LIFE EVENTS IN THE DESIGN OF PUBLIC SERVICES

Creating Communities of Service in the Finnish National AuroraAI Program

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Master's Thesis, 30ECTS
Collaborative and Industrial Design
School of Arts, Design and Architecture

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Abstract

Many governments around the world strive to deliver more effective, efficient, and user-friendly digital public services. In order to take a perspective of everyday life over one of internal processes in the design of these public services, in many cases a Life Event approach is utilized.
The Finnish national Aurora artificial intelligence program, who commissioned this research, aims to implement an AI-powered and data-driven model in which service providers serve people in their Life Events. First established in 2018 by the Ministry of Finance, the program is currently implementing Life Event service ecosystems in which service providers build service packages delivered across different organizations that answer people's needs connected to events in their lives.

However, a conclusive definition for the concept of Life Events is missing and how it can be utilized in practice to deliver better services remains unclear.
In the context of public services, Life Events have first been introduced in the field of eGovernment as an approach to organize services in online government portals. Later they have been understood as an organizational framework for collaboration between different service providers, and most recently service designers in the public sector have started to utilize them as a lens for user research to understand the context in which people are using services.
At the same time, in the field of psychology, Life Event research seeks to quantify the level of stress certain events trigger in people's lives. Therefore, one objective of this thesis research is to provide an understanding of the concept of Life Events and its potential as an approach for delivering better

public services. Further, the requirements beyond technological infrastructure and access to shared data for service providers to develop service packages across multiple organizations and sectors is not well understood; therefore, the second objective is to outline these requirements.
To investigate these issues, literature and grey literature including cases and practitioners' accounts were reviewed; public service experts working with Life Events were interviewed (n=6); and stakeholders within the AuroraAI program were continuously engaged throughout the research.

The findings indicate that (1) the wide range of definitions for Life Events stems from the fact that they are utilized with regard to different levels of service experience (Polaine et al, 2013); (2) Life Events are particularly valuable as a lens to take into account the human experience of a service, allowing service providers to understand people's needs, goals, and motivations; (3) in addition to technological infrastructure, a common vision, bottom-up development, and clear responsibilities enable service providers to develop service packages around Life Events; (4) a design-led approach can enable service providers to develop Life Event-based services by making people's context understandable, painting the wider service picture, and facilitating collaboration.
Applying the findings to the AuroraAI program's planned approach to implementing Life Event service ecosystems, two gaps are identified. Service providers are found to be disconnected from the needs, goals, and motivations of individual people experiencing a Life Event and to be lacking the infrastructure for collaboration. A set of recommendations aiming to fill these gaps is proposed. Design-led methods for user research, storytelling, journey mapping, and facilitation are outlined, affording (1) a closer connection between service providers and individuals and (2) enabling collaboration of service providers by forming Communities of Service.

Keywords
public sector, service design, life events, service experience, service-dominant logic, electronic government, community of service

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Glossary

AuroraAI program

Commissioner of this research. The AuroraAI program is a public sector program led by the Finnish Ministry of Finance. It aims to implement an operations model for public and private services based on people's needs, where people are served in their Life Events with the help of artificial intelligence (AI).

Community of Service

Framework for collaboration in Service ecosystems, emphasizing relations-hips among service providers and a focus on *Service* rather than *services*. First outlined by Strauss & Wilson (2015).

eGovernment

Electronic government (eGovernment) is a multidisciplinary field of research concerned with the digital provision and delivery of public services.

Life Event

A significant event in someone's life. Common examples include getting married or the passing of a close relative. In the context of public services, Life Events are utilized to organize content on online government portals in order to help people find the right services at the right time. In psychology, they are utilized to asses and quantify stress.

Life Event Service ecosystem

Service providers collaborate in Life Event Service ecosystems in order to to be able to answer the Service needs that arise in the events in people's lives.

Service

The application of skills and knowledge—i.e. resources—for the benefit of others and thus, the fundamental unit of economic exchange (Vargo & Lusch, 2004). In other words, something that helps someone to do something (Downe, 2020). Superordinate to services.
In this thesis, when referring to *Service*, the S is capitalized.

services

The intangible outputs an organization produces (Vargo & Lusch, 2017).
The steps that make up a Service (Downe, 2020); therefore, subordinate to *Service*.

Service experience

Framework proposed by Polaine et al. (2013); expanded on by Bailey (2019). Used in service design practice to conceptualize and account for a person's experience of a Service. It consists of four levels—(1) the human experience; (2) the consumer experience and the service provider experience; (3) the customer experience; (4) the user experience.

Service journey

The different services someone needs go through in order to answer their Service need. Referring to *Service* with a capital S.

Service need

Describing the *Service* someone needs in order to achieve what they seek to do. Referring to *Service* with a capital S.

Service offering

Answering a Service need, containing all of the services along a Service journey—which likely are offered across different service providers.
Referring to *Service* with a capital S.

1

INTRODUCTION

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1.1. Life Events and Digital Public Services in Finland

Governments around the world entertain efforts to digitize their public services in order to make them easier and more pleasant to use for citizens and to make them more for effective and efficient (Downe, 2016, p. 86). According to the United Nations (2018), 193 nations maintain digital public services, delivering them through online portals and platforms (p. 84).
Yet, as many of these services are much older than the internet, they were not built with service delivery through digital channels in mind. Changing that by adding a layer of new technologies on top existing services or by merely re-designing digital touchpoints is unlikely to be successful—instead, public services need to be fundamentally reimagined with user needs in mind at every stage (Downe, 2016, p. 91).
One way to approach this and to create user-centric services is proposed by researchers and practitioners in the field of electronic government (eGovernment), which is concerned with the digital provision and delivery of public services. By bundling services around the events and experiences in people's lives, they propose to overcome organizational structuresof government, allowing for "people-friendly services geared to the needs of real people in their everyday lives" (United Nations, 2018, p. 18)—in other words, utilizing a Life Event approach allows governments to take a perspective of everyday life over one of internal processes (Vintar et al, 2002, p.3).

Researchers and practitioners of eGovernment use Life Events as a metaphor for structuring content and information (Wimmer, 2002) as well as to denote events that have significant impact in a person's life and trigger the need for different services at the same time (Dunham et al, 2014). Service designers in the public sector describe them as an approach to designing services to meet people's needs by understanding the wider context of their lives (Holliday, 2019b). Further, Life Event research in the field of psychology defines Life Events as those events in someone's life—including common everyday events, triggers for crises, and traumatic events—that require a behavioral response or adaptation (Sonneck, 2000). With this wide range of different framings and definitions for the concept of Life Events, it is not generally agreed upon how Life Events can be utilized in order prioritize the needs of real people in their everyday lives over internal structures and processes of the government.

Finland was ranked among the top 10 countries providing digital government services according to the *E-Government Development Index (EGDI)* (United Nations, 2018, p. 89). One of the most recent and most notable examples of eGovernment efforts the Finnish government has committed to is the *National Service Architecture program* from 2014 (*Kansallinen Palveluarkkitehtuuri* in Finnish or *KaPa* for short) which main objective it was to establish a national architecture for digital services (Yul-Huumo et al., 2018, p. 1). The main pillars of the KaPa program are a national data exchange layer; a shared service catalogue; a nation-wide e-identification model, and national solutions for the administration of roles and authorizations for organizations and individuals (p. 3).

Building on this infrastructure, Finland's national Aurora artificial intelligence program (AuroraAI program) aims to implement an operations model in which public and private services are serving people in their Life Events. Based on people's needs, services are designed in Life Event Service ecosystems, with artificial intelligence helping citizens and companies to utilize those services (*Implementation of the national AuroraAI programme*, 2019).
However, the ambiguity of the concept of Life Events with its wide range of framings and definitions becomes apparent in the AuroraAI program as well—despite of Life Events being at the core of the program's aims, it remains unclear how the program can enable public services to be designed to serve people in the events in their lives.

1.2. Research Setting: The Finnish National Aurora Artificial Intelligence Program

The Finnish national Aurora artificial intelligence program (AuroraAI program) aims to enable public, private, and third sector services to be provisioned around people's Life Events. Utilizing artificial intelligence (AI) technology, the program aims to implement a model of data-driven service provision that helps people take care of their arising needs proactively.
This research is commissioned and paid for by the AuroraAI program and conducted in close collaboration with the program, seeking to make a contribution to its successful development. This collaboration arose as a result of an earlier collaboration with the AuroraAI program within the Design for Government course at Aalto University in which the author of this thesis was part of a multi-disciplinary team of students exploring service provision based on Life Events once before (Chu et al., 2019).
Responsible for the program is the Finnish Ministry of Finance who describe the program's aims on their website:

> The aim … is to implement an operations model based on people's needs, where artificial intelligence helps citizens and companies to utilise services in a timely and ethically sustainable manner. The activities of the relevant authorities will be organised in such a way that they support people's life-events…, facilitating seamless… service paths consisting of the services of several service providers.
> (*Implementation of the national AuroraAI programme*, 2019)

This can be further dissected into two separate aims, as described in a document released by the Ministry of Finance, outlining the strategy for the AuroraAI program for the three years between 2020 and 2022:

> The aim of the National Artificial Intelligence Program AuroraAI (2020-2022) is to create better conditions for people to take care of their own and their loved ones' well-being by better understanding their own

> well-being and utilizing service packages that address different life situations and events. (Julkisen hallinnon ICT, 2020, p.1)

The first aim of the program is to enable people to understand and take care of their well-being in different life situations with the help of data and AI. The second aim is to build service packages that bundle the services which answer the needs people have in different Life Events.
This second aim is the main concern of this research with regard to the AuroraAI program. In order to achieve it—in addition to the implementation of an AI-powered technology layer—service providing organizations need to develop the capacity to develop user-friendly services that can be bundled in service packages and delivered across different service providers.

As its main task in building these service packages, the AuroraAI program identifies creating “the conditions for the involvement of different organizations in the program and their own development work” (p.2) by providing a network to enable services to interact across different service providers in the context of people’s Life Events, rather than creating new services (p.2). This results in what the AuroraAI program calls service ecosystems centered around Life Events (Kopponen & Ruostetsaari, 2019, p.30), or Life Event Service ecosystems, in which service providers develop their services to be delivered as part of service packages according to people’s needs in a given Life Event. However, developing service packages in Life Event Service ecosystems requires not just the technological infrastructure and access to data but also the organizational mindset and practices in place, the design tools and methods at hand, and the appropriate environment to apply them; therefore, the AuroraAI program’s task is also to provide service providers with these and enable them to develop the capacity to design services within Life Event Service ecosystems with users in mind from the very beginning.

Until 2023 the program plans to implement three Life Event Service ecosystem pilot projects, each based on one of the government‘s objectives to reduce youth exclusion, support employment, and strengthen skilled labor migration. These have been selected by representatives from all ministries collaborating in the AuroraAI Strategic Study Group (22.3.2019-30.9.2019). Currently, the focus in this first phase of implementation is on the Life Event chosen in relation to the government's objective of reducing youth exclusion—which is graduating from primary school, concerning teenagers aged 13-16. Special focus in this Life Event is on teenagers who struggle with getting a grip on life when they are about to graduate and might be in danger of dropping out of school before graduating, due to lack of support or orientation.

> The aim is to counteract the increased risk of exclusion … by targeting the services in a timely manner to the real needs and well-being of the target group … [and] build value-added service ecosystems for those young people. (Julkisen hallinnon ICT, 2020, p.2)

The development of the pilot project is planned to be launched later this year in four cities in Finland, namely Oulu, Mikkeli, Turku, and Espoo.

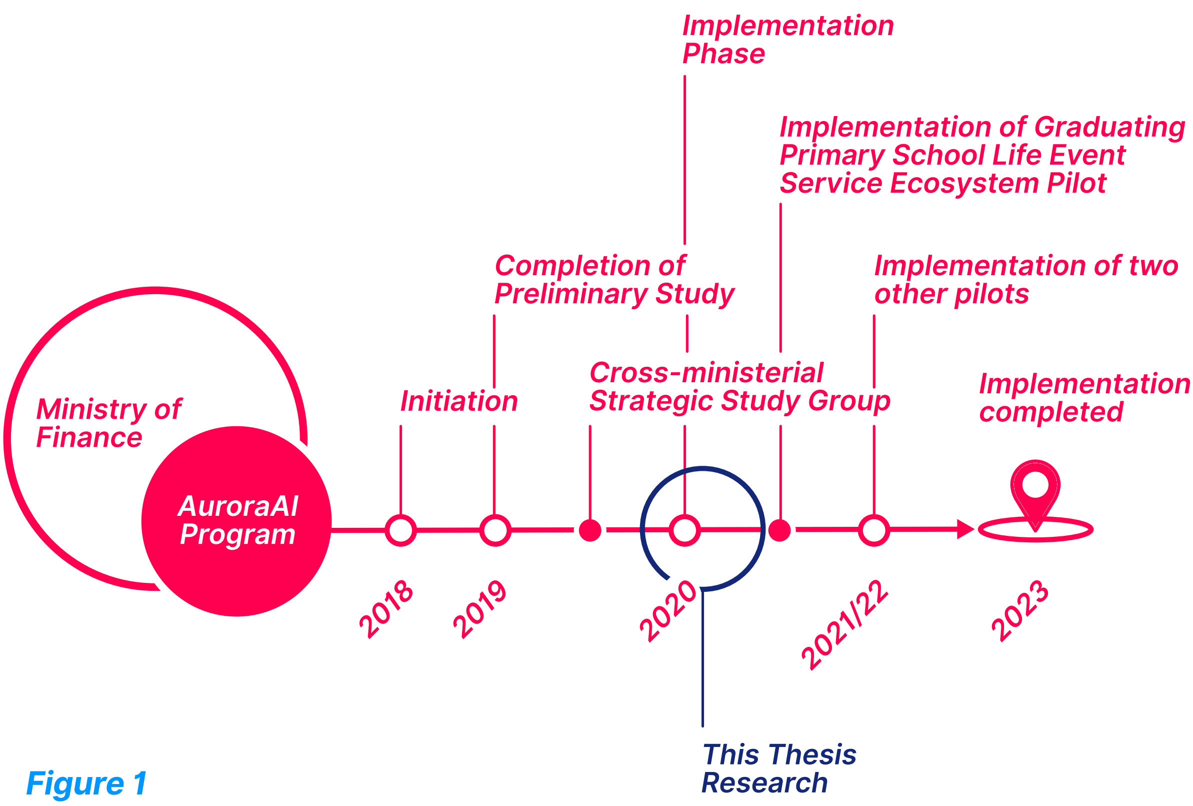


Figure 1

Timeline of the AuroraAI program.

1.3. Objectives and Research Questions

As this research is commissioned by the AuroraAI program and conducted in collaboration with the program, its objectives are twofold. Applying an action research approach (Mertler, 2011; Swann, 2002), this research seeks to (1) provide and understanding of the concept of Life Events and their application in the public sector and (2) make these findings applicable for the AuroraAI program.

The first objective is to provide an understanding of the concept of Life Events. This is done through review of academic literature from eGovernment, psychology, and marketing theory and review of cases as well as reports and blog posts of practitioners' of eGovernment and service design. Based on this background research, data is collected through semi-structured interviews with experts in the field. This aims to uncover how Life Events are utilized as a lens or approach to designing services in the context of events in people's lives.

The second objective is to find ways to apply the findings of this research to the AuroraAI program and devise a set of recommendations for the AuroraAI program to enable service providers to collaboratively develop services within Life Event Service ecosystems. This is done by continuously engaging stakeholders from within the program throughout this research.
The recommendations aim to enhance the AuroraAI program's approach when they begin implementation of the first Life Event Service ecosystem pilot project later in 2020.

Consequently, the research questions mirror these two objectives.
The first research question (RQ1) is deliberately kept rather open, allowing for a broad study about how the concept of Life Events can be understood.
The second research question (RQ2) then narrows down the scope, focusing on the specific case of designing services in the context of Life Event Service ecosystems within the AuroraAI program.

Research Question 1

What are Life Events?

SQ1 What are the current discourses on Life Events?
SQ2 How can Life Events be understood in the context of government and public services?

Research Question 2

In the AuroraAI program, how can service providers be enabled to design services within Life Event Service ecosystems?

SQ1 How are Life Event Service ecosystems understood in the AuroraAI program?
SQ2 What are the preconditions for Life Event Service ecosystems?
SQ3 What contribution can design make in Life Event Service ecosystems?

1.4. Structure of this Thesis

This Master's thesis is divided into six chapters. After this first introductory chapter, the second chapter presents the review of literature and grey literature. It provides an overview of eGovernment research, introducing some of the key concepts of eGovernment, namely *Government Portals*, *One-Stop Shops* and *No-Stop Shops*, and *Government as a Platform*, as well as two accounts critically assessing the impact of eGovernment efforts. Further, it presents research on Life Events in the context of public services and psychology. Three perspective on Life Events in the public sector are discussed—an IT perspective, an organizational perspective, and a service design perspective. The section concludes with an overview of Life Event research in psychology. The chapter then introduces the four levels of service experience (Polaine et al. 2013) as a framework to act on Service-Dominant Logic (Vargo & Lusch, 2004) and the distinction it proposes between *Service* (singular) and *services* (plural) (Vargo & Lusch, 2017), as well as a brief discussion on the importance of considering service experience in the public sector. The chapter concludes with a summary of the literature review.

In chapter three, the research methodology is presented. Briefly introducing the action research approach applied in this thesis (Mertler, 2011; Swann 2002), the research methods, the process of data collection, and the analysis of the collected data through affinity diagramming are presented.
Data is gathered through six semi-structured interviews with experts working with Life Events in the public sector in addition to six engagements with stakeholders in the AuroraAI program throughout the research—one of which was a small workshop to map and visualize the AuroraAI program's planned approach to implementing Life Event Service ecosystems.

In chapter four, the review of literature and grey literature and the interviews are synthesized and the four key findings are presented.
The findings address the wide range of definitions and framings of Life Events through the framework of service experience (Polaine et al, 2013); the potential of Life Events to enable service providers to understand their

services in the context of people's lives; the requirements for collaboration in Life Event Service ecosystems and the potential of Communities of Service (Strauss & Wilson, 2015) as a framework; and the role of design in Life Event Service ecosystems.

In chapter five, the findings are applied to the AuroraAI program.
The program's approach to implementing Life Event Service ecosystems is analyzed on the basis of the visualization created in the workshop.
Two potential gaps in the program's approach and thus opportunities for improvement are identified. The findings presented in chapter four are then applied to derive recommendations which aim to address these gaps and enhance the program's approach.
The proposal addresses service design and collaboration within Life Event Service ecosystems, consisting of recommendations on how to define, communicate, and act on Service needs and how to facilitate service providers to collaborate in Communities of Service (Wilson & Strauss, 2015).

The sixth and last chapter concludes the thesis.
The findings and their application are discussed with regards to the research objectives and research questions. Limitations of the research as well as pathways for future research are considered.

2

LITERATURE REVIEW

2.1. eGovernment

Electronic Government (eGovernment) is a multi-disciplinary field of research concerned with the provision of public services utilizing information and communication technologies, such as computers, the internet, or machine learning. It was first established through contributions from two other multi-disciplinary fields—Information Systems (IS) and Public Administration (PA) (Bannister & Connolly, 2015, p. 1). With the widespread adoption of the world wide web and the internet in the late 1990s, researchers and practitioners began exploring eGovernment for the first time. Today, 193 nations entertain eGovernment efforts and offer digital public services (United Nations, 2018, p. 84).

The purpose of this section is to provide a brief introduction to the field of eGovernment and outline some of its key concepts and present two critical accounts assessing the impact eGovernment efforts have made in practice and proposing strategies to improve them.

2.1.1. Key Concepts of eGovernment

Ever since the late 1990s, researchers have been working on what Bannister and Connolly (2012) identified as the grand visions of eGovernment. These visions comprise of a series of ideas so seemingly obvious and beneficial, they independently emerged mostly in practice in different places and points in time (p.6). Among these grand visions, they further identified two groups, the first one clustering ideas related to integration, such as desiloisation, interoperability, the one-stop-shop, seamless government and portals, the other one clustering ideas about electronic governance, such as e-collaboration, e-consultation, e-participation, and e-voting (Bannister & Connolly, 2012, p. 6). It is this first group that Janet Caldow (1999) fundamentally contributes to in her attempt to define a vision for electronic government. She describes eGovernment as "nothing short of a fundamental transformation of government and governance at a scale we have not witnessed since the beginning of the industrial era" (p. 1). Central to this fundamental transformation is the internet and how governments utilize it. According to her, they need to leave behind organizational structures and silos and consider the citizens' perspective in their web strategies instead (p. 7).

Government Portals and Life Event Portals

As citizens "do not need to know, nor do they care, what department actually processes the transaction" (p. 7), Caldow (1999) proposes to aggregate services across departments and make them accessible to citizens through common portals. She identifies a set of requirements for a citizen-centric portals to work, including "common and high bandwidth access to each other, seamless processes, electronic workflow and data exchange" (Caldow, 1999, p. 8).

Government portals became one of the central themes of eGovernment, with researchers starting to develop frameworks and practices to implement them (Todorovski et al., 2006, 2007; Trochidis et al., 2007; Vintar et al., 2002; Vintar & Leben, 2002). As a tool to structure content on these government portals, Life Events have first been utilized in eGovernment (Copping & Lewis, 1999), introducing the term Life Event portal (von Lucke, 2000).
Vintar and Leben (2002) consider the main objectives of Life Event portals "to bring governments and citizens closer and to improve efficiency, effectiveness and transparency of its operation and increase the quality of its services" (p. 1). Life Event portals are distinguished based on how citizens interact with them (Vintar et al., 2002). On passive Life Event portals, public services are clustered around thematic areas so that citizens can easily find and identify the service they need in a given situation from a list of services; whereas on active Life Event portals, services are not just clustered around but actively and individually provisioned based on a Life Event in order to make sure citizens are easily able to receive the right services to achieve what they need (Vintar et al., 2002, p. 6).

One-Stop Shop and No-Stop Shop

Building on the concept of government portals, the idea of online one-stop government was developed (Wimmer, 2002). The idea of one-stops in government is to provide access to public services which are actually provided by several different service providers via a single access point. Citizens would no longer be required to coordinate these services themselves but are provided with an individually tailored service package, no matter from which touchpoint they request it. Adding a public administration perspective to active Life Event portals, one-stop government does not just consider clustering citizen-facing information around life events, but also structuring administrative processes according to them (Wimmer, 2002, p. 95).

The one-stop shop relies on citizens to identify the relevant Life Event they are experiencing themselves and to approach and interact with the government at the right moment. Data is required to be shared repeatedly upon every interaction, with forms still the prevalent medium for data sharing which citizens seem to perceive as reactive and repetitive (Scholta et al., 2019, p. 12). In an attempt to move beyond these limitations of the one-stop shop, researchers began exploring the concept of no-stop shops (Kircher, 2019; Scholta et al., 2019). In this concept, citizens are no longer required to take any action or fill out any form whatsoever in order to receive government services, but they are served proactively. That means with a proactive no-stop shop in place, services are delivered in the moment a Life Event occurs—without the citizen explicitly asking for them.
Beyond that, researchers have outlined predictive no-stop shops where services are prepared or even delivered before a citizen enters a Life Event, thus potentially preventing certain unpleasant Life Events from occurring (Scholta et al. 2019).

Government as a Platform

Another significant concept in the context of eGovernment—although not mentioned as one of the grand visions—is Government as a Platform. With the widespread adoption of the Web 2.0 in the early 2000s, end-users started to engage with and contribute to the content they encounter online. This change in user behavior opened up new possibilities and thus triggered a change in eGovernment thinking as well. With Government as a Platform, O'Reilly (2011) who was among the first to coin the term Web 2.0 proposes to include the mechanisms of the Web 2.0 in eGovernment thinking. The Government as a Platform (GaaP) framework aims to provide governments with a novel mindset that allows them to frame and develop their online activities with participation and collaborative engagement in mind.It includes six lessons, each with a series of concrete practical steps that can be taken in order to implement GaaP and thus initiate fundamental service transformation (O'Reilly, 2011).

These lessons are derived from learnings in the context of computer platforms and aim to allow service providers from the public sector, the private sector, and citizens alike to innovate on open platforms and develop natively digital services according to their needs, using shared components, APIs, standards, and datasets. Originally a rather technology-driven approach, researchers and practitioners have assessed and developed the framework beyond its technological dimension (Brown et al., 2017; Loosemore, 2018; Pope, 2019; Price, 2016).

With the *Government as a Platform Playbook*, Pope (2019) provides a detailed account of the practical requirements and challenges to implement GaaP and "enable radically better services for the public" (p. 4). According to him, the primary users of GaaP are not the public but those who develop services—namely civil servants and politicians, the private sector and non-profits; therefore, GaaP is about making it simpler and faster for them to develop services that meet people's needs (p. 7). In this, the platforms are described as building blocks. Services within an ecosystem of platforms are not being built from scratch but assembled using those building blocks. This means that different services are joined together through their common building blocks, enabling interaction with multiple levels— central and local—of government in a single service (Pope, 2019, p. 35).
As platforms tend to be utilized in several services at the same time, designing services within a platform ecosystem naturally forces service providers to consider users beyond their own domain and thus encourages them to think beyond their own silos (Pope, 2019, p. 22).

Lesson 1	*Open standards spark innovation and growth*
Lesson 2	*Build a simple system and let it evolve*
Lesson 3	*Design for Participation*
Lesson 4	*Learn from your "hackers"*
Lesson 5	*Data mining allows you to harness implicit participation*
Lesson 6	*Lower the barriers to experimentation*

Table 1
The six lessons of Government as a Platform. Adapted from O'Reilly (2011).

2.1.2. Assessing the Impact of eGovernment Efforts

Since the late 1990s, many governments have pursued implementing eGovernment efforts—yet, their impact in practice has not been described as transformational. Among other issues, lacking interoperability of services and strong silos in the public sector (Bannister & Connolly, 2012, p. 1) are identified as major roadblocks and are considered as not just technical, but political, human, and organizational issues (p. 7). This section presents two critical accounts of eGovernment, highlighting some of the main challenges it faces and proposing points of departure to surmount those challenges.

Bannister and Connolly (2012) identify both one-stop shops and government portals as central pillars of eGovernment that have attracted researchers and practitioners alike to work on their implementation (p. 9). However, as "governments simply did not understand what it was that people actually wanted "(p. 10), they declare them as failed visions. Seemingly blinded by the promises of new technology, according to them, these efforts have relied too much on technical solutions to resolve issues that go far beyond the technical (p. 8). For one-stop shops, they point out two approaches to implement them—either by fundamentally re-designing processes within the organization to enable interoperability and overcome silos, or by establishing a coordinating layer on top of legacy back-office practices. While the first approach is the preferable one as it promises sustainable long-term solutions, the inherent complexity of real-world governmental organizations almost always only allows for the second approach. Opting for this second solution though, the fundamental issues of interoperability and silos remain untouched.
In contrast, Downe (2020) recognizes both approaches as equally valid. If an organization is not able to fundamentally change their operational model, improving communication and collaboration practices might have an equally profound impact and enable a "permissive environment for collaboration" (p. 119).

While Bannister and Connolly (2012) recognize the importance of technological innovation in order to achieve citizen-centered government services, they also urge researchers and practitioners to remember the original vision of eGovernment and put people in the center again—instead of giving in to technical rationality or even technical determinism, governments should ask themselves what people will actually use (p. 14). They recommend focusing on continuous and incremental progress, thinking in terms of people and processes for long term improvements (p.14).

Schuppan and Köhl (2017) criticize one-stop government in a similar vein. Life event-based and citizen-centric services, even when accessible through portals fall short of their promises because of strong siloed working practices, resulting in a fragmented user-experience that makes citizens feel alienated (p. 2453). Exploring the challenges with this beyond the technical, they identify the "bureaucratic dilemma" that civil servants face, as they are asked to meet bureaucratic needs above all else while also being expected to meet people's individual needs (p. 2451). Formal institutions, such as guidelines and laws, and informal institutions, such as values, norms, and habits, shape the culture of an organization and create this dilemma in the first place (p. 2454).
They recommend tackling this from within, starting with day-to-day working practices, and to collaboratively review and re-design those and thus shape new habits, new institutions, and ultimately change organizational culture (p.2455).

Concluding this section, it can be noted that eGovernment efforts, while being developed by a field of research and implemented in governments all over the world, have not yet quite been able to achieve their ambitious goals, such as establishing a closer connection between governments and citizens and enabling more efficient and effective services that can be delivered in a proactive or even predictive manner. The factors impeding these efforts, such as government portals and one-stop shops, to succeed have been identified to be the lack of interoperability and strong silos.
Developing different working practices inside the organizations, new institutional habits, and a more empathic view on citizens are proposed as ways to overcome those impeding factors; yet, the measures taken have mainly been focused on implementing technological solutions.

2.2. Life Events

This section presents the concept of Life Events by outlining of the discourses on Life Events in the public sector and the field of psychology. Life Events in the public sector are present through three perspectives identified, each utilizing Life Events in a different way. This discourse does not seem to be directly connected to Life Event research in psychology; although, it cannot be ruled out that the concept found its way into the public sector through its utilization in psychology, as Life Event research there has been conducted for more than six decades (Hawkins et al., 1957), while it has been introduced to eGovernment fairly recently (Copping & Lewis, 1999).

2.2.1. Life Events in the Public Sector

In the public sector, Life Events have first been introduced in the field of eGovernment as an approach to cluster and make accessible services on online government portals and Life Event portals. In the IT perspective presented in this section, the technological infrastructure for Life Event portals is considered and models for Life Events are described.
In the organizational perspective, the mindset for collaboration of different service-providing organizations in Life Event ecosystems is explored, thus providing a more comprehensive understanding beyond just the technical. Communities of Service and the potential role of service design are described. The service design perspective on Life Events in the public sector showcases how the concept is utilized in practice as a lens for user research, allowing service providers to understand the context in which people use their services and thus deliver better services that answer their needs.

IT Perspective: Infrastructure and Life Event Models

Life Events were first introduced in the development of government portals where they provide an everyday perspective to public service delivery (Vintar et al., 2002, p. 3). Citizens should not have to be concerned with the internal structures of the government—instead, information and transaction services across different organizations should be offered around events in citizens' lives and consider all of their concerns and issues connected to those. The underlying assumption here is that citizens usually do not know nor do they care about the organizational structure of the government (Caldow, 1999, p. 7) but they do know what they want or need to get done, such as building a house or starting a new business (Vintar et al., 2002, p. 2). According to von Lucke (2000), Life Events on Life Event portals could be based on a set of essential phases of life, such as birth, starting school, starting work, studying, military service, marriage, building a house, moving houses, becoming unemployed, becoming self-employed, retiring, and death (p. 14).

On passive government portals—portals that provide a centralized directory of services and the links to where one can receive these services—Life Events are utilized to bundle services in meaningful clusters so that citizens are able to easily identify the services they need in their situation (Todorovski et al., 2006, p. 1). Life Events denote specific situations and help users identify and locate services they need (p. 1), and are characterized as metaphors for structuring information (Wimmer, 2002, p. 95). Trochidis et al (2007) also note that Life Events are often used as "guiding metaphor[s] for customer-centric service provision" (p. 719), yet consequently, define them more strictly as a set of actions that—if performed appropriately—satisfies a citizen's need connected to a new life situation. Life Events in these instances, do not describe or detail the particular event but merely indicate outward to the citizen and inward to civil servants and developers that there is a situation that requires certain public services to be performed.

With these definitions in mind, researchers were mainly working on the technological feasibility in terms of content management and IT infrastructure of Life Event government portals and implementations of one-stop government. Wimmer (2002)—while acknowledging the need to put forward a holistic approach and consider internal administrative processes and legal issues—sketches out the IT infrastructure for service provision based on Life Events. Among other things, she proposes to establish a centralized Service Repository(SR) where all services are catalogued, described, and linked to the relevant Life

Events, as well as a Service Creation Environment (SCE) which is a set of tools that enables the front-end of the Service Repository to be built (p. 97).

Carrying on with this line of research, researchers developed ways of modelling Life Events in the context of a Service Repository or similar databases. One example is the work by Todorovski et al. (2006) who set out to develop a methodology for building models of Life Events in accordance to the Governmental Markup Language (GovML)—an open standard that provides a shared set of vocabulary and metadata management guidelines to enable interoperability of services as well as easier and more seamless collaboration between public service providers (Tambouris et al., 2005). Todorovski et al. (2006) describe a typology of models describing Life Events on four different levels of abstraction, each providing a different depth of information for service providers and users.

As seen in ***Figure 2***, the first level is the identification level. Life Event models on this level consist of a title and—at the most—a brief description.
A Life Event described on the second level, the specification level, is listed with all its corresponding services. These first two levels are sufficient in the context of passive life event portals, as they provide enough information to allow citizens to identify their situation and have access to the corresponding services.
In order to move beyond passive and towards active Life Event portals, Life Events need to be modelled in a way that allows individual users' circumstances to be taken into account; therefore, Life Events on the third level, the interaction level, contain not just a list of services but also all of the legally relevant user circumstances and the service flows in accordance to each of these circumstances—for instance getting married (Life Event) to a foreign citizen (circumstance). Finally, on the fourth level, the transaction level, Life Events contain information on not just what the services and circumstances are, but also on how they are supposed to be delivered. Only on this level, the qualitative dimension of a Life Event is captured, as the description goes beyond service provision and touches upon service delivery.

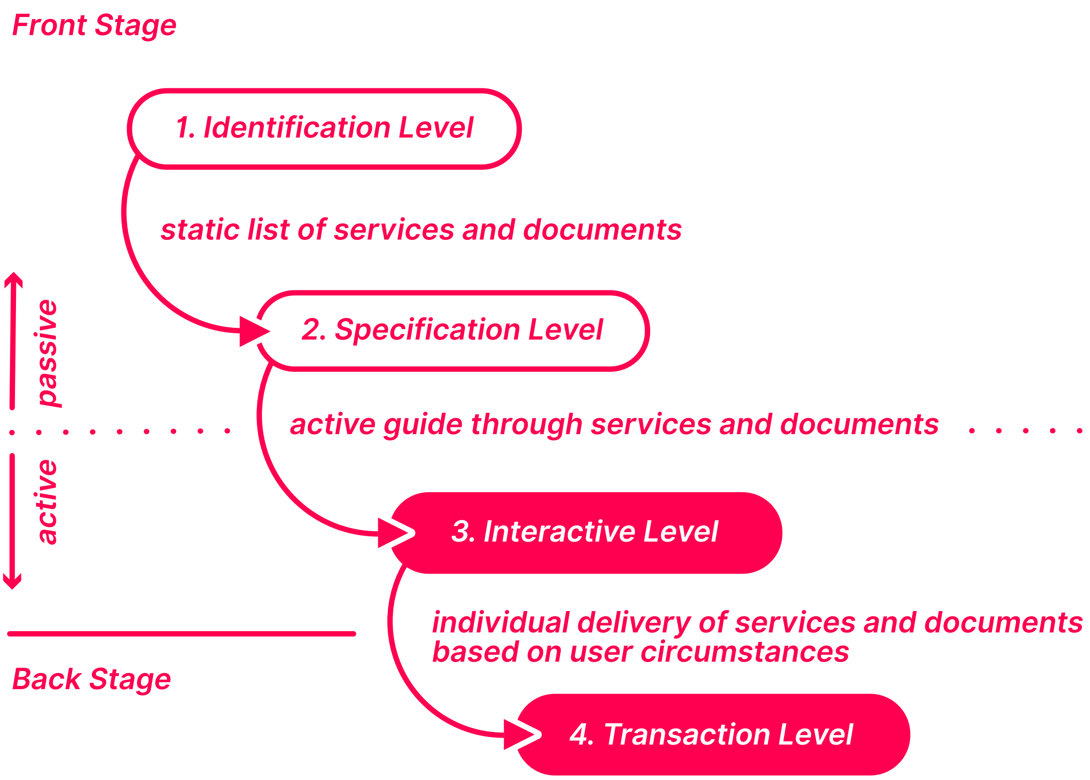


Figure 2

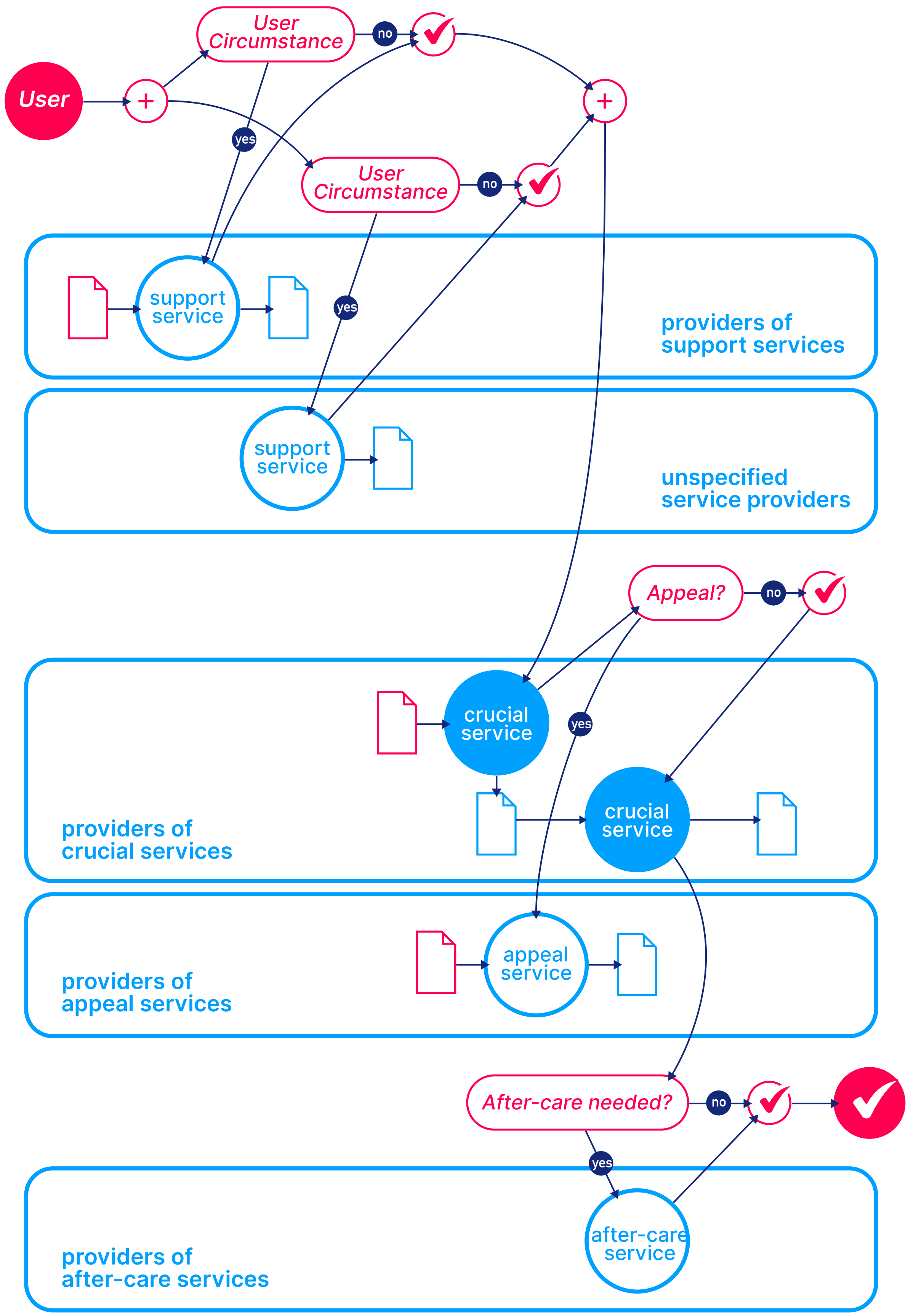
Life Event models at four levels of abstraction.

Adapted from Todorovski (2006).

Based on this model, Todorovski et al. (2007) devised a *General Life Event Reference Model* that "can be used as a template to model virtually any life event" (p. 4). With this model, they map out a workflow through a Life Event. The actors involved in this workflow are the defined as *User, Provider of Support Services, Unknown or Unspecified Service Provider, Provider of Crucial Services, Provider of Appeal Services*, and Provider of *After-Care Services*.

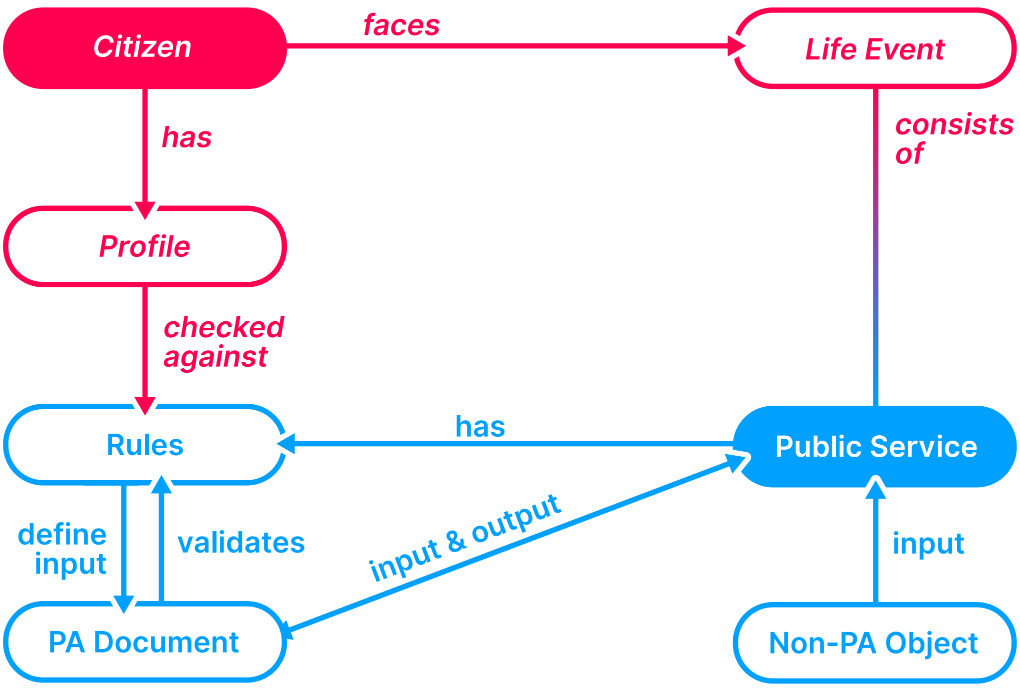
In this workflow, as shown in ***Figure 3***, first the user's circumstances are evaluated. If those demand support services to be performed by support service providers or other unspecified providers, these services are triggered. If that is not the case, the crucial Services—those services that will actually resolve the Life Event—are performed. In between those, the need for appeal services is evaluated. After the crucial services have been performed, after-care services or connected Life Events are triggered. The touchpoints the user engages with in all of the interactions with the different service providers as well as the outputs of the services are shown as paper-based documents.

Figure 3
General Life Event Reference Model.
Adapted from Todorovski et al. (2007).


User
User Circumstance
no
yes
User Circumstance
no
yes
support service
providers of support services
support service
unspecified service providers
Appeal?
no
crucial service
yes
crucial service
providers of crucial services
appeal service
providers of appeal services
After-care needed?
no
yes
after-care service
providers of after-care services

Moving beyond modelling Life Events according to workflows based on taxonomies—which is by nature linear and hierarchical—Trochidis et al. (2007) propose a more systemic and networked approach using ontologies instead. They disassemble Life Events into elements and assign classes and properties to each of those. Consequently, Life Events are modelled through the relationships between these elements. The classes they propose are *Life Event, Public Service, Citizen, User Profile, Input, Output, Rules, Public Administration (PA) Document*, and *Non-Public Administration Document*.
In ***Figure 4***, their relationships are illustrated.

Among the most salient benefits of their approach they point out its potential in overcoming difficulties with interoperability (p. 720). Ontologies, they argue, provide a clear framework that can be adopted across organizations and departments; thus, Life Events are distinctly defined and can be visualized easily. Further, public services and their properties only require to be modelled once, stored in a centralized repository and can then be referenced in the context of relevant Life Events. Compared to modelling individual Life Events through their workflows, this reduces workload of creating and maintaining Life Events considerably (p. 720).



To summarize the IT perspective on Life Events in the public sector, Life Events have first been introduced with the ambitious goal of making the delivery of public services and citizens' interactions with governments more user-centric, user-friendly, easier to navigate, more effective and transparent, as well as more efficient (Vintar et al., 2002, von Lucke, 2000). eGovernment researchers seem to be aware of the extent of this task and acknowledge its implications for processes, both in terms of customer-facing and back-office processes (Caldow, 1999; Wimmer, 2002). The work put forward addresses this by outlining technological infrastructure and Life Event models that allow for interoperability of services between different service providers across different governmental organizations.

Citizens are acknowledged as complex users with individual needs and issues (von Lucke, 2000). In some Life Event models their individual user circumstances are considered and evaluated (Todorovski et al., 2007). Yet, only those circumstances which are legally and bureaucratically relevant for the resolution of a Life Event and for the services are taken into account. Those individual circumstances on the other hand that remain bureaucratically invisible do not seem to be considered in the design of the services. This suggests that that the perspective taken is not one of everyday life but one of internal process after all.

Figure 4

Life Event ontology classes and properties.
Adapted from Trochidis et al. (2007).

Organizational Perspective: Ecosystems and Collaboration

As pointed out by Bannister & Connolly (2012), many of the challenges eGovernment is facing are not technical but political, human, and organizational. In this section, two notable accounts exploring the concept of Life Events in the context of public services from an organizational perspective are discussed, both of which are put forward by the American Council for Technology and Industry Advisory Council (ACT-IAC).

Dunham et al. (2014), explore a Life Event mindset as a transformational tool that can enable organizational change, while Strauss & Wilson (2015) propose ways to change organizational processes and create a “permissive environment” (Downe, 2020, p.118) that enables people, and ultimately the organization, to develop a Life Event mindset. With Communities of Service, Strauss & Wilson (2015) propose a framework to organize collaboration in service ecosystems catering to people’s needs in their Life Events.
The Starting Up Smoothly project (Miessner, 2019) conducted by the Finnish Immigration Office, Finnish Tax Administration, and the Finnish Patent & Registration Office is discussed as an example of a Community of Service.

Dunham et al. (2014) introduce Life Events as “vital triggers for government services that frame government interactions with the public“ (p. 4). They define them as events with a “significant impact in a citizen’s life ... that warrant government awareness or involvement” (p. 4). Life Events provide the context for organizations to design services that make said citizen “whole again” (p.4) by covering the whole spectrum of needs triggered by the event. This goes beyond legal and bureaucratic needs, and considers also social, emotional, spiritual, environmental, occupational, intellectual, and physical needs (p. 10). Life Events are not meant to be metaphors but refer to and capture the actual situation in a person’s life, thus providing context for organizations to collaborate throughout different levels of government and deliver joint services (p. 30) through Integrated Sets of Service Offerings (ISSO) (p. 28). These ISSO are bundles of services built around Life Events and delivered across multiple organizations.

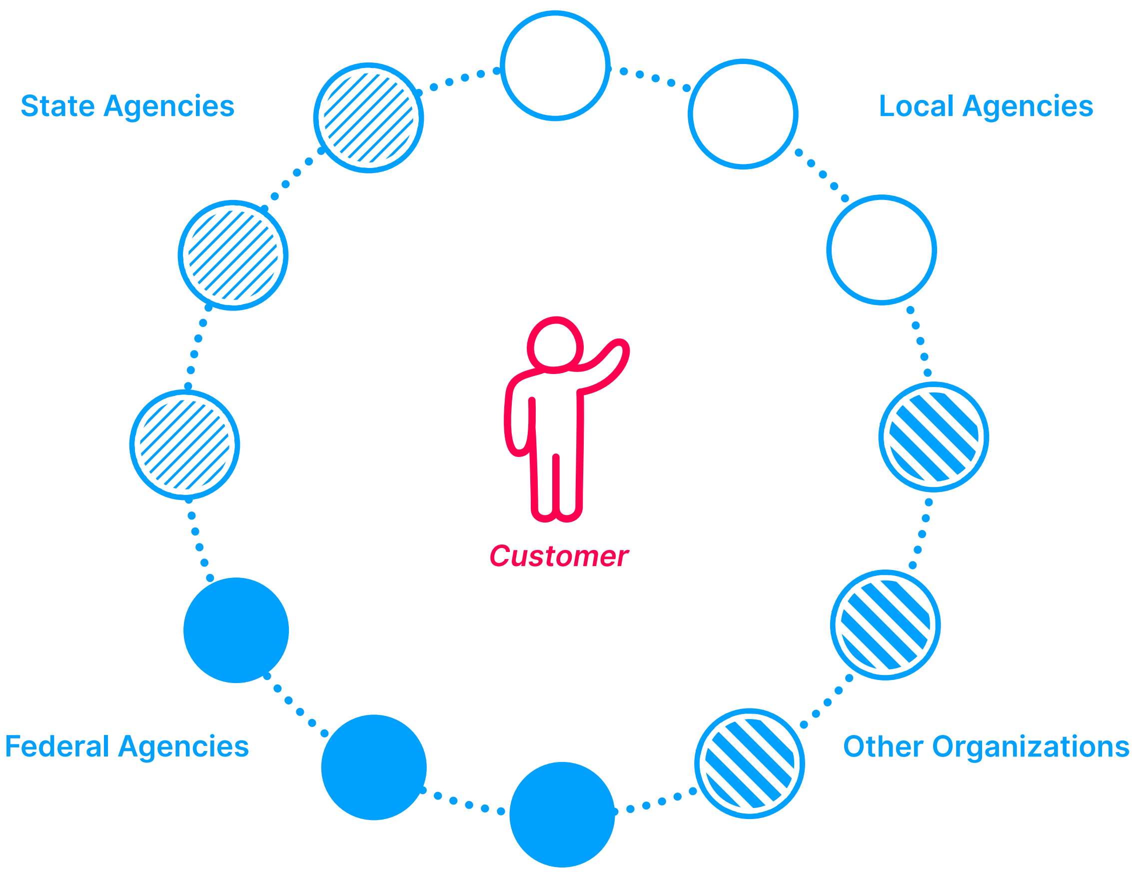
In order to build ISSO and design and deliver citizen-centered services, organizations need to establish an information-centric approach (data sharing, management, and evaluation practices) (p.7), a shared platform approach (open standards, shared APIs and components to reduce duplicate efforts) (p.8), and a customer-centric approach (p. 8). They describe this combination of a data-centric platform approach with efforts to build customer-centric services as a “significant paradigm shift in how agencies deliver services” (p. 13), as it would allow them to effectively bridge across silos, by integrating internal and external service providers, novel infrastructure, and new ways of incentivizing and measuring.
They conclude with five recommendations to achieve this paradigm shift, including (1) institutionalizing user research and feedback; (2) creating a common definition and catalogue of Life Events, and requiring each organization to define and recognize their specific contribution; (3) leveraging common Life Events, creating Communities of Service, and intensifying their collaboration by institutionalizing them; (4) starting small in order to have quick victories; and (5) getting on top of issues with sharing data among organizations.

Emphasizing the importance of customer-centric capabilities in organizations for customer interests to take precedence, Strauss and Wilson (2015) elaborate on the concept of Communities of Service (p. 4), which has been introduced and briefly touched upon by Dunham et al. (2014).
Strauss and Wilson (2015) define Life Events as “the common denominator” (p. 28), triggering related services that are bundled up so that all of a customer’s needs can be met in a single transaction. Customer needs tend to span multiple service-providing organizations (p. 13); therefore, these organizations need to collaborate in Life Event ecosystems in which they exchange data in order to enable more effective and efficient services (p. 28).
They identify the relationships among service providers as the key to successful collaboration in these Life Event ecosystems (p. 17), which can be fostered by forming Communities of Service that focus exclusively on the customer and their needs (p. 17). These communities collaboratively map end-to-end customer journeys that capture each organizations contribution to the resolution of the Life Event, assess their contributors’ maturity in terms

of resources and capabilities to contribute, and hold each other accountable (p. 17).

As the major barrier for organizations to overcome in order to be able to collaborate as Communities of Service in Life Event ecosystems, their research identified program-centric inside-out thinking of agencies (p. 9). Instead of relying on their own core competencies to design their services (inside-out), agencies need to adopt a customer-centric outside-in perspective and understand their services within the larger context of Life Events through their customers' journeys and experiences and develop the ability to assess if they are capable to enter a Community of Service and collaboratively joint Service offerings and measure the impact of improved customer journeys and experience (p. 23).

They propose a set of actions for organizations to take in order to enable these (p. 22). For staff, these include, among others, mapping customer journeys, cataloguing services in relation to Life Events, developing standards for evaluation; for management, designating Life Event product managers, creating core teams to lead Communities of Service, identifying education needs among the workforce.

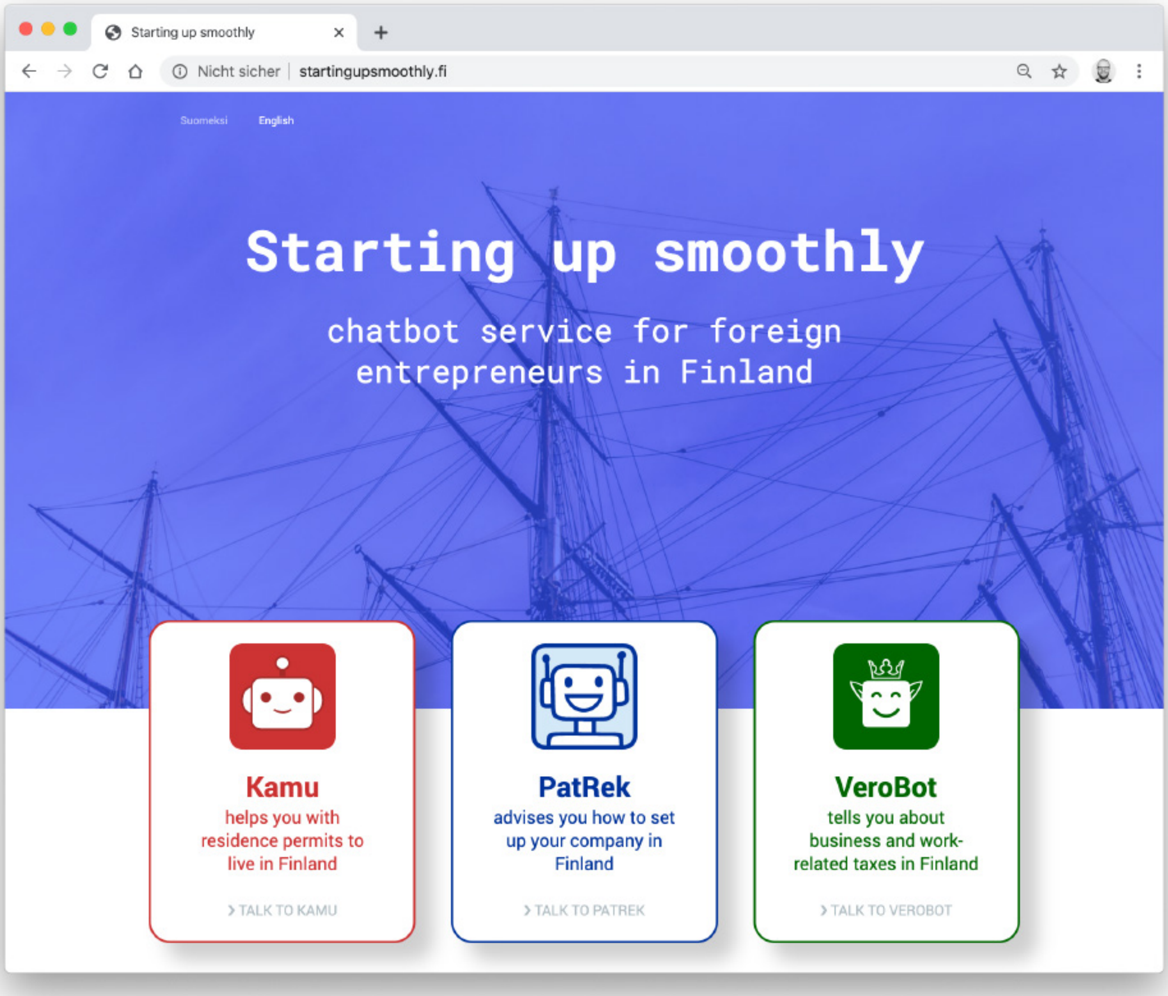


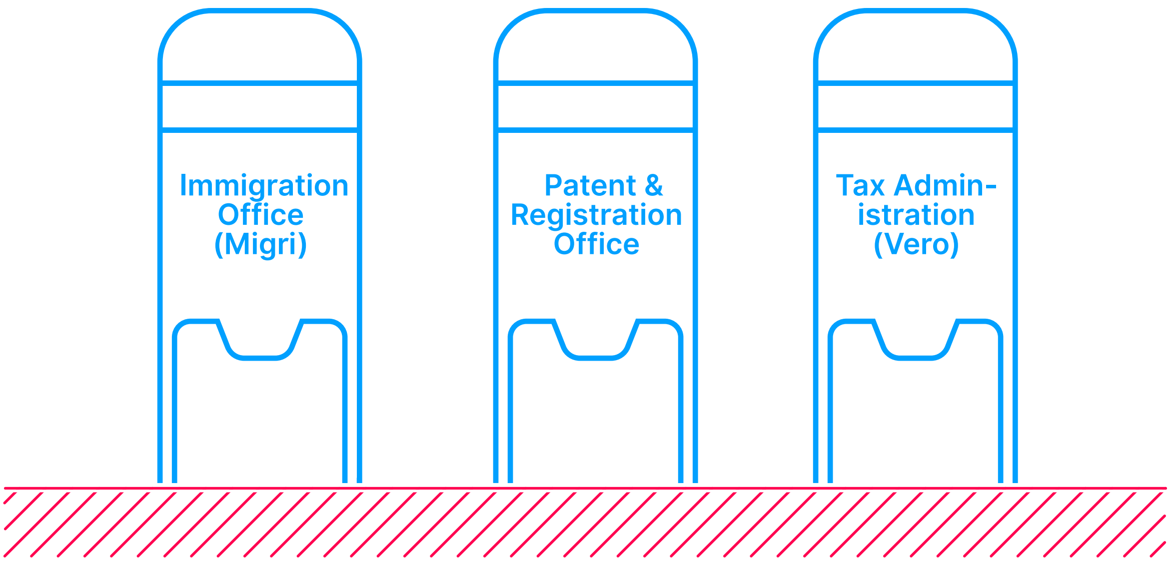
One example of a Life Event ecosystem where a Community of Service created an environment that permits collaboration is the *Starting-up Smoothly* project in Finland. Three government organizations—the Finnish Immigration Office, the Finnish Tax Administration, and the Finnish Patent & Registration Office—developed a network of chatbots that supports people who migrate to Finland and seek to start a new business to find the services they need in this event in their lives (Miessner, 2019).
From within—without top-down directive—these three organizations seemed to have formed a Community of Service organically within the Life Event ecosystem of services. The project initially started inside Finland's Immigration Office (Migri). Carried out by their inhouse design team Inland, they initiated an effort to better serve the needs of their customers.
Two other organizations joined the project later on, building a cross-organizational Service offering around a commonly defined service need rooted in a specific Life Event.

Despite their explicit objective not to develop the Service offering based on government silos but the users' needs, they did acknowledge the complexities of existing structures. The Community of Service holds each other accountable but responsibility about their services remains with each agency (p. 14). As the main challenge of the project she identified not the technical implementation but enabling the collaboration. As there are no precedents, seemingly small practical challenges such as finding common physical spaces to collaborate needed to be overcome (p. 15); therefore the main outcome of the project was considered the proof of concept (p. 5)—collaboration within a Life Event Service ecosystem is possible, given the right coniditions and the environment for collaboration.

Figure 5

Integrated customer-centered service environment with
service-providing agencies forming a Community of Service.
Adapted from Strauss & Wilson (2015).


Starting up smoothly
Nicht sicher | startingupsmoothly.fi
Suomeksi
English
Starting up smoothly
chatbot service for foreign entrepreneurs in Finland
Kamu
helps you with residence permits to live in Finland
TALK TO KAMU
PatRek
advises you how to set up your company in Finland
TALK TO PATREK
VeroBot
tells you about business and work-related taxes in Finland
TALK TO VEROBOT


Immigration Office (Migri)
Patent & Registration Office
Tax Admin-istration (Vero)

In conclusion, the organizational perspective on Life Events in the context of public services introduces considerations of collaboration within service ecosystems to the discourse. Bureaucratic barriers and legacy processes and the immense challenge of changing those is acknowledged; so is the need for coordinated IT infrastructure efforts and platforms (Dunham et al, 2014; Strauss & Wilson, 2015; Miessner, 2019).
In order to enable service providers to collaborate in Life Event Service ecosystems, Strauss & Wilson (2015) point to the relationships between them and propose Communities of Service as a framework for them to collaboratively develop joint Service offerings that answer the needs of people in the events in their lives.

Figure 6
The Starting Up Smoothly chatbot network operated from within organizational silos.
Adapted from Miessner (2019).

Service Design Perspective: User Context and Service Journeys

Strauss & Wilson (2015) mention the potential of service design as an approach that could enable customer-centric thinking inside the organization and “ensure the interests of the customer [to] take precedence” (p. 8); however, the concrete role service designers take in this and the tools and methods they would use are not specified. Still, service design practitioners in the public sector have adopted the concept of Life Events and explored its implications for the design of services in practice. They utilize it to frame user research and to understand the wider context of the services they design as well as their users’ needs, emotions, and expectations in the context of the situations in their lives (Holliday, 2019a, 2019b).

One example of Life Events being utilized by service designers are the digitization and design efforts of the government in Singapore. They introduced the *Moments of Life* mobile phone application as seen in ***Figure 7***, “anchoring services on key moments in life“ (Ganesan et al., 2019). Initially starting out with a small pilot focused on the key moment of starting a family, they aimed to overcome fragmented user experience of services by organizing them around citizens’ journeys. Main methods they have used are journey mapping, user interviews, and co-creation workshops with different stakeholders (Ganesan et al., 2019; Lau, 2019). The key user insights generated through this process were used to define those moments of life which services could be anchored around.

In order to foster a Life Event mindset throughout the organization, according to Alexander Lau (2019), principal design lead at the public service innovation lab in Singapore, they continuously engaged people from all hierarchical levels of the service-providing agencies in the user research process to give them an impression of how their services relate to the actual lived experience of people using them. The insights this process offered them on their services in the context of a specific user need or moment in life seemed to have helped to transform their perception of themselves, change the conversation about their services, and strengthen their design capabilities (Lau, 2019). Being provided with the necessary platforms and spaces to collaborate allowed them to bridge silos and pave the way to an organization-wide life event mindset.

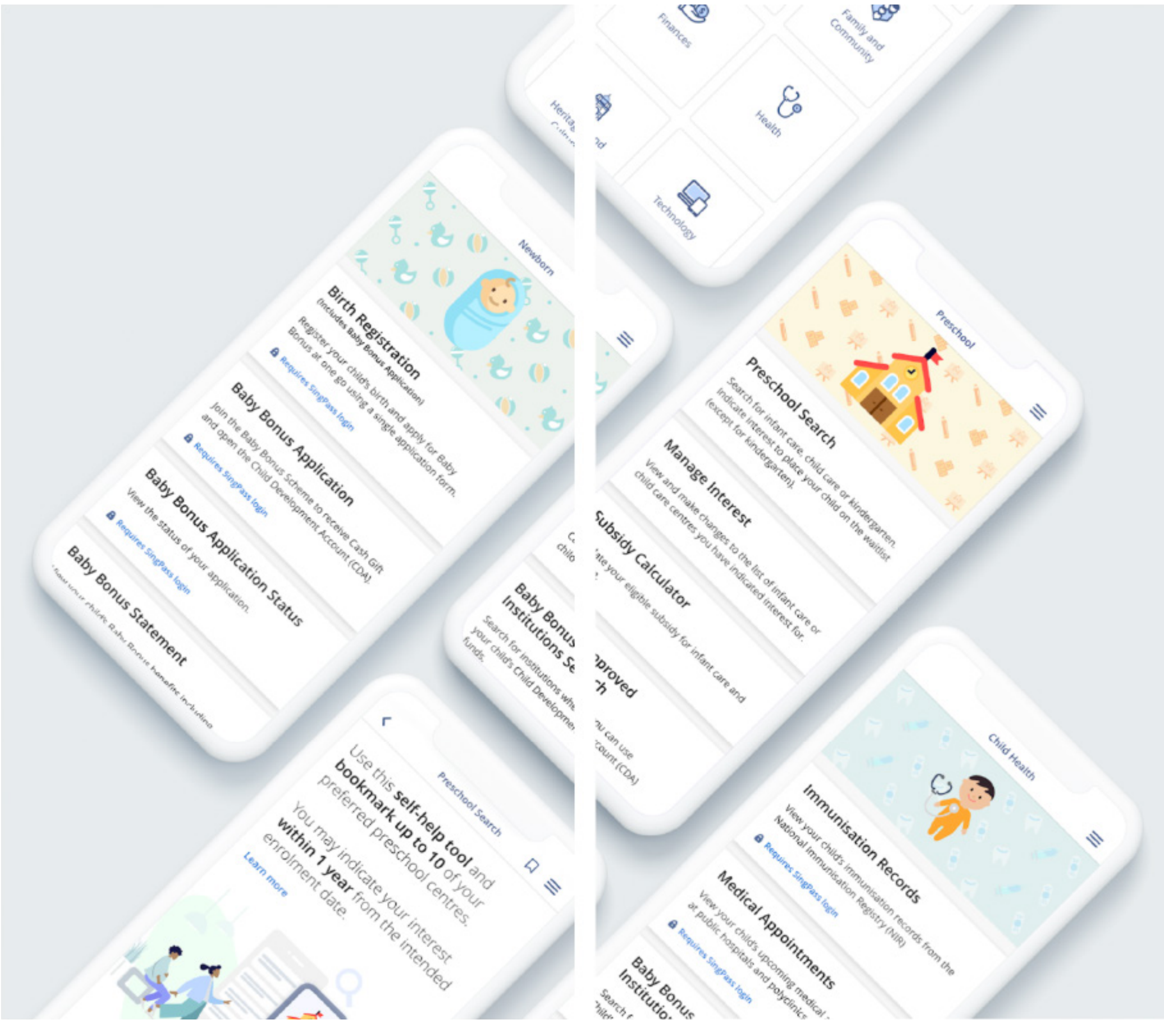
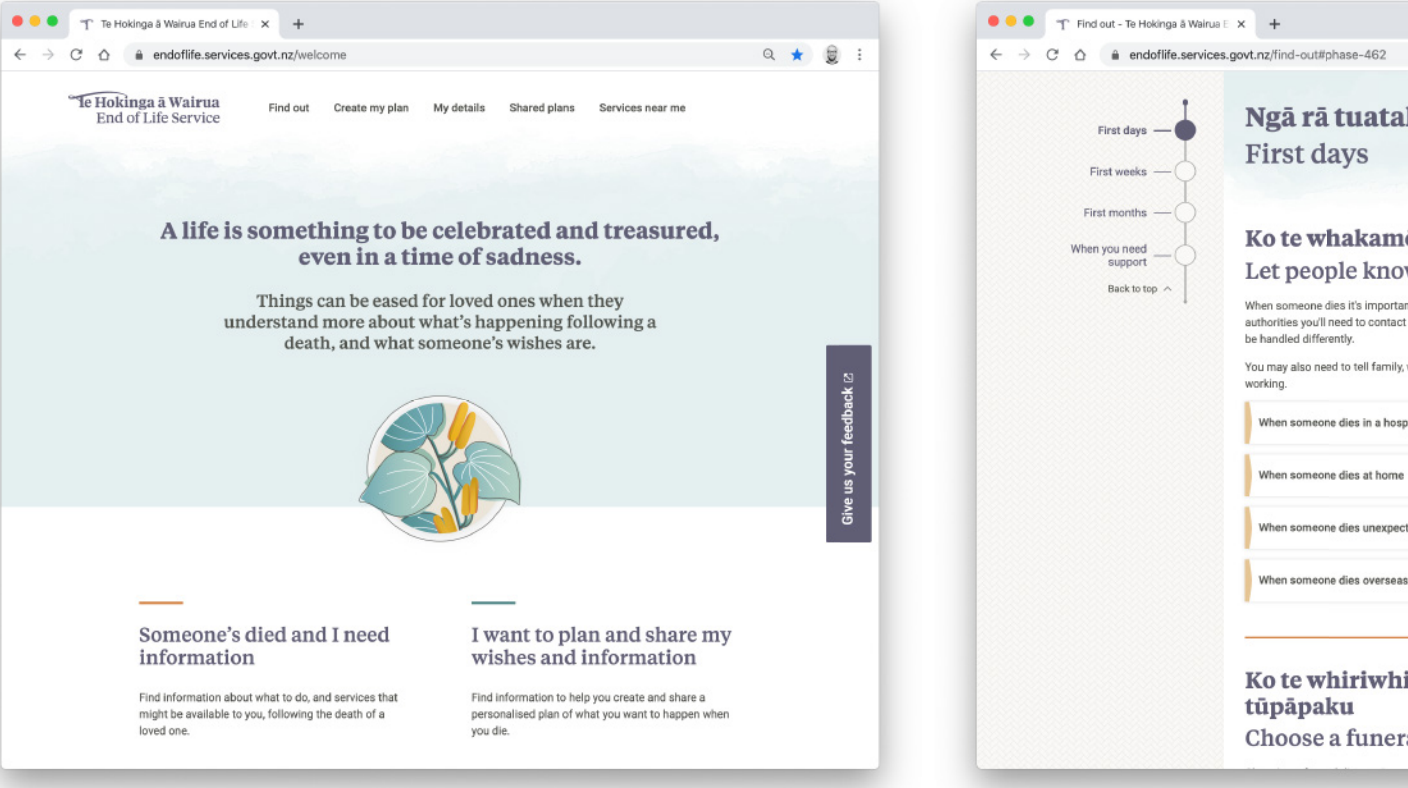


Figure 7

Moments of Life app. Screenshot from the Apple App Store.
https://apps.apple.com/us/app/mol-families/id1383218758?ls=1



Designers within the New Zealand government take a similar approach. They consider people's life journeys and design their services with—what they call—life journey events in mind, taking an approach that is described as human-centric, iterative, open, inclusive, and collaborative (Andrews, 2018).

Starting point is an extensive user research process and mapping of all of the services across governmental, non-governmental, and private service providers involved in the resolution of a Life Event. The result of this process are online portals built around a single life journey event, detailing many variations of said event. The two examples that are up and running at the moment are called *Start Smart*, covering anything related to having and raising a child, and *End of Life* (***Figure 8***), providing services, information, and guidance connected to the loss of a relative or close one.

Notable about these portals is that they go beyond clustering services. In addition to practical information about services and where to get them, they provide guidance for people to understand and deal with the emotional

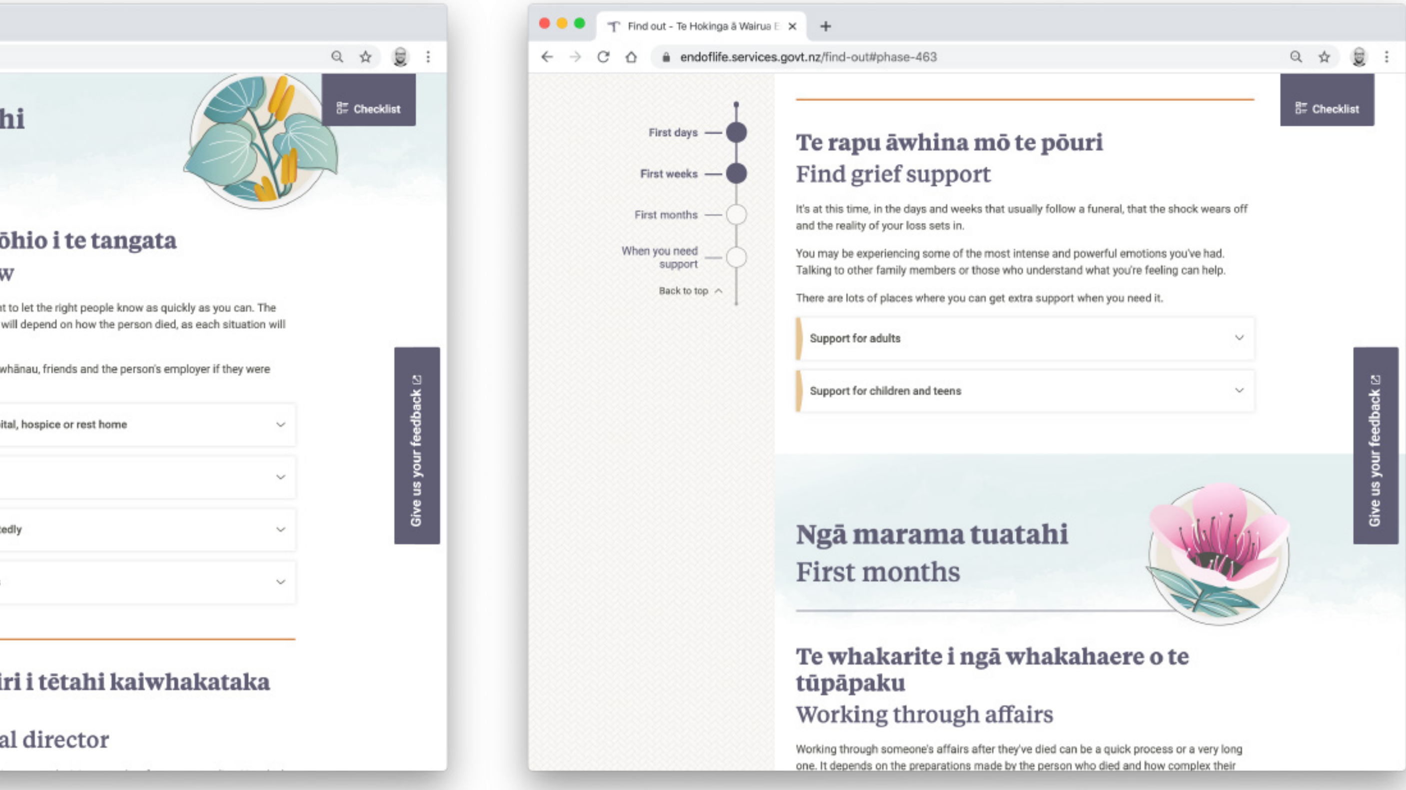


Figure 8
The End of Life portal by the New Zealand governments offers step-by-step support in the event of someone's passing. Screenshots from endoflife.services.govt.nz

dimension of the Life Event. On the End of Life portal for instance, users are guided through the whole process of resolving the Life Event step by step. They are provided with detailed information and check lists about what needs to be done, why, and when. Information is structured along a timeline that starts with the event—the passing of a close one—and is then divided into the subsections *First Days, First Weeks, First Months*, and *When You Need Support*. Each section contains the services that are practically relevant, as well as such services that are concerned with emotional user needs beyond the immediate practical resolution of the Life Event, such as finding grief support.
Further, there is a section where users can learn about measures to take already in advance and create a plan that covers their own eventual death.

This plan can then be shared with relatives and loved ones through the platform. As one's own passing and the passing of loved ones can be a sensitive, emotional, and traumatic event, that people only seem to deal with when they necessarily have to, providing detailed information, guidance, and support can potentially foster conversation, reduce stigma, and enable people living that situation to resolve it more easily—a process that is also described by Anne Matei (2019), service designer at the UK-based public sector design company *FutureGov* who describe their work as "reform[ing] health and public services by supporting organisations through digital transformation and service design" (FutureGov, 2015).

One project they have developed in collaboration with the Buckinghamshire County Council is concerned with adult social care. Matei (2019) points out that "residents, practitioners and even council professionals are navigating complex needs in a complicated system", similarly to the end of life journey event in New Zealand. Citizens are looking at many "front doors", when they only want to know what kind of support they can get in a situation that is potentially intimidating and emotional. Their solution was to create a "digital front door"—essentially a Life Event portal—that provides access to all of the relevenat information and services. This was based on their user research which had them conclude that it is not just services and information, but also guidance and support that people are looking for—especially considering this particular Life Event is one that people only seem to deal with when it has already happened (Matei, 2019).

The portal they devised provides access to services and important legal information but also to stories of people in the same situation and how they resolved the event. This is both an attempt to destigmatize the issue and foster conversation so that people will take measures to soften the impact of the actual event in advance and to make the information less bureaucratic and abstract, but more humane, digestible, and relatable (Matei, 2019).

She continues to describe another notable finding of their user research—experiencing and resolving a Life Event seems to make people experts in it,

as they acquire very specific knowledge on how to navigate the complexities of the event. They become aware of obstacles and develop clever work-arounds—knowledge that will most likely be useless after the event has been resolved. She describes how they leverage this fact in their adult social care portal by connecting people in social media groups where they can share their experiences and knowledge, thus being able to support each other in practical and emotional matters in the event.
Further, she emphasizes the potential of Life Events to allow the right information to be found at the right time and form clusters that “reflect people’s experiences” (Matei, 2019). What the right information and the right time is, needs to be defined by the users’ needs rather than internal structures and assumptions.

Holliday (2019b), chief design officer at *FutureGov*, sums up these ideas, defining Life Events as “an approach to designing services to meet people’s needs“ and as “trigger points for a user journey or the underlying problem someone is trying to solve” (Holliday, 2019b). According to him, Life Events provide “the context for services” and are “useful for considering [...] a wider system” (Holliday, 2019a).

Another example in which they utilized Life Events to consider the wider system in terms of service providers catering to the same needs are the *Service Patterns* for local government they have developed in collaboration with Essex County Council (Holliday, 2019c, Ward et al., 2019). The purpose of *Service Patterns* is to enable scaling of service design quality and enable consistent end-to-end services that are delivered across different organizations (Holliday, 2019c). These organizations map the services they offer and document the tasks and touchpoints involved in a step of the service, allowing them to identify service patterns that are shared among different services across the government—such as making a payment or identifying oneself online. These are turned into standardized shared technological components or *patterns* which allow service providers whose services are part of the same service journey to offer a predictable service experience for users (Holliday, 2019c).

In conclusion, service designers utilize Life Events as a lens for user research that allows them to take into account the wider context of people's lives and how services relate to other services in specific events in their lives, as well as people's needs, goals and, expectations. In order to do that, they map out service journeys (Andrews, 2018; Holliday, 2019a; Lau, 2019), conduct interviews with users and end-users, and engage stakeholders in the process in order to expand design capabilities service-providing organizations (Ganesan et al., 2019; Lau, 2019).

Contextualizing the insights from their user research through Life Events, they seek to learn about their people's needs beyond completing a task and about their motivations for interacting with an organization (Holliday, 2019a; 2019b; Matei, 2019).

With practical solutions such as service patterns or practices such as engaging stakeholders in user research, they aim to allow service providers to take a Service ecosystem perspective and deliver services as part of Service journeys that span multiple service providers and thus, seek to take a perspective of everyday life over one of internal processes and structures.

2.2.2. Life Events in Psychology

Outside the context of public services, the concept of Life Events is referred to in the field of psychology. It has been in use in psychology for much longer compared to eGovernment, with Hawkins et al. being the first to utilize the concept already in 1957. Life Event research in psychology is concerned with the impact the different kinds of events in a person's life have on their risk of developing mental or physical illnesses (Reinecker, 2014). In Wörterbuch der Psychotherapie (Dictionary of Psychoanalysis) (Sonneck, 2000) a Life Event is defined as any event in someone's life, including common everyday events, triggers for crises, and traumatic events that require a behavioral response or adaptation. If such an event is desirable or undesirable or planned or unplanned is not relevant.

Among the first to utilize the concept were Hawkins et al. (1957) who developed the *Schedule of Recent Experiences* (SRE). They designed a questionnaire through which subjects would describe their experiences of the events in their lives which then could be linked to subsequent health problems.
A decade later, Holmes and Rahe (1967) went on to develop a more refined version of this instrument. Based on the SRE, they developed the *Social Re-adjustment Rating Scale* (SRRS). The SRRS consists of 43 life events, each assigned a with a score—the Life Change Units—that indicates the event's severity, ranging from the most severe event (the death of a spouse) with a score of 100 to minor events such as minor violations of the law with a score of 11. Adding up the scores of all the events in a person's life or any other specific amount of time, the researchers aimed to quantify the total amount of stress a person experienced. Surveying the medical records of patients, they intended to find a link between the stress associated with Life Events and the risk of illness.

Research in this tradition continues until today. Yet, it has been found to be flawed (Schwarzer & Schulz, 2001), or at least to be presenting considerable challenges (Harkness & Monroe, 2016; Monroe & Slavich, 2020; Reinecker, 2014).

Schwarzer and Schulz (2001) point out that Life Event research takes a stimulus-based perspective, implying that by assigning average scores to certain events the focus lies on the particular characteristics of the stressor instead of people's individual perception of said events. Further, they point out that any life event can only ever be studied in retrospective. This can cause problems as people's recollections of events can be unreliable. People might not remember accurately or even have distorted memories due to trauma associated to the event. Another shortcoming they point out is the underlying assumption that it is purely the amount of change that is required of people in order to adapt that determines the level of stress it triggers, not the negative nature of an event. Because of this, events that are perceived positively and negatively are treated the same.

Consequently, researchers started classifying Life Events and developing more precise definitions of what they entail. Reinecker (2014) offers a list of identifiers that could help classifying Life Events, such as "normative versus non-normative, desirable vs. undesirable, events of loss vs. events of gain, expected vs. unexpected, controllable vs. uncontrollable, isolated vs. enduring, severe threat vs. daily hassle" (p. 968). Harkness and Monroe (2016) refer to acute Life Events and define them as "environmental changes that have a definable beginning point in time and that would be expected to be associated with a least some degree of psychological threat, unpleasantness, or behavioral demands" (p. 729) , with examples such as "beginning or ending a romantic relationship, starting or ending a job, being diagnosed with a serious illness" (p. 729). They suggest differentiating acute Life Events and consider major Life Events (such as getting fired from a job) and minor Life Events (such as spraining one's ankle). They point out the challenge of distinguishing discrete Life Events (1) from one another, as they often intertwine or form chains of events, and (2) from "daily hassles" and "chronic stressors" (p. 728). The former they describe as "bothersome, annoying, inconvenient" and only associated with mild negative emotion, whereas the latter are of "ongoing and enduring nature" (p. 729). Monroe and Slavich (2020) present the most recent definition of Life Events. They define them as "obstacles, dangers, challenges, and threats that are imposed by the dynamic physical and social environments people must overcome throughout their lives" (p. 7). They argue that "environmental conditions to which individuals are exposed to" (p. 9) are usually overlooked in life event research and that it is in fact crucial to consider also early life stress, chronic stress, and daily hassles. As future direction for life event research they suggest (1) looking into the differentiation of Life Events in different domains of life, such as romantic relationships, financial, education, work, crime, etc., (2) finding reliable ways to measure stress associated to Life Events, and (3) considering not just acute Life Events but accumulated life stress as well.

The concept of Life Events in the field of psychology is not yet developed conclusively. Life Event research is concerned with measuring the impact that stressful events in people's lives can have on their mental and physical wellbeing—or more precisely—on their risk of falling sick with a mental or physical illness. As of today, researchers in the field do not seem to have found a strong consensus on a scientifically sound operational definition (Monroe & Slavich, 2020, p. 11). They do not necessarily agree on how to classify and differentiate Life Events, what to consider when assessing their impact, or how to measure this impact reliably and in a meaningful way. One major obstacle that might have slowed the development of a meaningful classification or framework for Life Events is the deceiving simplicity of the concept (Monroe & Slavich, 2020, p. 11). The concept of Life Events might be oversimplifying, perhaps too obvious, and seemingly intuitive, thus making it hard to develop methodologically sound and credible measurement practices. Events that commonly occur in many people's lives such as marriage or childbirth might appear straightforward and suggest simple criteria for their evaluation. However, the context in which an event occurs— the complexity of one's accumulated individual life experiences; the mental, physical, and emotional environment; the emotional needs and expectations—can have a profound influence on how a person conceives that event and how they are able to deal with it. In order to meaningfully assess events on an individual level, the perspective needs to be wider and consider people as a whole and take into account their experience beyond singular events.

2.3. Service Experience

In the different perspectives on Life Events in the context of public services, terms such as Service, Service offerings, Service journeys, user context, needs, goals and motivations, and others are referred to. Introducing service experience (Polaine et al, 2013), this section aims to contextualize these terms and to provide a framework to conceptualize design activity with regards to services and assess how Life Events are utilized in thos.
Building on Service-Dominant Logic (Vargo & Lusch, 2004) and the distinction it implies between *Service* (singular) and *services* (plural) (Vargo & Lusch, 2017), the four levels of service experience (Polaine et al, 2013) are presented. Accounts from practitioners enhance the framework and connect it to service design practice by outlining how to design services with the four levels of service experience in mind (Bailey, 2019; Downe, 2020).
The section concludes with a brief discussion on why taking these four levels of service experience into account can be considered particularly relevant in the context of public services—and how Life Events can be utilized as an approach to do so.

2.3.1. Service-Dominant Logic: Distinguishing Service and services

With Service-Dominant Logic (S-D Logic), Vargo and Lusch (2004) have put forward a broad conceptual framework that challenged the dominant logic of marketing which up until that point was based on the exchange of tangible manufactured goods. S-D Logic portrays service provision as the fundament to economic exchange, with all economic activity being service-for-service exchange (Vargo and Lusch, 2017, p. 47). Effectively, this shifts the focus from the producer's perspective to the customers' perspective. What the customer wants to do and how they can be served to achieve that drives what a producer offers. As shown in ***Table 2***, S-DLogic is described through originally eight (Vargo & Lusch, 2004), later ten (Vargo & Lusch, 2008), and today eleven fundamental premises—five of which are elevated to the status of axioms (Vargo & Lusch, 2016).

FP1	*Axiom 1*	***Service is the fundamental basis of exchange***
FP2		*Indirect exchange masks the fundamental basis of exchange*
FP3		*Goods are distribution mechanisms for service provision*
FP4		*Operant resources are the fundamental source of strategic benefit*
FP5		*All economies are service economies*
FP6	*Axiom 2*	***Value is co-created by multiple actors, always including the beneficiary***
FP7		*Actors cannot deliver value but can participate in the creation and offering of value propositions*
FP8		*A service-centered view is inherently beneficiary-oriented and relational*
FP9	*Axiom 3*	***All social and economic actors are resource integrators***
FP10	*Axiom 4*	***Value is always uniquely and phenomenologically determined by the beneficiary***
FP11	*Axiom 5*	***Value co-creation is coordinated through actor-genereated institutions and institutional arrangements***

Table 2

The 11 fundamental premises (FP) and five axioms of Service-Dominant-Logic. Adapted from Vargo & Lusch (2016).

In the context of S-D Logic, there is an important distinction between *Service* (singular) and *services* (plural) (Vargo & Lusch, 2017, p. 47). *Service* (singular) is a process through which value is co-created, defined as the application of skills and knowledge—i.e. resources—for the benefit of others (Vargo & Lusch, 2004, p. 2). They emphasize the distinction between the two by characterizing *Service* as a "superordinate to goods and services", which are units of output (Vargo & Lusch, 2017, p. 48), whereby services are the intangible units of service provision; therefore, services provide service (p. 48). In an attempt to clean up this linguistic redundancy, they characterize *Service* as being provided indirectly (through services) or directly (through goods) (p. 48). In this thesis, the distinction between *Service* (singular) as co-creation of value and *services* (plural) as sub-ordinates to service is emphasized by referring to *Service* (singular) as *Service* with a capital S.

A more practice-based perspective on the matter is provided by Lou Downe (2020). According to her, "a service, simply put, is something that helps someone to do something. That 'something' can be short and straightforward, like buying a chocolate bar, or it can be long and in multiple parts, like moving house" (p. 20). This "something" that someone wants to do is the *Service*. It is defined by what someone wants to achieve; therefore, only the user gets to decide what is the *Service*. The *services* involved in a *Service* she labels as "Steps" and "Tasks" (p. 29). These are the intangible outputs an organization produces—which are not to be mistaken for *Service*, as *Service* is indirectly provided through them (Vargo & Lusch, 2017, p. 48).
The steps and tasks only then create value if the user is able to satisfy their need and achieve their goal in their own context. If the *Service* is rendered successfully, value is co-created instead of being created and then delivered (p. 47).

2.3.2. Four Levels of Service Experience

As it seems, Service-Dominant Logic is not just becoming the dominant logic of marketing or economic exchange but potentially a general theory for social science, establishing value co-creation as the fundamental purpose of society (Vargo & Lusch, 2017, p.64). Already, this shift in operational logic has hugely influenced what companies and organizations offer and—more importantly—how they frame what they offer, both internally for their own understanding as well as externally for their customers. With that, it has hugely influenced what people expect from an organization and their offerings, too.
One example illustrating this logic shift is the Helsinki-based company MaaS Global with their app *whim*, through which users can gain unlimited access to different means of transport by paying a fixed monthly fee. Essentially, they are putting their users' Service needs at the core of their offering, providing "Mobility as a Service" (Whim app, 2020). Users are not buying a car or a metro pass, they are purchasing mobility; therefore, the Service of mobility is superordinate to the services within the Service ecosystem.

In order to cater to a Service, service-providing organizations need to know when and why value can be co-created (Weill & Woerner, 2015)—they need to be aware of their customers' goals and needs and become responsive to those; understand their services as part of a Service and in the context of Service ecosystems; and embrace the challenges and opportunities of digital services. The implications of this for the practice of service design are explored by Polaine et al. (2013), who argue that service providers can design Services by considering four distinct levels of service experience, each covering a different time frame: the user experience, the customer experience, the service provider experience, and the human experience (p. 132). Reflecting on his own practice and experience as a service designer, Bailey (2019) expands on the levels of service experience outlined by Polaine et al. (2013). Bailey re-frames them through his own lens "as a person out in the world interacting with services" and draws conclusions for design on each level. He proposes a clear cut between the design of Service and the design of services and describes a design approach for each of the levels.

For both the design of Service and services, it appears to be vital to make sure the "customer voice [is heard] inside the company" (Weill & Woerner, 2015, p. 32). For service providers, this means embracing user participation, collaboration, and codesign (Penin, 2018, p.27) in order to learn about people's goals, motivations, and needs.

Designing Service

The two higher levels of service experience are about designing *what* someone wants—the *Service* they are seeking. Strategy and Service propositions ensure service providers can deliver services that successfully render a Service. (Bailey, 2019).

To design services with the topmost level in mind—the human experience level—Polaine et al. (2013) suggest to focus on bringing service systems and human value closer together and to think about the impact a service has over a long time frame and a personal, emotional, and global context (p. 137).
By looking at these contexts, service design can uncover and address people's needs, goals, and motivations, ultimately helping them to become their best selves (Bailey, 2019). The approach he suggests for this level is to design strategy based on by ethnographic research, empathic practices, and convincing storytelling.

The strategy based on the human experience then provides the context for Service propositions on the second level (Bailey, 2019). These are based on identified Service needs and describe the Service as an end-to-end journey, making sure people are able to achieve what they set out to do (Downe, 2020, p. 79) and convince them to "hire" the Service (Bailey, 2019). He coins the second level as the consumer level.
Framing Services as something people want to hire, he refers to the Jobs-to-be-done theory (Christensen et al., 2016)—a framework that has been introduced into the broad catalogue of methods that service designers like to apply to generate user insights (Stickdorn et al, 2018). Service users are assumed to hire goods and services for the jobs they are doing for them, with Jobs being what "an individual really seeks to accomplish in a given

circumstance" (Christensen et al., 2016, p. 58). Considering the functional, social and emotional scope of an offering (Stickdorn et al., 2018, p. 131), jobs based on user knowledge grounded in ethnographic research can help user researchers to describe users' goals, motivations, and needs (Bailey, 2019). Proclaiming "good Services are verbs" (2020, p. 46), Downe points out that it is crucial not to speak service provider language but call Services after what they are doing for the person tasking them when creating Service propositions based on users' goals, motivations, and needs. With Jobs-to-be-done, service providers are urged to take the user's perspective, describing their situation, motivation, and expectation when hiring a Service with everyday language.

When .... (situation),
I want to .... (motivation/forces),
so I can .... (expected outcome),

Figure 9
Jobs-to-be-done template.
Adapted from Stickdorn et al., 2018)

Still on the second level, according to Bailey (2019) "a broad range of capability owners" explore the potential for desirable, feasible, and viable Service offerings as Service increasingly is provided across more than one service provider (Downe, 2020, p. 76). This implies a Service ecosystem perspective on this level. In Service ecosystems, it is value that provides identity as it motivates and gives meaning to any interaction and exchange (Vargo et al., 2017, p. 6). Those organizations who manage to identify the value they seek to co-create in the context of other actors in the ecosystem—not just with users but other service providers—seem to be ones striving the most (Weill & Woerner, 2015).

Consequently, Polaine et al. (2013) consider the service provider experience on the second level, emphasizing that the service experience is co-produced in the interactions between actors in the Service ecosystem (p. 135).

Designing services

The lower two levels of service experience are about the delivery of Service. They are concerned with *how* Service is delivered through tangible and intangible outputs—through services and their touchpoints (Bailey, 2019).

The third level is coined as the customer experience level (Polaine et al., 2013). Service experience on this level is defined by the “sum of the task experiences involved in using a service” (Polaine et al., p. 134). The time frame spans the duration of one step, consisting of several tasks (Downe, 2020, p.29). Design for customer experience is about ensuring the service experience is consistent throughout these steps by aligning what is delivered—and how—with customer expectations. This is to avoid “weak links” (Downe, 2020, p. 132) that potentially lead to gaps in the service experience.
In order to design with the customer experience in mind, Services can be broken down into steps or services that can be represented in customer journey maps (Bailey, 2019). These steps—even through they are part of the same Service— are likely to be delivered by different service providers (Downe, 2020, p. 132); therefore it is important to consider the different perspectives here. Service providers still provide services; yet, from the users’ perspective, a Service breaks down not into services but into steps they have to take in order to achieve their goal.

The user experience on the fourth level describes the service experience with regards to tangible elements of the Service such as interfaces and other touchpoints. The time frame is short, only concerned with immediate interactions that help users complete a task (Polaine et al, p. 133). User experience design, interaction design, information architecture, content design and other sub-disciplines are contributing to the design of the touchpoints on different channels that people use to accomplish the tasks (Bailey, 2019).

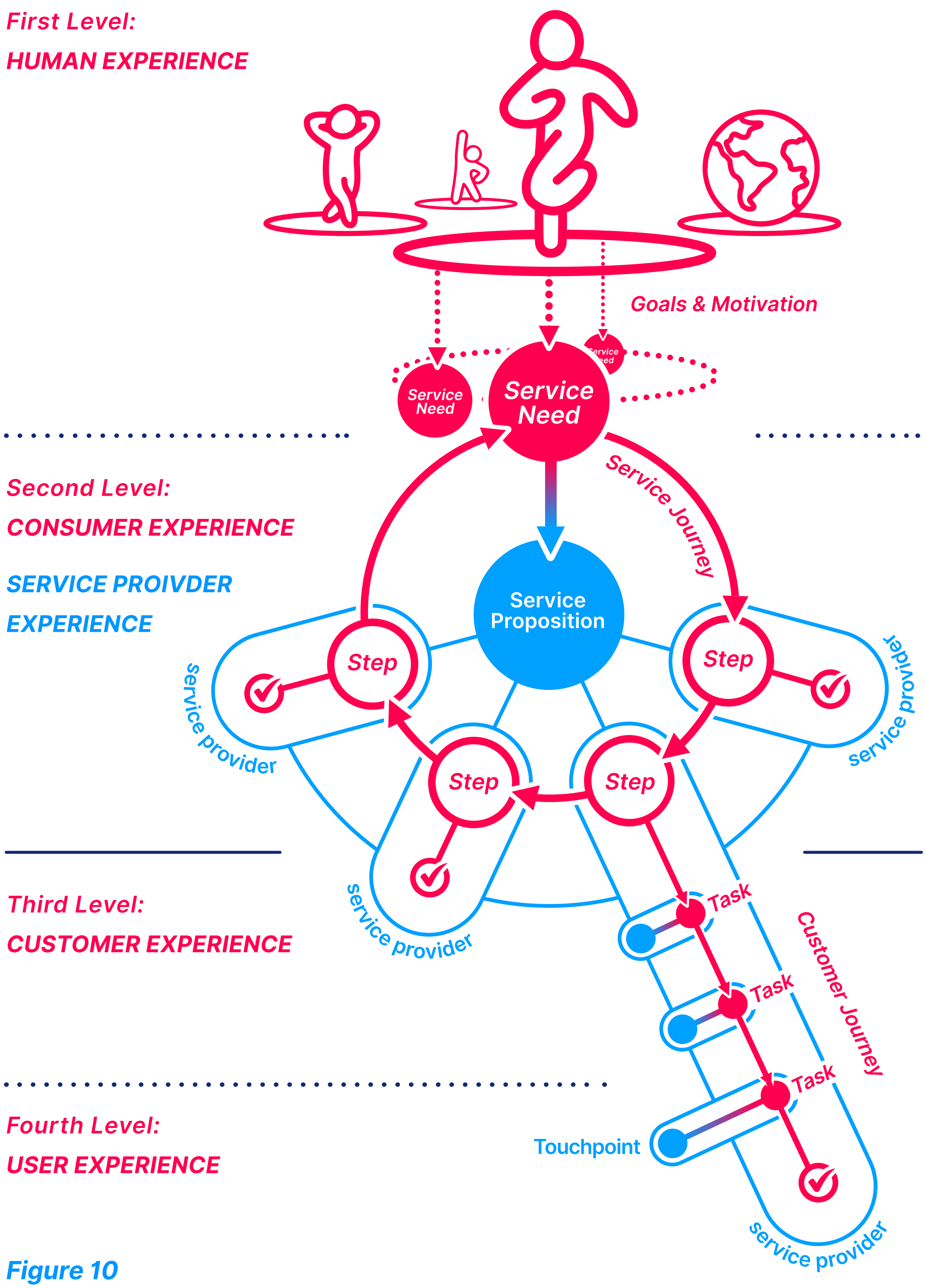


Figure 10

The four levels of Service exprience.
Based on Polaine et al., 2013; Bailey, 2019.

2.3.3. Service Experience in the Public Sector

In the context of public services, Service-Dominant Logic and the distinction between Service and services appears to be particularly important.
In a democratic state, by definition, the people are the state. The public sector works for the state and therefore the public sector works for the people—its inherent purpose is to serve the people. Yet, the sheer size of public sector organizations, their fragmentation into strong silos, and the intricacies of bureaucracy can make it hard to establish and act on a mindset that puts Service at the heart of all operations (Bannister & Connolly, 2012; Schuppan & Köhl, 2017). Interacting with the private sector, people usually have a choice—if an organization is not able to serve them in a way that answers their needs and helps them achieve their goal, they can seek Service somewhere else. In the public sector though, they do not necessarily have that choice, as some services are only available from public service providers (Polaine et al, 2013, p. 136).

This issue becomes particularly apparent in the realm of digital services.
As Downe (2020) demonstrates, with services moving to the digital space of the internet over the last two decades, they have become much more immediate (p. 21). Users, as she elaborates, access them not through expert middlemen who perform the particular steps and tasks on their behalf but experience a continuous journey through a whole Service. The increase of immediacy has re-established the connection between thinking about using a service and actually using it (Downe, 2020, p. 21).
She concludes that services are thus judged by their usefulness and functionality as it has become much easier for users to see how the services perform in the context of the Service ecosystem and how well they cater to a Service need and help them get their job done.

This increase of immediacy and the dependence on public services make it important to consider the different levels of Service experience and its implications for design in the public sector. As outlined above, designing Services with the human experience in mind is the basis for an overall positive Service experience.

2.4. Summary

In this chapter, through review of academic literature, practitioners' accounts in grey literature, and applied cases, the field of eGovernment was introduced by presenting some of its main concepts; the discourse on Life Events in the public sector was presented from three perspectives (IT, organizational, service design), as well as the discourse on Life Events in the field of psychology; Service-Dominant Logic and the four levels of service experience were introduced as a framework to conceptualize service design activity and Life Events in the public sector.

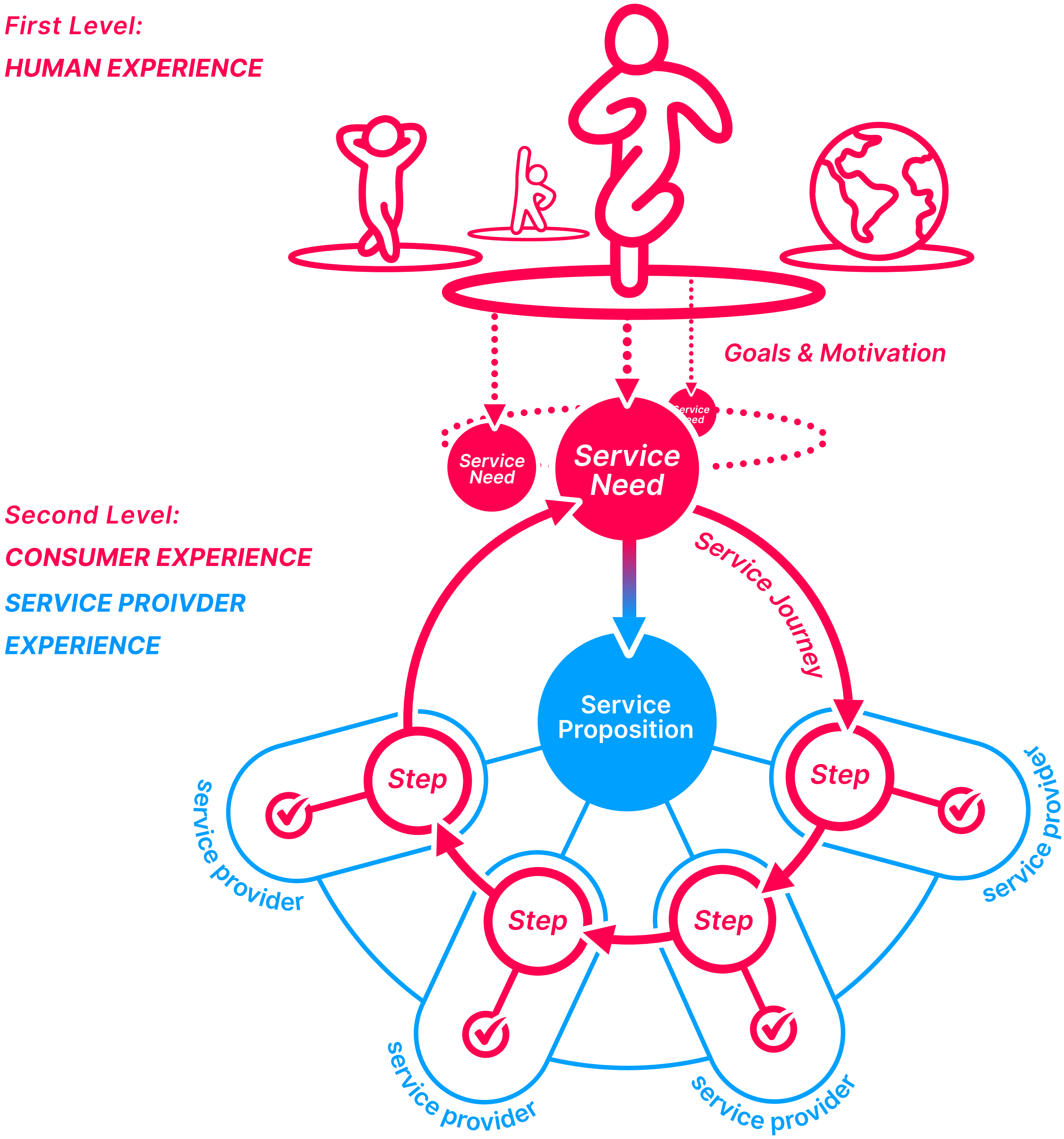
The three perspectives identified within the discourse on Life Events in the public sector are inherently connected and build on top of each other.
Life Events have first been introduced with the ambitious goal of making the delivery of public services and citizens' interactions with governments more user-centric, user-friendly, easier to navigate, more effective and transparent, as well as more efficient (Vintar et al., 2002, von Lucke, 2000). This goal remains consistent across the three perspectives.
eGovernment researchers engage with this goal by proposing ways to implement the technological infrastructure to enable services to be accessed and delivered digitally through government portals or Life Event portals (Vintar et al., 2002; von Lucke, 2000), according to the events in people's lives, thus enabling government one-stop shops or even proactive or predictive no-stop shops (Kircher, 2019; Scholta et al., 2019; Wimmer, 2002). However, it has been pointed out that the technology-focused point of view from the IT perspective alone will likely not yield success, as this this challenge also comprises of a human and organizational dimension (Bannister & Connolly, 2012; Schuppan & Köhl, 2018).

Consequently, researchers started exploring Life Events from an organizational perspective, proposing ways to enable service delivery around people's needs in their Life Events beyond the technological requirements. They suggest that service providers collaborate in Life Event Service ecosystems by engaging in Communities of Service that focus solely on people's needs (Dunham et al.,

2014; Strauss & Wilson, 2015), which are identified through customer-centric outside-in thinking (Strauss & Wilson, 2015). This thinking is enabled through service design, conducting user research and applying methods such as journey mapping.
Other methods and ways to work with Life Events in service design in the context of public services are explored by practitioners in the field. From the perspective of service design, Life Events are framed as a lens for user research that allows service providers to understand the context in which people use services, what their needs, goals, and motivations in a specific event in their lives are, and how the service connects to other services in that event (Holliday, 2019a; 2019b). They propose methods to conduct user research and engage stakeholders across organizations (Andrews, 2018; Ganesan et al., 2019; Holliday, 2019a; Lau, 2019), providing basis to make the delivery of public services and citizens' interactions with governments more user-centric, user-friendly, easier to navigate, more effective and transparent, as well as more efficient (Vintar et al., 2002).

Life Event research in the field of psychology seems largely unconnected to the discourse on Life Events in the context of public services. However, looking at its issues and challenges can potentially provide valuable insights for practitioners in the public sector as well. Among the issues worth pointing out is the perhaps oversimplifying, too obvious, and seemingly intuitive nature of Life Events that potentially prevents the development of methodologically sound practices (Monroe & Slavich, 2020). As a result, researchers in the field do not necessarily agree on how to classify and differentiate Life Events.

Service-Dominant Logic (Vargo & Lusch, 2004) and the four levels of service experience (Bailey, 2019; Polaine et al, 2013) provide a framework to understand how Life Events can be utilized in service design practice. It suggests a distinction between Service and services, with *Service* being the core of any organization's offering—answering people's needs in a specific situation and allowing them to reach their goal—and services as the steps in the Service journey, potentially spanning multiple service-providing organizations. A Life Event approach can enable service providers to consider the first two levels of service experience—(1) the human experience and (2) the consumer and service provider experience—, and understand the services they provide in the context of the *Service* people are seeking.



TAKE INTO CONSIDERATION

PERSONAL CONTEXT
What is someone's personal context? What is their emotional situation? Who do they relate to?

SERVICE NEEDS
What are the person's practical and emotional needs, goals, and motivations?

SOCIAL & GLOBAL CONTEXT
How do the societial and global context reflect in an individual's situation?

METHODS & TOOLS

- *Life Events*
- *Ethnographic research*
- *Long-term strategy*
- *Storytelling*
- *Personas*
- *Jobs-to-be-done*

SERVICE ECOSYSTEM
Who are the service providers connected to a Service need? How can they collaborate and coordinate their services in order to cater to the same Service and provide consistent and positive Service experience throughout all of the steps?

SERVICE STEPS
What are the steps someone has to take along a Service journey in order to satisfy their Service need?

- *Life Events*
- *User research*
- *Service journey mapping*
- *End-to-end Service propositions*
- *Shared data*
- *Service patterns*
- *Service repository*
- *Communities of Service*

Figure 11
The first two levels of service experience (Bailey, 2019; Polaine et al. 2013). Life Events are utilized as a lens to consider the human experience. Considering the consumer and service provider epxerience as well is vital to be able to serve people in their Life Events.

3

METHODOLOGY

Chosen because of its parallels to the practice of design (Swann, 2002), the research approach applied in this thesis is based on the action research process (Mertler, 2011).

This approach generally consists of nine steps which are (1) identifying and limiting the topic; (2) gathering information; (3) reviewing the related literature; (4) developing a research plan; (5) implementing the plan and collecting data; (6) analyzing the data; (7) developing an action plan; (8) sharing and communicating the results; (9) reflecting on the process (Mertler, 2011, p. 30).
The first four steps account for the planning stage, steps five and six make up the acting stage, step seven represents the developing stage, and steps eight and nine the reflecting stage (p. 31). Similar to the design process, these steps do not necessarily come together in a linear process.

Research steps one and two are presented in the first chapter of this thesis, with the second chapter documenting the literature review, which is step three. This chapter presents steps four and five.

Semi-structured interviews and stakeholder engagements are presented and discussed as the research methods. Explaining the process of data collection, the implementation of the research plan is documented. The last section of this chapter outlines the selected method for data analysis which is affinity diagramming.

3.1. RESEARCH METHODS

The review of literature, grey literature consisting of blogs posts and reports by practitioners, and cases was accompanied by a series of semi-structured interviews. Purpose was to outline the discourse about Life Events in the public sector, with the interviews deepening the understanding of the discoveries from the review of literature, grey literature, and cases, as well as guiding further research by providing a practice-based perspective.
Further, the interviews contextualized the research within eGovernment efforts in the Finnish context and the AuroraAI program, and thus provided the grounds for the findings of this research.

In addition, continuous engagements with stakeholders within the AuroraAI program throughout the research allowed for the development of an action plan (Mertler, 2011, p. 30) consisting of recommendations for the program. Six stakeholder engagements have been performed, including meetings for planning and shaping the research and potential outputs of the thesis; discussions and ideation with the newly established team working on the implementation of the Life Event Service ecosystems, and a workshop meeting with team members to map out the program's approach to implementing Life Event Service ecosystems, providing the basis to apply the findings of this research to the AuroraAI program and derive a set of recommendations.

3.1.1. Semi-structured Interviews

With the interviews' purpose being to guide the research and provide grounds for the findings, a semi-structured approach presented itself to be appropriate. According to Adams (2015), in semi-structured interviews single participants are interviewed in a conversational setting, using both closed- and open-ended questions, with the interviewer having the freedom to ask non-scheduled follow up questions to "meander around the topics on the agenda … and delve into totally unforeseen issues" (p.493). Semi-structured interviews are particularly well-suited in situations where the researcher is looking for the participant's independent thoughts or is "examining uncharted territory with unknown but potential momentous issues" (p.494).
Adams concludes that, despite requiring a lot of time and resources, semi-structured interviews are worth the effort as they are capable of uncovering substantial information and insights (p.505).

Stickdorn et al. (2018) characterize semi-structured interviews as "in-depth interviews [that are] conducted with relevant stakeholders or external experts to understand different perspectives on a specific subject" (p. 121). Interviewees in this research were stakeholders connected to the AuroraAI program as well as experts in the field, not connected to the program whatsoever.
The amount of six interviews was decided on based on two factors. Firstly, as Adams (2015) points out, semi-structured interviews are time-consuming and labor intensive (p.493). As this research is conducted by the author alone, limitations of time and resources have to be taken into account. Secondly, already after the six interviews, clusters of data became apparent. A larger sample with more interviews would have certainly allowed for more precise results (p.493), yet the data presented itself to be meaningful enough to move forward.

3.1.2. Stakeholder Engagements

As mentioned in the introductory chapter, one of the objectives of this research was to make it practically applicable to AuroraAI program. As it was incepted in 2018 and properly started in 2020, the program can still be considered fairly young; thus, there is not a huge organizational apparatus in place that could have been reviewed for this research and be used as the basis to derive recommendations for the program. Instead, continuously engaging stakeholders inside the program, accompanied by the review of materials they had produced so far, allowed the research and its focus to evolve over the course of the several months it was conducted and to shape insights and findings in a co-creative fashion.
Co-creation—or more precisely co-design—, according to Stickdorn et al. (2018), describes collaborative and cross-disciplinary efforts of creation (p.24), with Sanders & Stappers (2008) emphasizing the collaboration of designers and people not trained in design (p.6).
The basis for these stakeholder engagements was the review of literature and cases, the interviews with expert, and preparatory desk research (Stickdorn et al., 2018), reviewing material produced by the AuroraAI program. This was done in order to identify the right questions to ask and frame the research (p.118).

With the exception of one engagement, the setting for these were rather informal meetings with stakeholders from the AuroraAI program in which findings, insights and ideas were discussed. The sixth and last engagement was more facilitated by the researcher, with a collaborative mapping activity (Stickdorn et al., 2018, p.125) as the center of attention. Taking advantage of the knowledge of the stakeholders (p.125), a type of a system map was created, which Stickdorn et al. (2018) define as “visual or physical representations of the main constituents of the system in which an organization, a service, or a digital/physical product is embedded” (p.58). They identify three common types—the stakeholder map, the value network map, and the ecosystem map (p.58). The map in this case fits neither of these categories, but rather presents an attempt to map a process or an approach and the role of some stakeholders in it.

3.2. DATA COLLECTION

The six semi-structured interviews were conducted over a period of roughly one month in January and February 2020. Participants were approached via email about one week before the planned interviews, explaining the background of the research, the purpose of the interview, and the researcher's affiliation with Aalto University.
Of the six interviews, three were conducted remotely via Skype and one via telephone as there were technical problems with the video call. The other two interviews were conducted at the interviewees' premises. With consideration of the interviewees' busy schedules, the interviews were scheduled to be one hour long, which is also considered a reasonable length to "minimize fatigue for both interviewer and respondent" (Adams, 2015, p. 493). In practice, the length of the interviews ranged from 45 to 90 minutes.

1	*Digital Public Services Specialist*	*FI*	*Connected to the AuroraAI program*	*15.01.2020*
2	*Service Designer in the Public Sector*	*UK*	*Not connected*	*21.01.2020*
3	*Service Designer in the Public Sector*	*UK*	*Not connected*	*31.01.2020*
4	*Digital Public Services Specialist*	*FI*	*Loosely connected*	*10.02.2020*
5	*Service Designer in the Public Sector*	*FI*	*Connected*	*11.02.2020*
6	*Senior Digital Public Services Specialist*	*FI*	*Connected*	*13.02.2020*

The interview guide consisted of a set of core questions that were the same for every interview and sub-set of questions that were changed according to the expertise of the particular interviewee.
Further, the interview guide evolved over the course of the interviews, taking into account new insights, which according to Adams (2015) is to be expected (p.499). At the beginning of each interview, confidentiality was addressed. Interviewees were guaranteed to remain anonymous, as confidential interviews are expected to generate more candid insights (p. 501).

With the verbal consent of each interviewee, audio of all interviews was recorded. This was done for the sake of transcribing the conversation later and so that the interviewer could be focused on the conversation as it was happening. The first three interviews were transcribed verbatim first, with the key points being extracted only after. As this process proved to be quite time-consuming, verbatim transcription was skipped for the other interviews. Instead, key talking points and quotes were extracted directly from the audio recording.

Table 3

List of interviewed experts: Number of interview; role/title; country; connection to the AuroraAI program; date of the interview.

The engagements with the stakeholders took place over the course of three months between December 2019 and March 2020. The first engagement with the head of the program and the program coordinator took place in December of 2019 with the purpose of initiating the research process. The discussions in this meeting revolved around research questions, the rough direction of the research, and the potential output of the thesis, with the second meeting taking place in mid-January where all of the above were refined based on the initial research. In the third meeting mid-February findings and insights based on the initial research were the focus, leading us to agree on the focus of the thesis to be on facilitating service providers to collaborate within Life Event Service ecosystems, enabling them to deliver joint Service offerings. These first three informal meetings were documented through meeting notes.

In that same week, the newly established AuroraAI team commenced work on implementing the Life Event Service ecosystems, allowing this research to connect more closely to the implementation of the AuroraAI program from then on. Consequently, the fourth meeting with the team member in charge of viability of service ecosystems took place only days later. Discussed were potential ways for the research to connect to her work by offering concrete valuable and useful insights. It was tentatively agreed on for the research to outline workshops with service providers to develop Life Event Service ecosystems later this spring.

The following engagement about one week later with other AuroraAI team members revealed that this plan falls through because of a mismatch between the timelines of this research and the AuroraAI program. Instead, after a short co-creative ideation session, the brief for this thesis project was agreed on to be delivering guidelines, recommendations, or tools for the design of services in Life Event Service ecosystems.

The final engagement with the team then was a workshop meeting in which the program’s planned approach to implementing Life Event Service ecosystems was mapped. Unfortunately, the meeting had to be held remotely which rendered facilitation of the collaborative mapping to be rather challenging.

3.3 DATA ANALYSIS

After data had been collected, it needed to be analyzed and made sense of. For this purpose, a loose adaptation of the KJ Ho method or affinity diagramming was chosen.
According to Kunifuji (2013), the KJ Ho method is well suited to bring “unstructured information on a subject matter of interest into order through alternating divergent and convergent thinking steps” (p. 333). Further, it is characterized as a “bottom-up creative problem solving methodology for practical use” (p. 334). As show in ***Figure 11***,The four basic steps of this method are *label making*, *label grouping*, *chart making*, and *explanation*. Lucero (2015) coins the four steps as *creating notes*, *clustering notes*, *walking the wall*, and *documentation* (p. 232).

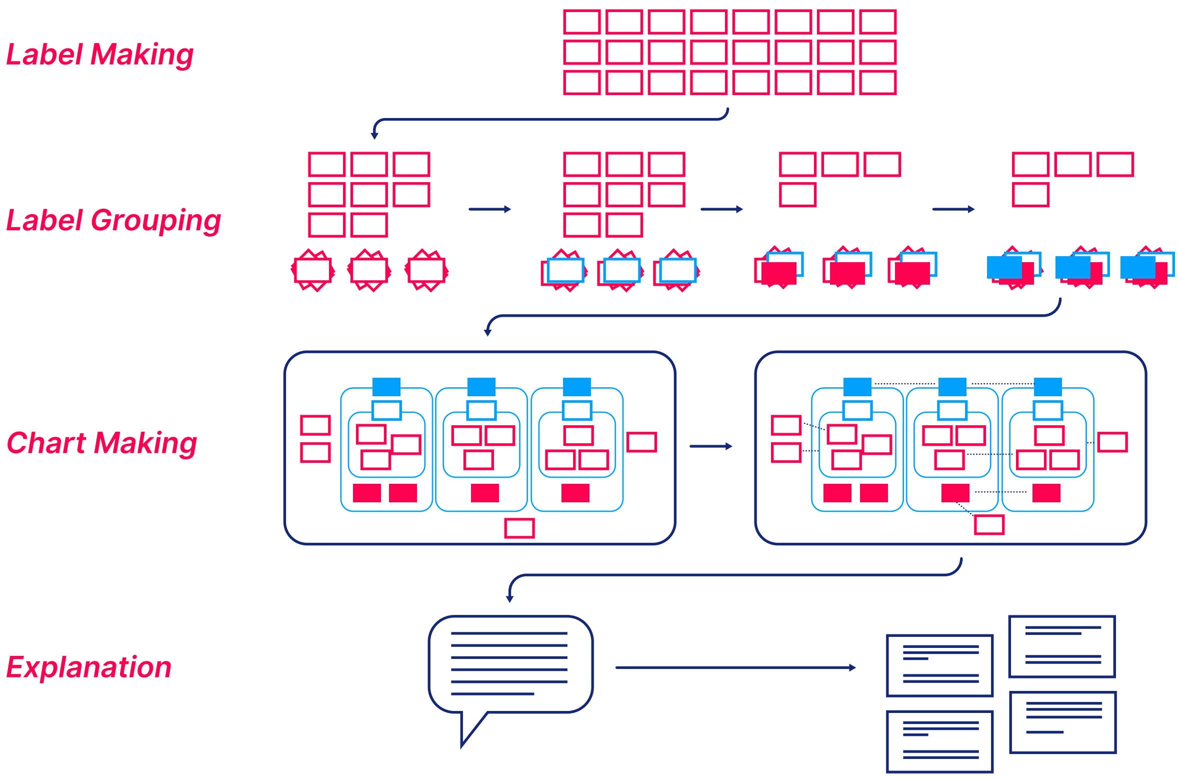


Figure 12
The four steps of the KJ Ho Method. Adapted from Kunifuji (2013).

In practice, the approach utilized in this research was more akin to what Stickdorn at el. (2018) describe as a research wall (p.128). The steps are essentially the same—material is hung on a wall and clustered according to emerging topics; clusters are named and connections between clusters and materials are identified; and patterns are uncovered, inviting further exploration and development of key insights and findings (p.128). However, compared to the KH-Ho method or affinity diagramming, the working with a research wall seems to be less strict of an approach.

Building the wall, key talking points and quotes from the interviews were transferred to sticky notes digitally in order to avoid messy handwriting and maintain legibility. As suggested by Lucero (2015, p.232), the notes were color coded to distinguish their source at a glance and from a distance while walking the wall. In the same way, findings from literature review were added, as well as few hand-written thoughts and connections. As suggested by Lucero (2015), not interview questions but overarching emerging topics were used to cluster the notes (p.232). The notes were re-arranged twice, ending up in clusters resembling the findings presented in the following chapter.

This particular method was chosen because the amount of data was perceived as rather manageable, rendering the research wall a flexible and easy-to-use tool to explore the data. Further, the spatial quality of the wall that enabled the researcher to quickly switch between the full overview and specific data points was appreciated (Lucero, 2015, p.246).

4

FINDINGS

Synthesizing the literature review and the expert interviews, this chapter presents the four main findings of this research concerning the utilization of Life Events in the context of public services.

The first finding indicates that the wide range of different definitions and framings of the concept of Life Events in the public sector stems from the fact that they are utilized with regard to different levels of service experience (Polaine et al, 2013).
Referring to the levels of service experience, the second finding implies that Life Events are particularly valuable as a lens to take into account the human experience of a service, allowing service providers to understand people's needs, goals, and motivations.
Finding three covers the infrastructure for delivery of public services based on Life Events beyond technological infrastructure. It indicates that a common vision, bottom-up development, and clear responsibilities enable service providers to develop Service packages around Life Events.
Finding four identifies a design-led approach as a potential enabler for service providers to be able to develop Life Event-based services by making people's context understandable, painting the wider service picture, and facilitating collaboration.
A summary of the four findings concludes the chapter.

4.1. Life Events and the Four Levels of Service Experience

The wide range of framings and definitions of Life Events in the context of public services stems from how Life Events are utilized to consider different levels of Service experience.

There seems to be neither an agreed upon definition for what a Life Event is nor an agreed upon approach how to utilize the concept in the context of public services. Life Events are defined as events with significant impact in a person's life (Strauss and Wilson, 2015)—they provide an everyday-life perspective to public service delivery (Vintar et al., 2002); function as triggers for sets of actions (Dunham et al, 2014); are utilized as metaphors for structuring information (Wimmer, 2002); are applied as an approach to designing services to meet people's needs (Holliday, 2019). Looking through the lens of Service experience, these different framings and definitions suggest that researchers and practitioners use Life Events with regards to different levels of Service experience (Bailey, 2019; Polaine et al, 2013).

With regards to the levels of User and Customer experience, Life Events are utilized to structure content or information. On government portals and Life Event portals, Life Events function as signposts for citizens to find the services they need as they are able to identify with the situation the Life Event denotes.

Interviewee 1, a digital services specialist working on the suomi.fi platform, confirmed this, stating they use Life Events to "increase usability of the platform and findability of services". Interviewee 3, a services designer in the public sector in the UK, working on digital services for government portals expanded on what increased usability means, explaining that "from a content perspective, Life Events are clusters to increase findability and help people navigate the complexity of the public sector". As people do not necessarily know what the government calls the service they need in a given moment or where it is located (Vintar et al, 2002, p.2), Life Event metaphors can improve User and Customer experience by reducing complexity.

Considering the Consumer experience, Life Events are utilized as a tool to ignore or overcome existing government structures (Vintar et al, 2002, p.3), helping service providers to recognize that "although government structures are separated, [Service] journeys are not" (Interviewee 3).
Interviewee 1 explained that "you naturally see these clusters of services—even if they don't necessarily interact—but they are linked by the same need". Here, Life Events function as the "common denominator" (Strauss & Wilson, 2015, p. 28) to organize collaboration across multiple service-providing organizations. Interviewee 2, a UK-based service designer working with public sector organizations, emphasized this, urging service providers to "consider not just seamless [Service] experience, but seamless partnerships between the organizations delivering the Service journey … as Life Events function as trigger points for public service journeys".

Beyond their functional value with regards to User, Customer, and Consumer experience, Life Events can also help to understand people and their situations, thus providing important context when it comes to the Human experience.
As Interviewee 2 explains:

> Life events are about understanding what is really happening in people's lives and understanding the context in which people use services. … What are our services from the perspective of the people who use them? And what is happening in people's lives that dictates that they have to interact with a service?

As becomes apparent when looking at for instance the End Of Life portal in New Zealand or the Life Event portal for adult social care in Buckinghamshire, this human context can shape the Service experience crucially, as it introduces the emotional dimension of a situation and allows service providers to understand how people connect not just to their services, but to other people in the same Life Event as well. Interviewee 5, service designer in the public sector in Finland emphasized how Life Events make tangible that "there is a real person on the receiving end" by providing "a common language" for service providers.

4.2. Understanding the Human Experience to Serve People in Their Life Events

Service providers need to consider the human experience of their services in order to be able to serve them in their Life Events. This implies understanding people's needs, goals, and motivations in their specific context.

Life Events are supposed to "bring governments and citizens closer" (Vintar & Leben, 2002, p.1). Looking through a Life Event lens can allow service providers to understand their services in context of user needs, emotions, and expectations, helping them to uncover and define Service needs and the context of the Service ecosystem their service is situated within and answer them with an individual Service offering (Strauss & Wilson, 2015). At the same time, Life Events are based on the idea that there are certain events in life that are universal (von Lucke, 2000)—Interviewee 1 explained that the Life Events they selected for their platform are "just things any average person would encounter". Selecting what events an average person would encounter though, relies on the likely biased assumptions of the one making the selection.
Developing services with a Life Event approach is aiming to individualize service provision and delivery by introducing an approach of standardization, rendering it difficult for Life Events to deliver on the promise of bringing governments and citizens closer.
This discrepancy might exist because of the deceivingly simple nature of the concept of Life Events (Monroe and Slavich, 2020). Interviewee 5 stated that Life Events are "so obvious—of course we should serve people in the events in their lives". The concept seems to have "popped up in different places at the same time, and people just latched on to it", as Interviewee 2 describes the situation.

How seemingly obvious the concept is might prevent in-depth analyses of Life Events and leaves the decision which Life Events to consider and what is relevant about them to people's assumptions based on intuition—or on internal government structures after all. Common examples for Life Events such as building a house or getting married (Vintar & Leben, 2002, p.2) do not quite capture the event in someone's life, but merely describe a Service need based on what services are on offer. This can be a major pitfall as Life Events are actually describing complex contextual situations in regard to people's lives. Normal or average do not seem to be the appropriate categories to apply as they tend to mask the depth of Life Events and their implications. Interviewee 5 pointed out that "different Life Events carry different significance for different people, emotionally as well as culturally", thus triggering different Service needs for each person individually.

Interviewee 6, senior specialist for digital services in a public sector organization in Finland, stated the obvious by saying that "governments need to serve everyone". Emphasizing that people often do not have a choice but to get certain services from the government, Interviewee 3 explained that "it's the nature of government [that] people have no choice but come to us". All the more important it is for public service providers to base their Service offerings on in-depth contextual user research that uncovers social, emotional, spiritual, environmental, occupational, intellectual, and physical needs (Dunham et al., 2014, p.10).
To achieve this, it is key to connect the different levels of service experience and allow for the human experience to inform the design of services on each of the levels of service experience.

4.3. Collaboration in Life Event Service Ecosystems

In addition to technological infrastructure, Life Event Service ecosystems require a common vision; develop bottom-up from within; have owners and clear responsibilities; and the opportunity to start out small.
Forming Communities of Service (Strauss & Wilson, 2015), service providers can organize collaboration within Life Event Service ecosystems in such a way and hold each other accountable.

A single Life Event can trigger several Service needs for a person, each of which consisting of a series of steps for them to take in order to satisfy the need. These steps are the services provided by different public, private, and third sector organizations (Downe, 2020). To answer the Service needs, service providers operate in Life Event Service ecosystems and collaborate to provide consistent Service offerings across silos and organizations. As interviewee 6 put it, "the public sector needs to understand that [they] need to build Service ecosystems in order to bridge silos".
However, in addition to technological requirements, Life Event Service ecosystems require a framework for collaboration. For them to be able to develop cross-organizational Service offerings that are consistent and feel truly seamless for end-users, they need to start out small, with a common vision, develop bottom-up from within, with owners and clear responsibilities.
With Communities of Service, Strauss and Wilson (2015) put forward a framework for service providers to collaboratively develop Service offerings around Life Events and the Service needs they trigger. Service providers in Communities of Service self-organize, assess their maturity, hold each other accountable, and measure the impact of their joint effort.

The technological requirements for seamless Service offerings around Life Events are one of the main subjects of eGovernment research. Shared APIs, platforms, and components, common language and semantics, and a centralized catalogue of services are identified as some of the key enablers of interoperability between services provided by different organizations, which was emphasized by Interviewees 1, 2, 4, and 6 as well.

All of these are developed and implemented in Finland at this moment, contributing to a Government as a Platform (O'Reilly, 2011) environment that enables service providers to efficiently develop services using building blocks (Pope, 2019).
With the technological infrastructure i in place, interviewee 4 identified as the next step "[developing] a common vision with all the stakeholder agencies [involved], defining how an interlinked Service ecosystem should look like". This includes defining what are the Services people are seeking based on the identified needs and motivations, and which services or steps are involved in these Services. This can manifest in Service propositions (Bailey, 2019) that allow service providers to take a "broader end-to-end perspective" and thus deliver "more efficient services" (Interviewee 2).

This common vision ideally is developed from within one or more of the service-providing organizations. Based on their experience developing a Life Event pilot project in the Finnish public sector, interviewee 4 emphasized that "the creation of Life Event Service ecosystems needs to be motivated from within, it needs to be bottom-up". The *Starting Up Smoothly* project introduced above showcases this intrinsically motivated, bottom-up development approach—Migri identified a real Service need, the solution of which enabled them to deliver more efficient services. This intrinsic motivation puts them at the core of the ecosystem, making them the owner of the Service offering.
The importance of ownership is emphasized by interviewee 5 as well, stating that "each milestone within a Life Event needs a stakeholder to take responsibility and coordinate development".

Interviewee 4 pointed out it is not just vital to define "who owns the Service Ecosystem around a Life Event [but also to] define the role of each stakeholder agency in the development of the Life Event Service ecosystem".
Again referring to the *Starting Up Smoothly* project, it becomes apparent how clear responsibilities allow for Life Event Service ecosystems to develop—after other organizations joined the ecosystem and started to develop a joint Service offering, responsibilities for the services remained with the service-providing organizations. However, they would hold each other accountable for the quality and maturity of their services. Within smaller ecosystems,

such as the *Starting Up Smoothly* project, this approach can work organically, although on a larger scale there might be the need for a more formal approach. Interviewee 4 suggests to “create a new role, the Life Event Service ecosystem coordinator, who coordinates collaboration and communication” from within the ecosystem and with little top-down guidance.

Further, it seems to be favorable for the development of Life Event Service ecosystems to start out small, delivering a proof of concept and thus attracting others to join or emulate (Dunham et al, 2014). Both interviewees 4 and 5 identified the proof of concept as crucial, so did the *Starting Up Smoothly* project (Miessner, 2019, p.5). In order to “to kickstart a Life Event Service ecosystem“, interviewee 6 suggested to “identify and implement the little things you can do right now.” Interviewee 5 identified those little things as “the low hanging fruits”—the Service needs that are easy to tackle as all of their Steps happen entirely within one organization.

With Communities of Service, Strauss & Wilson (2015) describe a framework to connect capabilities of service-providing organizations and allow them to build relationships across Life Event Service ecosystems. Communities of Service are characterized as self-organizing, as they assess service providers’ capabilities and maturity, hold each other accountable, measure the impact of their joint efforts independently. Strauss and Wilson (2015) do not go into much detail about how this is done in practice, but rather outline the need for a collaboration framework in Life Event Service ecosystems. Still, the framework serves as a valuable starting point. By using the term *communities*, a focus on relationships and collaboration among people is emphasized. Further, by using the term *Service*, the focus is directed towards *Service* (singular) defined by people’s needs rather than *services* (plural) defined by organizational structures.

With these implications, Communities of Service might be able to provide an environment for collaboration with a common vision, bottom-up development, clear responsibilities and ownership. Starting out small, they might eventually evolve into self-sustaining and dynamic institutions with their own culture and practices, bridging silos while sustaining Life Event Service ecosystems.

4.4. The Role of Design in Life Event Service Ecosystems

A design-led approach has the potential to enable Life Event Service ecosystems to deliver services according to Life Events by making understandable people's context; by painting the bigger Service picture; and by facilitating collaboration among them.

Service providers collaborating in Life Event Service ecosystems require the tools and methods to develop joint Service offerings. For these Service offerings to provide a consistent Service experience, service providers need to consider the human experience and the consumer and service provider experience in order to understand people's context and identify and cater to Service needs based on people's need, goals, and motivations.
Applying a design-led approach within Life Event Service ecosystems has been identified by many of the interviewees to be able provide the tools and methods to do this by enabling service providers to gain insights about the context in which people use services and paint the bigger picture of their Service need and thus identify what kind of Service offerings they might need. Interviewee 2 stated that "wanting to understand context has always been ingrained in design practice", emphasizing how design is predestined to play a leading role in this. Further, a design-led approach has been identified as a facilitator of collaboration among service providers once needs, goals, and motivations in context have been identified.

Expanding on how they understand user research with the aim of uncovering people's personal, emotional, and global context, both interviewees 2 and 6 identified user research on edge cases and extreme users as vital to gain an empathic perspective. As established above, services in the public sector need to work for everyone; therefore, it is paramount to avoid bias based on decision makers' assumptions. According to interviewee 6, recognizing and accounting for edge cases though, poses a "huge challenge in Life Event Service ecosystems". They suggested to "slow down and figure it out first", but recognized that "the public sector does not have the resources to do large scale user testing" and at the same time "cannot rely on people reporting

when things go wrong", which puts them in a predicament. Still, interviewee 2 insisted that "researching edge cases or extreme Life Events can be an opportunity to design better solutions for everyone".
Another important dimension to consider when it comes to context is put forward by interviewee 5. They urged user researchers to inquire "which Life Events are actually important to different people", suggesting to "consider different cultural backgrounds, different age groups, et cetera" when researching the personal, emotional, and global context people are situated in.

Interviewee 5 then went on to describe the strategic role of service design can take in Life Event Service ecosystems. They explained that "service design can provide guidance and own the bigger picture", essentially connecting the human experience to the consumer and service provider experience level. They, like Bailey (2019), suggested storytelling to be a crucial tool here. This view is supported by interviewee 4 who called "service design a key enabler to find and present the problem and create common understanding of possible solutions", implying that, beyond user research and storytelling, design can facilitate collaboration within Life Event Service ecosystems.
In regard to this, interviewee 5 described the role of services designers as educators and stewards, "helping people to understand Life Events as guiding lights for their everyday work".

One tool to facilitate collaboration identified by interviewees 2, 3, 4, and 5 is collaboratively mapping the Service journeys around uncovered Service needs. Interviewee 2, explaining their approach to designing services for Life Events, suggested to "map and understand the whole journey, locate disconnections, and try and join them up". The whole journey in this case means "all of the discrete services that make up a Service", as interviewee 3 expanded. They explained the importance of such Service maps, stating that "actually seeing how services connect helps you think about the bigger picture—what are the consequences of this service, where might the user go next". They suggested to also "document what technology supports each service and why people interact with it".

In order to create the Service journey maps, interviewee 5 recommended a series of workshops. First, with end-users and service providers to uncover Service needs and understand which service providers own the steps of the Service journeys; then, with all of the Service providers who are involved, in order to “break down the Life Event and create a common understanding” to allow them to act on the user insights. Interviewee 4 emphasized that in these workshops service providers are not just receiving information, but crucially contribute. Mapping the Service journeys, they “find their challenges and [define] what they would like to change”.

4.5. Summary

The four findings presented in this chapter cover the utilization of Life Events in the context of public services.
The first two findings outline how the concept is utilized in with regard to the four levels of Service experience, with the first finding describing how it is utilized on each of the levels and the second finding paying closer attention to the level of human experience and how Life Events can be an approach to understand and deliver services in context.
The third finding uncovers the infrastructural requirements for Life Event Service ecosystems beyond technology and identifies Communities of Service as a framework to implement those.
The fourth finding indicates that a design-led approach can be beneficial for the success of Life Event Service ecosystems and proposes methods that can be used in such an approach.

The concept of Life Events has been found to come with a range of framings and definitions as it is utilized from different perspectives with regard to the different levels of Service experience. Originally proposed from an IT perspective to introduce a user-centered view into the mostly technology-driven field, they were utilized with regards to the consumer experience—to cluster services around Service needs—and the user experience. In this perspective, the human experience as a basis is largely omitted, which results in a disconnection between the promises of Life Events and the overall service experience.
From an organizational perspective, Life Events are considered in terms of Service ecosystems and collaboration within them, exploring frameworks that need to be in place in public organizations in order for them to be able to collaboratively develop Service offerings with a consistent service experience, thus advocating to consider the customer and service provider experience as well as the human experience.
Exploring Life Events in their practice from a service design perspective, service design practitioners in the public sector have contributed to the discourse. They consider Life Events to be a lens to outline Service needs by understanding

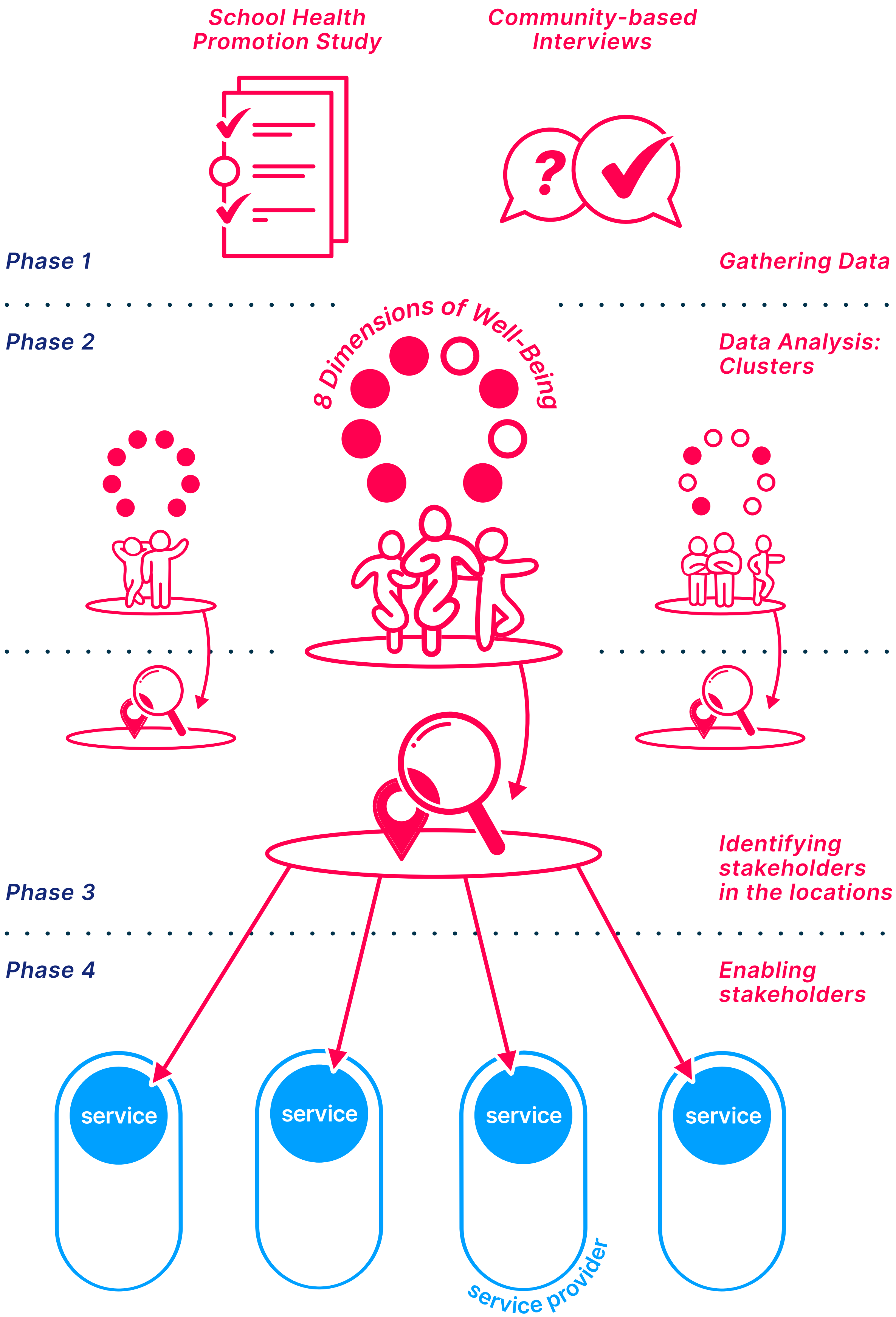
the human experience through people’s context, and thus to inform all four levels of Service experience.
In this framing it becomes apparent that Life Events—albeit appearing to be an obvious concept—are not a shortcut to better public services. What they can provide though, is a lens to understand what people’s needs are in the situations in which they use certain services, and how these services can cater to those needs. As pointed out by many of the interviewees, it requires an empathic understanding, the resources and tools to gain this understanding, and the necessary infrastructure for services to be provided within Life Event Service ecosystems.

This infrastructure does not only consist of technology, but also organizational infrastructure that allows service providers to collaborate in Life Event Service ecosystems as Communities of Service to develop joint Service offerings that answer identified Service needs. This includes the permissive environment to collaborate (Downe, 2020), enabled by formal and informal institutions (Schuppan & Köhl, 2017), such as clear responsibilities and ownership with regard to the Service ecosystem, a clear vision that gives the ecosystem purpose, combined with an intrinsic motivation of the service providers within it, and the opportunity to start out small.

Further, Life Event Service ecosystems can benefit from a design-led approach, especially when being first established. In addition to customer and user experience, services can be designed with the human experience and the consumer and service provider experience in mind. With broad and deep user research to capture people’s context and describe their Service needs, with storytelling as a way to paint the bigger Service picture, and with facilitation of co-creative workshops, design can contribute to the successful implementation of Live Event Service ecosystems.

5

THE AURORA AI APPROACH TO LIFE EVENT SERVICE ECOSYSTEMS


School Health Promotion Study
Community-based Interviews
Phase 1
Gathering Data
Phase 2
8 Dimensions of Well-Being
Data Analysis: Clusters
Phase 3
Identifying stakeholders in the locations
Phase 4
Enabling stakeholders
service
service
service
service
service provider

Purpose of this chapter is to present how the findings of this research can be applied to the AuroraAI program. Based on the map that has been drawn in a workshop with stakeholders within the AuroraAI program visualizing the program's approach to implementing Life Event Service ecosystems, their approach is described and analyzed. Comparing this analysis to the findings of this research, two potential gaps in are identified. These in turn provide the opportunities for the recommendations proposed to support the AuroraAI program to enable service providers to design services within Life Event Service ecosystems.

5.1. Analyzing the Approach

In order to be able to propose concrete recommendations for the design of services within Life Event Service ecosystems in the case of the AuroraAI program, it was crucial to gain an understanding of how these ecosystems are understood inside the program. In order to gain this understanding, the approach that the AuroraAI team plans to take when they start implementing the first Life Event Service ecosystem pilot later in 2020 was mapped in a workshop. This map visualizes how the Service needs of a person in a given Life Event are captured through data analysis and how this data is processed so that service providers can develop their services accordingly.

Mapping the program's approach to implementing Life Event Service eco-systems, it became apparent that there are four distinct phases to it. These phases are (1) gathering data, (2) analyzing data, (3) identifying service providers, and (4) enabling service providers.

Figure 13
The four phases of the AuroraAI program's approach to implementing Life Event Service ecosystems—(1) gathering data; (2) analyzing data; (3) identifying service providers; (4) enabling service providers.

Phase 1: Gathering Data

During the first phase, data about the situation of a person in a given Life Event is gathered. In the case of the first Life Event Service ecosystem pilot the program will be implementing—which is concerned with the Life Event of graduating primary school—a persona named Eveliina is utilized to represent 13-16-year-old people in this Life Event.

The data utilized to describe her situation is gathered from different sources. One source is data that has already been gathered through other studies; in this particular case of the graduating primary school Life Event, data from the *School Health Promotion study* is adduced which has been conducted bi-yearly since 1996 by the Finnish Institute for Health and Welfare. It asks students to assess their living conditions, schoolwork, health, health-related behavior and school health services in a questionnaire (Finnish Institute for Health and Welfare, 2020).

The other source of data are “community-based interviews” (Julkisen hallinnon ICT, 2020, p.2). These interviews are planned to be conducted in the different locations where the Life Event Service ecosystem pilot is to be implemented, namely Mikkeli, Oulu, Turku, and Espoo. This is done as people’s life situations and their corresponding needs are assumed to be different in different places.

Phase 2: Analyzing Data

In the second phase, this data is analyzed through a cluster analysis on the basis of the model for multidimensional well-being developed by Stiglitz et al (2009). This model defines well-being along eight dimensions, namely (1) material living standard, (2) health, (3) education, (4) personal activities including work, (5) political voice and governance, (6) social connections and relationships, (7) environment, (8) economic and physical insecurity (pp.14-15).

Through the cluster analysis, people are clustered according to how well they rank along these dimensions. The resulting clusters are then supposed to support the AuroraAI program and the service providers to understand the different Service needs different people can have in the same Life Event, and thus, allow service providers to develop their services accordingly.

Phase 3: Identifying Service Providers

After people in the Life Event are clustered based on their well-being, the third phase is concerned with identifying service-providing stakeholders whose services are answering to the Service needs of the people in those clusters. The service providers are planned to be identified through workshops with experts from the private, public, and third sector in the different locations (Mikkeli, Oulu, Turku, and Espoo).

While the workshops are planned to be conducted later in 2020, the concrete facilitation plan for these workshops and who the experts from the different sectors are who will participate, is not yet defined.

Phase 4: Enabling Service Providers

In phase four, the identified service providers are to be enabled to develop their services based on findings and insights about service needs from the cluster analysis. They are to be provided with the results from the cluster analysis and have the chance to develop their services either independently or through some sort of facilitation, such as workshops. Again, the details of how this will be done is not yet fully defined.

5.2. Gaps and Opportunities in the Approach

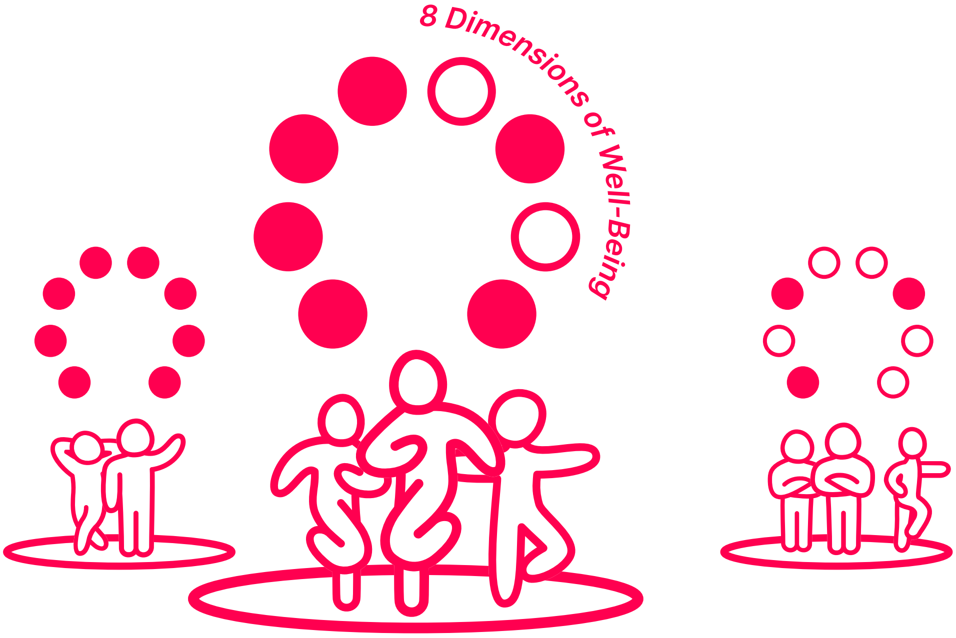
Based on this analysis, the findings can be applied to the AuroraAI program's approach. The four phases identified in the approach correspond with the first two levels of service experience (Bailey, 2019; Polaine et al., 2013).

Gathering data (phase 1) and analyzing data (phase 2) the program aims to gain an understanding of the first level of service experience through a Life Event lens, and thus provide the basis for service providers to consider the human experience in their service. In the AuroraAI program's approach, this experience is defined and understood based on a person's multidimensional well-being (Stieglitz et al., 2009), resulting in clusters of people who are assumed to have roughly the same Service needs.
Identifying service providers (Phase 3) and enabling them to improve their services (phase 4) is taking the service provider experience on the second level into account, allowing service providers to deliver Service offerings that answer identified Service needs.

On both of these levels though, there are gaps in the approach that might lead to actors within the Life Event Service ecosystem being left disconnected. First, the service provider experience seems to be disconnected from the human experience, and thus the individual people and their Service needs, as the human experience is not based on in-depth analysis of individual people. Second, service providers affiliated with the same Service need are not connected among each other.

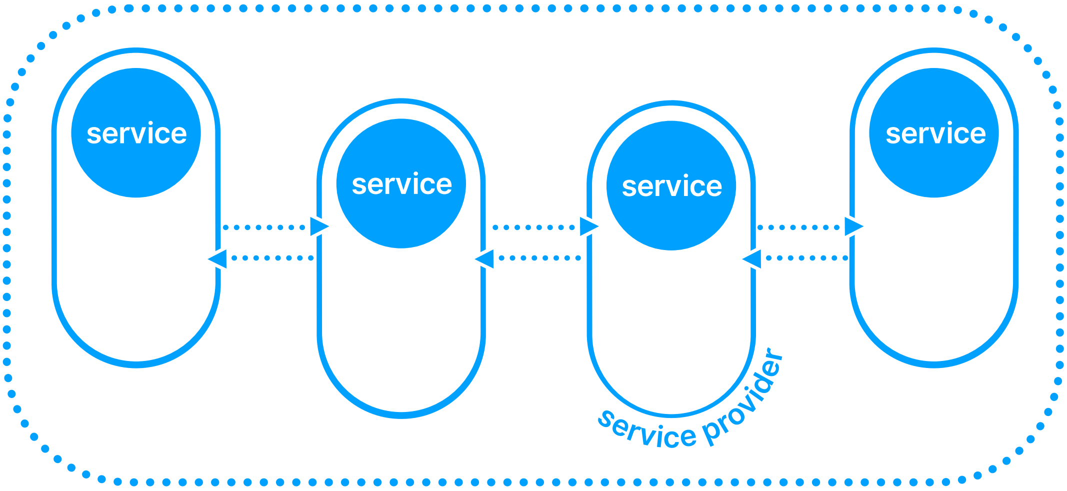
Figure 14

The potential gaps identified in the AuroraAI program's approach to implementing Life Event Service ecosystems—(1) disconnection between service providers and individuals' service needs; (2) disconnection among service providers.



Human Experience through Life Event

1 Service needs disconnected from service providers



Service Provider Experience

2 Service providers disconnected among each other

Taking a closer look at the first gap—disconnection between the human experience and the service provider experience—reveals two opportunities for improvement. Firstly, the data-based clusters might be lacking depth when it comes to individuals' experiences, and secondly, it is not yet clear how the information of the clusters is communicated to services providers.
Differentiating within a single Life Event using these clusters seems to be a reasonable strategy, as recognizing the fact that different people can have very different needs in a similar situation allows for a detailed and nuanced understanding of the Life Event. It is vital though, to ensure that the data and the resulting clusters are not disconnected from actual people, since that could result in rather hollow descriptions that are difficult to act on.
Clusters can be a good starting point for further in-depth research in order to identify concrete Service needs based on people's needs, goals, and motivations in a given Life Event. What kind of information these clusters contain, how this information is communicated with the Service providers, and how Service needs that can be acted upon are derived from them are important issues to consider here. Ultimately, the clusters need to capture people's context and provide insights that are easy to act on for service providers.

Looking at the second gap—the disconnection among service providers—another opportunity for improvement can be established. Service providers are identified and then expected to act on the insights from the cluster analysis they are provided with in and improve their services accordingly by developing joint Service offerings spanning several providers. In order to do this though, they need to be able to collaborate and be connected among each other.
Identifying the service providers with the help of municipalities and experts in the locations once again seems like a sensible strategy for they can be assumed to know specific service providers and their offerings which might be unique to the location. However, it is important to ensure that the service providers after being identified are not left alone to improve their services based on the data, but are enabled to know about valid and relevant Service needs and the corresponding Service journey and how their services connect to other service providers.

Concluding, with regards to both the human experience and the service provider experience, there seems to be a danger of actors in Life Event Service ecosystems being left disconnected.
Service providers and individual people in the Life Events could end up being disconnected, as service providers are provided with potentially rather hollow descriptions of needs based on clusters they then have to act on, with detailed in-depth analysis of people's situation and context in the Life Event potentially missing.
Service providers among each other might be left disconnected if they are left alone to decide what to do about their services based on the insights from the cluster analysis, without knowing about people's needs, goals, and motivations, their Service needs, and the corresponding Service journeys.

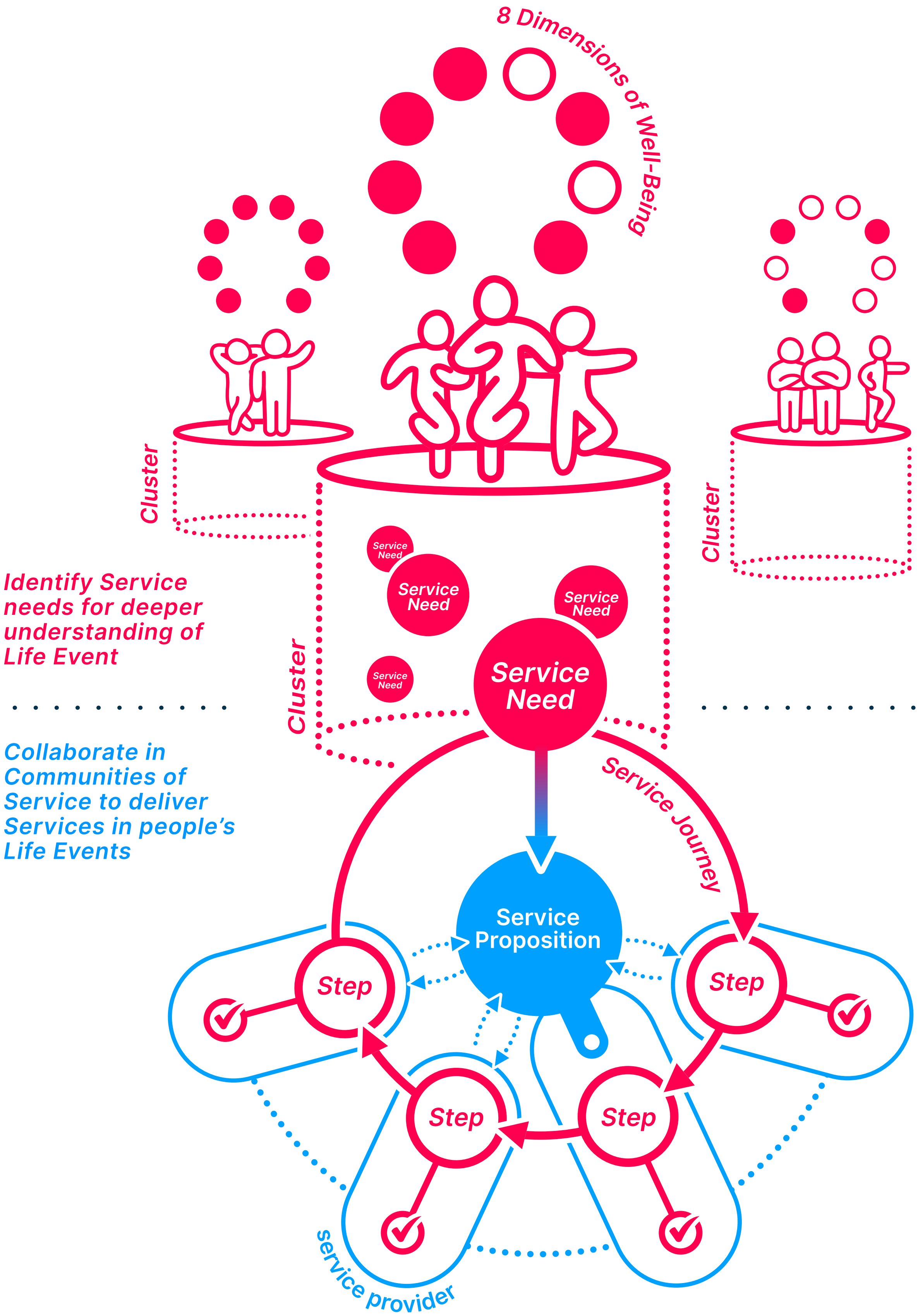
5.3. Recommendations

In this section, a set of recommendations addressing the opportunities created by the two gaps is proposed.
The main aims of these recommendations are to (1) connect service providers with individual people experiencing a Life Event, allowing them to look beyond the clusters; and (2) enable service providers to form Communities of Service in order to collaborate closely and develop joint Service offerings based on identified Service needs
The recommendations outline methods and approaches to derive and communicate Service needs from the cluster analysis and to connect service providers within Life Event Service ecosystems in Communities of Service.

In order to illustrate some of the recommendations, this chapter draws from user research that has been conducted in the context of the Design for Government course (MUO-E8012) at Aalto University between February and May 2019 by Hoai Van Chu, Nina Karisalmi, Nehal Jain, Eva Duran Sanchez, and Christopher Gros (author of this thesis). That user research was focused on people facing the Life Event of moving to Finland (Chu et al., 2019).

Figure 15

Recommendations to enhance the AuroraAI program's approach to implementing Life Event Service ecosystems.


8 Dimensions of Well-Being
Cluster
Cluster
Cluster
Identify Service needs for deeper understanding of Life Event
Service Need
Service Need
Service Need
Service Need
Service Need
Collaborate in Communities of Service to deliver Services in people's Life Events
Service Journey
Service Proposition
Step
Step
Step
Step
service provider

5.3.1. From Clusters to Individuals

People in a given Life Event are grouped through the cluster analysis according to their performance along eight dimensions of well-being, painting a detailed picture of a Life Event and the potential challenges it poses to different groups of people. However, this analysis alone likely does not tell the whole story about an individual experiencing a Life Event, as their needs, goals, and motivations might not be quite captured in this rather broad analysis, thus making it difficult for service providers to improve their services based on the data.

In order to enable them to act on the data and to improve their services in a way so that they cater to the same Service, this research suggests to conduct qualitative user research after the clusters have been identified in order to define concrete Service needs of people within them.
Based on these, individual experiences of a Life Event can be communicated through personas and storytelling, allowing to bring closer individual people and service providers, thus bridging the gap between the human aexperience and the service provider experience.

In order to expand focus from clusters to individuals, three steps are proposed:

1. Conduct qualitative user research to deepen the understanding of the people's individual experience and needs in a Life Event
2. Derive concrete service needs from the user research
3. Create personas that illustrate individual people's stories in a Life Event

The qualitative user research in addition to the cluster analysis is conducted through interviews with people who have been grouped within one cluster.
It consists of in-depth interviews (Stickdorn et al, 2018, p. 122) or contextual interviews (p.121) with people approaching or experiencing the Life Event.
Additionally, interviews or workshops with Life Event experts—people who have experienced and resolved the Life Event already can be part of the user research. These experts can report about their experience of the Life Event, reflecting about their situation before, during, and after, and about

the services they interacted with. Mapping their journey through their Life Event together with them can be a way to facilitate this reflection and to “visually and transparently gather user stories when interviewing“ (Stickdorn et al, 2018, p. 44). In addition to the steps they had to take and the tasks that were involved in those, these maps should include the issues that occurred along the journey and describe people’s experience and reactions to those.

The raw data gathered in this qualitative user research then requires interpretation in order to be able to define Service needs.
The data from the interviews provide important contextual information about individual people within a cluster. In addition to the fact that they are lacking on one or several dimensions of well-being, the interviews might provide insights on why that is the case.
Speaking with Life Event experts can provide insights about why someone was using a particular service and about their experience with it. For instance, people upon moving to Finland do not tend to book appointments at the immigration office and apply for their social security number because they want to, but because they need to get settled in the country; therefore, getting settled can be the starting point to define the Service need (Chu et al., 2019).

This interpretation of the raw data can be done internally by the user researchers after the data is collected or in situ, during the data collection, explicitly reflecting together with the interviewees in an interview or workshop setting on what their Service needs are or might have been.
Tools that can help with interpreting data and provide the basis for Service needs can be *Jobs-to-be-done* or *Key Insights* (Stickdorn et al. 2018, p. 131), both providing templates that help the user researchers to phrase insights on why someone is doing something from the individual’s perspective, rather than the organization’s.

In the next step, with these insights about people’s Service needs, personas can be created or existing personas such as Eveliina can be enhanced with much greater detail, telling a more compelling story about their situation, making understandable and relatable why and how people use certain services in a given Life Event and how they experience them.

With regard to the graduating elementary school Life Event whose implementation is planned for later this year, this process of expanding the clusters with a qualitative and individual perspective would be led by the AuroraAI team in the four locations. The user research, its interpretation, and the creation of personas and stories can certainly benefit from service design expertise; therefore, a collaboration or consultation with the D9 service design team within DVV is recommended, as they have applied a rather similar approach in a Life Event Service ecosystem pilot project.

5.3.2. Connecting Service Providers in Communities of Service

Based on the insights generated through the cluster analysis, service providers are to improve their services and make them more useful for people in a given Life Event. Yet, they do not necessarily have a way of knowing how their services relate to other services people use in the context of the same Life Event. Further, infrastructure is lacking that enables service providers to collaborate in Life Event Service ecosystems and develop joint Service offerings around Service needs.

In order to enable them to co-develop Service offerings that span multiple service providers, this research suggests facilitating them to collaborate in Communities of Service (Strauss & Wilson, 2015). In these, service providers consider the consumer experience by developing their services in the context of Service journeys based on identified Service needs.
End-to-end Service propositions describe joint Service offerings and hold service providers accountable by describing the Service journey and outlining the responsibilities within the Communities of Service, allowing for effective collaboration.

This research suggests that Communities of Service can be first established via three steps:

1. Map the Service journey around a Service need together with the service providers.
2. Service providers create end-to-end Service propositions, describing the joint Service offering from the provider and user perspective, outlining its desirability, feasibility, and viability.
3. Service providers commit to the Service proposition by defining responsibilities and practicalities for the Community of Service.

Mapping the Service journeys is done in workshops with service providers who are connected to a Service need. In these workshops, the users' perspective is present through the facilitator who guides the workshop by drawing from the user research. Alternatively, if resources allow for it, users—

people in the Life Event or Life Event experts—can be part of the workshops as well.
Starting from an identified Service need—such as getting settled—all of the steps of a Service journey and the corresponding services and their owners are mapped in order "to understand how existing services work and uncover pain points and opportunities for improvement" and "to envision future services" (Stickdorn et al, 2018, p. 44).
Doing this collaboratively with the service providers has the potential tofoster a sense of connection among them and establish relationships. Further, it makes visible gaps and disconnections in the journey for every stakeholder to see and discuss in a setting where all of them are present.

With the same stakeholders present, Service propositions are formulated (Polaine et al., 2013, p. 128). These outline a joint Service offering's desirability, feasibility, and viability. The desirability describes how and why Service experience for people in a given Life Event is improved; the feasibility is about how it can be realistically implemented by service providers in terms of technology; the viability is concerned with how it can make sense economically for service providers to join.
Ideally, rather than these being decided top-down, the specific service providers agree on terms for desirability, feasibility, and viability. As each Community of Service is different—different people from different organizations in different locations collaborate to create joint Service offerings to answer different Service needs—many variables can influence the success of such a community; therefore, it is important for them to form from within, allowing the service providers to take ownership and agree on their own terms. This applies to defining the Service proposition, as well as to agreeing on the responsibilities and practicalities for collaboration.

Defining responsibilities include choosing an owner or coordinator for the Community of Service, determining criteria to assess maturity of services and success of the joint Service offering, and deciding on ways to hold each other accountable by outlining the extent of the collaboration. Defining practicalities is about finding effective ways to collaborate, including the concrete tools and spaces. This also includes agreeing on how much time and resources the different service providers are able to devote to the development of joint Service offerings and finding ways to make the collaboration work within these limitations. This can be a crucial point as organizational structures, priorities, and budgets tend to differ wildly between different public organizations. Acknowledging this and consequently accounting for it can be the deciding factor for a Community of Service to fail or succeed.

With regard to the Life Event of graduating elementary school whose implementation is planned for later this year, the AuroraAI team takes the role of a catalyst for the initial formation of Communities of Service by bringing together the service providers based on the Service needs, and facilitate them to agree on Service propositions and responsibilities. After this initiation, the communities self-organize.
DVV and the Finnish Service Catalogue can be important collaborators as they hold the expertise in terms of technological feasibility of Service ecosystems and interoperability of services.

6

CONCLUSION

This thesis sought to take a first step in developing a consistent understanding of the concept of Life Events, with particular attention paid to Life Events in the context of public services. Beyond that, it aimed to outline how service-providing organizations in the public sector and beyond can collaborate in Life Event Service ecosystems in order to offer joint Service offerings. Based on these, the research sought to propose a set of recommendations to enable collaboration of service providers in Life Event Service ecosystems and foster the development of joint Service offerings in the concrete case of the Finnish national AuroraAI program who commissioned this research.

In order to achieve this, data was collected through review of academic literature from eGovernment, psychology, and marketing theory; review of cases as well as reports and blog posts of practitioners of eGovernment and service design; and a series of six semi-structured interviews with public service experts working with Life Events.
In addition, stakeholders of the AuroraAI program were continuously engaged throughout the research in order to ensure its relevance for their practice.

Four findings were presented. The first two findings contextualize how the concept of Life Events is utilized in practice through to the four levels of service experience (Bailey, 2019; Polaine et al, 2013), with the first finding describing how researchers and practitioners utilize it with regard to different the levels and the second finding paying closer attention to the level of human experience where Life Events can provide framework to design Service, rather than services.
The third finding describes requirements for Life Event Service ecosystems in terms of infrastructure beyond technology and identifies Communities of Service (Strauss & Wilson, 2015) as a framework to implement those.
The fourth finding outlines how a design-led approach can be beneficial for

the success of Life Event Service ecosystems and proposes methods that can be used in such an approach.

These findings were applied to the AuroraAI program's planned approach to implementing Life Event Service ecosystems. The AuroraAI program is currently planning the implementation of three Life Event Service ecosystem pilot projects in four different municipalities in Finland, the first of which is planned to be implemented later in 2020. In a workshop with stakeholders in the program, their approach to implementation of Life Event Service eco-systems was visualized as a map. This map served as the basis for analysis of their approach and application of the findings which unveiled two potential gaps and thus, opportunities for improvement.
Firstly, the research found the program's data-driven quantitative approach to user research to put service providers at risk of being left disconnected from the needs, goals, and motivations of individual people experiencing a Life Event.
Secondly, it suggests the service providers might be lacking the infrastructure and the framework for effective collaboration which might hinder the development of joint Service offerings.

In order to enhance the program's approach and enable service providers to collaborate in Life Event Service ecosystems and develop joint Service offerings, a set of recommendations was proposed. These recommendations outline a design-led approach (1) to afford a closer connection between service providers and individual people experiencing a Life Event and (2) to enable collaboration of service providers by forming Communities of Service.
The proposed approach recommends affording a closer connection between service providers and individuals by employing qualitative user research in addition to the quantitative research planned; identifying Service needs; and utilizing personas as a storytelling device. In order to enable collaboration of service providers, they are facilitated to form Communities of Service in which they map Service journeys based on the identified Service needs; build Service propositions; and define ownership and responsibilities within their Community of Service.

6.1. Reflection on the Results

The purpose of this section is to offer a reflection on the research process of this thesis and its results. After some general reflections, the research questions guiding this research are answered, aiming to allow for a reflection of the results with regard to the AuroraAI program.

Exploring the concept of Life Events and its application in the public sector and especially in service design in the context of public services as the main focus of this research proved to be an engaging endeavor—mainly because this connection had not been explored in any academic research before.
This lack of prior academic engagement with the topic made for consistently changing directions of this research throughout the process, rendering it difficult and even confusing at times. Yet, the broad examination of the topic, discovering suitable frameworks and connecting the dots along the way was one of the most rewarding aspects of this process.
Not only the lack of academic research to draw from but also the AuroraAI program as the research setting made this research process quite interesting. The rather young program is still in the process of becoming, constantly shifting shape and focus with every new stakeholder onboarded, making it difficult to grasp at times. Embedded in the public sector and heavily influenced by and crucially dependent on decision making processes that are naturally slow, the program's pace and scope are quite different than those of a master's thesis.

Beyond these limitations, the vagueness of the concept of Life Events proved to be one of the major obstacles to overcome. Life Events, admittedly, do seem like an obvious, almost trivial concept; however, their implications when applied in the context of public services are not. Within the program, this often seemed to be overlooked, leading to at times vague and buzzword-heavy communication. Clarity of concepts and terms, however, is paramount to allow for clear communication of the program's vision—which is all the more important considering the program's immense ambitions and its potential to influence not just every service-providing organization but every single person living in Finland.

RQ1: What are Life Events?

Contextualizing the concept of Life Events through Service-Dominant Logic (Vargo & Lusch, 2004) and the four levels of service experience (Bailey, 2019; Polaine et al., 2013), this research suggests that in the context of public services, Life Events can essentially be understood (1) as a lens for user research to understand the wider context of people's lives in which they are using services; and (2) as a metaphor for service providers to bundle services into Service packages beyond pre-existing government structures that answer Service needs which arise in the events in people's lives. Crucially, these two interpretations of Life Events as a lens or as a metaphor seem to be intertwined. The contextual information gained through user research can be considered essential for service providers to be able to bundle the right services into Service packages. In turn, only Service packages beyond government silos are able to answer Service needs effectively.

RQ2: In the AuroraAI program, how can service providers be enabled to design services in context of Life Event Service ecosystems?

For Life Event Service ecosystems to be successful, this research identified infrastructure beyond technology as the deciding factor that must not be omitted. Technological infrastructure that allows for service providers to collaborate and deliver Life Event-based services is the main focus of most of eGovernment research as well as the AuroraAI program—decidedly, it is one of the key enablers. However, in order to bridge silos effectively and allow service providers to collaborate, a framework for collaboration and the right methods appear to be as important.

With regard to the AuroraAI program, Communities of Service (Strauss & Wilson, 2015) were identified as a framework that might enable collaboration, emphasizing the collaboration among people and the importance of Service over services. In order to facilitate these communities, a design-led approach based on qualitative user research and service design methods was identified.

6.2 Limitations of the Research

In terms of limitations of this research, there are several things to consider. First, the service experience framework proposed by Polaine et al. (2013) and expanded by Bailey (2019) that was applied to assess how Life Events are utilized has served its purpose; however, a more rigorous approach might be called for. The framework is mostly based in design practice which made it valuable in the context of this research as it was concerned with the practical application of a Life Event approach in design. Yet, it can be questioned how academically sound the findings are in light of this focus on practice.

Second, the generalizability of the findings of this research might be limited due to the rather small sample of interviews (n=6) and the explicit focus on the AuroraAI program and the Finnish context; therefore, applying the findings in other contexts, such as other countries or other sectors, might prove to be challenging.

Third, the recommendations proposed for the AuroraAI program might be rather general and lacking in depth. Due to different timelines between this research and the AuroraAI program and the unpredictable pace of progress of public sector project of this extent, collaboration with AuroraAI was not as close as it perhaps should have been for the recommendations to be more valuable. For the same reasons, the recommendations have not yet been tested.

6.3. Future Research

This study opens up several pathways for future research to enhance the understanding of the concept of Life Events in the context of service design and the public sector. As implied above with regard to the limitations of this research, validating and critically assessing the findings with more data in the Finnish context or in another context could be a first step to build on this research. With regard to the AuroraAI program, the findings' validity can be assessed by detailing and applying the recommended approach in practice. Further, research and case studies detailing the Communities of Service framework are needed.

While referring to service ecosystems and organizational requirements in many instances, this thesis does not provide an in-depth analysis of either of them; therefore, future research is recommended to explore Life Events with regard to these. With regard to service ecosystems, this could include the creation of value in service ecosystems (Vargo et al., 2017) and the co-creation of services (Bischoffshausen & Hottum, 2015; Oertzen et al., 2018), which is particularly interesting in the context of user-personalized services (United Nations, 2018, p. 17) akin to the service model the AuroraAI program is proposing.
In terms of the organizational requirements for Life Event Service ecosystems, the role of design in the organization (Junginger, 2009) and its potential for organizational change (Deserti & Rizzo, 2014) and for cross-organizational service networks (Hyvärinen et al., 2015) should be taken into account.

Looking beyond the practical implementation of Life Event Service ecosystems, ethical implications should be considered. Data sharing and close collaboration among different organizations across government and across sectors has strong implications for essentially everyone. Taking into consideration issues of privacy and democratic legitimacy, the ethical dimension of initiatives such as the AuroraAI program could be discussed in future research.

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APPENDICES

Appendix 1: Interview Guide

First of all, can you briefly describe who you are and what you do?
What have you been working on lately?

From the perspective of your [abc] practice, what are Life Events?
Do you think they are worth considering and provide value to your [abc] practice?
How do they inform your [abc] process?
Do you utilize them in your work at [xyz]?

Where did the idea of Life Events come from? It is hard to trace back; somehow it seems that it emerged in different places at different times—when and how did you first encounter it?

How did you find a common definition of Life Events, i.e. where it begins and ends, what services are in it, etc.?

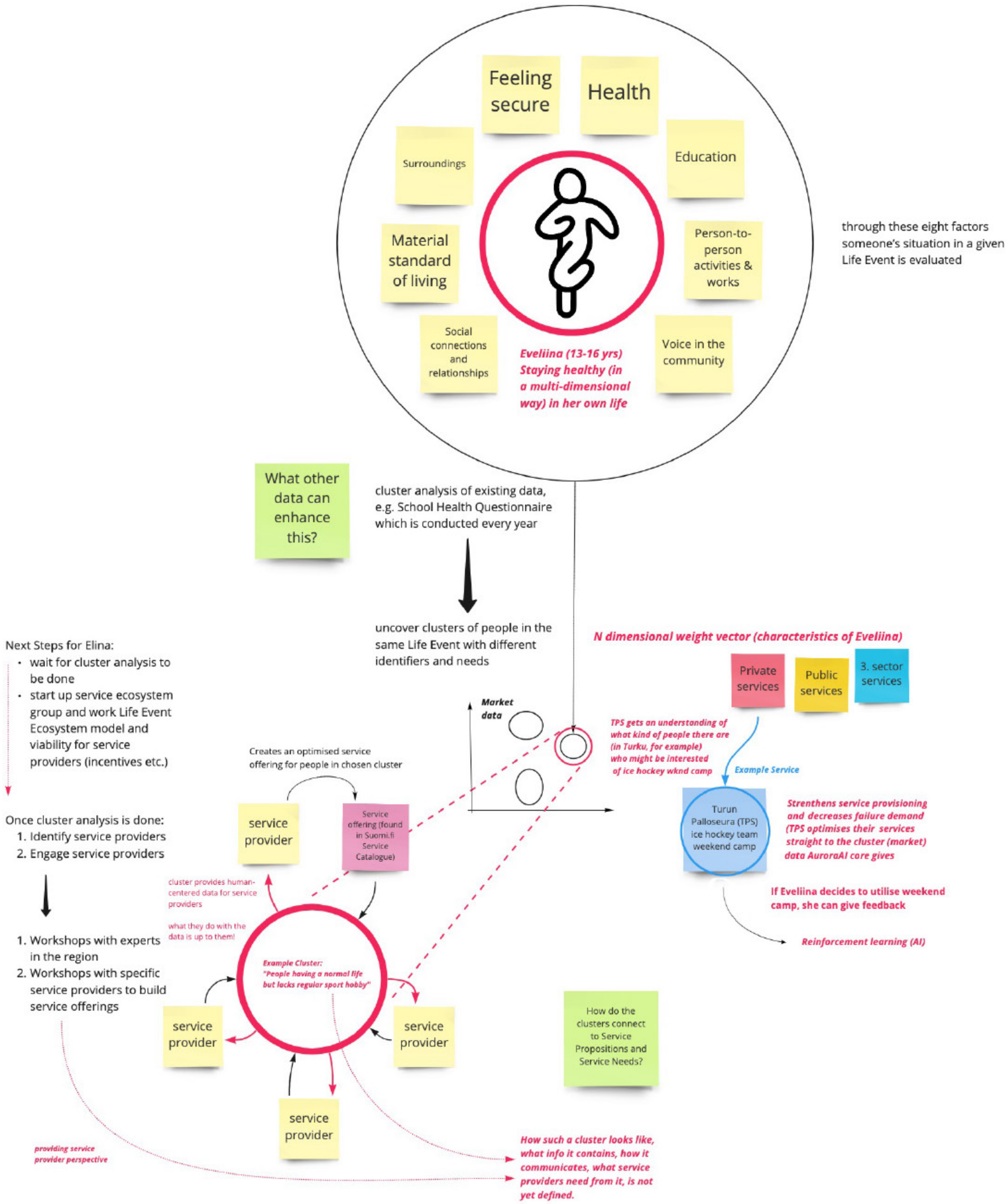
How does your user research look like? How do you make user insights available for service providers across the Life Event?
How do you coordinate collaboration of service providers across Life Events?

How do you think we can design consistent, seamless end-to-end user journeys around Life Events?

How do you convince service providers that Life Events are a good idea and they should perhaps change their processes and ways of working?

Do you know about the AuroraAI project?
Are you in talks with them, collaborate with them, or plan to do that in the future?

Appendix 2: Map of the AuroraAI program’s approach to implementing Life Event Service Ecosystems


Feeling secure
Health
Surroundings
Education
Material standard of living
Person-to-person activities & works
Social connections and relationships
Voice in the community
Eveliina (13-16 yrs) Staying healthy (in a multi-dimensional way) in her own life
through these eight factors someone's situation in a given Life Event is evaluated
What other data can enhance this?
cluster analysis of existing data, e.g. School Health Questionnaire which is conducted every year
uncover clusters of people in the same Life Event with different identifiers and needs
Next Steps for Elina:
• wait for cluster analysis to be done
• start up service ecosystem group and work Life Event Ecosystem model and viability for service providers (incentives etc.)
Once cluster analysis is done:
1. Identify service providers
2. Engage service providers
1. Workshops with experts in the region
2. Workshops with specific service providers to build service offerings
Market data
N dimensional weight vector (characteristics of Eveliina)
Private services
Public services
3. sector services
TPS gets an understanding of what kind of people there are (in Turku, for example) who might be interested of ice hockey wknd camp
Example Service
Turun Palloseura (TPS) ice hockey team weekend camp
Strenthens service provisioning and decreases failure demand (TPS optimises their services straight to the cluster (market) data AuroraAI core gives
If Eveliina decides to utilise weekend camp, she can give feedback
Reinforcement learning (AI)
Creates an optimised service offering for people in chosen cluster
service provider
Service offering (found in Suomi.fi Service Catalogue)
cluster provides human-centered data for service providers
what they do with the data is up to them!
Example Cluster: "People having a normal life but lacks regular sport hobby"
service provider
service provider
service provider
How do the clusters connect to Service Propositions and Service Needs?
providing service provider perspective
How such a cluster looks like, what info it contains, how it communicates, what service providers need from it, is not yet defined.

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