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„How to prioritize needs in order to guide profound
innovation.“

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Preface

This thesis is the sum of more than one year of work within the research group Knowledge-based Management at the Vienna University of Economics and Business. It was developed in a very close and fruitful collaboration with Prof. Alexander Kaiser as a supervisor. I owe a huge amount of gratitude to the whole research group namely Florian Kragulj, Thomas Grisold and Roman Walser who showed me how to do action research and challenged me in numerous epistemological discussions. This thesis would not have been possible without their continuous and extremely valuable support, feedback and discussions throughout the whole process.

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Abstract

Psychological and physiological well-being strongly depends on the satisfaction of needs (Thomson, 2005). We can define a fundamental need as a necessity for a purpose (e.g. survival, avoidance of harm, well-being). Needs seem to resist phenomenological and introspective assessment, i.e. we are not consciously aware of them (Maslow, 1943; McLeod, 2011). From a knowledge-based management perspective, it is possible to assess previously unconscious or hidden needs and make them explicit (Goffin & Lemke, 2004; Goffin, Lemke, & Koners, 2010; Kaiser, Fordinal, & Kragulj, 2014; Kaiser & Kragulj, 2016). It has been previously shown that considering needs of organizational members can have a significant impact on innovation (Bayus, 2008; Patnaik, 2004; Van der Bijl-Brouwer & Dorst, 2014) and organizational learning processes. However, mere explicit knowledge about needs lacks the strategic capacity-to-act which decision makers require to develop strategies to address those needs (Kragulj & Fahrenbach, 2016). Consequently, the following research question can be derived:

How to prioritize needs in a social system in order to guide effective need-satisfaction strategies?

Based on an action research methodology (Checkland & Holwell, 2007), this work introduces an extension of a previously developed method, Bewextra (Kaiser et al., 2014; Kaiser & Kragulj, 2016). In Bewextra-Collect, data is acquired in a future-learning-approach (Scharmer, 2009) by asking system members to report their dreams and wishes in a workshop setting. In Bewextra-Analytic, hypothesis about needs are generated using an abductive reasoning and a haptic clustering approach based on grounded theory (Charmaz, 2006; Reichertz, 2007). In Bewextra-Validate, system members are asked to validate the need hypotheses with an online questionnaire. Bewextra results in a catalogue of explicated and validated needs. Following Thomson (2005), who argues that needs are matters of priority, this work proposes a decision-support-system to prioritize the outcome of Bewextra in a coherent and replicable way with the aim to provide guidance for decision-makers within organizations and to inform scenario and strategy development. Using critical systems thinking, relevant stakeholders are identified (Achterkamp & Vos, 2007; Freeman, 1984).

If a need gets validated, it gets considered in the Bewextra Need Priority Index (BNPI) which reflects three perspectives: (1) the internal view of a system measures the importance and relevance of a need from the viewpoint of the members of an organization, (2) the external view considers the opinion of externals acquainted with the organization (e.g. experts, customers, facilitators), and (3) the

systemic view refers to the inherent relation of needs in a network. It asks about the impact of the satisfaction of one need on another. All variables are assessed on separate scales. In order to combine them, i.e. add them, they have to be normalized and re-scaled. All views are connected to weights which can be adjusted flexible and allow the decision maker to reflect his/her preferences and strategy. Based on the BNPI, need-satisfying strategies can be developed. Strategy development is a future-oriented process, based on cognitive processes like episodic future thinking (Atance & O'Neill, 2001) or imagination (Szpunar, 2010).

Reflecting two case studies led to the point that one part of the Bewextra Need Priority Index, namely a cross-impact-matrix (Gordon & Hayward, 1968; Vester, 1999), a method from the field of future studies (Gordon, 1992) has to be adapted. Two directions are proposed, namely a digitalization and a workshop setting in which the cross-impact-matrix can be applied. Both possibilities are subsequently discussed.

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1 Introduction

1.1 Outline of the thesis

This thesis focuses on the prioritization of human needs in organizational settings. “An organization can be seen as a group of individuals who have created an emergent common frame of reference (Sveiby, 2001). Some authors argue that needs affect organizational processes. Others contend that needs have a significant impact on (organizational) innovation (Bayus, 2008; Ericson & Stahlbröst, 2006; Holt, 1976; Patnaik & Becker, 1999; Van der Bijl-Brouwer & Dorst, 2014; Von Hippel & Von Krogh, 2016) and support strategic decision making as well as product development (Patnaik, 2004; Ulwick, 2002). From a management perspective, it is crucial to know customer needs to sense business opportunities (Teece & Al-Aali, 2012). Even though human needs seem to be such important to be considered in organizational settings, they have only been recently introduced to explain and guide organizational learning processes (Kaiser et al., 2014; Kaiser & Kragulj, 2016; Kaiser, Kragulj, & Grisold, 2016).

An organizational learning process can be defined as “a change in the organization that occurs when an organization acquires experience” (Argote & Miron-Spektor, 2011). Most authors agree that this means a change in the organizations knowledge which occurs as a function of experience (Argote & Miron-Spektor, 2011). This knowledge can be manifested in changes of cognition or behavior including explicit and tacit components as well as difficult to formulate components (Argote & Miron-Spektor, 2011). Hence, organizational learning results in knowledge, which can be both, a stock or a process (Argote & Miron-Spektor, 2011). It happens in a context, that includes the organization itself and the environment it is embedded (Glynn, Lant, & Milliken, 1994). Argyris and Schön (1978) distinguish organizational single-loop learning, which is a change in behavior to reach a given goal and double-loop learning, defined as adapting organizational goals and routines.

As a result of organizational learning, knowledge is “created by people in their interactions with each other and the environment” (Nonaka & Takeuchi, 2015). Knowledge creation is seen as a social and dynamic process. Based on the conceptions of Polanyi (1967) and Sveiby (2001), who stress that knowledge is defined as a “capacity-to-act”, knowledge can be tacit or explicit.

Knowledge about needs can guide and trigger organizational learning processes. Needs unfold their full potential, when they are explicitly known. Making needs explicit can be seen as a knowledge

creating endeavor. In general, we are not used to speak about needs in organizational settings. Explicitly taking needs into account rather happens in settings like psychotherapy, coaching or mentoring. Some scholars even argue that needs might be unconscious or hidden (Maslow, 1943; McLeod, 2011). It seems obvious that needs unfold their full potential, if they are explicitly known. Different scientific disciplines developed plentiful methods to explicate needs in order to serve different purposes (Baxter, Goffin, & Szwajkowski, 2014; Goffin & Lemke, 2004; Goffin et al., 2010). Developing and creating knowledge about needs and capacities to address them seems to be fruitful for individual learning as well as organizational learning processes, such as innovation, strategy or vision development, which can be outputs of organizational learning processes.

In general, a strategy can be seen as a “description of the course of actions to be taken in order to reach set goals” (Chandler, 1962). A strategy that is based on knowledge as a result of an organizational learning process, is a “knowledge based strategy”. Nonaka and Takeuchi (2015) argue for a “human, dynamic and social approach to strategy”. In this view, the social dimension of knowledge creation, in this case a strategy, has to be stressed. A knowledge based strategy is “formulated and executed by a subjective, interactive process driven by human beings, based on their beliefs as well as their judgements and actions taken within particular contexts with the common good in mind. It has knowledge creation theory and practical wisdom as its foundation” (Nonaka & Takeuchi, 2015). Nonaka and Toyama (2007) point out that “Strategy is created out of one’s existential belief or commitment to a vision of the future, the ability to interpret one’s environment and resources subjectively, and the interaction between subjectivity and objectivity. These abilities need to be distributed among organizational members.”, thus acknowledging the importance of the involvement of all stakeholders of an organization and a future orientation when building a strategy. Knowing the needs shared among a group of individuals (e.g. members of an organization) is a valuable starting point in an organizational learning process to develop such knowledge based strategies in order to satisfy them.

This is due to the reason that a property, inherent in needs, tremendously increases the range of possible need-satisfying strategies. Why is that? While we are used to base our actions on satisfiers, that means, known artefacts which have served our well-being in the past, needs are one level beneath and yield more potential to develop new and innovative solutions (Kragulj, 2014a).

A need and its potential satisfiers are connected in an

1 : N

relation (Watkins, Meiers, & Visser, 2012, pp. 68–69). A given need, can be satisfied in many ways. An example illustrates this. When a person decides between two tangible satisfiers, for example between ‘Pepsi’ and ‘Coke’, the decision is dichotomous. Differently, if that person considers to satisfy the intangible need ‘thirst’ instead, this opens up a space for more diverse need-satisfaction (e.g. milk, water, juice...) than staying on a satisfier-level. Put differently, a need has a great potentiality to point at various different satisfiers but has a low explicitness. A satisfier on the contrary has a low potentiality but a high explicitness (Kragulj, 2014a). Thus, explicit knowledge about needs can point at a tremendous amount of possible means of satisfaction.

1.2 Problem definition and motivation

Mere explicit knowledge about needs does not imply the order of their satisfaction. In general, not all needs can be satisfied at once and some needs might be more important than others which implies a specific order of satisfaction. The term ‘need’, as it is linguistically used, already points at some kind of prioritization as opposed to desires or satisfiers (Frankfurt, 1984). Many scientists who dealt with needs introduce a prioritization, be it conceptual or practical (Alderfer, 1969; Altschuld & Watkins, 2014; Goffin & Lemke, 2004; Goffin, Lemke, & Koners, 2010; Thomson, 2005; Von Hippel & Von Krogh, 2016). The most prominent theory, in which needs get prioritized according to its importance for the individual is the “hierarchy of needs” developed by Maslow (1943, 1970).

One method within the large field of organizational learning is Bewextra (German, for “Bedürfniswissenextraktion”). It is a method to generate validated knowledge about shared needs of members within an organization. It was developed and subsequently applied in several case studies at the Vienna University of Economics and Business (Kaiser et al., 2014; Kaiser & Kragulj, 2015; Kaiser, Kragulj, & Grisold, 2016; Kaiser, Kragulj, Grisold, et al., 2016). However, this method currently lacks a coherent prioritization of its output, a catalogue of validated needs. Experiences from several practical projects show, decision makers’ demand for advice, where to find leverage points on which need they should focus their actions and strategies in particular. In a world of limited time and resources, they require additional knowledge that reflects the relative importance of needs of members within an organization. In this regard, a prioritization of needs, explicitly known and shared within the organization, seems necessary to guide need-based organizational learning processes within Bewextra.

A prioritization should answer the questions: “Which need is the most important and urgent to satisfy?”, and furthermore: “Which need has the highest leverage potential for the satisfaction of other needs, in terms of: if need A is satisfied, would need B also be satisfied? In sum, explicit knowledge about needs and about their prioritization within an organization can guide the development of strategies to meet the most important needs first and thus, increase the capacity-to-act of decision makers.

Furthermore, empirical results indicate the necessity of prioritized needs if they should unfold their full potential in organizational learning processes and strategy development. This could be illustrated in a previous explorative study: strategies which were developed considering explicit knowledge about needs are *not* perceived differently than strategies developed with knowledge about the organization alone (Kragulj & Fahrenbach, 2016). We asked university students to develop strategies that aimed at improving the learning and teaching environment at the Vienna University of Economics and Business (WU). Students got divided into two groups, one (Group A) developed strategies without explicit knowledge about the needs of university students, whereas Group B was provided with a set of needs that should guide strategy development. Afterwards, we were interested in whether non-need-based-strategies (Group A) or need-based strategies (Group B) are perceived differently. To do so, a repertory grid analysis was used to elicit construct-contrast pairs in structured interviews (Fransella, Bell, & Bannister, 2004). Subsequently, interviewed students were asked to cluster the set of construct-contrast-pairs. This step resulted in 21 pairs of semantically different construct-contrast pairs. A questionnaire was sent out to a large number of students to judge whether they would perceive a strategy belonging more likely to the construct than to the contrast. We would have gathered meaningful results, if non-need-based-strategies (group A) had been perceived differently than need-based strategies (Group B). We did not. However, having our hypothesis rejected led to a further hypothesis in consistence with the current body of scientific literature: a prioritized set of needs leads to different results in developing need-satisfying-strategies than a plain set of needs without prioritization (Altschuld & White, 2010). This underlines the claim, that a prioritization of need knowledge is necessary to guide the development of need-satisfying-strategies.

1.3 Research question and goal

Even though organizations respond inspired to explicated needs as a starting point for organizational learning processes, they seem overwhelmed by the number of needs which can subsequently be satisfied. This observation is in line with the economic decision theory published by

(Bawden & Robinson, 2009), which states that the willingness to perform an action decreases when the number of options increases. The so-called “paradox of choice” could be overcome, if people have a well-defined and limited set of options to choose from. As a consequence, decision makers often do not know where to start an organizational learning or innovation process.

The main research gap can be identified as the lack of methods to prioritize intangible needs in order to enable need-based strategy development. To close this gap of knowledge, the following research question can be defined:

1. How to prioritize needs in a social system in order to guide effective need-satisfaction strategies?

The main goal of the master thesis is to develop a replicable and methodological coherent framework to prioritize explicit knowledge about needs in organizations. A general framework for a decision support system that prioritizes explicit and validated knowledge about needs within organizations is introduced and applied to the context of Bewextra. Henceforward, it is referred to as the Bewextra Need Priority Index (BNPI). Applying the Bewextra Need Priority Index in two case studies led to the conclusion that one method proposed within the Bewextra Need Priority Index, a cross-impact-matrix, is too complex for individuals in the way it was used. Consequently, a second research question can be formulated:

2. How can the cross-impact-matrix within the Bewextra Need Priority Index be adapted in order to reduce its complexity in usage?

To answer the second research question, two different ways are compared to reduce its complexity, namely a digitalization and a workshop setting.

The thesis aims at contributing to both, theory and practice. Theoretically, the thesis introduces a decision-support system, which allows to prioritize needs of relevant stakeholder groups in a social system in a holistic way. In so doing, an additional layer to knowledge about needs and their prioritization can be developed with the aim to guide organizational learning processes. Practically, knowledge about needs and its prioritization should increase the capacity-to-act of decision-makers when formulating needs-satisfying-strategies. In so doing, it contributes to the ongoing interdisciplinary debate about the prioritization of needs, outlined in chapter 3.

1.4 Interdisciplinary aspects

The thesis is combining the domains of organizational learning, an inherently interdisciplinary field (Argote & Miron-Spektor, 2011) with the system-theoretic perspective of identifying critical stakeholders (Achterkamp & Vos, 2007). Furthermore, it tackles the concept of needs which is originating in a physiological debate (Murray, 1938) and gained significant momentum in psychological motivational theories (Alderfer, 1969; Maslow, 1943; Ryan & Deci, 2000). The concept of ‘need’ is also debated in philosophy (Reader, 2005) and in the business context (see chapter 1.1). The formulation of strategies in organizational contexts has long been acknowledged as a cognitive act (Stubbart, 1989) and consequently, it has been proposed that management and in particular strategic management, depends on decision maker’s cognitive capacities. Regarding its methodology, this thesis is inspired by the multi-criteria-decision-making described by Brunelli (2015) and the development of decision support systems (Power, Sharda, & Burstein, 2015).

1.5 Structure of the thesis

This thesis is organized in the following parts: After an introduction including problem definition and research question, I outline the methodology, which was applied in the thesis. Henceforward, I review relevant approaches and theories. Based on the insights, I introduce a decision support system and describe it in detail. Subsequently, I present two case studies in which the decision support system was applied. In the following part, I focus on one part of the decision support system and discuss opportunities for further development.

In more detail the thesis is structured as follows. To answer the research question, I introduce an action research paradigm as an overall framework and a guided literature as a part of it. The theoretical part covers the domains of decision making, prioritization of needs, stakeholder theory and Bewextra, a method to explicate knowledge about needs which was developed at the Vienna University of Economics and Business and constitutes the ground for further research.

Based on the theoretical considerations and the approaches introduced, I propose a decision support system that enables stakeholders to prioritize their needs. To do so, three different dimensions are included. It assesses an internal view, in which members of an organization itself prioritize needs. Secondly, it assesses an outside view in which experts, who gained profound knowledge of the organization but are themselves not members (like scientists or customers), rate the needs. Thirdly, it

assesses a systemic view, in which decision makers rate the impact of needs on each other and thereby uncover the potentiality and leverage effects of needs in a system.

In a next step, I report two case studies with the Austrian Chamber of Economics in which the tool was successfully applied and discuss the results. Based on the discussion and reflecting on the experience from the case studies, a further research question is defined and subsequently answered. Here, I explore possible alternatives to the systemic part of the decision support system. Finally, I discuss theoretical and practical contributions, limitations and further research opportunities.

2 Methodology

2.1 Action research

In the following section, it is argued that action research is the best-fitting framework to answer the research question. Consequently, the overall framework of this thesis depicts an action-research cycle (Checkland & Holwell, 2007) and is therefore located within the action research paradigm (see Figure 3). Action research originates from social-psychology and is now a well-established qualitative research method (Baskerville & Wood-Harper, 2016). It is well suited to study technology in human domains and furthermore it is seen as a fundament for good organizational development. According to Baskerville and Wood-Harper (2016), action research can lead to double-loop learning in the sense of Argyris and Schön (1978). Hult and Lennung (1980) give a very well fitting and compelling definition: “Action research simultaneously assists in practical problem-solving and expands scientific knowledge, as well as enhancing the competencies of the respective actors, being performed collaboratively in an immediate situation using data feedback in a cyclical process aiming at an increased understanding of a given social situation, primarily applicable for the understanding of change processes in social systems and undertaken within a mutually acceptable ethical framework”.

According to Baskerville and Wood-Harper (2016), action research merges theory and praxis. It is described as a paragon of post-positivistic research paradigms. Yet it is at the same time:

- empirical & interpretative (empirical data is gathered but has to be interpreted on an intersubjective basis)
- experimental & multivariate (it is experimental in an iterative way; it takes place within a diverse multivariate and real world environment)
- observational & interventionist (scientists are observers of situations but change a system with their intervention, therefore it is necessarily interventionistic)

Checkland & Holwell (2007) describe any scientific research the following way, which should be adopted for this thesis: “a framework of ideas gets embodied into a methodology which is subsequently applied to real-world case-studies that should yield insights about the framework of ideas, the methodology and the area of concern, a further research question can be defined” (see Figure 1).

Traditional knowledge acquisition often happens to be within the positivistic paradigm of natural sciences. Here, hypotheses are tested and destructed. This might hold true for phenomena that follow physical laws, but when it comes to social phenomena, and especially organizational change, this approach suffers from severe and serious shortcomings. The results of applying positivistic paradigms to social phenomena can be vividly examined in the “replication-crisis” which shutter all areas of social sciences and especially the psychological domain. The debate challenges positivistic scientific approaches since 2010 (John, Loewenstein, & Prelec, 2012; Lakens & Evers, 2014; Open Science Collaboration, 2015; Simmons, Nelson, & Simonsohn, 2011). As a consequence, it seems questionable whether traditional criteria of validity and replicability as used in positivistic paradigms can hold true in organizational development. Therefore, we might have to give up replicability of results as a criterion of quality in research in general.

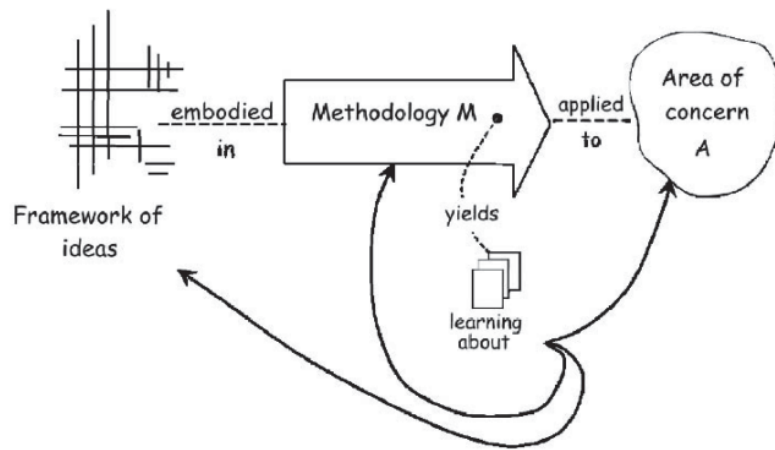


Figure 1: Elements relevant to any piece of research (Checkland & Holwell 2007)

As action-research cannot produce replicability, other criteria of validity have to be applied to action research. Checkland & Holwell (2007) propose recoverability as the validity criteria for action research: “the aim in AR should be to enact a process based on a declared-in-advance methodology (encompassing a particular framework of ideas) in such a way that the process is *recoverable* by anyone interested in subjecting the research to critical scrutiny”. This is due to the fact that in action research “the researcher enters a real-world situation and aims both to improve it and to acquire knowledge” (Checkland & Holwell, 2007). An action researcher is not simply an observer but changes the social situation through its intervention. When doing action research, it is unavoidable for the action researchers to state their epistemological foundations, in other words the set of ideas as well as the

methodology by which they make sense of the world. Figure 2: The cycle of action research in human situations. (“Fig 2” is depicted by Figure 1 in this thesis (Checkland and Holwell (2007)) depicts this type of research. In the following, it is outlined how the development of the decision support system fits in the general process of science (see Figure 1). Here, a framework of ideas (F) is embodied into the methodology (M). This method gets applied to a number of case studies and thus the application yields insights and learnings about the framework (F), the methodology (M) and the area of concern (A):

- the framework of ideas (F) is represented by the mental models and knowledge of the action researchers
- the methodology (M) is represented by Bewextra, and the decision support system (Bewextra Need Priority Index)
- the area of concern (A) is represented by the organizations we work with and apply our methodology

When researchers enter an action research cycle, framework of ideas and methodology should be declared. We used Bewextra (M) within a number of real world situations (see Kaiser et al., 2014; Kaiser & Kragulj, 2015; Kaiser, Kragulj, & Grisold, 2016; Kaiser, Kragulj, Grisold, et al., 2016). Several learning processes we conducted with organizations (A) in the past (Action in the situation), enabled us to reflect upon our experience with the methodology and the results of the case study which led to findings but also changed our framework of ideas. This experience, in combination with empirical results from Kragulj and Fahrenbach (2016) led to the finding that Bewextra generates validated knowledge about needs but mere knowledge about needs alone might not guide action and change. Consequently, a new research theme emerged with a new research question outlined in chapter 1.3.

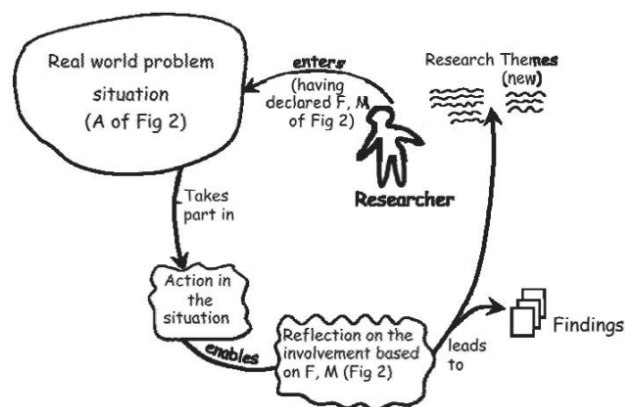


Figure 2: The cycle of action research in human situations. (“Fig 2” is depicted by Figure 1 in this thesis (Checkland and Holwell (2007))

2.2 Literature review

To answer the research question, I conducted a comprehensive and interdisciplinary literature review in the fields of organizational learning, motivational psychology, philosophy of needs, (multi-criteria-) decision-making, marketing, system science and future studies. The main sources for literature were Google Scholar and other digital libraries provided by the University of Vienna and Vienna University of Economics and Business. To build the ground for a theoretical foundation, I introduce several approaches to that prioritize needs or point at a prioritization. For theory building, I follow a social constructionist research paradigm, which is concerned with seeking explanations about how social experience is created and given meaning (Torraco, 2002). Theory is built upon the experiences from and reflecting on several case studies and from the structure of the organizations we worked with in the past.

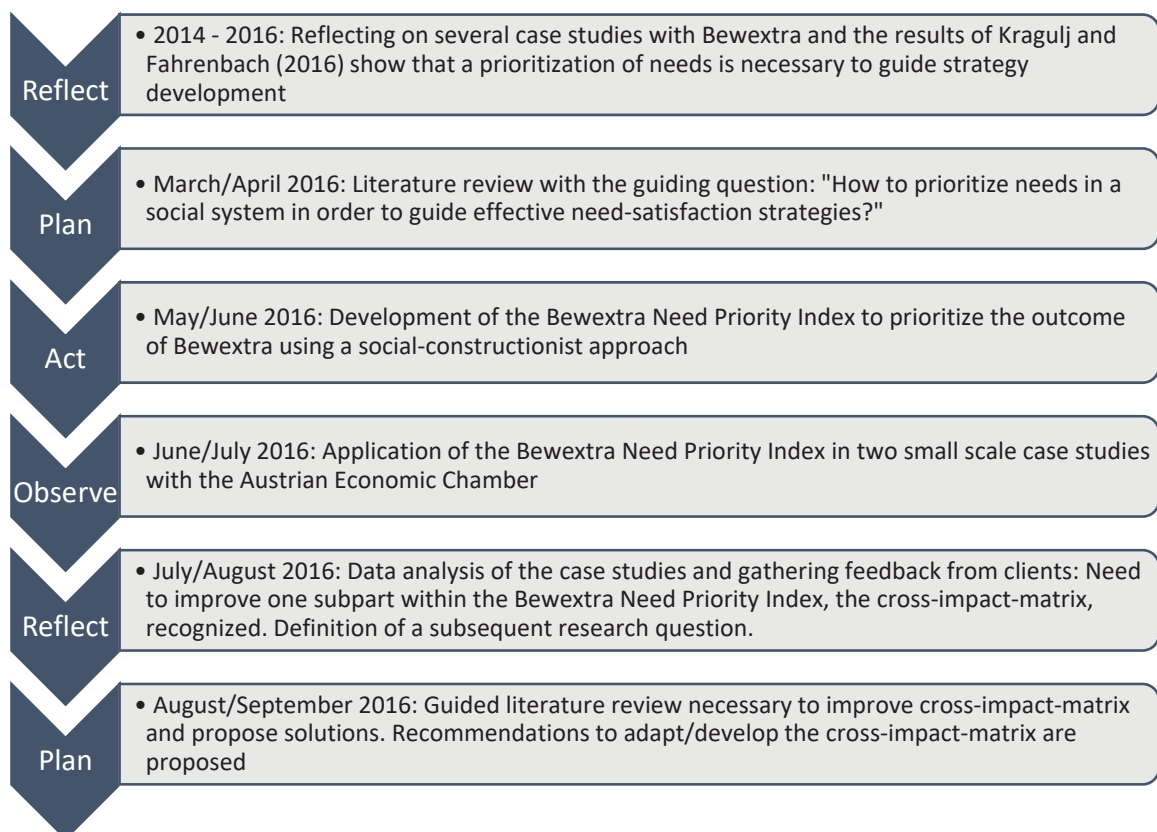


Figure 3: Action research cycle: timeframe of the research presented in this thesis

3 Theoretical foundations

3.1 Epistemological foundations of action research: pragmatism & systems thinking

This thesis is epistemological grounded within (neo)-pragmatism and systems thinking. The overall methodological frame is action research. The connection of those three approaches are described in the following.

3.1.1 Pragmatism & action research

The best fitting epistemic position for an action research process is pragmatism and neo-pragmatism. Pragmatism “rejects the possibility to achieve authentic knowledge regarding the real truth [...] we must make do with plausible information adequate to the need of practice” (Rescher, 2013). For pragmatists, “those theses are true whose implementation in practice “work out” by way of yielding success in matters of prediction and application” (Rescher, 2013). Put differently, “the truth of a theory or a statement can only be justified by the results that the theory or statement will have in the real world. To the degree that the results of a theory support our goals and values the theory or statement is true; to the degree that they do not support our goals and values the theory or statement is false” (Vodonick, 2016). Therefore, pragmatism is an epistemology, which is grounded in action and practice.

Greenwood and Levon (2007) argue that action research belongs within the neopragmatist approach as it “affirms that the only way to understand something is through a comprehensive, collaborative attempt to change it, placing it firmly within the neopragmatist approach”. Consequently, “Action research is scientific research within the pragmatic position” (Oquist, 1978). Here, the social and holistic component of action research is stressed.

Action research is seen as a research strategy that “generates knowledge claims for the express purpose of taking action to promote social analysis and democratic social change” and consists of three elements, namely action (i.e. altering an initial situation), research (i.e. in doing so by applying scientific methods) and participation (i.e. by fostering democratic processes and democratizing knowledge creation processes) (Greenwood & Levon, 2007). It solves “pertinent problems in a given context through a democratic inquiry where professional researchers collaborate with participants in the effort

to seek and enact solutions to problems of major importance to the local people” (Greenwood & Levon, 2007).

In action research, testing a theory is to examine its capacity to solve real situations: “Action research focuses on specific contexts, demands that theory and action not be separated, and is committed to the idea that the test of any theory is its capacity to resolve problems in real-life situations” (Greenwood & Levon, 2007). It is to be judged upon workability of the solution proposed: “In an action research processes, a first credibility challenge relates to the solution of the action research problem under examination locally. Here the workability test is central. We must figure out whether the actions taken in the action research process result in a solution to the problem”. In this regard, workability means “whether or not a solution can be identified as solution to the initial problem or whether revision of the interpretation or redesign of the actions is required” (Greenwood & Levon, 2007). To do so, action and reflection cycles are seen as crucial: “This is [...] a matter of collective social judgment by knowledgeable participants about the outcomes of a collective social action. Social judgment is itself the result of a kind of democratic conversation” (Greenwood & Levon, 2007).

To account for this democratic stance, action research necessarily is “multidisciplinary, multi-method, contextual, and holistic, because it must respect the multidimensionality and complexity of the problems people face in everyday life”. Furthermore, it is seen as a proper approach for a dynamic, multivariate, complex and interconnected world: “Epistemologically, action research rests on the premise that reality is interconnected, dynamic, and multivariate and always more complex than the theories and methods that we have at our disposal” (Greenwood & Levon, 2007).

3.1.2 Systems thinking & action research

Systems thinking has been widely discussed in organizational learning and management (Mele, Pels, & Polese, 2010) but systems-thinking and general systems theory also underlies action research. Greenwood and Levon (2007) state: “The systems approach necessarily underlies action research in all its manifestations. Both rely heavily on an interconnected and holistic view of the world. Humans are understood to exist only within social systems, and these systems have properties and processes that condition human behavior and are in turn conditioned by that behavior. Social systems are not mere structures, but are processes in continual motion. They are dynamic and historical” (Greenwood & Levon, 2007). When describing action research within general systems theory (Von Bertalanffy, 1968), “the units of analysis are systems, not individuals. Systems, not separate institutions, operate as wholes. Individuals operate within systems that create process environments that affect the outcomes of

behavior in complex ways” (Greenwood & Levon, 2007). “This is what Senge (1990) argues for as the “fifth discipline”-the ability to understand how elements and subsystems interact, forming a total situation” (Greenwood & Levon, 2007).

In sum systems thinking and pragmatism underlies action research: “One thread leading in the direction of or supporting the development of action research is general systems theory. Another is the considerably broader philosophical movements of pragmatism and neo-pragmatism” (Greenwood & Levon, 2007).

3.1.3 Ethics in pragmatism and systems thinking

The question: “What ought to be done?” is not only directed towards the future but is also an ethical one. Neo-pragmatism is not only fundamental for action research; it is also linked to ethics in systems thinking. Within strands on contemporary systems thinking “ethical questions are treated as black boxes” (Vodonick, 2016). From an ethical perspective, “pragmatism accepts the view that there is no knowledge of good and bad without knowledge of the consequences of actions upon the values, interests and goals that are supported by the theories which are attempted to be justified” (Vodonick, 2016). In other words, we can only judge upon good or bad when evaluating results in the real world.

Whereas some strands of systems thinking describe systems in a rather mechanistic manner, soft systems thinking describes the “world as problematic given the multiplicity of alternatives” (Vodonick, 2016). Consequentially, “Soft systems are essentially learning systems that allow inquiry in the sense of debate [...] in as much as Soft Systems Thinking relies upon the declared world view of the observers they are value based systems” (Vodonick, 2016). Soft Systems Thinking discusses ethical approaches developed within systems thinking, namely critical systems thinking (Jackson, 2001), emancipatory systems thinking and its method of boundary critique (Ulrich & Reynolds, 2010). Critical Systems Heuristics Methodology asks a series of questions to support reflective practice (Ulrich & Reynolds, 2010a). “These questions are profoundly driven by the values of the agents making the inquiry and accordingly are ethical issues” (Vodonick, 2016).

“The neopragmatic decision making process is [...] centered in the values held by the individual or community. Decisions are made that result in actions that support those values. Those values may (and probably will) change over time and will undoubtedly change from individual to individual and from community to community” (Vodonick, 2016). “A neopragmatic ethical approach best serves the moving parts of a system inasmuch as it can accommodate the new considerations without being

restrained by dogma. Neo-pragmatism is guided by individual or community values and those values will change and evolve over time” (Vodonick, 2016).

“There are other ways that the use of a neopragmatic approach to Systems Thinking can be useful. A neopragmatic approach is based upon the negotiation of a position that can be accepted by the stakeholders involved in the process and presumptively the outcome of the decision upon the processes and purposes of the system. That negotiation takes place through language [...] of the participating stakeholders which in turn will favorably affect solidarity and democratic processes” (Vodonick, 2016). Furthermore, Neo-Pragmatism argues that “all decisions can only be judged according to their good and bad quality only insofar as they can be justified through communicating to a specific audience” (Vodonick, 2016).

To conclude, it can be said that “the ethical question ‘what is to be done’ is as cogent to all branches of Systems Thinking as is the question of the boundary of the system that is being considered” (Vodonick, 2016). The question “what is to be done” as well as “what are the boundaries of a system are ethical and value based”

3.2 Identifying critical stakeholders from a system-theoretic perspective

In the context of this thesis, it must be identified who is capable of assessing the priority of needs for an organization (see Figure 4). Taking a systemic view, it must be considered the interactions and the relationships between parts to understand the organization as an entity, how it functions and what it contributes; we should see the organization as part of a whole (Checkland, 1997; Mele et al., 2010). An organization is not only defined by what the members think it is but its identity is also constructed by external entities, i.e. the environment (Luhmann, 1990). Selecting need knowledge, which could contribute to the organization’s capacity to innovate, cannot only be identified by the members but has to acknowledge the view of externals because the system itself cannot fully understand the complexity of the environment (Luhmann, 1990; Mele et al., 2010; Watkins et al., 2012, p. 56). In order to provide a holistic view on the system and how it is embedded in its environment, we must consider an *interconnectional* dimension (i.e. the system itself) as well as an *intraconnectional* dimension (i.e. the system from an external point of view).

It seems to be important to define what constitutes a learning system and to establish what parts of a system are important to consider for an organizational learning process. Here, the critical system heuristics approach (Ulrich & Reynolds, 2010) is used. Achterkamp and Vos (2007) adapted the

approach to define critical stakeholders (Freeman, 1984) in project contexts. A stakeholder is (by definition) any group or individual who can affect or is affected by the achievement of the organization's objectives. The concept of boundaries lies at the heart of identifying stakeholders, in other words, it is crucial to define the boundary conditions for a project context. Achterkamp and Vos (2007) state that "Identifying stakeholders means that a line is drawn between parties to be involved and parties not to be involved". To identify the critical stakeholders, it has to be defined, who falls in the boundaries and who does not. Consequently, boundary critique is a normative issue and touches upon ethical issues: "boundaries define both what issues are to be included, excluded, or marginalized in analyses and who is to be consulted or involved" (Midgley, 2003).

Whereas Ulrich and Reynolds (2010) distinguish between the involved and the affected, Achterkamp and Vos (2007) differentiate between the actively involved and passively involved. Ulrich (1984) furthermore distinguishes, based on three sources of influence, between three crucial roles stakeholders can take:

- Sources of motivation: whose purposes (values, interests) are being (ought to be) served? Answering this question leads to the role of the client.
- Sources of control: who has (ought to have) the power to decide? Answering this question leads to the role of the decision maker.
- Sources of expertise: who contributes (ought to contribute) the necessary expertise? Answering this question leads to the role of the planner.

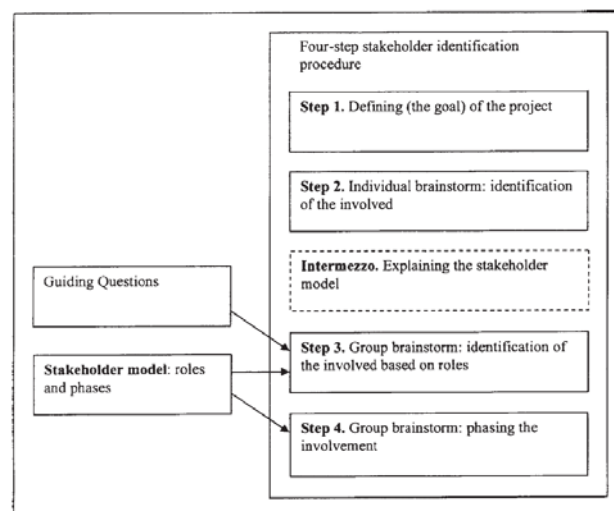


Figure 4: Process of stakeholder identification (Achterkamp & Vos, 2007)

3.3 Bewextra - an organizational learning method to explicate needs

Bewextra (see Figure 5) is a framework to create need knowledge of organization's members (Kaiser et al., 2014; Kaiser & Kragulj, 2016; Kragulj, 2014a). It describes a process that is based on “learning from the future” and is as such abductive. With Bewextra, shared needs of organizational members can be explicated in a methodologically coherent and replicable way. It consists of three steps. In Bewextra-Collect, data (satisfiers) are gathered. In Bewextra-Analytic, hypothesis about needs are developed and subsequently clustered. In Bewextra-Validate, the hypotheses are validated in a communicative setting. Bewextra results in validated knowledge about shared needs of members within a social system. In the following section, this process will be described in more detail.

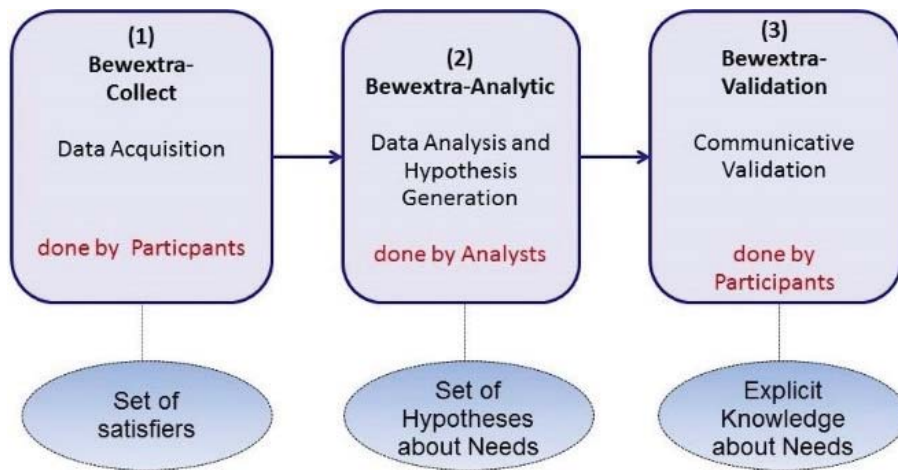


Figure 5: The framework of Bewextra (Kaiser & Kragulj, 2016)

3.3.1 Bewextra - Collect

The first step (Bewextra-Collect) covers data acquisition and is based on a “Learning from an Envisioned Future” approach (Kaiser, Kragulj, Grisold, & Walser, 2016) which is conducted in a group setting (see Figure 6: Bewextra-Collect). The most important precondition for Bewextra-Collect is to generate an enabling space (Peschl & Fundneider, 2014) or Ba (Nonaka, Toyama, & Konno, 2000). A Ba is defined as a space-time-nexus, which consists of a shared space in which interaction, interpretation and knowledge creating processes are facilitated. In other words, it is a shared context in which knowledge is shared, created and utilized. In this step, facilitators create an atmosphere of trust to enable participants of an organizational learning process to articulate a great number of wishes, dreams, visions, goals and ideas (i.e. possible satisfiers) in a setting called “Interacting with an envisioned future” (Kragulj, 2014b). Here, participants engage in a guided time travel exercise in which the facilitator enables them to imagine a very desirable future. This process is based on the cognitive

capacity of imagination and episodic future thought (Atance & O'Neill, 2001, Szpunar, 2010). Participants should be supported to interact in this future “as-if” it is already real. In their imagination, they are asked: “What has come to an end?” and “What has emerged and is new?” Participants can answer on a question sheet which is collected from them after the mental time travel exercises. When participants engage in learning from an ideal future, they generate effective sustainable satisfiers (Ericson & Stahlbröst, 2006). Kaiser and Kragulj (2016) argue in line with Von Bertalanffy (1968) that it is necessary to include all relevant stakeholder groups during the process of “learning from the future”. In several case studies, it could be shown that this approach provides additional qualitative and quantitative value. Combining learning from past experiences with learning from a desired future scenario results not only in more innovative and radical ideas but also in a higher number of covered domains (Kaiser, Kragulj & Grisold, 2016).

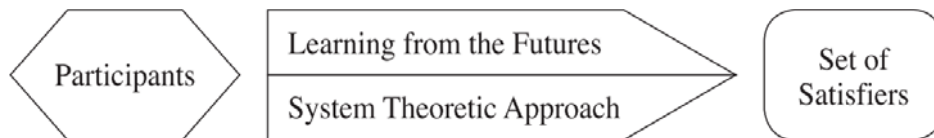


Figure 6: Bewextra-Collect (Kaiser & Kragulj, 2016)

3.3.2 Bewextra - Analytic

The second step (Bewextra-Analytic) entails the generation of hypotheses about the substantial needs within the organization (see Figure 7: Bewextra-Analytic). The generation of these hypotheses is enabled by a hermeneutic method, which is based on the technique of generative listening (Senge, Scharmer, Jaworski, & Flowers, 2005; Yackel, Stephan, Rasmussen, & Underwood, 2003) and grounded theory (Bryant & Charmaz, 2007; Charmaz, 2006). Generative listening is a dialogue setting in which knowledge is generated that transcends the information carried by spoken or written words (Kaiser & Kragulj, 2015; Scharmer, 2008). Here, one listens from the emerging field of future possibility. One tries to hear the essence of what participants say. By listening to the articulated satisfiers, we try to understand what the speaker wants to express; we aim to grasp the essence, not of what is being said but what is being meant. Thereby, we reveal these patterns and create knowledge about underlying needs. A haptic clustering approach is then subsequently used to build semantical clusters of needs, which are most similar within the cluster and most different between clusters. The output of Bewextra-Analytic is a set of hypothesis about needs. For a detailed description of generative listening in interview settings see Peet, Walsh, Sober & Rawak (2010).

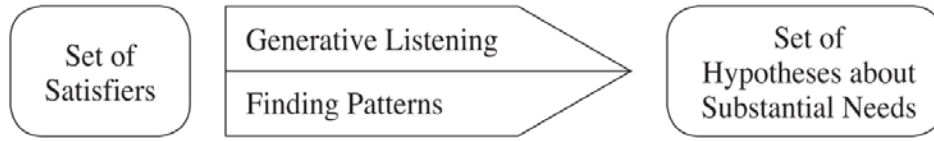


Figure 7: *Bewextra-Analytic* (Kaiser & Kragulj, 2016)

3.3.3 Bewextra - Validate

The third step (Bewextra-Validate) covers the validation of the formulated hypotheses by communicative validation and quantitative analysis by the means of an online-questionnaire (see Figure 8: Bewextra Validate). The validation is done towards correctness and completeness. The simultaneous use of qualitative and quantitative validation allows for accepting or rejecting the generated hypotheses about needs in order to finally create a catalogue containing explicit knowledge about substantial needs (Kaiser & Kragulj, 2016). This again, can be done in a workshop setting or in an online questionnaire using Likert-scales with 4 options to rate whether the hypothesis about a need fits completely or does not fit at all. Furthermore, in Bewextra-Validate, demographic data is assessed in order to draw inferences for age or gender for example. The output of this step is a catalogue of shared and validated needs of members within an organization.

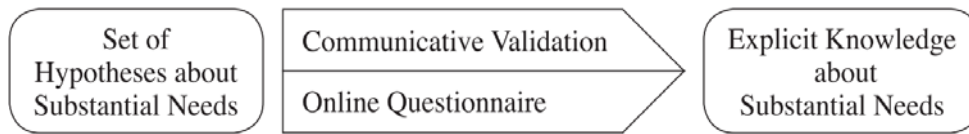


Figure 8: *Bewextra Validate* (Kaiser & Kragulj, 2016)

In sum, the output of Bewextra-Validate is a validated catalogue of shared needs of organizational members. Two examples of a possible Bewextra-output are given in Table 8 and Table 12. This is the input for the method proposed in chapter 4.

3.3.4 Summary

Needs gathered in Bewextra are contextual and depend on the organization. Needs are satisfied by satisfiers; however, a satisfier can be a concrete object, a process or something even more intangible. Needs assessed by Bewextra do not carry a moral priority. Moral priority is linked to harm and no harm will be done when not satisfying a need that has only be anticipated in its future satisfaction. Consequently, requirements that a decision support tool has to fulfill can be deducted. First, at least these three different perspectives have to be included: members of an organization, decision makers and facilitators. However, a decision support system must be that flexible that it can be adapted to even more perspectives. To allow decision makers to plan scenarios, each perspective should be

connected to a weight in order to switch “on and off” the different views in order to allow a balanced decision and include and balance different views and interests within organizations.

3.4 Decision - making

As discussed in chapter 1.1, not all needs can be satisfied at once and often, limited time and resources force us to decide which need to satisfy first. Also, we have to decide which the most valuable satisfier for a given need is. In general, people face countless decisions every day. They can be rather simple as deciding which yoghurt to buy or rather complex as deciding which study program to take. Because decision making and judging is seen as a fundamental part of thinking and reasoning that affects various aspects of daily life, it is part of manifold academic disciplines like psychology, sociology, economics, political science and law. Consequently, decisions can be made on a more individual level as described in psychology (Gigerenzer & Gaissmaier, 2011) or at a more organizational level (Forsyth, 2009). In general, judgment and decision making “involve assessment of the value of an option or the probability that it will yield a certain payoff (judgment) coupled with choice among alternatives (decision making)” (Holyoak & Morrison, 2005).

In the classical view of decision making, decision makers calculate the highest (expected) utility of an option (Schoemaker, 1982). Making the actual decision is then only the part of choosing the option with the highest (expected) utility. This standard view of decision making is challenged by the bounded rationality discourse (Simon, 1955) Human decision makers face resource constraints, limited mental capacities as well as limited time resources and consequently do not adhere to the rational model of decision making (Kahneman & Tversky, 1979).

We as decision makers want to make good choices. Normally, we justify why we choose option A instead of B or C. We would say that we have “good reasons” why we choose that particular program. Intuitively, making a choice without good reasons seems unwise to us. However, from the classical view of decision making, relying on good reasons seems puzzling because good reasons are often limited to what is introspectively accessible to us. Very often, what we describe as “good reason” are not those reasons that actually guide a decision. A huge amount of evidence suggests that we are not always aware of the reasons that govern our acting and deciding (Nisbett & Wilson, 1977).

Decisions can be made under conditions of certainty when the availability of options is essentially certain, for example when choosing between two candidates in elections. Decisions can be also risky when only the probabilities of outcomes are known like in gambling. Sometimes we have to decide in

ambiguous situations in which the likelihoods are not known and must be estimated by the decision maker like deciding between strategy A and B (Holyoak & Morrison, 2005).

Choosing one option out of a set of alternatives can be difficult. If we choose alternative A, we might shut doors for other compelling alternatives. In formalized decision making games, choosing one alternative implies necessarily rejecting the other alternative. Consequently, “choosing one” and “rejecting one” are logically the same choices. Differently, in real world situations and under ambiguous circumstances in which we might be able to choose alternatives that fulfill the (expected) utility of other alternatives as well (Holyoak & Morrison, 2005).

We as decision makers have a very limited capacity to combine information and attributes. The decision-making process in general and evaluating attributes as well can be distorted by many factors (Kahneman & Tversky, 1979; Tversky & Kahneman, 1973). We have to take some decisions (hopefully) only once as deciding which partner to marry. Other decisions have to be evaluated not based on a single occurrence but "on the long run". We have to treat them as repeated and regular decision, like which diet we choose or whether we exercise or not. The benefits of taking such a decision might yield only in the long run. However, we often do not take the long-term perspective but treat those decisions as isolated events (Holyoak & Morrison, 2005).

Furthermore, Kahneman and Lovallo (1993) distinguish an "inside view" and an "outside view". The inside view focuses on peculiarities in the process of decision making, whereas the "outside view" takes into account the evaluation of a large number of similar cases which leads to a much more accurate evaluation of the current case. As such, considering an outside view can limit the overconfidence decision makers might have of being correct in their point of view (Kahneman & Lovallo, 1993).

As showed above, decision makers often have to make decisions under constrained situations. To overcome these, decision support systems have been recently developed. A Decision support system is “an interactive computer-based system or subsystem intended to help decision makers use communications technologies, data, documents, knowledge and/or models to identify and solve problems, complete decision process tasks, and make decisions.” (Power et al., 2015). Put differently, a decision support system is a computer application which fosters a person’s or groups capacity to make decisions. Burstein and Holsapple (2008) argue that a decision support system should foster “the ability to relax cognitive, temporal and economic limits of decision makers – amplifying decision maker’s capacities for processing knowledge” and leads to an output, which can be a specific decision

or a recommendation. When decision support systems are used in group settings to prioritize and rate items (Gray, 2008), they are called group decision support systems.

In sum, deciding which need to satisfy first is an ambiguous decision problem in which we can choose between alternatives that do not necessarily exclude each other. Furthermore, decision makers have to take a long-term perspective into account. Taking different stakeholder-roles into account, the decision-maker is supported by different, external points of view that justify a decision. Decision support systems (Power et al., 2015) or decision methods like the Analytic Hierarchy Process (Saaty, 1977, 1988, 1989) could help in choosing the satisfier with the most impact on the system of needs. Consequently, a decision support system is introduced to provide decision makers with such an outside view of all relevant stakeholder groups within a decision-making situation to facilitate the prioritization of a set of elements which leads to a recommendation to guide decision making.

3.5 Needs and its prioritization

This chapter outlines how needs are usually prioritized in the scientific literature. A wide range of disciplines discuss and prioritize the term ‘need’. Gasper (1996, 2007) distinguishes three different modes in which the term ‘need’ is used:

- In the psychological tradition, the term ‘needs’ is seen as a stable trait and descriptive motivational force that governs our acting (Alderfer, 1969; Maslow, 1943; Ryan & Deci, 2000). In this area, Maslow’s hierarchy of needs provides the most prominent prioritization.
- The sociopolitical discourse sees needs as basic needs, that have to be fulfilled to avoid serious harm (Braybrooke, 1987; Doyal & Gough, 1991).
- The instrumental mode defines ‘need’ as a mere necessity for a purpose, which does not have an a priori moral priority. We can find this usage in marketing (Goffin & Lemke, 2004; Goffin, Lemke, & Koners, 2010) and for example software development (Wiegiers & Beatty, 2013).

I refer the interested reader to Kragulj (2016) for a more elaborated and recent review on the usage of needs in the literature. All streams of literature identify needs and deal with their prioritization. In the next section, it is showed how the different usages of the term ‘need’ point at different ways to prioritize them.

3.5.1 Need as a normative necessity

The philosophical tradition argues, that a need is truly a ‘need’, when it carries a certain moral priority as opposed to a mere desire (Frankfurt, 1984). Using the term ‘need’ normatively, already implies a prioritization. Following Frankfurt (1984), need claims get moral importance if they suffice the principle of precedence. A normative notion of need is frequently used in the basic need approach, a stream of research that guides and justifies social policy making (Braybrooke, 1987; Doyal & Gough, 1991). The most recent and in the philosophical discourse widely spread attempt to prioritize needs comes from Harry Frankfurt.

The philosophical account derives a priority of a ‘need’ over a desire by the meaning of the term ‘need’ itself. It circles around the question under which circumstances the term implies a moral priority and under which circumstances it is a mere desire. Thomson (2005) finds other words: “Needs are matters of priority; what we need usually overrides other reasons for action”.

Here again, a need is necessity for a purpose. An agent A needs N in order for a purpose Pu. If we need something we can always say what we need it for (there is always a purpose of what we need something for). When we use the term ‘need’ in natural language, we imply, as opposed to something we desire, a stronger moral importance for us. For example, the claim ‘I need to study to live a fulfilled life’ comes with a certain moral edge than when we claim ‘I want/desire to study to live a fulfilled live’. Frankfurt (1984) coins this moral edge ‘principle of precedence’ which points at an a priori higher importance of a ‘need’ as opposed to a desire.

But the principle of precedence does not apply all the time we actually use the term ‘need’. The a priori moral importance of a need depends on the purpose we try to fulfill when we satisfy this need. If we say ‘I need a higher salary in order to buy enough food for my children’, the claim has more moral weight than when we say ‘I need a higher salary in order to buy a luxury boat’. The reason for this is simple. If a person needs N in order to avoid serious harm, i.e. the satisfaction of this need is indispensable, this has, according to Frankfurt the highest moral priority. A need is only morally important if its satisfaction is linked to harm. If we do not feed our children, serious harm will be done. If we cannot buy a luxury boat, no harm at all will be done. From a moral point of view, it is more important to make things less bad than to make them better.

Frankfurt goes even further. He distinguishes between volitional needs and non-volitional needs. A volitional need depends on one’s free will, which means, that we can choose whether we desire something or not. He writes: “When something is needed because there is something else that a person

wants, then to that extent the need depends upon the person's will". One can choose whether one wants to satisfy this need or not. In opposition, if "the link to harm does not depend upon a desire, the need is a non-volitional one". Here, non-volitional needs have the higher moral stance than volitional needs, because we cannot choose to not satisfy a non-volitional need.

A volitional need can be further distinguished in free volitional and constrained volitional needs. If a volitional (i.e. a need where we can decide whether we want to satisfy it or not) need depends on an involuntary desire, Frankfurt calls it a constrained volitional need. An example for a constrained volitional need is the need for a certain drug. Constrained volitional needs satisfy the principle of precedence. They must be either satisfied or frustrated and therefore have more moral importance than free volitional needs. If a volitional need depends on a voluntary desire, Frankfurt refers to this as free volitional need. The frustration of a free volitional need causes an unpleasant feeling which can be avoided by its satisfaction. This is the case when we desire a purpose but do not really need it, as in the example of a luxury boat for which we need more money. This need claim comes with no moral importance as no harm will be done if we do not satisfy the free volitional need and does not fall under the principle of precedence. Consequently, free volitional needs can be treated as desires.

Frankfurt shows that only certain kinds of 'needs' fulfill conditions that are more important than mere desires. In order for a need to gain moral importance, (x) the need must be one that the person not only wants to meet but needs to meet (in order to avoid serious harm), and (y) what the person needs must be something that he cannot help needing (it must be non-volitional). We conclude that, what we need comes a priori with a stronger moral edge, which is called the 'principle of precedence' (Frankfurt, 1984).

In this section I wanted show, how the term need in itself implies some kind of priority over wants, desires, preferences and alike, if it is used in a correct way. Furthermore, the satisfaction of needs gets a moral priority if it is in any way connected to the avoidance of serious harm. However, seeing needs as a normative necessity is unsuitable to answer the research question because the prioritization lies in the linguistic meaning of the word 'need' itself.

Human Scale Development Approach

Manfred Max-Neef proposed the Human Scale Development approach which describes needs in the context of developmental economics (Cruz, Stahel, & Max-Neef, 2009; Max-Neef, 1992; Max-Neef, Hopenhayn, & Hamrell, 1992). Even though it was proposed within the third-world context, it can be applied in other societies as well. Max-Neef proposes a set of fundamental needs that are only

a few, finite and stable across cultures and over history. According to Max-Neef (1992), all human needs are interrelated and interactive, and must be understood in a system. Opposed to Maslow (1943; 1970), besides the need for subsistence, which roughly describes the need to remain alive, there is no hierarchy within the system. However, Max-Neef (1992) states that “simultaneities, complementarities and trade-offs are characteristics of the process of need satisfaction. In the Human-Scale-Development approach, needs are organized in two axes (Max-Neef, 1992). The existential axis describes the following needs (taken from (Cruz et al., 2009)):

- Being, which “refers to personal or collective attributes (usually expressed as nouns related to the subject's intrinsic attributes as our biological constitution, character and values)”
- Having, which “registers institutions, norms, mechanisms, tools that can be expressed in one or more words (like exosomatic tools, laws and information)”
- Doing, which “has to do with actions, personal or collective that can be expressed like verbs”
- Interacting, which “makes reference to locations and milieus (as times and spaces) and the way people relate to and articulate their environment”

The axiological dimension describes the needs of subsistence, protection, affection, understanding, participation, leisure, creation, identity and freedom (see Figure 9). All needs are seen as stable over time and culture, what changes are the means of their satisfaction (the satisfiers) which are in the Human-Scale-Development approach not concrete artifacts but contextual possibilities to satisfy a need. Max-Neef states, “there is no “one-to-one” correspondence between needs and satisfiers”. Rather a satisfier can satisfy more than one need at the same time or, the other way around, a need requires more than one satisfier in order to be satisfied. These relations may vary over time, culture and historical period. In sum, culture and time shapes the means with which general needs get satisfied. Interestingly, what defines a culture is according to Max-Neef (1992) the choice of its satisfiers. Consequently, needs can be satisfied in different contexts, namely (see Max-Neef, 1992):

- with regard to oneself (Eigenwelt)
- with regard to the social group (Mitwelt)
- with regard to the environment (Umwelt)

Needs are expressed and understood in a twofold character of deprivation and potential. This brings a tension. When needs are only perceived as deprivation, the overwhelming sensation is that “something which is lacking is acutely felt” (Max-Neef, 1992). But needs also engage and mobilize people, and thus, they can become a potential or even a resource.

Satisfiers are thus characterized the following way (Cruz, Stahel, & Max-Neef, 2009; Max-Neef, 1992):

- Synergic satisfiers are those which, by the way in which they satisfy a given need, stimulate and contribute to the simultaneous satisfaction of other needs. For examples, see Table 1.

<i>Satisfier</i>	<i>Need</i>	<i>Needs, whose satisfaction it stimulates</i>
1. Breast-feeding	Subsistence	Protection, Affection, Identity
2. Self-managed production	Subsistence	Understanding, Participation, Creation, Identity, Freedom
3. Popular education	Understanding	Protection, Participation, Creation, Identity, Freedom

Table 1: Synergic satisfiers (Max-Neef, 1992)

- Singular satisfiers aim at the satisfaction of targeted single needs; this kind of satisfier is neutral regarding the satisfaction of other needs. For examples, see Table 2.

<i>Satisfier</i>	<i>Need which it satisfies</i>
1. Programmes to provide food	Subsistence
2. Welfare programmes to provide dwelling	Subsistence
3. Curative medicine	Subsistence

Table 2: Singular satisfiers (Max-Neef, 1992)

- Destructive satisfier are elements of paradoxical effect. Applied under the pretext of satisfying a given need, they do not only annihilate the possibility of its satisfaction, but they also render the adequate satisfaction of other needs impossible. (Sometimes specially related to the need of protection). For examples, see Table 3.

<i>Supposed satisfier</i>	<i>Need to be supposedly satisfied</i>	<i>Needs whose satisfaction it impairs</i>
1. Arms race	Protection	Subsistence, Affection, Participation, Freedom
2. Exile	Protection	Affection, Participation, Identity, Freedom
3. National security doctrine	Protection	Subsistence, Identity, Affection, Understanding, Participation, Freedom

Table 3: Destructive satisfiers (Max-Neef, 1992)

- Inhibiting satisfier are those which by the way in which they satisfy (generally over-satisfy) a given need seriously impair the possibility of satisfying other needs. For examples, see Table 4.

<i>Satisfier</i>	<i>Need</i>	<i>Needs, whose satisfaction is inhibited</i>
1. Paternalism	Protection	Understanding, Participation, Freedom, Identity
2. Over-protective family	Protection	Affection, Understanding, Participation, Leisure, Identity, Freedom
3. Taylorist-type of production	Subsistence	Understanding, Participation, Creation, Identity, Freedom

Table 4: Inhibiting satisfiers (Max-Neef, 1992)

- Pseudo-satisfier satisfiers are these elements which stimulate a false sensation of satisfying a given need. Though they lack the aggressiveness of destructive, they may, on occasion, annul, in the medium and long term, the possibility of satisfying the need they were originally aimed at”. For examples, see Table 5.

<i>Satisfier</i>	<i>Need which it seemingly satisfies</i>
1. Mechanistic medicine: ‘A pill for every ill’	Protection
2. Over-exploitation of natural resources	Subsistence
3. Chauvinistic nationalism	Identity

Table 5: Pseudo satisfiers (Max-Neef, 1992)

Even though Max-Neef refuses to prioritize needs, he argues that, the need for subsistence rules out other needs. Other than that, he does gives no explicit hierarchy, stating that “there is no fixed order of the precedence in the actualization of needs” (Max-Neef, 1992) However, if a certain need is not satisfied at all (below a certain pre-systemic threshold) and the gap is large, this need may override the satisfaction of other needs. This implies to assess the gap of current and ideal need-satisfaction (see chapter 4.2.1). A methodology to assess the gap of current and desired need-satisfaction the has been proposed earlier (Cruz et al., 2009).

Max-Neef (1992) recognizes the importance to assess the systemic relation of those things to be satisfied (needs) and the means of their satisfaction (satisfiers and goods). Satisfiers can be in an exogenous relation to needs, when they are realized top down. But satisfiers can be also endogenous. Then, satisfiers derive from “liberating processes which are the acts of volition generated by the community on a grass roots level”. In the ideal case, needs are satisfied by synergic satisfiers in which one satisfier is able to satisfy more than one need. Consequently, a tool to assess the systemic relation of needs should depict positive effects of singular and synergic satisfiers and negative effects of violators, inhibitors and pseudo-satisfiers. According to Max-Neef (1992), a group which comes

together in regular dialogue is required to identify the satisfiers that can fundamentally satisfy needs of the community. Consequently, it is important to find those satisfiers, which are synergic satisfiers and satisfy more need at once. Opting for synergic satisfiers gives “rise to a healthy, self-reliant and participative development” (Max-Neef, 1992). A method that assesses how elements influence each other and thus accounts for different types of satisfiers in the approach of Max-Neef (1992) is introduced in chapter 4.2.3.

Needs according to existential characteristics	BEING (personal or collective attributes)	HAVING (institutions, norms, tools)	DOING (personal or collective actions)	INTERACTING (spaces or atmospheres)
Needs according to axiological characteristics				
Subsistence	1/ Physical health, mental health, equilibrium, sense of humour, adaptability	2/ Food, shelter, work	3/ Feed, procreate, rest, work	4/ Living environment, social setting
Protection	5/ Care, adaptability, autonomy, equilibrium, solidarity	6/ Insurance systems, savings, social security, health systems, rights, family, work	7/ Co-operate, prevent, plan, take care of, cure, help	8/ Living space, social environment, dwelling
Affection	9/ Self-esteem, solidarity, respect, tolerance, generosity, receptiveness, passion, determination, sensuality, sense of humour	10/ Friendships, partners, family, partnerships, relationships with nature	11/ Make love, caress, express emotions, share, take care of, cultivate, appreciate	12/ Privacy, intimacy, home, spaces of togetherness
Understanding	13/ Critical conscience, receptiveness, curiosity, astonishment, discipline intuition, rationality	14/ Literature, teachers, method, educational and communication policies	15/ Investigate, study, educate, experiment, analyse, meditate, interpret	16/ Settings of formative interaction, schools, universities, academies groups, communities, family
Participation	17/ Adaptability, receptiveness, solidarity, willingness, determination, dedication, respect, passion, sense of humour	18/ Rights, responsibilities, duties, privileges, work	19/ Become affiliated, cooperate, propose, share, dissent, obey, interact, agree on, express opinions	20/ Settings of participative interaction, parties, associations, churches, communities, neighbourhoods, family
Idleness	21/ Curiosity, receptiveness, imagination, recklessness, sense of humour, lack of worry, tranquility, sensuality	22/ Games, spectacles, clubs, parties, peace of mind	23/ Day-dream, brood, dream recall old times, give way to fantasies, remember, relax, have fun, play	24/ Privacy, intimacy, spaces of closeness, free time, surroundings, landscapes
Creation	25/ Passion, determination, intuition, imagination, boldness, rationality, autonomy, inventiveness, curiosity	26/ Abilities, skills, method, work	27/ Work, invent, build, design compose, interpret	28/ Productive and feedback settings, workshops, cultural groups, audiences, spaces for expression, temporal freedom
Identity	29/ Sense of belonging, consistency, differentiation, self-esteem, assertiveness	30/ Symbols, language, religions, habits, customs, reference groups, roles, groups, sexuality, values, norms, historic memory, work	31/ Commit oneself, integrate oneself, confront, decide on, get to know oneself, recognize oneself, actualize oneself, grow	32/ Social rhythms, every day settings, setting which one belongs to, maturation stages
Freedom	33/ Autonomy, self-esteem, determination, passion, assertiveness, open mindedness, boldness, rebelliousness, tolerance	34/ Equal rights	35/ Dissent, choose, be different from, run risks, develop awareness, commit oneself, disobey, meditate	36/ Temporal/special plasticity

Figure 9: Matrix of needs and satisfiers (Cruz, Stabel, & Max-Neef, 2009; Max-Neef, 1992)

3.5.2 Needs as a descriptive drive for behavior

In the domain of psychology, needs are discussed within the field of motivation. Even more focused, they are called “content theories of motivation” (Fisher, 2009). In this field, Maslow’s (1943) hierarchy of needs is the most prominent attempt. Other content theories of motivation are the “Existence-Relatedness-Growth” theory (Alderfer, 1969), which subsumes Maslow’s Hierarchy of needs in three broader categories (ERG). Furthermore, the Self-Determination-Theory of Ryan and Deci (2000) gained momentum, which postulates three basic needs (autonomy, competence, relatedness) that are cross-cultural valid and stable over the period of life. Other theories in the field are the Achievement Motivation Theory by McClelland (1961) which was developed to explain managerial success in companies and postulates a need for power, achievement and affiliation. In the following, I will discuss the hierarchy of needs in more detail.

Maslow’s Hierarchy of Needs

Even though a hierarchy of needs was already proposed earlier (Marshall, 1890), Maslow’s (1943; 1970) theory about human needs has gained significant impact within the psychological literature in the last century. It is described within the stream of research including theories that deal with the “what” of our motivation. Maslow’s states that the satisfaction of needs motivates us for action and behavior and he describes needs as a motivational force that set us in motion and cause change. In general, his theory of motivation is based on the satisfaction of existential needs. He distinguishes between deficit needs (e.g. shelter or clothing) and growth needs (e.g. academic achievement). The precondition to satisfy a growth needs is that deficient needs have to be satisfied first. A deficient as well as growth need is a gap between “is” and “ought”. Maslow (1943) rejects the fact that needs are either satisfied or frustrated but describes a decrease in the prepotency in which needs are satisfied. For example, physiological needs can be 70% satisfied, whereas safety needs can be only 50% satisfied. Maslow originally proposed that five basic needs which are ordered in a hierarchical structure, have to be met in an order from bottom to top to ensure human existence.

- *Physiological needs, for example: homeostatic needs (hunger, thirst) and non-homeostatic-ones (sexual desire, sleep)*

Physiological needs are the beginning or most profound stone in Maslow’s motivation theory. The motivation for the satisfaction of some physiological needs is to maintain a homeostasis (e.g. sugar in blood level). But also, other non-homeostatic needs are meant by this like sexual desire, or the need for sleep or sensory stimulations (e.g. tastes, tickling’s). Maslow argues that

the physiological needs as the most pre-potent and uses the example of hunger. The hunger of a being has to be very strong and extreme that it overrides all other needs. In most western societies, there is few extreme hunger or lack in the satisfaction of physiological needs. That is according to Maslow why other needs emerge.

- *Safety needs, for example: Children needs for safety: "a safe, orderly, predictable, organized world", protected jobs, saving accounts*

If physiological needs are satisfied, the being converts into a safety-seeking-mechanism who uses his capacities as safety-seeking-tools. Maslow describes this needs with the example of a child who has to be in fear that "anything can happen at all time" when the need for safety is not satisfied. He states that the safety needs in developed societies are mainly satisfied why they are no longer active motivators. People search for a job with protection, open savings accounts and insurances of diverse kinds to satisfy their need for safety.

- *Love Needs, for example: Need for love, affectionate partnerships, belongingness*

When physiological and security needs are satisfied, love needs emerge. They can be characterized as the need for love, belongingness and affection. A person wishes affectionate relations with people in general. Love needs consists of giving as well as receiving love.

- *Esteem needs, for example: self-respect, self-esteem, achievement, confidence, independence, freedom, recognition, attention*

Individuals who satisfy their esteem needs are described by a high evaluation of themselves which includes self-respect and self-esteem. More concretely, Maslow states that individuals desire strength and a feeling of achievement, as well as adequacy and a feeling of confidence to face the world. Maslow also subsumes independence and freedom under esteem needs as well as recognition, attention, importance or appreciation (Maslow, 1943).

- *Self-actualization, for example: self-fulfillment, development, becoming what one is capable for*

Need for an individual to do what he is fitted for. Maslow describes it like this: what an individual can be, it must be. Maslow describes a desire to self-fulfillment, towards actualization of what is potentially in this individual. Rephrased, the need for self-actualization might be: "become everything that one is capable of becoming". The realization of this need varies dramatically, a painter will become a painter, whereas an athlete will become an athlete (Maslow, 1943).

The hierarchy of needs as a starting point for the prioritization of needs in general

The hierarchy of needs and Maslow's understanding of needs in general, offer valuable insights, how needs can inform organizational learning processes and the prioritization of needs. First of all, Maslow argues that needs might be unconscious. He states that they can be conscious or unconscious but normally, the average person is rather not aware of their needs. This is in line with Thomson (2005). This finding yields the possibility that finding ways to explicate needs can be fruitful in organizational learning processes. Furthermore, he provides an argument that one satisfier fulfills more basic needs (Maslow, 1943). This means prioritizing satisfiers in regard to the needs they satisfy and then decide for the most potential satisfier, that satisfies the most needs. Consequently, Maslow argues in line for a systemic understanding of needs in which they have to be considered in relation to the others and also in relation to their potential satisfiers. Maslow (1943) states: "Human needs arrange themselves in hierarchies of pre-potency. That is to say, the appearance of one need usually rests on the prior satisfaction of another, more pre-potent need. Man is a perpetually wanting animal. Also no need or drive can be treated as if it were isolated or discrete; every drive is related to the state of satisfaction or dissatisfaction of other drives." With the hierarchy developed, Maslow already implies a prioritization of needs, namely, to fulfill deficit needs first and just afterwards growth needs. The hierarchy, however, is inherent to the (existential or basic) needs themselves. The fact that needs are seen as stable categories makes them unsuitable for organizational learning processes which are per definition contextualized. The hierarchy of needs provides a useful concept and starting point for the prioritization of needs in general.

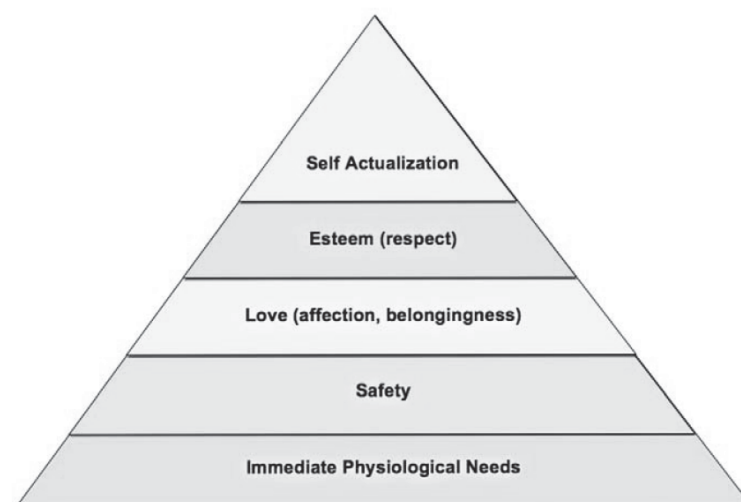


Figure 10: *A hierarchy of human motives* (Kenrick, Griskevicius, Neuberg, & Schaller, 2010)

3.5.3 Needs as instrumental necessity

Needs as an instrumental necessity are seen in the literature in customer-related-fields like innovation, software development (Wieggers & Beatty, 2013) and marketing (Baxter et al., 2014; Goffin & Lemke, 2004; Goffin et al., 2010). Here, needs are necessities to meet a given goal (e.g. Customer satisfaction, employee satisfaction).

Needs Assessment

Needs Assessments are used in the United States since 1960s to collect data from community or enterprise members to base (social) policy decisions on and have become a widely-used approach since then (Watkins et al., 2012). A typical task where needs assessment comes into play is to develop and improve any kind of system. A need is “in the simplest sense [...] a measurable gap between two conditions— what currently is and what should be.” (Altschuld & Watkins, 2014). Knowing the needs of a social system and knowing where to direct limited resources and time can help to make justifiable and informed decisions (Watkins et al., 2012). Rossett (1987) defines needs assessment as the “systematic study of a problem or innovation, incorporating data and opinions from varied sources, in order to make effective decisions or recommendations about what should happen next”. In this context, “Needs assessment also includes making judgments with regard to needs and putting them into prioritized order to guide decisions about what to do next.” (Altschuld & Watkins, 2014). According to the definition of needs as a gap between current and desired results (see Figure 11), “needs are prioritized through the comparison of (a) costs associated with addressing the needs (or closing the gap) and (b) costs associated with not addressing the needs (or leaving the gap)” (Watkins et al., 2012).

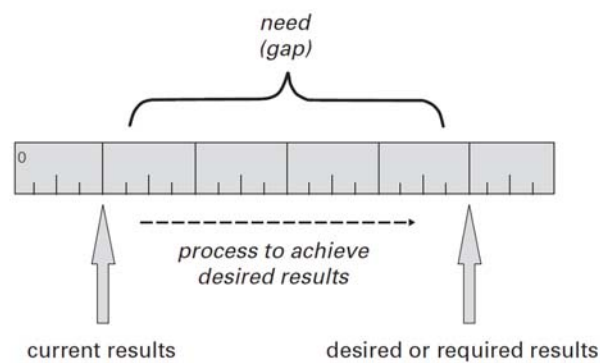


Figure 11: Relating needs to discrepancies current and desired results (Watkins et al., 2012)

The complete process of needs assessment is done by a Needs Assessment Committee, a group of representatives carefully picked by the facilitators (Altschuld & Eastmond, 2010), which is also responsible for prioritization. A large committee which represents multiple constituencies is to be preferable for the prioritization with the aim to include all relevant stakeholder-groups. Even though multi criteria assessments are recommended by needs assessment experts, most studies on needs assessment gather data with a single method like written questionnaires, structured interviews, telephone surveys, self-reports or the Delphi technique (Witkin, 1994).

Priorities in Needs Assessment are only assessed in about half of reported studies (Witkin, 1994) and are based on the magnitude of discrepancy between the current state of affairs and a desired state of affairs. Priority setting is done by discrepancy questionnaires, ranking preferences or responses on Likert-scales are analyzed for means (Witkin, 1994). Altschuld & Watkins (2014) state that a prioritization should identify “which gap might be most amenable to change and for which a solution strategy has a high likelihood of success”. The needs assessment literature reports many techniques to prioritize needs depending on the situation and data available. For a concise overview see Watkins et al. (2012). Altschuld & White (2010), who dedicated a whole volume within a guide for needs assessment propose the following methods to prioritize previously assessed needs:

- Group discussions are used to arrive at a consensus within the needs assessment committee. They are relatively fast, simple to do and it is easy to see when a general agreement is reached. On the downside, discussions can be dominated by a few influential members and criteria on which a prioritization should be based might not explicitly mentioned.
- When rank-ordering, needs are ranked according to their perceived importance by the needs assessment committee. This is relatively easy, fast and works well for shorter lists of needs. However, ranking might too simplistic for complex needs if it is done on the basis of one criteria (importance) and different rankers ascribe subtle and different meanings to this criterion. If a longer list of needs should be ranked, the perceived difference between ranks might get blurry.
- In a Zero-sum-game-structure, members of the needs assessment committee can allocate a number of points to needs as they reflect their preference. According to Altschuld and White (2010) it is fun to do, easy to see subgroup patterns and to resolve differences. But again, needs are ranked on the basis of one criterion (importance) lacking applicability for complex types of needs.
- Multiple criteria are helpful to prioritize needs. The needs assessment committee assesses each need in terms of criteria such as importance for the organization or organizational feasibility of

the resolution (Altschuld & White, 2010). Prioritizing in regard to multiple criteria is relatively easy to implement and can be done with yes/no responses or Likert-scales. However, prioritizing needs in regard to multiple criteria might be still too simplistic for complex needs and importance/feasibility criteria have to be broken into subparts and thus operationalized.

- Prioritizing needs in regard to multiple criteria with a screening is more complex and requires deliberate cognitive effort from the needs assessment committee. Multiple criteria are identified and rank-ordered. Each potential need is looked at in terms of the most important criterion first. If it passes the screening, it is examined in regard to the other criteria in order of their importance (Altschuld & White, 2010). Members are forced to elaborate about the respective needs and the procedure rapidly reduces the number of needs for consideration. But the implementation is difficult and the procedure may fractionate the decision-making process because criteria should be considered jointly rather than in isolation.
- Needs can be ranked according to their importance and feasibility. Importance and feasibility get divided into logical subcategories to be used in selecting the highest priority needs. Each importance and feasibility sub-criterion is rated on a 1-5 scale which subsequently leads to summed group ratings for the categories. This procedure fits more complex and sensitive situations and additional criteria can be brought in and rated in the same manner. The procedure is labor intensive if a large number of needs is sorted through and requires a deeper consideration within the needs assessment committee. This approach can be extended with a formally included risk assessment where internal and external risks of attending or not attending to needs are added to the process.

In sum, the methods proposed by Altschuld and White (2010), seem applicable to be used to prioritize needs within the framework of Bewextra. Especially rank-ordering according to perceived importance or feasibility seems to be viable.

Identifying viable need-solution pairs

Von Hippel and Von Krogh (Von Hippel & Von Krogh, 2016) state, that, counterintuitively, in problem-solving, finding the solution precedes exact problem formulation. They argue that problems are only formulated, when forming “need-solution pairs”. We find viable solutions at the same time with corresponding needs and formulate a problem in a subsequent step. In other words, problem solving precedes problem formulation. However, the formulation depends on influencing factors of solution such as costs and benefits of a certain action or behavior and those factors have to be known to support viable solution finding.

Conventionally, problem-solving starts with clearly formulating the problem as this seems to be necessary for developing strategies to solve it. In contrast, Von Hippel and Von Krogh (Von Hippel & Von Krogh, 2016) criticize that sequential problem formulation and subsequent problem solving is too costly in reality, thus highlighting deficiencies in the problem finding and solving approach. In their paper, they argue for two things. First of all, for a solution induced ‘problem finding’, i.e. a simultaneous discovery of needs and viable solutions. Problems and solutions cannot always be separated because they emerge as problem-solution or “need-solution pairs” which can be discovered serendipitously. Their second argument is that deliberately choosing a single problem or need restricts the firm from valuable reformulations of the problem that guides rich “landscape search” (Felin & Zenger, 2016). Reformulated, they argue that one way to engage in need and solution landscape search is to not formulate a problem first, but instead to look for possible solutions provided by the environment. While evaluating whether these solutions are suitable with salient needs, we generate “need-solution pairs”. Then, these pairs are tested against need and solution landscape information for viability. Thus, problem formulation comes only after discovery of a potentially viable need–solution pair, if problem formulation is done at all.

Problem solving through search for viable need-solution pairs is a process that can be done by individuals as well as by groups of people. A potential advantage is that in such problem-solving processes the potentially relevant need and potentially useful solution come hand in hand together. Since one does not need to formulate a problem a priori, this approach saves costs of problem formulation. Rather one needs to test the found need-solution pair for viability against the points in the relevant landscapes. Von Hippel and Von Krogh (Von Hippel & Von Krogh, 2016) argue that this approach may be frequently used in practice today and may be valuable under conditions yet to be assessed.

In order to illustrate this evaluation of the two landscapes, Von Hippel & Von Krogh (2016) propose a visualization of need-solutions pairs (see Figure 12). In fact, two three-dimensional landscapes represent solutions and needs. In case of a viable connection between a point on the need landscape and the solution landscape, an arrow refers to a need-solution pair. Although the authors account for diverse influencing variables, including costs and benefits represented by the Z-axes of the graph, they do not further elaborate on formalizing the three axes and, thus, the influencing variables which affect the generation of the linkage between a solution and a need. As mentioned before, detailed knowledge about needs, i.e. an understanding of the relative importance and the prioritization of needs, can be of critical value for organizational learning processes.

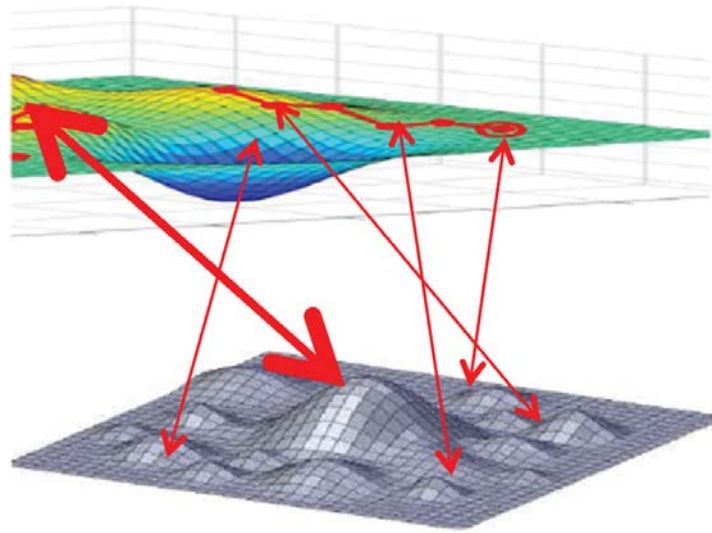


Figure 12: Need-solution landscape (Von Hippel & Von Krogh, 2016)

Felin and Zenger (2016), who responded to the critique of Von Hippel & Von Krogh agree that there are incidences in which need-solution pairs were found serendipitously but most of the time viable need solution pairs do not come into existence *ex nihilo*, rather, they are developed by other focal firms and come with a price. In this sense, solutions do not come out of nowhere to be linked to problems but most of the time have been developed beforehand in response to a problem. In this regard, a firm should not base their business-model on serendipitously finding need-solution pairs but rather on establishing a theory-of-a-firm in theorizing (Felin & Zenger, 2016), an abductive cognitive process guides rich landscape search.

Leaving serendipitously found need-solution pairs aside, explicit and well-established knowledge about the need-landscape as well as a theory which guides through rich “landscape-search” yields, promising possibilities to connect problems or needs to solutions in a reasoning or theorizing process

(Kragulj, 2016). Consequently, this thesis contributes to the question how to prioritize needs in order to establish a need-landscape that is crucial for establishing viable need-solution pairs.

3.5.4 Summary

There are several approaches throughout the literature proposed to prioritize needs. None of the approaches seems fully applicable to prioritize needs as described in Bewextra, as a set of contextualized and future oriented, hence abstract set of requirements that should be fulfilled within an organization in order to foster flourishing and well-being.

- The philosophical tradition linguistically derives a prioritization of the term ‘need’ itself. The term implies some kind of priority over wants, desires, preferences and alike. The satisfaction of needs gets a moral priority if it is in any way connected to the avoidance of serious harm. However, seeing needs as a normative necessity is unsuitable to answer the research question because the prioritization lies in the linguistic meaning itself.
- Approaches that belong to the content theories of motivation and see needs as stable traits are not fully applicable either. The famous hierarchy of needs from Maslow (1970) proposes a distinct and stable set of needs as well as their prioritization. The concept as well as its prioritization is solely theoretical founded and refers to existential or unavoidable needs. Consequently, it cannot account for changing and contextualized needs within organizational settings (Maslow, 1970).
- When seeing needs as an instrumental necessity, manifold methods of prioritization can be applied because a need is basically defined as a necessity for a purpose. Needs assessed in Bewextra carry a future-orientation. The prioritization of anticipated need-satisfaction is missing in approaches in this line of research.
 - o The debate around needs assessment evolves around policy making. A couple of well-fitting prioritization methods to assess needs and prioritize them is proposed (Altschuld & White, 2010). A future oriented approach is missing; a need is seen as a gap between ‘is’ and ‘ought’. In this regard, methods from needs assessment can be useful to prioritize need-knowledge.
 - o Von Hippel & Von Krogh (2016) propose a three-dimensional need-solution landscape which hints at a prioritization in form of a visualization. However, no concrete method of prioritization is given which makes the conceptualization too abstract to practically guide the prioritization of explicated need knowledge. However,

visualizing the relative importance of needs would be helpful in order to effectively develop need satisfying strategies.

As it is shown above, approaches that prioritize needs are either conceptual (Maslow, 1970; Von Hippel & Von Krogh, 2016), they are located in marketing (Goffin & Lemke, 2004; Goffin et al., 2010) and software development (Wieggers & Beatty, 2013) or are not directly applicable for a future oriented organizational learning process. If they are pointed at organizational learning in the widest sense (e.g. policy making), they lack a system-science perspective to coherently combine the views of different stakeholder groups in a methodological replicable way (Altschuld & White, 2010). In organizational learning, different stakeholder-groups have to be considered which is a normative endeavor. Approaches from software development that prioritize needs miss the normative component of explicitly integrating different stakeholder roles in the process of prioritization.

4 Outline of a decision support system to prioritize needs

4.1 Establishing a Need Priority Index

Based on the theoretical considerations, a general Need Priority Index can be deduced for organizational learning processes (see Figure 13).



Figure 13: Outline of a Need Priority Index

4.2 Establishing the Bewextra Need Priority Index

In the following section, the Need Priority Index, as introduced in 4.1 is applied to Bewextra (see chapter 3.3) in order to calculate an index for each need of a catalogue of substantial needs which has been generated as outcome of Bewextra-Analytic (see 3.3.2). The index represents the relative importance of a need in a system and is referred to as the Bewextra Need Priority Index.

As discussed in chapter 3.2, at least three different stakeholder roles should be considered in such an organizational learning process, namely clients, decision-makers and planners who facilitate such a process. Based on Bewextra, clients are all participants (the affected) who engage in an organizational learning process. Decision-Makers, can be also clients but in addition, they are the contracting authorities in such a process. Furthermore, they know the organization as a whole and thus have overview and resources available to assess the systemic relation of needs. Planners or designers are those who have knowledge about the organization but are themselves not part of it, like the researchers who conduct an organizational learning process as Bewextra, clients or other connected entities.

As a result, three different views, which should be depicted in the decision support system to prioritize needs. Those views can be briefly summarized as an internal view, which depicts the role of the client, a systemic view, which depicts the role of the decision maker and an external-view which takes into account the role of the designer or planner, namely a knowledge driven external perspective. In the following, it is outlined how the BNPI assesses those views.

As outlined above, a prioritization of needs should include three different views of an organization (see Ulrich, 1984). These views are:

- The internal-view (*I*) of the system, which can be defined as the overall view of the members of the organization (system). The affected of an organizational learning process prioritize needs according to their view.
- The external-view (*E*) of the system, which can be defined as the overall view of people who are not member of the system but who have gained experience about the organization during the process of facilitating the organizational learning process. This view can be assessed by facilitators as well as analysts.
- The systemic view (*S*) in which the connection of needs in a network is analyzed, in the concrete sense that a need is perceived as more potent if it pulls the satisfaction of other needs as well. This view is assessed by the decision-makers of an organization as they can contribute

knowledge of the organization as a whole. Assessing the relation of needs in a network is a tedious task and requires deliberate effort which goes further and is more elaborated than “day-to-day” business.

Furthermore, the Bewextra Need Priority Index provides a color mediated visualization of the relative importance of needs in a network. Depending on the score within the Bewextra Need Priority Index, needs are colored (high score = green, medium score = yellow, low score = red). This “traffic light” indication is very simple and intuitive to grasp and is used in different contexts like food choices to mark the difference of options based on criteria (Sacks, Rayner, & Swinburn, 2009; Thorndike, Riis, Sonnenberg, & Levy, 2016).

4.2.1 Establishing and specifying an internal-view on a system

The internal-view of a system (I) measures the importance and relevance of a need from the viewpoint of the members of an organization. Within the internal view of the system there are three relevant factors which have to be considered. Using an extended version of the online questionnaire within the step of Bewextra-Validate (see 3.3.3) it is easy to collect concrete values for the three factors, henceforward denoted as I_0 , I_1 and I_2 .

While I_0 reflects the acceptance rates of need hypotheses, I_1 can be computed by the aggregation of the rankings of importance of each accepted hypothesis for each member of the system. I_2 can be computed using a scaling question for each need. The internal view will be consequently assessed by three different measures, I_0 , I_1 , I_2 .

Acceptance Rate of Bewextra Validate

First, it should be verified whether a need is shared by the majority of the organization’s members. Through the acceptance of a need by an obvious majority of members, an individual need becomes a *systemic* need. The acceptance rate is denoted as I_0 and is depicted by the rate of validation in Bewextra-Validate. Here, participants are asked on a four-point scale questionnaire, whether they perceive a need presented as belonging to them or not, in other words whether they identify themselves with the need presented.

The scale ranges from:

- “I agree”,
- “I somewhat agree”,
- “I somewhat disagree”,

- “I disagree”.

In the Bewextra Need Priority Index,

- the answer “I agree” is weighted with 100%,
- the answer “I somewhat agree” is weighted with 75%,
- the answer “I somewhat disagree” is weighted with 25% and
- the answer “I disagree” is weighted with 0%.

To assess agreement, levels of agreement have to be categorized to fit a Likert-scale format. Connecting the answer “I somewhat disagree” to a weight of 25% seems counterintuitive. However, the intention to do so, is to account for the different semantical meanings of “I somewhat disagree” and “I disagree”. There are some, even though small, parts of agreement in the answer “I somewhat disagree”, whereas the answer “I disagree” depicts absolute disagreement.

Only, if a need-hypothesis is shared (i.e. acceptance rate) by more than 67%, a need-hypothesis is considered as a system need. This threshold depicts the supermajority rule of voting (McGann, 2004) and is politically applied in situations when, for example, changing a countries legislation. It is argued that applying such a high threshold protects minorities as they can more easily and efficiently vote against an undesired situation. Consequently, need hypothesis are only considered as system-needs when they are shared by a majority that is also needed to change a countries legislation.

Ranking of system-members

Second, the importance of each need from the point of view of each member of the system has to be considered. The higher the aggregated rating of importance of a need, the more important it is to take this need into account when developing satisfiers. This factor is denoted as I_1 . It is depicted by a ranking of system-members. Here, participants are asked to rank the given needs from the most important to the least important. A ranking has the advantage that participants have to choose the most important and the least important. On the downside, if the number of variables to rank is high, the perceived differences between top and bottom might become indistinct. For example, it might be hard for participants to explain the difference between need 14 and 15 and why they ranked it this way.

Gap between current and desired amount of need satisfaction

Third, it is necessary to take into consideration the current level of need satisfaction. The lower the current level of need satisfaction of each approved need from the point of view of each member of the system, the more urgent it might be to take this need into account when developing satisfiers. This factor is denoted as I_2 . It is assessed by a gap between the current need satisfaction and a desired state

of need satisfaction. Here, participants indicate on a scale from 1 to 10 how much the need is currently satisfied. 1 stands for: This need is currently not satisfied at all whereas 10 stands for: this need is currently totally satisfied. Seeing a need as a gap is described in the needs assessment literature (Altschuld & Eastmond, 2010; Altschuld & Watkins, 2014).

With I_0 , I_1 and I_2 together, the acceptance rate, ranking of needs relating to their importance and urgency of need satisfaction can be depicted from an internal point of view.

4.2.2 Establishing and specifying an external-view on a system

In order to avoid blind spots and investigate needs holistically, a second view which reflects the perception of individuals being familiar with the system, but outside of it is proposed. The external view of the system (E) refers to the assessment of needs from the point of view of system expert's others than system-members. However, in order to understand what needs are and how they affect the needful entity, i.e. the organization and its members, some profound relationship has to exist between the assessor and the organization. Candidates for such an external assessment include, for instance, customers, facilitators, analysts or industry insiders. This external view is based on data accessible for externals. This could either be data gathered from long-time interaction with the system, such as experiences of partners, customers, retirees, or (short-term) selective in-depth data, such as experiences of facilitators who worked with the organization.

In order to implement the external view for the Bewextra framework, two sets of data are generated while working with an organization in a Bewextra project. On the one hand side, the personal impressions and experiences of the researchers and data analysts gets exploited, and on the other hand side, (quantifiable) data generated during Bewextra-Analytic gets incorporated. While a scaled questionnaire is used to capture the first set of data (E_1), a sophisticated approach is used to include the second set of data (E_2). During the steps of data acquisition (see 3.3.1) and analysis of data (see 3.3.2) researchers gain profound knowledge about the organization in scope. From a system theoretic perspective, the external view takes into account the role of a planner or designer (Achterkamp & Vos, 2007). Here, two subscales to address this view are introduced.

Ranking which is done by analysts

E_1 reflects the relative importance of validated needs of the social system as they appear to externals. Here, non-members (e.g. analysts, facilitators) are asked to rank the needs within the system according to the relative importance they estimate.

Relative width and depth of a cluster

In Bewextra-Analytic, analysts organize the codes collected in the generative listening process as clusters (see Figure 14). Need categories emerge from those clusters. The aim of the interpretative task of clustering is to find semantically coherent patterns. Clusters should be most coherent in themselves and most distinct from other clusters. They are shaped like a table and organized as follows: Columns represent distinct aspects of the same need category, while rows represent codes assigned to the same need aspect. As a result, a ‘wide’ but hardly ‘deep’ cluster represents a need category which is of little density but high diversity. In favor of prioritizing ‘wide’ clusters, one could argue that these reflect wide ranges of aspects which have to be satisfied. However, in contrast, it could be also argued that ‘deep’ clusters reflect a very prevailing and powerful need since many indications are assigned to a single cluster/need aspect. Since both dimensions are worth considering, the relative ‘wide’ as well as the relative ‘depth’ of a cluster into the measure E_2 are included and weighted equally (α and β). E_2 (see Equation 1: Calculating relative width and depth of a cluster) reads as follows:

$$\alpha * \frac{\text{width}}{\text{avg. width}} + \beta * \frac{\text{avg. depth of the cluster}}{\text{avg. depth of all clusters}}$$

Equation 1: Calculating relative width and depth of a cluster

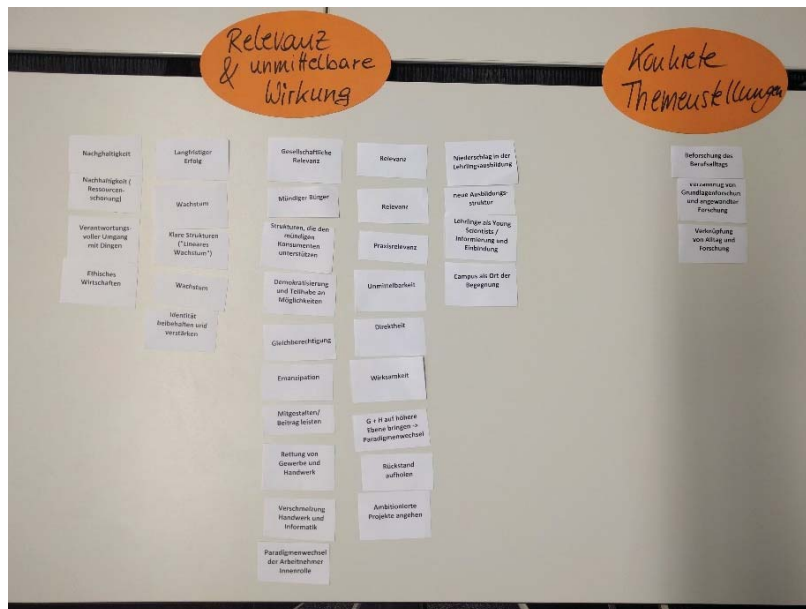


Figure 14: Example two clusters which emerged during data analysis of the case study presented in 5.1. The left cluster is very wide and deep whereas the right cluster has a width of 1 and a depth of 3 (in relation to the other clusters emerged during data analysis).

4.2.3 Establishing and specifying a systemic-view on a system

The systemic view ($\mathcal{J}$) assesses the inherent relation of needs in a network. Knowledge about the interaction and dependencies of needs may be implicit but can be made explicit. This view asks about the impact of the satisfaction of one need on another: “If satisfaction of need 1 changes, how would that influence the satisfaction of need 2?”. The aim of this view is to uncover leverage effects that might have been missed when merely assessing internal and external view.

To assess the systemic view, a cross-impact-matrix (Gordon & Hayward, 1968; Vester, 1999) is used. This method has been widely used in long range-planning, future studies and management studies (Schlange & Jüttner, 1997). Extensions and combinations with other methods have been proposed (Bañuls & Salmeron, 2007; Bañuls & Turoff, 2011). A cross-impact-matrix can be defined as a “tool for systematic description of all potential modes of interaction between a given set of variables and the assessment of the strength of these interactions” (Schlange & Jüttner, 1997).

In the Bewextra need priority index, the cross-impact-matrix assesses the perceived impact of the satisfaction of one need on another. The intensity of this impact can be none (0) weak (1), medium (2) or strong (3). The statues of each need within the system of needs is depicted as an active-sum (sum of the rows for each need); in other words, how strong one need influences the whole systems, and a passive sum (sum of the columns for each need) which indicates how sensitive (or reactive) a need is when changing the whole system (Schlange & Jüttner, 1997).

Cross Impact Matrix					
	Need 1	Need 2	...	Need N	<i>Active-sum</i>
Need 1		1	...	0	1
Need 2	2		...	3	5
...	...	...		...	...
Need N	1	0	...		1
<i>Passive-sum</i>	3	1	...	3	7

Table 6: An example of a cross-impact-matrix

To gain knowledge about the active or reactive character of a need and thus possible leverages and steering potentials of them, the relation between active sum and passive sum is calculated. The quotient $\frac{\text{active sum}}{\text{passive sum}}$ depicts the power of a need in the system. The higher the quotient is, the more active is

the need. The lower the quotient is, the more the need is reactive to others. To calculate how much influence at all a need has in the system, the product of *active sum* * *passive sum* is calculated. The higher the product is, the more involved is the need in relation to the other needs (critical character). The lower the product is, the less is the need involved in the relation (buffering character). The cross-impact-matrix enables researchers and organizational members to characterize needs on the dimensions: *active vs. reactive* and *critical vs. buffering* (Vester, 1999). Product and quotient are independent from each other (see Figure 15: Possible leverage potentials in a cross-impact-matrix).

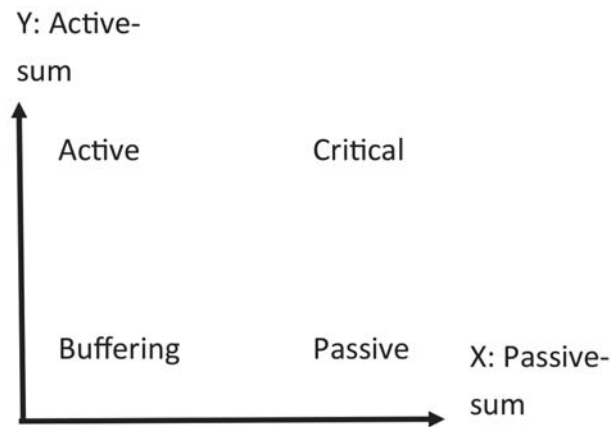


Figure 15: Possible leverage potentials in a cross-impact-matrix

To apply the cross-impact-matrix in a Bewextra process, key players within in the organization (e.g. decision makers) are asked to fill out such a matrix to assess the relation of all needs between each other. Afterwards, the results of all responded cross-impacts-matrices are averaged and product and quotient of active and passive sum are calculated. The quotient or active/reactive dimension depicts S_1 , whereas the product or critical/buffering dimension depicts S_2 in the measure described below. Vester (1999) argues that elements which are active-buffering (upper-left) have a high leverage and, after changing, will stabilize the system again. This could point at needs which are promising to satisfy first in an organizational learning process.

4.3 Calculating the Bewextra Need Priority Index

The Bewextra Need Priority Index covers the three dimensions mentioned, i.e. an internal view (I), an external view (E) and a systemic view (S), and includes the several measurements described above. All three views can be combined into one equation (BNPI) which is illustrated in Equation 2.

4.3.1 The Bewextra Need Priority Index including sub measures

A need is only being considered for further investigation if and only if I_0 (which reflects the acceptance rate of a need) exceeds a threshold reflected by 67%. The weights (depicted by values α to ζ) can be adjusted flexible and allow the decision maker to reflect his/her preferences and strategy. This possibility for adjustment enables to construct multiple scenarios and allows for adapting to the decision maker's preferences. Consequently, the formula to model the Bewextra Need Priority Index can be depicted as follows (see Equation 2):

$$BNPI = \begin{cases} [\alpha * E_1 + \beta * E_2] + [\gamma * I_1 + \delta * I_2] + [\varepsilon * S_1 + \zeta * S_2] & I_0 \geq x \\ 0 & I_0 < x \end{cases}$$

Equation 2: The Bewextra Need Priority Index

Internal view:

- I_0 : = Level of acceptance (online survey, Bewextra Validate)
- I_1 : = Importance (ranking performed by system-members)
- I_2 : = Urgency (level of current need satisfaction, gap)

External view:

- E_1 : = Importance (ranking performed by analysts)
- E_2 : = "Surface calculation" of need clusters

Systemic view:

- S_1 : = Cross-impact matrix, quotient: $\left(\frac{\text{active sum}}{\text{passive sum}} \right)$
- S_2 : = Cross-impact matrix, product: $(\text{active sum} * \text{passive sum})$

4.3.2 Formula to rescale values for the Bewextra Need Priority Index

All variables are assessed on separate scales. In order to combine them, i.e. add them, we have to normalize and re-scale all data points (P) to a common scale (e.g. 1 to 10). Therefore, it is proposed to proceed as follows:

$$P_{new} = \left(\frac{P - N}{M - N} \right) * (T - Q) + Q$$

Equation 3: Formula to rescale values for the Bewextra Need Priority Index

- P = Original value
- N = Minimum (data point) of original scale
- M = Maximum (data point) of original scale
- Q = Minimum of new scale (= 1)
- T = Maximum of new scale (= 10)

This rescaling (see Equation 3) does not impair the relative distances of data points on their original scales.

5 Empirical findings of two case studies

In the following section, two different case studies in which the BNPI was successfully applied are presented. Both case studies were conducted within the Austrian Federal Economic Chamber which is an institution that represents corporate interests within the Austrian economic system. The Austrian Federal Economic Chamber represents more than 440.000 enterprises from seven industry sectors. 73% of the Austrian labor force is represented by the Austrian Federal Economic Chamber (WKO, 2015b). The first case study was conducted in May 2016 with the Institute for Applied Business Research, a newly founded research cluster within the Austrian Federal Economic Chamber (see chapter 5.1). The second case study was directly conducted with members of the Austrian Federal Economic Chamber (see chapter 5.2). Both case studies were comparable in sample size and complexity. Learnings from both case studies are discussed in 5.3.

5.1 Empirical findings of a project with the Institute for Applied Business Research

In May 2016, the research group for knowledge based management at the Vienna University of Economics and Business carried out a Bewextra-project (see chapter 3.3) with the scientific board of the Institute for Applied Business Research which is part of the Austrian Federal Economic Chamber. The Institute for Applied Business Research is a platform of scientists and interest representatives who are concerned with the future of trade and craft. The Institute should connect science and business and discuss the topics of trade and craft within the scientific discourse. Furthermore, the Institute should suggest policies and recommendation for policy makers (WKO, 2015a). The aim of the project was to support the mission and vision development process of the newly founded Institute for Applied Business Research. To do so, 13 members of the institute (2 female) with an average age of 53 participated in the Bewextra Process to explicate and prioritize needs. The research question was:

What are the substantial needs of members of the scientific board of the Institute for Applied Business Research?

In Bewextra Collect, participants reported approximately 90 satisfiers during the workshop in which they engaged in “interacting with an envisioned future” (Kragulj, 2014b). In Bewextra-Analytic, analysts derived needs from these 90 satisfiers, using generative listening and a haptic clustering approach which resulted in a total number of 6 underlying needs (see Table 7). Through an online

questionnaire that was sent out to the participants of the workshop we then validated our understanding of the emerged need hypotheses (Bewextra-Validate). In the online questionnaire, participants were asked to express their degree of consent to our hypotheses about their needs: 1. I agree: 100%; 2. I rather agree: 75%; 3. I rather not agree: 25%; 4. I do not agree: 0% (see chapter 4.2.1). Overall, each need hypothesis was accepted by the participants and passed the threshold of 67% acceptance rate. The detailed numbers of the acceptance rate (I_0) for Bewextra-Validate are shown in Table 8. Based on the catalogue of validated needs, we assessed the Bewextra Need Priority Index.

Catalogue of validated needs
Networking and cooperation
Relevance and immediate impact
Recognition and appreciation
Experimental & interdisciplinary research
Research-promoting framework conditions
Concrete themes / subjects

Table 7: Results of Bewextra in a project with the Institute for Applied Business Research

5.1.1 Calculating the Bewextra Need Priority Index

The procedure how we assessed the Bewextra Need Priority Index can be found in chapter 4.2 and 4.3. The six normalized factors (I_1 , I_2 , E_1 , E_2 , S_1 , S_2) were added up for each need. In Table 8, we applied identical weighting (1/6) for all factors. The Bewextra Need Priority Index is the compound evaluation of the respective need. It ranges from 1 (lowest) to 10 (highest) and indicates which needs are likely of a higher priority for the organization. The results of this calculation are depicted in Table 8, last column.

The results from Bewextra Need Priority Index which take into account three different views, suggest to satisfy the need for “networking and cooperation” first as it has the highest value in the BNPI. Furthermore, the BNPI points at a satisfaction of the needs for “relevance and immediate impact” and “research-promoting framework conditions”. Feedback from project partner within the Institute of Applied Business Research indicated that the results were valuable and highly useful for deciding on the next steps which should be taken towards developing a mission and vision based on explicated and prioritized needs.

Bewextra Need Priority Index: Institute for Applied Business Research																
Need	I0	α	I1	β	I2	γ	E1	δ	E2	ϵ	S1	ζ	S2			
Networking and cooperation	67%	90%	17%	10	17%	4,86	17%	10	17%	6,3	17%	1,33	17%	10	=	7,08
Relevance and immediate impact	67%	94%	17%	6,68	17%	6,4	17%	8,2	17%	10	17%	1,74	17%	8,53	=	6,93
Recognition and appreciation	67%	77%	17%	1	17%	1	17%	1	17%	5,5	17%	2,79	17%	3,32	=	2,44
Experimental & interdisciplinary research	67%	90%	17%	7,63	17%	5,37	17%	2,8	17%	4,1	17%	1	17%	8,08	=	4,83
Research-promoting framework conditions	67%	92%	17%	9,05	17%	10	17%	7,3	17%	4,83	17%	4,22	17%	4,47	=	6,65
Concrete themes/subjects	67%	90%	17%	6,92	17%	4,6	17%	1	17%	1	17%	10	17%	1	=	4,09

Table 8: Overview of the results of the Bewextra process and the application of the BNPI with the Institute for Applied Business Research

5.1.2 Different scenarios in the case of the Institute for Applied Business Research

In the Bewextra Need Priority Index, every factor is connected to a weight (Greek letters) which allows for scenario planning. It is possible to switch on and off certain views by setting a weight to 0. For example, asking only members of the Institute for Applied Business Research, in other words, taking into account only the internal but not external and systemic view is depicted in Table 9. This perspective indicates a satisfaction of the needs for “research-promoting framework conditions” and “networking and cooperation”.

Bewextra Need Priority Index: Institute for Applied Business Research																
Need	I0	α	I1	β	I2	γ	E1	δ	E2	ϵ	S1	ζ	S2			
Networking and cooperation	67%	90%	50%	10	50%	4,86	0%	10	0%	6,3	0%	1,33	0%	10	=	7,43
Relevance and immediate impact	67%	94%	50%	6,68	50%	6,4	0%	8,2	0%	10	0%	1,74	0%	8,53	=	6,54
Recognition and appreciation	67%	77%	50%	1	50%	1	0%	1	0%	5,5	0%	2,79	0%	3,32	=	1,00
Experimental & interdisciplinary research	67%	90%	50%	7,63	50%	5,37	0%	2,8	0%	4,1	0%	1	0%	8,08	=	6,50
Research-promoting framework conditions	67%	92%	50%	9,05	50%	10	0%	7,3	0%	4,83	0%	4,22	0%	4,47	=	9,53
Concrete themes/subjects	67%	90%	50%	6,92	50%	4,6	0%	1	0%	1	0%	10	0%	1	=	5,76

Table 9: Dimension I1 and I2 weighted 50% each, other dimensions weighted 0%

Taking into account only the external view but neglecting internal and systemic view is depicted in Table 10. The external view suggests concentrate mainly on the satisfaction of the needs for “relevance and immediate impact” and “networking and cooperation”.

Bewextra Need Priority Index: Institute for Applied Business Research															
Need	I0	α	I1	β	I2	γ	E1	δ	E2	ϵ	S1	ζ	S2		
Networking and cooperation	67%	90%	0%	10	0%	4,86	50%	10	50%	6,3	0%	1,33	0%	10	= 8,15
Relevance and immediate impact	67%	94%	0%	6,68	0%	6,4	50%	8,2	50%	10	0%	1,74	0%	8,53	= 9,10
Recognition and appreciation	67%	77%	0%	1	0%	1	50%	1	50%	5,5	0%	2,79	0%	3,32	= 3,25
Experimental & interdisciplinary research	67%	90%	0%	7,63	0%	5,37	50%	2,8	50%	4,1	0%	1	0%	8,08	= 3,45
Research-promoting framework conditions	67%	92%	0%	9,05	0%	10	50%	7,3	50%	4,83	0%	4,22	0%	4,47	= 6,07
Concrete themes/subjects	67%	90%	0%	6,92	0%	4,6	50%	1	50%	1	0%	10	0%	1	= 1,00

Table 10: Dimension E1 and E2 weighted 50% each, other dimensions weighted 0%

Results of the BNPI when taking into account only the systemic view but not internal and external view are depicted in Table 11. This view points at a satisfaction of the needs for “networking and cooperation” and “concrete themes/subjects”.

Bewextra Need Priority Index: Institute for Applied Business Research															
Need	I0	α	I1	β	I2	γ	E1	δ	E2	ϵ	S1	ζ	S2		
Networking and cooperation	67%	90%	0%	10	0%	4,86	0%	10	0%	6,3	50%	1,33	50%	10	= 5,67
Relevance and immediate impact	67%	94%	0%	6,68	0%	6,4	0%	8,2	0%	10	50%	1,74	50%	8,53	= 5,14
Recognition and appreciation	67%	77%	0%	1	0%	1	0%	1	0%	5,5	50%	2,79	50%	3,32	= 3,06
Experimental & interdisciplinary research	67%	90%	0%	7,63	0%	5,37	0%	2,8	0%	4,1	50%	1	50%	8,08	= 4,54
Research-promoting framework conditions	67%	92%	0%	9,05	0%	10	0%	7,3	0%	4,83	50%	4,22	50%	4,47	= 4,34
Concrete themes/subjects	67%	90%	0%	6,92	0%	4,6	0%	1	0%	1	50%	10	50%	1	= 5,50

Table 11: Dimension S1 and S2 weighted 50% each, other dimensions weighted 0%

5.2 Empirical findings of a project with the Austrian Federal Economic Chamber

The second project within the Austrian Federal Economic Chamber was conducted in June 2016. The purpose was to facilitate and trigger an organizational learning process, namely how the organization could be structured in 2025. All of the participants were members of the Austrian Economic Chamber, more specifically a group which was assigned to the task. In this project, data from 14 participants (3 female) with an average age of 47 was collected.

During Bewextra Collect, 192 satisfiers were gathered. Bewextra Analytic resulted in 8 need hypotheses (see Table 12). In Bewextra Validate, 7 out of 8 need hypotheses could be validated (see Table 13, I_0). A need is considered a shared need if the rate of acceptance in Bewextra Validate exceeds 67% (see chapter 4.2.1). The need-hypothesis “centralization” did not reach the threshold during validation. Therefore, it was not further considered as relevant dimension in the BNPI.

Catalogue of validated needs
Clear self-image
Community (good atmosphere)
Openness and Innovation
Appreciation
Market-orientation and business-oriented appearance
Clear and simple structures
Decentralization
(Centralization)

Table 12: Results of Bewextra in a project with the Austrian Economic Chamber

5.2.1 Calculating the Bewextra Need Priority Index

The procedure how we assessed the Bewextra Need Priority Index can be found in chapter 4.2 and 4.3. The 6 normalized factors (I_1 , I_2 , E_1 , E_2 , S_1 , S_2) were added up for each need. In Table 13, factors are weighted identical (1/6). The Bewextra Need Priority Index is the compound evaluation of the respective need. It ranges from 1 (lowest) to 10 (highest). The BNPI indicates the satisfaction of the need which is closest to 10. Consequently, when taking into account all view and assigning the same weights, an organizational learning process should point at a satisfaction of the needs “clear and simple structures”, “openness and innovation” and a “clear self-image”.

Bewextra Need Priority Index: Austrian Economic Chamber																
Need	I0		α	I1	β	I2	γ	A1	δ	A2	ϵ	S1	ζ	S2		
Clear self-image	67%	88%	17%	10	17%	3,52	17%	10	17%	5,03	17%	1	17%	10	=	6,59
Community (good atmosphere)	67%	89%	17%	3,55	17%	1	17%	3,45	17%	6,51	17%	2,58	17%	1	=	3,01
Openness and innovation	67%	93%	17%	8,35	17%	7,84	17%	9,59	17%	7,87	17%	2,78	17%	6,73	=	7,19
Appreciation	67%	91%	17%	3,85	17%	3,16	17%	3,86	17%	3,37	17%	1,2	17%	1,65	=	2,85
Market-orientation and business-oriented appearance	67%	79%	17%	6,85	17%	8,92	17%	7,14	17%	5,79	17%	3,89	17%	5,76	=	6,39
Clear and simple structures	67%	93%	17%	7,15	17%	10	17%	7,95	17%	10	17%	5,92	17%	5,15	=	7,70
Centralisation	67%	59%	17%	1	17%	6,4	17%	1	17%	1	17%	8,78	17%	9,93	=	4,69
Decentralisation	67%	73%	17%	1,45	17%	5,68	17%	1	17%	2,19	17%	10	17%	7,05	=	4,56

Table 13: Overview of the results of the Bewextra process and the application of the BNPI with the Austrian Economic Chamber

5.2.2 Different scenarios in the case of the Austrian Federal Economic Chamber

Asking only members of the group within the Austrian Federal Economic Chamber, in other words, taking into account only the internal but not external and systemic view is depicted in Table 14. This perspective indicates a prioritized satisfaction of the needs for “clear and simple structures”, “openness and innovation” and “market-orientation and business-oriented appearance”.

Bewextra Need Priority Index: Austrian Economic Chamber																
Need	I0	α	I1	β	I2	γ	A1	δ	A2	ε	S1	ζ	S2			
Clear self-image	67%	88%	50%	10	50%	3,52	0%	10	0%	5,03	0%	1	0%	10	=	6,76
Community (good atmosphere)	67%	89%	50%	3,55	50%	1	0%	3,45	0%	6,51	0%	2,58	0%	1	=	2,28
Openness and innovation	67%	93%	50%	8,35	50%	7,84	0%	9,59	0%	7,87	0%	2,78	0%	6,73	=	8,10
Appreciation	67%	91%	50%	3,85	50%	3,16	0%	3,86	0%	3,37	0%	1,2	0%	1,65	=	3,51
Market-orientation and business-oriented appearance	67%	79%	50%	6,85	50%	8,92	0%	7,14	0%	5,79	0%	3,89	0%	5,76	=	7,89
Clear and simple structures	67%	93%	50%	7,15	50%	10	0%	7,95	0%	10	0%	5,92	0%	5,15	=	8,58
Centralisation	67%	59%	50%	1	50%	6,4	0%	1	0%	1	0%	8,78	0%	9,93	=	3,70
Decentralisation	67%	73%	50%	1,45	50%	5,68	0%	1	0%	2,19	0%	10	0%	7,05	=	3,57

Table 14: Dimension I1 and I2 weighted 50% each, other dimensions weighted 0%

Taking onto account only the external view but neglecting internal and systemic view is depicted in Table 15. The external view suggests concentrate mainly on the satisfaction of the needs for “clear and simple structures”, “openness and innovation” and a “clear self-image”.

Bewextra Need Priority Index: Austrian Economic Chamber																
Need	I0	α	I1	β	I2	γ	A1	δ	A2	ε	S1	ζ	S2			
Clear self-image	67%	88%	0%	10	0%	3,52	50%	10	50%	5,03	0%	1	0%	10	=	7,51
Community (good atmosphere)	67%	89%	0%	3,55	0%	1	50%	3,45	50%	6,51	0%	2,58	0%	1	=	4,98
Openness and innovation	67%	93%	0%	8,35	0%	7,84	50%	9,59	50%	7,87	0%	2,78	0%	6,73	=	8,73
Appreciation	67%	91%	0%	3,85	0%	3,16	50%	3,86	50%	3,37	0%	1,2	0%	1,65	=	3,62
Market-orientation and business-oriented appearance	67%	79%	0%	6,85	0%	8,92	50%	7,14	50%	5,79	0%	3,89	0%	5,76	=	6,46
Clear and simple structures	67%	93%	0%	7,15	0%	10	50%	7,95	50%	10	0%	5,92	0%	5,15	=	8,98
Centralisation	67%	59%	0%	1	0%	6,4	50%	1	50%	1	0%	8,78	0%	9,93	=	1,00
Decentralisation	67%	73%	0%	1,45	0%	5,68	50%	1	50%	2,19	0%	10	0%	7,05	=	1,59

Table 15: Dimension E1 and E2 weighted 50% each, other dimensions weighted 0%

Results of the BNPI when taking into account only the systemic view but not internal and external view are depicted in Table 16. This view points at a satisfaction of the needs for “centralization” and “decentralization”.

Bewextra Need Priority Index: Austrian Economic Chamber																
Need	I0	α	I1	β	I2	γ	A1	δ	A2	ϵ	S1	ζ	S2			
Clear self-image	67%	88%	0%	10	0%	3,52	0%	10	0%	5,03	50%	1	50%	10	=	5,50
Community (good atmosphere)	67%	89%	0%	3,55	0%	1	0%	3,45	0%	6,51	50%	2,58	50%	1	=	1,79
Openness and innovation	67%	93%	0%	8,35	0%	7,84	0%	9,59	0%	7,87	50%	2,78	50%	6,73	=	4,75
Appreciation	67%	91%	0%	3,85	0%	3,16	0%	3,86	0%	3,37	50%	1,2	50%	1,65	=	1,43
Market-orientation and business-oriented appearance	67%	79%	0%	6,85	0%	8,92	0%	7,14	0%	5,79	50%	3,89	50%	5,76	=	4,82
Clear and simple structures	67%	93%	0%	7,15	0%	10	0%	7,95	0%	10	50%	5,92	50%	5,15	=	5,54
Centralisation	67%	59%	0%	1	0%	6,4	0%	1	0%	1	50%	8,78	50%	9,93	=	9,36
Decentralisation	67%	73%	0%	1,45	0%	5,68	0%	1	0%	2,19	50%	10	50%	7,05	=	8,53

Table 16: Dimension S1 and S2 weighted 50% each, other dimensions weighted 0%

5.3 Visualization of prioritized need-knowledge

The visualization of knowledge is useful for its communication. Knowledge visualization, consequently, “examines the use of visual representations to improve the transfer of knowledge between at least two persons or group of persons” (Burkhard, 2004). Knowledge visualization examines methods to reduce the predominant problems of managers (Burkhard, 2004):

- Information overload: Decision Makers cannot identify the relevant information.
- Misinterpretation: Decision makers cannot understand, evaluate and interpret the information.
- Misuse: Decision makers cannot use or misuse the information for decision making.

When knowledge is presented accordingly, it can influence and guide behavior. For example, food choices are influenced by the way, knowledge about food properties is presented on the package. Consequently, several authors examined the relation between presentation of information and choices between food alternatives (Sacks et al., 2009; Thorndike et al., 2016). Traffic-light labels are widely used and tested to make healthy food choices easier. Traffic-light labels are visual representations of knowledge about food properties. In the BNPI, also traffic-light labels are used to visualize how needs score on the BNPI. Needs that score high in the BNPI are visualized green, needs that score medium is visualized yellow and needs that score weak (in relation to the other needs) are visualized red. This very intuitive visualization of the relative importance of needs should prevent the problems, decision-makers could encounter when deciding to develop strategies to satisfy the respective needs.

6 Alternative ways to assess the relation of needs

The aim of this chapter is to provide a further development for the cross-impact-matrix in the Bewextra Need Priority Index and thus include learnings from both case studies described in chapter 5. The cross-impact-matrix is a method which originates from exploratory forecasting (Gordon, 1992), a research stream that is embedded in future research. Future research, roughly speaking is the “systematic exploration of what might be” (Gordon, 1992). The cross-impact-matrix assesses the relation of needs on each other. Within the Bewextra Need Priority Index, its aims at predicted and therefore, future, need satisfaction by asking: “If satisfaction of need 1 changes, how would that influence the satisfaction of need 2?” (see chapter 4.2.3). The method fosters a prediction into the future, in a way that participants should first imagine a future state in which the satisfaction of one need changes and secondly imagine how that might influence the satisfaction of another need.

6.1 The problem

Unfortunately, as mentioned in chapter 5.3, the cross-impact-matrix suffers from serious shortcomings which deserve further consideration.

Individuals imagine their need-satisfaction differently. As it was outlined in chapter 1.1, one need can get satisfied by many different satisfiers, in a relation of 1 : N. In addition, individuals might not be consciously aware of their needs, only their desires and satisfiers (McLeod, 2011). If individuals imagine a need to be satisfied, they do not necessarily imagine the same satisfier for this need. Given these assumptions, the mental operations, which are necessary to fill out one cell in the cross-impact-matrix, differs from one individual to another. The imagination of a satisfier to meet the need for A will drastically influence, how that person perceives a change on the satisfaction of the need for B. Based on these assumed mental operations, individuals might imagine the satisfaction of the same need quite differently and consequently differ in filling out a cross-impact-matrix.

Furthermore, as experience from both case studies shows, decision-makers only hesitantly use the cross-impact-matrix. On the one hand, a high number of validated needs leads to a significant number of pairwise comparisons ($\frac{n(n-1)}{2}$) which are assessed by the cross-impact-matrix and therefore a

tedious amount of work for the individual. On the other hand, it is not intuitive to fill out a cross-impact-matrix. In both case studies, an excel-sheet (see

Table 17) was sent out to participants. Even though, we provided a detailed description with guidelines to fill the cells of the matrix, participants reported difficulties in understanding the task.

Averaging the results of participants who fill out the matrix independently, as it is proposed in the chapter above, turns out to be problematic as well. The results of a matrix with averaged values gets fuzzy and meaningless very fast because they do not fundamentally differ.

	Networking and cooperation	Relevance and immediate impact	Recognition and appreciation	Experimental & interdisciplinary research	Research-promoting framework conditions	Concrete themes / subjects
Networking and cooperation						
Relevance and immediate impact						
Recognition and appreciation						
Experimental & interdisciplinary research						
Research-promoting framework conditions						
Concrete themes / subjects						

Table 17: Example of a cross-impact-matrix which was used with the Institute for Applied Business Research

6.2 Possible solutions

There are at least two possible solutions to the problem. One is to digitalize the cross-impact-matrix and make it as easy as possible for individuals to provide values within the cross-impact-matrix. The other possibility is to fill out the cross-impact-matrix in a workshop setting to foster discussion about the systemic connection of needs. Both directions are discussed subsequently.

6.2.1 Digitalization

Digitalization of the cross-impact-matrix by using a decision-support-system might yield advantages over a simple excel spreadsheet, as presented in

Table 17. If individuals are presented with too much information at the same time – an information overload occurs (Burkhard, 2004), which is the case when decision makers cannot identify the relevant information. In such a case, decision making capabilities are reduced (Soll, Milkman, & Payne, 2015). A web based interface clearly comes with the advantage, that participants can be presented with one pairwise comparison of needs after another and henceforward, avoid information overload.

A further argument for a web based interface is that it provides the possibility to reduce the amount of tedious work for each participant. When programming a web based interface, each participant can fill out one part of the matrix. For example, when using a cross-impact-matrix to compare 20 needs, a decision support system could lower the number of pairwise comparisons from almost 380 to 19, if each single participant is presented with one row only from within the matrix. Subsequently, answers of different participants can be averaged for each row.

A data-collection tool that substitute the excel spreadsheet was developed in summer 2016. Experience from a pilot study with 18 participants, all students from the Vienna University of Economics and Business, is reported. Students were presented with 14 needs and that have been previously explicated and validated using Bewextra. They compared 182 needs on a scale from -3 to +3, which is comparable to a 7 point Likert scale. Students reported that around 50 pairwise comparison judgements are a reasonable number to avoid information overload (Soll et al., 2015). Results are presented in

Table 18. The range of averaged answers in relation to the possible range of answers is indicated in Figure 16. The averaged results do not show any remarkable variance – thus making them unsuitable to be used within the Bewextra Need Priority Index.

	active sum	passive sum
Needs		
Freiheit und Flexibilität im Studium	0,57	0,39
Gegenseitige Rücksichtnahme	0,48	0,42
Nachhaltigkeit	0,38	0,36
Praxisrelevanz und Praxisbezug	0,47	0,37
(Finanzielle) Sicherheit	0,49	0,40
Selbstverwirklichung	0,69	0,69
Effizienz	0,20	0,33
Bequemlichkeit im Studium	0,23	0,50
Kommunikation und Dialog	0,90	0,66
Hohe Qualität	0,64	0,83
Transparenz	0,58	0,31
Wertschätzung als StudentIn	0,71	0,63
Individualität	0,42	0,59
Gemeinschaft an der WU	0,51	0,67
Descriptive statistics		
average	0,52	0,51
variance	0,03	0,03
minimum	0,20	0,31
maximum	0,90	0,83

Table 18: Results of a pilot study testing a web-based implementation of the cross-impact-matrix in an Austrian sample

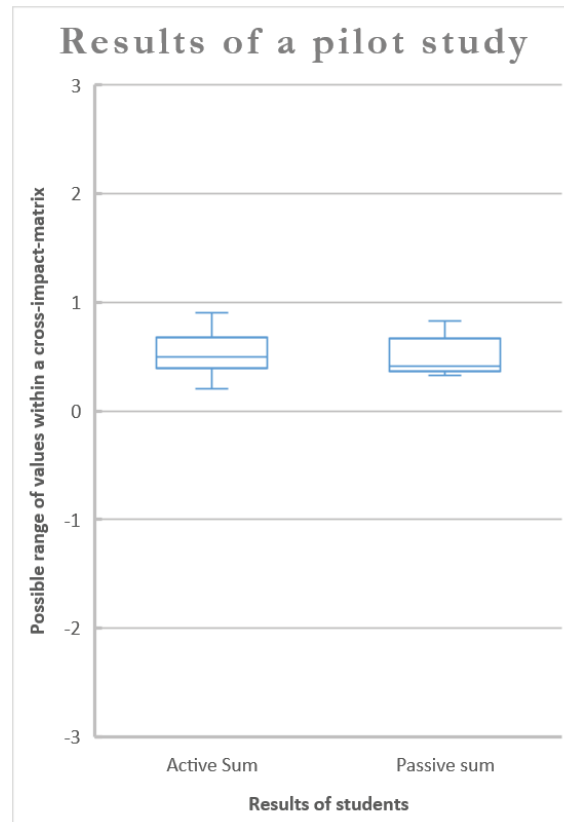


Figure 16: Results of testing a web-based implementation of the cross-impact-matrix

6.2.2 Workshop Setting

Originally, the cross-impact-matrix, which is used to assess the systemic-view was developed as a consensual method in which decision-makers provide one matrix for a whole system. The relation between different elements (needs) are subject to negotiation in a group setting. Schlange and Jüttner (1997) describe working with a cross-impact-matrix. Here, participants are gathered in a workshop or group setting. To learn the procedure, the whole group fills out one row of the cross-impact-matrix together. Then, the big group splits up in smaller subgroups and those groups evaluate the impact of each variable on all others. In a subsequent step, the results of each subgroup are compared in the big group and an overall consensus is found. Filling out the cross-impact-matrix in a workshop setting yields reliable results for organizational learning.

Using the cross-impact-matrix to foster discussion between organizational members and thus using it within a workshop setting is also supported by an action research approach as it “emphasizes collaborative knowledge creation and the importance of the development of mutually understood processes of communication” (Greenwood & Levon, 2007). Put differently, it is an “inquiry through

which participants and researchers cogenerate knowledge using collaborative communicative processes in which all participants' contributions are taken seriously” (Greenwood & Levon, 2007). Discussion about the relative importance of needs in a workshop setting could, and ideally should follow an ideal speech situation as described by Habermas (1984). In such a situation, which is free from domination and coercion, participants that fill out the cross-impact-matrix can negotiate without fear and freely express their desires and wishes. Consequently, action research can support this process as it is “first and foremost, a way [...] to open horizons of discussion, to create spaces for collective reflection in which new descriptions and analyses of important situations may be developed as the basis for new actions” (Greenwood & Levon, 2007). As it is necessary to include all relevant stakeholder-groups in such a workshop setting (Achterkamp & Vos, 2007), the group of people filling out the cross-impact-matrix should be representative for the community or organization. As group diversity is not always leading to positive effects on group performance (Williams & O'Reilly, 1998), it is necessary that the workshop facilitator moderates the workshop.

Consequently, to account for larger groups and sets of needs as well, a moderated discussion setting is proposed which follows the above-mentioned requirements. After time and space is dedicated for the workshop, the moderator guides the group through every cell of the cross-impact-matrix and thus assesses the relation of all need-pairs (rows and columns). In a first step, workshop participants are provided with colorful cardboards to indicate agreement, a neutral attitude or refusal towards the direction of the impact of need A on need B. The moderator then collects arguments for and against the direction and fosters a short discussion. If the majority votes in a certain direction of impact and a minority in another, the moderator makes sure that also the minority opinions are heard within the workshop. On the downside, a workshop setting to discuss the cross-impact-matrix is very time and resource demanding.

6.3 Summary

Even though, a web-based application for the cross-impact-matrix yields an uncomplicated and easy way to assess the relation of needs between each other, there might lie pitfalls. Initial research suggests, that the variance in results is too narrow to allow meaningful conclusions about the relations of needs in a network if assessed by a cross-impact-matrix. On the other hand, filling out a cross-impact-matrix in a workshop setting seems complicated, demanding and time consuming at first, but it yields the possibility to foster democratic processes and communicative action and thus, lies the ground for organizational development based on the fulfillment of needs of its members. Consequently, it fits well

in the action research paradigm which “is constituted by a series of communicative actions that take place in dialogical environments created by communities or other organizations for the purpose of the cogeneration of new knowledge, the development and implementation of plans of action, and the democratization of society” (Greenwood & Levon, 2007).

7 Discussion

7.1 Main findings

The thesis tried to answer the research question: *How to prioritize needs in a social system in order to guide effective need-satisfaction strategies?*

To do so, several factors were considered interrelatedly, namely:

- how do needs get assessed that should be prioritized?
- who is capable of assessing needs that should be prioritized?
- which methods can be used to prioritize needs?

There is one main finding within this thesis. First, a guided literature led to the development of a more general Need Priority Index. It depicts a possibility to identify critical stakeholders, methods to assess needs and methods that can be used by them to prioritize needs. Based on these more general considerations the Need Priority Index was adapted and specified to the concrete requirements and data available within the framework of Bewextra. The Bewextra Need Priority Index was introduced as one viable way within the Need Priority Index (however, not the only one) to prioritize needs and depicts the main contribution of the thesis. As the Bewextra Need Priority Index was within two case studies the requirement emerged to adapt one part within the decision support system. Consequently, reflections on the cross-impact-matrix within the Bewextra Need Priority Index points at a workshop setting to foster structured communication between stakeholder groups to develop need-satisfying strategies. In the following, strengths and weaknesses of the Bewextra Need Priority Index are discussed.

7.1.1 Strengths of the Bewextra Need Priority Index

The Bewextra Need Priority Index was developed within an action research paradigm, a well-established methodology to describe and conduct organizational learning processes. Placing the research within this methodology allowed to develop a decision support system based on a literature review and reflection on past projects. Furthermore, it supported to successfully apply it within two case studies and suggest a further development based on reflection of the case studies and a subsequent pilot study. The framework ensured a high ecological validity and recoverability of the findings.

It can be furthermore seen as a strength that the decision support system reflects a systems-thinking perspective. The systems thinking perspective is practically applied with the method of boundary critique. Using boundary critique to determine critical stakeholders allowed for adapting the decision support system introduced to changing problems and social systems. This stream of systems thinking suggests that at least members of the system, decision makers and experts should be considered in such a project which can be seen as a bottom-line within Bewextra. In addition, the Bewextra Need Priority Index is not a determined method and different subscales can be included or excluded depending on the data available within a social system.

The results of the Bewextra Need Priority Index yield practical relevance as well. Practical relevance is given by its contribution to knowledge about needs. When defining knowledge as capacity to act, the Bewextra Need Priority Index adds an additional layer of knowledge to knowledge about needs of members within an organization, namely knowledge about prioritized needs. The results from the Bewextra Need Priority Index suggest where to directly allocate limited time and resources. Decision makers should concentrate on developing satisfiers for the need that depicts the highest value within the Bewextra Need Priority Index.

The Bewextra Need Priority Index depicts the importance of each need prioritized with a color. Using color to indicate priorities is a very simple, yet effective tool to guide decision-making in situations of limited time and resources. The dual-processing theory (Evans, 2003) suggests that color of an object is a feature which is very easy for humans to recognize as we share color representations with animals (System 1). It is for example for most people very easy to act accordingly, depending on the color of a traffic light. On the other side, it is much harder to act based on numbers and calculations, as this requires elaborated thinking and reasoning (System 2). The color-schemed prioritization can be thus seen as a very easy to understand visualization of the relative importance of needs within a social system.

7.1.2 Weaknesses of the Bewextra Need Priority Index

It has to be acknowledged that both case studies presented in this thesis are small and similar as both organizations were suborganizations of the Austrian Federal Economic Chamber. There might be substantial differences between organizations as well as between different kinds of organizations and thus organizational learning processes.

One could furthermore criticize the sub measures used within the Bewextra Need Priority Index. It could be remarked that one subscale within the BNPI, namely E_2 , which depicts the relative width and depth of a need in a cluster is solely constructed and developed by taking into account experiences from earlier case studies and projects in which haptic clustering was used for data analysis. Furthermore, it is acknowledged, that I_0 uses a weighting of 25% for the answer “I somewhat disagree”. The rationale was, to account for the semantic differences of “I somewhat disagree” and “I disagree”. Through its embeddedness into an action research paradigm, this number however can be adapted based on experiences from practical projects and theoretical considerations.

Another limiting factor might be the different scale levels of the data assessed. The Bewextra Need Priority Index assesses ranked data and ordinal-scaled variables and combines them by normalizing them to a scale from 1 to 10. To allow this transformation, data collected for the Bewextra Need Priority Index has to be at least ordinal scaled, to be included in the transformation and thus in the Bewextra Need Priority Index.

7.2 Future research

As discussed above, the Bewextra Need Priority Index should be applied within larger organizations and different kinds such as schools, cities or companies as well in order to find out about its generalizability for other kinds of organizational settings. Furthermore, the question whether prioritized need knowledge *can* guide effective need satisfaction strategies has to remain unanswered at this point because the effectiveness of strategies can only be evaluated in retrospection and after they have been implemented. The results which are presented in this thesis offer a variety of possibilities to conduct future research. A promising topic which addresses questions raised in the discussion is to compare the effect of the Bewextra Need Priority Index on different systems in a quasi-experimental study (for a possible study design see Figure 17). In such a study, participants are not allocated randomly to treatment and control-groups but scientists compare predefined groups like classes in schools, universities or different companies (Döring & Bortz, 2015).

Further research should compare two different treatments, the effect of “Bewextra” and the effect of “Bewextra + BNPI”. The treatment group “Bewextra” is a group of individuals that engages in the explication of needs via Bewextra during an organizational learning process. The treatment group “Bewextra + BNPI” is a group that engages in the explication of needs via Bewextra + the prioritization of need-knowledge using the BNPI. The control group “No treatment” does not receive

any of both. This quasi-experimental design allows to compare the following different treatments: “Bewextra + BNPI” * “Bewextra”, “Bewextra + BNPI” * “No treatment”, “Bewextra * No treatment”. Consequently, the three different groups proposed serve as three different independent variables.

Kragulj (2016) introduces three capacities ($C_I + C_J + C_D$) that are crucial in organizational learning processes on identifying and addressing (hidden) needs: a capacity to “identify needs” (C_I), a capacity to “design satisfiers” (C_J), and a capacity to “judge needs and satisfiers” (C_D). In a Bewextra process, individuals develop and exploit these capacities. Additionally, the Bewextra Need Priority Index enhances the capacity to “identify needs” (C_I) as it adds knowledge about the needs’ priorities. Future research focuses on quantitatively test this conceptualization based on the Bewextra framework. Therefore, the three capacities could serve as dependent variables: “The capacity to identify needs relates to knowledge about the agent’s (contextual) needs, which can be identified in organizational learning processes” (Kragulj, 2016). “The capacity to design satisfiers refers to the necessary knowledge to develop (contextual) satisfiers which are basically able to satisfy (contextual) needs” (Kragulj, 2016). “The capacity to judge needs and satisfiers refers to the necessary knowledge to judge the potentiality of (contextual) satisfiers being able to meet the agent’s (contextual) needs” (Kragulj, 2016). Consequently, future research should focus on how these capacities could be operationalized in order to test them as dependent variable to answer the question:

How to operationalize the three capacities in order test them as dependent variable in a quasi-experimental research design?

The aim is to operationalize the three capacities in a way that they can be used as a dependent variable to test the effectiveness of the Bewextra Need Priority Index. It can be tested as outlined in Figure 17: Study design to test the effectiveness of the Bewextra Need Priority Index:

- RQ1: How do the treatments influence the capacity to identify needs?
- RQ2: How do the treatments influence the capacity to design satisfiers?
- RQ3: How do the treatments influence the capacity to judge needs and satisfiers?

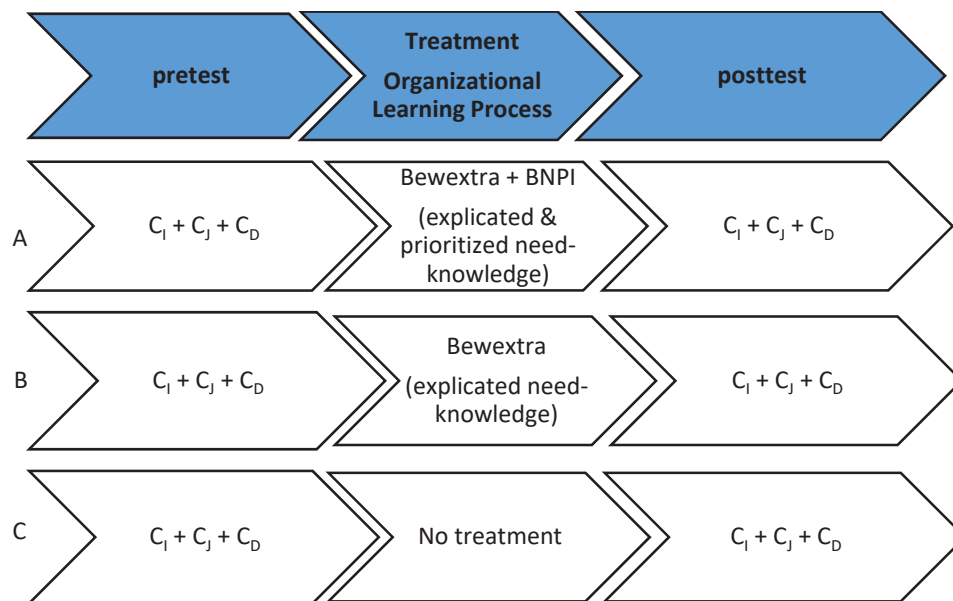


Figure 17: Study design to test the effectiveness of the Bewextra Need Priority Index

8 Conclusion and Outlook

The guiding question for this thesis was presented in chapter 1.3:

How to prioritize needs in a social system in order to guide effective need-satisfaction strategies?

To answer the research question, I introduced a decision-support-system that prioritizes a set of intangible variables like needs from different stakeholder views to foster organizational learning processes. To do so, I proposed an action research methodology, as the best fitting framework to answer the research question because action research allows to develop methods and test them within a social system. Subsequently, I conduct a guided and interdisciplinary literature. I argued that pragmatism is the best fitting epistemological foundation for action research in general and the research endeavor in particular. Furthermore, the notion of needs is discussed in regard of its prioritization. To do so, I introduced several accounts that deal with the explication and prioritization of needs theoretically or practically. If possible, I described the concrete methods how needs are prioritized within the approach. Furthermore, I argued that a prioritization of needs within a social system should take into account all relevant stakeholders. Consequently, I introduce a way to identify critical stakeholders within the organizational context. The decision support system is thus based on Bewextra, a method with the purpose to explicate needs within social systems.

In a subsequent step, a framework for a decision support system taking into account all relevant stakeholder groups was outlined. I argued that an organizational learning process should take at least three stakeholder groups into account, namely members of an organization, decision makers and experts who facilitate the organizational learning process. Subsequently, the general framework is applied to the context and data available within the process of Bewextra. Depending on the data available within an organizational learning process, different methods of prioritization can fit into the framework. To account for a system-science perspective, I proposed to assess the relative importance of needs in a system and their impact on each other. In the context of Bewextra, I introduced a cross-impact-matrix as a viable method to do so.

However, results from and reflection upon two case studies conducted with the Austrian Economic Chamber suggest that the cross-impact-matrix suffers from severe shortcomings which are subsequently outlined. In order to account for these shortcomings, I proposed two different ways to solve the problem. On the one hand, an enhanced digitalization of the cross-impact-matrix seems

promising and on the other hand, a workshop setting yields results. I argued that assessing the relative importance and impact of needs on each other can be better done within a workshop setting. Finally, I discussed implications for theory and practice as well as limitations and possibilities for future research.

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Zusammenfassung

Bedürfnisse motivieren uns und liegen menschlichem Handeln zugrunde. Das gilt auf einer individuellen Ebene aber zugleich auch in der Interaktion in sozialen Systemen. Wenn wir als Mitglieder eines sozialen Systems unsere Bedürfnisse kennen, dann können wir ausgewogenere, nachhaltigere und konsensfähige Entscheidungen treffen. Es reicht jedoch nicht, seine Bedürfnisse und die anderer nur zu kennen. Damit Wissen um Bedürfnisse konkret handlungsleitend wird, muss man wissen, welche Bedürfnisse wichtiger sind als andere und wo man limitierte Zeit und Ressourcen investiert. Hierzu braucht man Wissen darüber, welches Bedürfnis bei der Befriedigung den größten Nutzen bringt. Da Gruppen vernetzt sind und sich dort unterschiedliche Perspektiven und Meinungen treffen, ist es wichtig, verschiedene Sichtweisen in handlungsleitende Entscheidungen mit einzubinden. Aus diesem Grund behandelt diese Arbeit die Priorisierung von Bedürfniswissen aus einer systemtheoretischen Perspektive. Die Forschungsfrage kann daher wie folgt umrissen werden:

Wie kann Wissen über Bedürfnisse in sozialen Systemen priorisiert werden, damit sich damit Strategien entwickeln lassen, diese Bedürfnisse zu befriedigen?

Die Forschungsfrage umreißt also ein Entscheidungsfindungsproblem. Zur Lösung wird eine Methode zur Unterstützung von Entscheidungsprozessen vorgeschlagen. Um die Frage zu beantworten schlage ich im ersten Teil vor, dass das Paradigma der Aktionsforschung gut geeignet ist da es erlaubt, direkt mit und in sozialen System zu forschen und diese auch zu verändern. Das stellt die Grundlage dar, um die Methode zu testen und evaluieren zu können. In der theoretischen Fundierung stelle ich Ansätze aus der Philosophie, der Psychologie, den Bereichen Wirtschaftswissenschaften und Marktforschung vor, die eine solche Priorisierung theoretisch vorgeschlagen oder konkrete Methoden für die praktische Umsetzung dazu entwickelt und angewandt haben. Grundlage der Arbeit ist ein praktischer Ansatz aus dem organisationalen Lernen zum explizieren von Bedürfniswissen, Bewextra. Es wird eine Methode vorgestellt, die das Ergebnis, einen validierten Katalog von geteilten Bedürfnissen innerhalb eines Systems, priorisiert, als Entscheidungsgrundlage dient und damit handlungsweisend bei der Entwicklung von Strategien zur Bedürfnisbefriedigung ist.

Ich schlage vor, die hierzu relevanten Interessensgruppen eines sozialen Systems zu ermitteln und daraus Sichten auf ein System abzuleiten. Drei Interessensgruppen sind Teil eines Bewextra-Prozesses:

Mitglieder des Systems selbst, die Entscheidungsträger, und Experten, die in einen solchen Lernprozess mit eingebunden wurden.

In zwei Fallstudien mit der Wirtschaftskammer Österreich wurde die Methode getestet. Reflektion und Erfahrungen aus den Fallstudien deuten darauf hin, dass ein Teil der Methode, eine Einflussmatrix, adaptiert werden muss. Alternativen zur Adaption, nämlich eine Digitalisierung der Methode bzw. die Einflussmatrix in einem Workshop-setting abzuhalten werden im letzten Kapitel diskutiert.