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Service Systems Design – Developing Human-centric Systems in Organizational to Ecosystemic Scales

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Laurea University of Applied Sciences **Abstract**
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Customer Experience is becoming an increasingly important factor in defining the success of organizations and their efforts. The hard systems approaches from inherent in the efficiency-oriented IT and engineering disciplines should be augmented with soft systems approaches which can add the development of experiental, human issues to the mix.

This thesis proposes the concept and practices of Service Systems Design as a solution to the challenge of integrating hard and soft systems approaches. The concept is built on theory from the field of Service Science including Service-Dominant Logic from Vargo and Lusch and adding approaches from Service Design and Enterprise Architecture. Service Systems Design is defined as the Design of human-centered systems or Service Systems that can also be applied to developing Service Systems that span Service Ecosystems or multi-organizational collaboration.

The MyData movement, which seeks to promote the social, legal and technical underpinnings of empowering a person-centric data economy, is one of the underpinnings of the research questions. MyData seeks to promote the development of data-based services in which data is not owned by the organization that provides the services but rather follows the person in question to enable digital ecosystemic services.

The concept and practices of Service Systems Design are explored through MyData opportunities at ecosystemic and organizational contexts. The first empirical research question seeks to understand how to use Service Systems Design in developing a MyData Service Ecosystem Concept within a Professional Summer School. The second empirical research question explores Service Systems Design as a means of developing a Consent Service System Concept for Elisa Oyj which would enable customers to delegate responsibilies related to subscriptions to family members or other designated people.

Based on the exploring the concept and practices Service Systems Design, further research that would look at the complete lifecycle of designing and delivering a Service System is proposed to understand and expand it to suit practical purposes. Digital Legal Design is also proposed as an area of future Service Systems Design research that deals with MyData.

Keywords: Service Science, Service-Dominant Logic, Service Design, Enterprise Architecture, MyData

Laurea-ammattikorkeakoulu **Tiivistelmä**
Master's Degree Programme in Service Innovation and Design

Mikael Seppälä

Palvelujärjestelmien muotoilu – Ihmiskeskeinen järjestelmäkehitys organisaatio- ja ekosysteemitasoilla

Vuosi 2017 Sivumäärä 149

Asiakaskokemuksesta on tulossa enenevässä määrin tärkeämpi asia organisaatioiden menestystekijänä. IT:stä ja insinööritieteistä tuttujen tehokkuutta edistävien kovien järjestelmäkehityksen lähestymistapojen rinnalle kaivataan pehmeitä järjestelmäkehitysmenetelmiä, jotka voivat laajentaa aluetta lisäämällä kokemukselliset, ihmiskeskeiset seikat osaksi järjestelmäkehitystä.

Palvelujärjestelmien muotoilun käsite ja sitä tukevat lähestymistavat saattavat olla ratkaisu kovien ja pehmeiden järjestelmäkehitysmenetelmien yhdistämiseksi. Käsite perustuu palvelutieteiden alueeseen, jossa Vargon ja Luschin palvelulogiikka on keskeisessä asemassa, sekä palvelumuotoilun ja kokonaisarkkitehtuurityön lähestymistapohin. Palvelujärjestelmien muotoilu määritellään ihmiskeskeisten järjestelmien tai palvelujärjestelmien muotoiluksi, jota voidaan hyödyntää myös moniorganisatorisissa ekosysteemeissä kehitettävien palvelujärjestelmien kehittämiseen.

MyData-liike, joka pyrkii edistämään sosiaalista, lakiteknistä ja teknologista henkilökeskeistä datataloutta, on tutkimuskysymyksiä yhdistävä tekijä. MyData pyrkii edistämään datalähtöisten palveluiden kehittämistä, jossa data ei ole palveluita tuottavan organisaation omistamaa, vaan seuraa henkilöä digitaalisten ekosysteemeissä tuotettavien palveluiden kehittämiseksi.

Palvelujärjestelmien muotoilun käsitettä ja käytänteitä tutkitaan MyData-mahdollisuuksien kautta sekä organisaation sisäisessä että ekosysteemisessä kontekstissa. Ensimmäinen empiirinen tutkimuskysymys pyrkii selvittämään, miten palvelujärjestelmien muotoilua voitaisiin käyttää MyDataan perustuvan palveluekosysteemin konseptoinnissa Professional Summer School -kontekstissa. Toinen empiirinen tutkimuskysymys tutkii palvelujärjestelmien muotoilua tapana kehittää valtuutuspalvelujärjestelmä Elisa Oyj:lle, jonka tavoitteena on tarjota asiakkaille mahdollisuuksia delegoida sopimuksiin ja tuotteisiin liittyviä vastuita perheenjäsenille ja muille soveltuville henkilöille.

Palvelujärjestelmien muotoilua koskevan tutkimuksen perusteella ehdotetaan seuraavia tutkimuskohteita palvelun koko muotoilun ja tuottamisen elinkaaren kattavista lähestymistavoista, jotka tarkastelisivat paitsi prototypointia, mutta myös tapoja, joilla kehitetty palvelu saadaan aikaiseksi. Digitaalista lakimuotoilua ehdotetaan myös alueeksi, jossa MyDataa koskevaa palvelujärjestelmämuotoilututkimusta voitaisiin edistää.

Avainsanat: Palvelutiede, palvelulogiikka, palvelumuotoilu, kokonaisarkkitehtuuri, MyData

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1 Introduction

Service Design, by definition, focuses on the collaborative efforts that go into developing a service. A great definition of Service Design is presented by The Copenhagen Institute of Interaction Design (2008; Stickdorn & Schneider 2011, 23):

> Service design as a practice generally results in the design of systems and processes aimed at providing a holistic service to the user.
>
> This cross-disciplinary practice combines numerous skills in design, management and process engineering. Services have existed and have been organised in various forms since time immemorial. However, consciously designed services that incorporate new business models are empathetic to user needs and attempt to create new socio-economic value in society. Service design is essential in a knowledge driven economy.

We've come a long way since Lynn Schostak (1984) introduced the service blueprint to align the organizational processes with the customer process. In the face of the increasing complexity associated with the evolution of a connected world we as service designers are posed with both opportunities and challenges. The challenges we face include scaling our customer-centric practices around developing services reside not only within our organizations but also in ecosystems made up of many organizations. How we as service designers can respond to these challenges is the driving force of this thesis.

In the light of current design theories and practices many questions seem difficult to answer. How can we use customer insights to develop the whole organization's offering and bring customer-centricity to the heart of the enterprise? How do we create and transform the service systems that deliver the services? How do we push beyond organization-centricity to enabling services which employ business ecosystems which are built on enterprises that collaborate to create not only physical products but also digital services? How do we make business ecosystems adaptive so that they are not only formed ad hoc but can integrate new players, evolve and transform over time?

Donald A. Norman and Pieter Jan Stappers (2015) share similar sentiments. They speak about DesignX problems that are present in complex sociotechnological systems that they feel the design community is rather new to even though the topic has been researched and explored in other disciplines for a long time.

According to Norman and Stappers (2015, 90), "DesignX problems involve complex sociotechnical systems, which by definition involve a complex, non-linear mix of people and technolo-

gy. The mix of human and social aspects is the major contributor to the difficulty in managing, understanding, and implementing these systems." To describe what DesignX problems are made of, Norman and Stappers (2015, 86) elaborate on three categories which encapsulate nine properties:

The Psychology of Human Behavior and Cognition

1. System Design that Does Not Take into Account Human Psychology.
2. Human Cognition: The Human Tendency to Want Simple Answers, Decomposable Systems, and Straightforward Linear Causality.

The Social, Political, and Economic Framework of Complex Sociotechnical Systems

3. Multiple Disciplines and Perspectives
4. Mutually Incompatible Constraints

The Technical Issues that Contribute to the Complexity of DesignX Problems

5. Non-Independence of Elements
6. Non-Linear Causal Relations: Feedback
7. Long and Unpredictable Latencies
8. Multiple Scale Sizes
9. Dynamically Changing Operating Characteristics

Multidisciplinary collaboration is at the heart of tackling DesignX problems and design's role is to add the human-centered aspects to systems development. This type of human-centric approach is not yet popular in engineering, operations, and industrial engineering. (Norman and Stappers 2015, 90.)

Despite not being popular, similar notions have been around for a long time. In Operational Research a distinction between hard systems and soft systems is nothing new. The hard systems approach aims towards optimization and efficiency and is used in the technical disciplines such as engineering. The soft systems approach on the other hand seeks to define a problem by looking at it from humane, stakeholder perspectives. (Kijima 2015, 45.)

These two approaches from Operational Research are visualized below. Integrating these two approaches is one of the goals of this thesis.

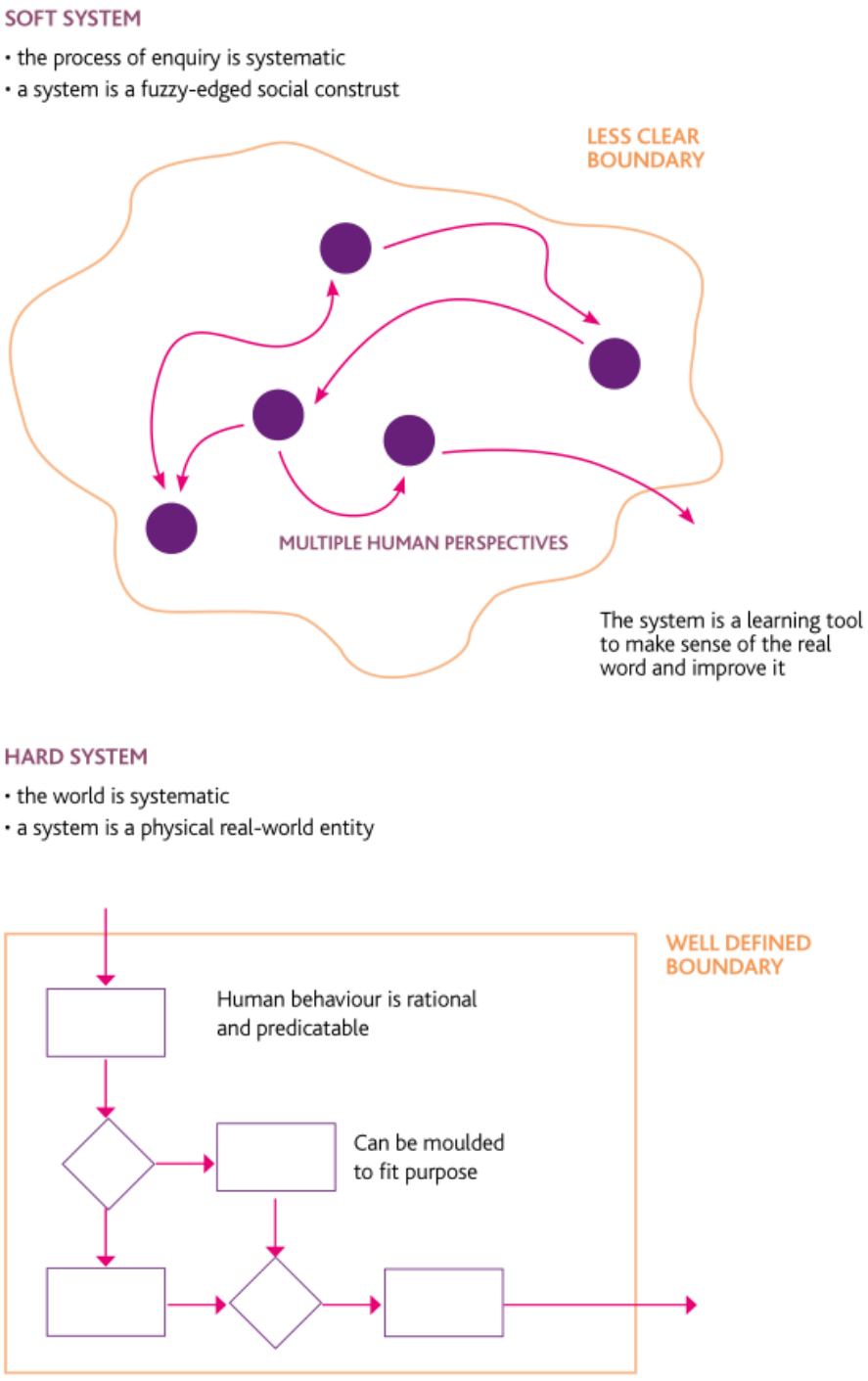


Figure 1. A summary of Operational Research approaches (Harries et al. 2015, 17).

My personal work experience in the fields of business intelligence and enterprise architecture primarily in the higher education field lead me to echo what Norman and Stappers (2015) note about human-centric issues in developing complex sociotechnical systems. Indeed, many of the IT-disciplines that deal with organizational scales and transforming old to new are still underdeveloped in terms delivering human value. The goal for many IT-organizations still

seems to be better at supporting their business organizations rather than focusing on the end users, customers, consumers and citizens who use the services.

The time in which this thesis has been done is indeed an interesting one and this is a real opportunity to explore an emerging area. The exploration requires the consolidation of perspectives and practices from soft systems approaches such as service design and hard systems approaches such as enterprise architecture. I propose that the theoretical concept of Service Systems from the Service Sciences field could help us do this. However Service Systems Design has to be defined better than it has been done in the theoretical texts to elaborate perspectives and methods that could be used by practitioners both in the fields of Service Design and Enterprise Architecture.

“The times they are a-changin’,” sang Bob Dylan back in the 1960s. Just looking at where we have come from there, change has never stopped. Simultaneously with the need for speed, many vanguard organizations are trying make their software-assisted operations more human-centric to avoid the pitfalls of so many projects that have failed to deliver on their promises.

For example the Government Digital Service which is in charge of the GOV.UK platform for public services have given up on the traditional waterfall process used in software engineering which goes from capturing requirements to prioritizing the requirements for development without extensive user review in favour of a more interative approach where the user needs are the starting point and they are reviewed in each phase of the fast, agile and iterative software development process. (Loosemore 2015.)

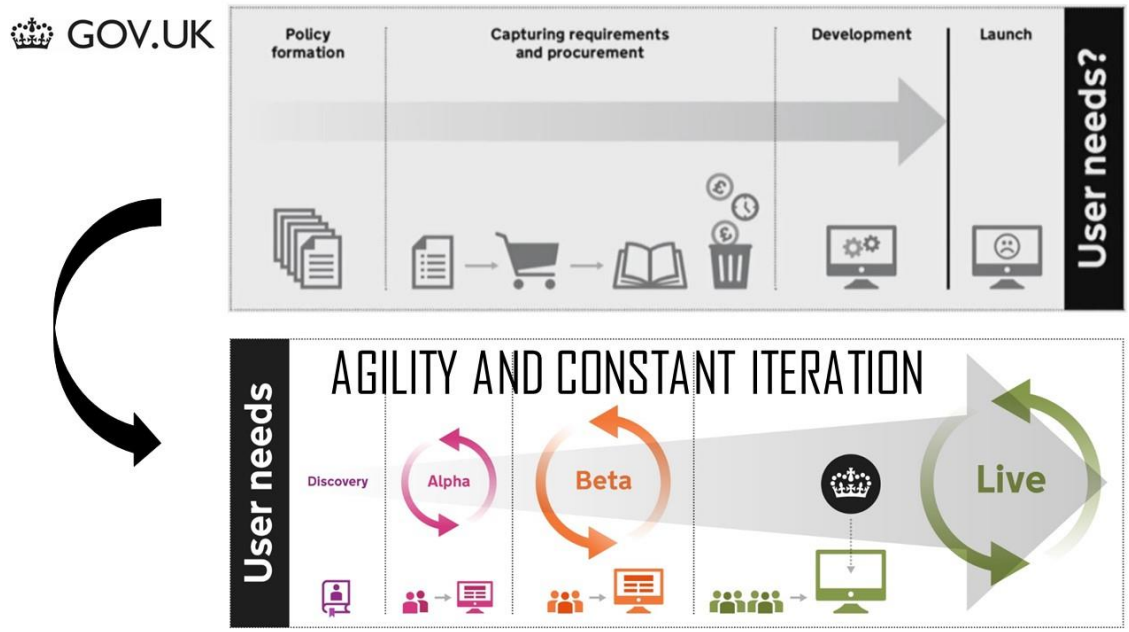


Figure 2. The UK Government Digital Service's transition from waterfall development to user-centric, agile and iterative software development (Loosemore 2015).

However over the last years mere focus on engineering the business and focusing on cost efficiency has turned out not to be enough in the rapidly evolving markets. The fall of the Nokia Mobile Phones is an example of this. Where Treacy and Wiersema (1993) identified three value disciplines for organizations, namely product leadership, operational excellence and customer intimacy, focus on just two is no longer enough in all cases. Customer intimacy, as means of adapting the organizations to the needs of their beneficiaries, has gained ground as a key competitive advantage in many industries. This transition is also elaborated in the shift from Good-Dominant Logic (and organization-centric production) to Service-Dominant Logic outlined by Lusch and Vargo (2014).

In addition to rigid software development methods that don't necessarily focus on delivering value to the end-users or beneficiaries, many established and large organizations are faced with a high degree of complexity because of historical choices which make transitions extremely difficulty.

The Enterprise Architecture (EA) discipline is very strong in evaluating and planning for the impact of different types of scenarios. However, as it is a discipline that has its roots in IT, it is often criticized for IT centricity and subsequently being so abstract that most business practitioners and other stakeholders have difficulties in communicating with Enterprise Architects. Whereas EA is strong where service design is not, EA fails where service design is strong.

Consultant Craig Martin has an interesting take on how the practices in different disciplines relate to each other. Product and service design are strong in defining what should be done yet don't necessarily venture into the area of how the service should be delivered and maintained. Whereas this is where Enterprise Architecture that supports the portfolio management practices is rather established. Traditional solutions architecture and development are often also separated from the forefront of business. The Enterprise Architecture has a subfield called Business Architecture that seeks to promote the alignment of the strategy and the business model with Enterprise Architecutre but this field is still in underdeveloped in terms of who the business creates value to its surroundings – other than through promoting internal cost-efficiency. Craig Martin also joins many others in promoting a discipline called Enterprise Design that could integrate these separate aspects. (Martin 2015.)

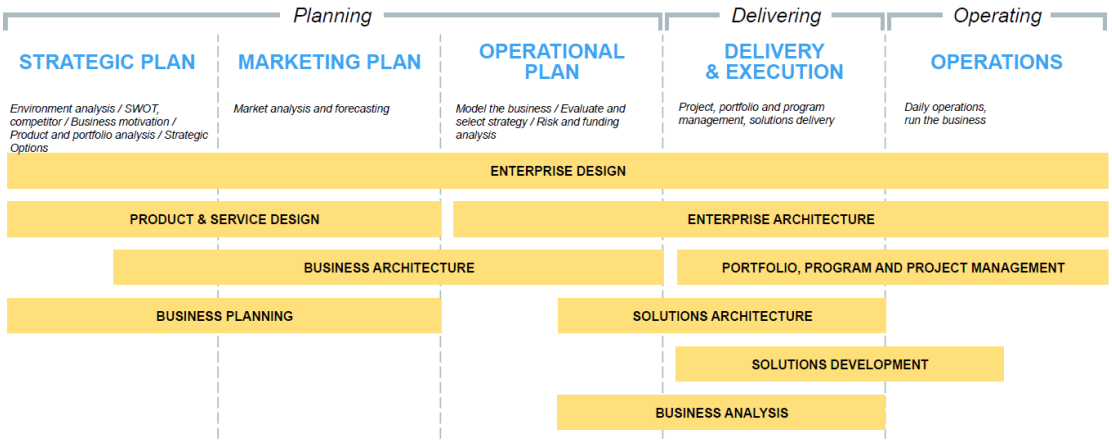


Figure 3. Understanding how different discipline relate to each other between strategy and operations (Martin 2015).

Since around 2013 I have been following many practitioners talk about an integrated approach that could assist in bringing these two fields closer in order to develop a more robust approach that could integrate the holistic human aspects from Service Design to the holistic aspects of digital operations from Enterprise Architecture. Concepts such as Enterprise Design, (Guenther 2012; Martin 2015) Cohesive Enterprise Design (Roscam Abbing & Clark 2015), Whole-Enterprise Architecture (Graves 2016) and multiple others have emerged to evolve Enterprise Architecture practices to embrace the opportunities and approaches that are relevant right now.

Based on some of the expert interviews of consultants in the Enterprise Architecture field done over the course of making this thesis I know that even though the new approaches have not been extensively tested and standardized, some forerunner customers are now exploring the approaches.

1.1 Research Questions

This thesis will explore two research questions in the area that incorporate the two fields of Service Design and Enterprise Architecture with theory from Service Science. The first research question deals with Service Systems Design in a ecosystemic context and does so by exploring the development of a MyData-based Health Service Ecosystem. The second research question seeks to explore how Service Systems Design can be integrated into organizational practices in a Consent Service Systems Concept which requires the integration of multiple socio-technical systems and perspectives together around the creation of a Consent Service.

This thesis is based on two case studies. According to Silverman and Marvasti, a case study contains something of interest to the researcher and aims to use appropriate methods to understand the case as fully as possible. As a case study looks at a limited sample size, further efforts would be needed to generalize the results. Results could however be used as hypotheses or starting points for further research if needed. (Silverman & Marvasti 2004, 162-164.)

Silverman and Marvasti elaborate on three types of case studies: intrinsic, instrumental and collective case studies. The intrinsic case study seeks to do the research but not generalize the research beyond its scope. A consulting case study might be an example of this. The instrumental case study, seeks to study the case in depth but connect the results to something else. The third case study type is the collective case study in which a number of cases are used to investigate a general phenomenon. (Silverman & Marvasti 2004, 164.) For the purposes of this thesis, I am using a collective case study to connecting the two Elisa-related cases to explore the concept of Service Systems Design.

The first research question seeks to explore how we can integrate aspects of soft and hard systems when designing a concept for a distributed MyData Health Service Ecosystem. To explore these approaches, a student team in the Laurea, Metropolia, Haaga-Helia Professional Summer School was tasked by Elisa Oyj to create a MyData Service Ecosystem Concept where Elisa could be a stakeholder and product provider. An array of possible methods for doing this is evaluated after which the student team is both facilitated and observed in terms of how the methods support the Service Ecosystem Concept development. The end-result here is an evaluation of methods that could be used in Service Systems Design and the OmaNeuvola MyData Service Ecosystem Concept made by the student team.

The second research question is also explored with Elisa Oyj and has to do with taking the first steps towards participating in a MyData Service Ecosystem. Consent is one of the big issues by which MyData service users can transfer their data to designated services and learning about developing a Consent Service System would provide Elisa with relevant information. To support this learning consumers are interviewed about their initial thoughts on consent issues in operator business, Elisa's experts are interviewed about multiple projects that could be taken into account when developing a consent service for Elisa's customers, a consent service concept is developed, prototyped and its Service Architecture is evaluated based on possible impact on Elisa's current Enterprise Architecture.

The following table summarizes the essentials related to the two research questions.

Table 1. Research questions, methods, context, and deliverables.

Chapter	Research Question	Research methods	Context	Deliverables
4	How do we tie in customer centric aspects in creating a service ecosystem concept?	Case Study Research	Helsinki Region Applied Universities' Professional Summer School, Elisa MyData-case	Exploration of design methods and student-created service concept
5	How can we use service systems design to combine methods and perspectives from service design and EA in order to create a consent service concept and understand its developmental impact on Elisa's current operations?	Interviews, observations, co-creation, prototyping	Elisa consent service concept	Consumer and expert insights, consent service concept, consent service architecture, consent service prototype

2 Methodology

The methodological choices for this thesis are not based on the traditional scientific approach of observing what has happened and using this data to extrapolate the future. In the domain of design research we have too many interralated variables that effect outcomes to be able to create predictive, causal results. The aim instead is to do research with impact in the form of design research which seeks to use traditional qualitative scientific methods to understand a domain but also help empower actors within the domains to influence their contexts to create desirable outcomes.

This type of methodology supports the overarching goal of this thesis: to explore process-based methods that can support the development and understanding of new knowledge in the context of design human-centric Service Systems at organizational and ecosystemic scales. Methods that support background research, visualizations, modeling, facilitation and prototyping support science as design very well.

In terms of understanding the benefits of a design-based methodology, Nigel Cross (2006, 1) calls design as the third area of education, the first two being the sciences and the arts or humanities. The designerly ways of knowing is described by multiple aspects. The designerly mode of problem-solving is “solution-focused” using synthesis as opposed to that of scientists who focus on problem-solving by analysis (Cross 2006, 6).

This also means that designers create satisfactory, fast solutions rather than use a lot of time to find a optimum solution. Designers also tackle “ill-defined”, wicked problems that are not solvable as scientific problems but rather open-ended and rarely reductable to elements that can be understood completely. Another aspect of design is that it is “constructive” and seeks to invent new things or desirable futures and forms rather than looking back to analyse the nature of existence (Cross 2006, 7). This constructive aspect is close to abductive reasoning that seeks to create conjectured or possible solutions rather than generalize as in inductive and narrow down as in deductive reasoning (Cross 2006, 19). Another key aspect of design according to Cross (2006, 19) is the use of non-verbal media for thought, communication and visualization. Informed by Cross’ analysis we understand why a designerly methodology has its strengths in unknown contexts in comparison to traditional science.

Cross (2006, 102) states that good research fulfils the following criteria:

- It is purposive or solves a problem worth and possible to be solved
- It is inquisitive and seeks to create new knowledge
- It is informed by previous research
- It is methodical: planned and disciplined

- And finally, it is communicable: results can be reported, tested and accessible by others

According to Cross (2006, 102) there is no reason why design research could not adhere to these criteria. Cross' work is based on his research from the 1980s and since those times design in which design came from the crafts, the approach has become popular in the abstract service context and is becoming an ever more legitimate approach to systems contexts. The ways that Cross sees design can augment science can provide valuable addition to the popular scientific methodologies.

To sum up, the methodological approach employed in this thesis is design research. The research methods that are used for each research question are discussed separately in the context of each question.

3 Theory – Exploring Services, Systems and Design

This chapter on theory seeks to build a common theoretical framework for the two research questions. Doing this will start with a brief review on how theorists and practitioners in the Service Design field understand complexity and how it relates to the maturity levels of design practices.

After this the multidisciplinary Service Science field and its main concepts are reviewed. This is followed by taking a look at the economic and social theory that builds the basis for the Service Sciences, Service-Dominant Logic.

These underpinnings are used to develop and explore the concept of Service Systems Design which could integrate the perspectives and methods that practitioners in both Service Design and Enterprise Architecture fields could use to create sociotechnical Service Systems that embrace the potential outlined in Service-Dominant Logic.

3.1 Levels of Complexity and Maturity in Design

Service Design is a growing field yet young and increasingly maturing both in terms of theory and practice (Sangiorgi & Prendiville 2014, 61). Many theoretical and practitioner views show where we could look to for opportunities of expanding the practices.

In the practitioner fields especially in the ICT sector it is not uncommon that Service Design is seen as an expansion of the Visual Design and User Experience (UX) fields. In his article *Service Design Goes Agile,* Jens Otto Lange (2014) proposes one way of classifying the design ma-

turity of software-driven organizations in which Service Design adds to Visual and UX Design by bringing a strategic capability which incorporates customer and user aspects to cross-functional development.

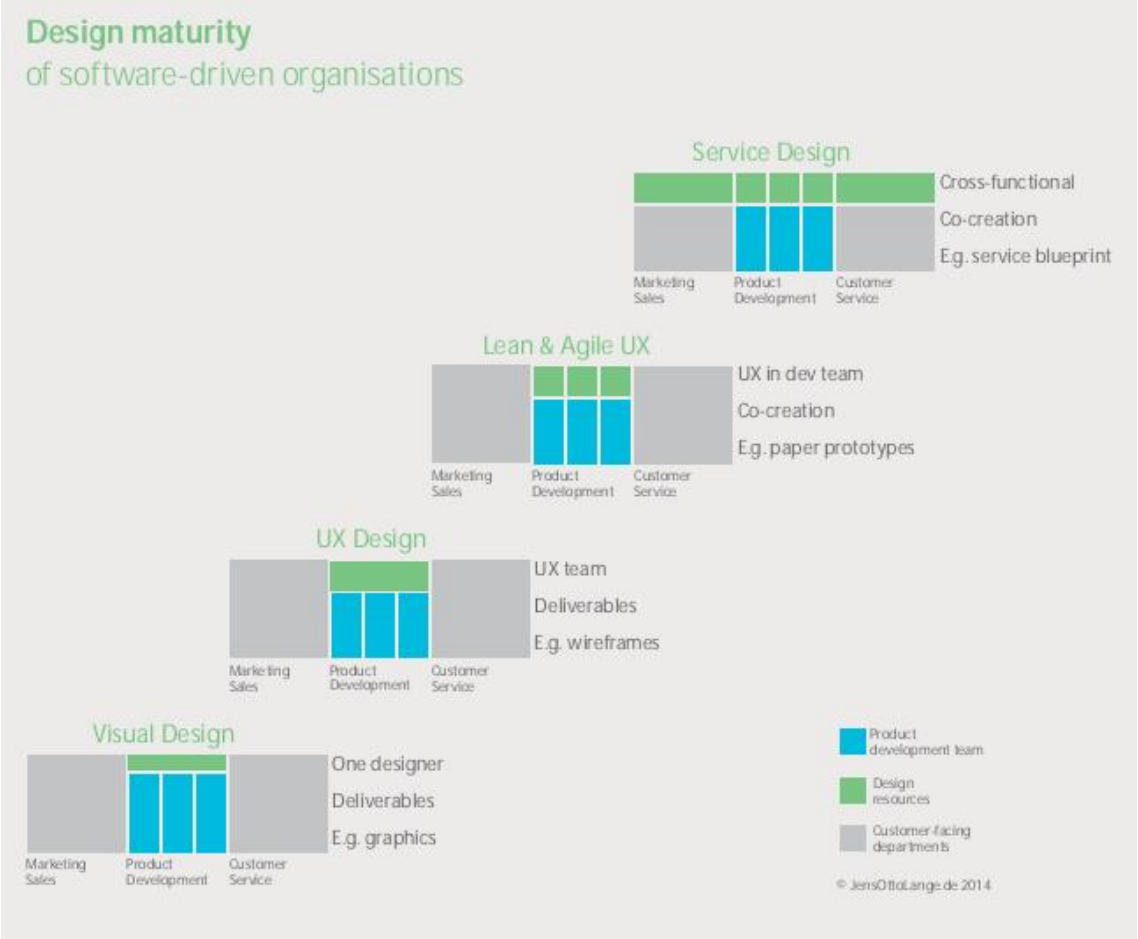


Figure 4. Design maturity of software-driven organizations (Lange 2014).

Lange's depiction is limited because it places Service Design only in the context of software development and especially the development of the software-enabled ways by which the user interacts with the services. In terms of what services are and how we can interact with services, a lot is left out from this view.

One attempt to frame design in another way can be seen in the Design Ladder by the Danish Design Centre (2001) that elaborates on four levels of design maturity:

1. Non-design
2. Design as form-giving (or styling) at the end of the design process
3. Design as process in which design is involved at the beginning of development
4. Design as strategy in which design influences the future of the organization.

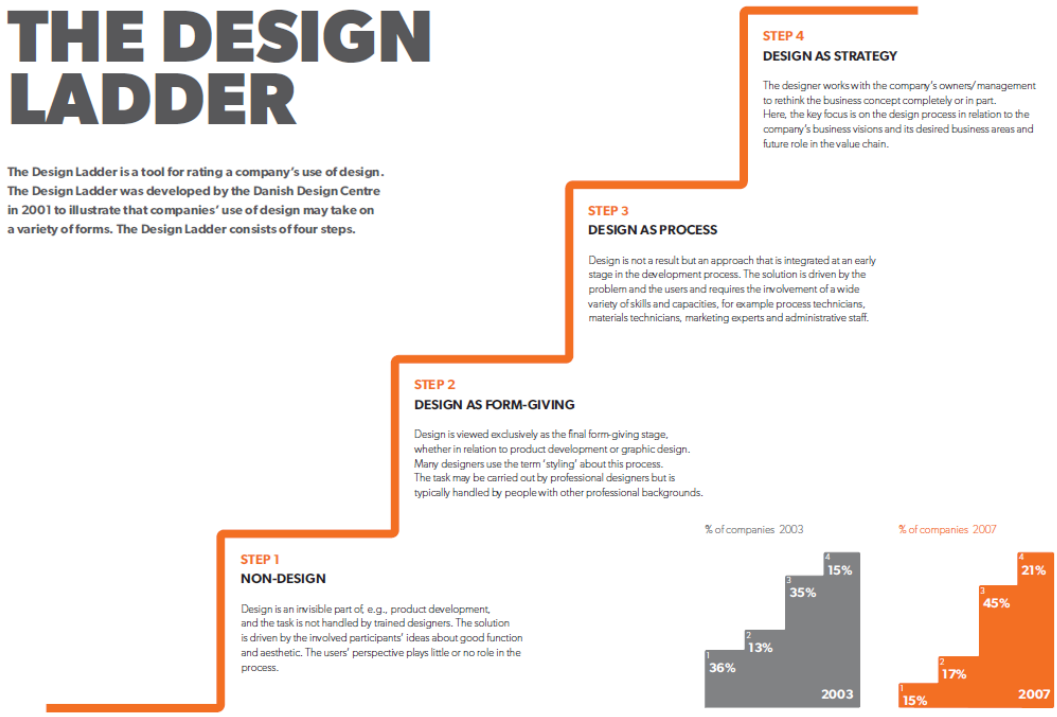


Figure 5. The Design Ladder (Danish Design Centre 2001).

Where the Danish Design Ladder does succeed in broadening the focus of design practices from just one type of design (like design for software development), it could be criticized for being limited to a organizational focus. Processes and strategies are often concepts which are often organization-centric.

A more recent classification is the typology of design thinking by Di Russo (2016, 42) which attempts to classify the objects of design thinking over increasingly complex scales. It starts off from "artefact" (such as product, jewelry, graphic) and moves to "artefact and experience" (the focus of f.ex. Interaction Design and User Experience) which relate to physical objects. "Systems and behavior" (which are inherent to Architecture, Service Design, Urban Planning, Strategic Design) relate to services. Design thinking for "large scales systems" (such as Policy Design in government, Systems Design, global contexts, etc.) have systems as the object of their activities.

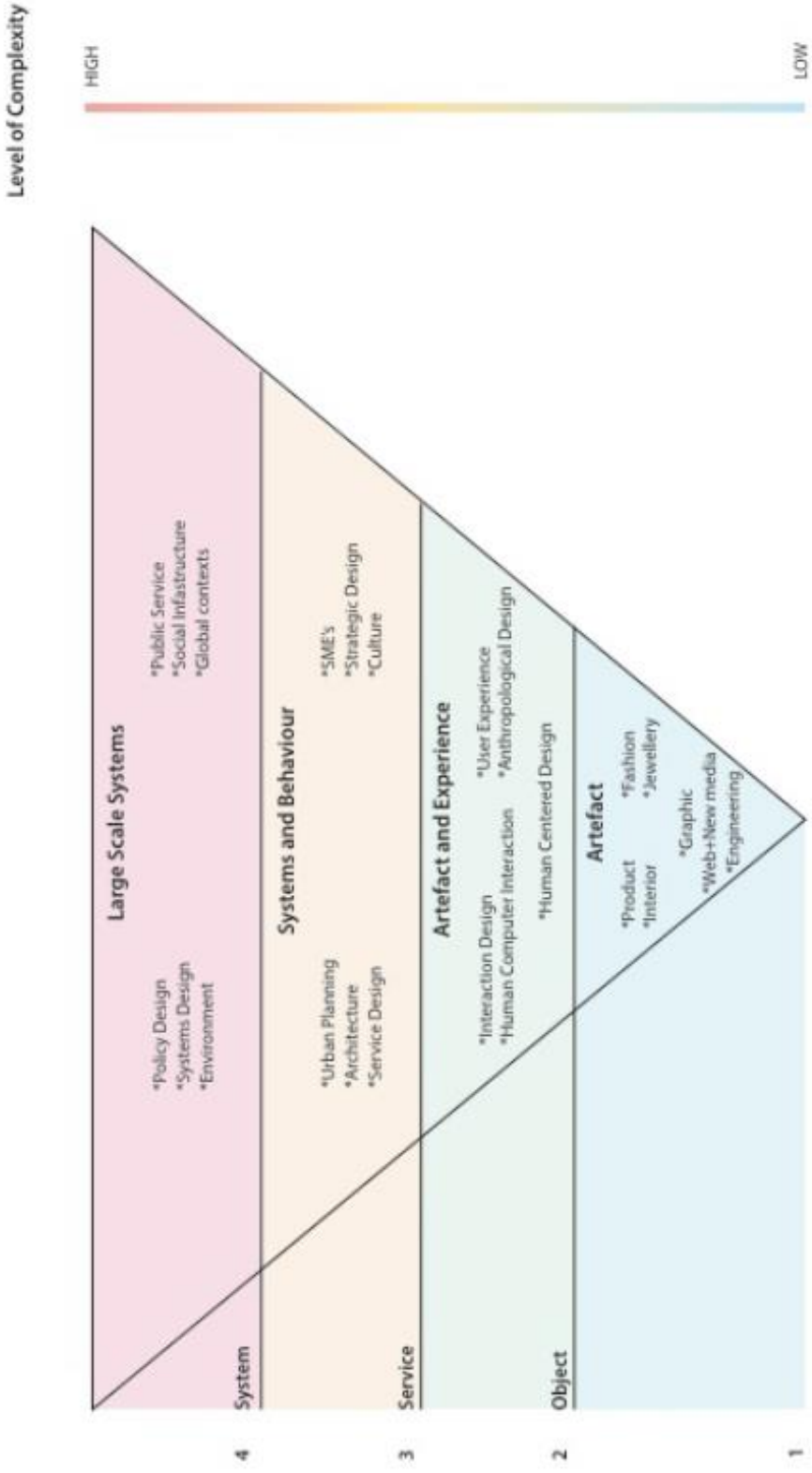


Figure 6. Typology of design thinking (Di Russo 2016, 42).

Di Russo's typology is successful in breaking out of organization-centricity by showing the different scales that can be affected by Design Thinking and the objects of design relevant to them. The value of Di Russo's typology is in showing the scales at which different disciplines operate at.

Another well known classification is from the Carnegie Mellon University School of Design in which the objects that are still a large part of Di Russo's classification are giving way to higher orders of design: Services (the existing paradigms and systems), Social Innovation (the emerging paradigms and systems) and Transition Design which seeks to envision and enable future paradigms and systems. In this classification, the designer can design tangibles for the real world but is also a proactive participator who seeks to create a better future. (Irwin et al. 2015, 9.) This classification shows that we can indeed use design over many scales.

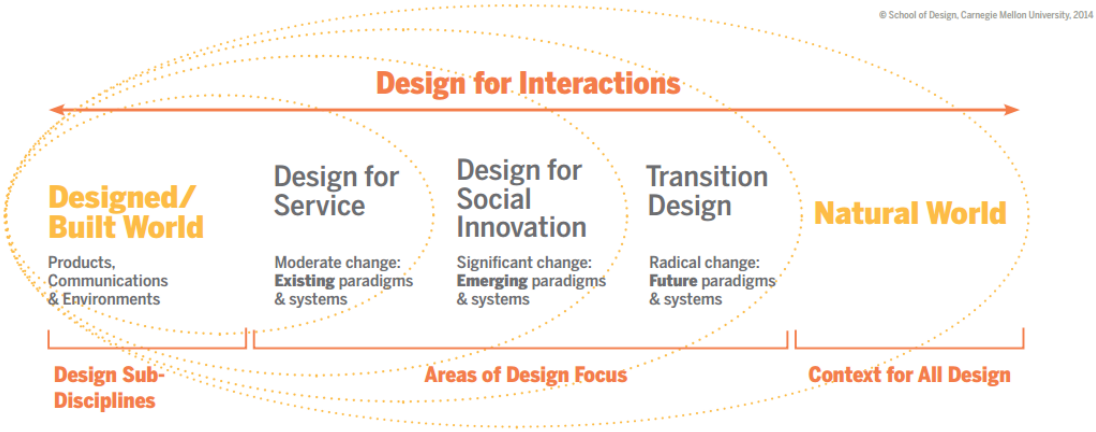


Figure 7. Transition design and a classification of design as participation (Irwin et al. 2015, 9).

The concept of Transition Design echos the notion of using design to enable "societal transitions to more sustainable futures" and this requires the ability to "design for change and transition within complex systems". This call to action requires an multidisciplinary approach. (Irwin et al. 2015, 1-2).

What becomes evident looking at these scales and elements which organizations and ecosystems use to enable customer-centric services is that the understanding embedded in our popularized approaches to service design is insufficient. How could we expand on the double diamond process, customer insights, service blueprints, customer journey mapping and other methods (Design Methods for Developing Services)? It seems like they work well on project, team and organizational levels but they seem lacking to support the efforts at systemic or ecosystems and societal levels.

The strengths of Service Design include being advocates for the customers, employees and other human stakeholders. I assert that the a key capability we as Service Designers should develop in the ever-changing, ever-expanding environment is how to scale our human-centered practices. This requires adding an understanding of adjacent disciplines.

In the well-known venn-diagram from IDEO containing desirability (human), feasibility (technical) and viability (business), feasibility is usually attributed to technology (IDEO). In scaling Service Design approaches, perhaps we should have a better understanding of the design of technology and technological systems.

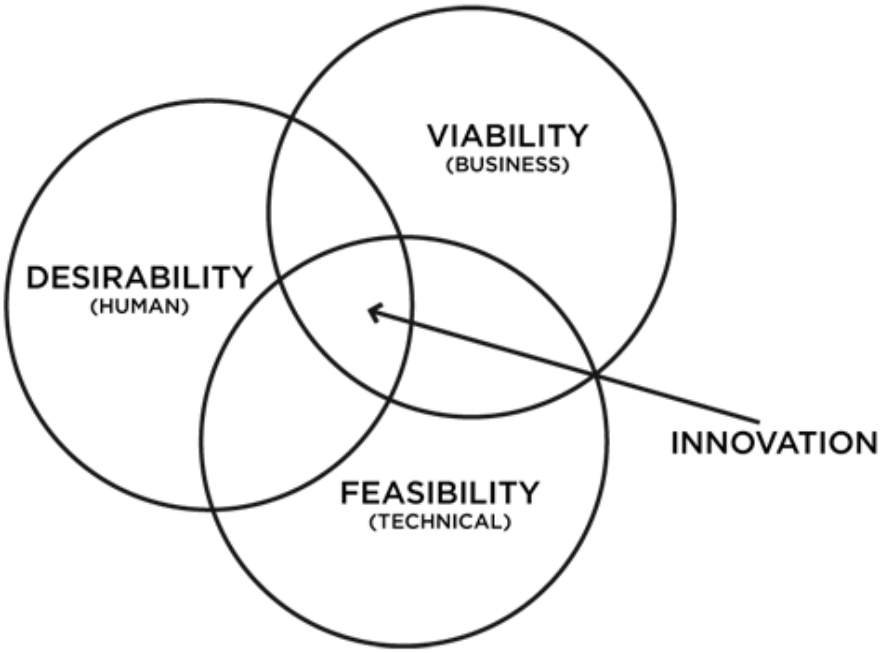


Figure 8. Innovation requires a view on desirability, viability and feasibility (IDEO).

What is becoming increasingly popular is what Roger L. Martin (2009) and the Reason, Loevlie and Brand Flu (2016) write about in setting the stage for Business Design – an expansion of Service Design which uses human-centric approaches to promote viable business. Its practices or the discipline itself has not been defined very well because it is relatively new. Possibilities range from adding a strategic aspect to Service Design (Martin 2009), the Live|Work approach of attempting to link the customers' expectations to "business drivers and metrics and take into consideration the organisation's policies, practices, processes, people, and systems" (Arico 2015; Arico 2016) or using the brand to leverage behavioral change that supports service/product development (Roscam Abbing 2010).

Arico's definition of the Live|Work approach to business design incorporates some sociotechnical systemic elements to it. However even though the approaches to developing desirability, viability and feasibility are overlapping, I would still not use the business design concept

to integrate both viability and feasibility aspects because focusing on the business aspects themselves is a broad field of specialization. Whereas the viability disciplines seek to focus on whether doing something is worthwhile, the feasibility disciplines look at can that be done and how it could be done. I believe a third approach, Systems Service Design would be beneficial as a design specialization to answer the questions relating to technological and systemic feasibility and how it integrates with desirability and viability.

Perhaps we might turn to Service Science to get an idea on how we might promote design at a systems scale in a way that makes most of the sociotechnical systems that we have at our disposal today and that will be a part of the future paradigms and systems.

3.2 Service Science: Lenses and Core Concepts

One of the goals for this thesis is to dive into the integrative discipline of service science and apply some of the findings in the practices in the fields of Service Design and Enterprise Architecture. Service Science provides us with an economic and social theory called Service-Dominant Logic, lenses (disciplines and perspectives: Service Science, Management, Engineering, Design) and core concepts that describe an evolving new paradigm. This section will present the lenses and an overview of the core concepts of Service Science. I believe there is huge practical and academic value in the cross-disciplinary efforts it seeks to promote.

In defining the lenses, Spohrer and Kwan (2009, 1-2) state that Service Science is in fact a combination of the fields of Service Science, Management, Engineering, and Design (SSMED). It is a relatively young that had its inception through the efforts of practical researchers from IBM in 2004.

Spohrer and Kwan (2009, 9-18) state that Service Science should attempt to bring together diverse perspectives from history, marketing, operations, governance, design, anthoropology, engineering, computing, sourcing and futures. Larson (2008, 11) groups these perspectives into a venn-diagram of three overlapping categories of Management, Social and Engineering sciences.

In its use of lenses the discipline aims to understand and predict the activities of service system entities (science), improve capabilities, measure progress and optimize investments (management), improve control, optimize resources (engineering), improve experience and explore possibilities (design). It poses a large shift to the way science should be done as the target is no longer the static and knowable nature that is researched by the natural sciences but an artificial, evolving, man-made target that we can effect. (Spohrer & Kwan 2009, 6-7.)

In terms of concepts service science seeks to study how value is cocreated between interacting service systems and it consists of three main categories of core concepts: the entities (Service Systems), interactions (Service Networks) and outcomes (Value Changes) that in turn combine a number of other core concepts (Demirkan, Spohrer & Krishna 2011, 2).

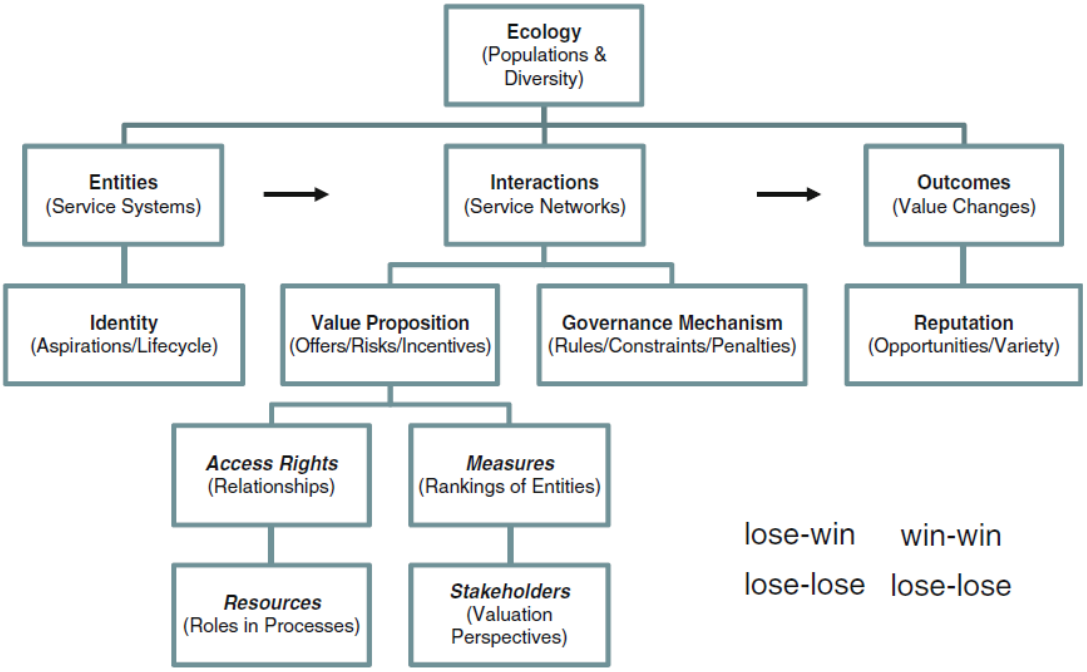


Figure 9. The ten core concepts of service science (Demirkan, Spohrer & Krishna 2011, 2).

The entities form a large part of Service Science. The main abstraction that is used in the category is Service Systems. Maglio, Vargo, Caswell and Spohrer (2009, 399) define Service Systems as "a dynamic value-cocreation configuration of resources, including people, organizations, shared information (language, laws, measures, methods), and technology, all connected internally and externally to other service systems by value propositions."

A more simplified definition of Service Systems is from Fromm and Cardoso (2015, 12) who state that they "consist of elements (e.g., people, facilities, tools, and computer programs) that have a structure (i.e., an organization), a behavior (possibly described as a process), and a purpose." Service Systems can be anything for small customer-provider relationships of two entities to a business and its customer to a complex network of customers and providers like government, a market or an industry.

To describe the more complex arrangements of Service Systems, a multitude of concepts exist that take different points of view such as Service Networks, Service Ecosystems, Value Networks, Service Value Networks and Service Supply Chains. (Fromm & Cardoso 2015, 12.)

According to Lusch and Vargo (2016, 11) such complex service systems could be divided into two groups. The first being the technical infrastructures or architectures that enable them in todays world and for which we could use the Service System concept. The second being the Service Ecosystems which are the collectively defined purposes, rules and beliefs that are the reasons for the service systems' existences.

However, it should be noted that due to the abundance of concepts that describe the complex relationships of Service Systems, they are used interchangeably in Service Science depeding on the researchers and their viewpoints. Also, in practice we use the concepts like business ecosystems and platforms to describe the socio-technical aspects that are related to the complex interactions of Service Systems.

In terms of enabling the interactions between Service Systems, the value proposition concept is very important. Service Systems interact to co-create value using value propositions in which providers offer their resources to customers who can use the resources to co-create what they require (Lusch, Maglio & Akaka 2008, 148). These interactions are subject to governance which seeks to define the collective rules of the interactions and help with dispute resolution (Demirkan, Spohrer & Krishna 2011, 2).

The interaction of Service Systems on both customer and provider sides seeks to enable outcomes or the created value. Value propositions are offerings of value whereas outcomes are results of value co-creation. Understanding the value creation of Service Systems is the third main category of Service Science. (Demirkan, Spohrer & Krishna 2011, 2.)

The hierarchical, treelike figure presented previously that Demirkan, Spohrer and Krishna (2011, 2) use to elaborate on the ten main concepts of service science falls a little short in what it attempts to visualize. Stakeholders, whether they are individuals, collectives or machines, are a key part of all three conceptual groups: they form the Service Systems in practice, are active in creating value propositions and seek desired outcomes. Value can not conceptually exist in itself without the perspectives of the stakeholders as is echoed by Lusch and Vargo.

Service science is an evolving an young field burdened by abstract concepts that are not established nor shared by practitioners and are that overly theoretical. Also many core concepts of Service Science are not (to my knowledge) defined well enough in the Service Science community. These include concepts from the third category proposed by Demirkan, Spohrer and Krishna which includes the perception of value and outcomes.

We must understand that Systems has a dual meaning in this thesis. First, it can refer to the understanding of soft systems in Systems Thinking which sees them as abstract wholes of nodes, links and their evolving interactions. Second, systems can be looked at from the engineering approach in which hard systems are purposeful technical constructs. There is increasing overlap between these two approaches.

Ontology, in philosophy, refers to the study what is "being" or "real" and seeks to answer questions such as "what is reality?". Epistomology then again is the study of knowledge or the ways we understand what is real. Ontology and epistemology are interrelated because our view of reality both enables and restricts what we perceive. Service-Dominant Logic provides us with a revised ontology for economic and social activity which in turn has the potential to affect the way we frame things and is thus a relevant angle to understanding the conceptual implications it has upstream to our everyday practices.

3.3 Service-Dominant Logic

A lot of our thinking is based on shared, cultural assumptions that could be used to frame the times yet when the times change radically, as they have after the rise of the internet supported by the simultaneous exponential development of access and technology, we need to revisit these assumptions (Ismail, Malone & Van Geest 2014). Service-Dominant Logic offers the theory to explain the social and economic implications of the new times.

According to Lusch and Vargo a new paradigm called Service-Dominant Logic is emerging to supplement the traditional goods-dominant logic paradigm. Goods-dominant logic sees the production and exchange of goods as the fundamental purpose of the firm. This thinking leads firms to think in terms of goods-centricity, firm-centricity, and focus on value-in-exchange. (Lusch & Vargo 2014, 4-5.)

Goods-centricity has been challenged in terms of the reductionist thinking that consumers and buyers are motivated only to buy products, whereas the products as solutions to needs or problems and the experiences that go with them are discarded (Lusch & Vargo 2014, 6).

The assumptions behind firm-centricity in which firms are the only relevant actors in manufacturing and providing goods to apparently passive markets has also been challenged. Markets consist of humans who make participate in market-facing, private, public and institutional communities to create value. If we choose to see humans as active participants in value creation, understanding why and how humans act is a new perspective that should be a perspective that firms should take into account. (Lusch & Vargo 2014, 6-7.)

Instead of value creation ending at the moment of sale, seeing humans as active participants in value creation pushes us beyond looking at only value-in-exchange but also incorporating the perceived value and experiences in use-value which is created through the use of the product or service (Lusch & Vargo 2014, 7-8).

Lusch and Vargo (2016) propose five axioms of Service-Dominant Logic to propose the new ways of framing the activities of social and economic actors. The axioms are summarized in the following table.

Table 2. The axioms of Service-Dominant Logic (Lusch & Vargo 2016, 18).

Axiom	**Desciption**
Axiom 1	Service is the fundamental basis of exchange.
Axiom 2	Value is cocreated by multiple actors, always including the beneficiary.
Axiom 3	All social and economic actors are resource integrators.
Axiom 4	Value is always uniquely and phenomenologically determined by the beneficiary.
Axiom 5	Value cocreation is coordinated through actor-generated institutions and institutional arrangements.

Axiom 1 states that “service is the fundamental basis of exchange (Lusch & Vargo 2014, 15-16). In terms of what is exchanged, the goods-centric view is very reductionistic because it puts into focus only the means of exchange rather than the overall activities or services that enable them. Services can also incorporate the intangible value we often pay for whereas goods are “appliances that act as intermediaries in service delivery”. (Lusch & Vargo 2014, 10-13.)

The second axiom by Lusch & Vargo (2016, 8-10) states that, “value is cocreated by multiple actors, always including the beneficiary.” This axiom refers to the notion that value is generated all over the value network which creates it and also during the beneficiaries, or users of services or products. This view incorporates both the value created during production and during use and helps break out of firm-centric thinking.

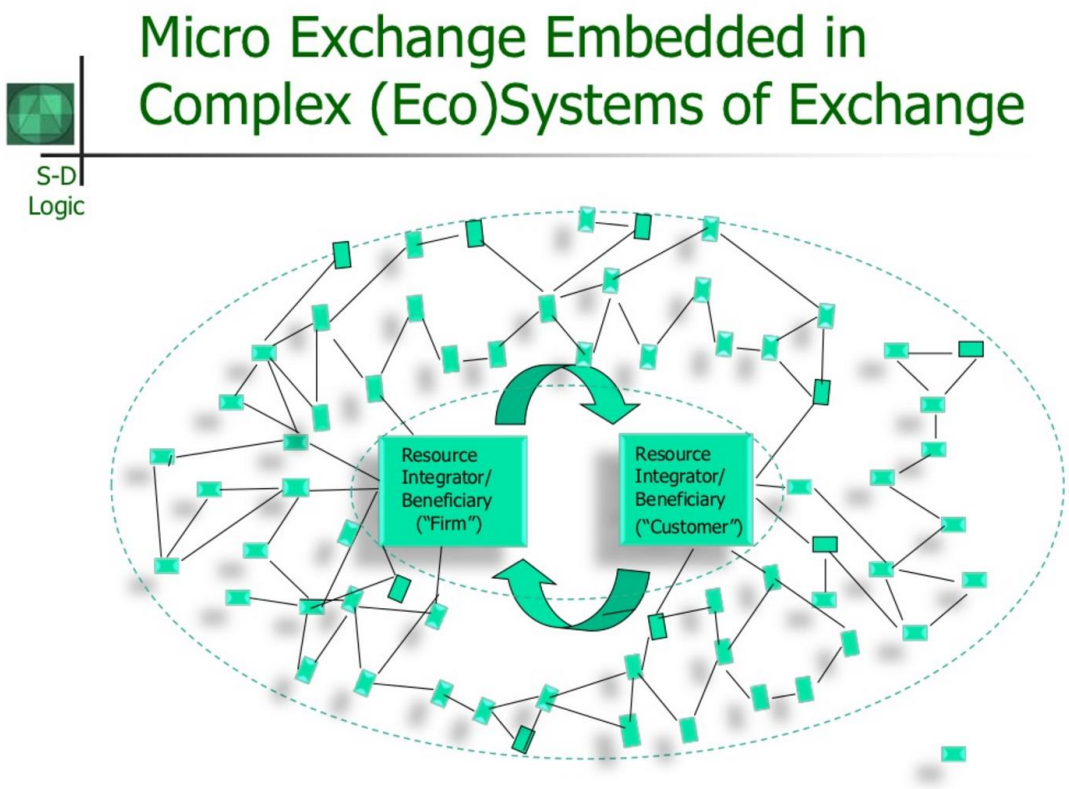


Figure 10. Value is co-created in networks of resource integrators (Lusch & Vargo 2014, 162; Vargo 2012).

Rather than thinking in terms of roles such as businesses and consumers we should talk about actor-to-actor (A2A) interchanges in which we combine resources in manners that provide solutions to what we require in different roles (Lusch & Vargo 2014, 9-10).

According to axiom 3, "all social and economic actors are resource integrators." This means that all actors integrate a diverse array of resources from private, market, and public sources to fulfil what they require. The activity of resource integration connects all types of actors. (Lusch & Vargo 2014, 16.)

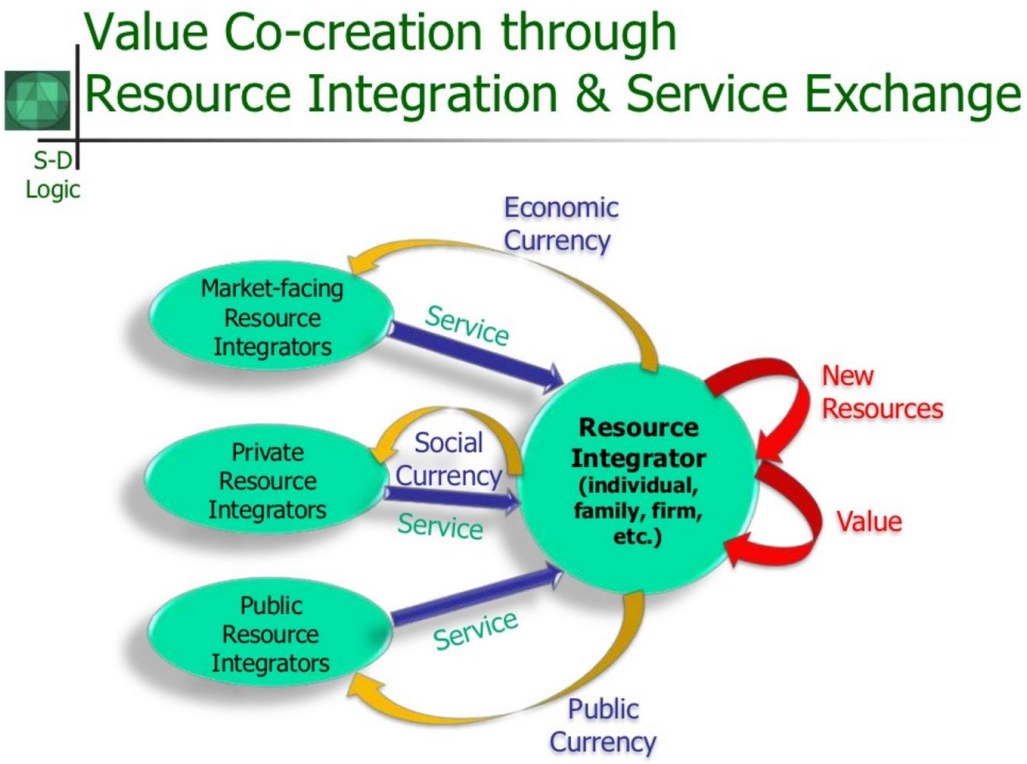


Figure 11. All social and economic actors are resource integrators (Lusch & Vargo 2014, 132; Vargo 2012).

The fourth axiom defines that "value is always uniquely and phenomenologically determined by the beneficiary". This helps us break out of firm- and goods-centricity and look at the diverse and also intangible types of value which depend on the beneficiary and are not absolute. (Lusch & Vargo 2014, 16.)

Building upon the idea of Service Ecosystems and the institutional logic that accompanies them, the fifth and most recent addition to the axioms of Service-Dominant Logic states that, "value cocreation is coordinated through actor-generated institutions and institutional arrangements." (Lusch & Vargo 2016, 18.)

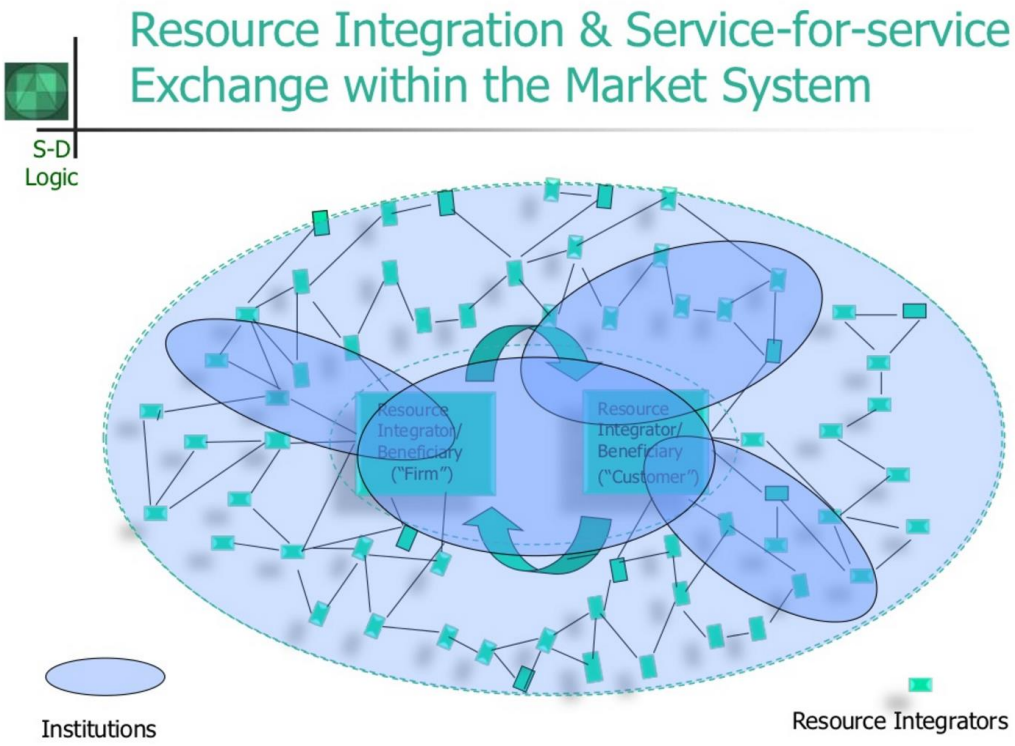


Figure 12. Value is coordinated through institutions made of actors and institutional arrangements (Lusch & Vargo 2014, 168; Vargo 2012).

The institutions that make up Lusch & Vargo's Service Ecosystem refer to the "humanly devised rules, norms, and beliefs that enable and constrain action and make social life predictable and meaningful." Institutional arrangements are groups of interrelated institutions. (Lusch & Vargo 2016, 10-11.)

Institutions are not necessarily organizations, they are the "rules of the game"; the decisions, contracts, rules, norms, routines, and other issues whereas the organizations are interchangeable players (Lusch & Vargo 2016, 11). Markets or other ecosystems of collaboration are thus a form of institution whereas firms and organizations are actors in them.

Institutions have dual roles: in Goods-Dominant Logic they create the basis of specialization by outsourcing non-essential parts of what an organization is doing, in Service-Dominant Logic institutions make cooperation and coordination possible and also solve possible conflicts in them (Lusch & Vargo 2016, 17). For example, open markets are still governed by laws, contracts and bodies which upkeep standards such as the 4G standard in mobile operations or the USB standard in connectivity.

Institutions can both hinder and promote activities. Lusch and Vargo (2016, 19) state that "institutional work" should be a part of making innovations possible in order to remove unde-

sired effects and promote desired ones. An example of this might be the recent discourses towards Uber which seeks to create a open market for transportation services which is something that many consumers deem worth promoting. However Uber does not conform to local norms nor does it distribute its income in an equal manner between acting and owning stakeholders (drivers) (Scholz & Schneider 2015).

Institutions, as Lusch and Vargo understand them, can link together economical, legislative, technology and innovation perspectives. Innovation is not only diffused by the innovators, and understood as entrepreneurs and inventors, but also by institutions. Policies and rules have just as much to do with them as the inventions themselves. (Lusch & Vargo 2016, 20.)

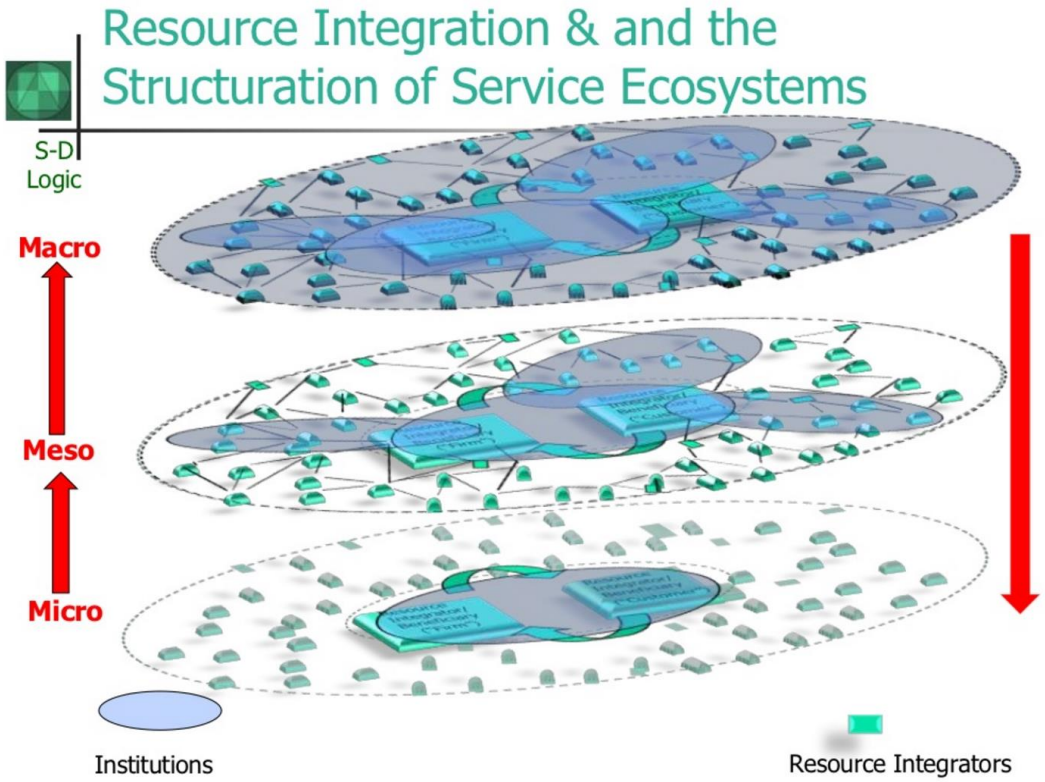


Figure 13. The interconnected nature of innovation activities at different levels (Lusch & Vargo 2014, 171; Vargo 2012).

According to Lusch & Vargo (2014, 161) Service Ecosystems differ from mere networks due to their systemic dynamism and adaptability and can be characterized having four properties:

1) They are relatively self-contained,
2) self-adjusting systems of resource-integrating actors,
3) connected by shared institutional arrangements and
4) mutual value creation through service exchange.

The key practical takeaways from the axioms of Service-Dominant Logic are fourfold. First, the service concept helps focus on the relationship between the customer and the provider, breaking out of firm-centricity (axiom 1). Second, value is cocreated by multiple actors including the customer and not only during development but all through the service lifecycle (axioms 2, 3). Third, value is not derived from money and the functions of the products, but it is determinded phenomenologically by each stakeholder and can include intangible value, such as experience (axiom 4). The fourth is that innovations are framed in complex systems comprising not only the direct actors but also the communities and societies that the services are created in.

In terms of using Service-Dominant Logic to assist with strategic thinking and new service development, Lusch and Vargo (2014, 182) propose five types of activities that might be of assistance:

1) Developing a systems view of exchange with Service Ecosystems
2) Designing density and relationships for collaboration
3) Cocreating value propositions with multiple stakeholders
4) Designing value creating ecosystems
5) Configuring advantage in unstable environments

The first activity of developing a systems view of exchange with Service Ecosystems helps break the traditional linear approach that is the basis of process modeling and value chains. Value chains can be standardized and usually end at the end user which is the end point in Goods-Dominant Logic. Rather, a Service Ecosystem could make it possible to integrate any resources from anywhere in the Service Ecosystem. A holistic view of how value is created in a service ecosystem and how different actors might participate in its creation might be use ful. (Lusch & Vargo 2014, 182-184.)

Designing density and relationships seek to promote adaptable and sustainable collaboration in the Service Ecosystem. Lusch and Vargo refer to density as being the “optimal or right concentration and configuration of resources”. The resources can be owned by any actors in the ecosystem and can be aimed towards creating density towards its customers so that they can integrate resources in ways that are suitable for them. Creating density requires the possibility of unbundling and rebundling the resources. Relationship within the Service Ecosystem promote its sustainability by creating and dividing value to all the actors that are participating. (Lusch & Vargo 2014, 184-186.)

Instead of just creating value propositions in the form of products or goods, the whole ecosystem should be modeled in terms of how the stakeholders might create value together. Because value propositions have beneficiaries or customers, their phenomenological value

should be put in the forefront because they create the value that can be spread around the Service Ecosystem. Value-in-use can be evaluated as can value-in-context which suggests that there are more than just one use cases for value propositions because resource integration can be contextual. (Lusch & Vargo 2014, 186-189.) For example the user interfaces we might use for listening to music on Spotify will differ when we are sitting by the desktop computer and while we are driving a car.

Designing value creating ecosystems refers to creating what Nassim Nicolas Taleb (2012) means when he speaks about Antifragility: something that is not fragile: something that does not brake but rather adapts and changes form. Ecosystems must deal with the change and uncertainty that comes with changing customer behavior and the uncovering of the future. This can be done by using customer insights, anticipating the future and understanding the roles that different parties in the Service Ecosystem can take. (Lusch & Vargo 2014, 189-191.)

The service concept and subsequent Service-Dominant Logic can be of use when configuring advantage in unstable environments. As services can adapt to external issues such as changes in customer behavior, they are not necessarily hindered by predictive practices such as strategy-making. This can lead to faster adaptation or even the creation of new markets. There are also multiple strategies that can be used for making more adaptable resources. (Lusch & Vargo 2014, 191-195.)

The five activities that Lusch and Vargo propose can be used as principles and perspectives that can be used in practical Service Ecosystem Design. In turning them into a development method, they are very close to Elke den Ouden's Value Flow Modeling method that is summarized in the following chapter.

3.4 Towards a Concept and Practices of Human-Centered Service Systems Design

Moving from theory to practice I will explore the implications of Service Science and Service-Dominant Logic on two fields: Service Design and Enterprise Architecture. Both fields include both academics and practitioners who are in a dynamic relationship in which they affect each other. Theory affects practice and practice affects theory. The combination of the two fields is interesting because together, like Craig Martin (2015) states, they might be able to fulfil a lot of the promise and expectations relating to Service Science.

Shelley Evenson defines Service Design as a process which creates an understanding of people, context, service provider, market strategies, and social practices. According to her, it focuses on the systemic aspects of the human experience. Service Design combines "human-centered research that is exploratory, generative, and evaluative" to design methods and

tools that make it possible to evidence stakeholder-oriented Service Systems interactions. A key promise of Service Design is the facilitation of creating the required holistic understanding between the other disciplines participating in Service Science efforts. (Evenson 2008, 25-27.)

Service Design practice has many functions. Aligning the services, the organization and its operations around any human experience be it Customer Experience or Employee Experience. The experiental factors are also taken into account in the Service Design co-creation practices in which people from all over the organization including the beneficiaries (customers) are put together to evaluate what should be done. Thus one of Service Design's main promises is promoting the human alignment around collective and collaborative intentions. (Stickdorn & Schneider 2011.)

In their article on how Service Science challenges Service Design, Voss and Hsuan (2011, 232) state that while the focus of Service Design is the service concept and the design of interfaces which promote desired values such as Customer Experience, the Operations Management disciplines take a broader view and place the service concept in conjunction with service delivery.

To Voss and Hsuan (2011, 232) Service Design is also very focused on New Product Development, meaning that there are expectations that the new service concepts that are developed could and should be implemented despite existing delivery platforms. Another issue that Service Design should address is over focus on B2C services which makes it difficult to adapt the methods and approaches to B2B contexts.

Voss and Hsuan (2011, 233) propose approaches that should be integrated to Service Design to create a better fit in the overall Service Science landscape: focus on service delivery systems, service architecture (modularity and platforms) and service supply chains/networks.

An option for understanding the role of Service Design in Service Science is to use the service delivery system design framework by Roth and Menor (2003, 151) which elaborates on three domains: structural (the physical elements, technology and planning required for delivery), the infrastructural (people, systems and processes) and integration, which coordinates the whole. Service Science aims to focus on especially the integration aspects of different areas to form a coherent whole.

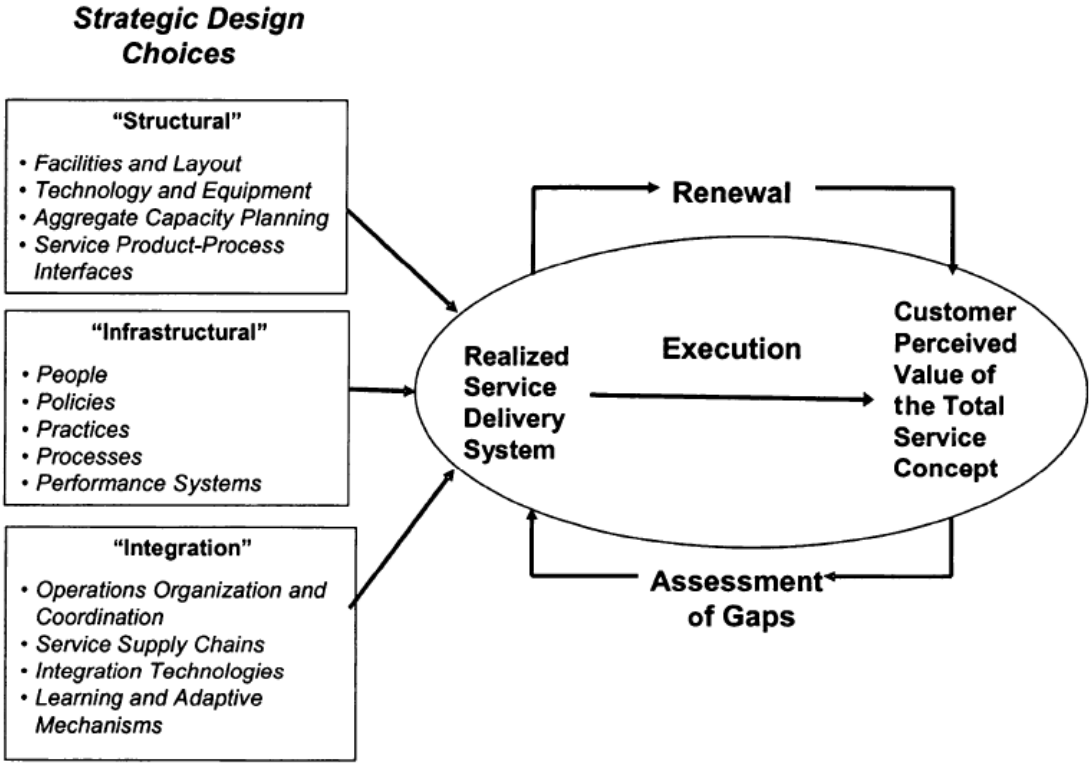


Figure 14. The service delivery system design framework by Roth and Menor (2003, 151).

Even though the service delivery system design framework might not be complete, it elaborates on the different aspects that are required for the service concept to be delivered. To Voss and Hsuan (2011, 234) Service Design should attempt to integrate itself and its practices better in this type of context.

Voss and Hsuan propose Service Architecture as an approach which seeks to integrate these aspects. It breaks down the service into modules such as the ones presented in Roth and Menor's framework and evaluates optimal ways of putting them together in terms of delivering value to the different stakeholders or beneficiaries. Understanding services in terms of modules and architectures could help understand them more deeply than just from the customer perspective that Service Design provides. This is important because in complex systems such as large organizations or Service Ecosystems there exist so many dependencies that the cost of optimizing for just one aspect, such as the Customer Experience, might be high (Voss and Hsuan 2011, 234).

Voss and Hsuan also define the concept of platforms which combine the rules and procedures outlined in Vargo and Luschs' concept of Service Ecosystems and the technical architectures that are the focus of Service Systems in Service Science. These platforms are often a basis for service development yet they have not been explored sufficiently in Service Design. (Voss & Hsuan 2011, 240.)

To be able to look beyond the single service perspective in Service Design and connect the activities to the Service Systems perspective, Voss and Hsuan (2011, 240) propose understanding the supply chain/network perspectives and how multiple actors choreograph their activities to enable a service.

Service Oriented Architecture (SOA), the IT centered practice of putting together choreographed, modular service architectures, is one of the main enablers of these new Service Systems. Yet there is still need to combine the physical, organizational and information systems perspectives outlined by Roth and Menor to enable the Service Systems that Service Science seeks to promote (Voss & Hsuan 2011, 242-243).

Combining Service Design with Enterprise Architecture practices can show promise in creating human-centered Service Systems and Service Ecosystems.

Rhodes and Nightingale state that the goal of Enterprise Architecture is to evaluate a system's value, cost and risks in terms of the purposes of the system sponsors. The value of a holistic, systemic take on the enterprise rises when enterprise complexity grows. The goal of the Enterprise Architecture practices is not only to analyse "as-is" states and design "to-be" states but also evaluate "could-be" scenarios to make best possible choices on how to go forward. (Rhodes and Nightingale 2008, 165-166.)

Rhodes and Nightingale propose that Service Science could help foster Service Architects who would have skills spanning engineering, management, social sciences and the humanities. They state that an obvious candidate discipline that could handle this could be Enterprise Architecture which is established but is a extension of software/systems architecting. According to them the approach is IT-centric but has done a lot of work in integrating the small bits and pieces that IT has to deal with to business aspects such as strategy and business processes. (Rhodes & Nightingale 2008, 163-164.)

Rhodes and Nightingale (2008, 166) contend that industry training in Enterprise Architecture is rather IT-centric and is also template-centric meaning that the templates themselves do not teach holistic thinking that is needed.

How could we resolve question of adding what I called the feasibility disciplines to Service Design? Referring to Voss & Hsuan, this would mean adding perspectives and practices to incorporate service delivery systems, service architecture (modularity and platforms) and service supply chains/networks. Could we at the same time use similar approaches to bring human-centric approaches to the Enterprise Architecture field?

The IDEO venn-diagram that seeks to promote desirability, viability and feasibility as sources for innovation seem like a good starting point because it integrates human desirability (or in Vargo and Luschs' terms, creating phenomenological value to the beneficiary), viability (what type of value is created and how is it distributed among the co-creating producers), and feasibility (how resources are integrated to create value).

Focusing on how the feasibility disciplines integrate with the other two, we could look at the work from Roth and Menor (2003) from the Operations Management discipline and the proposed concept of Multilevel Service Design from Patricio, Fisk, Falcão e Cunha and Constantine (2011).

The Service Strategy Triad by Roth and Menor (2003, 148) seeks to show how a service operations perspective seeks to promote the strategic cohesion of three issues which contribute to the service encounters.

1) the targeted market and customer segments
2) the notion of a service concept as a complex product bundle (or "offering" to customers)
3) the service delivery system design

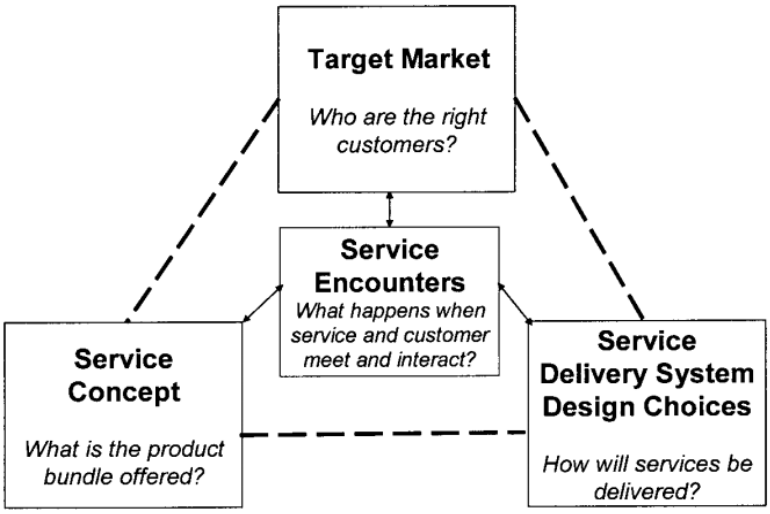


Figure 15. The Service Strategy Triad: Target Market, Service Concept and Service Delivery System Design Choices (Roth & Menor 2003, 147).

The key takeaways from Roth & Menor's approach include that we should understand the target markets (desirability), design the service concept (viability, what type of value is created?), develop the service delivery systems (feasibility) and integrate these three

approaches into the service encounters that form the basis for the provider-customer relationships.

In terms of the future expansion of service design we should explore and elaborate on the approach for Service Systems Design outlined by Patricio, Fisk, Falcão e Cunha and Constantine (2011) in their integrated approach which they call Multilevel Service Design (MSD). They seek to promote the ability for Service Designers to design both the networks of actors, their relationships and the systems components that help it all work together. This perspective helps take a holistic view on the Service System or Ecosystem and design for its overall performance rather than just single actors that are optimizing for themselves. (Patricio et al. 2011, 180-181.) This approach can be used for both multichannel services provided by one organization or service provided by a collaborative Service Ecosystem.

The MSD approach consists of three layers. The first one is designing the Service Concept which defines the desired benefits to be created and ways of delivering the benefits to the customers. The Value Constellation concept is close to Lusch and Vargo's Service Ecosystem concept but also adds the collaborative offering of the ecosystem to the mix. (Patricio et al. 2011, 182.) Even though the value constellation concept is somewhat used in service design, it is not popular among practitioners who choose to speak about ecosystems and platforms instead.

The second layer is designing the Service System that delivers the Service Experience (Service Systems Design). The Service Systems model consists of the asset and resources that collaborate to cocreate value with the customer. The writers propose that navigation architecture, or how the user interface incorporates different touchpoints for navigation is a part of this layer. (Patricio et al. 2011, 182.)

In terms of modeling for service delivery it is possible to go even deeper into modeling the Service System to create something that can be used by all the disciplines that participate in creating the Service System. Even though MSD does propose the existence and importance of such models, they are not sufficiently developed in the article. This is an area where Service Designers and Enterprise Architects could work together to create a system of models that in which we can connect all the models that are relevant to the different disciplines that are participating in the Service System's creation. Combining different models to create a coherent whole is an established practice in Enterprise Architecture. Yet popular approaches in EA are still missing models for customer value creation and designing services around the Customer Experience.

The third layer proposed for MSD consists of the Service Encounter models. They include the customer-centered Service Blueprint, the software-oriented UML activity diagrams that are popular in software engineering and the Service Experience Blueprint that has been developed by the writers themselves. (Patricio et al. 2011, 182-183.)

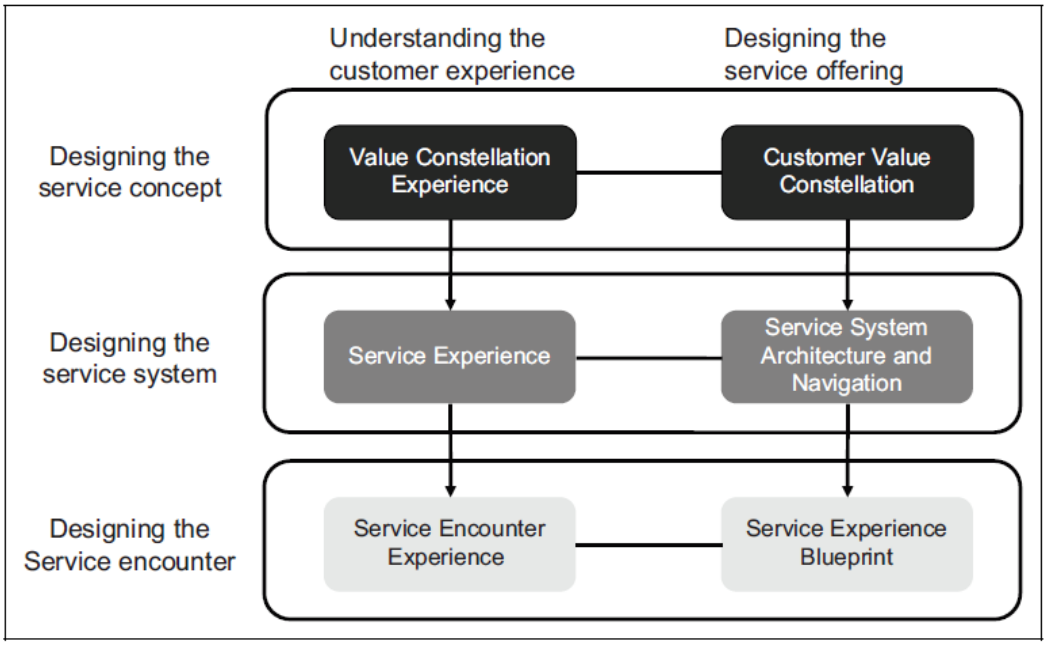


Figure 16. General overview of Multilevel Service Design (Patricio et al. 2011, 183).

In order to implement MSD the authors elaborate on four main steps that have subtasks that are shown in the following table. Two concepts that have to do with designing the service concept should be elaborated upon. The Value Constellation Experience refers to looking beyond the interactions with the main service provider and looking at the whole journey and its different providers that the customer goes through when engaging with the service. This creates an understanding of the current situation. The Customer Value Constellation on the other hand is the future service concept which puts the customer in the center of the value constellation. (Patricio et al. 2011, 183.)

Table 3. The MSD steps and their concrete tasks (Patricio et al. 2011, 185).

MSD Step	**Concrete tasks**
Step 1. Study the three levels of customer experience	Qualitative study Quantitative study
Step 2. Design the service concept	Understand the value constellation experience Design the service concept with the customer value constellation

MSD Step	Concrete tasks
Step 3. Design the service system	Understand the service experience Design the service system architecture Design the service system navigation
Step 4. Design the service encounter	Understand the service encounter experience Design the service encounters with the service experience blueprint

In terms of designing the service encounter, understanding the Service Encounter Experience refers to researching the interaction that the customer has with the Service System at each step. The Service Experience Blueprint offers tool by which the target experience can be designed. (Patricio et al. 2011, 186-187.)

The Multilevel Service Design model is an impressive, pioneering approach for Service Design research which attempts to bridge the gap between the human-centered design of services and the complex socio-technological systems that they are built on. The authors see their efforts as a contribution to developing interdisciplinary Service Design methods (Patricio et al. 2011, 197) but their approach has not been popularized since and has not become a standard in Service Design nor other fields.

In terms of promoting Service Systems Design, Service Design stands to learn about creating holistic Service Systems and enabling Service Ecosystems from the established yet evolving approaches of the Enterprise Architecture discipline. The Enterprise Architecture discipline in turn has a lot to learn from the human-centered approaches of the service design field outlined in the Multilevel Service Design model.

To recap, according to service-dominant logic (SDL), economic activity is the result of resource-integrating and service-providing actors participating on different levels which form adaptive entities. These entities are at least social actors whose interaction is often mediated or assisted by technology forming complex sociotechnical systems where social practices have the ability to drive the development and use of technology whereas technology enables new forms of social interaction.

I offer the concept of Service Systems Design as a practice that could use design to improve on the social aspects of the entities in SDL, institutions, service ecosystems and service systems. As the social aspects can be mediated or enabled by developments of new technology, Service Systems Design should be able to embrace at least a working knowledge of how technology can affect or assist value creation.

Table 4. The entities and the sociotechnical aspects that could be part of service systems design.

Entities in SDL	**Social aspects**	**Technical aspects**
Institutions	Laws, policy, etc.	Infrastructure
Service ecosystems	Contracts, rules, etc.	Platforms and interoperability
Service systems	Value propositions, desired value changes, etc.	Information systems

MyData, the phenomenon that is in focus in the following chapter, is an example of a institutional socio-technical approach where Service Systems Design could be used at all the entity levels. It seeks to enable the laws and policies that make it possible for humans to access, manage and use the data that has been recorded about them in multiple current services. This also requires a common infrastructure into which changing stakeholders can join when new organizations are created or when new services are started.

On the short run Service Systems Design could have the possibility to create impact on the humanization of our current services which could be done by supplementing our Enterprise Architecture practices with the human-centered aspects of design or the entities of service-dominant logic. As per the layers in the Transition Design approach to design outlined at the Carnegie Mellon University School of Design, perhaps Service Systems Design practices could be a key enabler to the Social Innovation that is possible through emerging technologies such as big data, IoT, the blockchain, robotics and others that have great yet unrealized potential. If we look into the hyperconvergence of all the technologies and subsequent Social Innovations, we might even get a glimpse of the area that is the target of Transition Design.

What is key to the Service Systems Design perspectives and methods is integrating the social and sustainable (business) aspects of value creation to the technical enablers of scaled interaction. One way of understanding the different scales that we can develop value propositions using Service Design is the Value Framework from Elke den Ouden (2011, 55) which elaborates on multiple perspectives from we can start developing innovation. User Experience starts at the user but we might as well start on the organizational level, the ecosystems level of collaborating partners or the societal level. Services can have aspects that span one or many of these levels. According to den Ouden, value (from a social standpoint) can be categorized as being economical, psychological, sociological and ecological. These value perspectives span the levels of value creation.

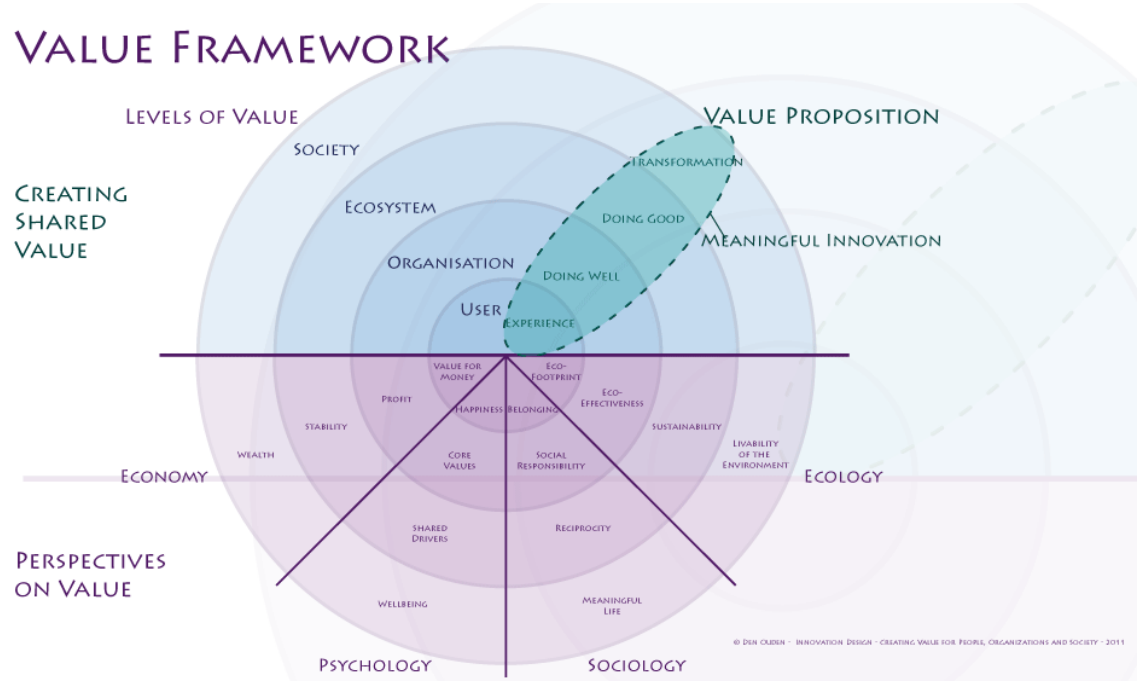


Figure 17. The Value Framework: an integrated view on value from social sciences (den Ouden 2011, 55).

Elke den Ouden does a great job in identifying many levels of value, her list is not exhaustive. The organization can be broken down to multiple levels and approaches such as organizational structures, processes, capabilities, resources, digital assets, and many others. One might interpret that in Service Design and Service-Dominant Logic, the user is not subordinate to the organization but rather part of the ecosystem. Also, her focus on meaningful innovation and perspectives on value seem to be normative which means that the framework contains inherent values of what types of value decisions we should make in service design. In some cases making these types of decisions might be in conflict with the intrinsic goals an organization might set for itself for example focusing on delivering shareholder value.

The following chapters will explore some of the perspectives and methods that we might use in enabling socio-technical innovations that are somehow digitally mediated and could benefit from the consolidation of Service Design and Enterprise Architecture approaches in value cocreation.

4 Using Service Systems Design in Digital Service Ecosystems – Case: The OmaNeuvola My-Data Health Service Ecosystem Sprint

The first research question that will be used to explore the concept and dimensions of Service Systems Design is as follows: How do we tie in customer centric aspects in creating a Service Ecosystem concept?

To answer this research question I will go through additional theory as the concept of MyData is defined in terms of what it is and why a MyData concept is a prime example of Service Systems Design.

Practices and methods relating to developing a MyData Service Ecosystem Concept are explored in the context of the Professional Summer School which was organized by Laurea, Metropolia and Haaga-Helia between the 30th of May and 10th of June 2016. One of the student groups developed a MyData Service Ecosystem Concept called OmaNeuvola to provide Elisa Oyj with new ideas on expanding their offering in a fresh context.

The empirical research that supports this research question is twofold. First, the MyData Clinic approach developed in the Digital Health Revolution and the common methods of the Professional Summer School are presented and expanded upon. Second, the students participating in developing the MyData concept are facilitated and observed in terms of how the methods support their work.

Table 5. The research question, method, context and deliverables for the first research question.

Research Question	Research methods	Context	Deliverables
How do we tie in customer centric aspects in creating a service ecosystem concept?	Case Study Research	Helsinki Region Applied Universities' Professional Summer School, Elisa MyData-case	Exploration of design methods and student-created service concept

4.1 Case Study Research Method

The research method used to answer this research question is a case study research method. This is suitable because the aim of this research question is to evaluate a service systems design case from multiple perspectives:

- MyData Theory – What is MyData?
- Opportunties for MyData in the evolution of Healthcare

- Evaluating and expanding the MyData Clinic process developed in the Digital Health Revolution research program
- Applying all the elements mentioned before in a MyData Health Service Ecosystems Concept Sprint
- Evaluating the sprint process and fitness of facilitation methods
- Undercovering the implications to Service Systems Design for Service Ecosystems

According to Syjälä, Ahonen, Syrjäläinen & Saari (1995, 11) the case study research method is useful when the issue that is being researched is multifaceted in which many aspects have relationships to each other. Because of this generizability of the findings is not the goal but rather to uncover the powers that affect each other.

There are many definitions for a case study but the aligning factor is that the case study reflects real life events that can not be made into a situation that can be tested for patterns. Qualitative case study is especially suitable when we are interesting in unique structures, the meanings given by participants to the cases and looking at real life situations. Case studies focus on processes, not end goals, environments rather than individual variables and trying to uncover something new that is relevant to the research question. (Syjälä, Ahonen, Syrjäläinen & Saari 1995, 11-13.)

The approaches used to explore this case are many and span from literature and case reviews, participating in an seminar on the topic, expert interviews, facilitation and ethnographic observation, analysis and theorizing. The following table explains how the approaches relate to the different features of the case study.

Table 6. Case study features and approaches.

Case Study Feature	Approach
MyData Theory – What is MyData?	Literature review
Opportunties for MyData in the evolution of Healthcare	Participation in the Digital Health Revolution results seminar 23.5.2016, literature, Hämeenlinna case review
Evaluating and expanding the MyData Clinic process developed in the Digital Health Revolution research program	Participation in the Digital Health Revolution results seminar 23.5.2016, case review and undocumented expert interviews for background information
Applying all the elements mentioned before in a MyData Health Service Ecosystems Concept Sprint	Student group facilitation and ethnographic observation in the Professional Summer School, field notes and photography
Evaluating the sprint process and fitness of	Analysis based on ethnographic observation,

facilitation methods	field notes and photography
Undercovering the implications to Service Systems Design for Service Ecosystems	Theorizing

The method used to gather information on the fitness of the MyData Clinic process and analysis in the Professional Summer School context is ethnography. It refers to studying people in everyday contexts using participant observation and creating unstructured data. The focus of ethnography is to study a small-scale like a group of people and uncover meanings, functions and consequences of practices within the domain. (Hammersley & Atkinson 2007, 3.)

Because the summer school spanned two weeks, it would have been impossible to record and analyse all of the activities of the group involved. For this purpose fieldnotes were used to document the most relevant observations (Hammersley & Atkinson 2007, 141-143). Fieldnotes were augmented with photographs to document the progress and the results of the group (Hammersley & Atkinson 2007, 148-149). Analysis is based on these artefacts.

4.2 What is MyData and Why is a MyData Concept an Example of a Service Ecosystem?

MyData is a Finnish concept for an approach which seeks to promote the rights of the individuals; citizens and consumers, to gain access and control to the data that has been collected about them by different types of institutions and organizations. Promoting these rights is a dual-bladed sword as it seeks to strengthen digital human rights and enabling the digital infrastructure that would make it possible to create a service ecosystem around the data and the consumers/citizens that the data is about. (Poikola, Kuikkaniemi & Honko 2015, 1.)

Poikola, Kuikkaniemi and Honko (2015, 2) define three MyData principles which elaborate on the aspects that the approach seeks to promote:

1. Human centric control and privacy. Citizens and consumers are in control of the use of their data and understand the privacy issues that relate to its use.
2. Usable data. MyData should be machine-readable, in open formats and served through standardized APIs. This enables new types of service to be built on top of data that has previously been hidden from the citizen/consumers eyes.
3. Open business environment. To operate, MyData requires an infrastructure to be effective but at the same time it simplifies the integrations between companies around creating services for the citizens/consumers. MyData also seeks to open data from lock-in situations and allow the simple transferal of data from one service to the other.

Where traditionally we as citizens/consumers interacting with organizations and services do not have a clear visibility to the data stored about us nor the ability to transfer it at will to another services, the MyData movement seeks to change this and create a revolution in our digital lives. It utilizes personal data management and processing practices to make a transition from organization-centric services to human-centric services. The definition of MyData includes the ability for the citizen/consumer to access and control their own data. (Poikola et al. 2015, 3).

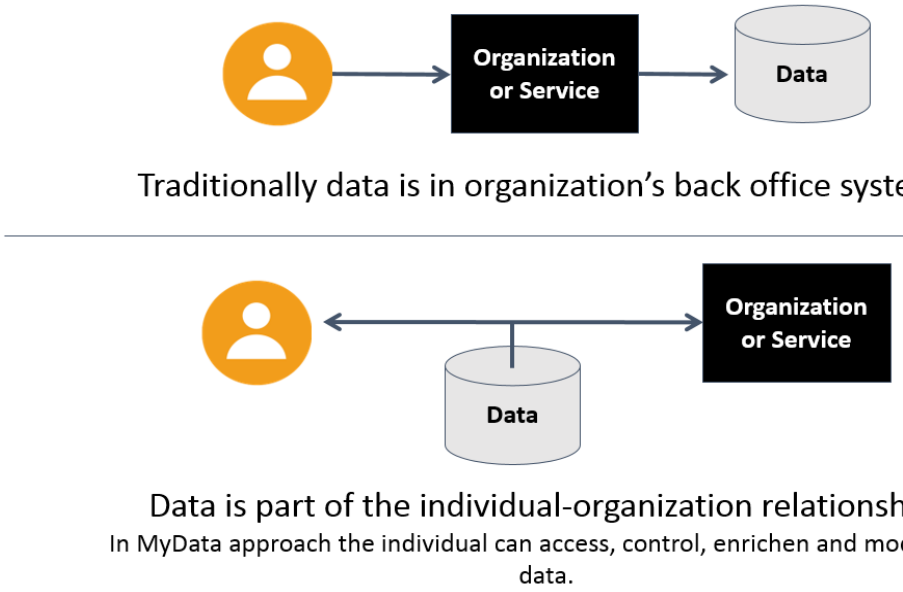


Figure 18. MyData makes data a visible part of the individual-organization/service relationship (Poikola & Kuikkaniemi 2016).

There multiple groups of stakeholders that could potentially benefit from MyData. According to Poikola, Kuikkaniemi & Honko (2015, 4) in addition to the things MyData seeks to promote, the citizens/consumers could be provided better data based services (ie. personalized recommendations), holistic insight into own behavior (self tracking), an increased choice of services through data portability and possibilities for the monetization of personal data.

Companies are currently lacking the infrastructure that might enable large scale, complex and pre-indetermined services around the citizen/consumer. Poikola, Kuikkaniemi & Honko (2015, 4) state that companies might benefit from MyData by:

- Heightened consumer trust strengthens engagement
- Integrated complementary services could enhance the company's core service product
- Helping attain a critical mass of users for new innovations through data portability in the open business environment
- Insight and transparency into consumer behavior could help optimize service production)

- Providing collective tools for complying with data protection legislation
- And lowering the transaction costs for data acquisition

Society might also benefit in many ways. Poikola, Kuikkaniemi & Honko (2015, 4) cite several ways in which this happens. First, MyData would lead to the parallel development of digital rights, innovation and business growth. Second, a collective digital infrastructure facilitates smart regulation in practice. Having more data sources available could lead to more informed decision-making based on rich data. MyData also has the ability to encourage responsible and sustainable citizen behavior.

In addition to being a digital rights approach, MyData must also be supported with an infrastructure solution. Traditionally it has been difficult for different providers to combine data with each other on a large scale because of missing data integration infrastructure. The large ecosystems Google, Apple, Facebook, and Microsoft have the power to integrate a large number of providers within their ecosystem in the aggregator model. The problem with this is that they are competing with each other and it is difficult to transfer big data between ecosystems. Also transparency is an issue when data is controlled by large private aggregators. (Poikola et al. 2015, 5.)

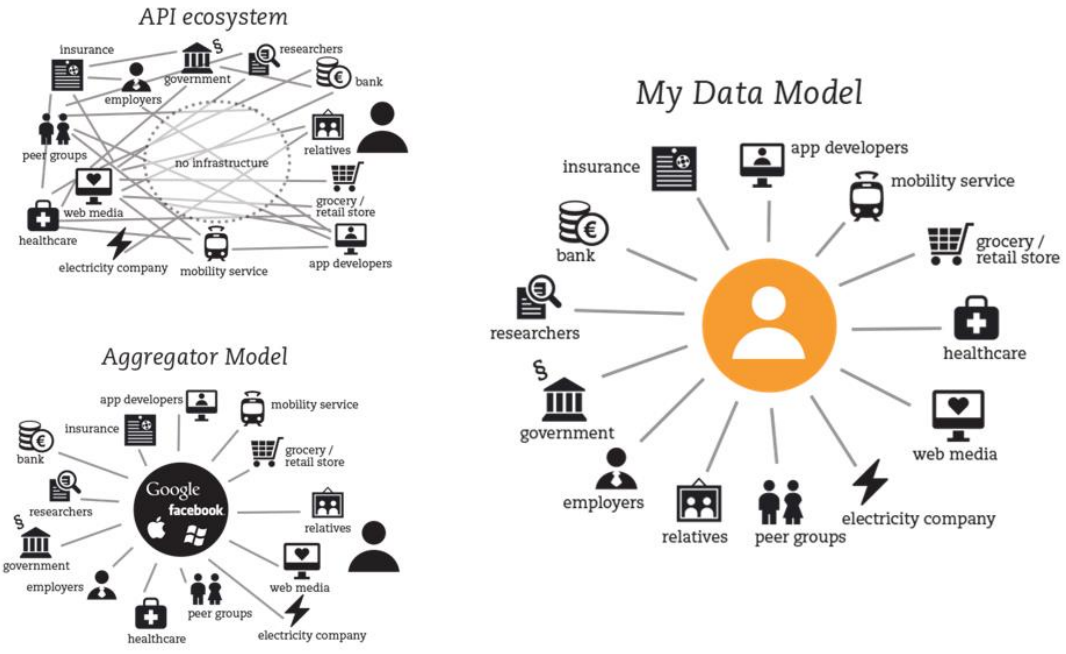


Figure 19. Transitioning from no infrastructure and large aggregator models to MyData models (Poikola & Kuikkaniemi 2016).

The key to MyData is a service called a MyData account which enables the citizen/consumer to aggregate the data that concerns him/her, give services the consent to use the data, and also review the usages of the data. (Poikola et al. 2015, 5.)

The four key elements of a MyData architecture include the individual (citizen/ consumer)/data subject/account owner, a MyData Operator which provides MyData accounts and the services related to them, data sources (from multiple organizations/services) and the services which use the data. Between these can flow consent and data but not all of them have to recide in the same service. This means that consent can be attached to data that is located elsewhere than the consent service. MyData operators should also be interoperable meaning that it should be possible to change them as you could change bank accounts between different banks. (Poikola et al. 2015, 6.)

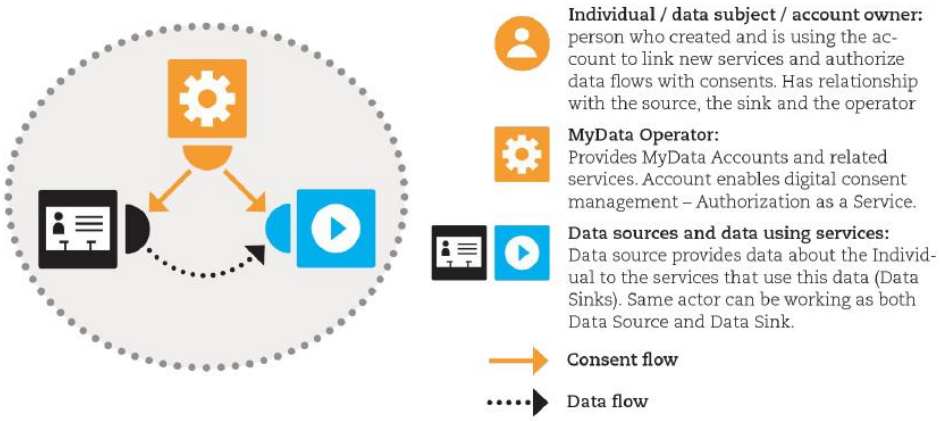


Figure 20. The elements of the MyData architecture (Poikola & Kuikkaniemi 2016).

The concept of consent is very important to MyData services and is a relevant issue to be understood in depth. In the context of MyData, consent is the permission for service and data providers to transfer and use the data in a designated manner. In reference to the EU GDPR directives Poikola and Kuikkaniemi outline four types of ways consent can be used in MyData. The first is delegation (top left in following figure). In this case an extermal consent service might be used to allow data transfer or integration from a data source (consent A) to a separate service (data sink, consent B). (Poikela and Kuikkaniemi 2016.) For example a student might want to share his validated university degree (data source) with a future employer (data sink) in digital format rather than in the paper formats they usually are in.

The second consent case (top right) is repurposing. In this case data that is collected for one purpose might be used for another. (Poikela and Kuikkaniemi 2016.) For example a university might use student credit data from their Student Information System for creating Business Intelligence applications for management to follow the aggregation of credits throughout a year.

The third consent case is using the MyData account as a Personal Data Storage (PDS). Instead of transferring/integrating the data directly from the original data source to the service that utilizes the data as was the case in Delegation, in this PDS case the data is aggregated in the MyData account and transferred through that to the data sink service that uses the data. (Poikela and Kuikkaniemi 2016.)

In the fourth consent case, the MyData account is notified of automatic data transfer. Public offices often have reporting duties to different places in the public sector for which they transfer citizen data from organization to organization. This consent case makes it possible for the person who's data is transferred to get a notification of when this has been done. (Poikela and Kuikkaniemi 2016.) Currently universities and other public educational institutions are required to report their student data to at least Statistics Finland (Tilastokeskus) but new uses for the data are being developed all the time. These data transfers are described in the privacy policies (rekisteriseloste) of the Student Information Systems but people rarely read them and currently are not able to get any information on when and where their data has been transferred.

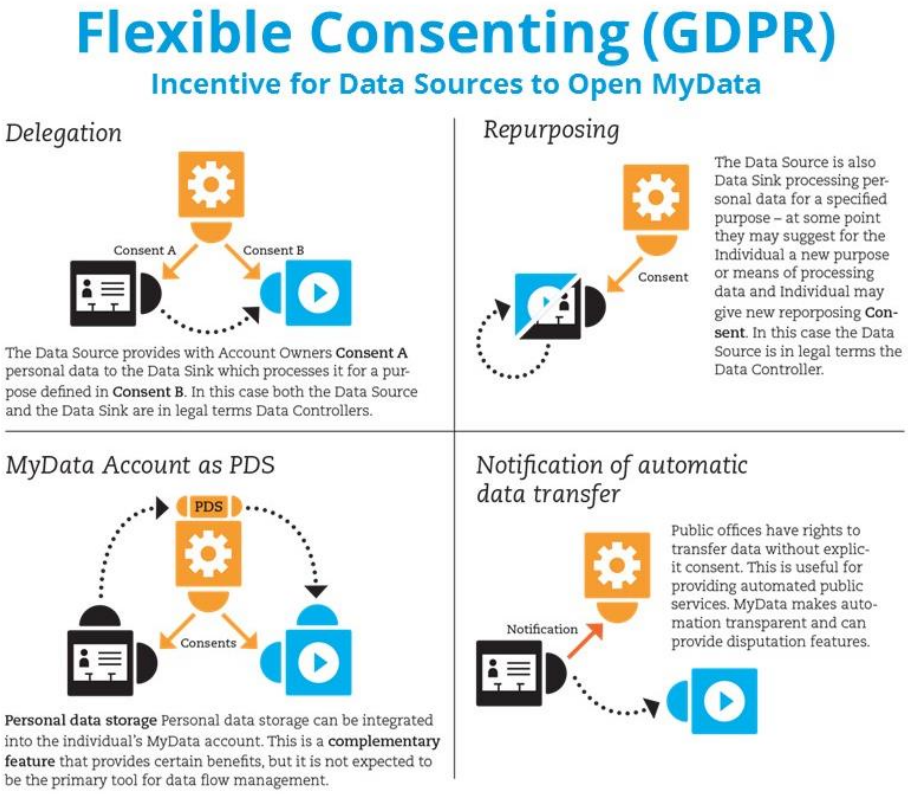


Figure 21. Flexible ways of consenting: how can user consent be used in relation to data and services (Poikola & Kuikkaniemi 2016).

Pilots around MyData are being done all over the world but there still is no consensus on what a umbrella term should be for the approach as it is multi-sided and complex (Digital Health Revolution 2016). MyData is used mostly in Finland, in the UK, there are initiatives around MiData (Digital Health Revolution 2016), and the World Economic Forum (2011) has published a report about the topic named *Personal Data: Emergence of a New Asset Class*.

Currently there is a lot going on in Finland around MyData. The Ministry of Transport and Communication (Liikenne ja viestintäministeriö) published a report on the topic in 2015 (Poikola, Kuikkaniemi & Kuittinen 2014), the government agenda contains a mention about how "people's right to decide about and monitor their personal information will be enhanced", the government spearhead projects include starting MyData-based pilots, and the EU General Data Protection Regulation (EU GDPR) seeks to impact the way data is used in businesses. (Poikola & Kuikkaniemi 2016.)

Research about the topic is also being done on many fronts in Finland. The Digital Health Revolution is a TEKES-funded research project (http://www.digitalhealthrevolution.fi/; Digital Health Revolution 2016) that aims to promote MyData in Healthcare. Working towards the common goal are researchers from the fields of MyData in society, IT and IT architecture, law, service design/UI, and business. The research programme collaborates with the government, the city of Hämeenlinna and a few companies to look at the different aspects needed to get MyData going. Healthcare is one of the main areas the research project is focusing on as it is one of the most largest beneficients of the approach as health is such a complex issue. There also is a MyData Alliance in Finland which brings together companies that are interested in the topic and are promoting some types of services and collaboration which might benefit from a MyData infrastructure. (Digital Health Revolution 2016.)

4.2.1 MyData and the Healthcare Industry

The theme of the Laurea, Metropolia and Haaga-Helia Professional Summer School was Healthcare, as it is one of the pioneering areas in which MyData pilots have been done and as the case company Elisa has participated in the pilots, it is relevant to look at the promise of MyData in the healthcare industry. Contextualizing MyData in the industry also helps understand a MyData Service Ecosystem concept from a user's point of view.

To understand a MyData user scenario better the researchers at the Digital Health Revolution (2016) research project have illustrated the case of "Sauli" and his occupational health services. In the first case Sauli starts in a new job and while engaging with its occupational health services, is provided tools to support wellbeing and performance at work. He is given wearables, laboratory tests and so on in order to do this.

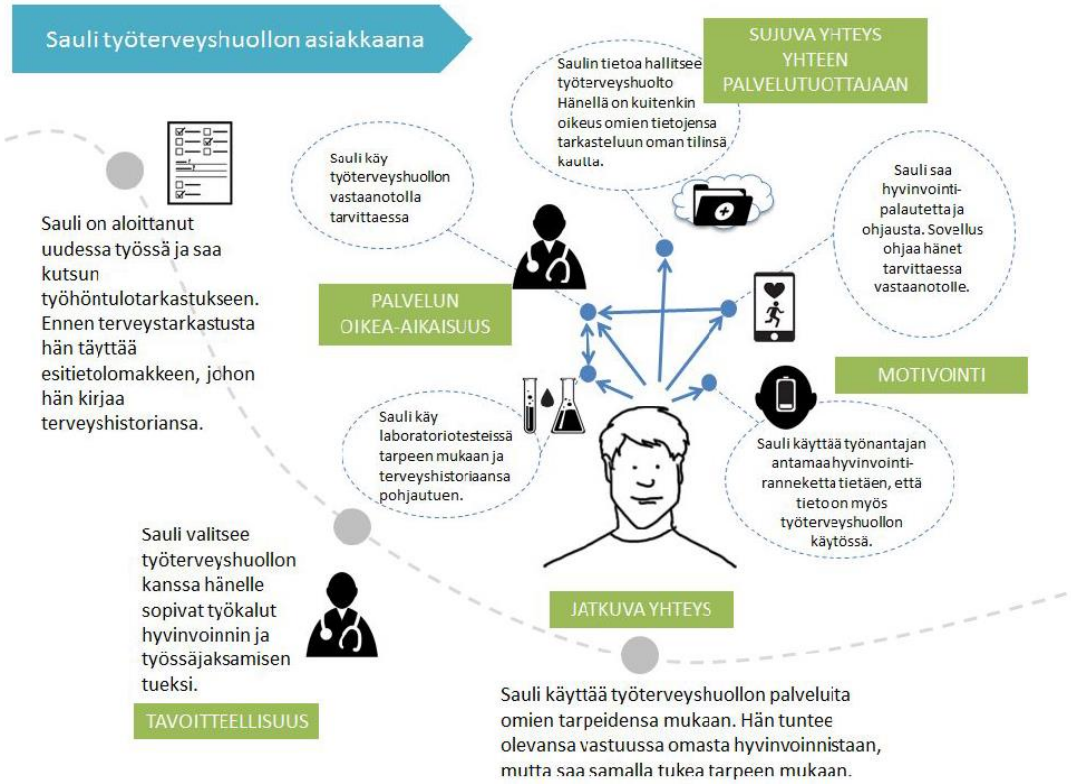


Figure 22. MyData-case: Sauli and his occupational health services (Digital Health Revolution 2016).

However, Sauli decides to become an entrepreneur and has to relinquish his wearables and work mobile phone. After ending his contract, he receives a notification that he can now access the data that has been gathered previously by his occupational health service on his Omakanta health account. He then chooses an online wellbeing system to support himself and is able to transfer his data to the professionals who can help him in his new situation. (Digital Health Revolution 2016.)

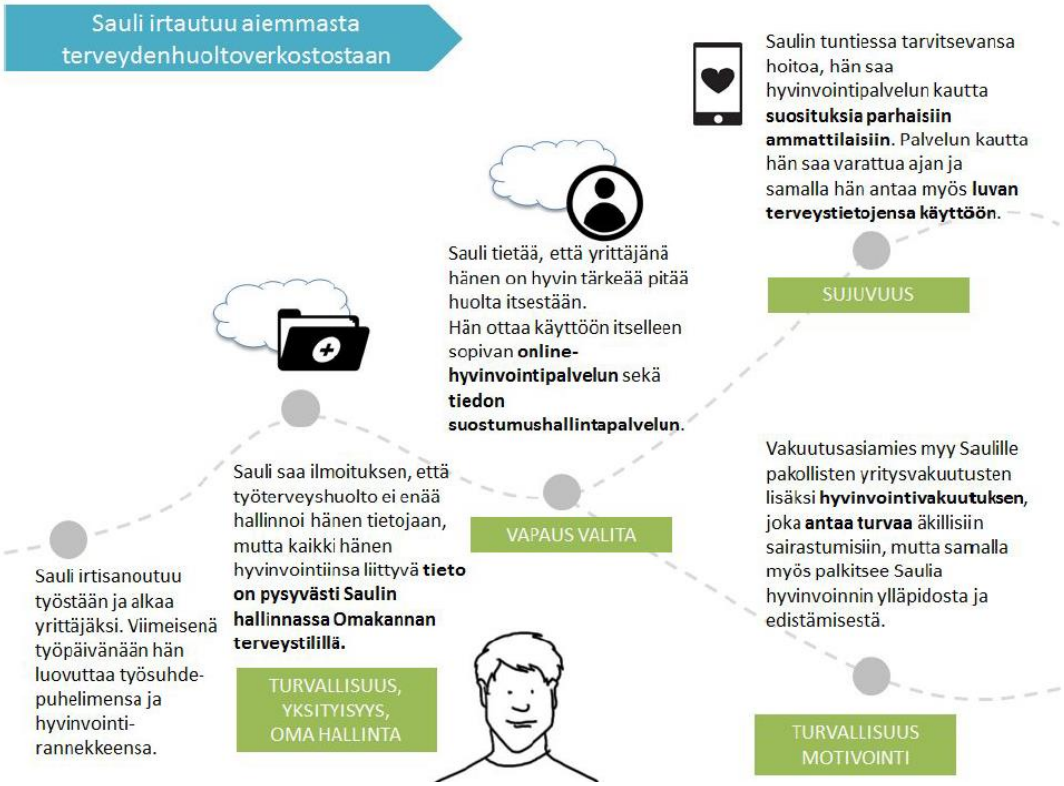


Figure 23. MyData-case: Sauli changes jobs and his occupational healthcare network (Digital Health Revolution 2016).

The goal for the Digital Health Revolution research programme is promoting a personalized, predictive, preventive and participatory service ecosystem. MyData-based service are at the heart of enabling a proactive digital healthcare society, a new digital health marketplace and the real-time self-management of health and wellbeing for individuals. (Digital Health Revolution 2015).

The new tools that are available are also pushing clinical work into a new direction in which the doctor is no longer the center of clinical work but rather there is a software and network of experts and peers who are supported by shared data about the patient. In addition to the traditional pharmacolocial interventions and therapy, changing behaviour and prevention is a big part of the future vision for clinical work. (Perälä-Heape 2015.)

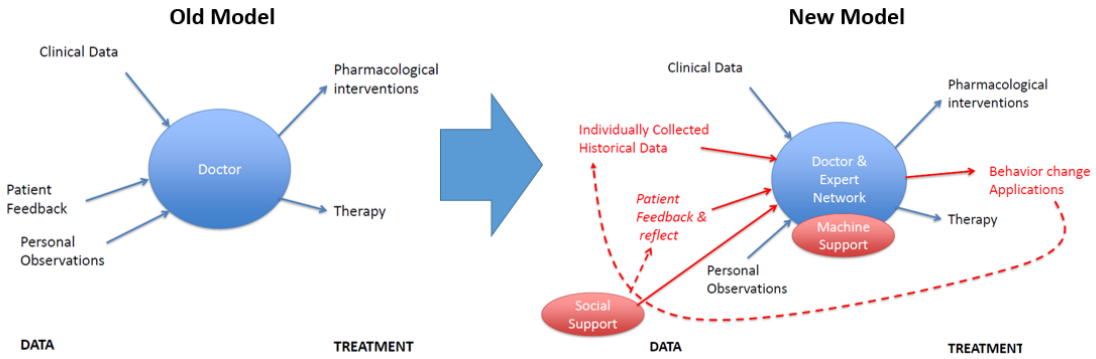


Figure 24. Clinical work is moving crom a doctor-centric model to a network model that is supported by machines (Perälä-Heape 2015).

The City of Hämeenlinna has been one of the partners for the Digital Health Revolution MyData research programme due to the city's longstanding efforts towards digitizing healthcare services that have been covered in multiple media outlets. (Digital Health Revolution 2016.)

Hämeenlinna has done a lot facilitate patient-centric healthcare. Between the years 2010-2014 the city had two projects called Potku 1 and 2 which aimed to put the patient in the drivers seat of healthcare. The goal of these projects was to let customers define their goals and needs for self treatment and get co-ordinated support from their treatment specialists and a team of multidisciplinary workers. The second phase of the Hämeenlinna journey went on from 2013-2015 with the goal of adding to the previous projects' outcomes the abilities for the customers to utilize their patient and healthcare data to make a self-health check, analyse their symptoms and get suggestions on next steps from medical decision support systems. The goal was to integrate these into the services of the health care centers. In the third and current phase of Hämeenlinna's healthcare service development, the customer can track their data based on sensors and self-measurement equipment and get support based on the data. (Rönkkö 2015.)

The end results of the projects in Hämeenlinna has been a healthcare portal called Minunterveyteni.fi which the citizen/patients can use to do their self-diagnosis assessments, connect their wearables, access their health and medical data, and participate in health coaching. (Rönkkö 2015.)

Figure 25. The Minunterveyteni.fi service portal used for the Hämeenlinna Healthcare services (Rönkkö 2015).

Even though the solution looks rather simple from the point of view of the citizen/patient, it is actually an integrated user interface to multiple services delivered over a digital business ecosystem.

According to Harri Honko, Hämeenlinna's Minunterveyteni.fi platform is such as connected collection of services from multiple organizations the ecosystem architecture of which is depicted in the following figure. Connected to Minunterveyteni.fi are Effica (the city's current social and healthcare system) which in turn accesses and writes data to Kanta, the national patient data registry. The data in Kanta can be seen and accessed by the citizen/patients through OmaKanta which includes consent services that make it possible for the users to provision their data to desired destinations. (Digital Health Revolution 2016.)

The medical decision support system that can be accessed through Minunterveyteni.fi is called Duodecim EBMeDS and this is used to assess the self-diagnosis of symptoms. Taltioni.fi is a Finnish health data aggregation and connectivity service which allows users to connect and collect data from various sources such as occupational health services, digital health services like the iOS Health App and, using W²E (Wellness Warehouse Engine), a wide range of wearables from Polar, Fitbit, and others. (Digital Health Revolution 2016.)

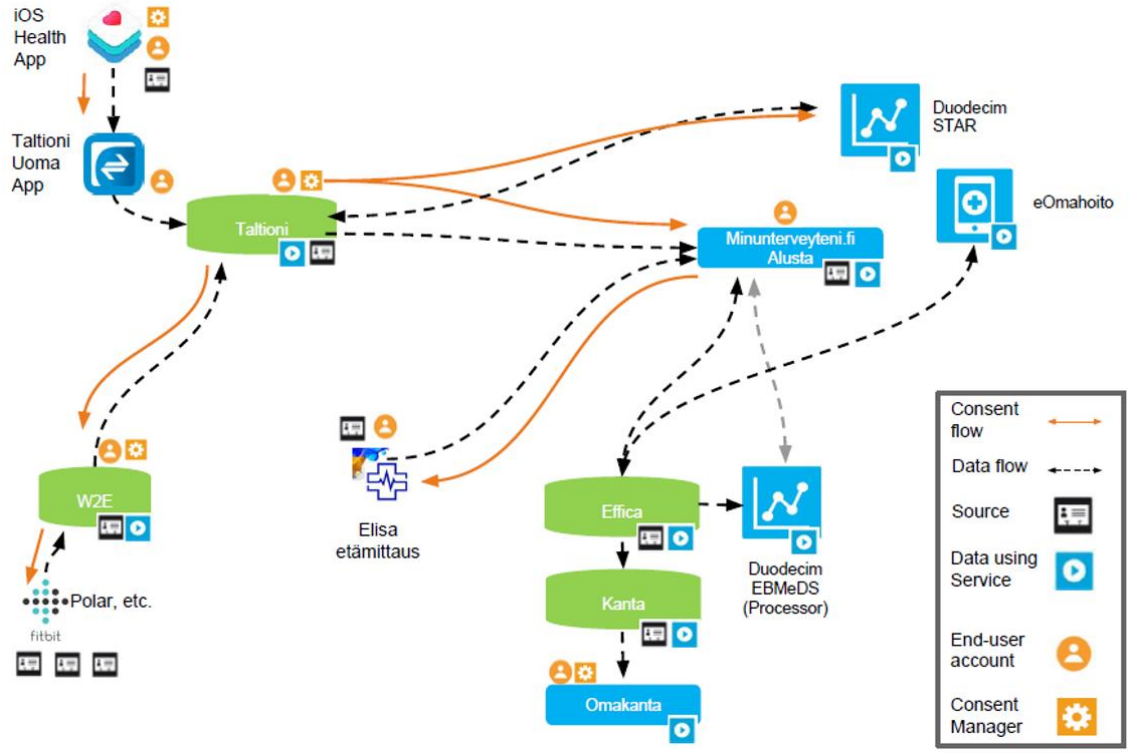


Figure 26. Hämeenlinna's Minunterveyteni.fi digital Business Ecosystem and Service Architecture (Digital Health Revolution 2016).

Elisa provides the healthcare system and subsequently citizens/patients of Hämeenlinna with their Elisa Etämittaus App which works on a mobile phone and collects plus distributes data from connected self-measurement devices. Measurements that can be done from anywhere using the self-measurement devices include blood pressure, PEF-tests, oxygen saturation, blood sugar levels and heart monitoring. Citizens/patients can borrow the devices from Hämeenlinna's healthcare centers, use them at home and transfer the measurement data automatically and in real time to their physicians for possible real-time monitoring and evaluation. (Elisa 2015.)

Even though the Minunterveyteni.fi platform integrates multiple data sources and devices into one user interface, there are still many steps to take to improve the usability of such a digital business ecosystem from user's point of view. The Hämeenlinna picture contains six separate end-user accounts (that are shown) and four consent managers. To employ the full potential of the digital Service Ecosystem, most of these accounts and consent managers must likely be used by the potential user. Could the idea of flexible consenting done through just one consent manager help the user put the whole ecosystem to use more easily?

Another design challenge for the digital Service Ecosystems follows from the right to access, manage and use one's own data. Recently the Norwegian Consumer Council conducted a live reading of the terms and conditions of 33 mobile phone apps (including Netflix, Youtube, Fa-

cebook, Skype, Instagram and Angry Birds), an average amount of apps for each Norwegian consumer. The reading finished after about 32 hours (31:49:11 to be precise). "The current state of terms and conditions for digital services is bordering on the absurd. Their scope, length and complexity mean it is virtually impossible to make good and informed decisions," said Finn Myrstad from the Norwegian Consumer Council. (BBC.com 2016.) Poikola and Kuikkaniemi (2016) state that one of the goals for the MyData user should be creating humanized terms and agreements that could benefit on applying Design Thinking in the realm of Legal Design.

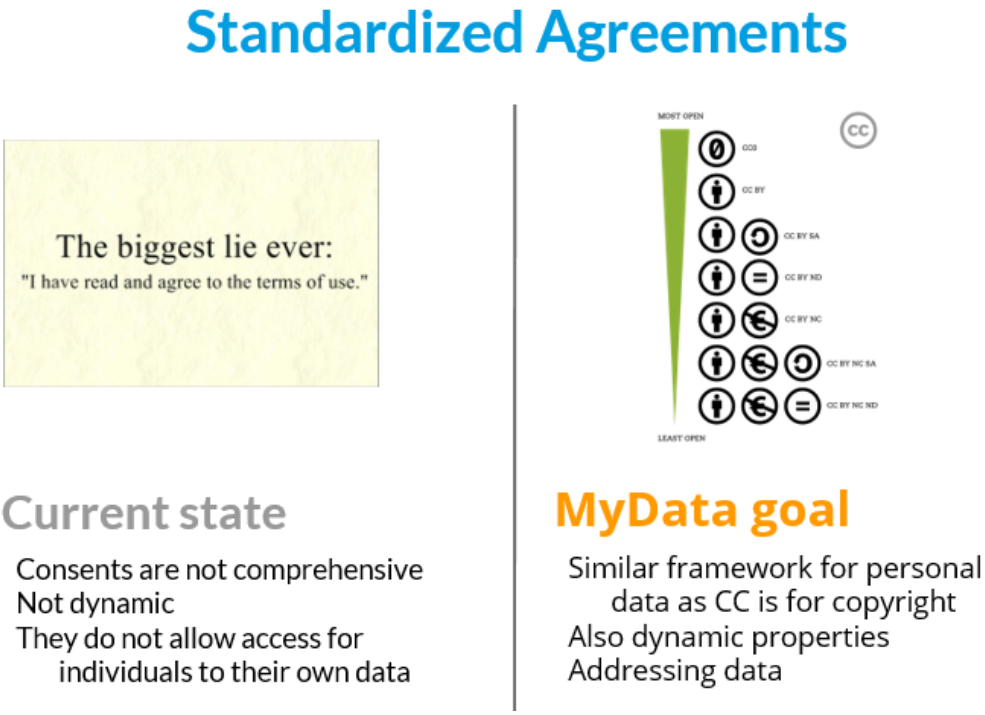


Figure 27. Designing legal texts that are easily understandable to humans is another MyData challenge (Poikola & Kuikkaniemi 2016).

There is much in the domain of MyData that Service Systems Design approaches could tackle. In talking about how to combine systems, organization and Service Design Jeff Sussna (Merholz 2016, italics by author) states that Service Ecosystems based in distributed systems pose interesting frontiers for design: “The problem is that when you get into a much more complex world, which now is the world of the Cloud and will soon be the world of the Internet of Things, *design has to help people navigate distributed systems*, and that means that on some level designers need to understand what’s different about distributed systems and how to help people navigate them.”

4.3 Choices in Methods for Facilitating Service Ecosystem Concept Development

As one might gather from the examples of MyData Service Ecosystems in the healthcare industry, a MyData Service Ecosystem is not just composed of what the User/Customer Experiences but in addition to that it requires an understanding of the underlying Service Ecosystem which to operate in this case is a distributed system which requires a digital Service Ecosystem consisting of multiple partners. This requires multi-sided approaches rather than looking at the system that is composed by a single service providing organization such as the city of Hämeenlinna.

To gain inspiration into the methods that could be used in facilitating the MyData Service Ecosystem Concept I tried to find a balance between two approaches. First, the general Professional Summer School program and its embedded methods and second, the MyData Clinic set of methods which have been tried out in the Digital Health Revolution research programme in developing customer-centered Service Ecosystem concepts.

The Professional Summer School's official name was the Digital Wellbeing co-creation and Start-up Summer School 2016 as it focused on promoting skills and knowledge in both Service Design and Entrepreneurship. Because the Professional Summer School had more student groups than facilitators, the tasks and methods for each day were given at the start of each day in lectures for all the participants. Thus the Professional Summer School had an embedded timetable and proposition of methods that could be used by the students that is summarized in the following table.

The first day of the Professional Summer School was focused on telling the students about the next two weeks, introducting them to their teams and a few informative lectures. For the team building task students were divided into the rooms where they would work over the next two week, played some improvisation games, and made posters of themselves and their teams.

The goal for the second day of the Professional Summer School was to interview the organizations that were providing the tasks for the concepts, filling in value proposition canvases and finally making research plans for the next day.

The third day of the Professional Summer School was dedicated to interviewing potential customers/end-users for the concepts in the field. The day started once again with an introductory lecture into methods, approaches and types of interviews that could be made to support finding a relevant concept.

The methods of the fourth day were focused exploring future-facing opportunities using the futures wheel method and creating storyboards to explore how the student concepts could impact the lives of their potential users.

The goal for the fifth day of the Professional Summer School was to ideate ideas for concepts in a facilitated manner and create plus pitch three interesting concepts to a group of teachers from the participating institutions who were there to give support to the students.

The second week of the Professional Summer School started with rapid prototyping some of the concepts that the students had come up with. The goal for the rapid prototyping phase was to create three lo-fi prototypes that could be done and iterated rather quickly.

The rapid prototyping day was followed by a day for making one more advanced prototype that could be used to support the service experience. The third day of the second week was meant for creating a Business Model Canvas and a marketing plan. The last two days of the Professional Summer School were focused on getting the pitch ready and pitching to a crowd of teachers, peers, facilitators and organization representatives.

Table 7. The Professional Summer School timetable and proposed methods for each day.

Week 1				
Monday 30.5.	Tuesday 31.5.	Wednesday 1.6.	Thursday 2.6.	Friday 3.6.
Team Building	Value proposition canvas	Field research	Storyboards	Facilitated solution ideation
	Research plan for interviews		Futures wheel	Posters for three customer-centered concepts
Week 2				
Monday 6.6.	Tuesday 7.6.	Wednesday 8.6.	Thursday 9.6.	Friday 10.6.
Rapid prototyping	Creating one proper prototype	Business Model Canvas & Marketing	Prepare for pitching	Pitch concept

The MyData concept task by Elisa was a bit different from most of the other tasks in the Professional Summer School because of three main reasons. The first being the fact that the student group working on the concept would have a dedicated facilitator to help them with its development which would offer the ability to adapt the approaches to what is needed. The second was the fact that the student concept development could and would be supported by

background information both in terms of what MyData is and about the research done previously in the Digital Health Revolution programme.

The third difference to other tasks is in the Professional Summer School was the nature of a MyData Service Ecosystem Concept. As MyData is based on organizations exchanging data in order to create customer-centric services, the traditional Service Design and Entrepreneurial process embedded in the common Professional Summer School methods must be expanded by methods that make it possible to embrace the multi-sided/multi-organizational nature of a MyData Service Ecosystem Concept.

To facilitate the development of MyData-based services, the Digital Health revolution research project has developed the MyData Clinic service development process which covers the aspects required in these specific cases. (Pikkarainen 2016.)

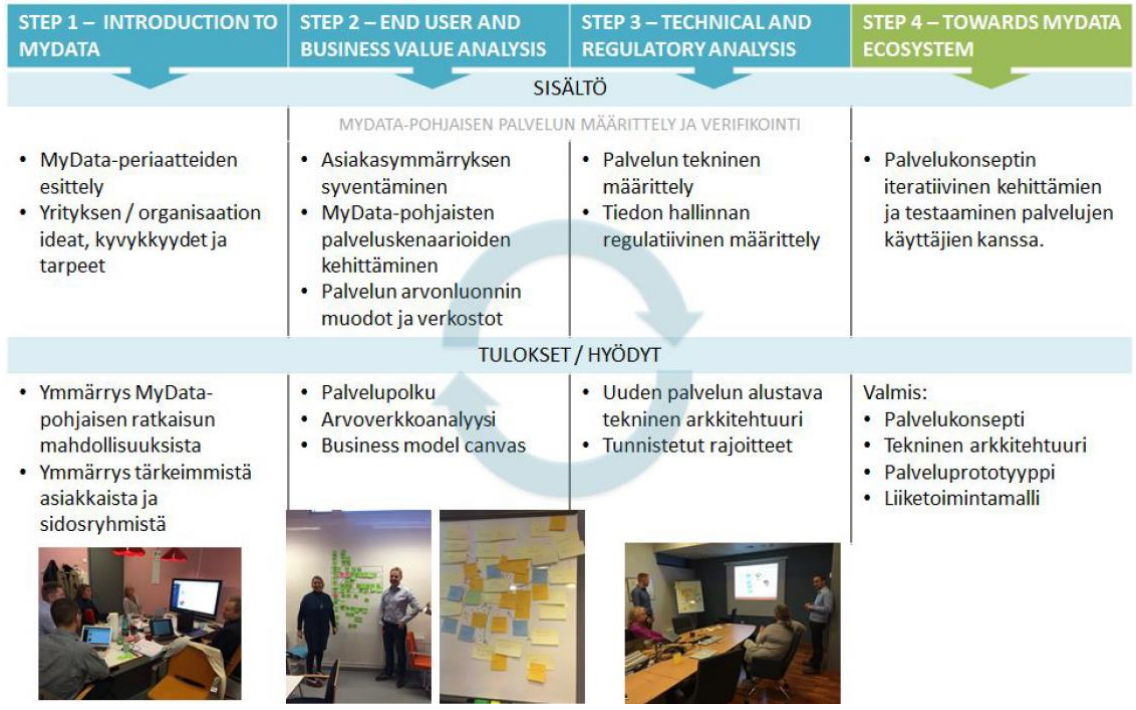


Figure 28. The MyData Clinic service development process (Pikkarainen 2016).

The MyData Clinic process starts off with Step 1 which is an introduction to MyData. This includes looking at what the MyData movement seeks to accomplish with its principles and combining this to the ideas, capabilities and needs of the organization in question. Step 1 seeks to give the participants an understanding of the possibilities of a MyData-based solution and look at the most important customers and stakeholders related to a project. (Pikkarainen 2016.)

Step 2 seeks to provide an analysis of end user and business value. During this step, customer insights are researched, MyData-based service scenarios are developed and a view into how the service creates value within a network is created. The outcomes of this step are a customer journey map, business model canvas, and value network analysis. (Pikkarainen 2016.)

Step 3 looks into the technical and regulatory analysis of what is to be developed. During this step the service's technical requirements are defined and the regulatory issues that have to do with data management are looked into. The end result of this step is a preliminary technical architecture and its possible constraints both in technical and regulatory dimensions. (Pikkarainen 2016.)

Creating the MyData ecosystem is the goal of step 4. During this step the service concept is developed iteratively and tested with the service users. After this step there will be a user-validated service concept, its technical architecture, a service prototype and a business model. (Pikkarainen 2016.)

For the context of the Professional Summer School, the MyData Clinic model seemed a bit too heavy and broad. Especially the aspects embodied in its step 3, the technical and regulatory analysis go too deep into the subject than is useful for the Professional Summer School. Also step 4, the iterative development and testing of the MyData service was beyond the scope of what could be done over the course of two weeks.

What is absolutely necessary to MyData is some type of Value Network Analysis in which stakeholders are identified, their roles and different types of exchanges are analyzed. In the MyData projects like the one presented from the Hämeenlinna Minunterveyteni.fi case the technical diagrams focus mainly on the IT-services, consent flows and data flows. User accounts, data sources, data using services and consent managers are also shown.

The MyData Clinic method proposes the use of Value Network Analysis for looking beyond just the IT aspects of modeling the digital business ecosystem and its distributed service architecture. The Value Network Analysis itself described by Verna Allee (2008) is also a powerful tool to consider when doing this as it enables the usage of negotiated intagibles as drivers of business models in addition to the traditional tangibles.

Allee (2008, 14) sees that value networks consist of roles, transactions (flows), and deliverables (the "things" that move between the roles). The value network can then be analyzed based on exchange (what are the exchanges and how well do they succeed), impact (what do roles provide) and value creation (how to create, extend, and leverage value).

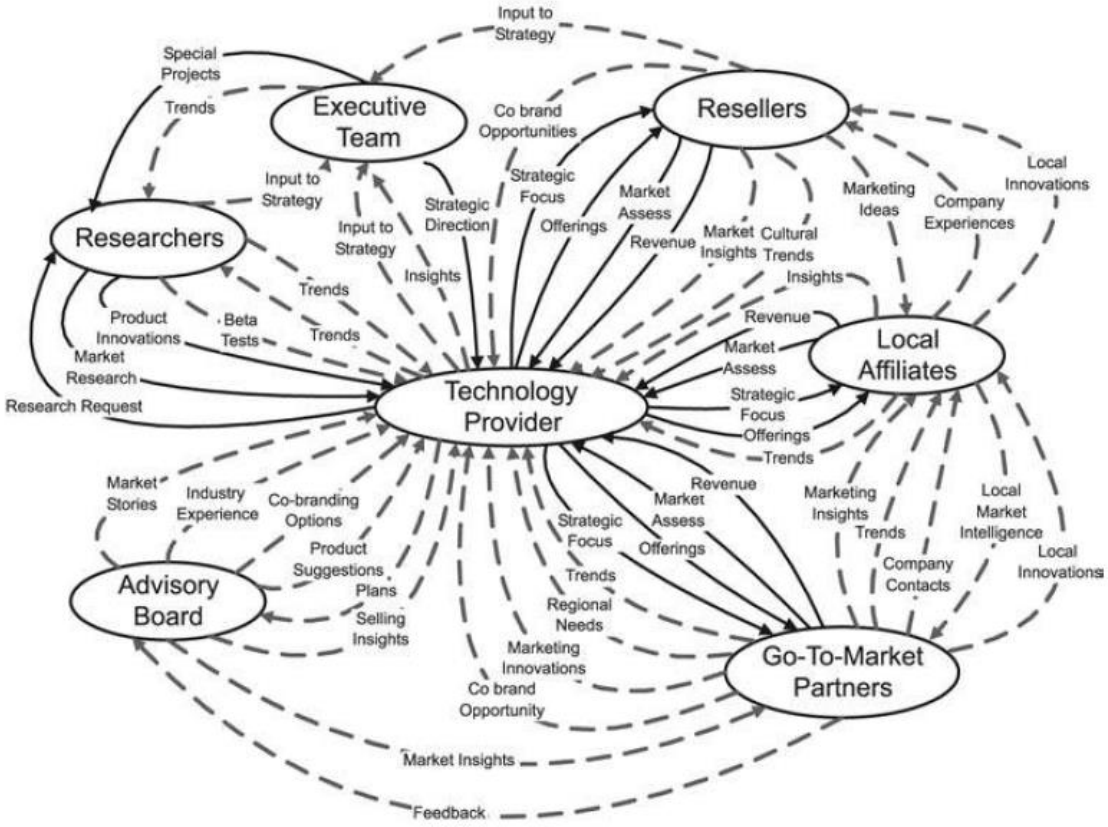


Figure 29. Exchange analysis for a technology company (Allee 2008, 15).

The exchange analysis presented before has its problems from the standpoint of Service-Dominant Logic because it is hightly firm-centric and does not incorporate the cocreation of value that happens with the beneficiaries (customers) of the system. However value aspects can be added to the Value Network Analysis impact and value creation analysis tables.

Impact analysis is done by analyzing how roles benefit each other and the overall. Transactions are analyzed using the factors depicted in impact analysis tables. (Allee 2008, 16.)

Transactions			Impact Analysis							
Deliverable	From	To	What activities generated	Impact on financial resources	Impact on intangible assets			Overall cost/risk	Overall benefit	Perceived value in view of recipient
					Human Competence	Internal Structure	Business Relationships			+2 +1 Neutral -1 -2
Intangible										
Tangible										

Figure 30. Impact analysis table (Allee 2008, 17).

Value creation analysis on the other hand seeks to analyze the value of intangible assets and turn them into negotiable value. There are many tools that are used to analyze this but the main set can be seen in the following figure. (Allee 2008, 18-21.)

Transactions		Perceived value		Value Creation							
				Tangible asset utilization	Tangible costs	Risk level	Intangible asset utlization	Intangible costs	How we add value	Cost/ Risk	Benefit

Figure 31. Value creation analysis table (Allee 2008, 20).

What is interesting about value network analysis is that it is compatible and can be used with other business analysis disciplines such as system dynamics, asset management, process modeling and social/organizational network analysis (Allee 2008, 22).

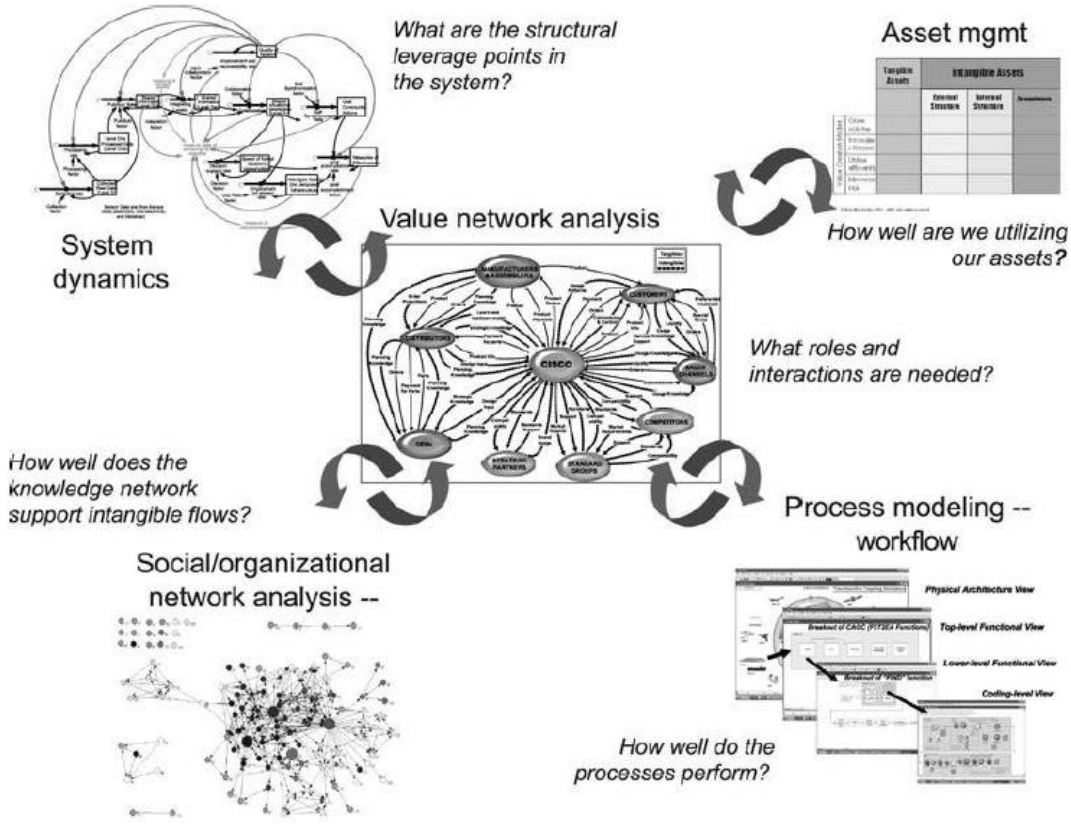


Figure 32. An overview of Verna Allee's approach to Value Network Analysis and it's relation to other approaches (Allee 2008, 22).

From a facilitation standpoint even though Allee's approach to Value Network Anaylsis is working and robust, it seems like an expert's tool rather than something someone unfamiliar

with it might adopt quickly and get the value out of in a short workshop. Therefore an alternative approach should be considered.

Another approach that might help improve on this types of IT-centered MyData architecture diagrams can be found from Elke den Ouden (2012, 154) who proposes a Value Flow Model to design new ecosystems the process of which can be seen in the following figure.

Figure 33. Steps in designing a new ecosystem (den Ouden 2012, 154).

The end result of Elke den Ouden's value flow model can be seen in the figure below in an example by Jan Schmiedgen (2013) who attempted to model the Apple business ecosystem. The model consists of many types of flows: goods & services, money & credits, information, intangible value (such as feelings, reputation, well-being, etc.) (den Ouden 2012, 158-159). These could be used to bring business and customer aspects to the type of MyData architecture modeling done in the Digital Health Revolution MyData projects.

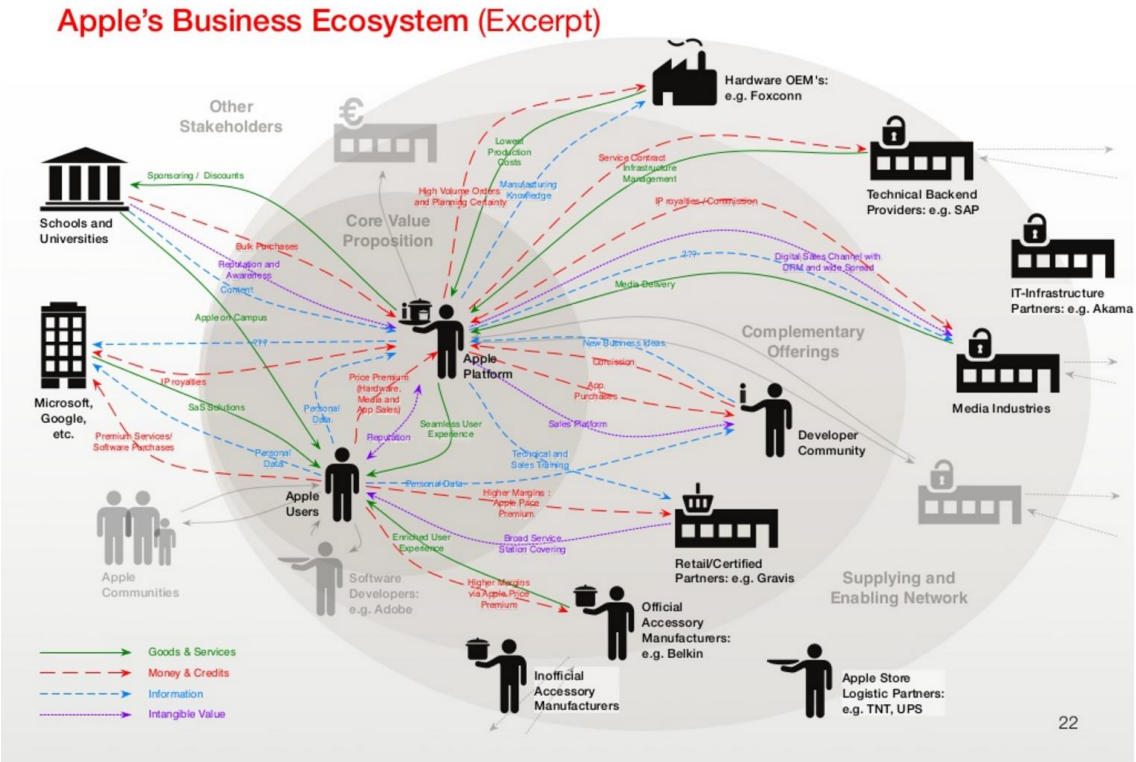


Figure 34. Apple's Business Ecosystem (Excerpt) (Schmiedgen 2013).

The background of the Value Flow Model groups the stakeholders and their relationships to the core value proposition which refers to the enablers of the service which creates value to the end-users and also enables value creation for the ecosystem. The core value proposition is supported by complementary offerings and the supplying/enabling network. (den Ouden 2012, 160; Schmiedgen 2013.)

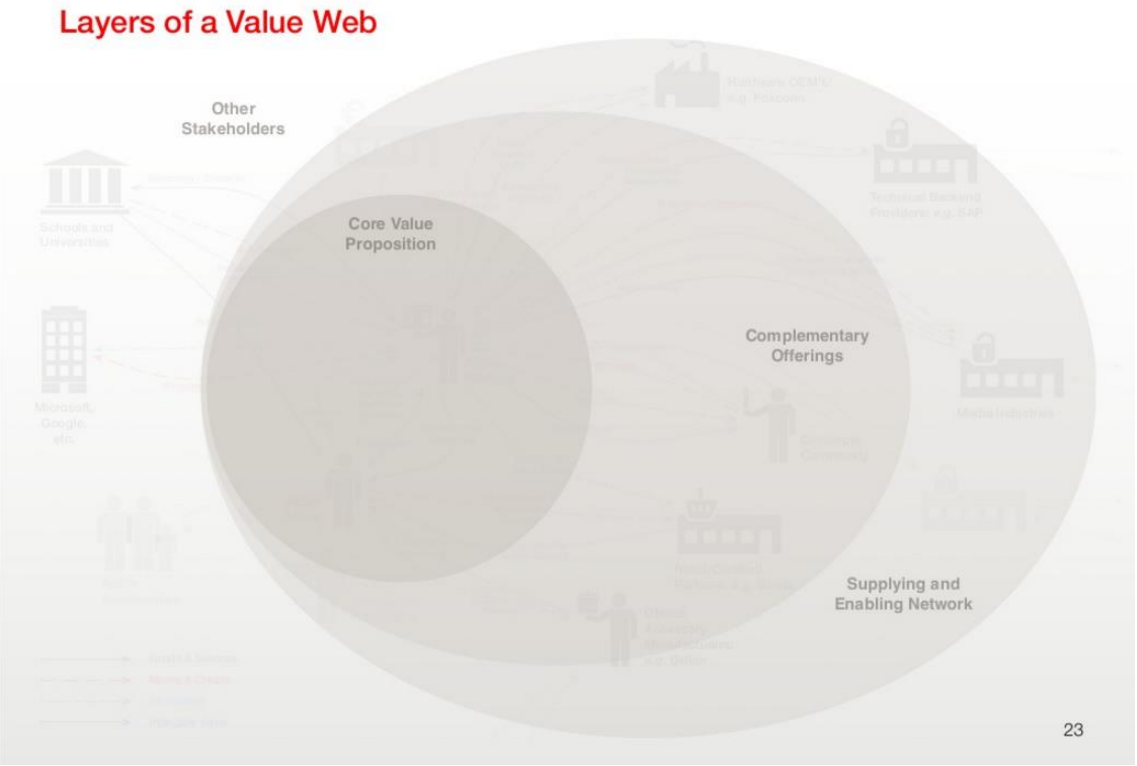


Figure 35. The Value Flow Model background (den Ouden 2012, 160; Schmiedgen 2013).

Like Vargo and Lusch define value to be phenomenologically determined by the beneficiary, reducing a Service Ecosystem to just one core value proposition does not present the whole potential of the Service Ecosystem. It does work in the aggregator model presented earlier where large ecosystems such as Apple, Google, Microsoft and Facebook are able to integrate a number of other providers around their service delivery channels.

However in the case of the MyData model we no longer have a central value proposition but rather the possibilities for multiple value propositions which might involve the same actors or stakeholders. Whereas de Ouden's Value Flow Model looks at one core value proposition, an actual MyData service ecosystem is closer to the complex and adaptive means of collaboration that Vargo and Lusch call Service Ecosystems.

Stakeholders can take multiple roles in the Service Ecosystem so we're not looking only at the customers and the organization that directly services them but also all the participants who

make it possible for the ecosystem to function. Potential stakeholder roles are explored in the following figure. (den Ouden 2012, 172; Schmiedgen 2013).

Figure 36. Stakeholder roles within an ecosystem (den Ouden 2012, 172; Schmiedgen 2013).

Value Flow Modelling also taks into account the the idenfication of the types of transactions or value flows between the stakeholders. Transactions can be for example goods & services, money & credits, information and intangible value. The reason why this is important is that it helps the designers of the ecosystem push beyond looking at monetary value and also look at other types of value disciplines.

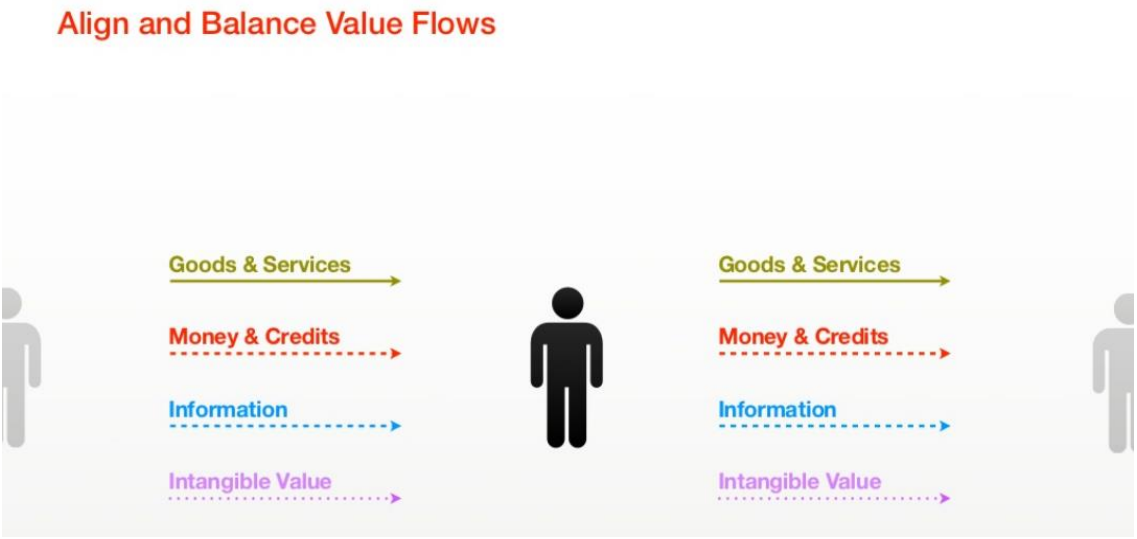


Figure 37. Different types of value flows or transactions between stakeholders (den Ouden 2012, 158-159; Schmiedgen 2013).

Elke den Ouden (2012, 155-158) goes even further in assessing the stakeholders that participate in the ecosystem. To understand their roles better, the stakeholders should be evaluated in terms of motivation, compatibility with the value proposition, influence over the ecosystem, investment and the time horizon it would take the stakeholder to participate. To give the participants the tools to integrate these approaches to possible future efforts I had previously created an ecosystem stakeholder canvas to help assess the stakeholders. In addition to the aspects that den Ouden proposes, I decided to add aspects from the value proposition canvas to explore the dimensions of motivation through jobs/pains/gains.

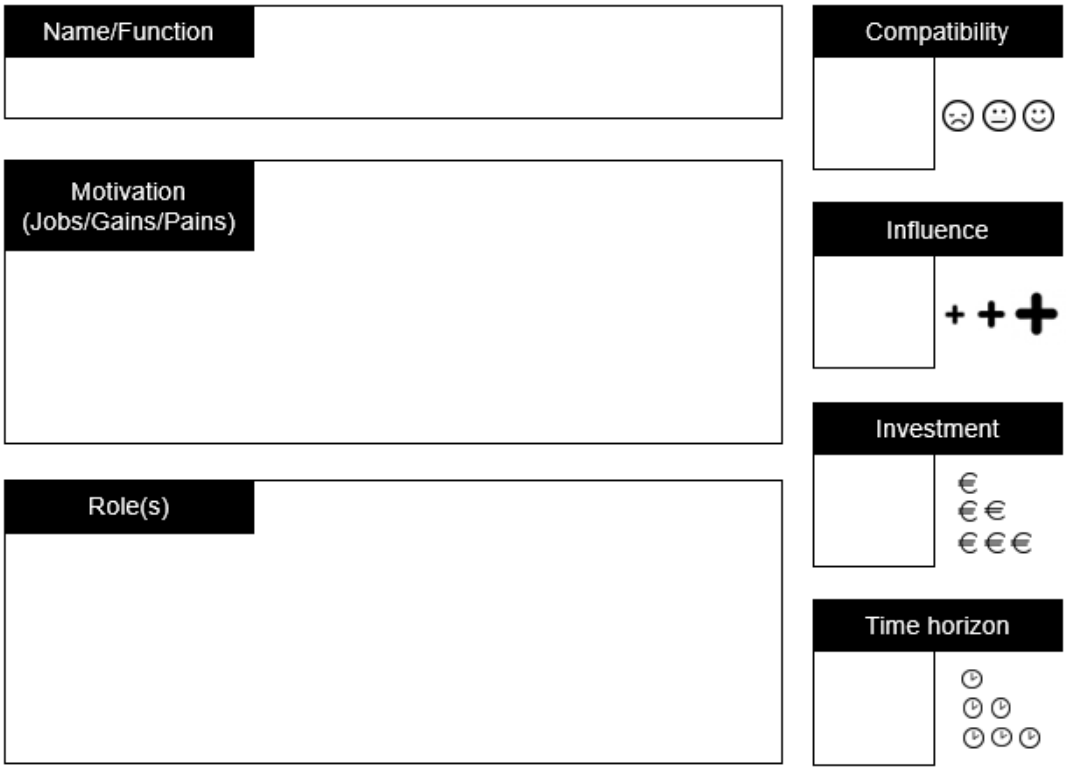


Figure 38. The ecosystem stakeholder canvas.

The two methods, Value Flow Modeling by Elke den Ouden and Value Network Analysis by Verna Allee have their strengths. Value flow modeling however seems like a more collaborative effort that could be done in Service Design workshops whereas the Value Network Analysis is more about optimizing an established network because of its rigorous approach to analysis. For the exploration of a MyData Service Ecosystem Concept in the Professional Summer School the Value Flow Modeling approach seemed more suitable than the Value Network Analysis.

Thus the initial set of methods for developing the MyData ecoservice system concept and the schedule of how to do this in the Professional Summer School's context was a combination of the Summer School's shared methods added with some aspects of the MyData Clinic method and utilizing the Value Flow Modeling for the business ecosystem mapping in stead of Value Network Analysis.

The initial set of methods and the schedule for developing the MyData Service Ecosystem Concept is depicted in the following table.

Table 8. The initial set of methods and their schedule for developing the MyData service ecosystem concept in the Professional Summer School.

Week 1				
Monday 30.5.	Tuesday 31.5.	Wednesday 1.6.	Thursday 2.6.	Friday 3.6.
Team building	Understanding MyData and ideation	Field research, Customer Insights	Customer insights, Ecosystem mapping	Customer concepts
	Understanding the stakeholders in the ecosystem	Validate customer needs	Value Flow Modeling and storyboards	Create posters and pitch
Week 2				
Monday 6.6.	Tuesday 7.6.	Wednesday 8.6.	Thursday 9.6.	Friday 10.6.
Prototyping three lo-fi concepts	Functional prototype (UI), Understanding the concept	Business Model Canvas & Marketing	Prepare for pitching	Pitch

4.4 Facilitation and Observation

I had made the engagement to be a facilitator at the Professional Summer School during the spring of 2016 and happened to meet Elisa Oyj's Head of Service Design (referred to in this thesis as HSD), at an IxDA x Elisa MyData event in April 2016. Our common interest in MyData led us to develop a case task for a student group participating in the Professional Summer School. The goal of the task was to let students develop a MyData Service Ecosystem Concept in healthcare that would utilize Elisa's current service offering. The task itself is summarized in the following table.

Table 9. The MyData concept development task given to the students by Elisa.

Case company	Elisa
Problem description, open format. What business problem, social problem etc. is the client willing to tackle?	Elisa wants to promote a culture in which citizens/customers are more aware and in control of the usage of their data. MyData offers a solution to this but what kinds of implications could it have on our interaction with multi-organizational healthcare services?
Target audience. Who are the primary users or user groups for the new solution?	Citizens/customers are the beneficiaries and actors in MyData. They can interact with frontline workers or electronic services and are supported by backstage services and organizations.

Expected outcomes from the clients side	2-3 potential service and UI scenarios in healthcare where My-Data is an enabler with customer journeys and potential business motivations.
Inclusions & exclusions	There is an ongoing project in which the city of Hämeenlinna, Elisa, HIIT, Uni. of Oulu, Lapland and TTY are working together. The project and its actual cases will be presented to the students but new ones can also be considered by the team.

The first day of the Professional Summer School was geared towards team building and the Elisa team was formed by three Bachelor's degree business students from Metropolia: Jenn, Zahar and Toan and two Master's degree students from Laurea: Suna (Innovative Digital Services) and Sami (IT).

The students were provided the Elisa MyData task on the second day and we started it off with a short introductory lecture on MyData, the Digital Health Revolution research programme with special focus on the city of Hämeenlinna case and Elisa's Etämittaus healthcare business offering.

The UK Design Council Double Diamond model is a popular way of describing how the design thinking approach works. It seeks to create options in the divergent discover and develop phases and create something tangible in the convergent define and deliver phases. The first, discover phase, seeks to identify the problem, opportunity or needs and create inspiration and insights into the topic at hand. (Design Methods for Developing Services 6-8.)

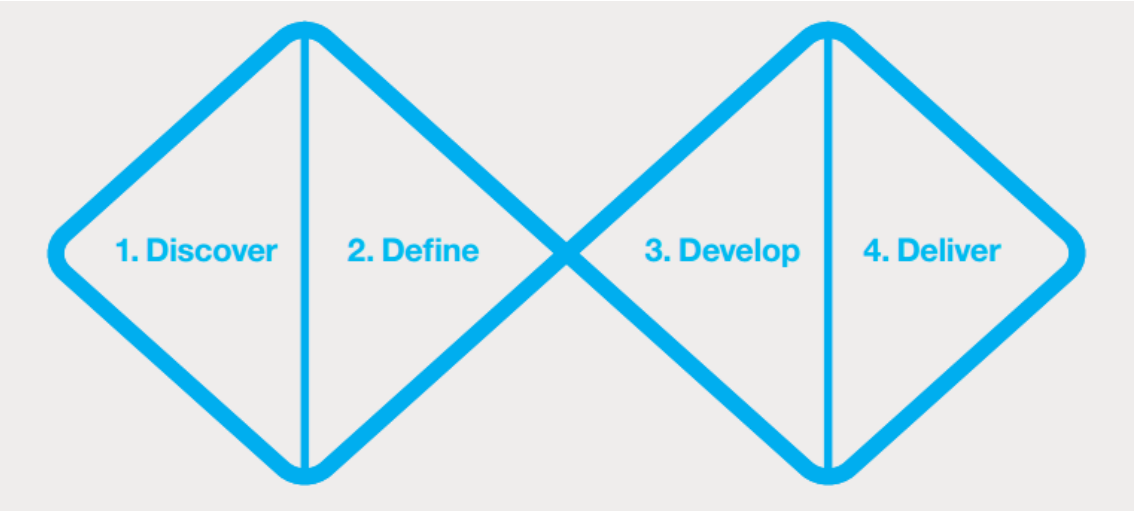


Figure 39. The UK Design Council Double Diamond (Design Methods for Developing Services, 6).

Following the Double Diamond Model, we started off with the discover phase to understand the problem area. As the Elisa case made it possible for the students to come up with their own concept but as it should be grounded in some type of Service Ecosystem, the team was introduced with the stakeholder map (Stickdorn & Schneider 2011, 143) as means to explore how municipal healthcare services might work in the city of Hämeenlinna. The team put the patients in the center of it and explored the different stakeholders ranging from doctors to insurance companies that might take part in creating the services.

The goal of the use of this method was to help to team get a better and shared understanding of the target area rather than map the actual Hämeenlinna ecosystem because the Hämeenlinna case did not necessarily have to be the base ecosystem for the team's concept.

After getting a good understanding of this, the students were given the service design tool of the day for the Professional Summer School, the Value Proposition Canvas (Osterwalder, Pigneur, Bernards & Smith 2014). For his yet unpublished thesis, Predrag, a fellow student of mine from the Laurea Master's Degree Programme in Service Innovation and Design, has worked on using the Value Proposition Canvas to explore the different perspectives stakeholders in a digital Service Ecosystem have in developing a common MyData Service Ecosystem. Using Miskeljin's efforts as inspiration, we decided to do two Value Proposition Canvases to understand the most important stakeholder relationships in a municipal healthcare case.

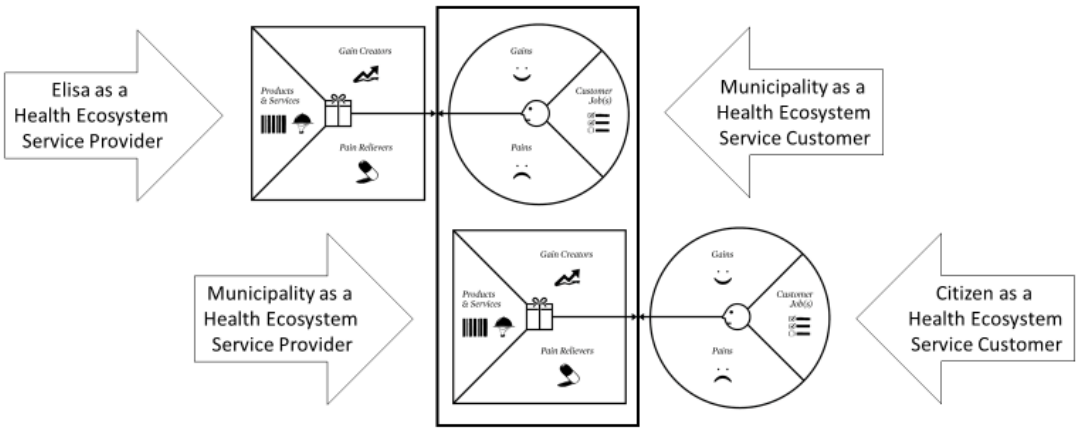


Figure 40. The multi-sided value proposition canvas for the MyData Health Service Ecosystem Sprint.

In the first Value Proposition Canvas the team explored the relationship between the Hämeenlinna healthcare services offering to the possible needs of the citizens/patients. The

second one was done to understand the relationship of the offering of Elisa's healthcare services to the needs of the city of Hämeenlinna.

What the team learned from working on the Stakeholder Map and Value Proposition Canvases was that the service offering of the municipal healthcare services is extremely broad and thus developing a new concept that would encompass them all would be extremely difficult. As the tools that were used for learning about the context did not provide sufficient results for concept development, I decided to improvise and provide the students with a persona canvas (Stickdorn & Schneider 2011, 243) to help focus efforts. Perhaps understanding the citizens/patients needs better might help find previously uncovered possibilities for concepts?

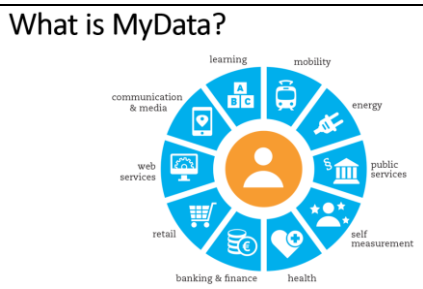
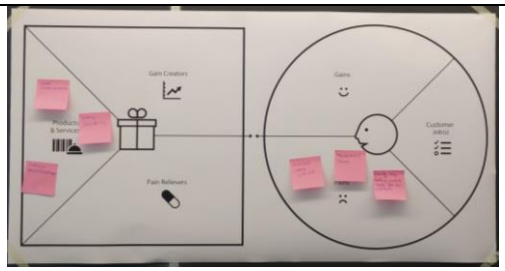
In thinking about who's problems and needs to design for created a breakthrough for the team in terms of uncovering their concept. Suna told the othm members about her experiences with the neuvola (maternity/parenthood) services and wondered especially about how paper-based and disjointed the services were. However the team found out trying to use the persona canvas did not work very well in trying to understand the context of maternity and parenthood. This also meant that the team had partially moved into the define phase of the Double Diamond Model. However real-life concept development is not as linear as the model proposes and the team would go back to discover phase tasks as well.

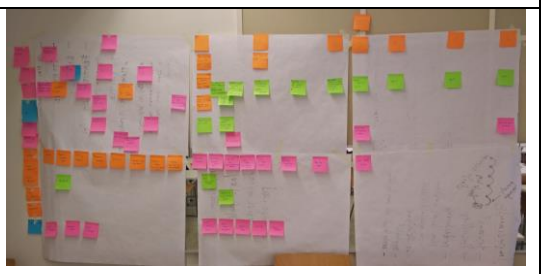
At this point the Customer Journey Map (Stickdorn & Schneider 2011, 151) was introduced to the team as a tool for understanding what a mother and parent goes through during the 6-7 years they are customers to the services. Suna told the team and was interviewed by them about the different things that have to be done during the services. What was especially interesting in developing a MyData service system concept that might solve these problems was the point that mothers and parents have to send multiple paper forms to for example KELA, their insurance providers, their work places and others that prove that they indeed have had a baby.

After creating an initial overview of the Customer Journey Map, the team decided to focus on co-creating research questions that they could understand the opportunity and solution spaces using field research and an online survey. This is where the second day of the Professional Summer School ended.

What should be noted from the flow of the second day is that the team required more methods to uncover their concept than was proposed by the Professional Summer School methods and what had been planned by the facilitator initially. In this context it was useful for a facilitator to have a grasp of diverse methods to support the flow and arising questions that groups have rather than only follow a predefined process for concept development.

Table 10. The methods, their motivations and outcomes introduced and used on the second day of the Professional Summer School.

Method	**Motivation**	**Outcome**
Introduction to MyData	Familiarize the participants with MyData principles, the Hämeenlinna MyData case, technical issues and Elisa Health services.	
Stakeholder map	Identify the actors in the business ecosystem that interact to create municipal healthcare services for the citizens.	
Multi-sided value proposition canvas: Elisa -> Hämeenlinna	Understand the services that Elisa Health provides.	
Multi-sided value proposition canvas: Hämeenlinna -> Citizens	Identify the healthcare services services that the case city of Hämeenlinna provides its citizens.	
Persona canvas	Identify and empathize with whoever the solution will be designed for. In this case the pregnant mother, parent and child.	

Method	Motivation	Outcome
Customer journey mapping	Interviewing a mother and empathizing with her journey from pregnancy to the end of the neuvola services.	
Co-creating research questions	Planning and prioritizing customer research questions with a grid of importance / relevance.	

The team got together in the morning of the third day and another team building task was introduced. This time they were taught the basic stuff that service designers should know: namely how to peel a post-it correctly and how to open a sealed package of post-its. The team had a few laughs and proceeded to finalize the questions they would like answers to and identify who to interview. The team divided into two groups for the day. The Finnish-speaking students went interview mothers at a nearby playground and also visited a neuvola in Leppävaara to speak with experts in the field. The English-speaking students decided to focus on making a online survey and explore the neuvola services in more detail off the internet. At the end of the day the team got together to discuss the findings. One of them was the neuvola card (neuvolakortti) which seemed to be very important to a lot of mothers yet it was still provided in paper formats.

Table 11. The new methods, their motivation and outcomes used during the third day of the Professional Summer School.

Method	Motivation	Outcome
Team building	Learning basic stuff service designers know: how to peel post-its and how to open a sealed package of post-its. (It's harder than you'd think!)	

Method	Motivation	Outcome
Field research	Interviews and insights into mothers and neuvola staff.	
Online Survey	To gain input on the questions from a broader audience than just those who are met for the interviews.	 Research Study - Making Maternity Health Care More Efficient

The goal of the Professional Summer School's fourth day was to work on a Future's Wheel to explore what might be possible in the near future and gain insight on how to use these ideas in the concepts. This however was not relevant to the MyData Service Ecosystem Concept as many of the future trends in both healthcare and developing MyData Service Ecosystems were embedded in the introduction to MyData. The Digital Health Revolution and City of Hämeenlinna were already working on the future concepts so exploring them again was unnecessary.

Instead of this the student team decided to explore the interviews in more depth and conduct some more of them. The interviews of mothers done on the fourth day were conducted on the telephone and over Skype.

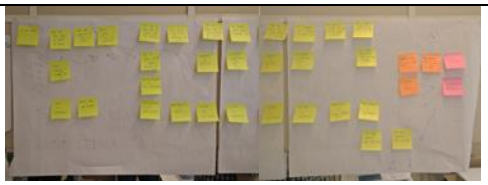
The other goal for the day on part of the Professional Summer School was to make storyboards and this was the first point in which the team was supposed to put the concept together based on the ideas that they had gotten by making the Customer Journey and the field research. The students decided to use the Pixton online comic software for making the storyboards.

At this point the students started moving into the develop phase of the Double Diamond Model. To begin the storyboarding the team had started together to define the customer activities/steps that would be presented in the storyboards (Stickdorn & Schneider 2011, 125). They did this by starting to work on a service blueprint (Stickdorn & Schneider 2011, 201). However after the common customer activities had been defined, the team divided into two groups: Suna and Jenn working on the storyboards and Zahar, Toan and Sami filling in the rest

of the Service Blueprint. This decision was made because everybody could not simultaneously work on the computer and there was a lot to do before the concept should be pitched on Friday.

Because of the distributed nature of a MyData Service Ecosystem, the customer activities/steps in the Service Blueprint were used to identify both the touchpoints that would help the customer's fulfil them and the integrations needed for the touchpoints.

Table 12. Storyboarding was the new method that was used on the fourth day of the Professional Summer School.

Method	**Motivation**	**Outcome**
Storyboarding	Embed the concept in the life of a potential customer by telling a story of the service encounver using a few pictures.	
Service Blueprinting	Understand the customer actions/steps that had been outlined in the storyboards. Identify the touchpoints that are required to enable each step. Understand the customer data integrations that are required for each step.	

Friday, the fifth day of the Professional Summer School, turned out to be a very busy day with a lot of tasks that the team would have likely wanted to have more time to work on. The goals for the day in terms of the Summer School's timetable was to first do some facilitated ideation which the team deemed not necessary because they had come up with their concept over the previous days and pitching the concepts accompanied with concept posters to teachers for feedback.

After the morning lectures, the tem continued in the same groups as the previous day but divided the tasks so that Suna and Jenn would work on the doctor's view into the patient data and concept posters. Zahar, Toan and Sami working on the Value Flow Model which would illustrate the digital business ecosystem behind the concept and the citizen/patient view of the service.

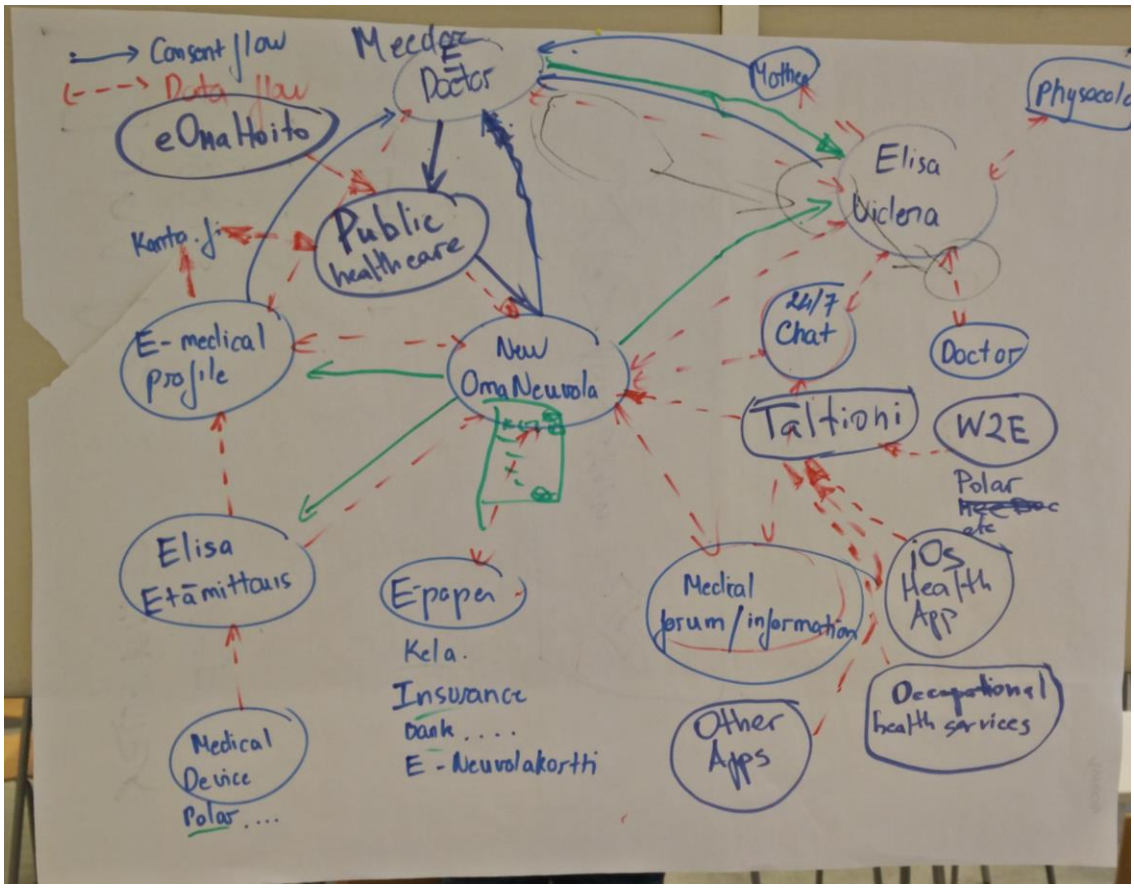


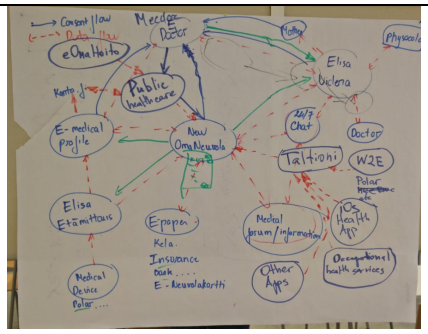
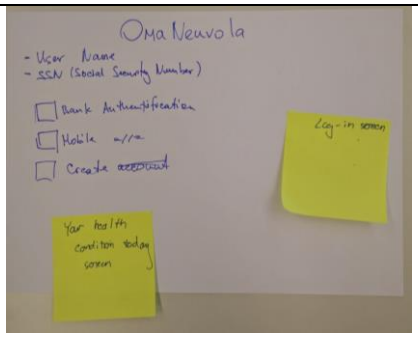
Figure 41. The Value Flow Model created for the OmaNeuvola service ecosystem.

In making the final version (presented with the whole concept) of the picture of the OmaNeuvola service ecosystem, the team decided to drop the additional linkages proposed by the Value Flow Model and focused on the main connections between the systems. The links for separating between data, consent and money was not important because the team wanted to focus on communicating the whole Service Ecosystem as the business model and technical detailed aspects (part of the Service Ecosystem) were not apart of the concept they were supposed to make.

The three concepts (doctor, patient and Service Ecosystem) the team pitched were actually three different sides of the same MyData Service Ecosystem Concept. Getting many important things ready simultaneously and turning the into a format that could be communicated was not necessarily useful for the team at the point where their concepting was. They could have

used some more time to work things through together and get better shared understanding of the concept rather than hassle to get something ready for a pitch. The teachers' feedback reflected this: the concepts seemed difficult to understand in a short 3 min pitch and required more work.

Table 13. The methods used during the action-packed Friday.

Method	Motivation	Outcome
Value Flow Modeling	Illustrate the digital service ecosystem, understand the role of different stakeholders and explore the flows in terms of consent, data and money.	
Lo-fi UI prototyping	Making concepts for doctor and patient views into the OmaNeuvola MyData service ecosystems concept.	
Concept posters & pitching	Create posters for three concepts and pitch them to teachers for feedback.	

During the following week's Monday the students were tasked with making three lo-fi prototypes based on the service concept. This work had begun already during the previous Friday and continued on Monday. On this, the sixth day of the Professional Summer School, the stu-

dent's had the opportunity to conduct an expert interview of Antti Poikola, one of the writers of the MyData manifesto published by the Ministry of Transport and Communication.

Elisa's Head of Service Design (HSD) also had the opportunity to mentor the student's with its development. His main feedback into developing the concept was for the team to employ storytelling to make the complex service ecosystem concept more understandable. Also, because the UI prototypes were not going to be used for any service at least straight away, a story would help communicate the idea better.

The students also had the opportunity to get feedback from a UI teacher from Metropolia during the day and started working on visualizing the citizen/patient UI because it was to contain more interesting elements than the doctor's UI. Because consenting and connecting is a large part of a MyData interface, this was a very good focus. The team decided to use Powerpoint for working on the prototype because they were not intending to make it functional.

Table 14. The new methods used on the sixth day of the Professional Summer School.

Method	**Motivation**	**Outcome**
UI prototyping	Create a understandable experience prototype to show what it would look like.	

On Tuesday morning the action-packed and distributed team work of the two previous working days showed its downside. The students no longer had a shared understanding of the whole because one part of the team had worked on the doctor's UI and the other on visualizing the digital business ecosystem and the citizen/patient's UI. The team felt it difficult to understand how the pieces fit together especially because of the Service Ecosystem Concept was an unfamiliar way of understanding how a service works. One of the team members had visualized her confusion with a telling picture containing the design squiggle, the ecosystem and other concepts on the team's war room blackboard.

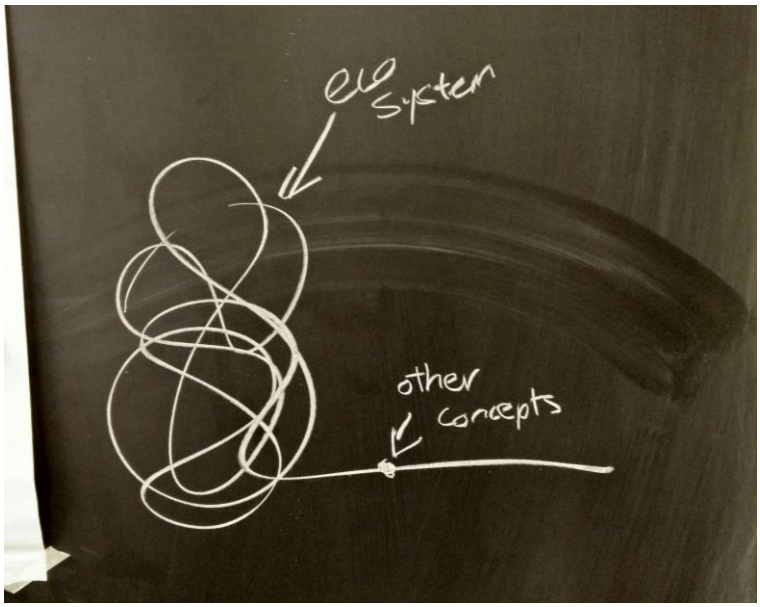


Figure 42. A visualization of how the MyData Service Ecoystem felt to the team members in comparison to the other parts of the concept.

I had told the team along the way that their concept which was not just a service but also a Service Ecosystem is most likely much more difficult than the tasks that had been given to the other groups. Then again, it could also turn out to be a very good learning experience because of the same thing. The students would have participated in creating something in a manner that many Service Ecosystems will likely be developed in the future.

However the message to humanize and make the distributed Service Ecosystem concept more tangble was heard. As this was an unexpected development, a way to do this had to be improvised and very quickly. Improvisation and roleplaying came to mind as a way of doing this so we made costumes for each member of the team who was present. We had a pregnant mother, two doctors (one from the private sector and another from the public sector), a nurse/child and a person playing the Service Ecosystem who delivered data and consent as physical pieces of paper between the parties.

In the beginning of the roleplayed (Stickdorn & Schneider 2011, 204) customer scenario, the pregnant mother went to the public sector doctor who used his tablet to verify the pregnancy. The mother gives consent for the data (which was physically a scapped piece of paper given to the actor of the ecosystem) to be transmitted to Kanta. After this the mother wanted to get better care from the private sector so she provides the private sector doctor with the consent (another piece of paper) and the data (paper) that the ecosystem actor passes on to the private sector doctor. In a later phase of the customer scenario, the mother shows her daughter (now born and older) the data that has been collected into the digital OmaNeuvola service.

Even though the decision to roleplay the aspects of the OmaNeuvola MyData service ecosystem concept was done rather quickly, it turned out to work very well in alleviating the frustration that came with working with such a difficult task. The team had a lot of fun working on constumes for the roleplay and had many laughs with the situations that the improvisation put them through. The consensus among the team was that they felt more confident with the concept after this.

After the roleplay the students wanted to focus on what Elisa's Head of Service Design (HSD) had suggested for them and what the roleplay had shown them: telling the story behind their OmaNeuvola Mydata Service Ecosystem Concept. They decided to do this by revising their storyboards using the ideas they had played out.

Figure 43. The new methods used on seventh day of the Professional Summer School.

Method	**Motivation**	**Outcome**
Roleplaying	Make the multi-sided and complex MyData service ecosystem tangible and understandable to the team.	

This was the last day I was able to participate in the Professional Summer School and during the following days the students worked on putting together the elements they had worked on during the previous days, making a Prezi to support pitching their concept and finally pitching it to the Professional Summer School crowd on the second Friday.

4.5 The Team's OmaNeuvola MyData Service Ecosystem Concept

The end result that the team pitched at the end of the Professional Summer School combines Multilevel Service Design aspects that exceed the elements embedded in just a Service Concept and incorporate both Service Architecture/Ecosystem and Service Experience aspects.

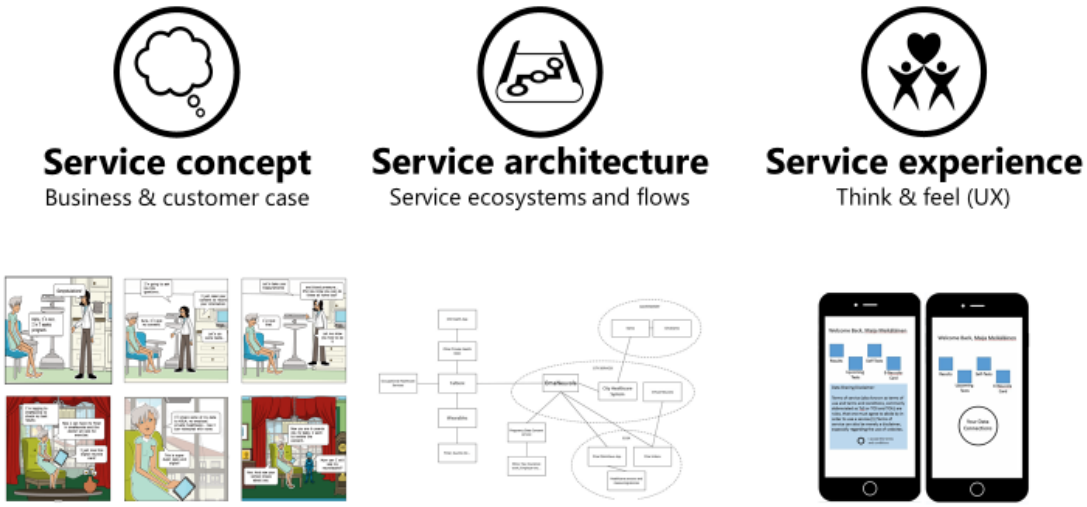


Figure 44. Components of the OmaNeuvola MyData Service Ecosystem Concept.

The team came up with the OmaNeuvola name for the whole concept rather early on. The overall concept is explained in the storyboard in the following figure. The concept is described from the citizen/patient's viewpoint. At the heart of it is a OmaNeuvola maternity/parenthood healthcare portal which incorporates and expands on many of the elements that are also present in the Minunterveyteni.fi portal used by the City of Hämeenlinna that was a large source of inspiration to the team.

4.5.1 The OmaNeuvola MyData Service Ecosystem Concept

OmaNeuvola integrates five service groups into a coherent whole: consent services, a eNeuvola card, Elisa Etämittaus self-measurement equipment and connected measurement applications and virtual video neuvola services enabled by Elisa Videra and connecting third party services (such as the iOS Health App, wearables, occupational healthcare) to the ecosystem using Taltioni.

As MyData is a major enabler of the Service Ecosystem, consent services play a large part of how the citizen/patient uses the service to interact with different parties. First, the doctors and nurses can be given the consent to access the parent's and child's health and wellness data from Kanta and also other possible sources.

Second, the OmaNeuvola concept contains services that provide consent to external services, service providers and institutions to access the data created during the services. These would include the ability to provide consent for the doctor-validated pregnancy data to be passed on to KELA, the insurance company, the work place or occupational healthcare services and

other potential users. This is one of the major use cases where MyData might be of use because, according to some of the interviews conducted by the team, this data is currently transmitted by filling in paper forms and sending copies of the papers in which doctor's validate the pregnancy. If this data was in a machine-readble form, the data could be transmitted to the different users by consent.

A third part of the consent services would be to allow the parents to provide consent on behalf of the child. Kindergartens and schools might want to use some of the data created during the neuvola process and they could be given access to this using the consent services embedded in the OmaNeuvola Service Ecosystem.

The fourth part of the consent services is revoking the consent that accompanies the data. Rather than providing some service provider like for example to insurance company indefinite access to the neuvola data, the parent might want to revoke the consent some point. This might also be useful in situations where the neuvola service provider changes, for example when moving from one city to another.

In addition to the consent services, a second service that the OmaNeuvola concept seeks to promote is an electronic version of the neuvola card. According to the interviews the team did, the parents are very fond of the neuvola card. However it is also one of those things that are currently done in paper format and this creates hassle especially if the neuvola card is lost at some point. Creating a digital eNeuvola card would provide the parents with the neuvola data that is important to them but in a manner that is not lost and can also be accessed by the child online.

Elisa can provide their services to the OmaNeuvola concept in two ways. The first is through the Elisa Etämittaus self-measurement equipment with connected measurement software that transmits the measurements online where the doctor can, if needed, access it in real time. Currently the Elisa Etämittaus offering does not include services specific to maternity and the possibilities in the domain, such as monitoring the unborn child or monitoring the recently born child's sleep, might be possibile areas for future services.

The second way Elisa might help the users of OmaNeuvola could be through their Elisa Videra online video conferencing solution which already is used by some doctors who provide online health consultancy. The team's interviews uncovered that especially during the last months of pregnancy, the rate of going to the neuvola increases significantly. Because of the mother's condition at this point, leaving to go the neuvola is a painpoint for the mothers sometimes. The interviews showed that if these meetings could be held online and supported by self-measurement equipment, the mothers efforts would be reduced and also would provide

savings for the municipalities. Elisa Videra is not in use in the City of Hämeenlinna case but might be a future source of exploration.

The last part of the OmaNeuvola MyData service ecosystem concept consists of the extended connectivity services provided by Taltioni health account services (in sense, a MyData operator) which makes it possible to connect third-party healthcare services to user-designated uses. Taltioni makes it possible for wearables, occupational health service data, and other third party service such as the iOS Health App to be combined to the other services provided within the OmaNeuvola umbrella.

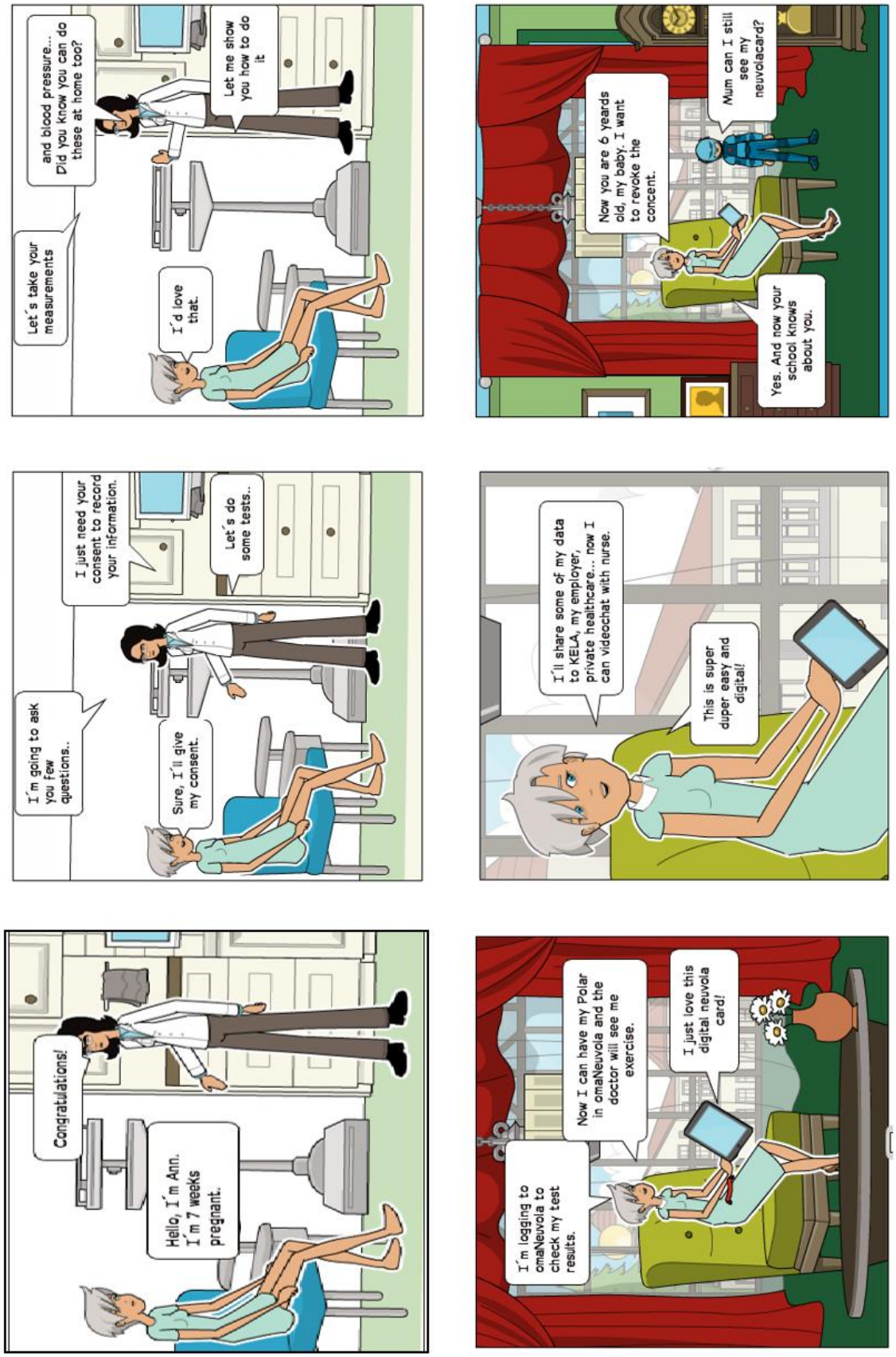


Figure 45. The OmaNeuvola service concept's storyboard.

4.5.2 The OmaNeuvola Service Architecture and Service Ecosystem

The Service Architecture and Service Ecosystem the team created to depict the concept shows the integrations between the different stakeholders in the OmaNeuvola digital Service Ecosystem.

The city services provide the core services of the concept: the OmaNeuvola portal, the City Healthcare System (f.ex. Effica in Hämeenlinna) to access other health data and employ the doctors/nurses who provide the virtual neuvola services. The City Healthcare System is integrated to Kanta, which is the governmental database/service for health data and OmaKanta which is the user interface to Kanta which citizens can use to check their data.

Taltioni can be integrated to OmaNeuvola using the consent service and provides the added services mentioned before. Elisa is connected to the OmaNeuvola portal through the Etämittaus App which transmits the data from Elisa's connected healthcare sensors and measuring devices. The users of OmaNeuvola use Elisa Videra to access the doctors and the nurses who provide the Virtual Neuvola video chat services.

The team had a discussion on who should be responsible the pregnancy data consent service that transfers the data to KELA, the tax office, insurance company, occupational healthcare services and other. Currently a similar service does not exist. It should be accessed through the OmaNeuvola portal but the pregnancy data transfer service could be provided by another service provider as well. One possibility that was discussed was the Kansallinen palveluväylä (KAPa).

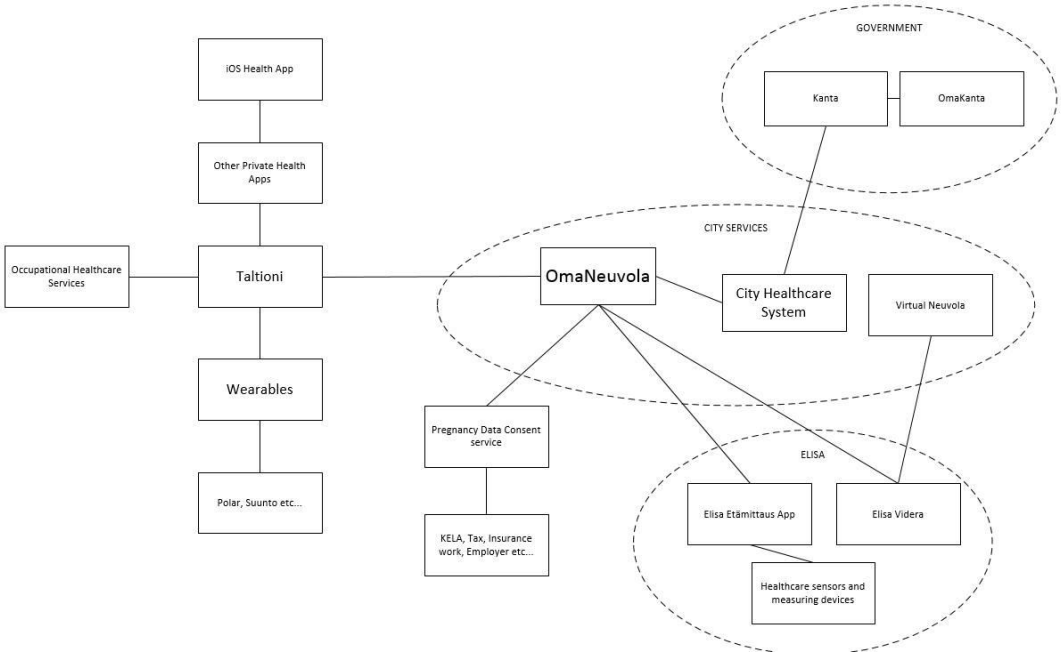


Figure 46. The Service Architecture for the OmaNeuvola Mydata Service Ecosystem.

4.5.3 The OmaNeuvola Service Experience

The digital healthcare industry is facing large changes and there are huge possibilities for improvement. This is one of the things the team wanted to do in developing the Service Experience of the OmaNeuvola concept. The team stated that there are huge possibilities in developing more human-centered services and User Interfaces as the current systems are very database-oriented as can be seen from the screen in the figure below.

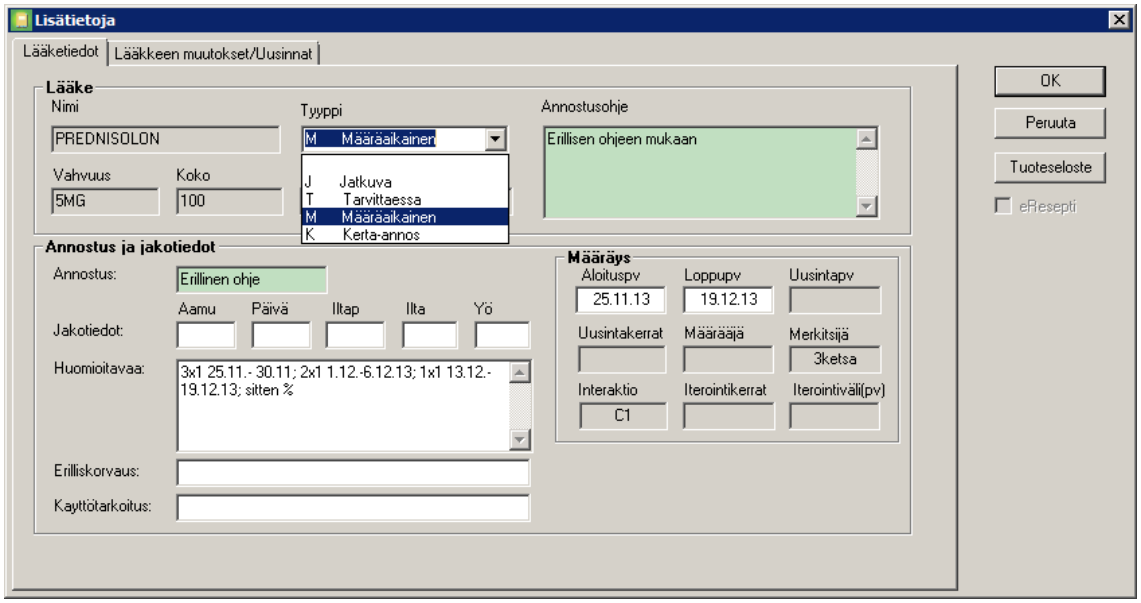


Figure 47. An example user interface screen from Effica, the city healthcare system used in Hämeenlinna.

As stated earlier, in their prototyping efforts, the team decided to focus on the citizen/patients viewpoint. The end result of prototyping the service experience is a series of screens that are sketches of the mobile app that integrates the core functionalities of the concept. The Professional Summer School timetable did not include testing the prototypes with possible customers so the prototypes done by the team are a first version of what they could look like.

The overview page allows users to access the main functionalities of the OmaNeuvola service ecosystem. These include results from tests done by the doctors or nurses at healthcare centers of neuvolas, a calendar for upcoming tests, self-test results and the eNeuvola card. Once the disclaimer has been accepted, the user is also offered a button which makes it possible to access the consent services for the data connections.

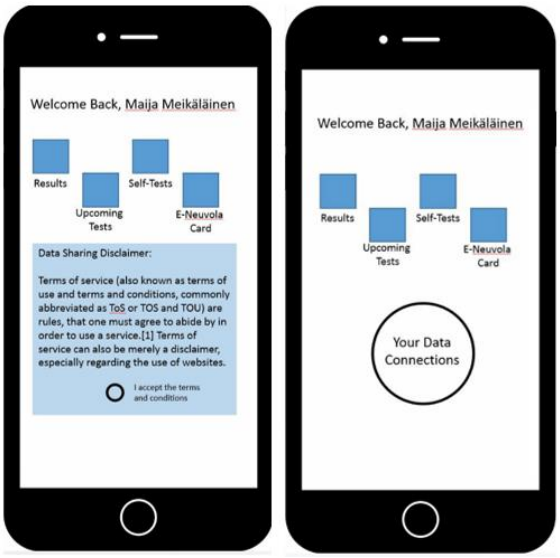


Figure 48. The basic functionalities of the citizen/patient OmaNeuvola User Interface.

Pushing the "Your Data Connections" button enables the citizen/patient to access the consent services. It is possible for the user to either enable all possible data connections or choose one and adjust the data that the service might require on a case basis. For example KELA could be provided the amount of data required or access to all the data in OmaNeuvola if the user chooses to trust the provider very much. It is also possible to review and possibly customize the data that is being sent to KELA.

The team did discuss the consent services quite much and they were also one of the main things that Elisa wanted to learn from the case. How does a user engage with a whole ecosystem and manage their data in a way that is simple yet sufficient enough to create the required level of trust with people who might differ in their requirements. The approach the team came up with could possibly be used for other types of consent issues as well.

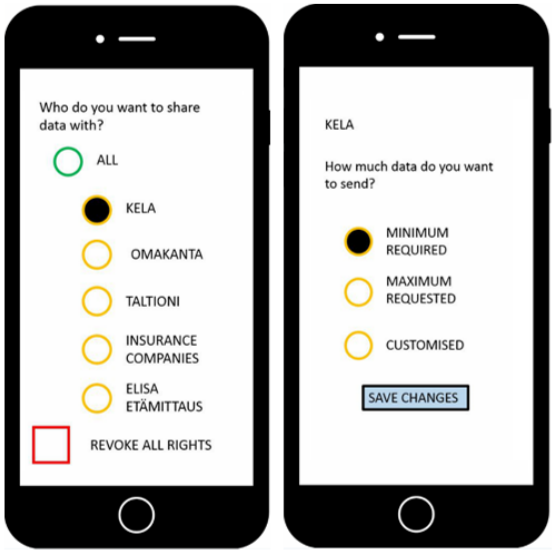


Figure 49. The consent services embedded in the OmaNeuvola User Interface.

From their interviews with neuvola personnel the team had found out that blood pressure and sugar levels are among the most done tests in the Finnish neuvola. The Elisa Etämittaus offering includes self-measurement devices that make it possible to do both of these tests at home. The Elisa Etämittaus App for mobile devices also provide reminders to the users about when tests should be made. In stark contrast to the database-driven Effica User Interface, the team felt that it would be important to visualize the measurement data in a way that is both easily understandable and makes it possible for the citizen/patients to respond the findings.

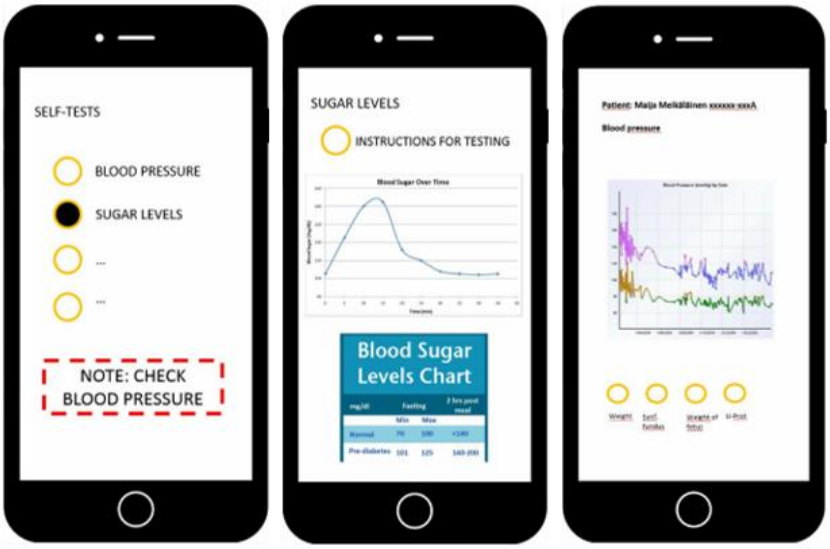


Figure 50. The visualization of self-tests in the OmaNeuvola User Interface.

As the team had found out from their interviews, the neuvola card was a very important artefact to the parents and should not just be digitized in terms of the values and information that it containts.

However the interviews informed the team that the neuvola card is sometimes lost and this results in the information it contains to be lost completely. Even though a digital one could be created, it should be designed to be memorabilia, something that the parents and their children could return to as one of the remiders of their child growing up.

Figure 51. The old and new: the traditional neuvola card and the eNeuvola card of the Oma-Neuvola concept.

Even though mentioned as being a part of the OmaNeuvola concept, the team did not have the opportunity to explore what the Virtual Neuvola enabled by the Elisa Videra solution could be like to the users. Also the Taltioni third party added services were not explored in terms of their service experience.

4.6 Conclusions on the Research Question

“Yes, you guys are definitely going for the future. The trend is that citizens will be in charge of their own data rather than the organizations that until now have owned it,” stated one of the judges of the Professional Summer School after the team’s pitch. The judges were overall very impressed about how the team had embraced a future business environment that is close to becoming popular in the development of their concept. To the judges the concept was an inspirational case of what will be possible in the future.

In terms of results, the team’s OmaNeuvola MyData Service Ecosystem Concept was chosen to be the winner of this year’s Professional Summer School. Given the difficulties and frustration that the team faced in creating such an abstract and multi-sided, not just service, but service ecosystem, their hard work definitely paid off in the end.

Figure 52. Toan, Suna, Sami, Jenn and Zahar, the winners of the Professional Summer School competition with their OmaNeuvola concept.

In terms of using the concept development as a way of exploring the area of Service Ecosystems Design it seems like there is a added layer that is present in a MyData Service ecosystem Concept that is not necessarily there in our traditional service design toolkits. The added layer is the Service Ecosystem Architecture which in this case was explored by creating the Service Ecosystem that works together in enabling the integrated services that can be accessed in the OmaNeuvola portal.

It should be also noted from the team's frustrations and experience with developing the distributed system that the development of a Service Ecosystem requires a rather thorough understanding of both the different stakeholders that enable the ecosystem and also the technical understanding of how the ecosystem can be digitally tied together. Understanding the stakeholders is something that is easily doable in a workshop where participants are not technical but understanding the abstractions embedded in Service Ecosystems Architectures, the different means of integrations available and the information architecture that is the basis of the applications like OmaNeuvola that bring together data from different sources, require an above average grasp of the subject. This could be part of the specialist domain of a Service System Designer.

The difference between a Service System Designer and a User Interface Designer is where the work starts and where it focuses on. Whereas the User Interface Designer has the goal of understanding the system sufficiently to create a user interface, a Service Systems Designer might operate on higher abstraction levels: weaving together customer problems or needs, the systems – and their diverse participants – that might provide the solutions and understand the implication of the systems on the service experiences.

5 Service Systems Design in Organizations: Case: Developing a Consent Service System Concept for Elisa's Operator Business

The second research question for this thesis related to the question of what is Service Systems Design within an organizational context? The specific research question is: how can we use Service Systems Design to combine methods and perspectives from Service Design and EA in order to create a Consent Service System Concept and understand its developmental impact on Elisa's current operations? This research question can be broken down into four sub-questions that reflect the case in question:

- What are the most pressing Elisa's customers and their front-line customer service employees are facing that could be resolved using consent issues?
- What types of solutions do consumers prefer on the consent issues?
- What is Elisa's Service Architecture like and how would it and the ongoing projects be impacted?
- How could Elisa future-proof their development in terms of consent issues framed by the prospects that relate to MyData?

The inception of the research questions was in discussions with Elisa's Head of Service Design (HSD) in which we spoke about Elisa's interest in MyData that was implemented in a MyData discovery project, a sprint-based approach by which Elisa seeked to establish the business potential of consent issues, that had just finished at the time of the discussions in May 2016. As consent is a large part of a MyData solution, we decided working on it might be interesting for both parties.

According to Elisa's Head of Service Design (HSD) major drivers for investing in Customer Experience lie in the fact that for Elisa it is cheaper to hold on to existing customers rather than try to get new ones. Focus on Customer Experience keeps these existing customers happy. At the same time Elisa, like all companies, seeks to decrease costs. One way to do these both is to focus on the Customer Experience of their online services that could help customers get their jobs done when they want to.

The problem of interest in this research question stems from the situation that the user of a contract such as a moble phone subscription can by default not make altercations to their products, subscriptions and subsequent services. Elisa was interested in the notion of developing consent services that could help with these authorization issues.

I spoke to Elisa's experts E4, E2 and E1 who had been part of the MyData Discovery project to understand the issue better. During the MyData discovery project Elisa had used their Cus-

tomer Relationship Management data, ethnography in an Elisa Shop and a consumer panel to uncover and quantify the estimated amount of situations where customers would have required authorization to get their jobs done.

Figure 53. REDACTED quantified customer situations with authorization issues.

Some of the cases the Elisa MyData discovery project's ethnographic study uncovered provide a good example of what types of situations could benefit from a consent service. For example a teen getting a new SIM card for a new mobile phone, a mother ordering a new 4G modem for a son in the army, husband ordering a new STB for Elisa Viihde that is owned by his wife and a son terminating service on mother's behalf who is in a retirement home.

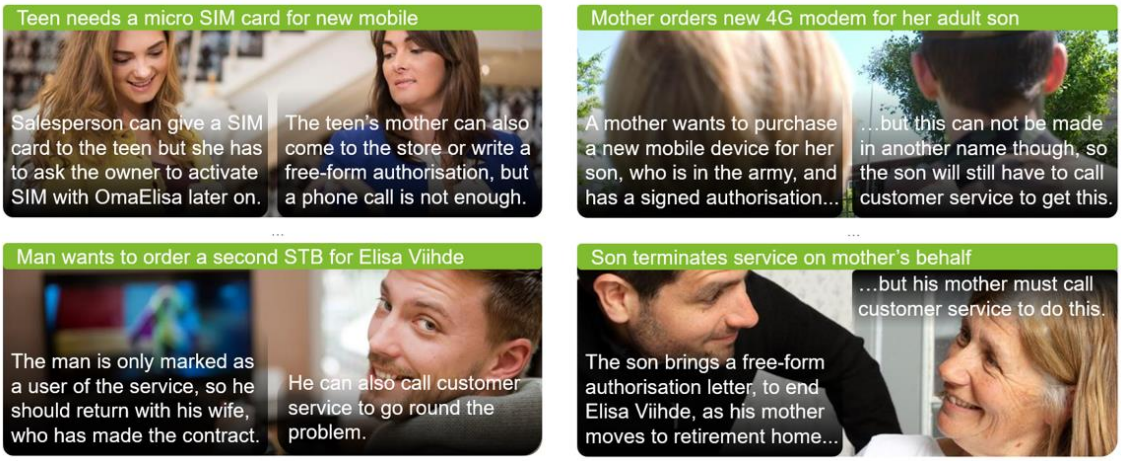


Figure 54. Generic authorization cases where consent services might be of benefit.

The problem with the failures of the customers in these authorization cases did not only impact the customers but also sellers who might have progressed far in their sales process only get stopped by the authorization issues.

Figure 55. Failures in authorization issues is a problem for sellers and customers alike.

During the interviews E1 and E4 spoke about the idea that had come during the consumer focus group that they would prefer it if consent should be grouped into levels that elaborate on some general functionalities. This was one of the solutions that would be discussed with both consumers in my additional interviews and during developing the service concept with Elisa's experts.

The following table summarizes the second research question, research methods, context and deliverables.

Table 15. Research questions, methods, context, and deliverables.

Research Question	Research methods	Context	Deliverables
How can we use service systems design to combine methods and perspectives from service design and EA in order to create a consent service concept and understand its developmental impact on Elisa's current operations?	Interviews, observations, co-creation, prototyping	Elisa consent service concept	Consumer and expert insights, consent service concept, consent service architecture, consent service prototype

The Multilevel Service Design (MSD) (Patricio et al. 2011) outlines the framework in which the project was conducted. The following table provides an overview of the project and its phases.

Table 16. The MSD steps, their concrete tasks, context and timetable.

MSD Step	**Concrete tasks**	**Context and Timetable**
Step 1. Study the customer experience	Qualitative & Quantitative study Qualitative study Qualitative study	MyData discovery project, spring 2016 Expert interviews, 6-10/2016 Consumer interviews 7/2016
Step 2. Design the service concept	Understand the value constellation experience Design the service concept with the customer value constellation	Group Interview 9/2016, Group Interview 10/2016 & Consent Service Blueprinting Workshop 10/2016
Step 3. Design the service system	Understand the service experience Design the service system architecture Design the service system navigation	Consent Service Blueprinting Workshop 10/2016 UI Prototyping Workshop 12/2016

MSD Step	Concrete tasks	Context and Timetable
Step 4. Design the service encounter	Understand the service encounter experience Design the service encounters with the service experience blueprint	UI Prototyping Workshop 12/2016

The role I was working on in the project was a support role in which I gathered consumer insights and information to assist the experts develop their services and the underlying capabilities that make them possible. The way to make an impact in this type of situation was to influence the development of the Consent Service System Concept, empower and inform those who are working with the different aspects that are related to it.

5.1 Research Methods

This research question was also approached as a case study. Two categories of methods were used over the course of this research question. The first ones are interview methods and these include a combination of thematic, stuctured and active interviews which are used with consumers. Also multiple experts from Elisa were interviewed but the goal of interviewing them was to get a complete picture of what types of projects are going on in Elisa and who is doing what. The methods that are used with them are open interviews complemented with the active interview method.

The second method category is based on co-creation in which the Service Blueprint model and a subsequent facilitation method utilizing it is used to create an overview of a consent service concept with Elisa's experts. Prototyping is used to visualize what was spoken about in the Consent Service Concept Workshop.

The first part of the consumer interviews is based on the thematic interview. In thematic interviews the topics and themes are defined in advance but their depth and bredth can vary from interview to another (Eskola & Suoranta 2001, 86).

As the goal of the consumer interviews was to assist in the development of the consent service concept, the thematic interview method worked here very well because it allows the interviewee to speak rather freely. The themes however guanrantee that each interviewee is conducted in a similar manner. The themes also allowed the content of the interviews to be analysed more easily than in a fully open interview. (Eskola & Suoranta 2001, 87.)

The second part of the consumer interviews is based on the structured interview. In this part the consumers are told Elisa's four common consent cases and, as is done in structured interviews, asked specific questions about solving the cases (Eskola & Suoranta 2001, 87).

The second interview method that is used is the open interview. This method is based on a open discussion with the interviewee (Eskola & Suoranta 2001, 88). The open interview is used because in many of the cases with the expert interviews it was difficult to plan ahead because the point of the interview was to find out what the person is doing and how it might affect the consent service concept.

The other method used for the interviews was the active interview method developed by Holstein and Gubrium (1995). Holstein and Gubrium state that the active interview is a perspective rather than a fully fledged tool for research (Holstein & Gubrium 1995, 4). The active interview is an adaptive discussion where both the interviewer and the interviewee can affect each other. The discussion is directed by the interviewer and the research agenda. Contrary to the structured interview where there are clear questions, the active interview utilizes the themes or an interview guide as a shared background but allows for adaptation. (Holstein and Gubrium 1995, 76.)

The goal of the active interview is to stimulate the interviewees own narrative activities. For example in some cases with the consumers it was not necessary to explicitly state the theme or ask a question related to it because they were able to steer the discussion in those directions themselves. This allowed the interviews to have a improvised yet focused quality to them. (Holstein & Gubrium 1995, 77.)

According to Holstein and Gubrium (1995) the understanding of the research subject or the experience of the interviewee can be a valuable source of knowledge to the interviewer. When the interviewer has sufficient background information, it is possible to move between abstract and particular questions which is a fruitful way of promoting a rich description of the content. (Holstein & Gubrium 1995, 77.)

It is also common for the active interview that the interviewer intentionally yet carefully seeks to promote multiple perspectives. This encourages the interviewee to change their narrative positions and look at things through multiple roles (Holstein and Gubrium 1995, 77). This was done by telling the interviewees of the thoughts and ideas other consumers and experts had proposed to promote a shared understanding and build upon ideas of others.

The active intervew method is based on the constructivist approach where knowledge is created in interaction and the method is also well aligned with the interventionist, design re-

search methodological assumptions for this thesis: rather than creating information about an absolute reality, we are attempting to build something new and desired.

5.2 Customer Experience to Service Concept: Consumer interviews

The consumer interviews were planned and done after the first expert interviews in which Elisa's inquiry into the authorization problems and consent issues presented to me had been done. To take the next step forward, as stated earlier, the goal for the consumer interviews was to assist in bringing the consumer views to developing a Consent Service System Concept.

In choosing the sample I wanted to have a broad take on different age groups ranging from pensioners to students. As the main target group of a consent service is the people who own and pay for subscriptions at mobile operators, I wanted to find people who might fit this description. Even though the younger interviewees do not have children whose accounts they might have owned, they were chosen because they might be future users of such a service and might be more inclined to use a digital consent service than the older interviewees.

It should also be noted that at the time of the interviews I thought it possible to target consumers in general to inform attitudes towards a consent service as I did not have access to target Elisa's actual customers who might have authorization issues. A general overview of the interviewees and interviews is provided in the following table and picture.

Table 17. The consumer interviewees, dates and lengths of the interviews.

Name	**Age**	**Employment**	**Date**	**Length**
Sasu	41	Entrepreneur	12.7.2016	60:40
Hannu	44	Assistant to Member of Parliament	15.7.2016	34:42
Jenni	35	Information service manager	16.7.2016	39:57
Markku	66	Former entrepreneur, pensioner	17.7.2016	42:56
Oskari	27	Student, part-time janitor	19.7.2016	42:50
Satu	32	Student, part-time teacher	19.7.2016	62:28
Johanna	41	Taxation specialist	21.7.2016	38:43
Tarja	59	Secretary	23.7.2016	40:58
Juha	35	Unemployment benefit specialist	24.7.2016	35:50
Katariina	33	Sales manager	30.7.2016	34:25

Figure 56. Pictures of the interviewees. Top row (starting left): Sasu, Hannu, Jenni, Katariina, Juha. Bottom row: Markku, Oskari, Tarja, Johanna, Satu.

Themes that were discussed with the interviewees included the following:

- Operator services in use now or previously
- Preferred channels for interaction with operators
- Attitudes towards using digital operator services
- Possible experiences with consent cases
- Attitudes towards giving consent to someone else
- Perceived importance of the consent service, especially in terms of impact on being a customer of an operator provides functionalities for providing consent
- The general aspects that does the interviewee see relevant for a consent service
- The types of individual services (or service components) that a consent service should be made out of

In addition to these themes I used Elisa's four usual consent cases that were described earlier to elicit answers to the following structured questions:

- How would the interviewee solve the case?
- What types of consent service components would he/she prefer to use in dealing with the case?
- What would the consumer perceive as an failure in the cases?
- How could a digital consent service be used to solve the problems?

In accordance design research methodology that seeks to facilitate impact in context rather than elaborate on different viewpoints and discourses as is the case often in qualitative research in the social sciences, the data collected was subjected to a rather light analysis. Following the interviews I listened to them again and made notes of the answers to the different themes and questions.

As the interviews were done with consumers, not customers, and not in service context but rather about attitudes, their results were used not as absolute answers that should guide the development of the Customer Experience. Thus the distributions of the answers between the interviewees was not considered relevant because of this and also the small sample size that might easily accentuate some issues and understate others. A larger sample size and distributions of experiences would however be useful at a later stage when testing the hypotheses embedded in the Service System Concept.

The results were rather used as inclinations and the elements of first hypotheses for the use of facilitating the development the service concept. To test actual Elisa's customers' attitudes towards the Consent Service, interactions with actual customers based on the service prototype are proposed later on.

Even though the interviews provided a wealth of information, not all of them are relevant to this thesis and its goals within this research question. The most imporant takeaways from the consumer interviews that I used as starting points to facilitate the Consent Service System Concept development were the following. First, the consumers spoke of four components that might be considered the elements of the consent service.

Consent could be provided in a digital channel using either groups to provide an easy way of choosing a set of typical permissions or choosing individual elements that the user is given permission to do. An example of the group-based approach is in S-Pankki where the account owner can choose one of three groups: giving another person complete access to the account, give permission to withdraw money from the account or just view account information (S-Pankki FAQ). When choosing individual permissions, the user might for example be given permission to get a new SIM-card but not upgrade their mobile subscription to a faster and possibly more expensive one.

Some interviewees also thought about limiting the potential financial risks that have to do with consenting to some one else doing something with an subscription. For example when travelling abroad it is possible to monetary limit for how much data can be used. Interviewees spoke of having a monetary limit for how much money another user might use over a certain period. This idea is close to the saldo limit that many operators already offer but in a broader context which encompasses all the possible products, not just a mobile phone subscription.

The second component of a Consent Service System Concept that the interviewees outlined was a digital letter of attourney which could be written in the OmaElisa portal and be accessed by Elisa's employees in shops and telephone contact centers. This could replace the paper version that is currently in use but does not come in a standardized form.

The third component could be polling the subscription owner to accept the activities of the user. The user could go to an Elisa shop and propose a purchase or an upgrade on a mobile subscription. The point of polling would be that these requests would not be fulfilled unless the subscription owner would accept them.

Related to this I asked the interviewees how they would prefer to respond to the requests if they were the subscription owner. Almost all of them stated that they would like a simple way of doing this like answering to a text message, email or something. Most interviewees stated that they do not prefer to use their operator's digital services because they are in contact with the operators very rarely (8/10 of the interviewees said that they use operator services less than once a year) and don't want to go through the hassle of recovering lost or forgotten passwords. In their preceding consumer panel done during the MyData discovery project, E1 and E2 from Elisa had cited a similar behavior. Even though this is not directly related to the consent services, "the ease of access" is a principle that could be taken seriously if deemed necessary to promote the use of digital channels.

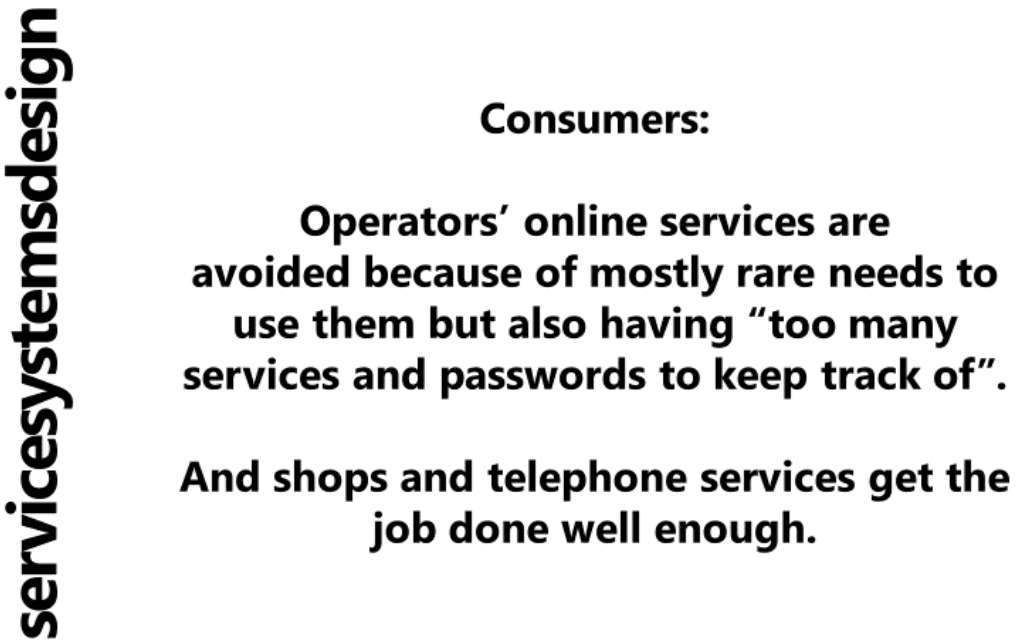


Figure 57. The consumers rarely use operators' online services because they do not make changes often.

The fourth consent service component proposed by the interviewees was providing the subscription owner notifications of the changes and important events done by the user. This could be done via text message, email or some sort of notification. Some interviewees mentioned that even though they would not require an acceptance poll (third component),

they would wish to have some kind of ability to handle risks related to someone else doing something with their subscription like having a cancel period.

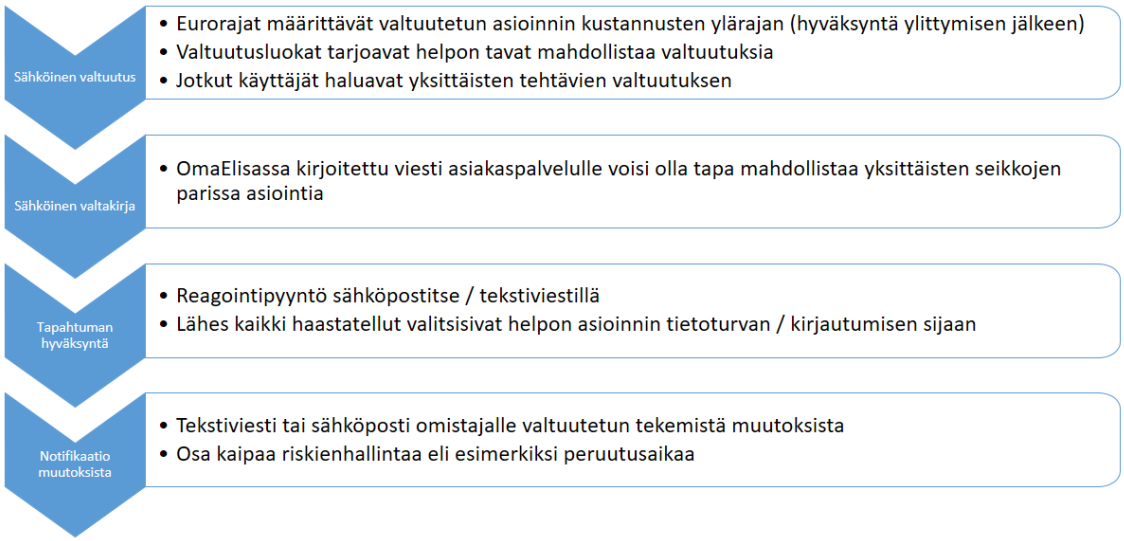


Figure 58. A summary of the consent service components that were proposed by the interviewees.

With someone else having the permissions to create costs and changes to subscriptions prompted some of the interviewees to think about an event log of these that could be accessed to gain an overview of the changes over time. This could include information on who did what, where and how was this person identified? All in all the need for additional transparency seemed like a topic that might be taken into account when others are empowered to create trust in a consent service.

Another relevant piece of information from the interviews was the statement that a consent service concept is not a reason to change operators but it would be deemed good customer service and an positive element of the overall customer experience. This was relevant to pass on to Elisa in order for those who can effect change to prioritize the value of the consent service accordingly.

5.3 Service Concept to Service Architecture: Expert interviews

As stated earlier, a open and active interview method was employed with the experts at Elisa. The goal for the discussions was to get an overview of Elisa's Service Architecture and what the different people with responsibilities relating to it are doing currently in order to develop it.

However even though people and their responsibilities were known up front, we did not have a complete picture of what is going on, how a consent service might be made possible and also should affect the development of the architecture behind it.

It should also be noted that most interviews of Elisa's experts were pair interviews in which Elisa's Head of Service Design (HSD) and myself were having open interviews with individual people and there were also some group interviews to gain a shared view of the situation.

It was difficult to plan for the interviews up front because of not knowing the people and responsibilities before heading into them. Because of this it was also extremely valuable that I had Elisa's Head of Service Design (HSD) to accompany me in many of the interviews because he could also steer the discussions in directions that he found relevant based on his experience.

The active interview method was used to create cross-pollination between the thoughts of the different consumer and expert interviewees. Both experts and consumers were told ideas from each other and this also influenced the way the interviews were structured. Especially the expert interviews did not have much structure to them as they did not have set themes apart from the consent service and what others had been talking about related topics.

Table 18. The expert interviews done at Elisa.

Expert Number	**Expertise**	**Interview type**	**Date**	**Length**
E1, E2	E1 had made a ethnography of consent issues in Elisa's shops, E2 an evaluation of records of consent in CRM database. Together they had met up with a consumer panel to discuss consent issues.	Group interview	23.6.2016	1:28:22
E3, HSD	E3, Head of Architecture, tells about the concept model for the ongoing MDM project.	Pari interview	23.6.2016	
E4, HSD	E4 had headed the previous enquiry into consent issues in Elisa which E1 and E2 participated in.	Pair interview	30.6.2016	1:27:18
E5	External UX consultant who is working on developing OmaElisa.	One-on-one interview	1.7.2016	52:37
E6	Business/marketing goals of the MDM project.	One-on-one interview	1.7.2016	34:23

E1	Recalling the observations made in the shops and the consumer round table about consent issues.	One-on-one interview	7.7.2016	Not recorded, ~45:00
E7	Channel development for shops.	One-on-one interview	4.8.2016	46:05
E8	Company sales at an Elisa shop.	One-on-one interview	5.8.2016	22:34
E9	Store Manager at an Elisa shop.	One-on-one interview	5.8.2016	28:57
E10	Head the MDM and IAM project on the IT side.	Pari interview	11.8.2016	59:09
E11, E3, E5, HSD	Coordinator of multi-channel customer service. We spoke about the initial possibilities of the service concepts.	Group interview	19.9.2016	Not recorded ~120:00

During the interviews I wrote notes about the main issues that were being discussed and afterwards listened to them to make additional notes to create a better picture of what had been discussed.

These interviews also provided a wealth of information on how Elisa works and how difficult it is to coordinate a distributed company with multiple divisions, projects and 4100 employees in 2015 (Elisa 2016). All of this information however is not relevant for the purposes of this thesis which is to explore the methods for facilitating and modelling service systems.

Table 19. Elisa's ongoing projects that are related to the consent service and who spoke about which projects during the interviews.

Legal	**IT Projects**		**Business Projects**	
Upcoming legal changes	**Identity Management**	**Master Data Management**	**Customer service projects**	**Customer applications**
E6: Tietoyhteiskuntakaari set of laws in Finland (2018)	E10, E3: Elisa ID IAM solution	E3, E6: Customer-centric data model	E11, E7: New private customer service application	HSD, E12, E5, E13: OmaElisa
E6: Laws pertaining to TelCo operators	E10, E5: Mobile authentification	E3, E6: Standardized data formats	E3, E9: Old private customer service applica-	E5: OmaElisa mobile application

			tion	
E6, E10: EU's General Data Protection Regulation (GDPR)	E10: OmaElisa ID	E6: Data ownership and management	E8: Business customer service application	E12, E5, E13(2): Online retail channel (kauppa.elisa.fi)
	E10, E3: Light authentification	E3, E6: Marketing permissons management	E7: Guidelines to customer service employees	

5.3.1 Master Data Management

Master Data Management refers to the governance practices related to extracting, transforming and standardizing, and reusing enterprise data that is often initially in separate systems. As data is the new oil, it can be used to both understand and manage the enterprise at scale and develop new customer-facing applications. (Gartner IT Glossary 2017a.)

Elisa's Master Data Management efforts were ongoing and I had the opportunity to interview E3, Head of Architecture and E6 from marketing about the efforts. The goal of the project was to create a 360 degree view of Elisa's customers over the different products (mobile products, Elisa Viihde & Elisa Kirja), possibly enhance the ability to target customers with relevant offers to their given situations.

According to E6 the Master Data Management project aimed to create enterprise level coordination for customer, product and contract data including developing processes for data ownership and communicating about changes to those affected. In addition to this the MDM project seeks to fulfil the requirements of the EU General Data Protection Regulation that will be effective in May 2018 requires that companies be able to provide users with the data about them and also request removal of this data.

According to E3, an external consultant had been working on the enterprise data model over the spring and identified "customer", "contract" and "product" to be the central concepts that organize Elisa's business.

To do this Elisa had developed a customer-centric data model that would integrate customer data around the user rather than the traditional CRM (customer relationship management) system data that had revolved around the distinct products.

The core elements of the customer-centric data model were identifying a person and linking him/her to their relationship to the business and an account that would enable him/her to deal with any of Elisa's products without having multiple accounts as has been in the CRM-centric approach.

A person can have multiple roles with different products and the contracts that describe them more specifically. The concepts that Elisa uses to describe the roles that they call personas include owner, payer, user and guardian (or consented person without a business relationship).

Whereas the owner of the subscription and the payer are allowed to make changes, normal users of a have not been able to make them automatically. In some cases consented users, such as guardians of the elderly or the mother who would like to make changes on behalf of her son in the army, do not have a customership with an operator.

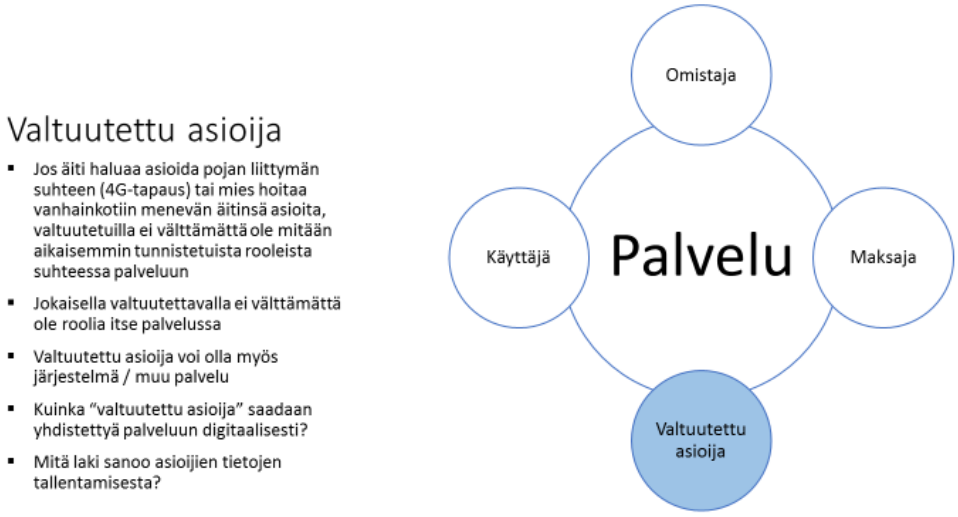


Figure 59. The consented user is a role that had not traditionally been part of the operator services.

For a consent service to work, each user should be able to be designated these roles. The roles in turn affect the usage rights that the customer has towards the products both in the OmaElisa portal and when being serviced face to face in the Elisa Shops or call centers.

5.3.2 Elisa ID & Identity Access Management

According to the Gartner IT glossary (2016) Identity and Access Management (IAM) "is the security discipline that enables the right individuals to access the right resources at the right times for the right reasons."

Closely related to the Master Data Management project was the Elisa ID Identity Access Management (IAM) project which seeked to create the possibility for Elisa customers to be identified and log in to all of Elisa's services using just one ID rather than having separate ID's for mobile, Elisa Kirja, Elisa Viihde and other services.

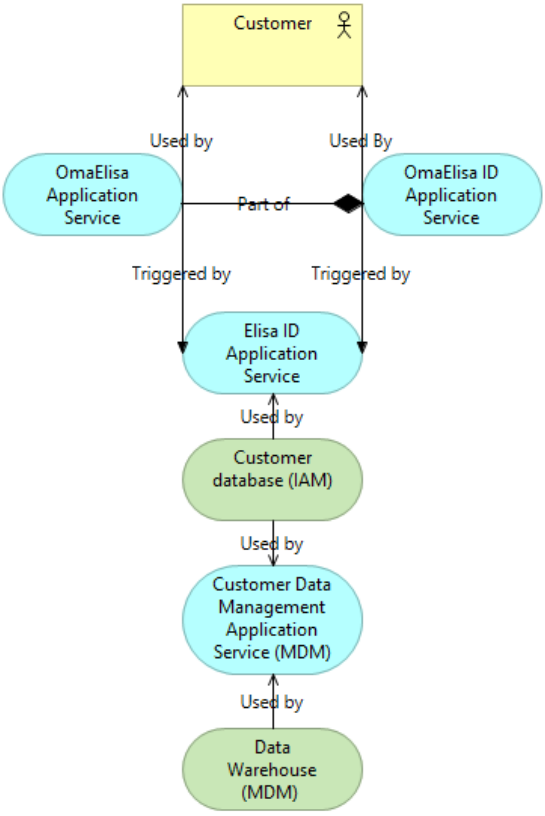


Figure 60. An overview of the relationships between OmaElisa, IAM and MDM modelled based on the interview using the ArchiMate notation.

In the expert interview with E10 who is in charge of the efforts in IAM at Elisa, we spoke about the efforts in this area. One of the interesting facts related to the development of a consent service is that the "guardian/consented person" role is not present in the MDM data warehouse but this is a part of the IAM solution. This is because the data warehouse does not handle data about the logic of how something works but this is done in the IAM solution.

Elisa's applications, such as OmaElisa deal directly with the IAM solution rather than the MDM solution. This means that if changes are to be made in the way OmaElisa is to handle and show data, the IAM solution should be accessed. According to E10 the IAM solution did already have the capabilities to show a portion of another customer's data to another, meaning that if consent functionalities would be built in OmaElisa, they could be implemented without changes to the IAM backend.

We also spoke about the customer issue of not remembering their password to the mobile operator self service. E10 told us that he had previously done a consumer panel in another context in which consumers said that they would rather make a new account based on their email rather than use their Facebook or Google accounts to login to a service where payments are made. The reason for this was the consumer's need for security in such relationships.

5.3.3 Shops and Contact Centers

In terms of customer-facing channel development there was also a lot going on that might affect the development of a consent service. Digitalization efforts were on the way to change the applications that the sellers in shops and call center people were using. A new version of these applications which reflected the Elisa Online Shop and OmaElisa was being piloted and rolled out during the making of this thesis. Therefore the focus of developing the consent service should be in the new Elisa Online Shop and OmaElisa rather than the expiring systems.

I spoke to E7, who is in charge of coordinating the development of the Elisa Shops. His main comment about developing a consent service was that it would definitely be good in terms of lifting Elisa's customer experience but the reality of sellers in shops is that the selling situation is already overloaded and should thus be kept simple. This is because sellers are legally obliged to go through the terms and conditions including details of the contract verbally in shops. E7 believed that consenting should be done somewhere else than during the sales situation because sellers incentives are in selling more.

E16, who works in a similar role as E7 but with Elisa's call centers, noted that this is something that should be thought about seriously because of the benefits downstream in situations in which consent and authorization would be beneficial.

I also visited an Elisa Shop where I spoke with E9, the shop manager and E8 from their business customer sales. With E9 we spoke about the current situation of sellers and how consenting and authorization happens. Mostly consenting is done but letters of attourney and it is up to the seller to be careful and assess the situation. Because of the diverse ways that consenting was done currently, E9 believed that it would be beneficial to develop more systematic ways of doing it.

E8 said that consent and authorization issues are faced daily in the company services. It is often the CEO of a company who can act on behalf of a contract and calling a CEO to get a PUK-code for a worker seems like a heavy process to many customers. Currently a fax can provide an official consent message and this is why they are still in use. In developing a consent service E8 had the idea of using the Elisa mobile certificates (mobiilivarmenne), which is like an SMS provided to a mobile phone, to poll CEOs and subscription owners about possible changes. Elisa's company services use Salesforce and not the same system as the consumer services to access their CRM data. This should also be taken into account in developing a consent service.

5.3.4 OmaElisa

I had the opportunity to interview E5, an external UX consultant, about the development of OmaElisa, the customer self-service portal and the OmaElisa app. We spoke about the opportunities related to developing them. The overall goal for OmaElisa is to make it into a self-service in which customers can execute all of their jobs-to-be-done related to their operator services rather than having to use multiple channels for them.

At the time of the interview consent services were on the roadmap for developing OmaElisa but the functionalities of the service were not ready yet. The work done here on a consent service seeked to tie into this. To promote developing a consent service concept and under stand its implications onto Elisa's different projects, we decided to organize consent service concept workshop.

5.3.5 The Consent Service System Stack

Based on Elisa's expert interviews we can identify the main elements that are required to work together enable a digital consent service in Elisa's online customer channels (Kauppa and OmaElisa) that are also used by the sellers in Elisa Shops and call center personnel. For relevant information to be shown and accessed by the people that subscription owners/payers have authorized, the Elisa ID IAM solution is ready to be configured to integrate customer-facing solutions and/or show the relevant customer data from the Master Data Management solution which combines information that is gathered around the customer.

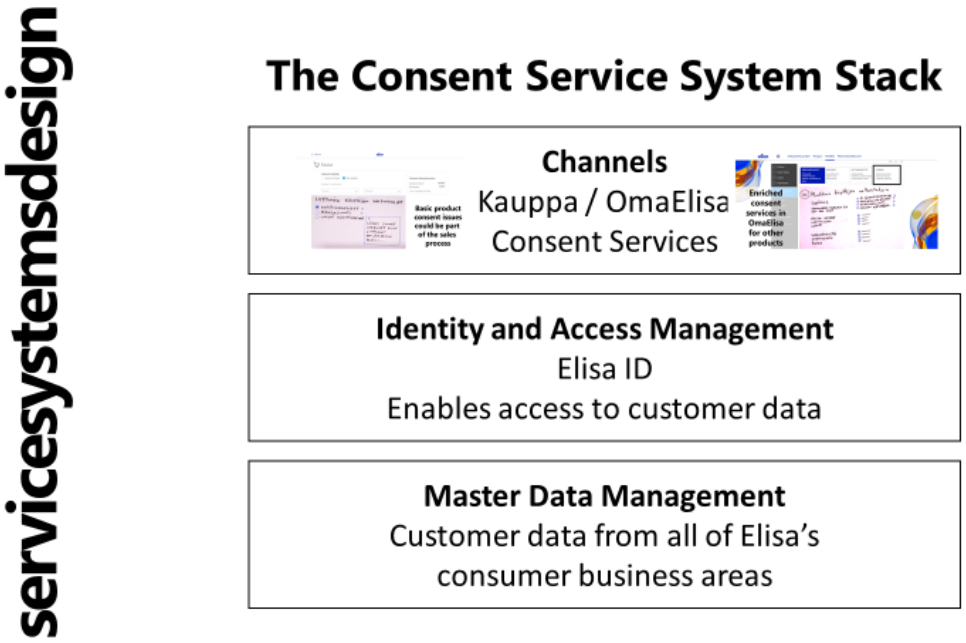


Figure 61. The Consent Service System Stack.

5.4 From Consent Service Concept to Consent Service Architecture

The basis of the Consent Service System Concept Workshop was the creation of a Service Blueprint. However because the usage of consent services are not neccesarily linear, the Service Blueprint had to be modified partly to fit the needs.

This section will describe the Service Blueprint model and how it was adapted for the Consent Service System Concept Workshop and also the results of the workshop itself.

5.4.1 Service Blueprints and Capabilities

The Service Blueprint is an excellent diagram that visualises value co-creation. Jim Kalbach (2016, 4), the author of *Mapping Experiences*, calls Service Blueprints a form of alignment diagrams which show how interactions mediate the value creation between individuals and organizations.

The Service Blueprint is close to the Customer Journey Map but whereas the Customer Journey Map is used to visualize what the customer is doing, thinking or feeling over the journey, the Service Blueprint focuses more on how the service is delivered (Samadzadeh 2015).

According to Samadzadeh (2015):

The blueprint is best when your goal is:

- to identify process breakdowns and opportunities for process improvements
- to inform an implementation plan for a new service
- to examine service metrics in the context of service delivery processes
- to define a vision for how a service or touch point(s) could become higher or lower touch

Samadzadeh (2015) continues that:

The journey map is best when your goal is:

- to identify customer pain points and service gaps
- to design a new service with customer experience at the core
- to examine the customer experience across touch points of a service
- to define a vision for how a service or touch point(s) could change the customer experience

Thus whereas the Customer Journey Map is a great tool for creating research-based understanding of where to focus in developing the service, the Service Blueprint is a tool that is helpful in visualizing the target state of the service.

In their article *Service Blueprinting: A Practical Technique for Service Innovation* Bitner, Ostrom and Morgan (2008, 67) provide a description of the Service Blueprint model which can be used for service innovation and improvement. There are many versions of service blueprints going around. The Service Blueprinting method proposed in the article lies heavily on process mapping (Bitner et al. 2008, 68). The only element expanding the process view is the level of "physical evidence" which adds the physical layer to the process view. The Service Blueprint components in the traditional Service Blueprint can be seen in the following figure.

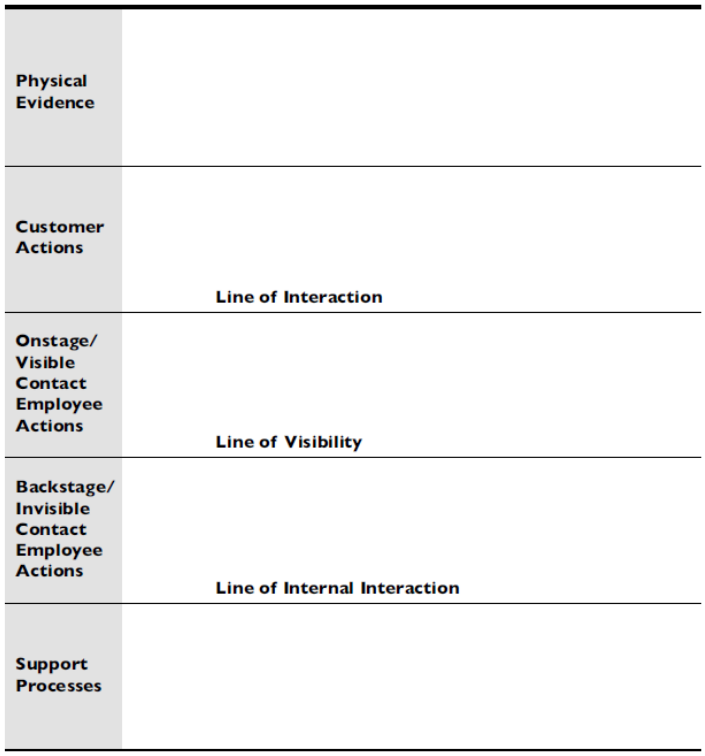


Figure 62. Service blueprint components (Bitner et al. 2008, 73).

"Customer actions" refers to the steps that the customer engages in during the service delivery. They are often chronological and serve as the anchor that all other activities are aligned with. "Onstage/visible contact employee actions" depicts those activities that frontline employees engage in to service the customer actions. These actions can also be performed by self-service technology. (Bitner et al. 2008, 72.)

The "backstage/invisible contact employee actions" are beyond the customer's line of visibility and are performed to support the customer actions. Making telephone calls and other preparatory activities that the employees do are located here. "Support processes" are beyond

the line of internal interaction and this layer refers to the interaction between the employee who is servicing the customer and the other internal parties or systems who support the employee. (Bitner et al. 2008, 72.)

Successful customer actions are called “moments of truth” and they are often supported by “physical evidence” that are tangibles that the customer receives. They can be contracts, bills or products. (Bitner et al. 2008, 72-73.)

Service Blueprinting is evolving to adapt to a world where services are provided over several channels some of which are provide opportunities for human to human interaction that is the basis of the process-based service blueprint. However many digital channels are static services based on interactions rather than processes. Digital channels’ functionalities, or what they do, are more important than sequences at which things are done, the processes.

In framing services in blended physical/digital contexts traditional service blueprints don’t work because there is not necessarily any physical evidence nor employee actions. It is also problematic to call IT systems support processes. Efforts have been made to solve for this.

On their web page, Livework (Service blueprint) present their approach to the service blueprint and it provides a valuable addition to the process-based service blueprint because it adds an omnichannel view to promote understanding on the multiple ways of how the customer can choose to interact with the business.

In the book *Service Design – From Insight to Implementation* Polaine, Loevlie and Reason propose that it is a good practice to start out with phases rather than steps to get the big picture or customer lifecycle view on the service. These phases could include aware (learning about service), join (sign-up), use (usage period), develop (expanding usage) and leave (finishing the usage for the session or forever). These phases, in turn, can be broken down into smaller steps or customer actions, and these steps in channels are called touchpoints. (Polaine, Loevlie and Reason 2013, 98.)

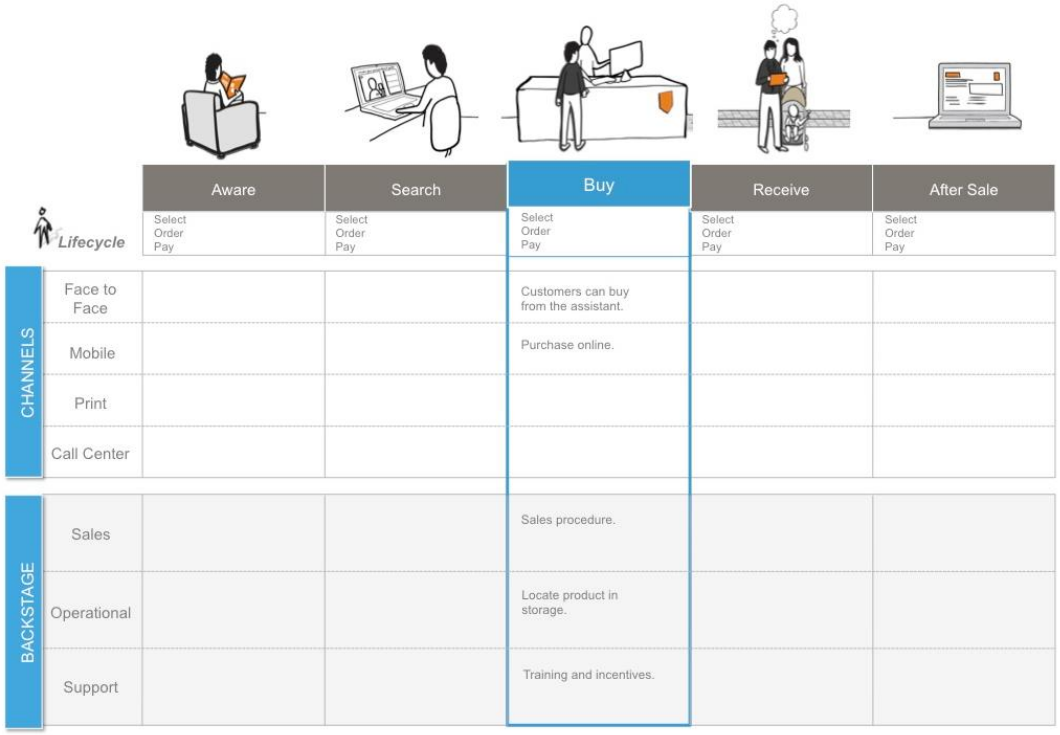


Figure 63. The Livework take on service blueprinting (Service blueprint).

Building such a matrix enables us to choose the most relevant touchpoints that should be developed or prioritized in terms of the moments of truth or customer pain points (Kalbach 2016, 15).

Whereas the Livework Service Blueprint succeeds in elaborating on the different types of channels that can be used in service delivery, it is still a little bit light in terms of the backstage activities/systems/processes that might require huge overhauls to be in line with the desired customer experience in the desired channels. This is where borrowing some concepts from the Enterprise Architecture field might be useful.

Where there is no standard for making a service blueprint in Service Design (Polaine, Loevlie and Reason 2013, 94), the model is rarely used in the Enterprise Architecture field as customer-centric modelling is just being explored in the area. In EA the capability concept is often used to reduce the complexity related to the organization and its systems and refers to “the ability for a business to do something” or, formally, “a business capability is a particular ability or capacity that a business may possess or exchange to achieve a specific purpose or outcome.” (The Open Group 2016, 2).

Business capabilities are built out of components that work together to produce the capability. The components of business capabilities include: roles (for individuals or groups), processes, information (and the data it is embedded in), and tools/resources/assets such as “in-

formation technology systems and applications", "physical, tangible assets like buildings, machinery, and vehicles", and "intangible assets like money and intellectual property" (The Open Group 2016, 3-4).

Table 20. Example of a "Recruitment Management" capability (The Open Group 2016, 4-5).

Name		**Recruitment Management**
Description		The ability to solicit, qualify, and provide support for hiring new employees into the organization.
Components	Roles	User: - Recruiter Stakeholders: - Manager - Candidate Employee
	Processes	Evaluate New Hire Requisitions Recruit/Source Candidates Hire Candidate
	Information	Candidate/Applicant Details Position Descriptions Recruitment Agency Data Industry standard role definitions
	Tools	Recruitment Management Application HR Application Social Media Application

Each component of a capability can be broken down into subsequent models or artefacts such as job descriptions for roles, process diagrams for processes, data models for information and solution architectures for tools. In modelling Enterprise Architecture, most of the relevant models are visualized as separate models that contain elements that are binded together using a metamodel. A metamodel is essentially a data model for elements that can be used to describe Enterprise Architecture but I will return to this in the next chapter.

Substituting the backstage processes of the Service Blueprint as Capabilities could help reduce the complexity involved in modeling the organizational aspects and backstage support services but yet provide a linkage to the more detailed models that can used for realizations to support service development. The concept of capability is however not well known outside EA to many and activities have yet to be understood in terms of capabilities most organizations. The capability concept is also very IT centric and does not take into account the human aspects of service provision, such as culture and practices that are equally relevant in terms of being able to do something.

Based on the research made for his doctoral thesis *Reframing the Relationship Between Service Design and Operations: A Service Engineering Approach*, Henri Karppinen (2014, 55)

points out another difference between modeling for shared understanding (as in Service Design) and modelling for service realization (as in Enterprise Architecture): “The results of the study indicated that service designers and managers could create interesting insights if existing operations were recomposed to Service Design representations, instead of decomposing designs into realisations.”

Even though the requirements for these two types of models are different it does not mean there is no overlap between them. Finding this overlap is key to creating models that build both shared understanding between silos and are able to support service realization. It might be a good idea to start with a service blueprint workshop and use the results for technical modeling.

Business Architecture is part of a business-IT architecture management discipline called Enterprise Architecture in which we model how all the known elements of an organization fit together. The architectural elements are often divided into four groups: business, data, systems and technology. Whenever large scale change is necessary, these dimensions are evaluated to understand the implications of the change and also evaluate controlled transitions. Reducing the amount of systems doing the same operations is something that Enterprise Architecture is useful in. To do this we map services and processes (including value chains) to data and IT systems through the concept of capability which refers to the different types of resources which an enterprise has. For example it is probably unnecessary for an organization to have several systems for marketing communication management but it is very common that organizations have several systems to do this because they might have gotten them at different times and for different purposes. Whereas processes show us the stakeholders, their tasks and the phases of their interaction, capability encompasses also the people and the functions which enable a business to do something. (The Open Group 2016.)

One attempt at visualizing the service blueprint for combining the customer and business architecture aspects is from Mike Clark (2013) who proposes the following type of model.

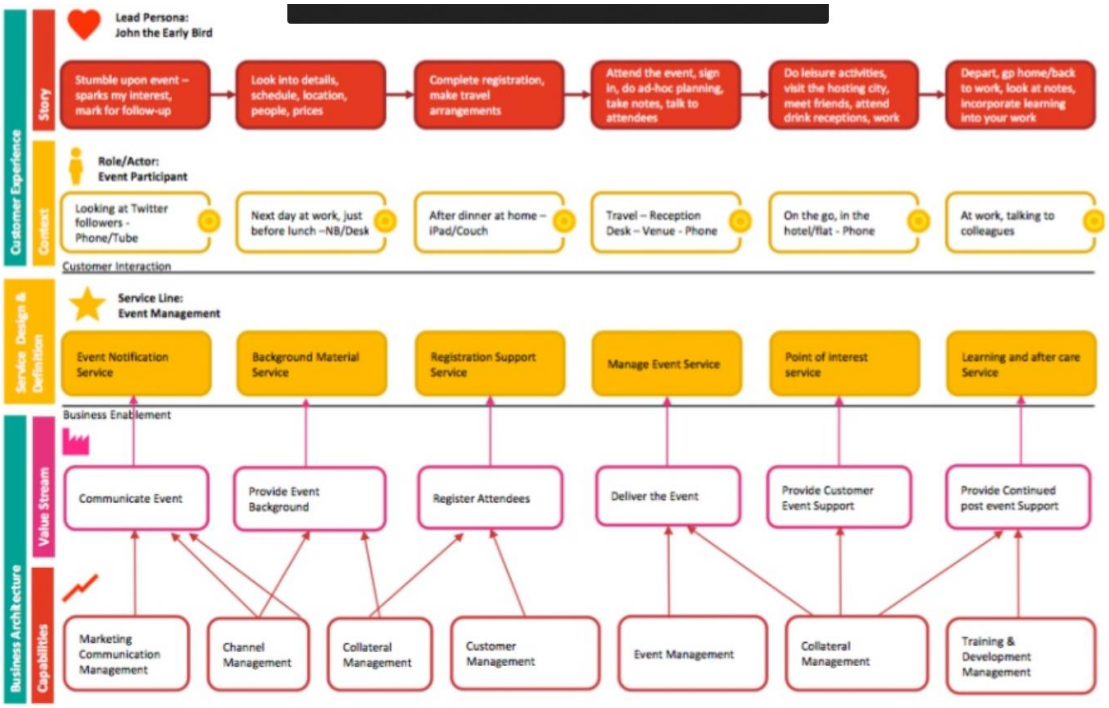


Figure 64. Service blueprinting in digital environments (Clark 2013).

The customer experience layer of this service blueprint consists of story and context. Service design and definition is the layer where interaction between the customer and the business happens. Business architecture is made up of value streams which are made up of capabilities. (Clark 2013.)

In terms of models even though you can combine different aspects in very creative ways, the most relevant outcome of the modelling practices is that they are of actionable relevance to those who view them. Even though you might be able to combine story, context, service design, value streams and capabilities, doesn't mean you should always do this.

In terms of how capabilities are used in communicating relevant yet not complex actions, heat mapping them, for example in terms of a desired goal such as capability maturity, effectiveness, cost, or even identifying the impact of development efforts, provides a quick look into what must be done (The Open Group 2016, 11).

Table 21. Heat mapping capabilities (The Open Group 2016, 12).

Strategic	Business Planning	Marketing	Partner Management
	Capital Management	Policy Management	Government Relations Management
Core	Account Management	Product Management	Distribution Management
	Customer Management	Channel Management	Agent Management
Supporting	Financial Management	HR Management	Procurement Management
	IT Management	Training	Operations Management

Live|work has developed the service blueprint to incorporate a sort of capability heat map to visualize business impact in what they call the Organizational Impact Diagram. The process behind making one is called the Organizational Impact Analysis and it highlights the changes that are necessary to deliver the new service. Heat maps can be used to analyze how well the capability is delivering on the customer needs and understand how cross-functional team must collaborate and change to deliver the new services. Instead of using capabilities it is also possible to visualize impact on other types of elements such as functions and departments. (Reason, Loevlie & Brand Flu 2015, 174-176.)

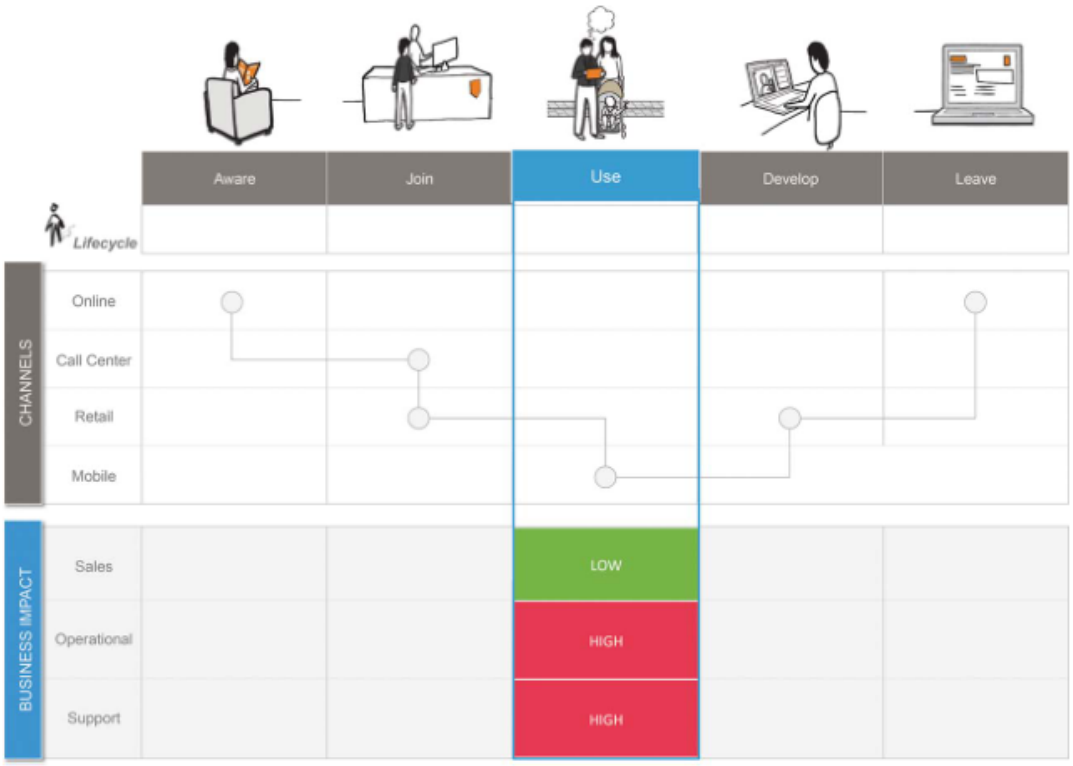


Figure 65. Organizational impact diagram (Reason, Loevlie & Brand Flu 2015, 175).

Summing up Service Blueprints: their usage should always be evaluated and adapted to context. If you are describing service processes, the traditional view of a Service Blueprint will work but if you are describing service abstractions like Clark does or omnichannel interactions like in the Live|work cases, you should probably adapt your Service Blueprinting to suit these contexts.

5.4.2 Consent Service Concept & Delivery Blueprint

For the purposes of the Consent Service System Concept workshop I developed a modified Service Blueprint that I called the "Consent Service Concept & Delivery Blueprint" which is pretty close to the Live|work Organizational Impact Diagram. It consists of four components. The consumer solution components that were uncovered in the consumer interviews, the four common consent cases that had been found in the previous ethnography and finally the business and IT projects that are ongoing at Elisa and were summarized based on the expert interviews.

The Consent Service System Concept Workshop had the goal of facilitating Elisa's experts in the development of a concept that might contain possible solutions to the perspectives uncovered in both the consumer and expert interviews. One of the goals of the workshop was also to reduce the amount of possibilities by asking those who work with the subject to make judgement calls especially to find a relevant starting point for new service development. The question "How can Elisa deliver desired value with feasible resources?" seeked to provoke participants to answer this.

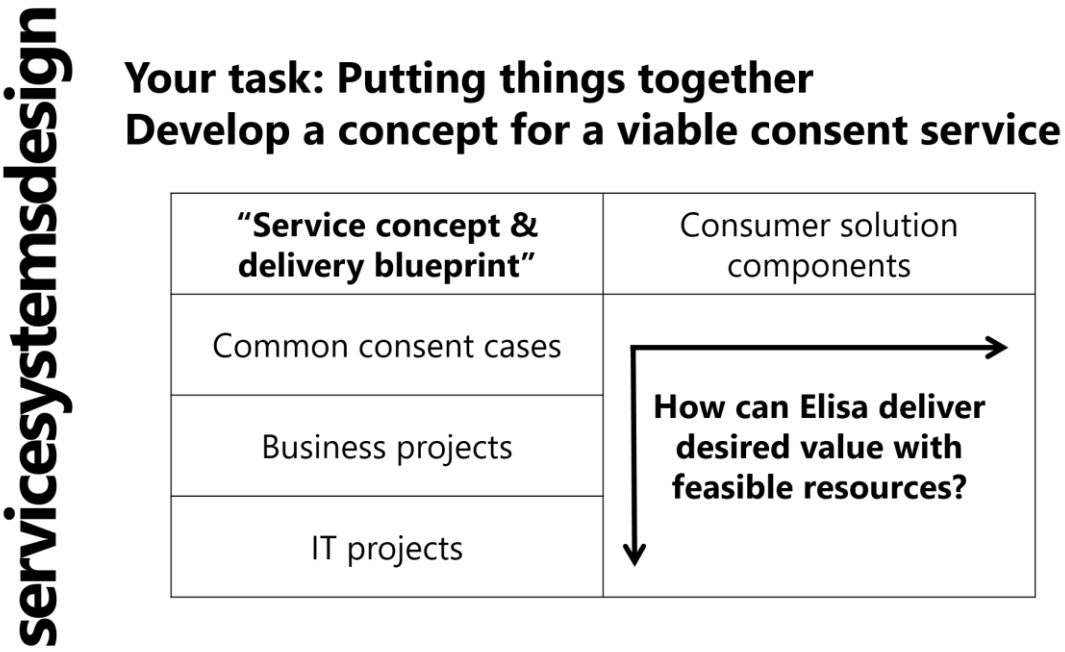


Figure 66. The initial plan for the Consent Service System Concept workshop.

The first intended workshop which had the goal of bringing toghether all the people and all the perspectives became a group interview because part of the busy invitees were able to participate only via Skype. Rather than working on a wall this group interview was used to uncover some more information.

The second, this time successful, attempt to organize the workshop, involved the following people who were mostly from Elisa's Service Design team and working mostly on their online customer service OmaElisa. In addition to them E16, the development manager for Elisa's Call Center customer services was present. This combination of people did not include those who were in charge of Elisa's IT projects or capability development so we focused mostly on the customer-facing services: Elisa Shops, OmaElisa and the Elisa Online Shop.

Table 22. Participants of the Consent Service Concept workshop.

Name(s)	**Expertise**	**Interview type**	**Date**	**Length**
E16, E12, E13, E5, HSD	Development Manager, phone customer services. UX specialist. External UI Consultant. External UX Consultant. Head of Service Design.	Group interview / service blueprinting workshop	10.10.2016	Not recorded ~1:00:00

We started the workshop by reviewing the consent service components that were uncovered in the consumer interviews. We followed this with a discussion on ideas and evaluations on which of these might be relevant on the short run or a good starting point, which ones might be relevant on the long run and which ones should be abandoned completely. After devising an overview of how to procede, we took the time to go through one of the consent cases to see how the service might work as a process.

Figure 67. An overview of the service blueprint from the consent service concept workshop.

The starting points of the workshop included the components of the consumer solutions (Figure 59) and the idea of three general consent levels and their functionalities. During the course of the service blueprinting workshop the Elisa experts were asked to evaluate and provide new ideas about the components. In addition to this the components were integrated to a customer journey to understand which touchpoints, backend systems and subsequent projects should be impacted by their development.

Figure 68. The three consent levels.

The Consent Service blueprint itself was divided into four sections:

- Product onboarding, or how the sales process might be impacted based on consent issues.
- OmaElisa onboarding, or how the customer might find the consent services in OmaElisa.
- Determining the level of consent, or what are the three levels and which functionalities might be relevant to them.
- Customer capabilities, or other issues related to how the subscription owner can deal with consent issues.

A full picture of the consent service blueprint augmented with some findings from the interviews of Elisa's experts can be found in Appendix 1. The main propositions that came out of the Consent Service System workshop were that first, it might be a good idea to incorporate consent issues already in the sales process but this idea should be triangulated because of possible conflicting interests between the sellers and those servicing the customers with consent cases later on in the customer lifecycle. Second, the contract (sopimus) page on OmaElisa would be a suitable place to edit consents because that is the place where one can see an overview of the products that are in use.

5.5 Prototyping the Consent Service Experience

A first sketch of the Consent Service Experience was done by me after the previous workshop to visualize the propositions for further analysis. Because they were intended to be starting points for a discussion rather than finalized versions I decided to make them a combination of Elisa's actual touchpoints and the proposed additions.

After making the first prototypes we had a UI prototyping workshop later on where Elisa's experts who were working on the development of the Elisa Oline Shop and OmaElisa were engaged to collaborate on how they would actually implement consent issues in these channels.

Table 23. Participants of the UI prototyping workshop.

Name(s)	**Expertise**	**Interview type**	**Date**	**Length**
E12, E13, E5	UX specialist. External UI Consultant. External UX Consultant.	Group interview / UI prototyping workshop	20.12.2016	Not recorded ~2:00:00

The prototype for the product onboarding phase included being able to set the consent level already in the during the sales process. From the expert interviews the application that is used during the sales process is the same in both shops and online. Thus adding consent functionalities here might be a good idea. Consumers should also be tod what the consent levels entail at this point for them to make a good decision.

What is missing from this first sketch that came as a development idea in the UI prototyping workshop is that a tie-in into the Elisa ID of the consented person should be made here. The easiest way to do it is to ask for the email of the consented person by which the Elisa ID IAM system can prompt to create a new user or add the consented functionalities to an existing user. The Elisa ID could take care of identifying the person using TUPAS or some other way of verifying that the customer is actually who they should be.

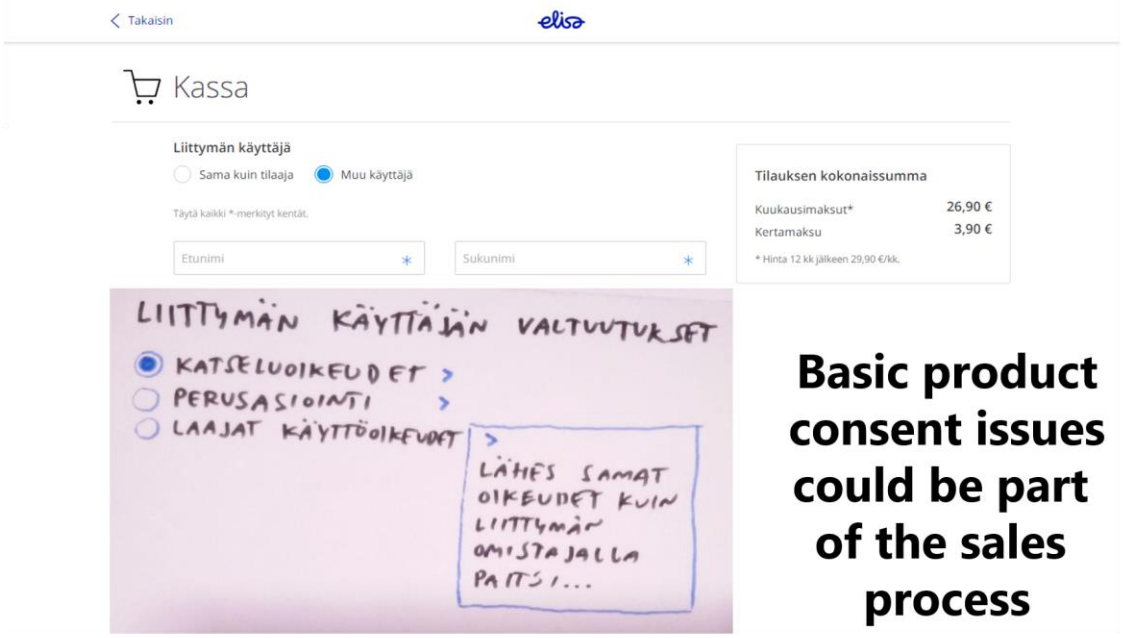


Figure 69. A sketch for how single product consents issues could be part of the sales process.

The consent services within OmaElisa could be found in the contracts section where current users are already updated. This section could include all or some of Elisa's products and adding users and consent levels to them could be possible here. The person who is to be consented should be added here as well using an email address that would provide that person with login information or the functionalities.

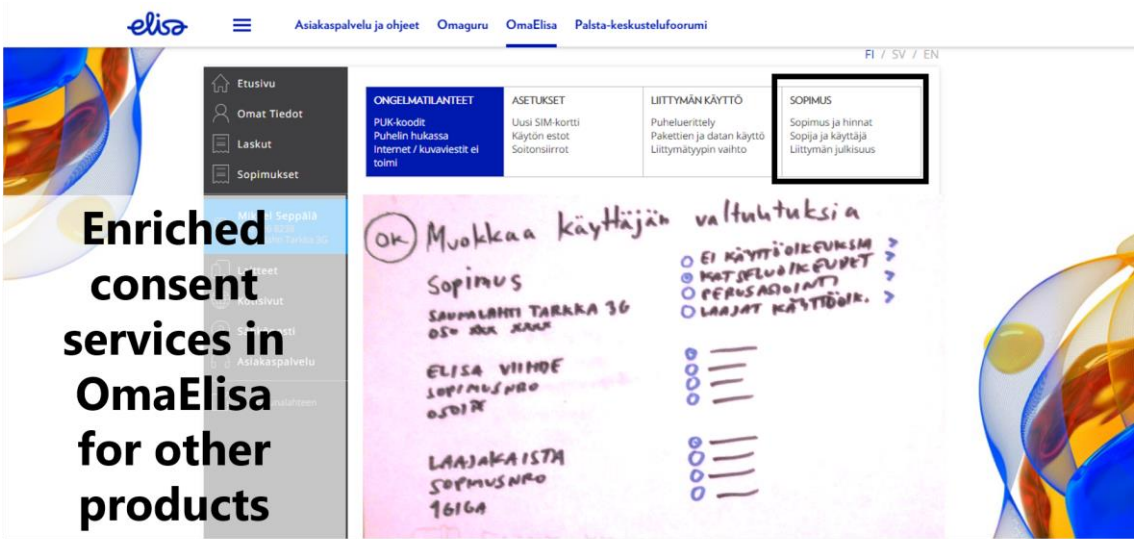


Figure 70. A first sketch of consent services in OmaElisa.

The resulting prototypes of the UI prototyping workshop will not be published as part of this thesis because they have yet to be published and might contain information that might be viable for competitors as well.

After finishing high-fidelity prototypes I proposed that Elisa's experts might want to go through the prototypes and the whole experience of the consent service with a possible focus group of consumers to get more customer feedback before locking into implement the services.

5.6 MyData Opportunities for Elisa

The prototypes shown earlier were first presented in a meeting on 12.10.2017 with some of Elisa's business and IT managers who might be interested in promoting the ideas and what types of opportunities might be in MyData for Elisa in the future.

Table 24. Participants of the meeting about the results and MyData opportunities.

Name(s)	**Expertise**	**Interview type**	**Date**	**Length**
E14, E15, E10, HSD	Head of Elisa's new consent project. Development Manager (IAM). We discussed the results of my research and possible implications.	Group interview	12.10.2016	Not recorded ~90:00

As one of the short-term drivers for Elisa's Master Data Management project was the ability to handle consents for cross-product marketing, what E6 had called the "holy grail", by the end of the project this was technically possible according to E10. Elisa had the ability to read contract data and was able to use this to market other products to customers with some types of contracts. What I proposed might be interesting to Elisa would be to create a consent user interface related to these marketing consents whereby the user might be able to choose or revisit the marketing consents within a contract at a later time.

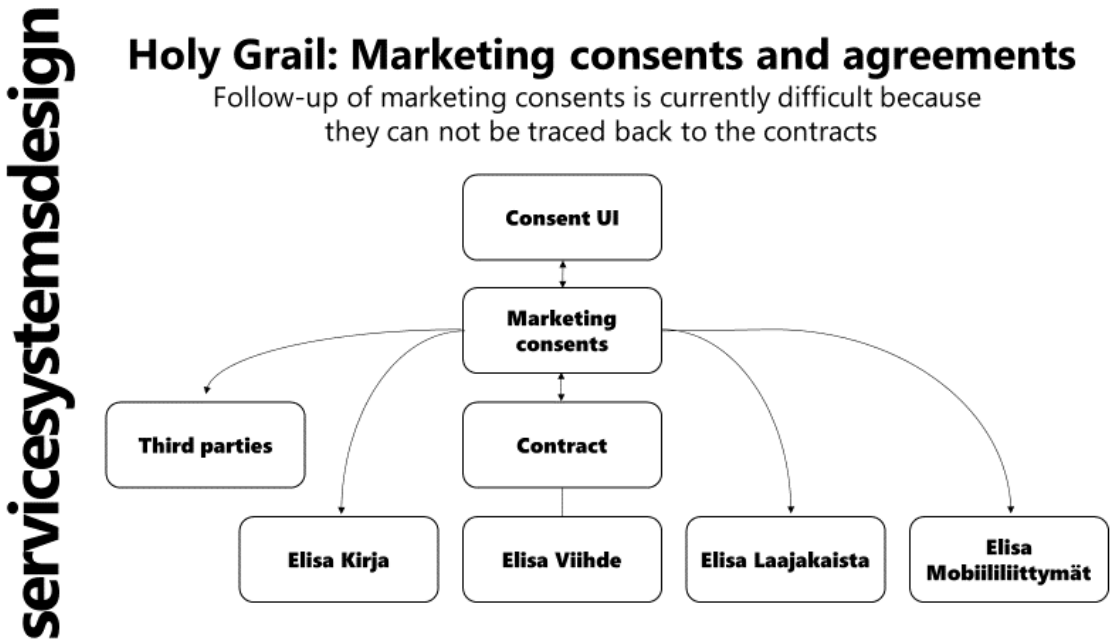


Figure 71. Elisa's Holy Grail for the MDM project: Marketing consents and agreements.

This type of an approach could be in line with future developments in multi-organizational or ecosystemic services that are on the rise. Two further proposed services for Elisa and initial ideas for data flows in order to utilize ecosystemic data that are depicted in the following figure.

The first of these is using the Suomi.fi consent services (Suomi.fi-valtuudet, marked in the following figure and formerly known as “Suomi.fi asiointipalvelu”) to inherit national authorization and role information to enable similar authorizations in Elisa’s services. Suomi.fi consent services enable combinations of digital person and company authorizations (person-to-person, company-to-company, person-to-company, etc.) that can be used by public and also other organizations (Suomi.fi-valtuudet 2017). For example in the consent use case of the elderly lady in a retirement home who wants her son to end her mobile phone subscription, if the son is authorized to act on behalf of the lady in the Suomi.fi consent services, this information could be used as authorization also in Elisa’s services.

Second, Elisa’s IAM and MDM solutions could rather easily be technically augmented by MyData Consent Services to transfer suitable data to third parties. However institutional, legal and infrastructural elements should be in place to determine the socio-technical procedures of sharing and utilizing personal data in ecosystems. Finland is strongly heading into this direction but many issues are still to be solved.

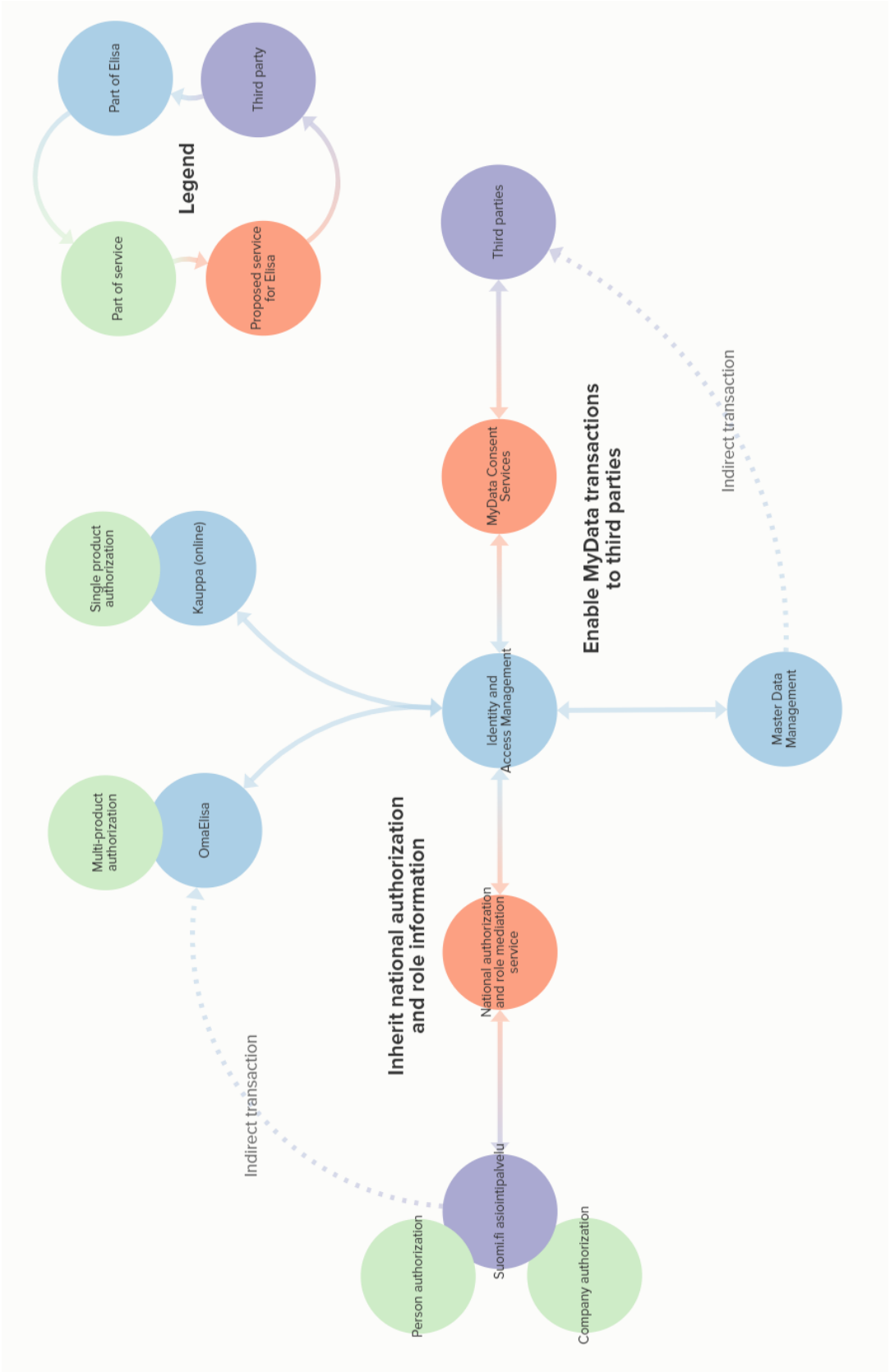


Figure 72. The Consent Service Systems Stack extended with future service opportunities.

Other future research opportunities for this area are elaborated upon in the final chapter of this thesis.

5.7 Conclusions on the Research Question

Applying Service Systems Design within a large organizational context such as Elisa's is definitely difficult because of multiple ongoing projects and dependencies. Elisa's Service Design unit that HSD heads is definitely in a good spot to, like HSD said in one of the interviews, create prototypes developed using customer-centric methods that challenge existing was of doing things things and encourage collaboration within the organization.

In terms of where Elisa is on the Danish Design Ladder (Figure 6), to me it seems like they are on step 3, Design as a Process in which design is part of development from an early stage and drives collaboration around customer problems. However, there are many types of teams in Elisa, some more focused on innovating for the future and there might also be teams which operate also in the Design as Strategy step.

The Multilevel Service Design process which seeks to look at the customer experience, develop a service concept, develop the service architecture and prototype the service encounter provided a suitable basis for the development of a Consent Service in such a complicated environment with many actors, teams and projects such as Elisa's.

What I noticed in my assisting role in developing the Consent Service is that Service Design, even expanded with Service Systems approaches, should be augmented with project or product management to keep a timetable and focus on delivering a service. Incorporating delivery into Service Design is a longer process than the development of a service concept, it's architecture and subsequent experience prototypes.

Expanding design with delivery is one of those issues where it would be beneficial to expand Service Design with other disciplines and the interactions that go with creating a working prototype or rolled-out service.

Whereas this research question focused on understanding potential consumer needs and develop a Consent Service System prototype with implications on Elisa's Enterprise Architecture, an area of future research into service systems design would be to participate not just in the prototyping but also delivery aspects related to a service or the more strategic issue of developing the overall Customer Experience.

6 Conclusions

The goal of this thesis was to explore the area overlapping Service Design and Enterprise Architecture, fields that are both focused on design. Whereas Service Design looks at a single service context Enterprise Architecture takes a broader systemic, enterprise level view on design.

Service Systems Design is proposed as a concept with practices that could incorporate elements from both of these two fields. The concept is developed by combining theory from the Service Science (Management, Engineering and Design, SSMED) field that shares a ontological basis with Lusch and Vargo's Service-Dominant Logic, Service Design to incorporate human-centric aspects and Enterprise Architecture that can help design for the actual holistic investments and delivery issues related to actualizing a Service System.

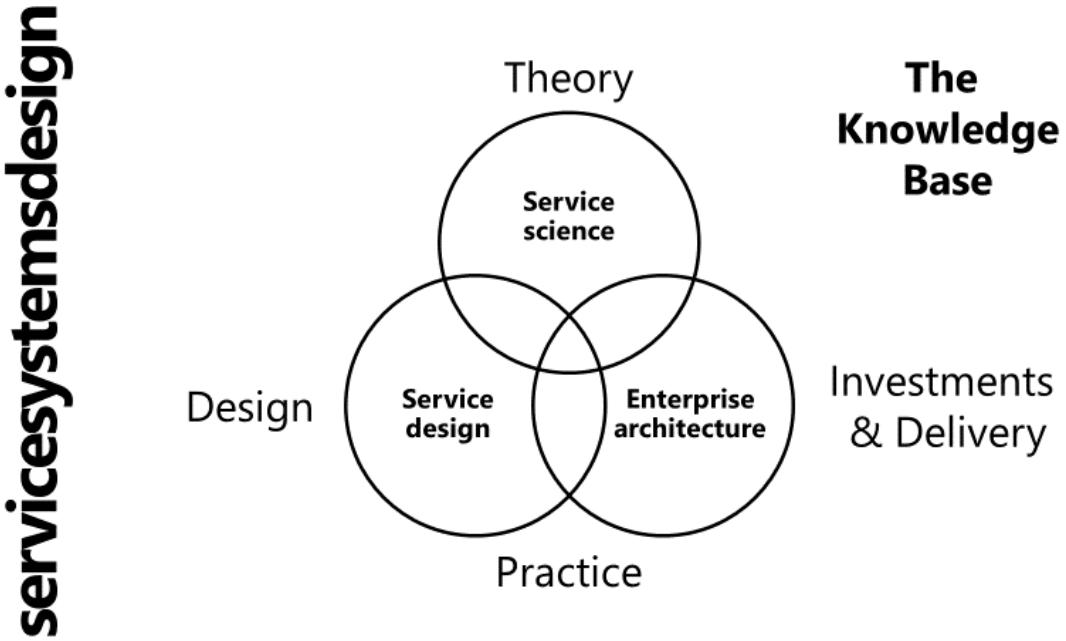


Figure 73. An overview of the knowledge base that assists the development of the concept of Service Systems Design.

The way how the concept and practices of Service Systems Design are explored in this thesis is by looking at human-centric approaches at developing Service Systems at organizational to ecosystemic scales. This is done empirically through two MyData-related projects that were done with Elisa Oyj: developing a MyData Health Service Ecosystem Concept and developing an organizational Consent Service System Concept.

6.1 Service Systems Design at Ecosystemic Scale

Exploring the concept and practices of Service Systems Design at ecosystemic, or multi-organizational scale was done by facilitating the development a MyData Health Service Ecosystem Concept in the Professional Summer School 2016 organized by Haaga-Helia, Laurea and Metropolia. A team comprising of students from Laurea and Metropolia were tasked with developing a MyData Health Service Ecosystem that was inspired by the digital health ecosystem portal of the City of Hämeenlinna where Elisa is one of the service providers.

Table 25. An overview of the first research question, its methods, context, and deliverables.

Research Question	Research methods	Context	Deliverables
How do we tie in customer centric aspects in creating a service ecosystem concept?	Case Study Research	Helsinki Region Applied Universities' Professional Summer School, Elisa MyData-case	Exploration of design methods and student-created service concept

The team's Sprint was based on methods from both the Summer School in general and the MyData Clinic method set developed in the Digital Health Revolution (2016) research project. Modelling the digital ecosystem was based on the ecosystem architecture model in use in Hämeenlinna and the Value Flow Model by Elke den Ouden (2011) which looks beyond data at the other types of value interactions between the ecosystems players.

The end-result of the sprint was the OmaNeuvola MyData Service Ecosystem Concept which focused on customer-centric maternity (neuvola) services provided in a multi-organizational context. The concept was chosen as the winning concept of the Professional Summer School by the judges.

As the Hämeenlinna case showed, customer-centric multi-organizational Service Ecosystems are already here. The added value of applying Service Systems Design in such a context is to create flows or customer journeys that are user-centric rather than being separate functionalities within a system.

Expanding a Design Sprint with the Value Flow Model was not difficult from a methodical standpoint but it should be noticed from the experiences of the students participating in the sprint that modelling complicated socio-technical ecosystems is not neccesarily natural for all. However embodying the activities through roleplaying can help overcome these limitations.

6.2 Service Systems Design in Organizations

Service Systems Design in organizations is a lot like Service Design but with more emphasis on the socio-technical systems that enable services. The second research question explored the opportunities for creating a Consent Service System Concept for Elisa Oyj.

Table 26. An overview of the first research question, its methods, context, and deliverables.

Research Question	Research methods	Context	Deliverables
How can we use service systems design to combine methods and perspectives from service design and EA in order to create a consent service system concept and understand its developmental impact on Elisa's current operations?	Interviews, observations, co-creation, prototyping	Elisa consent service system concept	Consumer and expert insights, consent service concept, consent service architecture, consent service prototype

The Multilevel Service Design (MSD) approach was employed as a basis of the project. The Consent Service System Concept was developed by using the active interview method to bounce ideas between consumers and multiple experts from Elisa.

The possible Consent Service Architecture was explored in the interviews with Elisa's experts and developed further using a modification of the Service Blueprint called a Consent Design and Delivery Blueprint. The Service Experience was developed in two phases: during the Blueprinting session which led to the creation of two rough prototypes that were refined further in a UI prototyping session with Elisa's experts.

Conclusions on the research question include the notion that in actual organizational contexts Service Design nor the expanded idea of Service Systems Design would benefit from being integrated with disciplines that add the aspects of actual Service delivery into the mix. In complicated and rapidly changing organizational environments mere design is not enough to influence activity in fulfilling the design.

6.3 Limitations

As stated ealier the goal of this thesis was to explore the concept and practices that would consolidate Service Science, Service Design and Enterprise Architecture in creating human-centered service systems and ecosystems.

The limitations of the implementation of the research in this thesis include the fact that the two research questions were focused prototyping Service Systems and Ecosystems. Because of this the initial idea of incorporating more aspects from Enteprise Architecture and the IT delivery disciplines were left underdeveloped in this context.

Taking a more broad and complete approach to the design and delivery of services that are grounded in the theoretical undepinnings of Service-Dominant Logic would further assist in developing the concept and practices of Service Systems Design.

6.4 Future Research Opportunities

In addition to exploring how to expand Service Design and Service Systems Design with disciplines that focus on delivery such as Enterprise Architecture, Product Management, Project Management and the like, there are also very interesting practical future research opportunities in Service Systems and Ecosystems which employ MyData. Marrying the socio-technical approaches embedded in Service Systems Design with legal aspects that are present in Lusch and Vargo's (2016, 18) fifth axiom of Service-Dominant Logic, or "value cocreation is coordinated through actor-generated institutions and institutional arrangements", seem like an interesting opportuntity for the future.

In looking beyond Elisa's own use case for sharing customer data, bringing third parties into the mix for example through business collaborations or digital ecosystems, consent issues can be divided into two categories: usage and actors. Usage includes the contracts that define how the data can be used but use cases, such as providing data for research purposes, is something that the customer might be willing to consent to separately if sharing data for research is not lawfully binding.

Consent also relates to different types of actors. In the cases that we went through within this research question, consent was being given to people. But in looking at consent issues in a broader context, a person might want to provide consent to a organization, such as a bank that might, for example, provide some type of payment services related to a mobile subscription. Consent can also be provided to a service like a MyData operator that provisions the personal data where the consumer would like it to be used.

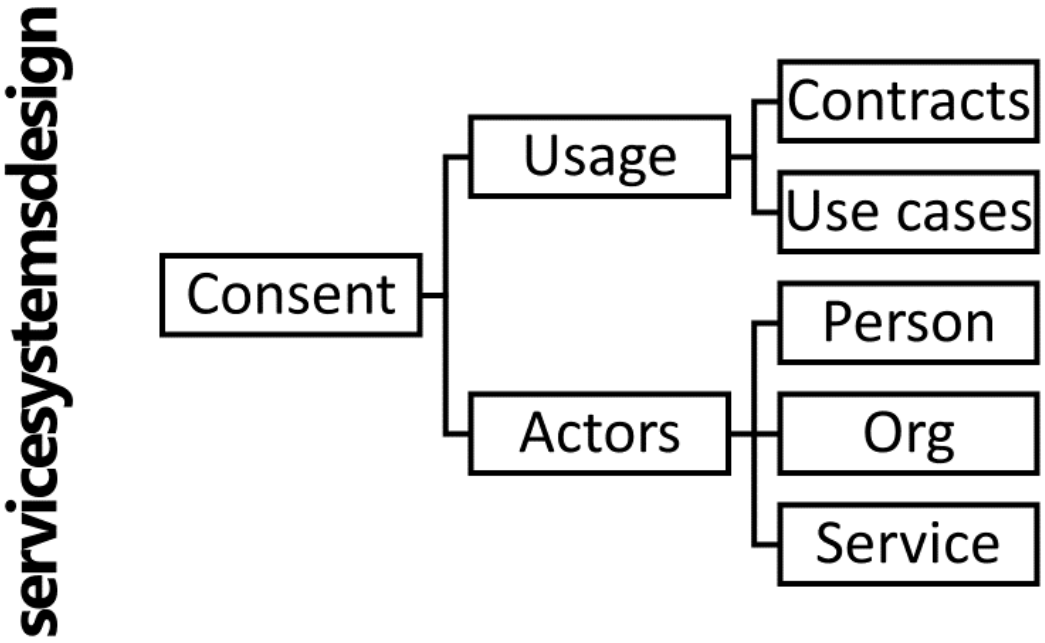


Figure 74. Consent is related to both usage and actors.

Consent, contracts, terms & conditions are all issues that could be tackled using approaches from the legal design field. Legal Design researcher Margaret Hagan (2016) describes the field as "the application of human-centered design to the world of law, to make legal systems and services more human-centered, usable, and satisfying." Where legal design can be applied is very similar to what di Russo was proposing in her typology of design thinking (Figure 7). Legal design can span information, product, service, organization and systems design (Hagan 2016; Passera 2017, 38).

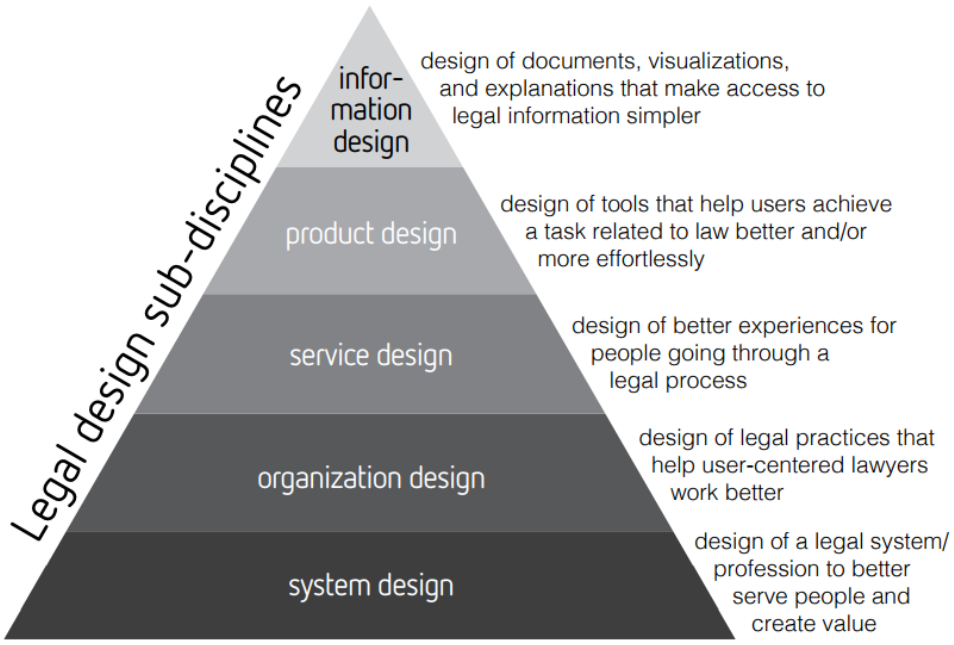


Figure 75. Conceptualization of the field of legal design (Hagan 2016; Passera 2017, 38).

Why Elisa might want to consider exploring this type of approach is the rise of digital legal design which is one of the underpinnings of the MyData movement. Digital legal design requires understanding in legal, design and technological issues.

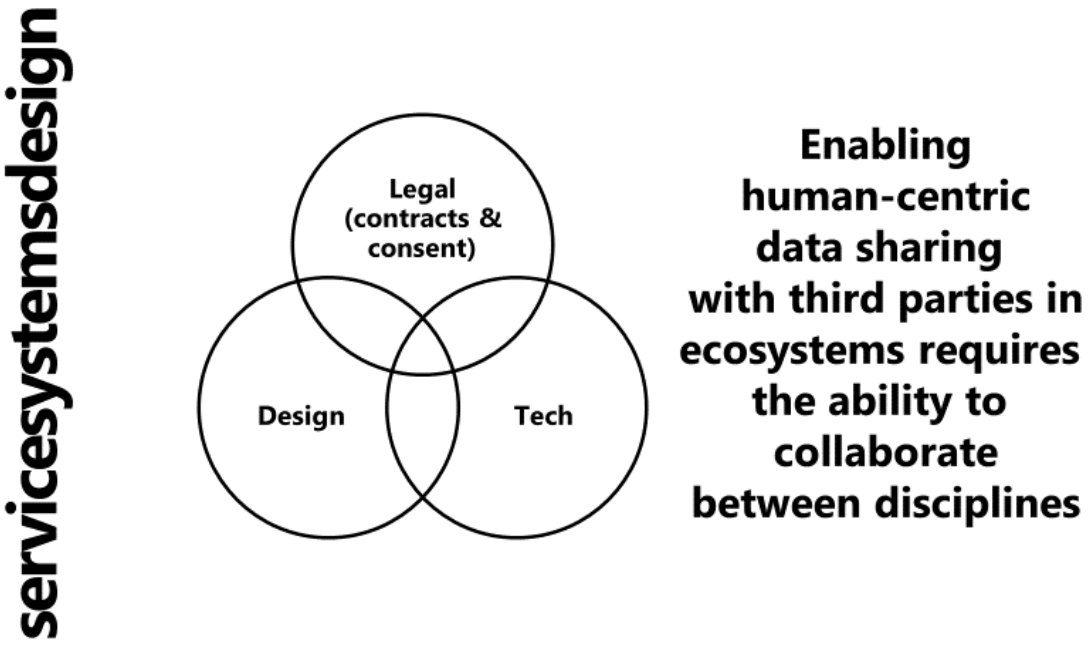


Figure 76. Digital Legal Design is an underpinning of sharing personal data in ecosystems (adapted from Hagan 2016).

The role of design in digital legal design is to make consent issues sufficiently understandable for humans, evoke trust in the services and provide consumers with usable consent services that they can feel in control of their data with. For example the MyData reference architecture developed in a MyData research group here in Finland contains both technical and user interface components that bring together these functionalities in a digital environment (Honko 2016).

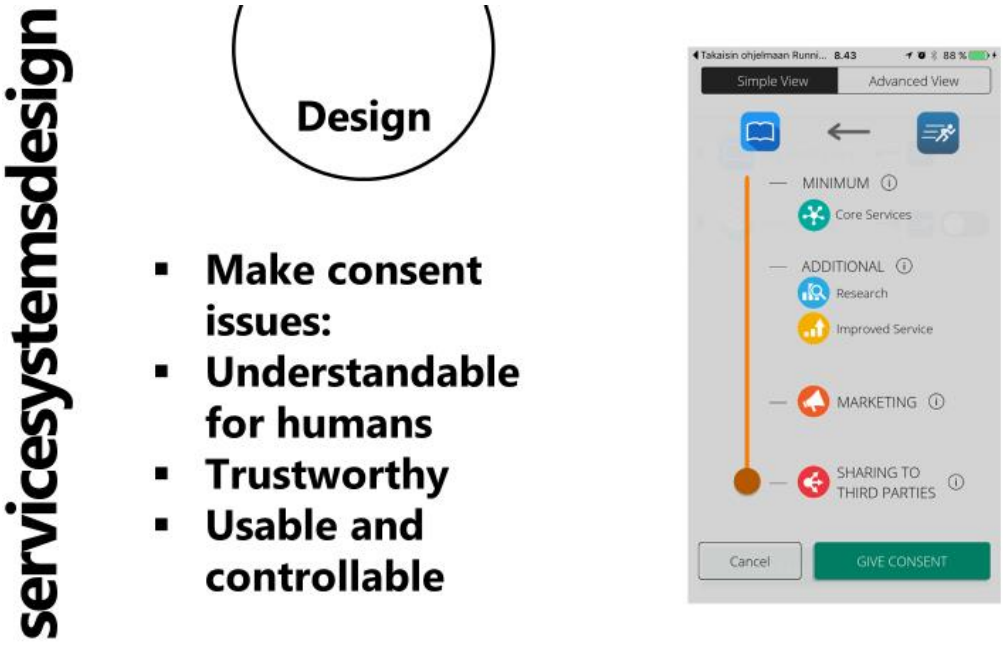


Figure 77. The role of design in digital legal design.

The technology in digital legal design is probably the most mature of the practices. It is related to handling data in a secure manner that leakages do not happen. In addition to this the legal issues should be machine readalbe and transferable from one database to another. This requires creating suitable data models that can elaborate the content and ID contracts. An example of how to do this is through using Consent Reciepts that break down contract content and add data that is required both for handling the data and fulfilling national legislative requirements (Nati 2016; Lizar 2016).

Figure 78. The role of technology in digital legal design.

Because data controllers are subject to high expectations in the EU GDPR and national legislations in addition to consumer expectations, sharing personal data in ecosystems requires defining legal issues, governance, sanctions accountabilities related to it (Guenther & Myhrberg 2016).

Figure 79. The role of Legal in digital Legal Design.

From an IT systems standpoint what is necessary for digital legal design is the interplay between user interfaces, data and contracts. The user interfaces should fit into actual customer journeys and should enable communicating the content of contracts and customer obligations in a manner which is understandable. Every adult has probably signed contracts or accepted Terms & Conditions during their lives but how often do we actually read the small print and sufficiently understand the content? This is where data models that break down the content into pieces and user interfaces which visualize and are able to affect the content can help us.

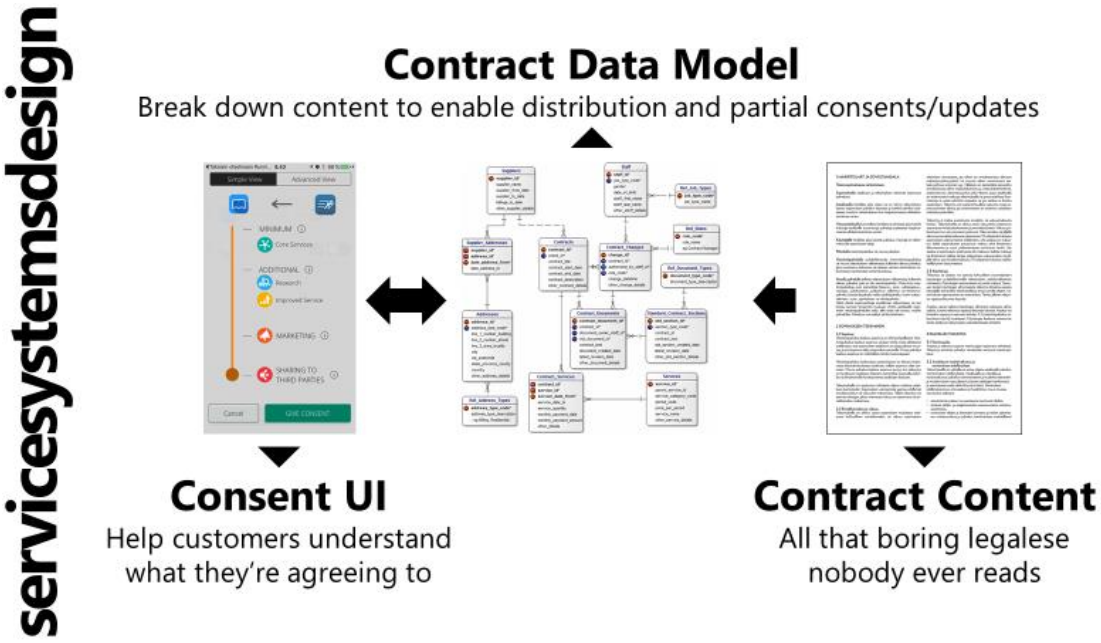


Figure 80. Consent User Interfaces, Contract Data Models and Contract Content work together to enable digital legal capabilities.

Where all of this is heading is creating a legal and technical infrastructure that supports multi-organizational collaborations in facilitating customer journeys. Mobility-as-a-Service (MaaS) is one example where this is already being done around an actual journey from place to place using multiple modes of transport (MaaS Global 2017). However, information design researcher Andrea Resmini (2016) proposes that similar integrations of customer journeys with multiple organizations, what he calls Cross-Channel Ecosystems, could enable journeys with also other types of options in service providers. According to Resmini (2016), "cross-channel ecosystems are semantic constructs that straddle digital and physical spaces, locations, devices, people, and contexts." For example, a Friday night out with the idea of watching a movie and getting something to eat including all or many of the possible options for the customer journey might look something like the following. This is very close to a practical and real-time implementation of resource integration of what Vargo and Lusch (2014) envision as a Service Ecosystem in their theory about Service-Dominant Logic.

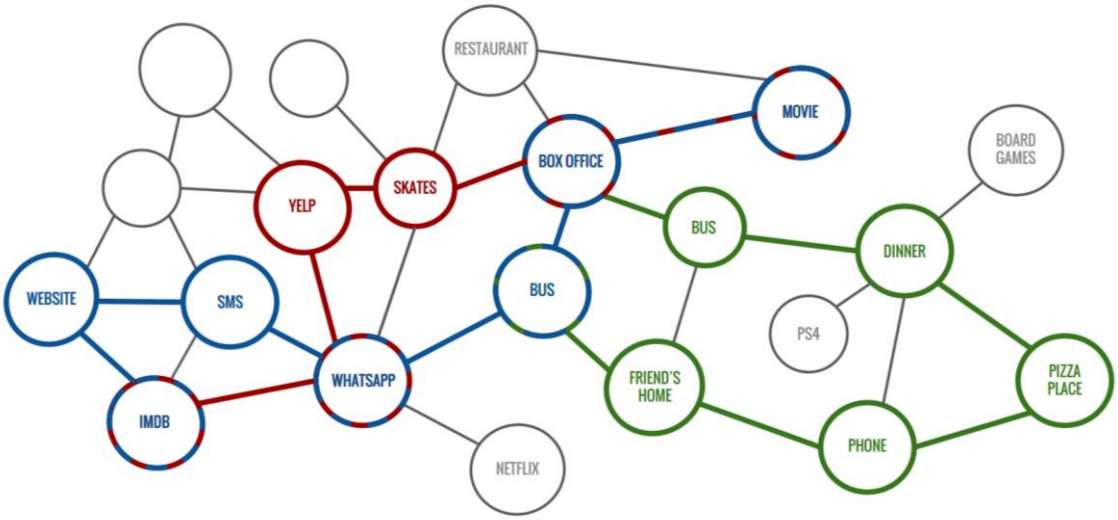


Figure 81. A visualization of a customer journey with options within a Cross-Channel Ecosystem (Resmini 2016).

The interplay and orchestration of personal preferences and data (MyData) in digital multi-organizational or ecosystemic contexts is one of those rising opportunities and trends in creating digital service systems around individuals. This area requires the true multidisciplinary approach that is called for in Service Science. An example of how to combine MyData architectures with what Resmini calls Cross-Channel Ecosystems can be seen in the following figure.

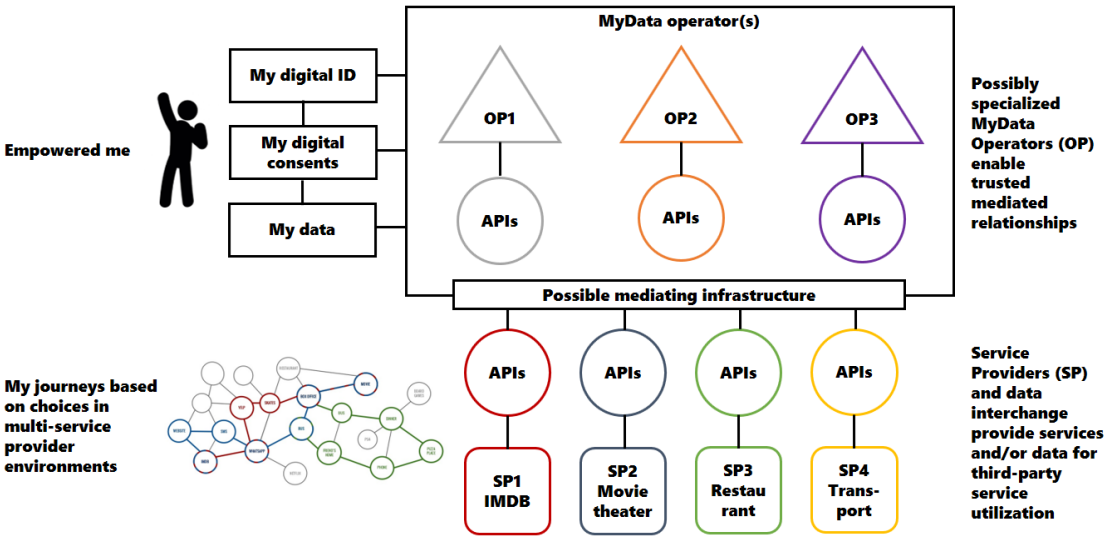


Figure 82. Combining MyData architectures and Cross-Channel Ecosystems.

How to design this digital interplay between services within multi-organizational ecosystems is one of the rising opportunities for design research as well. Some research in the field is al-

ready being done within the Systemic Design field which seeks to combine Systems Thinking with Design Thinking. A prominent researcher from the field, Eunki Chung (2016) states that this shift focuses not only on perfecting single artefacts in systems to creating flourishing ecologies.

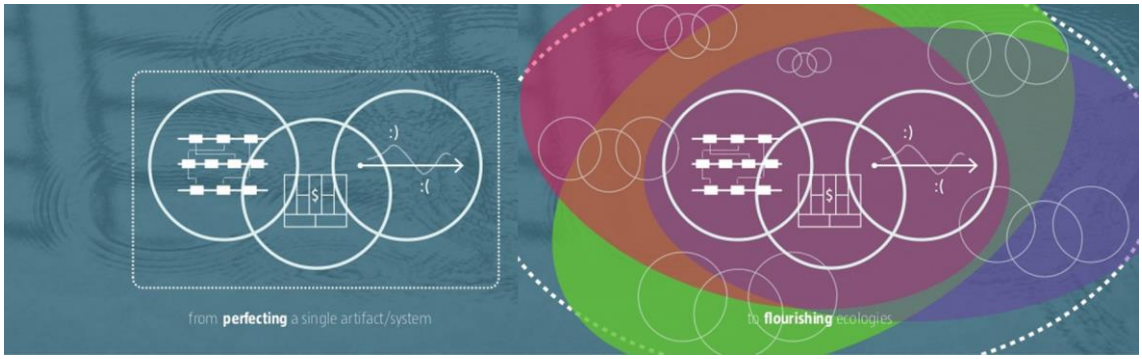


Figure 83. From single artifacts systems to flourishing ecologies (Chung 2016).

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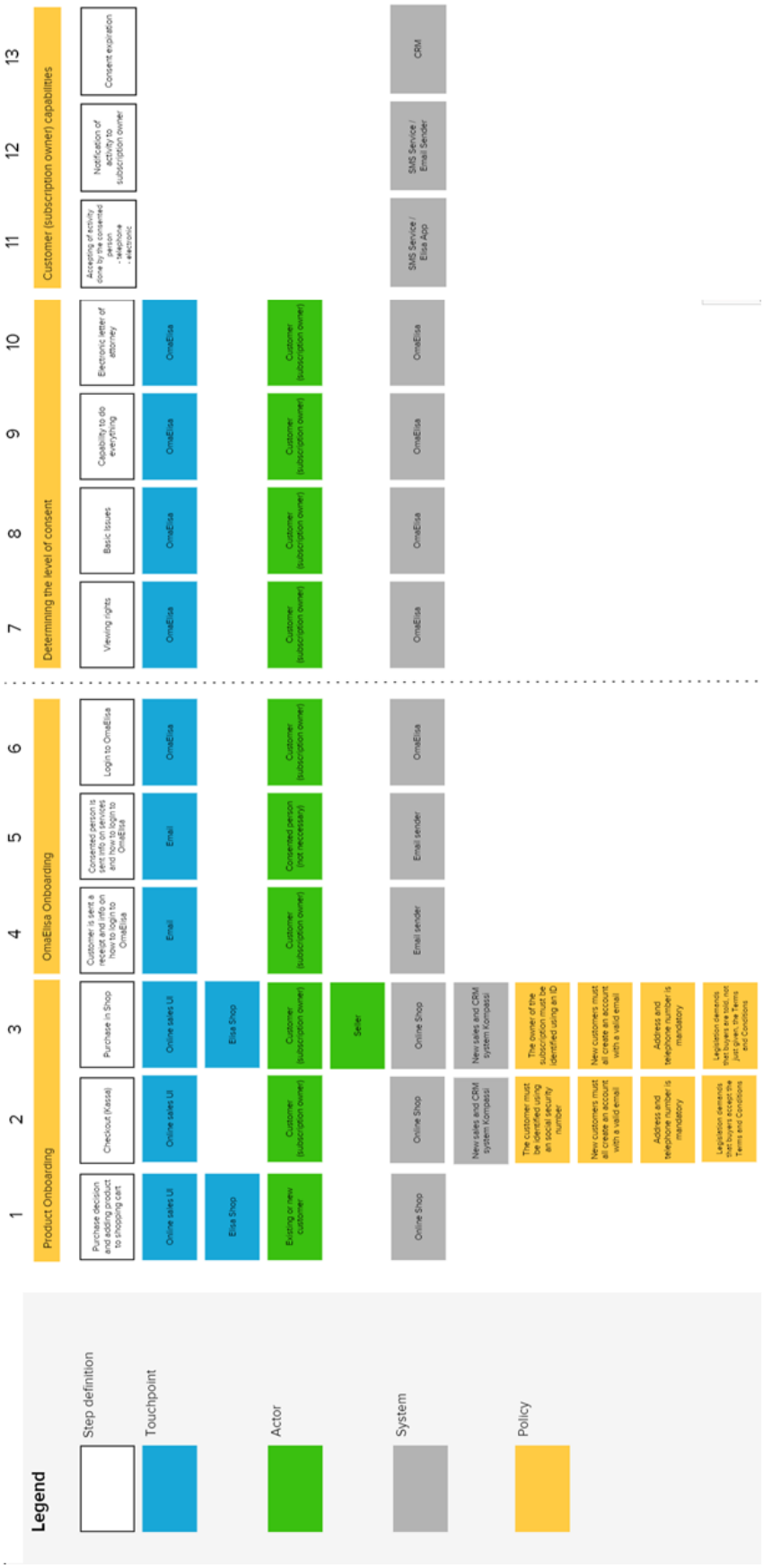
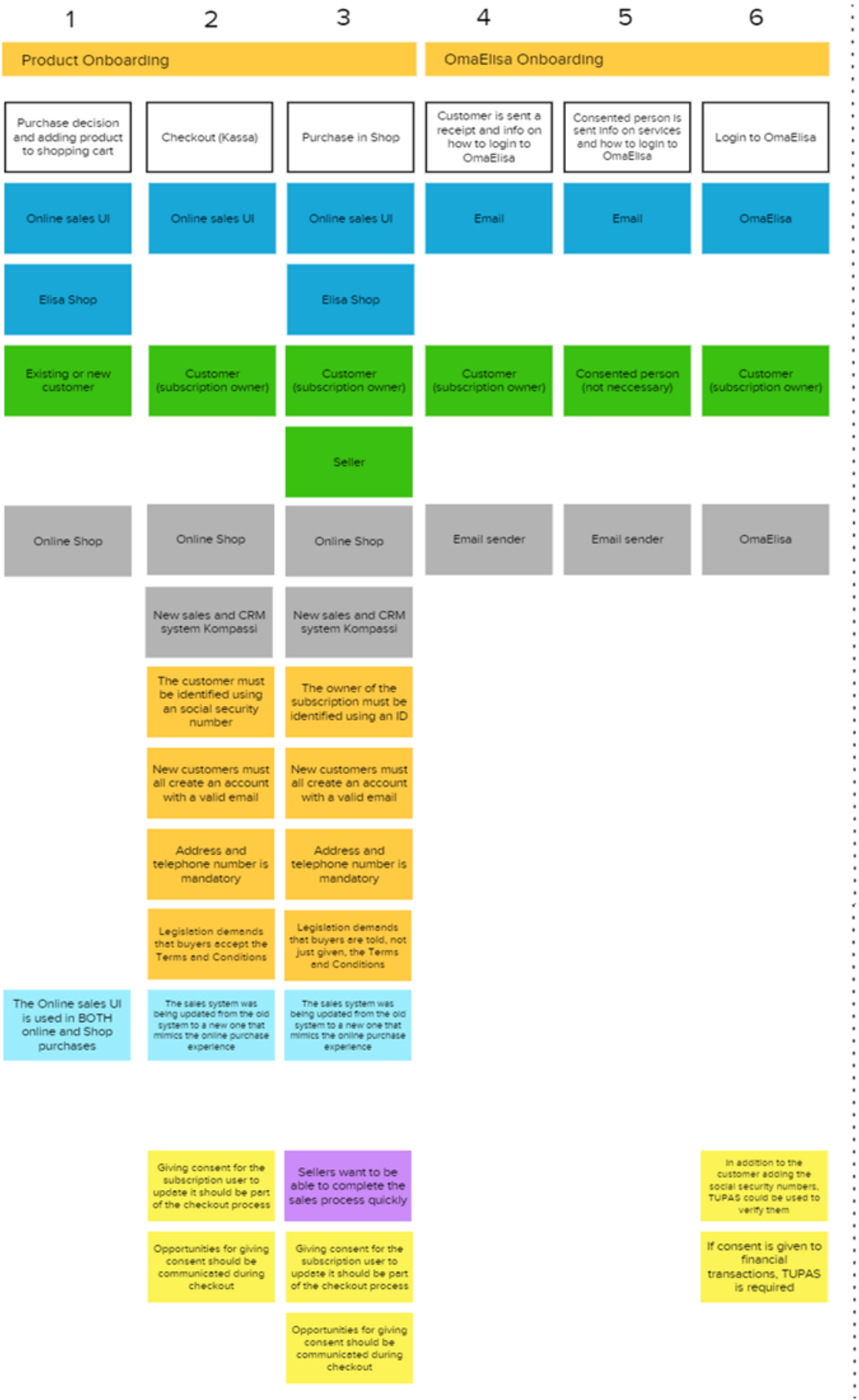
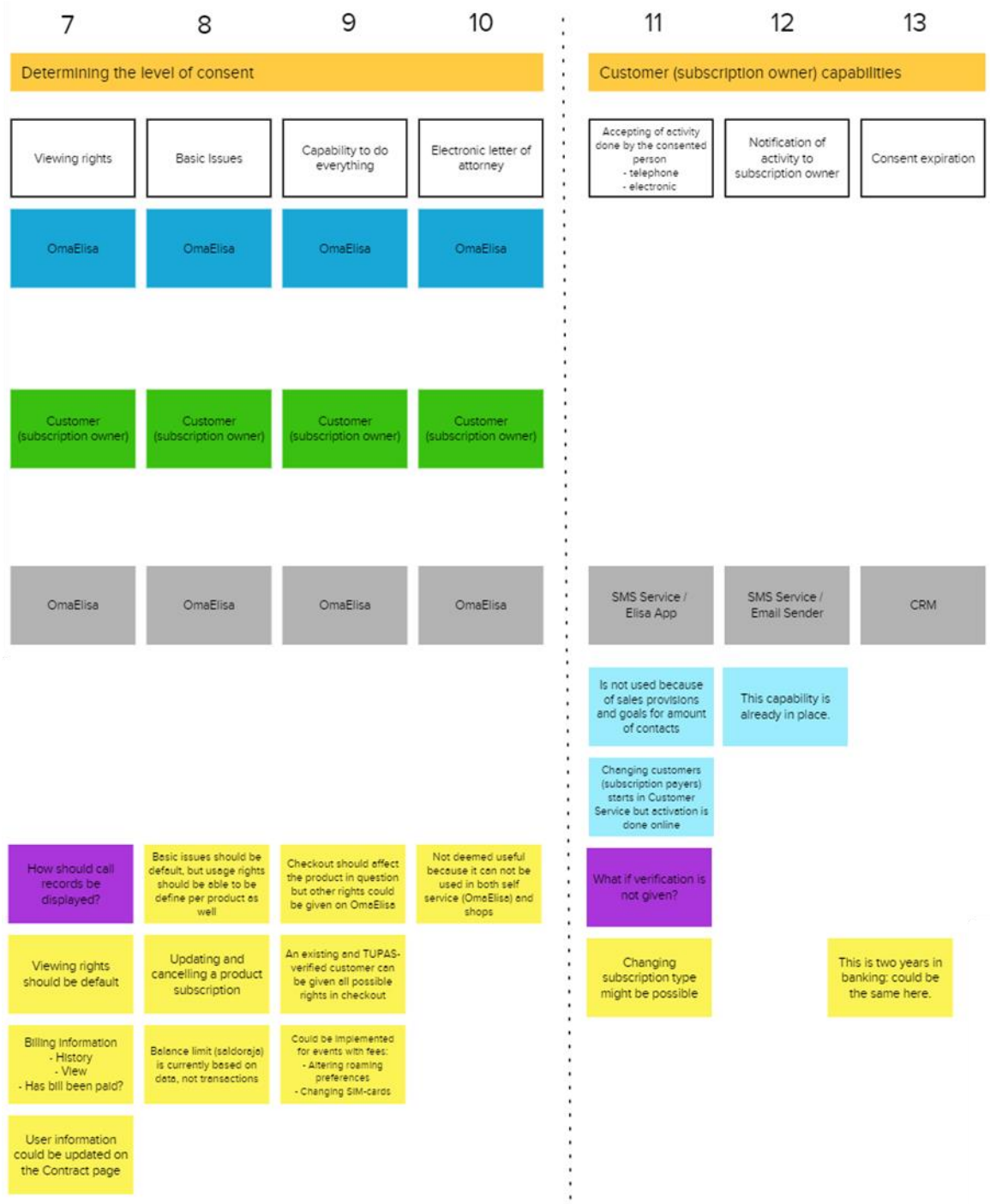
Figures

Tables

Appendix 1. Consent Service Blueprint.




1
2
3
4
5
6
Product Onboarding
OmaElisa Onboarding
Purchase decision and adding product to shopping cart
Checkout (Kassa)
Purchase in Shop
Customer is sent a receipt and info on how to login to OmaElisa
Consented person is sent info on services and how to login to OmaElisa
Login to OmaElisa
Online sales UI
Online sales UI
Online sales UI
Email
Email
OmaElisa
Elisa Shop
Elisa Shop
Existing or new customer
Customer (subscription owner)
Customer (subscription owner)
Customer (subscription owner)
Consented person (not neccessary)
Customer (subscription owner)
Seller
Online Shop
Online Shop
Online Shop
Email sender
Email sender
OmaElisa
New sales and CRM system Kompassi
New sales and CRM system Kompassi
The customer must be identified using an social security number
The owner of the subscription must be identified using an ID
New customers must all create an account with a valid email
New customers must all create an account with a valid email
Address and telephone number is mandatory
Address and telephone number is mandatory
Legislation demands that buyers accept the Terms and Conditions
Legislation demands that buyers are told, not just given, the Terms and Conditions
The Online sales UI is used in BOTH online and Shop purchases
The sales system was being updated from the old system to a new one that mimics the online purchase experience
The sales system was being updated from the old system to a new one that mimics the online purchase experience
Giving consent for the subscription user to update it should be part of the checkout process
Sellers want to be able to complete the sales process quickly
In addition to the customer adding the social security numbers, TUPAS could be used to verify them
Opportunities for giving consent should be communicated during checkout
Giving consent for the subscription user to update it should be part of the checkout process
If consent is given to financial transactions, TUPAS is required
Opportunities for giving consent should be communicated during checkout


7
8
9
10
11
12
13
Determining the level of consent
Customer (subscription owner) capabilities
Viewing rights
Basic Issues
Capability to do everything
Electronic letter of attorney
Accepting of activity done by the consented person
- telephone
- electronic
Notification of activity to subscription owner
Consent expiration
OmaElisa
OmaElisa
OmaElisa
OmaElisa
Customer (subscription owner)
Customer (subscription owner)
Customer (subscription owner)
Customer (subscription owner)
OmaElisa
OmaElisa
OmaElisa
OmaElisa
SMS Service / Elisa App
SMS Service / Email Sender
CRM
Is not used because of sales provisions and goals for amount of contacts
This capability is already in place.
Changing customers (subscription payers) starts in Customer Service but activation is done online
How should call records be displayed?
Basic issues should be default, but usage rights should be able to be define per product as well
Checkout should affect the product in question but other rights could be given on OmaElisa
Not deemed useful because it can not be used in both self service (OmaElisa) and shops
What if verification is not given?
Viewing rights should be default
Updating and cancelling a product subscription
An existing and TUPAS-verified customer can be given all possible rights in checkout
Changing subscription type might be possible
This is two years in banking: could be the same here.
Billing information
- History
- View
- Has bill been paid?
Balance limit (saldoraja) is currently based on data, not transactions
Could be implemented for events with fees:
- Altering roaming preferences
- Changing SIM-cards
User information could be updated on the Contract page