look like? What network structure elements and arena games constitute the development space and development process of the Petaplan project? From the interview data, three general norms emerged, and three aspects based on which the participants determine if they like the other attendees of the arena. The interview data also confirmed the usefulness of all four kinds of arena games, since all discussions and negotiations could be categorized in the categories problem statement, solution, participants, or timing. The same goes for the three role categories of

task roles, socio-emotional roles, and individual roles, although the task roles were divided in two main categories by the interviewees.

6.1.1 Norms

Norms guide the behavior of arena attendees and create expectations about the behavior of other arena attendees. Three main norms emerged from the data, which can be coupled with the norm categories that were found in the literature. One norm concerns the goal of the Petaplan project, namely joint learning. This is similar to the norm category 'evaluation criteria' that was suggested by Remmerswaal and Forsyth (Remmerswaal, 2004; Forsyth, 1999). The other two norms that emerged concerned the way of working of the Petaplan project group, being working from an informal governance structure, and with attention for implementation tactics. This norm on the governance structure contains norms on the norm categories conflict resolution, language use, and transparency. The norm implementation tactics is the norm for decision-making. So, the categories for operationalization of norms that were suggested in the literature are meaningful categories in the research framework. Below, the findings on norms are described in more detail.

The motivation of joint learning

The main reason for this coalition's existence is exploring the possibilities this coalition has to offer related to increasing the capacity of green energy in The Netherlands. But it is not just their common goal that is related to learning. Participants indicate that they also want to learn things for their own organization or personal development. In this light, it is common practice during meetings to tell each other how they are working on things to inspire each other and receive feedback from the others. They purposely aim to start doing things quickly, so they will also learn about the practical implications of their ideas, and keep their meetings a safe space in which having to conclude that something failed is okay. If they learned something is the main criteria for all participants to judge a project to be successful.

Working from an informal governance structure

The first thing that strikes when a new individual enters the meeting room of the Petaplan core team is the easy-going atmosphere. There are cookies on the table, people wear casual clothing, make jokes with each other, and tell about their ideas in a way that does not hide their passion or doubts. Their commitment to the project is based on this enthusiasm and

trust, because there are no targets, budgets, or fixed responsibilities. According to several participants, this is the secret of the success of the Petaplan project so far. *“We cannot provide a solid business case in this stage of a project, so when our bosses join for a captain’s meeting, we need this atmosphere to convince them”*, says one interviewee. Another interviewee is under the same impression: *“The organic development of the project largely contributes to the speed of doing things: Who is ready to start, starts, the others will join later”*. This latter quote illustrates the conflict resolution norm.

Attention for implementation tactics

A large part of the meetings is reserved to talk about implementation tactics, like who is the next party or department they will involve in the project, or how they will communicate about the project. Several interviewees indicated that this was new to them, because within their own organization, they normally are the only one in a meeting interested in talking about this. In this coalition, however, they share the opinion that this is (at least) as important as the content of the project in the decision-making process. Apart from regularly discussing the next steps together, this norm is also confirmed by the fact that core team members sometimes ask advice about how to deal with a situation in their organization, by them sharing the outcomes of their strategies, for example when they managed to convince an influential person of the attractiveness of the Petaplan project.

6.1.2 Roles

As was discussed in Chapter 2, Forsyth defined three types of social roles: Task oriented roles, social roles, and blocking roles. When these categories were used to look at the data on the social context, they could not accommodate all data seamlessly. The main difference is that the participants perceive their task to be dependent on two very different roles: Content creators and the tactical masterminds. So, an extra category was added to the operationalization of roles to ensure saturation. Below, the role categories distinguished in the data are described in more detail. These categories should be considered characterizations of role *behaviors*, not as characterizations of individuals, since individual arena attendees were observed to take several roles (even at the same time).

Task role: Content creators

Content creators are people that do suggestions about what the Petaplan project should look like in its final state. Some content creators are experts on a topic like capacity calculation or business models. The members of the Petaplan core team were confronted with them during the workshops, and during some of their meetings. Other content creators are referred to by most participants as 'the dreamers'. They are the creative minds that make new connections and envision the large scale impact of the project.

Task role: Tactical masterminds

The tactical masterminds are the people that are busy making the envisioned content of the project reality. They focus on ensuring that bottlenecks in the implementation of the project are circumvented. Behavior related to this role is aimed at process and relation management, like thinking about the next steps: Who should be involved next and how should these people be approached to be convinced of the value of their cooperation with the project? The entrepreneurial role that one of the interviewees is missing fits in this category too, since he refers to people that make connections with parties that can further the project. Of course, by having this concern, this interviewee also demonstrates behavior that fits the role of a tactical mastermind himself.

Social-emotional role: Social glue

Individuals that function as social glue are the people that make everyone feel happy and safe. Example behaviors of this role are raising spirits by making jokes, making others feel at home by supplying others with drinks and food, making others feel involved and recognized by asking people about their personal experiences or opinions, and creating team spirit by celebrating successes. All interviewees agree all core team members display behaviors that belong to this role, although there does not seem to be someone who makes this his main focus. At least, it is not always there. This is demonstrated by reported experiences of having felt left out at some point in the process.

Dysfunctional roles: Blockers

Blocking behavior is trying to prevent something from happening. The interviewees judge the blocking behavior they noticed during the development of the Petaplan project to come from either another personal focus, a selfish attitude, or a lack of courage to 'just go for it'.

During most interviews, it was mentioned that they were surprised by the small amount of blocking behavior they were confronted with until now.

6.1.3 Relations

What creates affectionate relations between members of a group was not shared by the scholars of group dynamics that were consulted to operationalize this network structure element. The interview data suggest that these relations are mainly based on three things: Fun, trust, and recognition. These three aspects of the operationalization are added to the research framework, and are described in more detail below.

Fun

The members of the Petaplan core team share a lot of fun times together. They celebrate successes with the Project, go out for dinner a few times a year, and make jokes during meetings. “I am not the *one with the best humor, but I can really, really enjoy the jokes of the others a lot*”, one interviewee shared. Sharing this fun together gives them a positive image of the other members of the Petaplan project.

Trust

The positive relation between participants can also be partly attributed to their mutual trust. They know that they all have the same desires for the world, and experience the same problems in their organizations. So they can believe that nobody is trying to take advantage of them and let their guards down. The personal conversations they have increase their liking of each other.

Recognition

Some members of the Petaplan core team shared to have a certain liking for another member of the team because they admire certain qualities they have. “*I appreciate his qualities to dream big a lot*”, an interviewee says for example. The other way around, the person mentioned by this interviewee also feels appreciated for his qualities, which strengthens his perception of their bond even more.

6.1.4 Arena games

In almost all interviews, examples were found of the interviewee having perceived arena games in all twelve directions of the arena games: Four topics of arena games (problem statement, solution, participants, and timing) that can all be aimed at extending, diminishing,

and maintaining the current options in this category. This confirms the operationalization proposed based on the scientific literature from Koppenjan (Koppenjan, 1993). Below, examples for each direction are given.

Arena game	Direction of game	Example from interviews or observation
Problem statement	Additional problem(s)	Proposing to solve the employee shortages in their companies.
	Fewer problems	<i>"Let's focus on this [energy generation] first."</i>
	Keep current set of problems	<i>"I do agree that creating impact is important, but it is not what I would remember as the goal of the Petaplan project. That is generating as much energy as possible on RWS lands as soon as possible."</i>
Solution	Additional solution(s)	<i>"I am so happy that we came up with the smart design perspective."</i>
	Fewer solutions	Some of the DSO's suggest they do not have to be the energy purchaser of the projects.
	Keep current set of solutions	Proposing to start the pilots based on the current plans
Participants	Additional participant(s)	Involving the press with a press release
	Fewer participants	One company sharing that they will leave the project if the regulatory problems cannot be overcome
	Keep current set of participants	<i>"What do we have to win with involving extra partners at this stage of the project?! Nothing!"</i>
Timing	Increase decision-making pressure	Deadlines are set with the captain's meetings
	Lower decision-making pressure	<i>"Some of us sometimes go too fast. Then, I have to call them back: I want you to stop now, otherwise you mess things up for my company."</i>
	Keep current decision-making pressure	Not participating in the SER energy agreement relieves them from pressures related to this commitment.

Table 6.1: Examples of references to games that interviewees perceive to play a role in the social context

6.2 Filling the mental representation

During the interviews, data was gathered on how the proceedings in the social context are perceived by the arena attendees, and how this influenced if a proposal or emotion becomes part of their mental representation of the Petaplan project. Two main mechanisms emerged from the interview data: Quality assessment and Fitness assessment. Below, these assessments and a more detailed operationalization will be presented in a big assessment scheme. Then, it is explained how this scheme should be read to understand the processes that underlie the assessment's results. Of course, the relation between other elements of the research framework for imagination as a driving force for innovation fueled by its social context will be described too.

6.2.1 The assessment scheme

How these main mechanisms work, so how the quality assessment and fitness assessment are completed by the arena attendees, is summarized in the visualizations of Figure 6.3a and 6.3b.

QUALITY ASSESSMENT

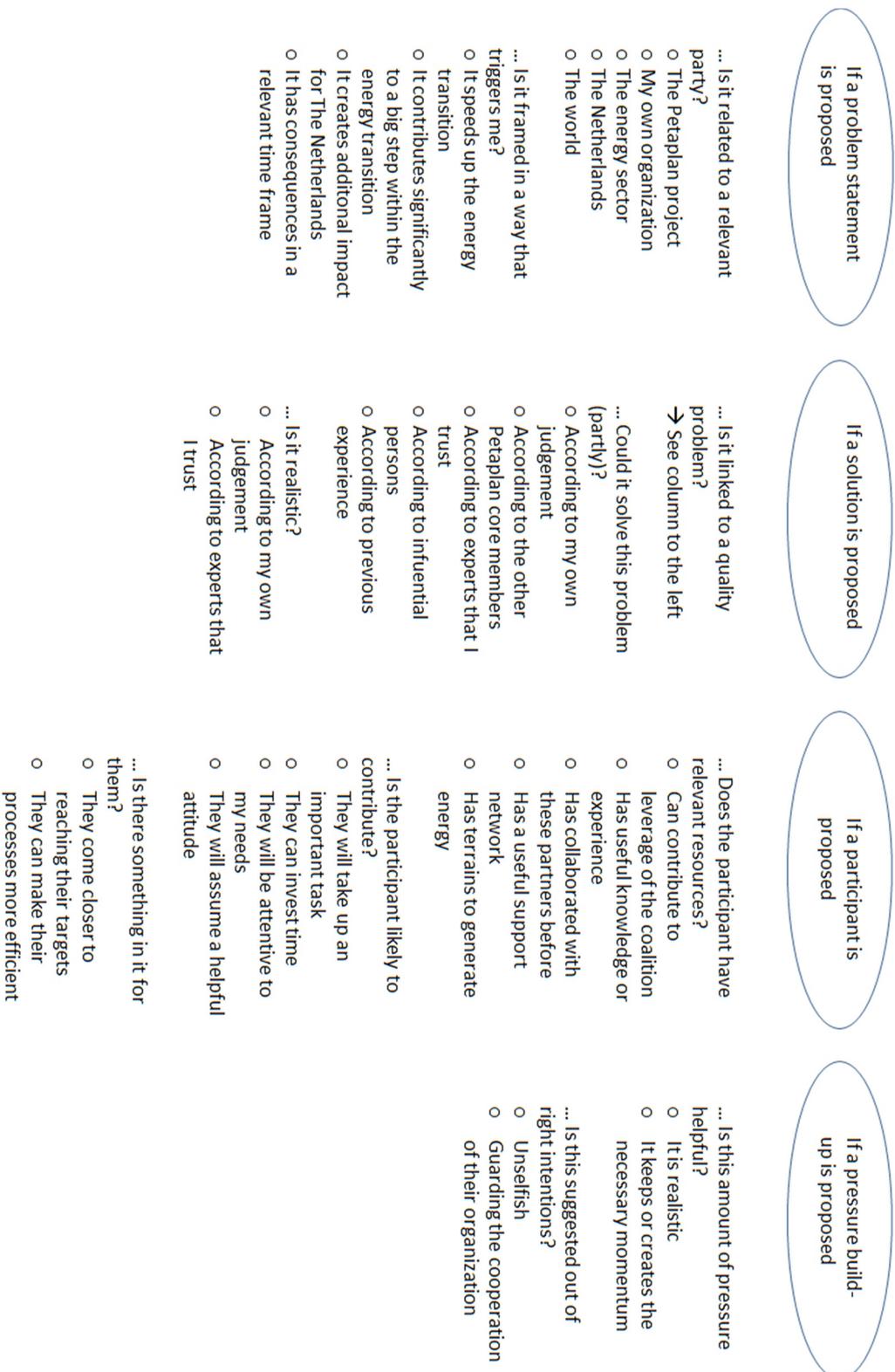


Figure 6.3a: The quality assessment scheme. See for reading directions the next page

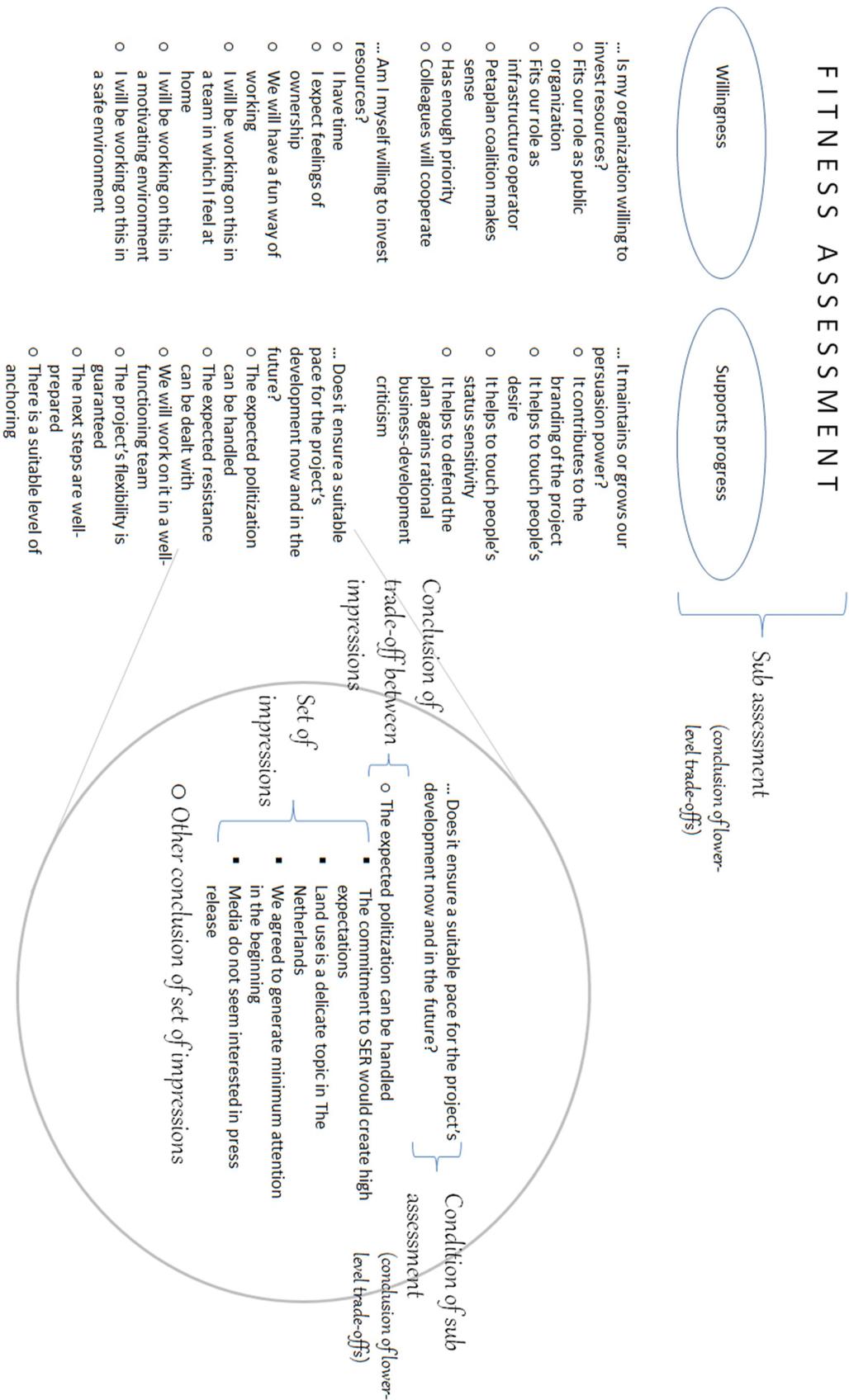


Figure 6.3b: The fitness assessment scheme with reading guide that is filled with impressions from one interviewee

Reading guide

As can be seen in Figure 6.3b, the assessment scheme has five levels of nested trade-offs that represent, amongst others, the influences from the individual's social context. The results of these trade-offs is a decision to either change the mental representation or keep it the way it was. Below, the five levels of the scheme are described, and the process of evaluation is explained.

Five levels of the scheme

The lowest level of the scheme is indicated in the enlarged view with squares (■). Each square represents an *impression* the arena attendee has. This impression is a piece of information that can have different origins. It can come from the attendee's interaction with the arena (an observation the attendee did, or a claim he heard), or an impression that comes from somewhere else (like a book, or previous experience). The impressions are grouped in sets of impressions that enable a *trade-off of impressions*. This trade-off forms the next level, and is indicated with circles (○). In the scheme, a question illustrates the trade-off. The set of impressions that is grouped underneath it provides the information to draw a conclusion on this question. The level above these trade-off of impressions is indicated with three dots (...). Now it becomes clear that the questions written on the circle level are not random questions: They are questions that the interviewees indicated to use when they were determining if a certain *condition* was fulfilled. So, the dotted level is the level of conditions. But what are they conditions for? For the *sub-assessments* that the arena attendee does: The Quality assessment and the Fitness assessment. The conditions are grouped underneath the assessment it belongs to, which are indicated in capitals. The entire *assessment* scheme represents the total assessment that an individual does and that influences the contents of his mental representation of the Petaplan project.

Process of evaluating nested trade-offs

To the arena attendee, each level provides the information that is needed to determine the answer to the question that is asked in the level above. The question on the highest level would be "Do I want this idea to become part of the Petaplan project?". Then, a sequence of box-in-a-box like questions follows. Namely, this main question is answered by looking at the conclusions from both sub-assessments, each of which is determined by how well all conditions belonging to the sub-assessment are fulfilled, which is determined by the

conclusions of the sets of impressions, which are determined by the single impressions of the arena attendee.

Using the word 'determined' in the paragraph above to indicate the result on one level might suggest this is a logical consequence of the available information in the level below. This, however, is not the case. Each arena attendee has his own preferences that influence how he deals with the trade-off in case not all information points in the same direction. The interview data seems to indicate that the result of this trade-off can change over time, based on new impressions the arena attendee has acquired. For example, when an expert says that it is possible to generate 28PJ of renewable energy on the land of RWS, and the individual arena attendee does not believe that, he might at first choose to follow his own assumptions. If, however, more experts join the previous expert, amongst others an expert the arena attendee trusts completely, then the conclusion of this set of impressions becomes a positive influence on the condition that a proposed solution should be a realistic solution.

Looking at the assessment scheme, it becomes clear that the scheme does not have to be refilled completely for each new assessment to be made. For example, the impressions that are used to check if a motivating environment to work in can be expected, are largely the same for all assessments that concern something that will be executed by the core team of the Petaplan project. Because other sets of impressions do change, it is however possible that the priority that is given in the trade-off to this evaluation, becomes higher or lower.

6.2.2 Linking the assessment scheme to the research framework

The literature suggested to operationalize the cognitive processes with three phases of encoding, elaboration, and evaluation. These phases overlap a lot in the assessment scheme as it emerged from the interview data, so they are judged to be not so meaningful for the operationalization of this research framework. Instead, new concepts are introduced for the operationalization of the cognitive processes: The Assessment of nested trade-offs, Quality assessment and Fitness assessment, Willingness assessment and Progress assessment, and conditions, trade-offs of impressions and impressions themselves. The assessment is activated when arena attendees are subjected to stimuli from the social context stemming from behavior related arena games and network structure. Below, it will be first explained how the stimuli from the environment can shape the assessment scheme and the resulting

mental representation. Then, it is discussed how the influence of these stimuli on the five imaginative qualities of the mental representation can be traced via this assessment scheme.

Stimuli from the social environment

The two kinds of stimuli from the social environment that are part of the scope of this research project, arena games and network structure, have a different place in the assessment scheme. Arena games shape the mental representation both directly and indirectly, because they provide the input of proposals that are assessed for a place in the mental representation, and the impressions that shape the assessment scheme. Network structure mostly shapes the mental representation indirectly, because they influence the impressions.

Actions related to arena games

Arena games are negotiations about the content of the common plan for the Petaplan project. These provide two kinds of input to the assessment scheme. First and foremost, these arena games provide the proposals that are being judged for their quality and fitness, so it can be decided if they become part of the arena attendee's mental representation of the project. If it is proposed to add or remove an arena component (being a problem statement, a solution, a participant or decision pressure), then the arena attendee assesses this proposal to see if this is indeed something desirable. Of course, individual arena attendees do not have to come to the same conclusions. They build their own mental representation based on the impressions they gain. How they deal with differences between their own mental representation and the common plan will be discussed in Section 6.3.

Apart from proposals, the arena games also provide new impressions to the arena attendee, because the negotiations are an opportunity in which other arena attendees share their knowledge about the quality of a proposal, or their ideas about how it will influence the speed of the project and other conditions that determine how willing the participants are to incorporate the proposal in their mental representation. This input from the arena can change the conclusion of a trade-off, and therefore also the mental representation of the arena attendee.

Actions related to network structure

The network structure elements influence several impressions that play a role in the scheme. Even though they all have an influence in the fitness assessment part of the scheme, it differs on which set of impressions actions related to norms, roles and relations have an influence. Actions related to norms influence sets of impressions in three places of the fitness assessment. Most references from interviewees were placed in impression sets 'We will have a fun way of working', and 'I will work on this in a safe environment', and are therefore part of the trade-off that determines the willingness of the arena attendee himself. Some interviewees also see actions related to norms as input for the deliberation if the proposal supports the progress of the project because it maintains or grows its persuasion power. They see the personal and passionate way of working of the Petaplan project team as helpful in dealing with the tendency of decision-makers to criticize a plan from a rational business-development perspective. The final impression set that is found to be influenced by actions related to norms, is the impression set referred to as 'We will be working on it in a well-functioning team'. Interviewees that mentioned this connection referred to the organic and easy way of decision-making the governance norms permit.

Actions related to roles are found to influence two impression sets in the fitness condition 'keeps a suitable pace now and in the future'. The specific sets of impressions that are influenced by role behavior of other arena attendees can be found in the assessment scheme under the names of 'We will be working on it in a well-functioning team' and 'The next steps are well-prepared'. An example of role behaviors that are observed by arena attendees and used to assess the functioning of the team, is the impression that there is a good balance between people that take the dreamer role to create content for the plan, and people that take the role of the tactical mastermind to bring this dream a step closer to reality.

Finally, actions related to relations are exclusively influencing the answer to the question if the arena attendee himself is willing to work on a proposal. The impression sets 'I will be working on this in a team in which I feel involved', and 'I will be working on this in a motivating environment' are exclusively formed by impressions related to relations. References to these actions also suggest they constitute a big part of the impression set 'I will be working on this in a safe environment'. So, apart from the influence the experienced relations have on the impression set 'We will be working on this in a fun way', these stimuli

mostly influence impression sets related to the environment in which the arena attendees expect to work during the development of the Petaplan project.

Imaginative qualities of mental representations

In total, the assessment answers the question: Do I want this proposal to become part of my view of the Petaplan project? In this section, it will be described how the assessment scheme can help to say something about the status of the imaginative qualities of this mental representation. All imaginative qualities can be linked to the assessment scheme, but other levels of the scheme are relevant for the determination of the creative imaginative qualities and the emotional imaginative qualities of the mental representation. First, this will be discussed for the creative imaginative qualities of the mental representations. Then, the same will be done for their emotional imaginative qualities.

Creative qualities

There are three creative qualities of an imaginative mental representation: Diversity, quantity, and originality. The scores on all three qualities can be increased or decreased after the assessment of a proposal. If a proposal is judged worthy of becoming part of the mental representation, it increases the diversity of the mental representation if no alternative to this proposal was part of the mental representation yet. If an alternative to the freshly assessed proposal was available in the mental representation, the quantity increases. The originality of the mental representation of the Petaplan project simply increases when a proposal is taken up that is judged to be original in a context that is relevant for the arena attendee. All three scores decrease when a proposal is removed from the mental representation. A proposal can be removed from the mental representation after its assessment is redone and based on new impressions and new priorities. So, the creative imaginative quality of the mental representation is mainly dependent on the final conclusion from all trade-offs that decide what is taken up in the mental representation. Diversity, quantity, and originality qualities of the mental representation are mere consequences from the diversity category and originality category the proposals belong in.

It seems that participants often have preferred and less preferred alternatives in their mental representation. For example, one participant said *“It is too early to drop the idea that we [the DSO’s] can buy the energy”*, while she also shared that her organization would continue their

participation if they could not buy the energy. This illustrates she has two options in her mental representation. It became also clear that she strongly preferred the first option, since this would solve an important problem of her organization. The position of a proposal on this list of preferred alternatives is dependent on how close the trade-offs have been during its assessment: If all questions taken into consideration were clearly answered in favor of the alternative, it will have a higher position in the ranking than an alternative for which some important questions were answered in a way that points to removal from the mental representation.

Although, in principle, an original proposal will be assessed for its quality and fitness like any other before it can become part of the mental representation, the interview data suggest that the originality of a proposal does have an influence on how this assessment is conducted. If interviewees observe the originality of a proposal, this can change the impressions that determine the fitness of the proposal. As we saw in chapter 5, some participants have a special liking for original ideas, which comes back in their special attention to the impressions that suggest that it fits their role, and that it solves a problem that is very important, while ignoring other impressions like those about colleagues that might not be too keen on joining. Other participants are less keen on incorporating innovative ideas, which is reflected in the fact that they give more attention to the criteria that a solution should be realistic, that the speed of the project should not lower, and/ or that it will cost them time they do not have. So, the qualities of a proposal itself also change the priorities that are set for the trade-offs that are made during the assessments.

Emotional qualities

In Chapter 2, two emotional qualities of imaginative mental representations were introduced: Desire and trust. Both emotions are more strongly attached to the mental representation when the alternatives that have become part of the mental representation are positively evaluated in certain parts of the assessment. Desire, for example is boosted by positive evaluations of the quality of the problem, the quality of the solution, the willingness of the arena attendee himself, and a promise of a speedy delivery of the project. The trust that is associated with the mental representation is boosted by qualitative participants, the rightfulness of the pressure that is present in the arena, and for every alternative in the mental representation that was positively evaluated on the willingness of the attendee's

organization, the safeness of the environment they will operate in, the persuasion power, and its pace keeping promises.

Feedback from the arena that confirms the impressions on which these evaluations are based can boost the trust and desire even more. On the other hand, the levels of trust and desire attached to the mental representation diminish when the feedback from the arena suggest that the positive evaluation of these elements was wrong. So, although emotional imaginative qualities are only attributed to proposals that have become part of the mental representation, they are not the result of the final conclusion of the trade-offs, but of the in-between conclusions of lower level trade-offs. For example, a positive evaluation of the expected feeling of ownership of a project (as a consequence of a specific proposal) will boost the desire, while having doubts about how motivating the working environment will bite the desire. The sum of boosts and bites of the ensemble of proposals in the mental representation determines the total desire and trust attributed to the mental representation.

Like originality, the desire and trust qualities can have a blurring effect on the trade-offs that have to be made before a proposal will be part of the mental representation. This seems to be especially the case when the trust and desire for the project is high, and an impression is added that threatens to erase alternatives from the mental representation that contribute largely to these desire and trust levels. By ignoring these impressions, the arena attendees can get trapped in an upward spiral in which more and more desire and trust is attributed to the mental representation, or the other way around when trust and desire levels are low and arena attendees are biased towards the impressions that confirm this. Then, they could end up in a downward spiral of trust and desire.

6.3 Feedback from the arena

If an arena attendee has decided to add a proposal from the arena to his mental representation of the Petaplan project, this proposed element does not necessarily have to stay part of it forever. The construction of a mental representation seems to be a permanent negotiation that is constantly fired up by arena events (and presumably also input from other situations and cognitive processes). How interviewees seem to deal with additional input from the arena is summarized in Figure 6.4, and will be further explained in the remainder of this section.

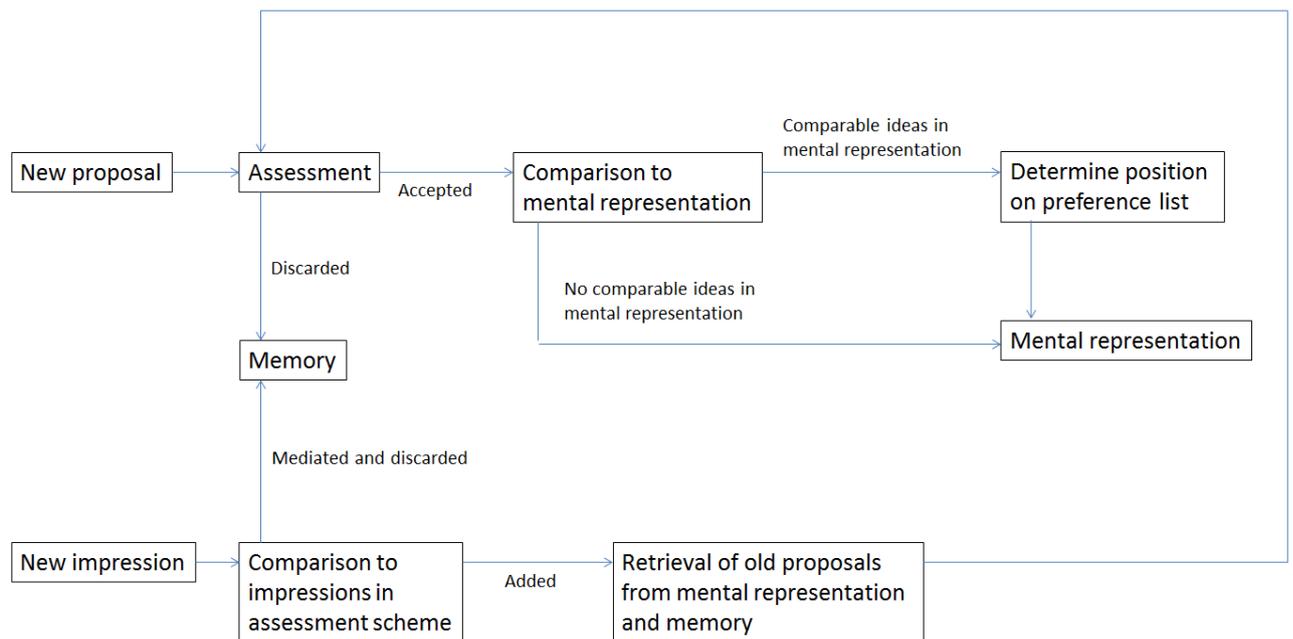


Figure 6.4: Handling of feedback from the arena in the form of new proposals and new impressions

6.3.1 Comparing the feedback

As was demonstrated in Section 6.2, when an arena attendee is confronted with a proposal, conclusions of impressions sets are taken into consideration to determine if a certain condition is fulfilled. The ensemble of evaluated trade-offs determines the final verdict about a proposal, and thereby if it is taken up in the mental representation of the Petaplan project. Stimuli from the environment are either impressions, or proposals. After a first image of the Petaplan project is put together, the social environment still fires stimuli upon the arena attendees. When an arena attendee is confronted with a stimulus, the first reaction is to compare this input to the information in the existing impression sets and the existing mental representation.

Now, two situations and the comparison that is made in each situation will be described. If a new proposal is done, in a phrase like “The Petaplan project will have a capacity of 28PJ”, this proposal is compared with the existing mental representation. If a new impression is provided by the arena, like an arena attendee taking a certain role, or someone saying “I think it is important to consider the biodiversity function of the terrains we are using for the Petaplan project in the calculation of the project’s potential capacity”, then this new information is compared to the existing impressions that are used in the assessment scheme.

6.3.2 Incorporating the feedback

After comparing the input from the social environment to the relevant parts of either the assessment scheme or the mental representation, the arena attendee knows if the input is challenging his current views or not. Since the same impression can work on different proposals (as was explained in Section 6.2.1) and the assessment for each proposal is unique, the same information can be challenging and non-challenging at the same time for different parts of the mental representation. Below, it is explained how the new input influences what elements are still or newly incorporated in the mental representation.

Non-challenging input

The effects from a non-challenging proposal are slightly different than the effects from non-challenging information. Both kinds of input are described below.

Non-challenging proposals

Non-challenging proposals are proposals that have no links to the existing mental representation (they open up a new dimension), or they are clearly inferior to the options that are currently part of the mental representation. In this case, the new proposal is assessed like described in Section 6.2, which leads to the attendee to decide if he makes this proposal part of his mental representation (as less preferred option) or not.

Non-challenging impression

Non-challenging impressions come in two shapes. Either they are exactly the same as the impressions that were already part of the assessment scheme. The other option is that they are different from the previous impressions, but this difference has no effect on the mental representation since it does not change the conclusions of the trade-offs. Because the presence of new impressions in the scheme can change the underlying evaluation without influencing the final result, it is certainly possible that non-challenging information changes the position of proposal(s) in the preference list in the mental representation.

Challenging input

Like with non-challenging input, the way in which challenging proposals are incorporated differs from the way a challenging impression is handled. The differences become clear from comparing the descriptions below.

Challenging proposals

If a proposal is found to be a good alternative for the elements that are currently part of the mental representation, only one course of actions is possible. The new proposal becomes the preferred alternative in the mental representation, and the other options are placed below this new addition in the list of alternatives.

Challenging impressions

Challenging impressions change the evaluation of one or more conditions, and therefore the assessment of proposals that were previously considered. This has two consequences for the mental representation. Firstly, options that are currently part of the mental representation are reconsidered and might be erased from it. Secondly, options that were rejected once are retrieved from memory, reconsidered, and possibly added to the mental representation.

6.3.3 Mediating the feedback

Even when feedback from the arena challenges the current assessment scheme and/ or the current mental representation, this does not necessarily mean these will be changed. The interviewees reported to regularly mediate impressions that threaten their assessment of a proposal or the level of trust or desire that were attributed to the project.

Mediating the effect of an impression on the mental representation

Concerning the mediation of an impression that challenges the assessment of a proposal, one interviewee shared how he thought about the negative reactions of his colleagues to the idea that his company should collaborate with the other companies that take part in the Petaplan project. Yes, uncooperative colleagues would mean that the willingness of their organization was low, and yes, if your energy specialists doubt the integrity of a participant in the arena, this might make it look less likely that this participant will contribute fully to the plan. This was not the case, however, because the interviewee determined after some research that his colleagues were suspicious of the other participating companies for invalid reasons. Like this, he could ignore their input and keep his old mental representation.

Mediating the effect of an impression on the emotions in the mental representation

An example of mediating an impression that influences an emotional quality can also be provided. In principle, it has a bad influence on the trust of arena attendees to notice that their view of the plan is not shared by someone. Most of the time, however, interviewees

reported that this did not influence their trust, because they understood where the difference came from and concluded there was no reason to lose trust in the person doing the proposal or the project in general. So, they can mediate the influence of this observation on their trust levels, as is illustrated with the following excerpt from one interview: *“[Even though it is a key partner] it did not damage my trust in the project that RWS could not yet assure us that they would participate. I understand that their organizational structure is different, that it is a long way to get permission from the minister. So, it is logical they need more time.”* The feedback she gets from the arena, a key partner not willing to commit to the project, is a potential threat for her trust in the project, but because she can justify for herself why this partner reacts like this, and assure herself that it is likely that this will be different in the future, the trust levels are not really affected.

6.4 Summary of the research framework

The empirical data supported some of the suggestions from the literature for the operationalization that were presented in Chapter 2. Other aspects of the operationalization need to be updated.

The operationalization of the social context is mainly confirmed by the empirical data. The suggested norm categories, and role categories also emerged from the data. One addition to the role categories is proposed: Splitting the task roles into content creators and tactical masterminds. No categories for affectionate relationships were suggested in the literature, but it was found in the data that these can be based on fun, trust, and recognition. Next to the network structure elements in the social context, also the arena game elements in the social context were investigated. The arena game categories suggested by Koppenjan turned out to be able to accommodate all the data on the content of negotiations and discussions that were held in the arena, so their meaningfulness is also confirmed.

Since the data on cognitive processes suggested other dynamics than linear encoding, elaboration and evaluation that was suggested by scholars of social psychology, an assessment scheme was developed that encompasses the operationalization of the cognitive processes in the conceptual framework. This assessment scheme provides a means to understand how all influences from the social environment come together to shape the mental representation. Although it still is a simplification of these processes, it acknowledges

the complexity of the cognitive processes. This assessment of nested trade-offs that answers the question “Does this end up in my mental representation?” is operationalized in more detail with the following levels (see also Figure 6.3a and Figure 6.3b):

- Impressions are the pieces of information from the arena and other sources. They are structured in sets of impressions, like for example ‘expert judgements’.
- Each set of impressions forms the basis for a trade-off, a conclusion if the sum of all expert judgments is in favor of something becoming part of the Petaplan project or not.
- These trade-offs are also grouped. Each group of trade-offs forms the basis of a meta-trade-off. For example, there is a meta-trade-off between expert judgements and own experiences.
- These nested trade-offs together conclude the sub-assessment. The example above is part of the quality sub-assessment. There is also a fitness sub-assessment.
- With the conclusions from the final trade-off between the sub-assessments fitness and quality, the assessment is concluded and a proposal is taken up in the mental representation or discarded.

The word trade-off could be misleading, since it suggests that there are always, on every level, reasons to say yes, and reasons to say no that make it difficult to come to a conclusion. This is not necessarily the case.

How the cognitive processes develop when an arena attendee is confronted with feedback from the arena with new impressions or proposals that challenge the existing mental representation and/ or the assessment scheme as it was used when a certain proposal was judged, was added to the operationalization of the cognitive processes. In short, the arena attendee compares the new information with the existing information, adds or mediates new impressions to the assessment scheme, retrieves previously discarded proposals from memory, reassesses the proposals from memory and the proposals that are part of the mental representation, and thus comes to a new mental representation. This process can be reviewed in more detail in Figure 6.4.

The relevance of this assessment scheme was confirmed by showing that the five imaginative qualities are influenced via different pathways in the scheme. And the relevance of the social

context element was illustrated by their place in the assessment scheme that potentially can change the assessment, and thereby the mental representation and the behavior of the arena attendee. So, the findings in this chapter are incorporated in the research framework for imagination as a driving force for innovation fueled by the social context. A visualization of the updated research framework and the updated conceptual framework will be added after the operationalization with empirical data is over, in the conclusion of Chapter 7.

7 Imaginative qualities of mental representations

In this chapter, the rest of the empirical foundations for the research framework of imagination in its social context are discussed. After explaining the detailed operationalization of the stimuli from the social context, and the cognitive processes that mediate between stimuli and mental representation in the previous chapter, the mental representation itself, and the behavior of the arena attendees will be reviewed in the current chapter. These elements are highlighted in Figure 7.1.

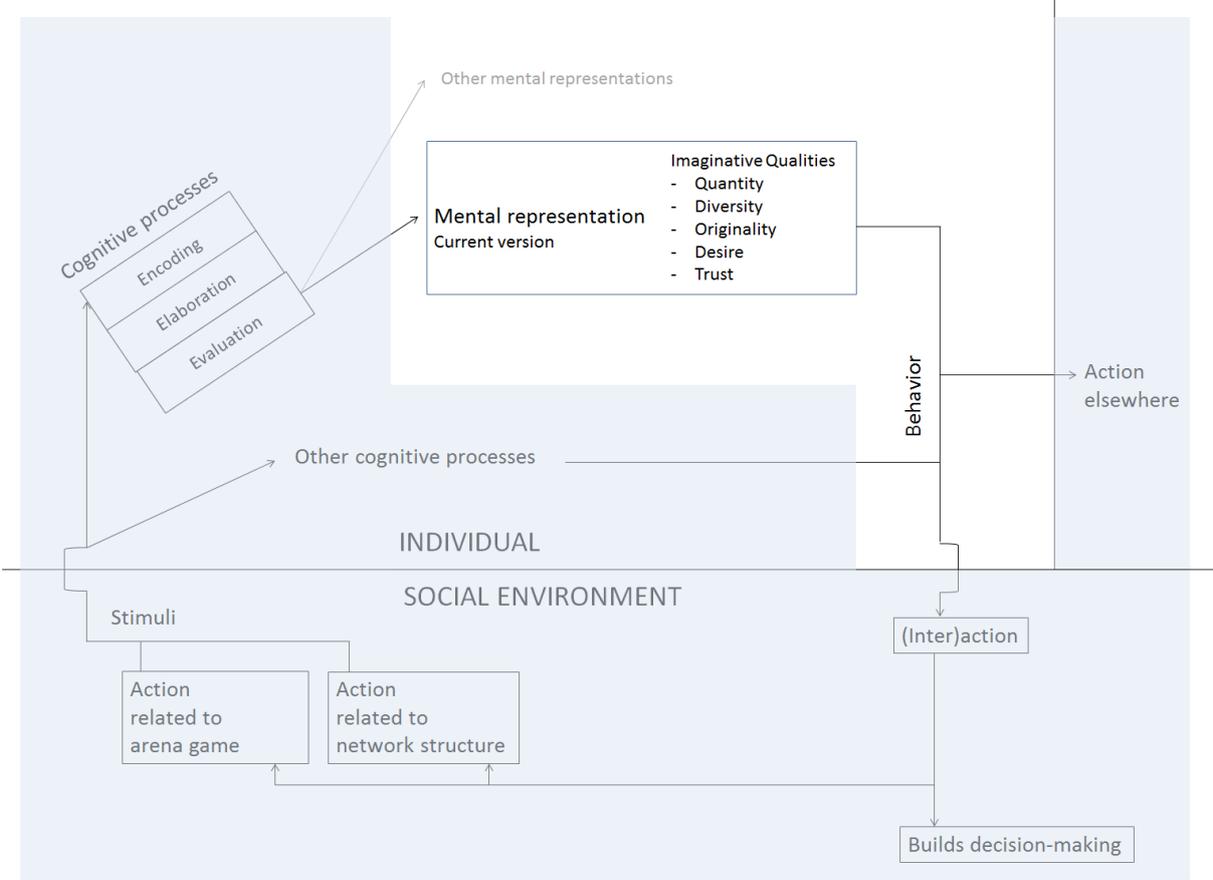


Figure 7.1: The white part of the research framework is operationalized in more detail in this chapter

So, here, the final elements are added to the answer of the third sub question “How can each part of this conceptual framework be operationalized with directions that are relevant for investigation?” and thereby the third level of the research framework is wrapped up. Section 7.1 contributes to this by describing the suggestions for the operationalization of mental representations that were done based on literature research are checked for their

meaningfulness, and updating the categories where they do not sufficiently structure the data. In section 7.2, the individual’s negotiations on behavior based on his mental representation are described.

7.1 Inventory of imaginative qualities of mental representations

What can be found if the proposed operationalization of the mental representation of the Petaplan project is used? That will be shown in this section. The creativity imaginative qualities will be reviewed first, to be followed by the emotional imaginative qualities.

7.1.1 Diversity and quantity

Each interviewee mentioned a lot of ideas of which they considered if they had to become part of the Petaplan project. To make it easier to handle and compare these ideas, it was decided to divide them into three categories: Ideas about the goal of the Petaplan, about the Petaplan as a whole, and about a specific instance of the Petaplan¹.

The first theme, the diversity of goals that participants see for the Petaplan project, contains ideas like ‘more green energy capacity in The Netherlands’ or ‘educating more people to work in the energy domain’. Ideas in the second theme concern what they think about when they envision the Petaplan as a whole. On what scale do they think the plan will be implemented? What capacity will eventually be installed? The third theme contains the directions the participants have thought about when it comes to concrete projects that will become part of the Petaplan project, like putting floating solar panels on Baggerdepot de Slufter, or a future green energy junction. Concerning these specific instances of the Petaplan project, participants think of different aspects like business models, renewable energy technologies that can be used, smart design options, etc. In Table 7.1, all diversity categories found are listed, together with the concrete options that are mentioned in this category by the participants. The count of these concrete options per category or per sub-category would be the quantity measure for imaginative quality.

Goal	More green energy	More green energy in The Netherlands; More green energy for my organization
	Contributing to a political debate	Showing that The Netherlands suffers from over-regulation; Incorporating green energy in spatial planning of The Netherlands

¹ Being a project in which green energy is generated at a specific highway junction, highway, lake, etc.

	Generating positive societal impact	Educating employees for the electricity domain; Green energy for the lowest possible societal cost
Petaplan project as a whole	Potential capacity	Matching with SER energy agreement; Matching with losses in electricity grid of three Dutch DSO's; 20 PJ; Several percent increase of current RE capacity in NL
	Communication	Careful regarding suppliers; Careful regarding politicians; Careful regarding journalists; Careful regarding citizens
	Institutionalization	Add task to current employees; Set up project organization of 30FTE; Connect people that currently develop pilots
	Scale	6 pilot projects; New focus of RWS with 2000 people working on it in 10 years' time; This is the quest of our generation; Iconic project for The Netherlands
	Timeline	Decision for scaling up not before finishing pilot; After pilots follows scaling up; Involve other participants after pilots; Take more time to avoid citizen resistance
	Division of roles	DSOs give information about grids; DSO's buy electricity; Electricity is sold to citizens; RWS and DSOs arrange permits together; Market should arrange permits; Petaplan partners themselves develop projects
Sub-project of Petaplan project	Business case	Use SDE+; Low risk investment with DSO's buying electricity lowers financial risk; Use pay-back period of 20 years instead of 15 years; Use crowdfunding
	Juridical structure	Market party generates energy and sells to electricity distributor; Project directly sells electricity to distributor
	Smart design	Solar and wind energy on one connection; Electricity cables for dykes; Generate energy close to big consumers; Generate energy where cables are present
	Type of area used	Roads and bridges themselves; Not wide, long pieces of land next to roads; Sludge reservoirs; Dykes
	Technologies	Regular windmills and solar panels; Floating solar panels, New windmills with horizontally rotating 'blades'

Table 7.1: Diversity of directions in which was talked about the Petaplan project and examples of each category.

7.1.2 Originality

When the interviewees talk about originality, they always implicitly or explicitly refer to the context in which the idea for the Petaplan project is new. The scope of this context could offer a means to compare the originality of ideas. Interviewees refer to four different originality scopes: Their organization, the sector they operate in, the country they operate in,

and the world. Given the international linkages between infrastructure operators, the sector and country levels of originality are not easy to compare in scope.

In Table 7.2, some examples of the (non-)original elements the participants see in their own mental representation are presented.

New to...	Element perceived to be original	Example from interviews
Organization	Large scale sustainable energy projects organized by RWS	<i>"If this plan is executed, RWS could build an <u>entire new department</u> that employs 2000 people in ten years' time."</i>
	Ownership structure that makes grounds RWS and ProRail available for sustainable energy production	<i>"The real difficulty is the ownership structure. The grounds are from RWS and ProRail, and <u>they do not know yet</u> how to ensure that they can still build a highway on it when they need to. That's what we have to solve, <u>all the rest is business as usual.</u>"</i>
Region = The Netherlands	Interpretation of the rules	<i>"Regulation is often like a rubber band: By joining our creative forces, we can <u>find a way of reasoning that makes this project possible</u> within the current rules."</i>
	Put an electricity cable in every dyke that is renovated from now on	<i>"No real <u>new things came up</u> there, apart from the cable in the dyke"</i>
Sector	Grid operators are involved in energy generating initiatives almost from the start	<i>"At a certain point in time, it became clear that we [the DSOs] would get a more proactive role. We would become partners, instead of only information suppliers."</i>
	Scale of planning renewable energy projects on land	<i>[On others' disappointing eagerness to start working on the plan]: "It makes me think: Do you even realize how important this is? <u>How big an opportunity this is for The Netherlands?</u>"</i>
World	Large scale planning of renewable energy projects between non-commercial partners	<i>"This is an <u>iconic project</u> for The Netherlands that could serve as an example for other countries"</i>

Table 7.2: Examples of ideas that the participants judged to be original, categorized depending on the context in which their newness was judged.

7.1.3 Desire

There are two things that the interviewees desire within the Petaplan project: The expected result of the project, and the process of getting there. When they mention their desire for the result of the Petaplan project, all participants refer to the significant amount of green energy that will be generated with this project. When expressing their desire concerning the process of the unfolding Petaplan project, they refer to the special potential of this specific group of organizations working together, and to the fact that they look forward to the practical approach of the project, in which concrete steps towards the end result are already being planned and executed. This one quote in which a participant shares his reaction to the name 'Petaplan project' illustrates both the desire for the end result and the process they are engaging in: *"The name Petaplan project shows that it's about a lot of energy. Peta is a big unit. And the word plan shows that it is more than a wish or a dream, we are planning something. That's already a step further than a vision."*

7.1.4 Trust

From the interview data, it can be concluded that the participants' trust is dependent on many things. For convenient handling of the large amount of trust references, they were sorted in two categories: The perceived presence of conditions that enable them to play a political game with government bodies and their own organization to win a place for the Petaplan project, and the experienced support of important parties. These elements that influence the closeness between the dreamed outcome of the Petaplan project and reality are described and illustrated with some examples below.

The participants seem to be constantly aware of the process they have to go through to make this plan reality. It's a political game within their own organization, and with other (governmental) organizations in which they fight to keep the project a priority, try to avoid that the project becomes an element in another political negotiation, and make sure the project is well embedded in the participating organizations so that they are prepared for the next steps. The name 'Petaplan', and the promise of a significant amount of capacity (the 20 PJ) were for example perceived as potentially helpful in giving the project priority in their organizations. Keeping the press out of the first phases of project development was meant to avoid the politization of the project, and the participants indicated that it was ok if one of the project members was less involved in the project, as long as they noticed that other people

in their organization were working on it. Another condition for the plan to be successful that was constantly checked by the participants was that of the speed of its development: Both a too fast and a too slow pace of development can harm trust in the project.

While talking about the support of other parties, the participants mostly mentioned their own bosses, civilians, the government, and other participating organizations in the Petaplan project. For example, many participants indicated that, if RWS would decide to stop the project, there would be no point in taking part for them either. The willingness of their own bosses was checked by looking at the atmosphere of the captain's meetings, and other moments of commitment. A participant said for example that the fact that the participating organizations were willing to invest €100.000,- in the exploration of the project by consultants confirmed his trust in the project. Several participants mentioned that they were afraid they were giving too little attention to avoiding resistance from civilians, and that this might become a problem later on.

7.2 Acting on the feedback

Apart from comparing loose proposals and information coming from their social environment, arena attendees also compare their mental representation to the image of the Petaplan project that is acted upon by the coalition, a kind of shared and negotiated mental representation that is similar to Koppenjan's total arena composition. When arena attendees ascertain differences between their personal mental representation and the common image of the plan, they have to decide if they act upon this and try to change the common image of the plan or not.

To act or not to act

As can be deduced from the conceptual framework, the decision of an arena attendee to act on the comparison between his own mental representation and the common plan influences the development of the arena discussion. The ensemble of these decisions of all individuals present in the arena generates the new feedback of information and proposals the individual participants have to deal with.

Open questioning

In case arena attendees did observe a difference between their own mental representation or assessment scheme, and those of others, but are either curious or have no idea which

view is the better alternative, their reaction could be to look for more information. They look for this information inside or outside the arena, so they can try if reconsidering the other's option with this sharpened assessment scheme adapts their own view. One participant, for example, at some point felt uncomfortable regarding the claim that was done by others that they would be able to generate energy for a very low price per kWh. This did not fit his ideas of how efficient public organizations generally fulfill their role, so he asked around for further explanation of this remarkable claim. In the end, he was told that this was due to the lower risk for funds to invest in an energy generation project of which the energy was already sold for the coming 20 years, and because the investment would be depreciated over a longer period of time than is commonly done by commercial project developers. This reassured him that this business case did fit their role as a public party, after which he added it to his mental representation of the Petaplan project.

Taking a stance

When arena attendees notice a difference between their personal mental representation and the common plan, and they are under the impression their version of the Petaplan project might be better, they could think it to be relevant that this is shared with the others. By firing up the discussion on the problem statement, a certain solution, or a participating organization, they aim to secure the quality and fitness of the eventual project. The arena attendee should choose these moments with caution, because interviewees explained that if too many proposals of the same attendee are found to be not worthy of consideration, this can make them less open for following proposals of the same attendee.

Another example of a reason to act is to protect the arena from a discussion or an impression that is not deemed relevant by the attendee. During the first workshop, one interviewee intervened in the questions his colleague was asking about the use of exploring the possibilities of the Petaplan project. He told him the decision to do this was already made by the board, and that he had no choice but to cooperate. *"I had to do that",* he said during his interview, *"this colleague would have kept coming back to it, and that gives a wrong impression to the others that were present and slows the process down unnecessarily."* So, this interviewee judged the problem statement of his colleague to be irrelevant, and was not willing to discuss it because it wasted time and risked the persuasion power of the project.

The final reason to act is when the arena attendee notices that the current common vision on the Petaplan project is very similar to his own. This is a moment at which he can decide to pressure the other arena attendees to come to a decision. So then, the arena attendee participates in an arena game about timing.

Not to act

Apart from the behavior options above, in which the arena attendee decides to participate in an arena game, it is also possible that the arena attendees conclude that no action is needed. This is the case when he finds that the topic that he and another arena attendee have a different view on is not part of the dominant view, or will not be decided on any time soon. Then, they accept the existence of the different views. An interviewee told that he did not believe the Petaplan project would indeed generate 28PJ of energy at some point. Based on his experience as a wind park developer, he assumed a lot of this potential capacity would be lost to practical problems that would still occur. He said he did not want to share this impression in the arena, because *“it makes no sense to say it beforehand. It will happen anyway, and for now, it’s not bad to use this potential in our communication with others”*.

7.3 Summary of the research framework

In this chapter, the operationalization of mental representations and behavior are taken a step further. This study of behavior also led to adding an additional pathway between stimuli from the social environment to behavior in the conceptual framework. The promising try-out of the research framework that finished this chapter shows that an addition to the research framework would be welcomed, namely a way to divide the development of an innovation project into different phases. Below, these outcomes of this chapter are summarized.

An additional level of operationalization was added to the mental representation element of the conceptual framework, because it makes it easier to handle the big amounts of data on the contents of the mental representation of the arena attendees. Diversity has main categories that refer to the ideas on the goal of the innovation project, the whole of the innovation project, and a particular instance of the innovation project. Originality can be judged within different contexts, like the arena attendee’s organization, the sector or the region the organizations belong to, and the world. As for the emotional imaginative qualities, desire can be attributed to the process and to the outcome of the project, and trust to the

development of the project's innovation conditions and to the support shown by other actors.

In this chapter, the negotiations internal to the individual about behavior were further made explicit too. Comparisons of the own mental representation with the common plan of the project group, appear to influence his actions. Differences might push the arena attendee to ask questions or take a stance concerning the problem statement, solution(s), or participants that are currently part of the common plan. Not acting is also a possibility when matters are not urgent or deemed worthy of energy. Similarities between his own mental representation and the common plan (or the mental representations of most other arena attendees) might push the individual to increase the pressure on making a decision. This further operationalization can be reviewed in the final research framework in Table 7.3 on the next page.

Main concept	Connection conceptual framework	Theoretical operationalization of element in conceptual framework			Visibility
		Level 1	Level 2	Level 3	
Inter-organizational collaboration	Stimuli from the social environment	Arena games	Problem statement	More, less, keep	Accepting, Précising, Redefining
			Solution(s)	More, less, keep	Selecting, Excluding, Developing
			Participants	More, less, keep	Mobilizing, Excluding, Introducing
			Timing	More, less, keep	Creating time pressure, Delaying
			Norms	Decision-making procedures, conflict resolution, language use, transparency, and evaluation criteria	Group attribution, Assumed reactions, Contrast with other groups
			Roles	Task roles (content creators and tactical masterminds) , socioemotional roles, individual roles	Characterizations, Contributions, Missing influence
			Affectionate relations	Fun, trust, recognition	Judgments about person, about collective
			Quality assessment	Conditions, sets of impressions, impressions	
			Fitness assessment (willingness and progress support)	Conditions, sets of impressions, impressions	
			(Mediated) assessment of nested trade-offs		

Main concept	Connection conceptual framework	Theoretical operationalization of element in conceptual framework			Visibility		
		Level 1	Level 2	Level 3			
Imagination	Current mental representation of innovation project	Creative qualities	Diversity	Goal, Whole, Instance	Number of emic or etic categories of proposals		
			Emotional qualities	Quantity		Count of all judged or mentioned proposals	
				Originality	Organization, Sector, Region, World	Newness to a particular context	
		Time	Desire	Attributed to process, attributed to outcome	Judgement about impact or contribution, priority of own interest, working around trouble		
			Trust	Development of conditions, support of important actors	Dependency relieved, likelihood of reaching the end-point		
			Current Future				
		Innovation	Other versions of mental representation of innovation project	Inter-personal	Own In-group Out-group		
					Challenging feedback	Action in arena	Do new proposal , look for new impressions
				Confirming feedback		Action outside arena	Look for new impressions
					No action	If not urgent or part of common plan	
		Action in arena	Increase pressure for decision				
		Action outside arena					
		No action					

Table 7.3: Research framework for imagination as a driving force for innovation

The description of the negotiations on the behavior of the arena attendees suggests a change to the conceptual framework is necessary: Adding a pathway between social context and behavior of the individual. Arena games do not only offer proposals of problems, solutions, participants, and pressure to the arena attendees to take into consideration for their own mental representation. The negotiations and announcements in the arena also give them an idea of how the dominant idea of the Petaplan is developing. Since the differences between this dominant idea and the individual's idea of the Petaplan project seems to be an important driver for behavior, it should be incorporated in the conceptual framework as well. As can be seen in Figure 7.2, the other versions of the mental representation are now linked to behavior as well.

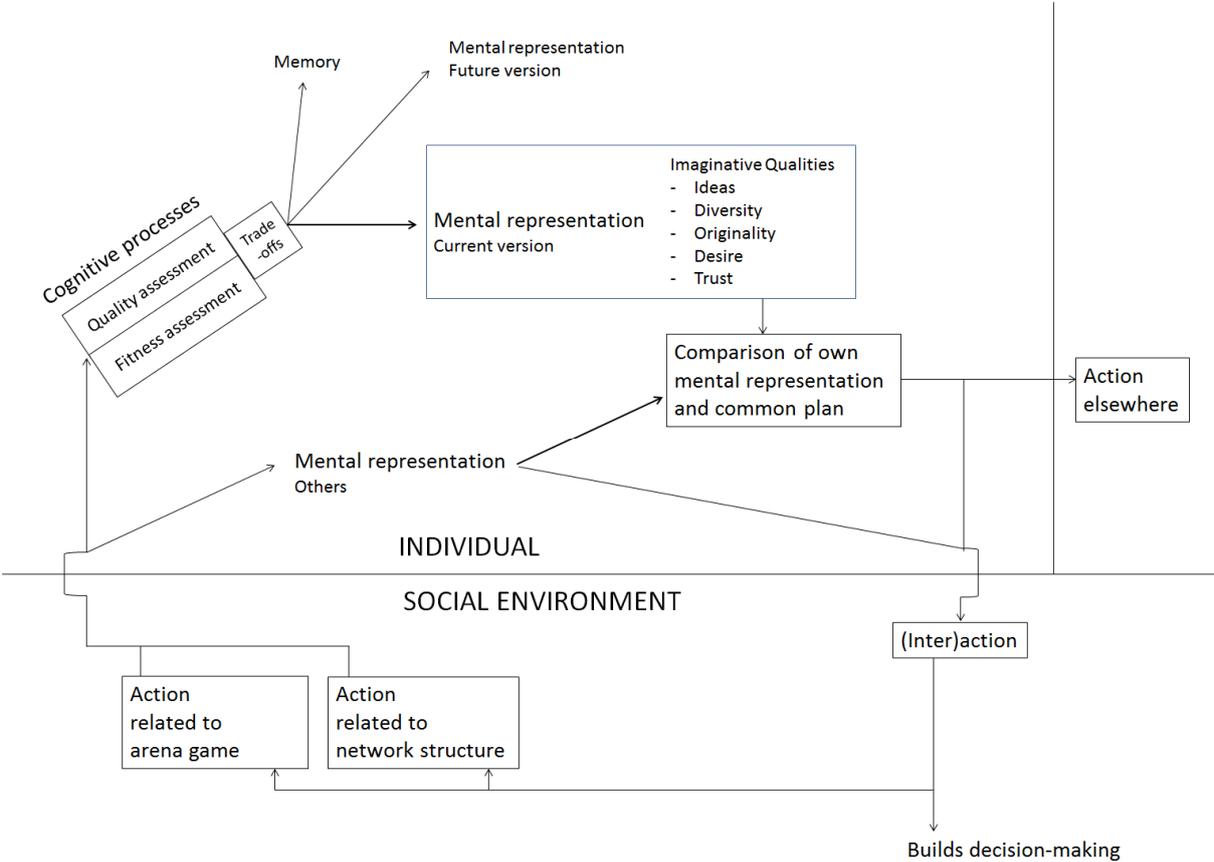


Figure 7.2: The final conceptual framework for imagination in its social context

8 Facilitation of imagination as a driving force for innovation

After the completion of the research framework, the question rises if this framework can help to gain insight in what helps and what does not help to fulfill the emotional and creative needs for an individual to successfully engage in innovation. In this chapter, this is tried out by investigating the development of the imaginative qualities of the interviewee's mental representations. This gives some first insights in what does, and what does not help in this respect. In this way, the fifth sub question "How can this research framework facilitate the development of a tool that helps the facilitation of the imaginative needs of arena attendees that work on inter-organizational innovation projects?" should be answered.

To enable the analysis of the development of the imaginative qualities of the mental representations of the Petaplan project, it is helpful to divide the project's development in several phases. Like that, the prevalence of imaginative qualities can be compared between phases. Phase one ended after the first board meeting, phase two ended after the second board meeting, and data that was gathered about the period after this second board meeting was considered to be part of phase three. Then it was indicated to which diversity categories each element belongs, if the element is original, and if it increases, diminishes or illustrates trust or desire. This schematic summary of each interview formed the basis for this section.

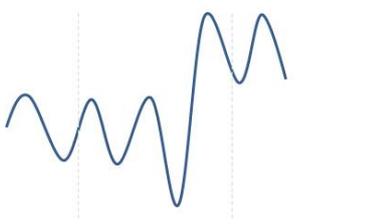
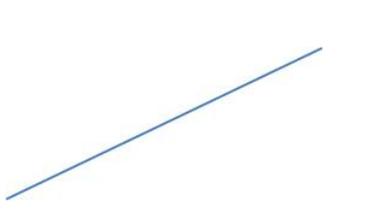
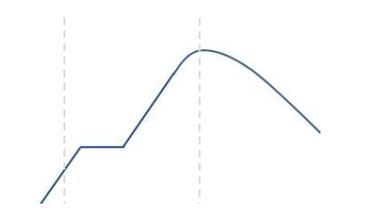
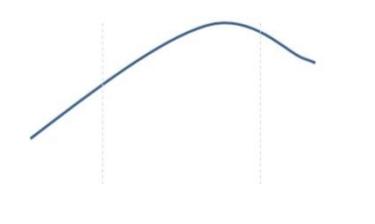
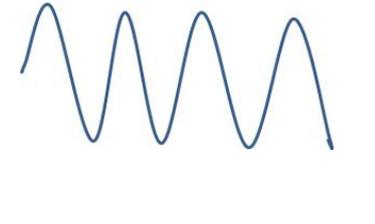
This way of working means that this analysis is heavily dependent on what was shared by the interviewees. Since the data was gathered by means of open interviews that were held before the diversity categories were known to the researcher, and a few months after the events that were the topic of investigation, no complete pictures of the mental representation could be assembled. Therefore, the results presented in this section should be read as 'based on the information that was provided in the interviews'. It is assumed that the bias in the interviews has been caused by what the interviewee experiences as important to communicate, and that this same bias plays a role in the assembly of their mental representation. So, based on this assumption, the results can be regarded as incomplete, but still valuable for the purpose of building first hypotheses on the facilitation of imaginative needs for successful innovation. A following research project could check these hypotheses

with a more structured and complete method for data gathering, for which this chapter provides some guidelines.

8.1 Development of emotional qualities

In this section, the development of the imaginative qualities trust and desire is presented for each participant. An overview of the development as it could be traced in the descriptions given during the interviews can be found in Table 8.1.

To get to Table 8.1, all elements that influenced trust and desire were taken from the schematic interview summaries and categorized, judged for the size of the impact of their influence, and summarized in a graph based on their chronological order. In the remainder of this thesis, elements that influence the desire or trust of a participant positively will be called ‘boosters’, and those that influence the desire or trust of a participant negatively will be called ‘biters’. After presenting the table, the patterns that are visible in the graphs of desire and trust will be discussed, and the boosters and biters will be further described to help the correct interpretation of the table.

Interviewee	Trust development	Desire development
1		
2		
3		

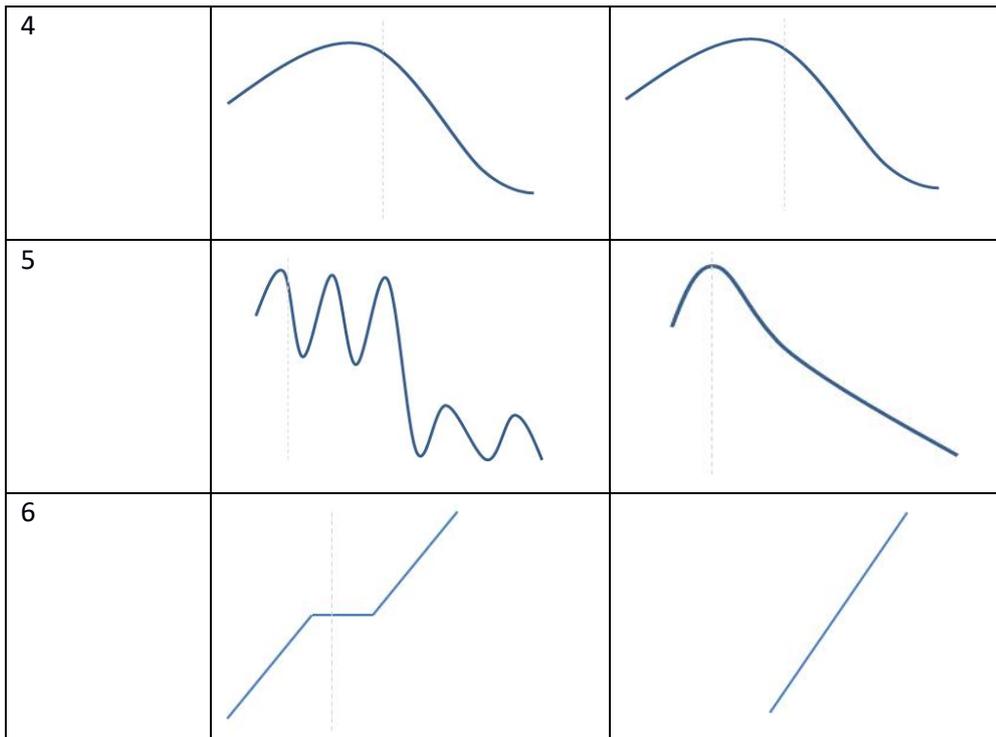


Table 8.1: Graphs for the development of trust and desire for each interviewee

8.1.1 Patterns of trust and desire

Looking at the graphs for desire and trust in the table, four elements can be distinguished that, in different combinations, build up the development patterns of each participant. These elements were named as follows: Steady growth, Downward move, Oscillation, and Pattern interruption and will be described below.

I - Steady growth

Steady growth of their trust and desire is what all participants experience in the beginning of the Petaplan project's development. Like interviewee 4 says: *"In the beginning, everyone can still have his own ideas on what the project entails."* In some cases, this growth continues over a longer (or even the entire) period of time. Examples of this are the development of the desire of interviewees 1, 2, and 6, as well as interviewee's 6 and a large part of interviewee's 2 trust.

Steady growth is the result of dominance of boosters or the absence of biters. Interviewees 2 and 6 do not report any case of their desire for the project to become hampered, for example, and report many that helped it grow. Because the relative dominance of boosters differs, some graphs that show steady growth are steeper than others. Their desire graphs are steeper than the one from interviewee 1, because she mentioned more biters that also

played a role. This difference in desire is also observed by the core team members of the Petaplan project. They all indicate that interviewee 2 and 6 are the trail blazers of this project.

II - Downward move

Downward moves are visible as parts of the trust graphs of interviewee 2, 3, and 4, and of interviewee's 4 and 5 desire graphs. A downward move is caused and prolonged by the dominance of biters or the absence of boosters. For example, the downward move from the desire of interviewee 2 and 3 is caused by them losing control when the pilots are (supposed to be) started. They see people in charge that they do not trust to have the same commitment to the project. The downward move in interviewee's 4 desire and trust graphs can be attributed to him having the feeling that the core aspects of the Petaplan project do not receive enough attention while several side elements do. His feeling that his suggestions are not seriously considered contribute to the length and steepness of this part of his graph. The desire graph of interviewee 5 bends down because the activities during the workshops lead to a shared image of the project that made her doubt the desirability of it for her company. *"It became a hassle"*, she says about this period of the project's development. Although all these participants experienced a downward move of their desire and/ or trust, none of them seems to have reached the absolute minimum level. They all want to continue with the project.

Not all participants experience a downward move. An explanation for this could be found in how participants describe that they actively ignored and mitigated elements that could threaten their trust or desire. As an example of mitigating the influence of certain elements, the realization of interviewee 2 that they had not taken into account the importance of biodiversity in the plan did not truly influence his trust levels, because he assured himself that this would be solved in future stages of the project. Interviewee 3 could postpone his downward move because he refused to believe that regulatory issues would become a problem for the Petaplan project. Generating renewable energy is something that the Dutch government should want, so he did have to take this issue very seriously².

² That is, he did not take the issue seriously in the compilation of his own image of the project. As the project's advisor, he did do some research in the topic, because he noticed it bothered others.

III - Oscillation

Oscillation is visible in the trust graphs of interviewee 1 and 5, and in the desire graph of interviewee 3. The constantly changing up- and downward movement has two possible causes. The first is, obviously, the alternating focus on boosters and biters. This seems to be the case with the trust of interviewee 1 and the desire of interviewee 3. Interviewee 3 reports that he gets easily annoyed by instances that slow down the process of realizing the Petaplan project. At these moments, he very often intervenes to speed up the process again, which then lifts his desire again. The second cause of oscillation in these imaginative qualities over time is distilled from the story of interviewee 5. She reports to gain trust in other people's flashes of inspiration that she observes during the regular meetings, and when everything goes well during captain's meetings and she gets the special feeling that *"this is where it all happens"*. The effect of these interpersonal trust boosters seems to fade away over time, which causes the oscillating trust level.

Probably, all graph parts that have been drawn as straight lines would have similar oscillating moves if it was possible to measure trust and desire directly. Finding this pattern with only a few participants can be the result of a more detailed style of the participant for describing situations, or a bias towards them of me as a researcher that influences my general impression of their story. This result was still incorporated in this thesis, because the interesting possibility still exists that this difference comes from people being less or more easily influenced in their trust or desire.

IV - Pattern interruption

Pattern interruption is visible in the trust graphs of interviewees 1, 2, 5 and 6. In the case of interviewees 2 and 6, the growth of the trust level is interrupted for a while, because they have been confronted by something that threatened the Petaplan project fundamentally in their experience. Interviewee 2 was confronted by the reaction of the department of his organization that should implement the Petaplan project, being that they would never have enough people to finish this project in the time frame he envisioned. After deciding that an employee recruitment program should become part of the project, his trust level could grow further. So, the trust levels can flatten when they are under threat while the arena attendee thinks something can be done about that threat. Interviewee 2 and 6 worked on the threats to their trust (Interviewee 2 by designing a plan for the Peta-academy to decrease employee

shortages, and interviewee 6 by lining up the colleagues he deemed necessary for this project), and thereby reduced the impact of this threat until the problem was solved. Then, their trust could grow again.

The sudden drop of the trust level of interviewee 5, and the sudden rise of that of interviewee 1 is the result of a single event. In the case of interviewee 5, this event is the realization that market parties needed to be involved in the exploitation of the grounds of her company. She felt that the needs of her company would be safe by the members of the Petaplan project, but was not sure that a commercial party could gain her trust as well. This seemed to keep overshadowing her image of the Petaplan project. Similarly, the trust of interviewee 1 in the Petaplan project was at first overshadowed by the multitude of regulatory issues she feared. When it became clear there was nothing to fear in the direction the Petaplan was developing, this fear was gone and her trust in the project rose permanently.

8.1.2 Boosters and biters

In events that elevate or diminish a participant's trust or desire, pairs can be distinguished: Most boosters have a biting counterpart. More booster/biter pairs were found for trust than for desire, which suggest there are more kinds of events that can influence trust, than there are that influence desire. Below, the booster/biter pairs of trust and desire will be described in more detail. In each pair, the booster is mentioned first.

I - Trust

In the boosters and biters of trust, six pairs can be distinguished, and one loose booster. Three pairs are more process related: 'Attention to right things' and 'attention to wrong things', 'process' as a booster and 'process' as a biter, and 'suitable speed' and 'unsuitable speed'. The first of these process pairs seems to become relevant for trust when a participant has a preference for tactical discussions about the implementation of the project rather than for content driven discussions. The second pair of process comes in many forms. In the booster form, one interviewee loves the way practical issues are solved in the Petaplan core team, another explains to have experienced the process to have a lot of synchronicity. In the biter form, process can kill trust when steps are taken that are believed to need more institutionalization to be successful (like transferring the project to a project team), and

when participants discover they have ignored an important aspect of the plan for some time. An interviewee for example concludes that it would be a good idea to focus on avoiding citizen resistance, and another interviewee had a similar experience with employee shortages and biodiversity. Concerning the third process pair, speed can be perceived as unsuitable both when things are progressing too slowly or too fast.

The three other pairs are 'participation' and 'partner dependency', 'avoiding big issue' and 'big issue', and 'inspirational moments' and 'dull meetings'. The single booster is 'grandeur'. Participation and partner dependency refer to the resources partners joining or (threatening to) leave the project have to offer. The pair 'avoiding big issue' and 'big issue' refer to a successful attempt to avoid a problem that stalls the development of the Petaplan project, like the project becoming part of a political negotiation, and the experience of a big problem respectively. 'Inspirational moments' forms a pair with 'dull meetings', and does probably not need further explanation. 'Grandeur' has been indicated to be a trust booster by two participants. One participant said it was a good thing that the plan was presented within a big time frame of fifteen years, and another mentioned that the fact that the size of the project is similar to that of the Deltawerken made him realize that *"this has been done before!"*

II - Desire

The boosters and biters of desire come in three pairs and one single biter. The pairs are: 'Promise to reach goals' and 'other direction than expected', 'grandeur' and 'doubts about grandeur', and 'being able to contribute' and 'not involved in the process'. 'Process requirements falling short' is the single biter. The first pair refers to the goals the participants assume can be reached with the Petaplan project. If they are disappointed in this, their desire for the project to happen might diminish. The second pair refers to the fact that most participants feel attracted to the Petaplan project because of its grandeur. The project holds the promise to have a big impact on the renewable energy capacity of The Netherlands, and targets several other problems as well. After the press release is ignored by most of the media, one interviewee wonders if the Petaplan really is that huge. The third pair has to do with the feeling of personal acknowledgment. Several participants share that it would be awesome if, in twenty years, the Petaplan has become an iconic project and they helped to set it up. Not having the feeling that your contributions count is the biter part of this pair,

which is experienced by an interviewee. The single biter ‘process requirements falling short’ refers to things that can be part of a development process that make participants lose their willingness to start the project in the first place. Having to report extensively about everything in the process is such a thing, just like expecting the process to unfold differently and be less of a hassle.

8.2 Development of creative qualities

The development of the imaginative qualities quantity and diversity will be discussed for each participant in this part of the thesis. Table 8.2 presents an overview of the amount of sub categories the participant included in his/ her mental representation during the first and the subsequent two phases of the project. It also lists what in what sub categories most elements of the mental representation were replaced between the first and following phases, and in which sub category most ideas were added. In the largest part of this section, patterns that could be distinguished in the table are discussed.

Like the previous table, Table 8.2 was compiled from the schematic interview summaries of the participants. With the help of this summary, the amount of elements per diversity category the participants shared the existence of in their interviews could be counted, and their relative change assessed. The third creative quality, originality, is not represented in this table. It proved hard to gather data on originality during the interviews, so little information was available. What did become clear is that originality has a link with the emotional qualities of mental representations, which will be discussed at the end of this section.

Participant	Number of subcategories per main category after phase 1			Number of subcategories per main category after phase 3			Sub category most changed	Sub category most added
	Goal	Instance	Overall	Goal	Instance	Overall		
1	2	4	4	3 (+1)	5 (+1)	6 (+2)	Timeline and Capacity	Division of tasks
2	1	0	5	4 (+3)	5 (+5)	6 (+1)	Timeline	Institution and Case categories
3	1	0	5	1	2 (+2)	6 (+1)	-	Financial
4	1	3	5	1	3	6 (+1)	Timeline	Institution
5	4	1	5	4	1	6 (+1)	Division of tasks	Timeline

6	2	2	5	3 (+1)	4 (+2)	6 (+1)	Case categories	Institution
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Table 8.2: Overview of diversity and quantity in each phase per participant

8.2.1 Patterns of diversity and quantity development

Here, the patterns and categories that are observed in Table 8.2 will be described in an attempt to shed light on the development of the imaginative qualities diversity and quantity throughout the Petaplan project's development. The three diversity categories 'Goal', 'Instance', and 'Overall' clearly exhibit different dynamics. Each of the categories will be treated separately below.

I - Diversity category 'Goal'

In the main diversity category 'Goal', most participants start with one or two goals. Concerning the growth of the amount of goals in the second phase, there seem to be two categories of participants: Those that do make additional goals part of their mental representation, and those that do not. Three interviewees are not so keen on incorporating the plan to start an employee recruitment program as part of the Petaplan project or other additional goals, while the others do take up at least one. The reluctant attitude of some participants could be explained by their lack of capacity. Like one of them puts it: *"I have to make choices because I have no team of my own, I unfortunately cannot contribute to solving every problem in the world."* Another interviewee does have a team, she does not experience the space to work on an additional problem. The others seem to perceive this space, of which this is the most extreme example: *"Here [at my company], everything is going very well. There is room to look outside the walls of this organization and see where I can contribute."*

II - Diversity category 'Instance'

When looking at the dynamics in the main category 'Instance', again, there seem to be little participants that are interested in diversifying their ideas in this direction. Most of them do have elements in their memory that would be part of different 'Instance' sub categories, but being able to reproduce these elements does not mean they are part of their mental representation. Most participant qualified several sub categories of 'Instance' as not in their personal interest or in the interest of their organization and trusted that others would deal with the concretization of cases later in the project. Interviewee 5, for example, says that

smart design is not so relevant for her company to have an opinion on. Also, she deems the business model not yet of large importance, since her company perceives the project to be in a learning phase in which cost are not decisive. Interviewee 6 says he wants to ‘kind of understand’ the business models and the smart design propositions, but leaves the real work to experts. It might be a possible conclusion that they come to these views in which diversifying their mental representation with ‘Instance’ sub categories does not happen whole heartedly or not at all, because they have the role in their organization to decide what needs most focus. So, they filter the propositions in the Petaplan arena for this purpose.

Interviewees 2 and 3 seem to be the only ones that are really interested in the ‘Instance’ category. Interviewee 3 has the largest addition of elements in his mental representation in its sub category business model. Interviewee 2 has largely elaborated on the concreteness of the plan in his head³, especially about the smart design elements and the financial elements. For both gentlemen, their interest in this topic could be related to the role they took inside the Petaplan arena. One of them is the advisor who was asked to explore options for the business model. The other, on his turn, became an advocate of smart design, and often shared examples of what that could mean both for the design of the projects, and for the financial investment needed.

III – Diversity category ‘Overall’

For all participants, the most elements, and the most diverse elements, were found in the ‘Overall’ main category throughout the process. Already at the end of phase one, most participants report elements from five out of six sub categories to be part of their mental representation of the Petaplan project. During the second (and third) phase, they all add the final categories (scale and/ or communication).

Most of the sub categories that quantitatively changed most during for each participant during the development of the Petaplan project also belong to this main category. ‘Time line’ was the sub category confronted with most changes. Off course, this could be expected given the nature of this category. For most participants ‘Role’ was another category that

³ From Table 8.2 this seems to be especially the case, since he did not share anything about how he viewed elements of this category near the end of phase one. This, however, is not a 100% guarantee that he indeed had no idea on this at all.

underwent a relatively large amount of changes, which could point at progress in the development of the project.

But what do this large diversity and quantity of elements in this category mean? Does it really mean that they see most options in this category? Or is it an illustration of what they deem most important? The latter seems to be the case. With interviewees 1 and 5, this can be illustrated. Both shared in the beginning of the interview what had been their main quest the past few months. For interviewee 1, this was *“finding out how we as DSO can add value to renewable energy generation projects”*. Interviewee 5 told that she wanted to learn about collaborations for generation renewable energy on their grounds. When it was determined what categories had seen most additions in the second and third development phases of the project, interviewee 1 added most elements to the ‘Role’ category, and interviewee 5 added mainly learning trajectory related elements to the category ‘Time line’. The higher score in this part of the analysis therefore might be largely caused by a bias in the interview, since the participants talk in more detail about things they deem important than other things.

8.2.2 Pattern of originality

Little explicit references were given to originality. Since it would not have helped the fluency of the conversation, the interviewees were also not probed for a judgment about the originality of the ideas they were talking about. So, a score of the amount of original ideas in the mental representation cannot be provided. What did become clear is that for all participants, the originality of an idea that is proposed in the arena is linked to their desire and trust. With which of these emotional qualities originality has a stronger link differs per person. One participant shares that, when original ideas are discussed in the arena, this harms his trust in the project, because he thinks the Petaplan project is already complex enough. Incorporating innovative ideas would make the complexity of the project too big to be implemented properly. The other participants mainly connect the originality of ideas to desire, for example because it makes them feel special to be part of it.

8.3 From research framework to facilitation tools

So far, this chapter illustrated that, with the help of the research framework for imagination as a driving force for imagination fueled by its social context, it is possible to gain insight in what helps and what does not help to fulfill the emotional and creative needs for an

individual to engage in successful innovation. The research framework helps to find answers to questions like: What is it that fuels trust? How often do people need a trust booster? During which phases of the project needs for boosting certain imaginative qualities develop? This chapter shows that the data gathered with the research framework offer anecdotal evidence to set up hypotheses for this kind of questions for each imaginative quality.

It would be ideal if typologies of individuals’ imaginative needs can be compiled in the future. Of course, these typologies should not only refer to the individual’s needs for developing an imaginative mental representation, but also for its needs to act upon this mental representation, since this could create an positive feedback loop between an imaginative environment and the imaginative mental representations of the individuals in this environment. So, further developing a toolkit for facilitating the complete imaginative needs in inter-organizational innovation projects should be the main direction for future research into imagination as a driving force for innovation.

8.4 Suggestion for determining phases in an innovation project

So, it is suggested these analyses of development should be done more often to compile a tool to help facilitate the imaginative needs of different types of arena attendees. When working on the development analysis, a more universal way of determining the phases of an innovation project emerged. This suggestion, namely dividing the project’s development based on what gained most attention from the participants, is therefore added to the research framework for imagination in its social context.

Based on the criterion of attention, three phases could be distinguished in the period of the Petaplan project’s development that was studied. The borders of these phases are determined separately for each participant, based on their activities and perception. Even then, though, sometimes the consecutive phases overlap. How the three phases can be seen relative to the division in periods that was used during the interviews is depicted in Table 8.3. The characteristics of the phases are described in more detail underneath this table.

Preparation board meeting September	Board meeting September @ Springtij	Writing assignment for consultant	Workshop 1 @ ProRail	Workshop 2 @ Ecofys	Workshop 3 @ Ecofys	Preparation board meeting January	Board meeting January @ Tivoli	After-math
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Phase 1	Phase 2	Phase 3
Start-up phase		
Development phase		
	Transition phase	

Table 8.3 Phases in the development of the Petaplan project relative to the period-division used in the timeline during the interviews

8.4.1 Start-up phase

In the first phase, participants are focused on organizing the commitment of their bosses to invest in the development of the Petaplan project. For most participants, this phase starts with the beginning of the project, and ends with the first Captains' meeting, at which the Petaplan project group asked their board members for money to do an explorative investigation of their plans. One participant was busy with organizing internal commitment for a significantly longer period of time.

8.4.2 Development phase

In the second phase, the development phase, participants are roughly dividing their attention between three things. First of all, they check if others show signs that illustrate their ongoing commitment to the project, and show their own dedication. Secondly, they are exploring what opportunities this collaboration project has to offer. And thirdly, they are guarding the speed of development of the project. For most participants, this phase overlaps slightly with the start-up phase, because they were waiting for the official agreement of their board members, but already worked on the next steps of the plan. For most participants, this phase continued until after the official time scope of this research.

8.4.3 Transition phase

During the third phase, the plan is gradually handed over to the people that are asked to set a new step towards the execution of the Petaplan project. In this transition phase, new people are involved in the project, and a large-scale project is started up. Like the development phase, this phase overlaps with the phase that precedes it. The pilot project at the Slufter was already started during the workshops, and a project leader was already appointed by RWS during the second phase. The focus officially shifted to the pilots after the second captains' meeting, but not all participants experience this to be the start of this third phase. Some see the pilots as a moment to learn, an extension to the second phase. Others

are mostly influenced by the fact that new people are in charge of the project now, and do experience this phase to have started.

8.4.4 An innovation project as consecutive sets of these three phases

It is my impression that these three phases start over when the project is handed over to a next group of people. When the CSR-managers hand over the Petaplan project to the project organization, this for them is the transition phase. But for the employees of the project organization, this is the phase in which they have to create the commitment for this project within their own network. Then, they will do their part of the development, and maybe give the project to another group with another specialty. Like this, an innovation project becomes a process with waves of creating commitment and developing the project.

8.5 Summary of the research framework

This chapter showed that the research framework of imagination as a driving force of innovation fueled by its social context offers the possibility to study the development of imaginative qualities structurally and thoroughly. In the future, this could contribute to the creation of a tool that helps to facilitate the imaginative needs of arena attendees.

Since the results of this try-out suggest that the imaginative needs of arena attendees change during the project's development, it makes sense to divide the project into different phases that group these needs. So, to deliver a more complete research framework, it is accompanied by a suggestion of how to split the time line of an innovation project into phases. It is suggested to identify these phases based on the main focus of the arena attendees: Organizing commitment in the first phase, project development, confirming commitment, and guarding development speed in the second phase, and handing over the project to others in the third phase, that start their own first phase of building commitment, and will do their own part of the development of the project.

9 Conclusions

This graduation project for Industrial Ecology was focused on the question How can imagination be studied as a driving force for innovation in an inter-organizational context of established organizations? Answering this question was done by compiling a research framework for innovation as a driving force for innovation fueled by its social context with four levels: Main concept descriptions, a conceptual framework that links the main concepts, an multi-layered operationalization of the elements in this conceptual framework, and guidance on how references to the elements in his conceptual framework can be identified in raw empirical data.

In this conclusion, the answers to the sub-questions of this research project are revisited. Together, these answers form the research framework. Then, the results of this study are discussed for their validity, generalizability, and reliability.

9.1 Answering the sub-questions of this research project

The first steps towards this research framework were done by conducting a study of scientific literature from innovation studies, psychology, sociology, social psychology, and policy studies. This filled the first two levels of the research framework (main concepts and conceptual framework), as well as a large part of the third level (operationalization). A qualitative empirical study was conducted to fill the gaps in the operationalization and visibility levels of the research framework. This study also provided updates to the second and third levels of the framework. So, the answers to the sub-questions of this research that are presented below are the result of several iterations with complementary top-down and bottom-up qualitative approaches. This makes the research framework as a whole more robust.

The empirical evidence was gathered by means of a case study. The Petaplan project is the inter-organizational innovation project that was studied. This is a project of the Green Grids Initiative, a joint effort of the CSR-managers of several infrastructure operators to make the Dutch infrastructure systems more sustainable. In the Petaplan project, three DSO's⁴, and the

⁴ Alliander, Enexis, and Stedin

rail operator⁵ and highway and waterway operator⁶ work together to organize large scale installation of renewable energy technology on plots that surround for example high ways, train tracks, dykes, and locks.

The main source of data was the approximately 11 hours of open interviews with the five CSR-managers that were involved in the Petaplan project from the beginning, and one of their advisors. These individuals were selected, because they were physically present in the collective decision-making arena during most of the meetings, which means that they have largely been exposed to the same set of environmental influences. Below, the final conclusions from these interviews are presented per sub question, and therefore per level of the research framework.

9.1.1 How can the main concepts innovation, imagination, and inter-organizational collaboration be described?

Descriptions of the main concepts of this research were compiled from literature from social psychology, sociology, psychology, innovation studies, and policy studies. The text boxes below summarize the findings in these texts that seem to apply to many CSR-inspired inter-organizational innovation projects from existing organizations.

Innovation

The whole trajectory that leads to the successful implementation of a new product or process. For existing organizations, reaching CSR-goals often implies investing in process innovation (delivering the same function more sustainably) by changing their activities and external relations.

Imagination

Imagination is a driving force of innovation if it provides a mental image of the innovation at hand that is well-developed in a creativity dimension and an emotional dimension, since this provides the flexibility, holism, and motivation for action that is needed to develop and implement an innovation successfully in the constantly changing, multi-faceted environment of today's world.

⁵ ProRail

⁶ RWS

Inter-organizational collaboration

New initiatives for inter-organizational collaboration often take the form of progressively more detailed creative processes and negotiations about the problems and opportunities that should be incorporated in the project. This results in a complex decision-making process, because the actors in the arena are mutually dependent on each other, and belong to organizations with different goals, interests, resources and perceptions that all need to be accommodated in the decision-making process.

9.1.2 How can the relations between the main concepts be summarized in a conceptual framework?

A standard conceptual framework from social psychology was used to illustrate the relations between the three main concepts of imagination, inter-organizational collaboration, and innovation. This cognitive process scheme has four elements:

1. The *stimuli*, or information, that an individual is confronted with in the (inter-organizational) social environment
2. The *cognitive processes* (like imagination), that filter and interpret these stimuli
3. The *mental representation*, or mental image, of the innovation project that results from the sum of all stimuli and cognitive processes. The potential to use imagination as an innovative force manifests itself here.
4. The *behavior* of the individual, meaning his thoughts, actions, and feelings, that is influenced by the mental representation.

The empirical research showed that there is not one mental representation about the innovation project, but several versions along a time and an inter-personal dimension. These different versions form an important additional pathway between the social environment and behavior, since comparisons between the different versions of mental representations influence the behavior negotiations of the arena attendee.

A schematic reproduction of this conceptual framework is presented in Figure 9.1.

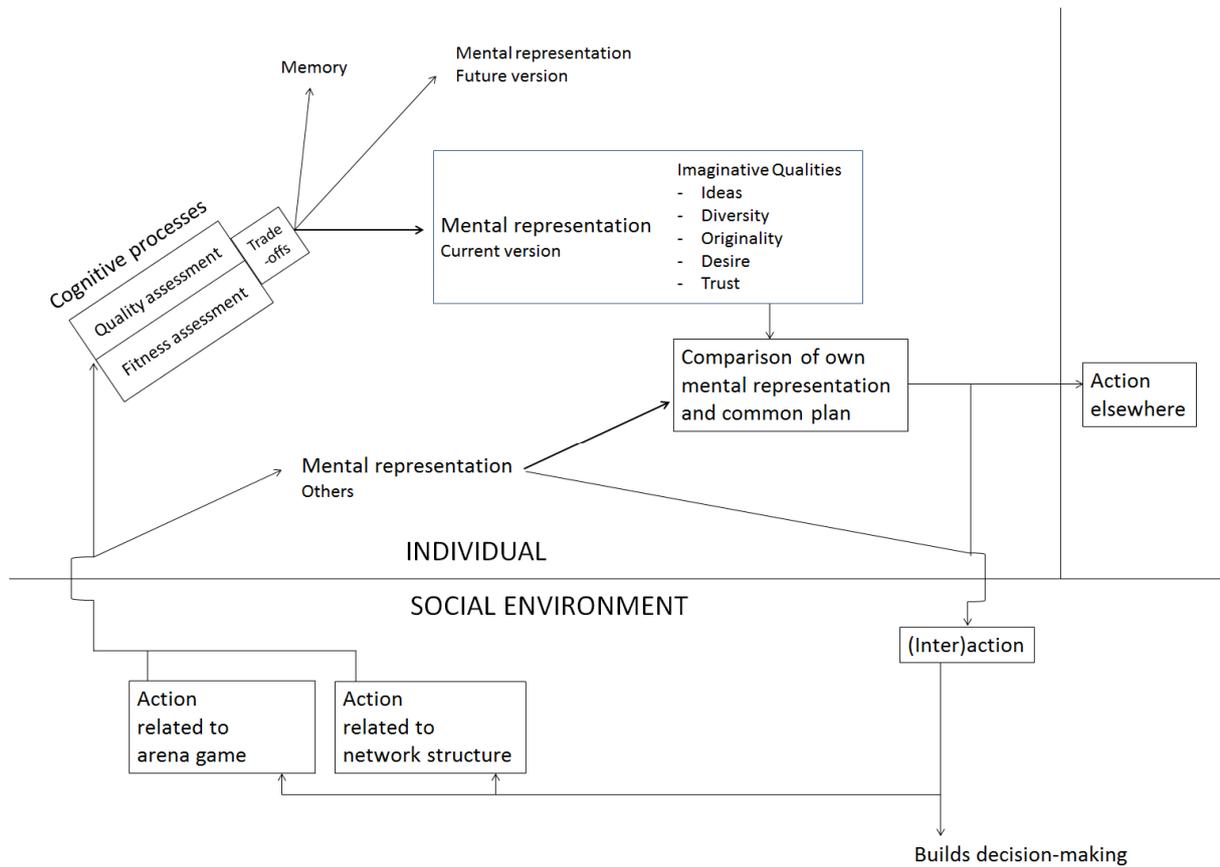


Figure 9.1: The final conceptual framework for imagination in its social context

9.1.3 How can each part of this conceptual framework be operationalized with directions that are relevant for investigation?

At first, this question was answered with the help of scientific literature. Later, the suggestions from the literature were checked and updated with empirical research that followed complementary bottom-up and top-down approaches. All four elements from the conceptual framework (stimuli, cognitive processes, mental representation, and behavior) were operationalized in several levels. The complete operationalization can be found in Table 9.1, and the main choices are revisited below.

Main concept	Connection conceptual framework	Theoretical operationalization of element in conceptual framework			Visibility
		Level 1	Level 2	Level 3	
Inter-organizational collaboration	Stimuli from the social environment	Arena games	Problem statement	More, less, keep	Accepting, Précising, Redefining
			Solution(s)	More, less, keep	Selecting, Excluding, Developing
			Participants	More, less, keep	Mobilizing, Excluding, Introducing
			Timing	More, less, keep	Creating time pressure, Delaying
			Norms	Decision-making procedures, conflict resolution, language use, transparency, and evaluation criteria	Group attribution, Assumed reactions, Contrast with other groups
			Roles	Task roles (content creators and tactical masterminds) , socioemotional roles, individual roles	Characterizations, Contributions, Missing influence
			Affectionate relations	Fun, trust, recognition	Judgments about person, about collective
			Quality assessment	Conditions, sets of impressions, impressions	
			Fitness assessment (willingness and progress support)	Conditions, sets of impressions, impressions	
			(Mediated) assessment of nested trade-offs		

Main concept	Connection conceptual framework	Theoretical operationalization of element in conceptual framework			Visibility		
		Level 1	Level 2	Level 3			
Imagination	Current mental representation of innovation project	Creative qualities	Diversity	Goal, Whole, Instance	Number of emic or etic categories of proposals		
			Emotional qualities	Quantity		Count of all judged or mentioned proposals	
				Originality	Organization, Sector, Region, World	Newness to a particular context	
		Time	Desire	Attributed to process, attributed to outcome	Judgement about impact or contribution, priority of own interest, working around trouble		
			Trust	Development of conditions, support of important actors	Dependency relieved, likelihood of reaching the end-point		
			Current Future				
		Innovation	Other versions of mental representation of innovation project	Inter-personal	Own In-group Out-group		
					Challenging feedback	Action in arena	Do new proposal , look for new impressions
				Confirming feedback		Action outside arena	Look for new impressions
					No action	If not urgent or part of common plan	
		Action in arena	Increase pressure for decision				
		Action outside arena					
		No action					

Table 9.1: Research framework for imagination as a driving force for innovation

I - Stimuli from the social context

Two sets of stimuli were selected. The first is the content of the negotiations the decision-making process is based on. These negotiations are described following the Koppenjan's ideas on arena games: There are essentially four topics of discussion, the problem statement, the solution(s), the participating organizations, and timing. When these elements align, it is possible to make a decision. The second set of stimuli that was studied concerns the interpersonal level of the collaboration context. This was operationalized with the help of the network structure concept of group dynamic theory. Three elements were focused on: Norms, roles, and affectionate relations. All these categories were found to be helpful in finding meaning in the data. Their sub-divisions were sometimes updated, so they adequately represented the experience of the interviewees.

II - Cognitive processes

Theory from social psychology suggested the cognitive processes that mediate between the stimuli from the social environment and the mental representation consist of three phases: Encoding, elaboration, and evaluation. The empirical data suggested a more complex process. This process is summarized in an assessment scheme of nested trade-offs. This scheme serves as a tool to understand how all impressions come together and form a conclusion on the question: Do I want this idea to be part of my mental representation of the innovation project? The main sub-assessments appeared to be concerned with the perceived quality of this idea, and the perceived fitness of this idea (which is determined by the willingness of the individual to contribute to this idea, and his impression of how this idea supports the progress of the project). However, even with this assessment scheme, the answer to this question cannot be predicted, since the priorities within trade-offs, and the impressions on which the trade-offs are based are constantly changing thanks to continuous feedback from the arena.

III - Mental representation

As was mentioned above, the use of imagination, and the potential of imagination as a driving force of imagination presents itself in the mental representation. For imagination to be a driving force, creative qualities and emotional qualities are needed. These creative qualities were defined following the creativity measures from the Torrance Test for Creativity: Quantity, diversity, and originality. Quantity is the amount of ideas for the

innovation project that the arena attendee made part of his mental representation. Diversity says something about the holism of these ideas, how many different perspectives were accounted for. Originality is a measure of how original the ideas in the mental representation are. The emotional elements were defined as trust and desire following literature on innovation in an inter-organizational context. All five imaginative qualities have gained additional categories in the empirical data analysis, to make big data sets more accessible. How the scores on these imaginative qualities of the mental representation emerge from the sum of all assessments that are done for a certain project by an arena attendee could be clearly traced in the assessment scheme: The creativity scores result from the conclusion to the entire assessment for each idea, and the emotional scores result from the total set of impressions from all ideas that belong to the mental representation of the innovation project.

IV - Behavior

The mental representation can trigger certain behavior of the individual both inside and outside the arena. The arena games provide the arena attendee with feedback on how the common image of the project group is developing. This feedback is compared to the own mental representation. Both differences and similarities between these two images of the innovation project can a reason to act. Differences can trigger a contribution to a negotiation on the problem statement, solution(s), or participants of the project. Similarities might push the arena attendee to pressure the project group to make a decision. Not acting on the difference is also an option, for example when the arena attendee has the idea the topic of conflict will not be decided on anytime soon.

9.1.4 How is the proposed operationalization visible in empirical data?

The references to the environmental stimuli and the cognitive processes can be identified quite directly in the raw data. Globally speaking project references are references to arena games, people references are references to network structure, and thought references are references to the cognitive processes.

Identifying the contents of the mental representation is a more complicated matter. First of all, because there are several versions of the mental representation along a time and an inter-personal dimension. The arena attendees do not only have a mental image of the

innovation project as they see they should be working on at that moment in time. They also keep track of the images others have about the project, and of options that could be added to the project in later stages. The second reason why the identification of the contents of the mental representation is more complex is because it leaves more to the interpretation of the researcher. To what diversity category does a certain idea about the project belong? How original is it? Does a certain judgment say something about the desire for or the trust in the project coming about? The decisions that were made for this research are summarized in the fourth level of the research framework (see Table 9.1).

9.1.5 How can this research framework facilitate the development of a tool that helps the facilitation of the imaginative needs of arena attendees that work on inter-organizational innovation projects?

To develop a tool that helps the facilitation of imaginative needs, it is important to gain more insight in what exactly are the characteristics of events or circumstances that boost the imaginative qualities of arena attendees' mental representations. Gaining this insight starts with the thorough mapping the development of the imaginative quality of an individual's mental representation. Chapter 8 illustrated that this is, if more structure research methods are used, supported by the research framework that was developed in this graduation project. Tracking the development of the imaginative qualities gives an idea of what events were the 'boosters' and 'biters' of the five imaginative qualities, and offers guidance in looking into what exactly helped them during these events. The try-out of the research framework suggests that it is a fruitful direction to work towards a typology of imaginative needs, both for the mental representation and action negotiations of the individual.

The try-out analysis suggests that different individuals have different needs, but also that needs might change during the project's development. To enable the development of a generalizable typology of changing imaginative needs throughout an innovation project, a way of dividing a project's development in phases is suggested: By looking at the main focus of the arena attendees. These topics of focus entail organizing commitment in the first phase, project development, confirming commitment, and guarding development speed in the second phase, and handing over the project to others in the third phase.

9.2 Discussion

In this part of the conclusion, the results of this research project are assessed for their quality. Questions that will be answered are:

- How valid are the lines of reasoning, and the connections that are made between the research constructs and the main concepts?
- How generalizable are the findings to other contexts of inter-organizational collaboration?
- How reliable are the data that were collected?

9.2.1 Validity

Validity is a measure for how well a conclusion or concept is founded on the actual world. There are three kinds of validity: Internal validity, external validity, and construct validity.

I - Internal validity

A research with a high internal validity is a project in which the chain of evidence is well-maintained. The claims can be traced back to the raw data. This research is based on a cause-and-effect chain that is a basic model in social psychology: The social context influences the behavior of an individual. It was shown how scientific literature and empirical data led to the further operationalization of this conceptual framework.

A problem for the validity of this research is that the main process, imagination, takes place inside the head of the arena attendees: No real-time data gathering is possible, so checking the lines of reasoning in this thesis for their occurrence in the real world will be impossible. The approach that was chosen in this project, using the interviewee's self-reflection, is an indirect access to this process that is colored by the interviewee's bias and recall errors. These blurring effects were tried to be contained by making the interviewees feel comfortable, prepare questions based on observations, bring tools that facilitate memory, but if this worked sufficiently can never be known.

II - External validity

Risks to external validity are causal relations that also influence the concepts under study, but that were not part of the research scope. So what are external influences that influence

how the elements of the conceptual framework look like that blur the conclusions about them in this report?

For the social context, such an influence would be the network structure from the Green Grids initiative. The Petaplan members are a sub-group of this initiative, but their network structure is not completely the same. Influences between the two arenas could spill-over, though. Both these social arenas are only small parts of the social context in which the arena attendees work throughout the week. They work for their own companies and the cultures within these organizations probably also have a very large influence on the trade-offs that are made in the assessment scheme. Maybe these are even larger than the influences from the direct social context of the Petaplan arena.

From the assessment scheme, the impression could be that imagination as a driving force for innovation is treated as an exclusively rational phenomenon, or at least, that the assessment is done consciously. This is not the intention. The assessment scheme is merely a way to make explicit what largely happens unnoticed. With its flexible trade-offs, it leaves a lot of room for the accommodation of irrational decisions and the complexity of daily life.

Imagination as a driving force for innovation really becomes relevant only when ideas about the innovation project are added to the mental representation. If behavior is not based on this mental representation (for example, if you joke about an idea for the innovation project), this still gives the other individual's in the arena the opportunity to be inspired in their own way by this input. If this inspiration leads to a new idea for the innovation project in the mental representation, this could change his innovation behavior.

About behavior, it has to be acknowledged that the mental representation of the innovation project only influences a part of the behavior of the individual. This means it does not say anything about the net-benefit of the arena attendee's behavior for the innovation project of study, since its successful implementation can also be counteracted with actions that stem from another mental representation.

III - Construct validity

Construct validity is a concept that refers to how well the different concepts that are used to describe the social reality are linked to this real-world phenomenon. In the case of this

research, there are two transitions between levels of constructs in which this relation needs to be secured. These transitions will be discussed below.

IIIa - From Level 1 to Level 2

This level has three links. During the empirical research, it became clear that the conceptual division between the social stimuli from the social environment, the mechanisms, the mental representation, and behavior was very helpful to structure the large amount of information that was provided by interview data.

Inter-organizational collaboration → Stimuli & Cognitive processes. Suggests there is an influence from the environment on the individual. This, however, assumes a certain openness to input from this environment from the individual. In most cases this is a safe assumption, since inter-organizational collaboration normally is not sought for things we already know how to do. These collaborations are sought for fields in which little experience is available, and it is unknown what is best.

Innovation → Behavior. Assumes that contributing to innovation is always the desired output of an individual's imagination. This innovation project that is contributed to, however, is not necessarily the same project the inter-organizational team decides to work on. This means facilitating imagination in an inter-organizational innovation project does not necessarily benefit this specific project. Spill-over effects are a possibility.

Imagination as a driving force of innovation → Mental representations. This is a strong link, since the mental representation concept leaves room for the creative and emotional elements of imagination as a driving force for innovation.

From Level 2 to Level 3

This level has four links, one for each element of the conceptual framework.

Inter-organizational collaboration → Stimuli → Network structure & Arena games. It is not guaranteed that these sets of stimuli encompass all possible influences from the social context. That they are relevant influences has become visible in the visualization of the cognitive processes, since they all have the potential to influence the mental representation of an arena attendee. The network structure elements work on the fitness assessment part of the cognitive processes (evenly divided over the sub-assessments 'support progress' and

‘willingness’). With their place in the assessment scheme, they all have the potential to influence the mental representation, and the behavior of an individual and thereby the innovation outcome of the project. Also, for all stimuli, a possible connection to desire or trust was determined. So, these categories are relevant in the real world.

Inter-organizational collaboration → Cognitive Processes → Quality assessment & Fitness assessment. This operationalization with a complex of nested trade-offs with changing priorities is closer to the real world phenomenon than the linear representation in literature from social psychology (encoding, elaboration, evaluation). The assessment scheme, however, has no predictive qualities because it recognizes this complexity.

Imagination as driving force for innovation → Mental representation → Five imaginative qualities. The question is, do these five imaginative qualities represent all elements, or too many elements, of the mental representation that can boost innovative behavior, and are they all equally important? Originality is probably the basic driver for innovation, since an idea that is unoriginal in every relevant context would not be called innovation. A higher originality score, however, does not necessarily mean better innovation. Most interviewees suggest there is an optimum. In the case study for this research project, not all diversity categories had a quantity score worth mentioning. This does not necessarily mean these categories are worthless: The bias could be related to the role the interviewees fulfill in this project. They are generally not specialists that need to think about the details of the project, but invest more in the thinking about the project as a whole. The categories for emotional imaginative qualities sometimes proved to be difficult to be distinguished from each other without the help of the interviewees. The blurry boundary between them, however, should not be a reason to refrain from using them. Their powers are widely recognized by the interviewees.

Innovation → Behavior → Inside arena & outside arena. The decision scheme on behavior that was presented addresses all theoretical ways of dealing with new information from the arena. It still is, however, a limited scheme. Probably, there are more layers on top of this scheme from other processes (with, for example, input about the own physical capacities and self-confidence).

9.2.2 Generalizability

If a research result can be generalized, this means it has value outside the specific context of the original research. Below, it is discussed per main concept how their operationalization might be useful in other research contexts.

Inter-organizational innovation and case study boundaries

The inter-organizational innovation project that was used as a research context has several specific characteristics: It has a project team of CSR-managers, it aims to develop a process innovation, it is executed by existing and well-established organizations from the semi-public and public domains, it is executed by a collaboration of infrastructure operators, its development just started, and it was blessed with the direct involvement of the board members of almost all participating organizations. Although these specific conditions do largely influence the innovation opportunities within this research context, it was tried to translate the opportunities and risks that the interviewees experienced in more general terms. The resulting research framework seems, maybe excluding the final layer of operationalization, a tool that can be used in many innovation projects. This should be tested in future case studies.

Imagination

It is important to keep in mind that this is not a research framework for imagination in general. It considers a specific potential of imagination, namely its capacities to supply an individual with enough inspiration to engage in activities that lead to successfully implemented innovations. This is not the day-to-day use of the concept of imagination, which is a more open-ended wandering of the mind, or even the basis of empathy. Although these aspects of imagination could supply arena attendees with input as well, they are not the main focus of this research framework.

9.2.3 Reliability

Reliable research findings are findings that would be found by another researcher as well, if he repeated the same analytical procedures on the same data.

I - Reproducing the same results

To facilitate critical examination of the analytical efforts, the data collection and analysis procedures were tracked in different ways. The interviews were recorded, and their

transcripts stored together with observation notes in Nvivo. Most categorization efforts that were done during analysis can be tracked in the Nvivo file. The categorizations that were done with the help of post-its were also tracked by means of numbers and other indications about where the content of the post-it came from, and how it was categorized.

Unfortunately, with such a big data set, it is impossible to document all decisions that are made during the analysis.

To facilitate reproduction of a scientific research, it is important to communicate clearly about the decisions and assumptions that were made. The thoroughness of this thesis is a result from working on a relatively new topic for which many assumptions still need to be made explicit, and boundaries of concepts need to be set. The side steps from the main conceptual framework that were made in this thesis (for example the elaboration on the different versions of the mental representation) are an illustration of this, since they try to avoid confusion from fellow researchers.

With the resources for this research, it proved impossible to have other researchers check the analysis procedure. Being dependent on the judgment of one researcher means that the results in this research, both from the literature study and the empirical study, are colored by my personal biases. To check if this bias is at least consistent, several text excerpts were coded again after a few days. This gave similar results to the first coding attempt.

II - Completeness

Several choices in the methods, and uncontrollable factors caused the data for this research not to be complete in the sense that the final research framework can be filled in completely for every interviewee at every moment of the Petaplan's development. The absence of a research framework at the beginning of this project made structured data gathering impossible. Because they were not asked to mention them directly, many details will not have been shared because interviewees did not deem them important enough. Also, the open interviewing strategy caused all the interviews to have a different focus. This means the same kind of data is not available for all interviewees.

The directions in which data was gathered are probably also not covered completely, because the interviewees were asked to recall experiences from several months ago, which

can lead to recall errors. It also became clear that not all interviewees were equally good at digging in their own experiences.

Of course, theoretically, with the new research framework, it is possible to gather data very structured and through, so that for all interviewees comparable data is available. A less stringent way of probing interviewees for this should be found though, because it was already noticed during this research that one hour of constantly reproducing experiences from memory bored the interviewees.

So, this research is not a complete study of imagination in its social context. It is mainly a first try to develop a research framework with the limited data one case study and literature from different domains provide. This is not a problem, however, since the aim of this research was not to present a complete and verified picture, but to provide directions and tools for future research into imagination as a driving force for innovation that is fueled by its social context. So, despite the limited completeness of the case study data, it does serve as a stepping stone for further developing this topic.

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Appendix A: Characteristics of organizations participating in the Petaplan project

	Rijkswaterstaat	ProRail	Alliander	Enexis	Stedin
Core business <i>Building, maintaining, and operating...</i>	...the main highways and waterways, and dams and flood barriers.	...the main train tracks and their electricity supply.	...the gas and electricity networks in the East and North of The Netherlandsthe gas and electricity networks in the South of The Netherlands.	...the gas and electricity networks in the West of The Netherlands.
Main values according to year report	Safety, reliability, accessibility, sustainability. ⁷	Safety, reliability, sustainability. ⁸	Safety, reliability, affordability, accessibility, sustainability. ⁹	Safety, reliability, sustainability, affordability, accessibility. ¹⁰	Safety, reliability, sustainability, affordability, accessibility. ¹¹
Perception of problem the Petaplan project should solve	RWS has much land that is not used and needs green electricity for the Dutch state.	ProRail has much land that is not used and wants green electricity for themselves and NS.	There is little renewable energy in The Netherlands.	There is little renewable energy in The Netherlands.	There is too little renewable energy in The Netherlands to satisfy our demand.
Interest in the Petaplan project	Supplying the Dutch state and others with relatively cheap, green electricity from their own grounds.	Learning lessons about generating electricity with infrastructure operators.	Create maximal impact for the Dutch society with a big renewable energy project.	Facilitate renewable energy generation for The Netherlands	Green energy from direct contact with a green electricity supplier.
Main direct stakeholders	Public organization reporting to ministry of Infrastructure and Environment.		Private organization in regulated sector. Shareholders are provinces and municipalities. Reporting to ministry of Economic Affairs.		
Information resources	Planning of maintenance, openness for renewable energy projects of the different provinces and municipalities, land allocation		Location of large electricity consumers, place of currently available cables, price per transported kWh per capacity of the cable.		

⁷RWS, 2016.

⁸ProRail, 2016.

⁹Alliander, 2017.

¹⁰Enexis, 2017.

¹¹Stedin, 2017.

	plans on different governmental levels.		
Knowledge resources	Collaboration history with nature conservation organization.	Thorough research on possible functions of their 'left-over'land.	Smart grid design; lowering the investment costs to deal with power peaks, minimize grid losses, etc. Especially Alliander: Experience with innovative pilots that stretch the Dutch regulations.
	Good relations with government bodies on all levels, experience with complex stakeholder management and large public tenders.		
Money resources	The parliament decides the budget every year.		Tariffs for each connection to the grid are set on a national scale each year.
Legitimacy resources	Asked to generate energy for the Dutch state, not yet allowed to install more capacity than needed.	Set itself the goal to produce green energy, the connections in their electricity grid are not allowed to deal with delivery of electricity to the grid.	Not allowed to install energy production units by law, but connecting renewable energy projects to the existing grid is their core business.
Power resources	Have a lot of left over land. The surplus of electricity can be sold to anyone.	Have little left over land. The surplus of electricity can be sold to anyone.	By law have to provide electricity connection in any case, and have little land. They can offer a lot of security to energy suppliers with a big, long term contract, though.

Table A.1: Characteristics of the organizations participating in the Petaplan project

Appendix B: Meetings attended for observation

Date	Kind of meeting	Location
28-10-2016	Green Grids meeting	Utrecht, office MVO NL
11-11-2016	Green Grids meeting	Utrecht, office MVO NL
25-11-2016	Green Grids meeting	Utrecht, office MVO NL
29-11-2016	Consultants interviewing people at RWS	Utrecht, office RWS
31-11-2016	Consultants interviewing people at ProRail	Utrecht, office ProRail
8-12-2016	Co-creation workshop Petaplan	Utrecht, office ProRail
13-12-2016	Co-creation workshop Petaplan	Utrecht, office Ecofys
20-12-2016	Co-creation workshop Petaplan	Utrecht, office Ecofys
03-02-2017	Green Grids meeting	Utrecht, office MVO NL
17-03-2017	Green Grids meeting	Utrecht, office MVO NL

Table A.2: Meetings attended for observation

Appendix C: Elaborate interview protocol (in Dutch)

Introductie van het eerste interview

“Mijn onderzoek gaat over verbeelding en daarvoor doe ik een case study van de ontwikkeling van het Petaplan. Ik wil graag weten hoe het Petaplan gegroeid is in jouw hoofd, hoe het er volgens jou uit kon zien op dat moment. Om het later te kunnen analyseren wil ik vragen of ik het interview op mag nemen. Alleen ik zal de opname terugluisteren en na m’n scriptie zal ik hem netjes verwijderen. Als ik je direct ga citeren zal ik aan je vragen om te checken of je het eens bent met het citaat. Heb je nog vragen aan mij?”

Introduceren van de tijdlijn

Als het interview begon, was alleen de bovenste rij post-its (met de periode-aanduidingen) zichtbaar. De rest van de tijdlijn lag in post-its op de tafel, maar dan met de onbeschreven kant naar boven. Afhankelijk van welke bijeenkomsten de geïnterviewde had bezocht, werden sommige delen van de tijdlijn weggelaten.

De tijdlijn werd als volgt geïntroduceerd: “Er ligt een tijdlijn voor je in gele briefjes. Dit zijn volgens mij de gezamenlijke activiteiten waar jij bij aanwezig was. Klopt dat? Ok, dan beginnen we bij het begin.

- Waarom doen jullie als organisatie mee aan het Petaplan?
- Wat is voor jou persoonlijk de reden om mee te doen?

Dan gaan we nu door de tijdlijn lopen. Ik zal steeds een van de blauwe briefjes omdraaien. Daarop staat iets wat in die periode gebeurd of besproken is. Iedere keer is de vraag: Wat veranderde dit aan *jouw idee* van wat het Petaplan zou kunnen zijn?”

Een voor een draai ik de kaartjes om, leid in wat er gebeurde, hou goed in de gaten of de deelnemer zich er iets van herinnert, en stel de vraag wat deze gebeurtenis met hen beeld van het Petaplan deed. Hiervoor gebruikte ik dit soort vragen:

- Toen werd er gesproken over de randvoorwaarden om het Petaplan uit te kunnen voeren. Hoe heb je dat ervaren?
- Er was iemand van I&M die aangaf interesse te hebben. Wat dacht je toen?

Vorbereiden bestuursbijeenkomst september	Bestuursbijeenkomst september @ Springtij	Schrijven van opdracht voor consultant	Workshop 1 @ ProRail	Workshop 2 @ Ecofys	Workshop 3 @ Ecofys	Vorbereiden bestuursbijeenkomst januari	Bestuursbijeenkomst januari @ Tivoli
RWS bij Groene Netten	Ministerie van Infrastructuur & Milieu wil helpen	Goal = Maximum societal impact	Potentieel berekening, discussie over criteria	Mogelijke rolverdeling	Uiteindelijk potentieel van 28PJ wordt medege-deeld	Oplevering verkennings-rapport	Presentatie "Wat zou Cornelus Lely denken?"
Naam "Petaplan" valt	Voorstel tot deelname in SER energieakkoord	Wens tot voorzichtig framen ambitie	Wat kunnen we beter dan de markt?	Mogelijke financiële modellen	Wie krijgt de elektriciteit?	Bestuurders vragen om projectorganisatie of pilots?	Besluit tot start pilots
+20 PJ genoemd als potentiële capaciteit		Onzekerheid over juridische mogelijkheden	Praten over randvoorwaarden zoals veiligheid, bomenkap	Berekeningen over investering en winst	Concretiseren pilots: Wat als we morgen zouden beginnen?	Sluiten we ons aan bij het SER energieakkoord?	Onzeker of directie RWS instemt met deelname
					Inventariseren risico's		Gezamenlijk persbericht over visie

Table A.3: De uiteindelijke versie van de tijdlijn zoals hij gebruikt werd in de interviews. De tekst op de post-its is weergegeven is zwart. In het grijs staat hier wat meer context bij voor de lezer van deze thesis.

Als het gesprek daaraan raakte, vroeg ik alvast door naar de invloed van elementen uit de netwerkstructuur of onderliggende mechanismen die geleid hadden tot de mentale representatie van het plan die de deelnemer met me deelde.

Introductie van het tweede interview

“De vorige keer hebben we het gehad over de ontwikkeling van het Petaplan in jouw hoofd. Deze keer gaan we het meer hebben over de invloed van de omgeving en je emotionele reacties op gebeurtenissen. Daarvoor heb ik twee briefjes meegenomen die ik hier op tafel ga leggen. De ene heet verlangen, de ander vertrouwen. Ik zal je regelmatig vragen wat iets deed met deze twee emoties. Je mag er ook zelf naar refereren als je er iets over te binnen schiet, natuurlijk. Heb je nog vragen?”

Praten over emotionele verbeeldingskwaliteiten

Het tweede interview begon met de vraag “Wat vond je het meest inspirerende moment?”

Andere vragen die daar op volgden waren bijvoorbeeld:

- Wanneer kreeg het verlangen naar het Petaplan de grootste knauw?
- Wat is het evenement geweest waarna je het meest actie ondernomen hebt?

Vragen naar mechanismen

Doorvragen naar mechanismen adhv antwoorden eerste interview en momenten waarop speciale games voorkwamen. Voorbeelden voor games met betrekking tot het uitbreiden of reduceren van het aantal participanten in het Petaplan:

- Dat Enexis roept dat ze stoppen zodra het juridisch vaag wordt, word je daar zenuwachtig van?
- Die doorlopende onzekerheid of RWS wel echt mee gaat doen, wat deed dat met je?
- Dat iemand tijdens die workshop riep dat hij vond dat Staatsbosbeheer hier ook aan tafel zou moeten zitten, wat dacht je daarvan?

Als deelnemers dan antwoorden met referenties naar de belangrijkheid van een speler, dan vroeg ik waar zij op baseerden dat deze speler belangrijk is. Zo zocht ik naar de grenzen van het concept ‘belangrijke deelnemer’ en wat meespeelde in die beoordeling.

Leren over de invloed van de sociale context

Het tweede interview eindigde met vragen naar elementen uit sociale context die nog niet (voldoende) aan de orde waren gekomen. Dit ging om dezelfde lijst onderwerpen die ik bij het eerste interview klaar had liggen om door te vragen mocht het onderwerp daar op komen.

- Het valt mij op dat jullie altijd heel open zijn als er iets even niet loopt binnen je organisatie. Hoe beïnvloedt dat de ontwikkeling van het Petaplan volgens jou?
- De sfeer bij bijeenkomsten van Groene Netten en het Petaplan is heel informeel, hoe is dat van belang geweest voor de totstandkoming van het plan?
- Hoe is je relatie met de andere mensen van het Petaplan?
- Ik heb hier kaartjes met vijf verschillende opschriften: Concreet maken, Nieuwe dingen willen, Openen voor nieuwe dimensies, Vertrouwen en Verlangen. Zou je die voor mij kunnen toewijzen aan de andere mensen van het Petaplan?

Afsluiting

Ter afsluiting bedankte ik de deelnemers, vroeg of ze nog wat toe te voegen of te vragen hadden en gaf aan dat van me zouden horen als het rapport af was.

Appendix D: Interview transcripts

See other version of this thesis

Appendix E: Code lists with descriptions

Pre-interview code list

Naam Code	Beschrijving
Aanwezig	Aanwezigen bij PP meetings
<input type="radio"/> AW Interviewee 1	Markering van document met vergaderstukken als zij erbij was
<input type="radio"/> AW Interviewee 6	Markering van document met vergaderstukken als hij erbij was
<input type="radio"/> AW Interviewee 3	Markering van document met vergaderstukken als hij erbij was
<input type="radio"/> AW Interviewee 5	Markering van document met vergaderstukken als zij erbij was
<input type="radio"/> AW Interviewee 2	Markering van document met vergaderstukken als hij erbij was
<input type="radio"/> AW Interviewee 4	Markering van document met vergaderstukken als hij erbij was
Netwerk Structuur	Elementen van netwerkstructuur
<input type="radio"/> Normen bij Groene Netten	Waarden/ Regels die gelden in het netwerk
<input checked="" type="checkbox"/> Benchmarken	Groene Netten heeft als functie om hun bestuurders functioneel zenuwachtig te maken door te laten zien wat andere infrabeheerders al doen op gebied X van duurzaamheid.
<input checked="" type="checkbox"/> Delen van lessen	Delen van intentie om informatieve beschikbaar te stellen, lessen over en bediscussiëren van interne politiek, en het delen van steun van een belangrijke partij
<input checked="" type="checkbox"/> Gedeelde visie, eigen tempo	Dit is niet voor het petaplan besproken, maar bij andere thema's binnen GN is het vaak zo dat er sessies zijn om de

Naam Code	Beschrijving
	gezamenlijke visie te bepalen, waarna iedereen in zijn eigen tempo bezig gaat met de implementatie. Hiervoor moeten vooral de basiswaarden afgestemd worden
<ul style="list-style-type: none"> ■ Informele sfeer 	Tijdens meetings van GN en PP wordt een informele sfeer omarmd. Lekkernijen worden meegenomen, grapjes gemaakt. Gunnen elkaar dingen, zijn open over hun bedoelingen, strategische spelletjes worden niet hard gespeeld, successen worden gevierd, en ze voelen zich een team dat de rest van hun bedrijven moet 'bekeren'. Dus geen onderhandelings sfeer.
<ul style="list-style-type: none"> ■ Samen experimenteren 	Snel tot uitvoering op kleine schaal overgaan, zodat daaruit lessen getrokken kunnen worden over opschaling, het bestuur meegenomen kan worden, etc.
<ul style="list-style-type: none"> Framing in kansen 	GN framed zijn experimenten naar de kansen die het misschien oplevert. Zoekt naar manieren om noodzaak, logischheid en gaafheid van hun experimenten te benadrukken voor henzelf, derden, en bestuurders.
<ul style="list-style-type: none"> ○ Onderlinge relaties 	Hoe goed een onderlinge relatie is
<ul style="list-style-type: none"> ○ Rollen bij Petaplan meetings 	Rollen die genomen worden door individuen die aanwezig zijn bij PP meetings
Strategieën	Voorbeelden van arenastrategieën die gevonden zijn in de tekstdocumenten
<ul style="list-style-type: none"> ○ Oplossing 	Als een oplossing besproken wordt
<ul style="list-style-type: none"> ○ Oplossing - Randvoorwaarde 	Als de randvoorwaarden voor de totstandkoming van het Petaplan genoemd worden
<ul style="list-style-type: none"> ○ Participatie 	Als een deelnemer of partner besproken wordt
<ul style="list-style-type: none"> ○ Probleemstelling 	Als een probleemstelling besproken wordt
<ul style="list-style-type: none"> ○ Timing 	Als de druk voor het nemen van een beslissing verandert

Final codebook

Naam Code	Beschrijving
Mechanismen	Hoe cognitieve processen de stimuli uit de sociale omgeving verwerken tot een teken van verbeeldingskwaliteit in de mentale representatie van het Petaplan
○ 1GPR Op waarde schatten voorstel anderen	Overwegingen nav voorstel (tot opnemen of wegnemen) probleem van een ander op zich
○ 1GPR Probleemstelling bewaken	Overwegingen nav voorstel van een ander aangaande de (mogelijke) conflicten met het eigen idee van de probleemstelling
○ 2GOP Beïnvloeden andermans IQs	Analyse van hoe een voorgestelde oplossing (of verpakking daarvan) andermans imaginative qualities zal beïnvloeden
○ 2GOP Niet oppakken eigen voorstel	Reactie als eigen voorstel voor een oplossing niet wordt opgepakt door de anderen
○ 2GOP Op waarde schatten voorstel	Overwegingen nav voorstel oplossing (nieuwe oplossing, of afzweren oude oplossingsrichting)
○ 3GPA Inschatten behulpzaamheid van partij	Overweging nav voorstel toevoegen nieuwe partij of weggaan huidige partner
○ 3GPA Observeren deelname anderen	Referenties naar de deelname van andere organisaties en individuen in de arena
○ 3GPA Vertrouwen in eigen plek in samenwerking	Referenties naar hoe de geïnterviewden hun eigen plek en die van hun bedrijf zien in de samenwerking
○ 4GTI Druk in de arena	Reacties op momenten waarop druk ontstaat in de arena
○ 5NO Normen	Referenties naar hoe normen houding tov Petaplan project beïnvloeden
○ 6RO Rollen	Referenties naar hoe rollen houding tov Petaplan

Naam Code	Beschrijving
	project beïnvloeden
○ 7RE Relaties	Referenties naar hoe relaties houding tov Petaplan project beïnvloeden
Ontwikkeling	Chronologische groepering van de uitspraken van deelnemers gebaseerd op het moment in de geschiedenis van het project waar de uitspraak naar verwijst.
○ 1607 Vooraf	Verwijzingen naar de verwachtingen van de deelnemers op het allereerste begin van het Petaplan in de zomer van 2016
○ 1608 Voorbereiden Captainsmeeting 1	Verwijzingen naar de gebeurtenissen en ervaringen van deelnemers tijdens de voorbereiding van de captainsmeeting op Springtij. Gedurende augustus en september 2016
○ 1609 Captainsmeeting 1	Verwijzingen naar de gebeurtenissen en ervaringen van deelnemers tijdens de captainsmeeting op Springtij in september 2016
○ 1610 Verkenningsopdracht formuleren	Verwijzingen naar de gebeurtenissen en ervaringen van deelnemers tijdens de core team meetings waarin gewerkt werd aan de verkenningsopdracht voor Ecofys en Accenture. Gedurende oktober en november 2016
○ 1612 Voorbereiden Captainsmeeting 2	Verwijzingen naar de gebeurtenissen en ervaringen van deelnemers tijdens de voorbereiding van de captainsmeeting in Tivoli (Utrecht). Gedurende december 2016 en januari 2017
○ 161208 Workshop 1	Verwijzingen naar de gebeurtenissen en ervaringen van deelnemers tijdens de eerste workshop van Ecofys en Accenture in het gebouw van ProRail op 8 december 2016.

Naam Code	Beschrijving
○ 161213 Workshop 2	Verwijzingen naar de gebeurtenissen en ervaringen van deelnemers tijdens de tweede workshop van Ecofys en Accenture in het gebouw van Ecofys op 13 december 2016.
○ 161220 Workshop 3	Verwijzingen naar de gebeurtenissen en ervaringen van deelnemers tijdens de derde workshop van Ecofys en Accenture in het gebouw van Ecofys op 20 december 2016.
○ 1701 Captainsmeeting 2	Verwijzingen naar de gebeurtenissen tijdens de captainsmeeting in Tivoli (Utrecht) in januari 2017
○ 1702 Achteraf	Verwijzingen naar de gebeurtenissen en ervaringen na de tweede captainsmeeting waar deelnemers nog naar refereren.
○ Beginfase	Fase 1 in de ontwikkeling van het Petaplan: Hoe het eerste commitment georganiseerd wordt en hoe dat ervaren wordt
○ Ontwikkelingsfase	Fase 2 van de ontwikkeling van het Petaplan: Invulling van wat het Petaplan is en hoe dat ervaren wordt
■ Commitment	Deelnemer laat merken dat hij tekenen van commitment van anderen registreert of is dat zelf aan het tonen
■ Inhoudelijk	Deelnemer werkt aan ontwikkeling van inhoud van het plan
■ Tempo	Deelnemer let op tempo waarin het project zich momenteel ontwikkelt en kan ontwikkelen met de huidige plannen en gang van zaken
○ Transitiefase	Fase 3 in de ontwikkeling van het Petaplan: Transitie naar implementatie en hoe dat ervaren wordt.

Naam Code	Beschrijving
Sociale context	Verzameling van wat geïnterpreteerd is als de stimuli uit de omgeving die onderzocht worden in deze scriptie: Arena game en enkele netwerkstructuuronderdelen
○ Games	De vier arena componenten volgens Koppenjan en de twee richtingen waarin arena games gespeeld kunnen worden ten opzichte van die componenten: Het voorstellen van een extra optie binnen een component, of het voorstellen om zo'n optie te schrappen.
■ Oplossing extra	Een extra oplossing wordt aangedragen in de arena
■ Oplossing minder	Er wordt voorgesteld een oplossing uit het gezamenlijke plan te schrappen
■ Participant extra	Een extra partner wordt aangedragen in de arena
■ Participant minder	Er wordt voorgesteld een deelnemer uit het gezamenlijke plan te schrappen of een deelnemer kondigt aan dat hij zelf misschien weg gaat
■ Probleem extra	Een extra probleem wordt aangedragen in de arena en gekoppeld aan het Petaplan project
■ Probleem minder	Er wordt voorgesteld een probleem dat gekoppeld was aan het Petaplan project geen aandacht meer te geven
■ Timing extra druk	Er wordt extra druk gecreëerd in de arena om een beslissing te nemen
■ Timing minder druk	De druk om een beslissing te nemen wordt van de ketel gehaald
○ Onderlinge relaties	In hoeverre de deelnemers elkaar persoonlijk mogen. Dit lijkt gestoeld op drie elementen: Vertrouwen, Erkenning, en Plezier

Naam Code	Beschrijving
<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Erkenning 	<p>De relaties tussen kernteamleden worden voor een deel bepaald door hun gevoel van erkenning naar anderen en een ervaring van erkend worden. Dat ze goed bij elkaar passen, elkaar aanvullen, en dat hun talenten goed tot hun recht komen, bijvoorbeeld</p>
<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Plezier 	<p>Referenties naar het feit dat de kernteamleden lol hebben met elkaar. Humor, vieren van successen, enthousiasme van anderen meekrijgen, dat soort zaken.</p>
<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Vertrouwen 	<p>De kernteamleden vertrouwen elkaar omdat ze weten dat ze dezelfde doelen hebben, dat ze open zijn naar elkaar, omdat ze elkaars struggles begrijpen, etc. Dit draagt bij aan een goede onderlinge relatie</p>
<ul style="list-style-type: none"> <input type="checkbox"/> Rollen 	<p>De rollen die de deelnemers zelf zeggen in te nemen of die ze ingenomen hebben zien worden door de andere mensen in de arena.</p>
<ul style="list-style-type: none"> <input type="checkbox"/> Waarden 	<p>Wat de deelnemers belangrijk zeggen te vinden in hun samenwerking en hoe die samenwerking georganiseerd is</p>
<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Aandacht voor implementatiestrategie 	<p>Waaruit blijkt dat de kernteamleden van het Petaplan het belangrijk vinden na te denken over de implementatie van het plan. Wie gaan ze eerst betrekken, hoe halen ze mensen over etc.</p>
<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Eigenwijze Governance 	<p>Referenties naar de aparte organisatiestructuur van Groene Netten en het Petaplan project. Er is geen hiërarchie, consensus is geen vereiste om iets te gaan doen, informele sfeer gebaseerd op persoonlijke vorm van professionaliteit, etc</p>
<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Gezamenlijk leren als doel 	<p>Referenties naar het feit dat de deelnemers in eerste instantie zitten bij het Petaplan om er samen wat van te leren,</p>

Naam Code	Beschrijving
Verbeeldingskwaliteiten	Illustraties van de verbeeldingskwaliteiten van de mentale representatie van de deelnemers
○ Diversiteit en Kwantiteit	Categorisering van de soort dingen waarvan de deelnemers een beeld hadden bij het Petaplan en hun concrete ideeën in die categorieën
<ul style="list-style-type: none"> ■ Doel <ul style="list-style-type: none"> - Discussie over energietransitie over een andere boeg gooien - Maatschappelijke impact maken - Vergroenen van energie - Tekort aan arbeidskrachten in energiesector opvullen 	<p>De beweegredenen die de geïnterviewden hebben om deel te nemen aan het Petaplan.</p> <p>Beïnvloeden van de maatschappelijke discussie over de energietransitie met een groot project als het Petaplan</p> <p>In het algemeen zoveel mogelijk positiefs willen bijdragen aan Nederland</p> <p>Duurzame energie opwekken voor Nederland of het eigen bedrijf</p> <p>Streven naar een gezamenlijk gefaciliteerd opleidingstraject voor de energiesector</p>
<ul style="list-style-type: none"> ■ Geheel <ul style="list-style-type: none"> - Capaciteit - Communicatie - Instituut 	<p>De categorieën waarin de deelnemers ideeën hebben over de invulling van het Petaplan als overkoepelend geheel van verschillende projecten voor de opwek van duurzame energie.</p> <p>Relateren capaciteit die potentieel met Petaplan opgewekt kan worden aan andere projecten of doelen</p> <p>Hoe en tegen wie wordt er wel of niet gecommuniceerd over het Petaplan</p> <p>Hoe is de organisatiestructuur van het Petaplan project of hoe zou die moeten zijn</p>

Naam Code	Beschrijving
- Juridisch	Hoe kan de regelgeving geïnterpreteerd worden zodat er geen problemen ontstaan
- Rolverdeling	Welke organisatie is verantwoordelijk voor welke taken in het Petaplan project
- Schaal	Hoe groot zal het uiteindelijke plan zijn
- Tijdslijn	Wat moet er gebeuren om het Petaplan werkelijkheid te laten worden
<input checked="" type="checkbox"/> Ten opzichte van één project	Categorieën van concrete ideeën en die concrete ideeën zelf die de deelnemers hebben over hoe de projecten die onderdeel zijn van het Petaplan eruit zouden komen te zien.
- Financieel	Welke business modellen (of elementen daarvoor) zijn er beschikbaar
- Smart design	Op welke manieren kan een project voor de duurzame opwek van energie duurzaam aangesloten worden
- Soort gebieden	Op welke soort terreinen de projecten van het Petaplan uitgevoerd zullen worden
- Techniek	Welke soort duurzame energietechnologieën gebruikt worden voor de uitvoering van het Petaplan
○ Originaliteit	Referenties naar elementen uit de mentale representatie die als origineel bestempeld kunnen worden
○ Verlangen	Referenties met de strekking "Ik wil graag dat het Petaplan er komt"
○ Vertrouwen	Referenties met de strekking "ik denk dat het Petaplan er zal komen"
Versies van de mentale representatie	Ordering van uitspraken obv of de verwezen

Naam Code	Beschrijving
	<p>wordt naar hoe ze zelf het Petaplan op dat moment zagen, of dat het ging over een beeld in een andere interpersoonlijke dimensie (van anderen), of een beeld in een andere tijdsdimensie (mogelijkheden voor de toekomst of uit het verleden)</p>
<p><input type="radio"/> HUIDIG - Ander IN</p>	<p>Mental representation van wat anderen in het Petaplan kernteam als elementen zien van het Petaplan zoals ze daar nu naartoe werken. Gebaseerd op feedback uit de arena, persoonlijke kennis van iemands voorkeuren etc.</p>
<p><input type="radio"/> HUIDIG - Ander UIT</p>	<p>Mental representation van wat anderen buiten het Petaplan kernteam als elementen zien van het Petaplan zoals ze daar nu naartoe werken. Gebaseerd op communicatiestrategie naar buiten: Wat weet de pers, wat is verteld op evenementen, tijden vergaderingen met externen etc.</p>
<p><input type="radio"/> HUIDIG - Eigen</p>	<p>Mental representation die centraal staat in dit onderzoek, namelijk van wat de geïntervieweden zien als onderdeel van het Petaplan op het moment waar ze aan refereren.</p>
<p><input type="radio"/> TOEKOMSTIG - Ander IN</p>	<p>Mental representation van wat anderen van het Petaplan kernteam als elementen zien die in de toekomst opgepakt zouden kunnen worden als onderdeel Petaplan</p>
<p><input type="radio"/> TOEKOMSTIG - Ander UIT</p>	<p>Mental representation van wat anderen buiten het Petaplan kernteam als elementen zien die in de toekomst opgepakt zouden kunnen worden als onderdeel Petaplan</p>
<p><input type="radio"/> TOEKOMSTIG - Eigen</p>	<p>Versie van eigen mental representation met daarin elementen die in de toekomst opgepakt zouden kunnen worden als onderdeel Petaplan</p>