Value of an e-health system for a value network of people with mental disabilities, their personal caregivers and their legal representatives

Key words: value co-creation, value network, value-in-use, value propositions, e-health

Master thesis
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UNIVERSITY OF TWENTE.

Value of an e-health system for a value network of people with mental disabilities, their personal caregivers and their legal representatives

A case study

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SUMMARY

BACKGROUND - Innovation in health care has led to the use of technologies to facilitate communication and decision making (Pagliari et al., 2005). These technologies are grouped under the term e-health. E-health is “the use of emerging interactive technologies to enable health improvement and healthcare services” (Ahern et al., 2006, p. 2). However, there is a mismatch between postulated benefits and actual outcomes of e-health systems (Van Gemert-Pijnen et al., 2011). Therefore, it is necessary to consider all users’ expectations and experiences during design and adoption (Pagliari, 2007). Integrating users’ expectations and experiences is well-suited for value co-creation (Zhang et al., 2015). Hence, the purpose of this research is to find out how value of an e-health system is co-created in a value network of people with mental disabilities, their personal caregivers and their legal representatives. Value co-creation means the determination of value through activities and interactions of users with the provider (e.a. Lusch et al., 2007). The outcome of a value co-creation process is value-in-use (Grönroos, 2011). Value-in-use starts with the enactment of value propositions, which are reciprocal promises of value, operating between organizations and customers (Ballantyne & Varey, 2006). Value propositions of the case organization are: Self-management of patients, Self-managed work teams and Interdisciplinary collaboration.

METHODOLOGY - The design of this research is a case study. Two questionnaires were developed for the personal caregivers and the legal representatives to measure the value propositions. 30 interviews were taken to determine use, value-in-use, and interaction within the value network. The subjects were 10 personal caregivers day care, 10 personal caregivers assisted living and 10 legal representatives.

RESULTS - The results of this research show that there are four ways of communicating within the value network. The value outcomes of the e-health system within this value network are: access to information, easier communication, involvement, professionalism, being quickly informed, time saving, less paper(work), more overview, and the pleasure of working in a digital environment. However, there are several barriers that inhibit optimal use of the e-health system such as the following main barriers: poor user-friendliness, lack of stakeholder support, and lack of motivation. As a consequence, other additional or substitutional communication channels are used, such as e-mail and telephone.

CONCLUSION - The resulted value outcomes do not fully align to the value propositions which are comprised of patient-professional communication, access to care, access to information, professional-professional communication, knowledge exchange, and medical decision-making. This might be caused by the low level of interaction with the e-health system due to low frequency of use and barriers in use. Also, there is a discrepancy between the role of the case organization and the role of (most) users. The organization adopted a white-print thinking approach while the users had the need for more information and more involvement from the organization, for example in the form of an obligatory meeting.

RECOMMENDATIONS - For the case organization it is advised to take a more present active role. Try to stimulate users by clear information and a greater sense of control since the users requested for more presence and involvement of the organization during the implementation process. This research shows that despite of what might be expected, users would like the organization to take more control in order to obtain more agreement between different user groups. Also, it is advised to make use of innovators and early adopters as influencers to convince others to use the e-health system. Early adopters stimulate the critical mass to adopt an innovation (Rogers, 1995).

WORD OF THANKS

First, I would like to make some acknowledgements to the people who contributed to this master thesis.
I would like to thank my supervisors Ariane von Raesfeld for her valuable knowledge, supervision and motivation, and Raymond Loohuis for his contributions. Also, my thanks go out to the case organization for their support and for making this project available. Then, I would like to thank all the participants for their time, their stories, their openness and their faith in me. They introduced me to a world I was never part of. Lastly, I would like to give my special thanks to my dear friends and family. Thank you for your joy, your support, your guidance and most of all your love. In the end, love is all.

Thank you,

Marion Carol
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1. INTRODUCTION

In health care, digital innovation is growing. Innovation is essential to improve accessibility, effectivity and efficiency of healthcare deliveries (Dumay, 2007). Overall, it can lead to higher quality of care. Within health care, innovation has led to the use of technologies to facilitate communication and decision making with emphasis on humans and organizations (Pagliari et al., 2005). These technologies are grouped under the term e-health. Since the term e-health is applied, its definition has been widely varied in scope and focus. Pagliari et al. (2005) conducted a systematic review in the research area of electronic health and identified 36 different definitions of e-health, with most definitions related to use of networked information and communication technologies. In line with this, e-health is defined by Ahern, Kreslake, and Phalen (2006) as “the use of emerging interactive technologies to enable health improvement and healthcare services” (p. 2). E-health can be seen as an umbrella concept which includes associated terms as telemedicine, mHealth, tele-care, ePublic health, eMental health, and tele-health (Ossebaard & Van Gemert-Pijnen, 2016). With the use of e-health one can speak of blended care, which means that conventional healthcare is blended with online interventions (Ossebaard & Van Gemert-Pijnen, 2016). These online interventions can be combined in a so called e-health system. Part of e-health systems can be electronic health records (EHRs). EHRs are repositories of patient data in a digital form (ISO, 2004).

Though digital innovation in healthcare is received with enthusiasm and public access to e-health is growing, e-health does not always match with an uptake and utilization in practice (Pagliari, 2007; May et al., 2011). There is a mismatch between postulated benefits and actual outcomes (Van Gemert-Pijnen et al., 2011). Furthermore, actual use of e-health systems is below expectations and also decreases over time (Glasgow et al., 2011; Nijland et al., 2011), for example due to lack of motivation or lack of stakeholder support (Edmondson, Bohmer, & Pisano, 2001; Pagliari et al., 2005). According to Dumay (2007), e-health must be implemented thoughtfully to generate full benefit for patients. Additionally, Pagliari (2007) states that e-health systems will not be used unless all users’ expectations and experiences are considered during the system’s design and adoption.

Integrating users’ expectations and experiences is well-suited for value co-creation (Zhang et al., 2015). In the emerging model of value co-creation, value is determined in use and through activities and interactions of users with the organization (Lusch, Vargo, & O’Brien, 2007; Vargo & Lusch, 2008; Schau, Muniz, & Arnould, 2009; McColl-Kennedy, Vargo, Dagger, Sweeney, & Van Kasteren, 2012). These activities and interactions mean that it is important to see humans as active and to collect feedback from all actors of the e-health system (McColl-Kennedy et al., 2012; Zhang et al., 2015). The outcome of a value co-creation process is value-in-use (Grönroos, 2011). Value-in-use starts with the enactment of the value propositions of the e-health system (Ballantyne & Varey, 2006).

Within the digital environment of e-health systems, multiple actors are involved (Pinho, Beirão, & Patrício, 2014). The benefits of e-health systems each actor receives depend on the input of other actors (Pinho, et al., 2014). Together, these actors interact in a value network (Patrício, Fisk, Falcão e Cunha, & Constantine, 2011). During value co-creation, value propositions of the organization and value for other actors in the value network can be specified and translated to requirements of the e-health system (Van Gemert-Pijnen et al., 2011). In the end, actors realize their value by transforming resources provided by other actors into specific benefits (Aarikka-Stenroos & Jaakkola, 2012; Lusch, Vargo, & Wessels, 2008). Macdonald et al. (2011) assess value-in-use through a holistic approach in which they capture three important considerations: 1) the role of the customer's usage process in value creation, 2) the extent to which the customer's intended outcomes are achieved – which is the customer's value-in-use, and 3) the role of the organization-customer relationship in defining what the organization's contribution is. The latter indicates the important role of organizations in the value-co creation process.

Value-in-use and value co-creation are relatively new concepts in marketing literature. Especially in the field of healthcare, the concept of value co-creation has received limited attention and is still in a theoretical and explorative phase (Hardyman, Daunt, & Kitchener, 2015). Therefore, it is necessary to further research this area. Additionally, it is important to understand why and how value of e-health systems in co-created in order to understand the mismatch between benefits and actual outcomes of e-health systems and consequently increase their use. Also, more information is needed about contributions of organizations in the value co-creation process as Macdonald et al. (2011) indicate the importance of the role of the organization.

Hence, the purpose of this research is to find out how value of an e-health system is co-created in a value network. The research will provide a closer look on interaction processes during value co-creation, value outcomes in use of an e-health system and their alignment to value propositions, in line with the holistic approach of Macdonald et al. (2011). Practically, this research provides managerial insights and implications about implementation and value co-creation of an e-health system. The context of the research is a healthcare service organization for children and adults with mental disabilities which recently started with the implementation of an e-health system. The e-health system can be used by the patients, their relatives and their caregivers. The focus of this research is the value network, which is characterized as a triangle, consisting of patients, their personal caregivers and their legal representatives. In order to get understanding of how value of an e-health system is co-created within this value network, this research will answer the following research question and sub questions:

How is value of an e-health system co-created in a value network of people with mental disabilities, their personal caregivers and their legal representatives in The Netherlands?

1. What is value of an e-health system?
2. How do actors of an e-health system interact during a value co-creation process?
3. What value outcomes in use of an e-health system do actors generate during value co-creation?
4. To what extent are these value outcomes aligned to value propositions of an e-health system?

2. THEORETICAL FRAMEWORK

This chapter elaborates on theoretical findings about value, value co-creation, and value of e-health systems.

2.1 AN INTRODUCTION TO THE CONCEPT OF VALUE

Since the late seventies it has been evolved that marketing of services is different to marketing of goods (Ballantyne & Varey, 2006). Whereas marketing of goods focuses on the exchange of tangible goods and economic activities, marketing of services focuses on the exchange of intangibles to cultivate relationships with customers in order to meet their specific needs (Vargo & Lusch, 2004). More recently, Vargo and Lusch (2004) introduced the service-dominant logic in which they state that marketing is a process of activities in interaction with the customer. With the shift from a goods-dominant logic to a service-dominant logic, the view on value changed from something being embedded and determined by the organization to something being co-created and determined in interaction between customer and provider inside out and outside in (Vargo & Lusch, 2004). The outcome of this value co-creation process is value-in-use (Grönroos, 2011). Value-in-use is defined by Macdonald et al. (2011) as “a customer’s outcome, purpose or objective that is achieved through service” (p. 6). It can only be judged through actual use of the service by the customer (Vargo & Lusch, 2004). According to Ballantaye and Varey (2006), value-in-use starts with the enactment of value propositions. An organization can only make value propositions because customers determine value and co-produce it (Vargo & Lusch, 2004). Consequently, value propositions are always two-ways: it are reciprocal promises of value, operating between organizations and customers (Ballantyne & Varey, 2006). The customers are active participants who perceive value. According to Vargo and Lusch (2008), value is created when the customer’s wellbeing is improved and the service has fulfilled its value proposition. Then, additions in use and development of value propositions can be made to generate sustainable improvements (Ballantaye & Varey, 2006).

2.2 CREATING VALUE BY CO-CREATION

As mentioned by Vargo and Lusch (2004), value is nowadays seen as something being co-created. Value co-creation determines joint activities, with customers and organizations involved (Zhang et al., 2015). Customers and organizations both address resources which are integrated in the collaborative interaction process (Aarrika-Stenroos & Jaakkola, 2012). In this way, customers are seen as active and get to play an active role in the provision of service and realization of its benefits (McColl-Kennedy et al., 2012).

In the context of healthcare, value co-creation is defined by McColl-Kennedy et al. (2012) as “a benefit realized from integration of resources through activities and interactions with collaborators in the customer’s service network” (p. 2). Hence, multiple actors develop many-to-many relationships within the e-health system and form a value network (Patrício et al., 2011). Within this value network, actors interact to integrate resources. The perceptions of these actors may be contradictory since every individual has his or her own goals regarding their own actions and outcomes of these actions (Gutman, 1997). This can lead to value conflicts in the value network (Aarikka-Stenroos & Jaakkola, 2012). When different disciplines and specializations are involved, information asymmetry and complexity in knowledge can challenge the co-creation process (Aarikka-Stenroos & Jaakkola, 2012). Nevertheless, contradictory perspectives and interactions are fundamental for value co-creation to develop, since they introduce new interpretations and meaningful creations (Fyrberg Yngfalk, 2013). These can eventually be used to optimize the e-health system.

2.3 VALUE OF E-HEALTH SYSTEMS

Within healthcare, value can be viewed by two different perspectives, the people perspective and the healthcare perspective (Ahern et al., 2006). The people perspective focuses on quality of life and the healthcare perspective emphasizes on quality of care in terms of access and efficiency. When both perspectives are combined, a holistic approach is conducted (Ahern et al., 2006). The holistic approach goes beyond the technology-driven approach engineers tend to apply which has no involvement of users. User involvement is important because resistance to new technologies is seen as a major barrier in implementation of technologies (Balfour et al., 2009).

2.3.1 CO-CREATING VALUE OF E-HEALTH SYSTEMS

Van Gemert-Pijnen et al. (2011) conceptualized the holistic approach into the CeHRes framework (Figure 1). During value co-creation, value propositions of the organization and value for other actors in the value network can be specified and translated to requirements of the e-health system (Van Gemert-Pijnen et al., 2011). Van Gemert-Pijnen et al. (2011) state that implementation is intertwined with e-health technology development. The framework combines users' values and needs with the design of implementation (Van Gemert-Pijnen et al., 2011).

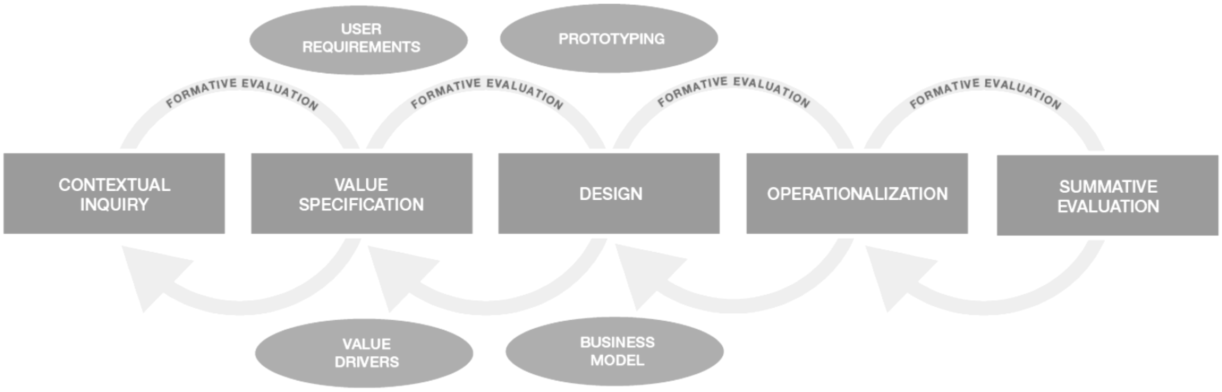


Figure 1. CeHRes framework for the development of e-health technologies. Reprinted from "A holistic framework to improve the uptake and impact of eHealth technologies" by Van Gemert-Pijnen et al., 2011, *Journal of Medical Internet Research, 13*(4), p. 9

The groundwork for the framework are the following six principles derived from other frameworks and empirical research, stating that e-health technology development: 1) is a participatory process, 2) involves continuous evaluation cycles, 3) is intertwined with implementation, 4) changes the organization of healthcare, 5) should involve persuasive design techniques, and 6) needs advanced methods to assess impact (Van Gemert-Pijnen et al., 2011). The different phases and activities of the framework are summarized in Table 1. During value specification, medical, economic, social or behavioural values of each stakeholder are specified, which will then be translated into requirements of the system and critical factors for implementation (Van Gemert-Pijnen et al., 2011).

Table 1

Phases and Activities of the CeHRes Framework (Van Gemert-Pijnen et al., 2011)

CeHRes framework phase	Activities
1. Contextual inquiry	• Identify weak and strong points in current healthcare situation • Identify stakeholders • Identify context (ethics and conditions for implementation)
2. Value specification	• Specify added value of technology for each stakeholder • Translate values into specific requirements for technology
3. Design	• Translate identified requirements into prototype
4. Operationalization	• Ensure technology becomes available as designed by business modelling
5. Evaluation	• Formative evaluations during development phases • Summative evaluation to measure effects of implemented technology on health and healthcare

2.3.2 SPECIFYING VALUE OF E-HEALTH SYSTEMS

The phase of value specification determines the recognition and qualification of values for the key stakeholders (Van Gemert-Pijnen et al., 2011). The case organization, as a stakeholder, formulates its own value, which are the value propositions. The e-health system of the case organization of this research should lead to more self-management of the patients and should enhance self-management of the work teams and interdisciplinary collaboration.

SELF-MANAGEMENT OF PATIENTS

According to Lorig and Holman (2003), healthcare organizations have no structure to support self-management though self-management enhances quality of life. Self-management is especially important for people with chronic conditions, such as mental disabilities (Lorig & Holman, 2003). According to Barlow, Wright, Sheasby, Turner, and Hainsworth (2002), self-management may bridge the gap between needs of the patient and the capacity of healthcare service organizations to meet those needs. Self-management is defined as “the individual’s ability to manage the symptoms, treatment, physical and psychological consequences and life style changes inherent in living with a chronic condition” (Barlow et al., 2002, p. 178). Barlow et al. (2002) conducted a systematic review and determined the following components of self-management: information, drug management, symptom management, management of psychical consequences, life style, social support, and communication.

With the use of e-health systems, patients are placed in an active role in which they can participate and communicate and interact with caregivers (Nijland et al. 2011; Van der Eijk et al., 2013; Gray, Miller, Kuluski, & Cott, 2014). Furthermore, e-health systems have the value of increased access to care (Hogan, Wakfield, Nazi, Houston, & Weaver, 2011; Hilty et al., 2013). With the use of e-health systems, patients experience more clinical choice and control, and better outcomes (Hilty et al., 2013). Also, access to information is a value of the use of e-health systems (Urowitz et al., 2012). However, information within the e-health system should be useful to its users (Urowitz et al., 2012). By patient-provider communication, access to care and access to information, patients become more knowledgeable, feel better empowered, socially supported, and consequently become more able to self-manage their life compared to non-users of e-health systems (Murray et al., 2005; Alpay et al., 2010; Samoocha et al., 2010; Nijland et al., 2011; Fokkenrood et al., 2012; Gray et al., 2014).

SELF-MANAGED WORK TEAMS AND INTERDISCIPLINARY COLLABORATION

Teamwork in healthcare is required to deliver safe care with high quality (Edmondson, 1999; West et al., 2002). E-health systems can foster teamwork in a new way of working. By using e-health systems with integration of an EHR, communication and knowledge exchange between caregivers are simplified (Van der Eijk et al., 2013; Gray et al., 2014). Consequently, teams can be stimulated to self-manage their work. In addition, e-health systems enhance interdisciplinary collaboration (Van der Eijk et al., 2013). Interdisciplinary collaboration is characterized by a deeper level of collaboration between professionals of different disciplines, who merge their knowledge during joint processes, such as evaluation or development of a plan of care, in an independent manner (Sorrells-Jones, 1997). E-health systems stimulate the professional networks outside an offline context because time and place are less influential (Wiecha & Pollard, 2004; Van der Eijk et al., 2013). As a consequence, e-health systems enable communication and support medical decision-making in these professional networks (Wiecha & Pollard, 2004; Van der Eijk et al., 2013).

2.3.3 BARRIERS TO THE USE OF E-HEALTH SYSTEMS

Besides value of e-health systems, there are some barriers in optimal use of e-health. First, poor user-friendliness of the e-health systems is a barrier in use. This is due to the given that e-health systems are often developed from an IT-perspective and therefore not in line with needs of the actual users (Nijland et al., 2011; Urowitz et al., 2012). Another barrier is appropriateness, which means that (potential) users do not feel the urgency to use an e-health system because of other important life events or the experience of stable health (Urowitz et al., 2012). As a consequence, non-adherence of use is caused. Also, lack of motivation and ability to use technology are barriers (Edmondson et al., 2001; Gray et al., 2014). It means that people might not have interest or are unable to use online technologies, or that they do not know how to integrate e-health systems in their daily work or care routines (Edmondson et al., 2001). Furthermore, lack of stakeholder support is a barrier in use of e-health systems (Pagliari et al., 2005). Especially in healthcare, stakeholders often have conflicting goals, including access to services, profitability, high quality, cost containment, safety, convenience, patient-centeredness, and satisfaction (Porter, 2010). Finally, privacy and data security is a barrier in use of e-health systems (Vodicka et al., 2013; Gray et al., 2014). This means that users fear the online environment of the e-health system.

2.4 ROLE OF ACTORS DURING VALUE CO-CREATION

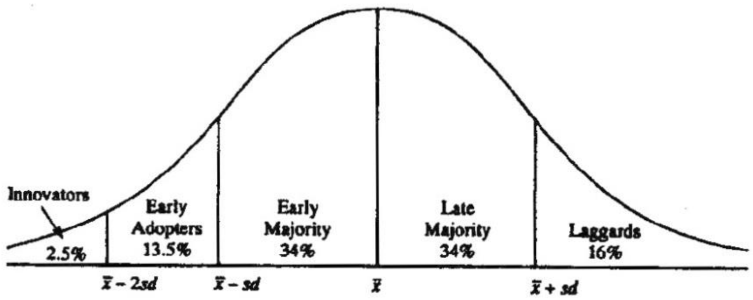
Co-creating value of e-health systems by reciprocating value propositions to value-in-use is a process of change. Within this process both the case organization and users of the e-health system have their own role. The role of the organization can be described by the colors of De Caluwé and Vermaak (2004) and the role of the users can be explained by Rogers' (1995) diffusion of innovations.

2.4.1 THE ROLE OF THE ORGANIZATION

De Caluwé and Vermaak (2004) presented five different perspectives of how change works within organizations. These perspectives are based upon theories about change and are labelled by color: yellow, blue, red, green, and white-print thinking (De Caluwé & Vermaak, 2004). For example, blue-print thinking assumes change is achieved by acting to a specified plan and red-print thinking believes in change through reward and punishment (De Caluwé & Vermaak, 2004). The case organization works with self-managed work teams and this concept was continued during the implementation of the e-health system. The case organization gave some support by making available study material and by organizing walk-in meetings. The personal caregivers and legal representatives were kept informed about the e-health system by e-mail. From 1 January 2017 the e-health system was ready to use but the organization counts the whole year for adoption. When comparing the process of change of the case organization with the colors from De Caluwé and Vermaak (2004), the organization adopts a white-print thinking approach. This approach believes in creating space for spontaneous evolution with self-organization as the core concept, stating that everything changes autonomously (De Caluwé & Vermaak, 2004). In white-print thinking interventions such as open space meetings, self-steering teams and appreciative inquiry are organized (De Caluwé & Vermaak, 2004). Personalities are expected to use their being as an instrument (De Caluwé & Vermaak, 2004). The pitfalls of this perspective lie in superficial understanding and laissez faire (De Caluwé & Vermaak, 2004).

2.4.2 THE ROLE OF THE USERS

Next to the case organization, users of the e-health system have their own role in the change process. According to Rogers (1995), there are five adopter categories in which people can be divided in based on the average time they take to adopt an innovation (Figure 2). The five categories are: innovators, early adopters, early majority, late majority and laggards. The innovator plays an important role in the diffusion process as a gatekeeper in the flow of new ideas (Rogers, 1995). Innovators should be able to cope with a high degree of uncertainty when adopting the innovation. By being more integrated in the local social environment, early adopters help trigger the critical mass when they adopt an innovation (Rogers, 1995). Since the case organization adopts a white-print thinking approach, which has a focus on persons being used as instruments (De Caluwé & Vermaak, 2004), users of the e-health system are expected to have a leading role in this process of change. Ideally, users should adopt the role of innovator or early adopter. The early majority adopt an innovation just before the average members. This group follows with deliberate willingness in adopting innovations but seldom have a leading position (Rogers, 1995). That is why the early majority are not optimal in a white print-thinking approach. After the average members of the environment, the late majority adopt an innovation, most often under pressure of peers (Rogers, 1995). Lastly, laggards are the final group of users to adopt an innovation. Laggards have high resistance to new innovations and tend to be suspicious (Rogers, 1995). They must be certain a new idea will not fail.



The innovativeness dimension, as measured by the time at which an individual adopts an innovation or innovations, is continuous. The innovativeness variable is partitioned into five adopter categories by laying off standard deviations (sd) from the average time of adoption ($\bar{x}$).

Figure 2. Adopter categorization on the basis of innovativeness. Reprinted from “Diffusion of innovations” by Rogers, 1995, p. 44

2.5 SUMMARY

To summarize, value co-creation is a process of activities and interactions between users and the organization (Lusch et al., 2007; Vargo & Lusch, 2008; Schau et al., 2009; McColl-Kennedy et al., 2012). All actors of this value co-creation process are active and determine their own value, including organizations who formulate value propositions (Ballantyne & Varey, 2006; Macdonald et al., 2011). This means that value propositions are part of the value co-creation process, which shows the connection between two concepts. As indicated, value propositions are always two-ways: it are reciprocal promises of value, operating between organizations and users (Ballantyne & Varey, 2006). The connection between value propositions and value outcomes lies in the given that value determination for users starts with the enactment of value propositions (Ballantyne & Varey, 2006). During value co-creation, the value propositions of the organization and value for other actors in the value network are specified and translated to requirements of the e-health system (Van Gemert-Pijnen et al., 2011). Value is then realized by transforming resources provided by other actors into specific benefits of the e-health system (Aarikka-Stenroos & Jaakkola, 2012; Lusch, Vargo, & Wessels, 2008). All in all, value is created when the customer's wellbeing is improved and the service has fulfilled its value proposition (Vargo & Lusch, 2008). The value propositions of the e-health system within this research are self-management of patients, self-managed work teams and interdisciplinary collaboration. Optimally, additions in use and development of value propositions can be made to generate sustainable improvements of the e-health system (Ballantaye & Varey, 2006). However, there are several barriers that inhibit optimal use of the e-health system and therefore impede the value co-creation process. Furthermore, there should be a fit in the roles of the organization and the users. Because the case organization adopts a white-print thinking approach, users should adopt the role of innovator or early adopter (Rogers, 1995). An overview of the theoretical findings of e-health systems in presented in Table 2.

Table 2
Overview of the Value Propositions and through What they are Achieved and Inhibit

Value propositions	Achieved through:	Inhibit by:
Self-management of patients	• Patient-professional communication (Nijland et al. 2011; Van der Eijk et al., 2013; Gray et al., 2014) • Access to care (Hogan et al., 2011; Hilty et al., 2014) • Access to information (Urowitz et al., 2012)	• Poor user-friendliness (Nijland et al., 2011; Urowitz et al., 2012) • Appropriateness (Urowitz et al., 2012) • Non-ability to use technology (Edmondson et al., 2001; Gray et al., 2014) • Lack of stakeholder support (Pagliari et al., 2005).
Self-managed work teams Interdisciplinary collaboration	• Professional-professional communication (Van der Eijk et al., 2013; Gray et al., 2014). • Knowledge exchange (Van der Eijk et al., 2013; Gray et al., 2014). • Medical decision-making (Wiecha & Pollard, 2004; Van der Eijk et al., 2013)	• Lack of motivation (Edmondson et al., 2001; Gray et al., 2014) • Privacy and data security (Vodicka et al., 2013; Gray et al., 2014).

3. METHODOLOGY

Within this chapter the research methodology will be discussed. This includes the research design, data collection, data analysis, the research procedure, and detailed information about the subjects.

3.1 RESEARCH DESIGN

The purpose of the research is to find out how value of an e-health system is co-created in a value network of people with mental disabilities, their personal caregivers, and their legal representatives. In order to find this out, a case study is conducted within a healthcare organization for people with mental disabilities. With a case study one can cover contextual conditions if they are relevant for the phenomenon of interest (Yin, 2003). As presented in the framework of Van Gemert-Pijnen et al. (2011), contextual inquiry is indeed important for value assessment of e-health systems. Furthermore, case studies are required when boundaries between the phenomenon and the context are not clear yet (Yin, 2003). Within this research, a single case study is conducted, which means that one case is used to describe the phenomenon of interest. A single case is sufficient for generalization because of the in-depth approach of case studies (Flyvbjerg, 2006). Summarizing, the research design is an explorative single case study. This type of case studies is especially used when the intervention being evaluated has no clear, single set of outcomes (Yin, 2003).

3.2 CASE SELECTION

The case of this research is a healthcare service organization for children and adults with mental disabilities. The case organization started with the implementation of an e-health system, combining an EHR with an online portal. The personal caregivers use the EHR which is connected to the patient's and legal representatives' portal. When using the online portal, patients and legal representatives can view what personal caregivers publish in the EHR. Also, all users can interact with each other using the messaging tool. Furthermore, users can view documents and upload documents, images and other content, and can make use of the calendar.

3.3 DATA SOURCES AND DATA COLLECTION

3.3.1 DATA SOURCES OF VALUE PROPOSITIONS

The value propositions of the e-health system were derived from the case organization. Data is collected through desk research and during conversations with employees involved in the project of the e-health system. The opportunity was given to view documents about the e-health system and which goals it should achieve. The researcher has collected all data and conceptualized the value propositions in accordance with the case organization.

3.3.2 DATA COLLECTION METHODS OF VALUE PROPOSITIONS

To measure the extent to which the value propositions are met, two questionnaires were developed. As Van Gemert-Pijnen et al. (2011) mention, e-health technology development needs advanced methods for assessment. The questionnaires serve as a baseline to measure if the value propositions of the organization are visible in the long-term. The use of questionnaires as research method in healthcare has increased past years (Rattray & Jones, 2007). Because of the different user groups, two different questionnaires were developed. The context of the research were taken into account when designing the questionnaires. Furthermore, the questionnaires were developed in collaboration with the case organization. After pre-testing the questionnaires, some textual adjustments were made.

QUESTIONNAIRE FOR PERSONAL CAREGIVERS

The questionnaire for personal caregivers represents self-managed work teams and interdisciplinary collaboration (Appendix A). The items about self-managed work teams are originally from Yang and Guy (2011), who adapted and developed items based on key characteristics of self-managed work teams discussed by other researchers (e.g. Cordery, Mueller, & Smith, 1991; Campion, Medsker, & Higgs, 1993; Kirkman & Shapiro, 2001). Items about interdisciplinary collaboration are adapted from Osborne, Elsworth, and Whitfield (2007) and Temkin-Greener, Gross, Kunitz, and Mukamel (2004). All journals have an impact factor from 2.2 to 6.3. The items used for the questionnaire were translated to Dutch in accordance with the guidelines for cross-cultural adaptation of self-administrated questionnaires in healthcare (Beaton, Bombardier, Guillemin, & Ferraz, 2000). To overcome bias in answering, the questionnaire included questions with the same intention and negatively formulated questions. Also, the questions were asked in a random order. The subjects were asked to answer each item on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). The choice of this scale was in accordance with the case organization. Also, the option No relevance was added to the answer scale because some items are not applicable to the personal situations of the patients. For instance, HSN1 *I communicate very confidently with my patient about his or her health* is not relevant for people who are not capable to communicate. Additionally, the questionnaire includes items about gender, age, education level and use of online devices.

QUESTIONNAIRE FOR LEGAL REPRESENTATIVES

The questionnaire for legal representatives is about self-management of patients the representatives are related to (Appendix A). The items from the questionnaire are adapted from the Health Education Impact Questionnaire (heiQ) (Osborne et al., 2007) and converted to the perspective of the legal representative. The journal has an impact factor of 2.2. Again, the questions were asked in random order including some questions with the same intention to overcome bias. Further, the items were translated to Dutch (Beaton et al., 2000) and measured on a 5-point Likert scale (1= strongly disagree to 5= strongly agree). Also, the option No relevance was added to the answer scale because some items are not applicable to personal situations of the patients. For instance, EIL4 *[name] feels like he or she is actively involved in life*. Additionally, the questionnaire includes items about general demographics and use of online devices.

3.3.3 DATA SOURCES OF VALUE-IN-USE

Data about value-in-use of the e-health system are derived from the users of the e-health system who collaborate together in a value network. Though the tendency of this part of the research was to be as open as possible, some guidelines from the theoretical framework were used for data collection about value-in-use of the e-health system.

3.3.4 DATA COLLECTION METHOD OF VALUE-IN-USE

Because of the explorative nature of the research, the most applicable research method for studying value-in-use of an e-health system is interviews. Interviews give the possibility to gain information about what people think and feel (Baarda et al., 2013). The interview type is semi-structured, which means that the main topics and interview questions are predetermined (Bryman & Bell, 2011). The research instrument was an interview schedule (Appendix B): one for the personal caregivers and one for the legal representatives. The interview schedules were designed based on the literature review and conducted pre-existed interview questions from Macdonald et al. (2011), Downs and Adrian (2004), and Gray et al. (2014). The last question of the interview was whether there is something that should be discussed that is not discussed yet. According to Downs and Adrian (2004), it is advisable to end an interview this way because unexpected information might be revealed. Again, all questions were designed in accordance with the case organization.

Table 3
Overview of the Data Sources and Data Collection Methods of the Concepts

Concepts	Data sources	Data collection methods
Value propositions	Project members organisation	Desk research and conversations
	Personal caregivers and legal representatives	Questionnaires
Value-in-use	Personal caregivers and legal representatives	Semi-structured interviews

3.4 DATA ANALYSIS

An overview of the operationalization of the value propositions and the reliability analysis is presented in Table 4.

3.4.1 OPERATIONALIZATION OF VALUE PROPOSITIONS

Self-managed work teams and interdisciplinary collaboration were measured with the questionnaires from Yang and Guy (2011), Osborne et al. (2007), and Temkin-Greener et al. (2004). Yang and Guy (2011) measured self-management of work teams by level of self-management, level of teamwork, job satisfaction, team performance, and resource attainment. Interdisciplinary collaboration is measured by items adapted from Osborne et al. (2007) about communication with the patient and from Temkin-Greener et al. (2004) about communication within the team and perceived effectiveness of the team.

Self-management of patients was measured with the heiQ (Osborne et al., 2007), which was developed to measure self-management outcomes after implementation of a patient education program. The heiQ measures a patient's positive and active engagement in life, health directed behavior, skill and technique acquisition, constructive attitudes and approaches, self-monitoring and insight, health services navigation, social integration and support, and emotional wellbeing (Osborne et al., 2007). These aspects are equal to the components of self-management from Barlow et al. (2002). Additionally, items about communication with the personal caregivers*,* from the heiQ (Osborne et al., 2007), were asked from the legal representatives own perspective to gain reciprocity between the answers.

3.4.2 ANALYZING DATA FROM THE QUESTIONNAIRES

Before the data analysis, negatively questioned items were rescaled in order to align with other items. A factor analysis is conducted to ensure whether the items correspond with the original questionnaires of Yang and Guy (2011), Temkin-Greener et al. (2004), and Osborne et al. (2007). As a threshold, variance should be above 40 to be significant (Ford, MacCallum, & Tait, 1986). This is the case for every construct. Furthermore, for each construct Cronbach's alpha is calculated to ensure reliability. Cronbach's alpha should be above 0.6 (George & Mallery, 2003). Except for Communication team and Positive and active engagement in life, all constructs score above this threshold. In total, the questionnaires for the personal caregivers and for the legal representatives have a Cronbach's alpha of 0.936 and 0.922, respectively. Based on the factor analysis and reliability analysis, two items were deleted in both questionnaires. These items are LSM3, LT5, HDB1, STA2.

3.4.3 ANALYZING DATA FROM THE INTERVIEWS

The interviews were transcribed verbatim and transported to Atlas.ti 8.0 software in order to identify concepts of the phenomena of interest. Because of privacy concerns, names of people, organizations, and locations were blurred. In Atlas.ti the transcripts were grouped to the three user groups that participated: personal caregivers from day care, personal caregivers from assisted living, and legal representatives. The transcripts were coded by a combination of open and axial coding because of the explorative nature of the research. During open coding the key concepts were noted through excessive familiarization with the data, and based on experiences of the researcher and findings from the theoretical framework. After that, all concepts and underlying quotes were reviewed using a codes report. This report hands an overview of all quotes from the concepts to be able to specify them into specific codes, which is the stadium of axial coding. For example, the sentence *What I really find annoying is registration of patients [..] You have to register every day and that is quite time consuming. It takes longer than with the old system* (PCA1) was first labelled as Barrier in use during open coding and coded as Registration during axial coding. The codes report also gives an overview of the different user groups. To ensure reliability, an inter-reliability analysis with Cohen's kappa was conducted. The coding schedule was used to code three randomly selected transcripts from each user groups. The three transcripts were coded by the researcher and a second coder. The inter-reliability analysis resulted in a Cohen's kappa of 0.7127. In accordance with the strengths of agreement from Landis and Koch (1977) a Cohen's kappa between 0.61-0.80 is substantial.

Table 4

Operationalization of Self-Managed Work Teams, Interdisciplinary Collaboration, and Self-Management with the Number of Items (N) and Reliability

Self-managed work teams						
Original				Personal caregivers		
Dimensions	Definition	N	Composite reliability	N	Cronbach's α	Variance
Level of self-management	Level of autonomy in making decisions	3	0.67	3	0.713	65.376
Level of teamwork	Level of team spirit, which stimulates collaboration	5	0.59	4	0.594	46.895
Job satisfaction	Pleasurable or positive emotional state resulting from the appraisal of one's job or job experiences (Locke, 1976)	7	0.88	6	0.884	65.272
Team performance	The quantity and quality of outputs, which includes efficiency, productivity, response time, product quality, customer satisfaction, and innovation (Cohen & Bailey, 1997)	5	0.86	6	0.606	40.239
Resource attainment	The general capability to get valued resources	6	0.81	6	0.798	50.527

Interdisciplinary collaboration (Osborne et al., 2007; Temkin-Greener et al., 2004)						
Original				Personal caregivers		
Dimensions	Definition	N	Cronbach's α	N	Cronbach's α	Variance
Health services navigation	Individual's understanding of and ability to interact with a range of health organizations and health professionals	5	0.82	4	0.771	61.045
Communication team	The degree to which team members are free to speak without fear of repercussion or misunderstanding, believe in accuracy of information provided by other team members	10	0.82	4	0.492	41.751
Perceived effectiveness	The perceived effectiveness of the team with respect to technical quality of patient care and ability to meet patient's and family's care needs and outcomes	7	0.89	4	0.697	53.173
Total		48		37	0.936	

Self-management (Osborne et al., 2007)						
Original				Legal representatives		
Dimensions	Definition	N	Cronbach's α	N	Cronbach's α	Variance
Positive and active engagement in life	The individuals' activities to convert intention into positive outcomes, and implies a change of lifestyle and life activities as perceived by legal representative	5	0.86	4	0.127	41.208
Health directed behavior	It relates to a change in lifestyle that is tangible and specifically related to healthful behaviors as perceived by legal representative	4	0.80	2	0.886	89.938
Skill technique acquisition	The knowledge-based skills and techniques (including the use of aids) that help individuals manage disease-related symptoms and health problems more effectively as perceived by legal representative	5	0.81	2	0.714	88.484
Health services navigation 1	Individual's understanding of and ability to interact with a range of health organizations and health professionals as perceived by legal representative	5	0.82	5	0.679	50.670
Social integration and support	The positive impact of social engagement and support that evolves through interaction with others as perceived by legal representative	5	0.86	4	0.837	72.525
Health services navigation 2	Individual's understanding of and ability to interact with a range of health organizations and health professionals	5	0.82	5	0.880	70.064
Total		42		22	0.922	

3.5 RESEARCH PROCEDURE

The research sessions took place on a for the subjects desired location. All subjects were informed about the research purpose, the procedure, and the ensured anonymity on verbal basis and via the informed consent (Appendix C). The subjects were given as much information as possible to create an open and transparent atmosphere in which they felt comfortable to express themselves. The research sessions took 30-40 minutes and started with the interview. The interview part was recorded with a voice recorder. Subjects were explicitly informed when the voice recorder was on and off to maintain the open atmosphere. After the interview, the subjects were invited to fulfil the questionnaire. This order was chosen to enlarge reliability because subjects knew they did not have to explain their answers of the questionnaire. To overcome bias, the questionnaires were anonymous which was explained to the subjects both written and verbal. During the whole session the researcher bracketed her own thoughts and did not suggest to a particular direction.

3.6 SUBJECTS

The users of the e-health system from the case organization collaborate in a triangle with on each angle a group of persons involved. These persons are patients with mental disabilities, their legal representatives and their personal caregivers – both from day care and living. Due to low intelligence level of the patients or rejection by the legal representatives, it was unfortunately not possible to interview the legal representatives with their patient in order to gain their perspective.

The selection of the subjects was through snowball sampling. With this type of sampling a number of subjects is selected from whom the desired data are gathered and who then help to recruit other subjects to be included in the sample (Magnani, Sabin, Saidel, & Heckathom, 2005). Snowball sampling is often used in hard-to-reach populations (Faugier & Sargeant, 1997; Atkinson & Flint, 2001; Magnani et al., 2005). The researcher actively approached personal caregivers to participate by e-mails, telephone calls and visits. With the help of the internal project leader, a number of personal caregivers was willing to take part in the research. The personal caregivers that participated were invited to select and approach a legal representative to join the research too. Due to insufficient response, some legal representatives were directly approached by the researcher.

In total, 30 users of the e-health system participated in the research. The subjects were equally distributed in ten personal caregivers from day care, ten personal caregivers from assisted living, and ten legal representatives. In research, samples must be large enough to have all or most perceptions covered (Mason, 2010). Within this research saturation was used to determine if more interviews were needed, which means that collection and analysis of more data does not lead to new insights (Van Aken, Berends, & Van der Bij, 2012),. After sixteen interviews with personal caregivers and nine interviews with legal representatives, a clear and consistent overview of the use, implementation and value of the e-health system was obtained.

Information about demographics of the subjects is presented in Table 5. When looking at personal caregivers, more women than men participated in this research, which can be declared by the fact that more women work in the function of personal caregiver at the case organization and in general. Gender and education level are almost equally divided for the legal representatives. For personal caregivers, education level is equally divided in total but not when looking at working area. 70% of personal caregivers from day care finished university of applied sciences compared to 30% of personal caregivers from assisted living. The average age of the personal caregivers is 44.55, divided in 45.80 for personal caregivers day care (PCD) and 43.30 for personal caregivers assisted living (PCA). The average age of the legal representatives is 63.00. All subjects make use of online devices on (almost) daily basis. Within the groups of personal caregivers there are no significant differences in use of online devises.

Table 5

Overview of Demographical Information from the participated Personal Caregivers and Legal Representatives

	Personal caregivers	N (%)	Legal representatives	N (%)
Gender	Male	3 (15.0)	Male	6 (60.0)
	Female	17 (85.0)	Female	4 (40.0)
Age	25-35 years	5 (25.0)	25-35 years	-
	36-45 years	7 (35.0)	36-45 years	-
	46-55 years	2 (10.0)	46-55 years	2 (20.0)
	56-65 years	6 (30.0)	56-65 years	5 (50.0)
	66-plus years	-	66-plus years	3 (30.0)
	Mean	44.55	Mean	63.00
Educational level	Vocational education	10 (50.0)	Vocational education	4 (40.0)
	University of applied sciences	10 (50.0)	University of applied sciences	6 (60.0)
	University of research	-	University of research	-
Location	Internal	11 (55.0)	Internal	8 (80.0)
	External	9 (45.0)	External	2 (20.0)
Working area	Day care	10 (50.0)		
	Assisted living	10 (50.0)		
Total		20	Total	10

	Use of devices personal caregivers					Use of devices legal representatives				
	Daily	Almost daily	2-3 times a week	< 1 time a month	Never	Daily	Almost daily	2-3 times a week	< 1 time a month	Never
Computer	16	3	-	-	1	5	1	1	-	3
Laptop	7	3	4	2	4	5	2	-	1	2
Tablet	11	2	2	-	5	5	-	-	-	5
Smartphone	17	1	-	1	1	8	-	-	-	2
Total	51	9	6	3	11	23	3	1	1	12

4. RESULTS

In this chapter the results of the research will be discussed, starting with results of the questionnaires. Thereafter, findings of the interviews will be presented.

4.1 RESULTS OF THE QUESTIONNAIRES

The results of the questionnaires on construct level are presented in Table 6 and 7. The results on item level are included in Appendix D. To examine significance a t-test is conducted resulting in significant outcomes for every construct. Other results are derived through descriptive statistics.

When looking at the descriptive statistics of the personal caregivers, it can be noticed that all constructs have an average score above 3.40 with differences in results between personal caregivers of day care and assisted living. The latter scores higher in total and on every average construct. Especially, differences between the constructs Level of self-management (0.73), Resource attainment (0.52), and Communication team (0.45) are significantly high. Job satisfaction has the highest average score for both personal caregivers of day care (4.37) as of assisted living (4.57). On item level, personal caregivers assisted living score significantly higher than personal caregivers day care on items JS4 *I'm doing something worthwhile in my job* (4.30 compared to 4.70), JS5 *My work is challenging* (4.40 compared to 4.60), and JS6 *My work is satisfying* (3.70 compared to 4.40). The lowest average score is from the construct Resource attainment for both day care (3.43) and assisted living (3.95). On item level this score can be declared by item RA6 *My team is rewarded when we perform well* which results in an average score of 2.30 for personal caregivers day care and 3.00 for personal caregivers assisted living. The missing items of Health service navigation (HSN) were answered with No relevance and are related to

Table 6
Mean, Standard Deviation and Significance of each Construct divided by Personal Caregivers Day Care, Personal Caregivers Assisted Living and in Total

	Day care			Assisted living			Total		
Self-managed work teams	Mean	SD	Sig.	Mean	SD	Sig.	Mean	SD	Sig.
Level of self-management (LSM)	3.50	0.724	0.00	4.23	0.473	0.00	3.87	0.704	0.00
Level of teamwork (LT)	3.98	0.478	0.00	4.25	0.456	0.00	4.11	0.476	0.00
Job satisfaction (JS)	4.37	0.554	0.00	4.57	0.473	0.00	4.47	0.512	0.00
Team performance (TP)	3.93	0.274	0.00	4.17	0.491	0.00	4.05	0.405	0.00
Resource attainment (RA)	3.43	0.394	0.00	3.95	0.533	0.00	3.69	0.528	0.00
Total self-managed work teams	3.87	0.314		4.23	0.420		4.05	0.405	
Interdisciplinary collaboration									
Health service navigation (HSN)	3.91 *missing: 2*	0.640	0.00	4.38 *missing: 3*	0.443	0.00	4.14 *missing: 5*	0.584	0.00
Communication team (CT)	3.65	0.394	0.00	4.10	0.543	0.00	3.88	0.516	0.00
Perceived effectiveness (PE)	3.89 *missing: 1*	0.356	0.00	4.28	0.463	0.00	4.09 *missing: 1*	0.450	0.00
Total interdisciplinary collaboration	3.88	0.362		4.31	0.408		4.11	0.435	
Total all	3.97	0.297		4.25	0.415		4.12	0.379	

HSN1 *I communicate very confidently with my patient about his or her health* and HSN 3 *My patient confidently gives the information my team needs*. The rationale behind this answering is the low level of intelligence of the personal caregiver's patient.

When looking at the results of the legal representatives, there is some variation in the average construct scores. The highest score is for Health service navigation 2 (4.48), which is about communication between professionals and legal representatives. The lowest score is for Skill and technique acquisition (2.83). However, Skill and technique acquisition shows a high standard deviation (1.199) which means that there is variation in answering. This can be declared by different ranges of patient's intelligence. The same applies to item 4 of Health service navigation 1 *[name] feels like he or she is being heard.* The missing results of all constructs are answered with No relevance since these patients do not have the intelligence level to indicate things. However, according to the legal representatives, all patients have a high level of Social integration and support which means patients get help and understanding. In total, self-management scored an average of 3.85.

Table 7
Mean, Standard Deviation and Significance of each Construct for Legal Representatives

	Legal representatives		
Self-management	Mean	SD	Sig.
Positive and active engagement in life (EIL)	3.63 *missing: 4*	0.468	0.000
Health-directed behaviour (HDB)	4.10	0.937	0.000
Skill and technique acquisition (STA)	2.83 *missing: 1*	1.199	0.000
Health service navigation 1 (HSN1)	3.64 *missing: 5*	0.607	0.000
Social integration and support (SIS)	4.14 *missing: 3*	0.748	0.000
Health service navigation 2 (HSN2)	4.48 *missing: 2*	0.575	0.000
Total	3.85	0.556	

4.2 FINDINGS OF THE INTERVIEWS

Within this chapter, the most important findings of the interviews are discussed in a process-oriented manner. All findings of the interviews are presented in Table 14 which is included in Appendix E.

4.2.1 USE OF THE E-HEALTH SYSTEM

All interviews started with questions about the use of the e-health system. Half of the interviewees started to use the e-health system directly from the starting point, which was 1st of January 2017. Some personal caregivers started later due to lack of time or organizational problems. Most legal representatives could only get started after two months or longer due to problems with login codes. The e-health system is used on a daily basis by almost all personal caregivers with no difference between personal caregivers day care and assisted living. Legal representatives use the system weekly or monthly. As a result, there is less space for interaction between personal caregivers and legal representatives. Popular topics for which the e-health system is used are: daily reports (90%), messaging with (other) care professionals (23%), calendar (17%), and registration (17%) which is necessary for day care activities. Barely used is messaging with or within family (13%). Also, none of the interviewees uses the e-health system to upload pictures or documents other than medically. Before the e-health system, personal caregivers reported in notebooks or Excel. Some assisted living groups reported on the computer with connection to day care groups.

Though the e-health system is frequently used, there are several things that inhibit optimal use of the e-health system. For example, poor user-friendliness and lack of stakeholder support, which are both mentioned by 70% of the subjects. Age is often mentioned in relation to lack of stakeholder support, both for personal caregivers as for legal representatives. Furthermore, lack of stakeholder support is named because doctors/specialists or other (personal) caregivers do not use the e-health system. This has consequences for other users because daily reports are not read or access to documents is not given. Poor user-friendliness has frequently to do with daily reporting: the e-health system has no text formatting, no ability to save interim, no ability to classify on topics, and no colour schemes with moods.

Further, lack of motivation (60%) and appropriateness (50%) are frequently mentioned. Lack of motivation is also related to age and the given that older parents have a hard time dealing with everything around having a child with mental disabilities. They are not as curious to know what their child did, most often because they feel helpless if they know something went wrong afterwards. Besides lack of motivation, appropriateness is often mentioned in relation to legal representatives. It means they do not feel the urgency to use the e-health system because they are satisfied with the current situation. One of the interviewees said the following about this:

> “For me it was not necessary that I said ‘oh yes, this is something handy’. Yeah things were good the way they were uh when I have something I call or e-mail […] and in fact that is still the way I think it will be.” (LR3)

Other barriers in optimal use are: non-ability to use technology (40%), lack of time (33%), no epilepsy lists (13%), and transparency (13%). The latter means that users do not like the fact that others, for example their own child, can login on the system. Consequently, users are note on their guard when using the e-health system. All barriers in optimal use lead to the use of additional or substitutional communication channels. Telephone and e-mail are used by about 60% of the users, mainly because others do not use the e-health system or in case of emergencies. Also, phone calls are used to inform legal representatives in advance before they read about a situation in the e-health system. Lastly, notebooks are used because patients feel attached to them and because of poor user-friendliness of the e-health system.

4.2.2 IMPLEMENTATION OF THE E-HEALTH SYSTEM

During implementation of the e-health system, the case organization organised several activities. Personal caregivers and legal representatives were informed by e-mail. However, 35% of the total interviewed personal caregivers (50% from day care) mentioned there were too many e-mails to read or they had no time to read them. Someone stated: “We had so many mails. We were overwhelmed by it. Tremendously. At some point you do not read them anymore, you think whatever” (PCA2). In addition to the e-mails, the organization offered an amount of trainings that could be requested by the employees. These trainings were followed by twelve of the interviewed personal caregivers (40%). Three of them (25%) perceived the given information to be insufficient. Next to the trainings, all (potential) users could visit plenary meetings for more information about the e-health system. These meetings were visited by half of the interviewees and one third of them mentioned there was insufficient information. This lack of information is visible in conversations about the introduction conversation for the value network. Almost half of the interviewees who already had this conversation mentioned they were unsure what to discuss or whether everything was discussed. They stated they missed the guidelines and reports they used to have during personal development plan conversations. Then, personal caregivers had a wishes-and-expectations list which gave direction and clarity, and all people involved were given documents as preparation. However, patients experienced personal development plan conversations as a judgement. As stated by the interviewees, the new conversations were more patient-focused and this is valued. However, more patient-focused is not always positive. Some interviewees indicated that unrealistic expectations are created, as mentioned by one of them:

> “There is a workbook with pictures. To me these pictures are completely unrealistic. In this group they are like ‘when I see a picture with big cookies, I really want a big cookie’. […] I just want something realistic and not like here is a luxurious apartment. Yeah, that is really nice but we do not have that here. And if I cannot offer that why should I ask the question.” (PCA10)

When discussing the role of the case organization during implementation, 57% of the subjects experienced insufficient information and insufficient involvement. This resulted in the fact that some people transported information from the personal development plan into the e-health system, which is not the purpose. Overall, the subjects experienced they were thrown into depth with no idea how to fulfil the job correctly. 40% of the interviewees would have wanted an obligatory meeting in which they were taught about the system. From the subjects who mentioned this, two did not attend to any training or plenary meeting. Furthermore, some subjects requested for information about both parts of the e-health system (EHR and online portal), especially for personal caregivers since they frequently have to respond to legal representatives when they have questions about the system.

When looking at the role of the users, most interviewees belong to the category of late majority (37%) divided in 60% day care, 40% assisted living, and 10% legal representatives. This user group does not feel any rush to start with the e-health system and most often started to use it when there was no other option. For the personal caregivers this means that they were forced to use the e-health system because other programs were shut down and their surroundings started to use it. A personal caregiver day care describes the following situation:

> “[…] and then something new starts, honestly, for as long as I work here. And if things are getting better, I do not know. No. Last with transfer yeah you can use that but you have to login. And if you can make a call, it is way faster. And uhm yeah you get more things on your plate and new things give all extra work. So at a sudden moment it is no more fun. I pretty like new stuff but when you have no time for it, there is no fun.” (PCD6)

The second large group is of early majority (33%) with 40% day care, 20% assisted living, and 40% legal representatives. These interviewees started to use the e-health system from starting point but do not use every option of the e-health system: most only daily reports and calendar. They contact frequently with others about the e-health system and the personal caregivers did not transfer information from personal development plan to the e-health system. However, they have some negativities against the system due to poor user-friendliness and lack of stakeholder support. In total, 13% of the interviewees belong to the category early adopters (20% assisted living and 20% legal representatives). These interviewees were curious to start with the e-health system and explored the e-health system by themselves. They are frequently a contact point for their surroundings. The other users are categorized as innovators (7%) and laggards (10%). The innovators already had an account on [name e-health system] and are always looking for new ways of communicating. In contrast, the laggards do not know how to use the e-health system, have no urgency to use it, and feel confused.

4.2.3 VALUE PROPOSITIONS OF THE E-HEALTH SYSTEM

All interviewees were asked about what they think the organization wants to achieve with the e-health system. In relation to self-management of patients there is a lot of speculation, mostly because patients have low levels of intelligence and are mostly not capable of using the e-health system themselves. However, almost half of the interviewees think the organization wants to achieve more focus on patients. Also, 50% of the interviewees think that the organization wants to achieve better communication between patient/legal representatives and personal caregivers. However, some legal representatives indicate that this is inhibit due to poor user-friendliness of the e-health system as mentioned by one of them:

> “Because I also read in the news letters that it is intended to get better connection between relatives and caregivers. But then you should be able to exchange everything in a good way. Right now that is not the case. For me, that is a huge disadvantage of the system.” (LR4)

In relation to self-managed work teams and interdisciplinary collaboration, some subjects think the organization wants to achieve better professional-professional communication because everything is connected. The other aspects of this theme – knowledge exchange and medical decision-making – were barely mentioned. Other value propositions of the organization according to the interviewees are: more overview (17%), time saving (13%), join the digital age (10%), and less paper(work) (7%).

4.2.4 VALUES OF THE VALUE NETWORK

During the interviewees there appeared to be four ways of communicating in the value network. These are 1) between patient and personal caregiver, 2) between personal caregivers, 3) between legal representative and personal caregiver, and 4) between legal representative and patient. Mostly valued in use of the e-health system is communication between legal representative and personal caregiver. Least mentioned is communication between legal representative and patient.

First of all, the e-health system has the value of access to information. This means that users have the possibility to see what happened to the patient in daily reports or medically. Especially between personal caregivers (43%) and between personal caregivers and legal representatives (43%) access to information is valued. Before the e-health system, day care and assisted living had oral or written transfers but sometimes not all information was given due to circumstances, such as presence of the patient. Moreover, information about the personal development plan was stored in cabinets and not accessible to others without asking. The interviewees value that everything is reported in the e-health system. This results in access to all information for all people involved. For legal representatives this means that they are better up-to-date about the situation of their daughter, son, sister or brother. Legal representatives were always given the opportunity to look into information about their relative, however, according to the personal caregivers there was a threshold to do. Especially, personal caregivers at day care value access to information between legal representatives and personal caregivers because they experience less attention from legal representatives or relatives in general.

Secondly, users value the fact that they can be quickly informed in terms of time. Again, this is valued within communication between personal caregivers (17%) and between legal representatives and personal caregivers (17%). Previously, for example, someone would come to day care by bus in a moody condition because of what happened at assisted living. The personal caregiver should then call to assisted living to hear what happened and why the patient is in this current condition. All of this takes time. With the use of the e-health system, the personal caregiver of assisted living can write a report in the morning when the patient is on the way to day care. At day care, the personal caregiver can read what assisted living writes at the same time. People know at the same time what has happened and can correctly respond to the condition of the patient without guessing or telephoning.

In the third place, easier communication is a value of the e-health system in all four ways of communicating: patient-personal caregiver (17%), between personal caregivers (30%), legal representative-personal caregiver (53%), patient-legal representative (10%). Overall, the interviewees state there are short lines of communication and communication is more open, also because they all have access to information. Legal representatives can read what happened and this makes communicating with professionals more easily, especially for legal representatives that do not live in the region. Also, communicating with patients is easier for legal representatives and professionals because they can watch what activities the patient undertook and consequently have a topic for conversation. Mostly, patients really want to share their experiences however it is hard for them to express themselves, as stated by one of the legal representatives:

> “My sister has her own language and sometimes she has a very enthusiastic story and I do not know where she went. When I know that, I can respond to her, ask questions and let her tell her story. […] I can better understand what she means. Actually I can uh better communicate with her”. (LR1)

Fourth, the interviewees experience more involvement between members of the value network by using the e-health system. For legal representative-personal caregiver communication (40%) this is mostly through access of information. This results in more shared responsibility and a sense of togetherness. Furthermore, within patient-personal caregiver communication (27%) there is more involvement. Personal caregivers can report on the tablet which gives them opportunity to be together with patients and involve them in reporting of daily events. Overall, interviewees experience they are more connected and can collaborate with each other to get to best situation possible for the patient and act more patient-focused. Also, the concept as a whole is valued because of its focus on patients rather than what others find necessary for the patients.

Another value of the e-health system is professionalism, which is only valued by personal caregivers. The interviewees experience that reporting is more objective and extensive, as stated by one of the personal caregivers from day care:

> “I think that you think more carefully about communicating the transfer. That is what I notice in the team, from other colleagues. Like: Oh! I need to take this more seriously than just a mail to the [assisted living] group. Because that is what it usually was. This is more professional. It feels more professional so you act more professional. Otherwise it was a bit informal and to me this is not. And that is good because otherwise it was too easy or so.” (PCD2)

However, some personal caregivers experience they should be more discreet or reserved in their reports and tend to keep things behind. Other mentioned values of the e-health system are: more overview (43%) because everything is centralized, working in a digital environment (23%), time saving (13%), and less paper(work) (10%).

5. CONCLUSION

Within this chapter the research question will be answered. For the sake of clarity, the research question is: *How is value of an e-health system co-created in a value network of people with mental disabilities, their personal caregivers and their legal representatives in The Netherlands?*

The case organization wants the e-health system to stimulate self-management of patients and self-managed work teams and interdisciplinary collaboration. The results of the questionnaire for personal caregivers show that self-management of the personal caregivers is high. This might be due to the program the organization implemented to realize self-managed work teams. Further, self-managed work teams and interdisciplinary collaboration are in total and per construct higher for personal caregivers of assisted living compared to personal caregivers day of care. Especially, Level of self-management, Resource attainment, and Communication team are higher for personal caregivers of assisted living. There is no explanation for this in the demographics age, gender, education level and location, which means that differences are related to the working area. When looking at the results of the questionnaire for legal representatives, it can be concluded that self-management of patients is high due to Health-directed behavior and Social integration and support but lowered by Skill and technique acquisition. Health service navigation 2, which is about communication between legal representatives and personal caregivers, has high scores and this means that legal representatives are satisfied with this type of communication.

When looking at the findings of the interviews, the users of the e-health system adopt different user roles while interacting in the value co-creation process. Most users are categorized in the categories early majority, late majority and laggards. They started to use the e-health system due to organizational issues and under influence of peers. The few innovators and early adopters tried to stimulate use of the e-health system by peers. The e-health system is almost daily used by personal caregivers. However legal representatives use the e-health system on a weekly/monthly basis. As a result, there is less interaction between the different user groups via the e-health system. Furthermore, several barriers in use inhibit interaction processes in the value network. Lack of stakeholder support and poor user-friendliness are the main reasons why the e-health system is not successfully implemented by all users. Stakeholder support is important because actors in the value network have interdependent relationships. Lack of stakeholder support means that values of the e-health system cannot develop within the value network. Further, the mind-sets of the users lead to use of other additional or substitutional communication channels such as e-mail and telephone. But the use of the e-health systems also leads to use of other communication channels to inform legal representatives in advance before they read about a situation in the e-health system. All in all, value co-creation between users of the e-health system is more difficult since there is less interaction with the e-health system due to frequency of use and barriers in use.

The findings from the interviews confirm that the organization adopts a white-print thinking approach in implementation of the e-health system. This is because of the open space meetings, self-steering teams and low involvement level. Overall, the case organization takes a passive present role. According to users of the e-health system, the role of the case organization has been insufficient during implementation. Users had the need for more information and more involvement from the organization, for example in the form of an obligatory meeting. Important to note is that users who mention this, also followed at least one training or meeting. This means that there is a misfit between the role of the case organization and the role of the users of the e-health system.

Within the value network, it can be concluded that value outcomes are co-created among four ways of communicating. Mostly valued in use of the e-health system is communication between legal representatives and personal caregivers. Least affected is legal representative-patient communication. For communication between personal caregivers, the e-health system leads to access to information, being quickly informed, involvement, professionalism and easier communication. Compared to the personal development plan the personal caregivers are more up-to-date about situations of the patient. This leads to a higher feeling of involvement between day care and assisted living. Personal caregivers of day care feel sometimes left behind compared to personal caregivers of assisted living especially in communication with legal representatives. For communication between personal caregivers and legal representatives, value is also originated from access to information, being quickly informed, involvement, professionalism and easier communication because of the same reasons as for the personal caregivers. However, some personal caregivers are more on their guard in their daily reports because legal representatives can watch everything. On the other hand, this transparency leads to more professionalism in communication. Between patients and legal representatives, value is originated from easier communication since legal representatives have access to the activities of the patient, are quickly informed and consequently have a topic for conversation. On the other hand, some legal representatives are more on guard because the patient can also login on the e-health system. Easier communication is also valued between patients-personal caregivers communication. Furthermore, within this type of communication value is originated from more involvement.

When looking at the value propositions, the findings of the interviews show that the users think the case organization wants to achieve self-management of patients. This construct is achieved through access to care, access to information and patient-personal caregiver communication. In some cases the patient should be replaced by the legal representative because these patients are not capable to communicate with the personal caregivers themselves. Besides access to care, access to information and patient-personal caregiver communication, the interviewees also think the organization wants to achieve more focus on patients because the e-health system is created from the perspective of the patient rather than what the personal caregivers and legal representatives find appropriate for the patient. In contrast, the users do not think the organization wants to achieve self-managed work teams and interdisciplinary collaboration. They only mention that the organization wants better professional-professional communication. Knowledge exchange and medical decision-making are only mentioned by one person. This means that the value propositions are not fully aligned to the value outcomes.

All in all, this research shows the current status of the value propositions as measured with the questionnaires. It indicates the roles of the users and the case organization and the discrepancy between them. Further, this research explains which and how value is originated from the e-health system and their alignment to the value propositions. Lastly, it provides overall information about user perceptions concerning use and implementation of the e-health system and through what optimal use is inhibit. Table 8 provides an overview of the outcomes.

Table 8
Generated Value Outcomes and their connection to User groups, Value propositions and Barriers

Value Outcomes	For:	Belongs to value propositions:	Inhibit by:
Access to information	• Patients • Personal caregivers • Legal representatives	• Self-management of patients • Self-managed work teams • Interdisciplinary collaboration	• Poor user-friendliness • Appropriateness • Non-ability to use technology • Lack of stakeholder support • Lack of motivation • Privacy and data security • No access to (medical) information • Transparency • Lack of time
Easier communication	• Patients • Personal caregivers • Legal representatives	• Self-management of patients • Self-managed work teams • Interdisciplinary collaboration	
Involvement	• Personal caregivers • Legal representatives		
Professionalism	• Personal caregivers • Legal representatives		
Being quickly informed	• Personal caregivers • Legal representatives		
Time saving	• Personal caregivers		
Less paper(work)	• Personal caregivers		
More overview	• Personal caregivers		
Working in a digital environment	• Personal caregivers		

6. DISCUSSION

This final chapter captures theoretical and practical implications of the research. Also, limitations and suggestions for future research are given.

6.1 THEORETICAL IMPLICATIONS

The goal of this research was to find out how value of an e-health system is co-created by analysing how actors act in a value network and which value outcomes are generated and perceived from each other. In total, 30 users of an e-health system, who all collaborate in a value network, participated in this research. With the use of questionnaires, self-management of patients, self-managed work teams and interdisciplinary collaboration were measured. Semi-structured interviews were used in order to gain understanding of how actors of an e-health system act in a value co-creation process and what value outcomes in use are generated.

Value-in-use starts with the enactment of value propositions an organization formulates (Ballantyne & Varey, 2006). The value propositions of the case organization were increased self-management of patient, self-managed work teams and interdisciplinary collaboration. It was expected that the e-health system would stimulate self-management of patients, since e-health systems provide patient-professional communication, access to care and access to information (Murray et al., 2005; Alpay et al., 2010; Samoocha et al., 2010; Nijland et al., 2011; Fokkenrood et al., 2012; Gray et al., 2014). The value outcomes generated in use of the e-health system are patient-professional communication and access to information. Access to care is not valued within this research despite from what was expected, as presented in Table 2**.** However, the results show that the e-health system is more patient-focused in comparison to the personal development plan. This is because the e-health system works from the perspective of the patient rather than what legal representatives and personal caregivers find appropriate. Furthermore, it was expected that the e-health system would increase self-managed work teams and interdisciplinary collaboration. These constructs are achieved through professional-professional communication, knowledge exchange, and medical decision-making (Wiecha & Pollard, 2004; Van der Eijk et al., 2013). In contrast to what was expected and presented in Table 2, the e-health system does not stimulate knowledge exchange and medical decision-making. This is also against expectations of the case organization. It can be explained by the fact that users experience poor user-friendliness of the e-health system and do not use all its functionalities. Other barriers in use are appropriateness, non-ability to use technology, and lack of motivation, all in line with what was expected (Edmondson et al., 2001; Pagliari et al., 2005; Nijland et al., 2011; Urowitz et al., 2012; Vodicka et al., 2013; Gray et al., 2014). Additionally, this research shows that no access to information, transparency and lack of time are also barriers in use of an e-health system.

Furthermore, this research shows that value is co-created among four ways of communicating: between personal caregivers, between personal caregivers and legal representatives, between personal caregivers and patients, and between patients and legal representatives. Different disciplines and specializations can challenge the value co-creation process because of information asymmetry and complexity in knowledge (Aarikka-Stenroos & Jaakkola, 2012). Within this research this was not the case. Overall, the users agreed in their opinions of and experiences with the e-health system.

Also, this research shows what value outcomes in use actors generate. In line with Nijland et al. (2011), Van der Eijk et al. (2013), and Gray et al. (2014), the e-health system leads to more patient-professional communication. Furthermore, the e-health system has the value of professional-professional communication in line with Van der Eijk et al. (2013) and Gray et al. (2014). Also, access to information is valued by the users and this corresponds with findings from Urowitz et al. (2012). In contribution, this research shows that value is also originated from being quickly informed, involvement, and professionalism. Lastly, time saving, more overview, less paper(work), and working in a digital environment are value outcomes of an e-health system.

The findings of the interviews confirmed that the organization adopts a white-print think approach, which means that persons are expected to use their being as an instrument in order to make change processes successful (De Caluwé & Vermaak, 2004). For optimal implementation of the e-health system it was necessary that the users acted as innovators or early adopters since these types of users have a leading role in diffusion of an innovation (Rogers, 1995). When looking at the role of the users, only a few adopted the role of innovator or early adopter. This means, there is a misfit between the role of the case organization and the role of the users of the e-health system. It confirms the important role of the organization during the value co-creation process stating that the organization should carefully define its own contribution, as presented by Macdonald et al. (2011). As stated by Dumay (2007), e-health must be implemented thoughtfully to yield full benefit to the patient. The pitfalls of the white-print thinking approach lie in superficial understanding and laissez faire (De Caluwé & Vermaak, 2004). This can be supported because the users experienced insufficient information and involvement from the case organization.

The barriers in use of the e-health system and the discrepancy between the role of the organization and the roles of the users can explain the mismatch between postulated benefits and actual outcomes of e-health systems, Van Gemert-Pijnen et al. (2011) were referring to. In order to get alignment between value outcomes and value propositions, this research shows there should be more involvement of organizations during the implementation process of e-health systems and e-health systems should compromise to the values of actual users before the implementation starts. Only then, users can generate valuable outcomes from the use of e-health systems.

6.2 PRACTICAL IMPLICATIONS

For practical implications, this research shows the importance for organizations to involve users during the implementation of an innovation. It will lead to more involvement and stakeholder engagement and, as mentioned by Van Gemert-Pijnen et al. (2011), stakeholder engagement results in trust, commitment and a positive attitude towards e-health systems. This research determines how users of an e-health system act when a discrepancy exists between the role of the organization and the role of (most) users. Within this research an innovation is implemented according the white-print thinking approach. The white-print thinking approach allows room for self-organization (De Caluwé & Vermaak, 2004). However, this research shows that the user roles might not fit an organization's desires. The users perceive the role of the organization to be insufficient and consequently the e-health system is not optimally used.

For the case organization it is advised to take a more present active role. Try to stimulate users by clear information and a greater sense of control since the users requested for more presence and involvement of the organization during the implementation process. This research shows that despite of what might be expected, users would like the organization to take more control in order to obtain more agreement between different user groups. Also, it is advised to make use of innovators and early adopters as influencers to convince others to use the e-health system. Early adopters stimulate the critical mass to adopt an innovation (Rogers, 1995). Furthermore, it is advised to have a critical look at the functionalities of the e-health system since the users mentioned poor user-friendliness as a major barrier in use of the e-health system.

Lastly, this research explains which and how value outcomes are generated within the value network of users. The value outcomes within this research can be used to convince potential users of the necessity of e-health systems, where after their use can help to generate more value outcomes since the value co-creation process can be expanded. The e-health system has values which were not mentioned in previous research, especially for personal caregivers and legal representatives. Therefore, this research might stimulate other organizations to implement an e-health system. Besides the given that most users enjoy working in a digital environment, being up-to-date leads to more involvement and consequently more focus on patients.

6.3 LIMITATIONS AND FUTURE RESEARCH

After all, every research has its limitations. The first limitation of this research is that the quantitative part was conducted with only a few respondents and therefore the outcomes are hard to generalise. Also, a small sample size might have influenced the statistics. The second limitation is that no patients participated due to a low level of intelligence or lack of permission from legal representatives. This means that findings about the patients are retrieved from the legal representatives' perspectives. Though the legal representatives know very well what the patients have on their mind, it limits the outcomes and reliability of the research. The last limitation is that the qualitative outcomes are obtained from self-reported data, to know the interviews. Interviews have the disadvantage of small sample sizes and therefore generalizations of the findings are hard to make (Boyce & Neale, 2006). To enlarge reliability of the outcomes it was advisable to organize more interview rounds with the participants. However, within this research there was no time and space to do so.

The limitations of this research offer space for future research. A suggestion for future research is to conduct a quantitative research, with a larger sample size, to strengthen the qualitative results. The qualitative results provide a starting point for a quantitative setup. In the quantitative setup, a questionnaire should be designed that covers the value outcomes from this research, like *professionalism, involvement* and *easier communication*. The questionnaire should be distributed within the value network of patients, personal caregivers and legal representatives. Another suggestion is to enlarge the user group. This research focused on the value network that represents the most important people involved. However, patients are surrounded by more professionals, like primary and middle school and general practitioners. Ideally, all those people should participate in the e-health system which means that the value network enlarges. The value co-creation process could then be researched in a more extensive way with the use of focus groups. In contrast to regular interviews, focus groups include group interaction which encourages participants to explore and clarify perspectives, both individual and shared (Morgan, 1996). Another suggestion is to research what influence self-management and self-managed work teams have on adoption of an innovation. Users that score high on self-management and self-managed work teams might adopt an innovation more easily since early adopters score high on social participation, are better able to cope with uncertainty, and have greater empathy (Rogers, 1995). Lastly, for most optimal results future research should conduct a long-term research, from the start of the implementation till optimal use, which gives possibility for more research interventions.

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APPENDIX A: QUESTIONNAIRES

Table 9

Questionnaire for Personal Caregivers with Answer Scale and Source

Questionnaire items	Answer scale	Adapted from
Introduction questions		
“What is your gender?”	1. Male 2. Female	
“What is your age?”	None	
“What is your highest level of education?”	1. Primary school 2. High school 3. Vocational education 4. University of applied sciences 5. University of research	
“How often do you use: - Personal computer - Laptop/netbook - Tablet/iPad - Smartphone	1. Daily 2. Almost daily 3. 2 to 3 times a week 4. 2 to 3 times a month 5. Less than 1 time a month 6. Never	
Self-managed work teams		
Level of self-management		
‘‘My team works independently of supervision.’’ ‘‘My team makes decisions autonomously.’’ ‘‘My performance evaluation is related to my team’s performance.’’ *(deleted)* ‘‘Top leaders in my organization trust my team.’’	1. Strongly disagree 2. Disagree 3. Neither agree nor disagree 4. Agree 5. Strongly agree 6. No relevance	Yang & Guy (2011) By Campion et al. (1993) *Personnel Psychology* Impact factor 2015: 4.057 Cordery et al. (1991) *Academy of Management Journal* Impact factor 2015: 6.233 Kirkman & Chapiro (2001) *Academy of Management Journal* Impact factor 2015: 6.233
Level of teamwork		
‘‘My team members share responsibility.’’ ‘‘Leadership in my team is shared among the members.’’ ‘‘My teammates are helpful to me.’’ ‘‘I am unhappy when my teammates perform poorly.’’ ‘‘My team relies on consensus to get the work done.’’ *(deleted)*	1. Strongly disagree 2. Disagree 3. Neither agree nor disagree 4. Agree 5. Strongly agree 6. No relevance	Yang & Guy (2011) By Campion et al. (1993) *Personnel Psychology* Impact factor 2015: 4.057 Cordery et al. (1991) *Academy of Management Journal* Impact factor 2015: 6.233 Kirkman & Chapiro (2001) *Academy of Management Journal* Impact factor 2015: 6.233
Job satisfaction		
‘‘My work is valued.’’ ‘‘My job is interesting.’’ ‘‘My work gives me a sense of accomplishment.’’ ‘‘I’m doing something worthwhile in my job.’’ ‘‘My work is challenging.’’ ‘‘My work is satisfying.’’	1. Strongly disagree 2. Disagree 3. Neither agree nor disagree 4. Agree 5. Strongly agree 6. No relevance	Yang & Guy (2011) By Campion et al. (1993) *Personnel Psychology* Impact factor 2015: 4.057 Cordery et al. (1991) *Academy of Management Journal* Impact factor 2015: 6.233 Kirkman & Chapiro (2001) *Academy of Management Journal* Impact factor 2015: 6.233

Team performance		
‘‘My team’s service quality is high.’’ ‘‘My team’s productivity is high.’’ ‘‘My team’s service costs are within the budget.’’ ‘‘My team is effective.’’ ‘‘My teammates are creative in their jobs.’’ ‘‘My team helps to achieve the organization’s mission.’’	1. Strongly disagree 2. Disagree 3. Neither agree nor disagree 4. Agree 5. Strongly agree 6. No relevance	Yang & Guy (2011) By Campion et al. (1993) *Personnel Psychology* Impact factor 2015: 4.057 Cordery et al. (1991) *Academy of Management Journal* Impact factor 2015: 6.233 Kirkman & Chapiro (2001) *Academy of Management Journal* Impact factor 2015: 6.233
Resource attainment		
‘‘My team has been able to attract good employees.’’ ‘‘My team has been able to obtain information necessary to do our work.’’ ‘‘My team has been able to receive the equipment that it needs.’’ ‘‘My team makes use of opportunities for training and career development.’’ ‘‘My team works well together when selecting new members.’’ ‘‘My team is rewarded when we perform well.’’	1. Strongly disagree 2. Disagree 3. Neither agree nor disagree 4. Agree 5. Strongly agree 6. No relevance	Yang & Guy (2011) Composite reliability: 0.81 By Campion et al. (1993) *Personnel Psychology* Impact factor 2015: 4.057 Cordery et al. (1991) *Academy of Management Journal* Impact factor 2015: 6.233 Kirkman & Chapiro (2001) *Academy of Management Journal* Impact factor 2015: 6.233
Interdisciplinary collaboration		
Health services navigation		
“I communicate very confidently with my patient about his or her health” “I have very positive relationships with patient” “My patient confidently gives the information my team needs.” “I work in a team with my patient and other healthcare professionals”	1. Strongly disagree 2. Disagree 3. Neither agree nor disagree 4. Agree 5. Strongly agree 6. No relevance	Osborne et al. (2007) *Patient education and counselling* Impact factor 2015: 2.232
Communication team		
“Information passed between team members is accurate.” “I find it difficult to ask the advice of others in my team.” *(rescaled)* “There is effective communication between team members about patient care.” “Team members are not well informed regarding events that happened in other shifts.” *(rescaled)*	1. Strongly disagree 2. Disagree 3. Neither agree nor disagree 4. Agree 5. Strongly agree 6. No relevance	Temkin-Greener et al. (2004) *Medical Care* Impact factor 2015: 3.081
Perceived effectiveness		
“My team does a good job in meeting family member’s needs.” “Although there is a variety of patients, our team’s outcomes are very good.” “My team almost always meets our patient’s care needs.” “Overall, my team functions very well together.”	1. Strongly disagree 2. Disagree 3. Neither agree nor disagree 4. Agree 5. Strongly agree	Temkin-Greener et al. (2004) *Medical Care* Impact factor 2015: 3.081

Table 10

Questionnaire for Legal Representatives with Answer Scale and Source

Questionnaire items	**Answer scale**	**Adapted from**
Introduction questions		
“What is your gender?” (Q01)	1. Male 2. Female	
“What is your age?” (Q02)	None	
“What is your highest level of education?” (Q03)	1. Primary school 2. High school 3. Vocational education 4. University of applied sciences 5. University of research	
“How often do you use..?” (Q04) - Personal computer - Laptop/netbook - Tablet/iPad - Smartphone	1. Daily 2. Almost daily 3. 2 to 3 times a week 4. 2 to 3 times a month 5. Less than 1 time a month 6. Never	
Self-management		
Positive and active engagement in life		
“[name] is doing interesting things in his or her life” “Most days [name] is doing some of the things he or she really enjoys” “[name] has plans to do enjoyable things for himself or herself” “[name] feels like he or she is actively involved in life	1. Strongly disagree 2. Disagree 3. Neither agree nor disagree 4. Agree 5. Strongly agree 6. No relevance	Osborne et al. (2007) *Patient education and counselling* Impact factor 2015: 2.232
Health directed behavior		
“[name] walks for exercise, for at least 15 min per day, most days” *(deleted)* “[name] does at least one type of physical activity every day, most days of the week” “[name] enjoys to exercise”	1. Strongly disagree 2. Disagree 3. Neither agree nor disagree 4. Agree 5. Strongly agree 6. No relevance	Osborne et al. (2007) *Patient education and counselling* Impact factor 2015: 2.232
Skill and technique acquisition		
“When [name] has symptoms, he or she has the skills that helps to cope” “[name] is very good at using the computer” (*deleted)* “[name] has effective skills that helps him or her handle anger”	1. Strongly disagree 2. Disagree 3. Neither agree nor disagree 4. Agree 5. Strongly agree 6. No relevance	Osborne et al. (2007) *Patient education and counselling* Impact factor 2015: 2.232
Health services navigation 1		
“[name] communicates very confidently with his or her healthcare professionals about his or her health” “[name] has very positive relationships with his or her healthcare professionals” “[name] confidently gives healthcare professionals the information they need” “[name] feels like he or she is being heard” “[name] works in a team with his or her healthcare professionals”	1. Strongly disagree 2. Disagree 3. Neither agree nor disagree 4. Agree 5. Strongly agree 6. No relevance	Osborne et al. (2007) *Patient education and counselling* Impact factor 2015: 2.232

Social integration and support		
"[name] has enough friends who help him or her cope with his or her health" "If [name] needs help, he or she has plenty of people to rely on" "When [name] feels ill, family and carers really understand" "Overall, [name] feels well looked after by friends and family"	1. Strongly disagree 2. Disagree 3. Neither agree nor disagree 4. Agree 5. Strongly agree 6. No relevance	Osborne et al. (2007) *Patient education and counselling* Impact factor 2015: 2.232
Health service navigation 2		
"I communicate very confidently with the healthcare professionals about [name] health" "I have very positive relationships with the healthcare professionals" "I confidently give healthcare professionals the information they need" "I feel I am being heard" "I work in a team with my doctors and other healthcare professionals"	1. Strongly disagree 2. Disagree 3. Neither agree nor disagree 4. Agree 5. Strongly agree 6. No relevance	Osborne et al. (2007) *Patient education and counselling* Impact factor 2015: 2.232

APPENDIX B: INTERVIEW SCHEDULES

Table 11

Interview Schedule for Personal Caregivers

Topic	Question	Adapted from
Introductie	- Voorstellen onderzoeker - Introduceren onderwerp - Uitleggen doel onderzoek - Uitleggen procedure (inclusief informed consent)	
Inleiding	1. Hoe lang maakt u nu gebruik van [naam e-health systeem]? 2. Heeft u al het gesprek gevoerd met een cliënt? 3. Hoe vaak gebruikt u [naam e-health systeem]? 4. Waarvoor gebruikt u [naam e-health systeem]? 5. Hoe vaak maakt u contact met [online portal]? 6. Waarvoor maakt u connectie met [online portal]?	
Implementatie	7. Kunt u iets vertellen over de manier waarop [naam e-health systeem] is geïmplementeerd? 8. Wat vond u hiervan?	
Gebruik	9. Kunt u iets vertellen over hoe u gebruik maakt van [naam e-health systeem]? 10. Hoe verloopt communicatie via [naam e-health systeem] met andere zorgverleners? 11. Hoe verloopt communicatie via [naam e-health systeem] met cliënten en cliëntvertegenwoordigers?	
Value propositions	12. Wat denkt u dat de organisatie met [naam e-health systeem] wil bereiken? [meer eigen regie en zeggenschap; andere samenwerking] 13. Wat vindt u hiervan?	Macdonald et al. (2011)
Value-in-use	14. Wat vindt u waardevol aan het gebruiken van [naam e-health systeem]? 15. Wat vindt u niet fijn aan het gebruiken van [naam e-health systeem]? 16. Wat zou er kunnen gebeuren om dit te veranderen? 17. In hoeverre denkt u dat [naam e-health systeem] bijdraagt aan de interactie binnen de driehoek?	Macdonald et al. (2011) Gray et al. (2014)
Afsluiting	18. Is er nog iets wat we zouden moeten bespreken wat relevant kan zijn?	Downs and Adrian (2004)

Table 12
Interview Schedule for Legal Representatives

Topic	Question	Adapted from
Introductie	- Voorstellen onderzoeker - Introduceren onderwerp - Uitleggen doel onderzoek - Uitleggen procedure (inclusief informed consent)	
Inleiding	1. Hoe lang maakt u nu gebruik van [naam e-health systeem]? 2. Heeft u ook al het gesprek gevoerd? 3. Hoe vaak gebruikt u [naam e-health systeem]? 4. Waarvoor gebruikt u [naam e-health systeem]?	
Implementatie	5. Kunt u iets vertellen over de manier waarop [naam e-health systeem] is geïmplementeerd? 6. Wat vond u hiervan?	
Gebruik	7. Kunt u iets vertellen over hoe u gebruik maakt van [naam e-health systeem]? 8. Hoe verloopt communicatie via [naam e-health systeem] door middel van de berichtenfunctie met zorgverleners en andere connecties?	
Value propositions	9. Wat denkt u dat de organisatie met [naam e-health systeem] wil bereiken? 10. Wat vindt u hiervan?	Macdonald et al. (2011)
Value-in-use	11. Wat vindt u waardevol aan het gebruiken van [naam e-health systeem]? 12. Wat vindt u niet fijn aan het gebruiken van [naam e-health systeem]? 13. Wat zou er kunnen gebeuren om dit te veranderen? 14. In hoeverre denkt u dat [naam e-health systeem] bijdraagt aan de interactie binnen de driehoek?	Macdonald et al. (2011) Gray et al. (2014)
Afsluiting	15. Is er nog iets wat we zouden moeten bespreken wat relevant kan zijn?	Downs and Adrian (2004)

APPENDIX C: INFORMED CONSENT

Beste deelnemer,

Hartelijk dank voor uw deelname aan deze evaluatieronde van [naam e-health systeem]. Uw medewerking wordt erg gewaardeerd.

Deze evaluatie wordt onafhankelijk georganiseerd door de Universiteit Twente vanuit de projectgroep. De evaluatie begint met een interview en daarna zal u gevraagd worden een korte vragenlijst in te vullen. De gehele sessie zal maximaal driekwartier in beslag nemen.

Er worden vragen gesteld die betrekking hebben op uzelf en op het gebruik van [naam e-health systeem]. Er wordt naar uw mening, ervaringen en ideeën gevraagd. Er zijn geen goede of foute antwoorden. Alles wat u zegt is relevant. Het is belangrijk dat u begrijpt dat er vertrouwelijk met uw gegevens wordt omgegaan en dat anonimiteit gegarandeerd wordt.

Het interview wordt opgenomen. Dit is noodzakelijk om dat wat gezegd wordt te kunnen analyseren. De geluidsopnames worden uitsluitend voor dit onderzoek gebruikt en zijn uitsluitend voor mij beschikbaar.

Mocht u in de toekomst nog vragen hebben of meer informatie willen, dan mag u contact opnemen met Marion Carol via m.carol@student.utwente.nl.

Zijn uw vragen voor nu beantwoord? Dan mag u de achterzijde van deze pagina doorlezen en invullen.

Met vriendelijke groet,

Marion Carol
student MSc Business Administration
Universiteit Twente

In te vullen door de deelnemer

Naam deelnemer:____

Datum: _______________

- Ik verklaar hierbij op voor mij duidelijke wijze te zijn ingelicht over de aard en methode van het onderzoek, zoals geschreven in de bovenstaande informatiebrief.

- Ik begrijp dat de geluidsopname uitsluitend voor analyse wordt gebruikt en uitsluitend beschikbaar is voor Marion Carol.

- Ik stem geheel vrijwillig in met deelname aan dit onderzoek. Ik heb het recht deze instemming weer in te trekken zonder dat ik daarvoor een reden hoef op te geven en besef dat ik op elk moment mag stoppen met het onderzoek.

- Indien mijn onderzoeksresultaten gebruikt zullen worden in wetenschappelijke publicaties, dan wel op een andere manier openbaar worden gemaakt, zal dit volledig geanonimiseerd gebeuren.

- Mijn persoonsgegevens zullen niet door derden worden ingezien zonder mijn uitdrukkelijke toestemming.

- Mijn vragen zijn naar tevredenheid beantwoord.

Handtekening deelnemer: ________________________

In te vullen door de uitvoerende onderzoeker

Naam onderzoeker: ____

Datum: _____________

- Ik heb een mondelinge en schriftelijke toelichting gegeven op het onderzoek. Ik zal resterende vragen over het onderzoek naar vermogen beantwoorden. De deelnemer zal van een eventuele voortijdige beëindiging van deelname aan dit onderzoek geen nadelige gevolgen ondervinden.

Handtekening onderzoeker: ________________________

APPENDIX D: RESULTS QUESTIONNAIRES

Table 13

Results on Item Level of Questionnaire for Personal Caregivers

	Day care		Assisted living		Total	
Self-managed work teams	Mean	SD	Mean	SD	Mean	SD
Level of self-management						
“My team works independently of supervision.”	3.00	0.943	4.00	0.667	3.50	0.946
“My team makes decisions autonomously.”	3.80	1.033	4.50	0.527	4.15	0.875
“Top leaders in my organization trust my team.”	3.70	0.949	4.20	0.632	3.95	0.826
Level of teamwork						
“My team members share responsibility.”	4.20	0.632	4.50	0.527	4.35	0.587
“Leadership in my team is shared among the members.”	3.10	0.994	4.00	0.816	3.55	0.999
“My teammates are helpful to me.”	4.50	0.527	4.40	0.516	4.45	0.510
“I am unhappy when my teammates perform poorly.”	4.10	0.568	4.10	0.738	4.10	0.641
Job satisfaction						
“My work is valued.”	4.70	0.483	4.50	0.527	4.60	0.503
“My job is interesting.”	4.70	0.483	4.60	0.516	4.65	0.489
“My work gives me a sense of accomplishment.”	4.70	0.823	4.60	0.516	4.45	0.686
“I’m doing something worthwhile in my job.”	4.30	0.699	4.70	0.483	4.55	0.605
“My work is challenging.”	4.40	0.516	4.60	0.516	4.50	0.513
“My work is satisfying.”	3.70	1.059	4.40	0.699	4.05	0.945
Team performance						
“My team’s service quality is high.”	3.60	0.516	4.60	0.516	4.10	0.718
“My team’s productivity is high.”	4.10	0.568	4.50	0.527	4.30	0.571
“My team’s service costs are within the budget.”	4.00	0.667	3.40	1.350	3.70	1.081
“My team is effective.”	3.80	0.422	4.10	0.738	3.95	0.605
“My teammates are creative in their jobs.”	4.10	0.568	4.20	0.632	4.15	0.587
“My team helps to achieve the organization’s mission.”	4.00	0.471	4.20	0.422	4.10	0.447
Resource attainment						
“My team has been able to attract good employees.”	3.90	0.316	4.00	0.667	3.95	0.510
“My team has been able to obtain information necessary to do our work.”	3.90	0.316	4.30	0.675	4.10	0.553
“My team has been able to receive the equipment that it needs.”	3.80	0.632	4.30	0.675	4.05	0.686
“My team makes use of opportunities for training and career development.”	3.10	0.876	4.10	0.738	3.60	0.940
“My team works well together when selecting new members.”	3.70	0.675	4.00	1.054	3.85	0.875
“My team is rewarded when we perform well.”	2.30	0.632	3.00	0.816	2.60	0.821
Interdisciplinary collaboration	Mean	SD	Mean	SD	Mean	SD
Health service navigation						
“I communicate very confidently with my patient about his or her health”	3.44 *missing 1*	0.892	4.25 *missing: 2*	0.707	3.82 *missing: 3*	0.883
“I have very positive relationships with patient”	4.50	0.707	4.40	0.516	4.45	0.605
“My patient confidently gives the information my team needs.”	3.78 *missing 1*	0.833	4.56 *missing 1*	0.527	4.17 *missing: 2*	0.786
“I work in a team with my patient and other healthcare professionals”	3.90	0.738	4.30	0.675	4.10	0.718
Communication team						
“Information passed between team members is accurate.”	3.80	0.422	4.00	0.667	3.90	0.553
“I find it difficult to ask the advice of others in my team.” *(rescaled)*	4.10	0.876	4.40	0.516	4.25	0.716
“There is effective communication between team members about patient care.”	4.00	0.943	4.20	0.632	4.10	0.788
“Team members are not well informed regarding events that happened in other shifts.” (*rescaled)*	2.70	0.949	3.80	1.033	3.25	1.118
Perceived effectiveness						
“My team does a good job in meeting family member’s needs.”	3.67 *missing 1*	0.500	4.40	0.516	4.05 *missing 1*	0.621
“Although there is a variety of patients, our team’s outcomes are very good.”	4.00	0.667	4.20	0.632	4.10	0.641
“My team almost always meets our patient’s care needs.”	3.80	0.632	4.20	0.422	4.00	0.562
“Overall, my team functions very well together.”	4.10	0.568	4.30	0.675	4.20	0.616

Table 14
Results of Item Level of Questionnaire for Legal Representatives

	Legal representatives	
	Mean	SD
Positive and active engagement in life		
“[name] is doing interesting things in his or her life”	4.10	0.568
“Most days [name] is doing some of the things he or she really enjoys”	4.30	0.483
“[name] has plans to do enjoyable things for himself or herself”	2.75 *missing: 1*	1.282
“[name] feels like he or she is actively involved in life	3.29 *missing: 3*	0.756
Health directed behavior		
“[name] walks for exercise, for at least 15 min per day, most days” *(deleted)*	3.70	1.059
“[name] does at least one type of physical activity every day, most days of the week”	4.00	0.943
“[name] enjoys to exercise”	4.20	1.033
Skill and technique acquisition		
“When [name] has symptoms, he or she has the skills that helps to cope”	2.89 *missing: 1*	1.453
“[name] has effective skills that helps him or her handle anger”	2.78 *missing: 1*	1.093
Health services navigation 1		
“[name] communicates very confidently with his or her healthcare professionals about his or her health”	2.75 *missing: 2*	1.035
“[name] has very positive relationships with his or her healthcare professionals”	4.40	0.516
“[name] confidently gives healthcare professionals the information they need”	2.86 *missing: 3*	1.215
“[name] feels like he or she is being heard”	4.10	0.738
“[name] works in a team with his or her healthcare professionals”	3.83 *missing: 4*	1.169
Social integration and support		
“[name] has enough friends who help him or her cope with his or her health”	3.38 *missing: 2*	1.061
“If [name] needs help, he or she has plenty of people to rely on”	4.20	0.919
“When [name] feels ill, family and carers really understand”	4.38 *missing: 2*	0.744
“Overall, [name] feels well looked after by friends and family”	4.50	0.527
Health service navigation 2		
“I communicate very confidently with the healthcare professionals about [name] health”	4.67 *missing: 1*	0.500
“I have very positive relationships with the healthcare professionals”	4.50	0.707
“I confidently give healthcare professionals the information they need”	4.67 *missing: 1*	0.500
“I feel I am being heard”	4.30	0.675
“I work in a team with my doctors and other healthcare professionals”	4.25 *missing: 2*	0.886

APPENDIX E: FINDINGS INTERVIEWS

Table 15

Findings of the Interviews per User Category with Number of Persons and Number of Quotes

Key themes	Sub themes	Definition	Code	Personal caregivers day care	Personal caregivers assisted living	Legal representatives	Total
1. Use	A. Duration	Time user started	1. From starting point	7	6	2	15
			2. 1 week from starting point	1	1	-	2
			3. 1 month from starting point	2	2	-	4
			4. 2 months from starting point	-	-	3	3
			5. Longer	-	-	5	5
	B. Frequency	Time user uses e-health system	1. Daily	7	8	2	17
			2. Almost daily	-	-	-	-
			3. 2-3 times a week	-	1	4	5
			4. 2-3 times a month	-	-	4	4
	C. Topics	For which use	1. Daily reports	9(11)	9 (11)	9(13)	27
			2. Messaging with (other) care professionals	1	2	4(5)	7
			3. Messaging with family	1	3	-	4
			4. Calendar	-	1(2)	4(5)	5
			5. Incident report	-	3	-	3
			6. Registration	4	1	-	5
			7. Medical	-	2	1	3
			8. Other	1	5(6)	1	7
	D. Barriers in use	Things that inhibit use of the e-health system	1. Poor user-friendliness	5(11)	9(25)	7(15)	21
			2. Appropriateness	4(7)	6(9)	5(7)	15
			3. Non-ability to use technology	4(4)	4(5)	4(5)	12
			4. Lack of stakeholder support	8(21)	6(16)	7(15)	21
			5. Lack of motivation	5(7)	7(10)	6(11)	18
			6. Privacy and data security	-	-	2(3)	2
			7. No epilepsy lists	2(3)	2(3)	-	4
			8. No access to (medical) information	-	-	4(16)	4
			9. Registration	2(2)	1(2)	-	3
			10. Transparency	2(2)	1	1	4
			11. Lack of time	6(10)	2	2(3)	10
			12. Other	7(11)	8(9)	1	16
	E. Other communication channels	That are used besides the e-health system	1. Telephone	5(7)	7(11)	7(10)	19
			2. E-mail	5(8)	7(11)	6(9)	18
			3. Notebook patients	2(5)	4(5)	2(4)	8
			4. Notebook professionals	1(2)	4(8)	-	5
			5. Community	1	-	1(2)	2
			6. Other	1	3	3	7
2. Implementation	A. ‘Het gesprek’	Things about the introduction conversation with the value network	1. Not clear what to discuss	4(6)	3(6)	1	8
			2. Unsure everything is discussed	-	-	1	1
			3. More patient-focused	3(4)	4(6)	1	8
			4. No “het gesprek” yet	4	4	3	11

			5.	Other	-	1	3(5)	4
	B. Training	That can be requested	1.	Followed on own initiative	6	6	-	12
			2.	Sufficient information	-	2	-	2
			3.	Insufficient information	3(4)	-	-	3
			4.	No training	4	4	-	8
	C. Plenary meeting	That could be visited	1.	Followed on own initiative	5 (1 verpl)	6(7)	4	15
			2.	Sufficient information	-	-	-	-
			3.	Insufficient information	-	3(4)	2	5
			4.	No plenary meeting	5	4	6	15
	D. E-mails	That have been received	1.	Too many to read or no time to read	5(6)	2(3)	-	7
			2.	Sufficient information	1	-	2	3
			3.	Insufficient information	-	-	-	-
			4.	No e-mails received	-	1	-	1
	E. Role organization	Position of the organization during implementation	1.	Sufficient information	1	2(3)	2	5
			2.	Insufficient information	6(11)	5(12)	6(12)	17
			3.	Sufficient involvement	1	3(5)	4(5)	8
			4.	Insufficient involvement	6(14)	6(11)	5(10)	17
			5.	Need for obligatory meeting	7	5(11)	-	12
			6.	Need for more information about both systems	1	1	3(5)	5
	F. Role users	Position of users during implementation	1.	Innovators	-	-	2	2
			2.	Early adopters	0	2	2	4
			3.	Early majority	4	2	4	10
			4.	Late majority	6	4	1	11
			5.	Laggards	0	2	1	3
3. Value propositions	A. Self-management of patients	What users think the organization wants to achieve for patients	1.	Patient/LR-professional communication	5(7)	3	7(10)	15
			2.	Access to care	3	-	-	3
			3.	Access to information	4	-	-	4
			4.	More patient-focused	5	7(10)	2(3)	14
			5.	Not possible due do levels	1	1	3	5
	B. Self-managed work teams/ Interdisciplinary collaboration	What users think the organization wants to achieve for employees	1.	Professional-professional communication	4(5)	2(3)	1(2)	7
			2.	Knowledge exchange	1	-	-	1
			3.	Medical decision-making	2	-	-	2
			4.	Other	-	-	-	-
	C. Other values	What users else think the organization wants to achieve	1.	Time saving	2	-	2	4
			2.	Less paper(work)	-	1	1	2
			3.	More overview	2	3	-	5
			4.	Join the digital age	-	2	1	3
			5.	Other	1	4	4	9
4. Values of value network	A. Access to information	How users value access to information within value network	1.	Patient-professional communication	3(5)	-	-	3
			2.	Professional-professional communication	6(14)	6(8)	1	13
			3.	LR-professional communication	5(6)	1	7(9)	13
			4.	LR-patient communication	-	-	1	1
	B. Quickly	How users value	1.	Patient-professional communication	-	-	-	-

		informed: in terms of time	time within value network	2.	Professional-professional communication	3	2(3)	-	5
				3.	LR-professional communication	2	-	3(5)	5
				4.	LR-patient communication	-	-	-	-
		C. Involvement	How users value involvement within value network	1.	Patient-professional communication	2(3)	3	3	8
				2.	Professional-professional communication	1	2(5)	-	3
				3.	LR-professional communication	3(5)	2(8)	7(14)	12
				4.	LR-patient communication	-	-	1	1
		D. Knowledge exchange	How users value knowledge exchange within value network	1.	Patient-professional communication	-	-	-	-
				2.	Professional-professional communication	1	-	-	1
				3.	LR-professional communication	-	-	-	-
				4.	LR-patient communication	-	-	-	-
		E. Professionalism	How users value to be more professional within value network	1.	Patient-professional communication	-	1	-	1
				2.	Professional-professional communication	4	-	-	4
				3.	LR-professional communication	2(3)	4	-	6
				4.	LR-patient communication	-	-	-	-
		F. Easier communication	How users value communication within value network	1.	Patient-professional communication	2(3)	2	1	5
				2.	Professional-professional communication	4(5)	5(6)	-	9
				3.	LR-professional communication	3(4)	6(7)	7(12)	16
				4.	LR-patient communication	-	-	3(5)	3
		G. Other values	What users else value in use	1.	Time saving	2	1	1	4
				2.	Less paper(work)	1	2	-	3
				3.	More overview	5(11)	4(5)	4(5)	13
				4.	Digital environment	3(5)	3(5)	1	7
				5.	Other	2	4(5)	1(2)	7
5.	Previous situation	A. Personal development plan conversation				7(12)	5(7)	6(11)	18
		B. Daily reports				4	5(9)	1	10
		C. Access to information		1.	Patient-professional communication	-	-	-	-
				2.	Professional-professional communication	5(7)	1(2)	3	9
				3.	LR-professional communication	-	1	2	3
				4.	LR-patient communication	-	-	-	-
		D. Involvement		1.	Patient-professional communication	-	1(2)	-	1
				2.	Professional-professional communication	2	1(2)	-	3
				3.	LR-professional communication	3(4)	1	-	4
				4.	LR-patient communication	-	-	-	-
		E. Communication		1.	Patient-professional communication	-	-	-	-
				2.	Professional-professional communication	4(6)	2(4)	2	8
				3.	LR-professional communication	1	4	7(8)	11
				4.	LR-patient communication	-	-	-	-
		F. Other		1.	Time	1(2)	-	-	1
				2.	Overview	2(3)	2(3)	1	5
				3.	User-friendliness	3	1	1	5