Innovate New Service Development

in a product-oriented and highly regulated corporation

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Executive Summary

To satisfy the growing needs of customers for services many product-oriented companies in various industries have started switching their focus from products towards service offerings. To stay competitive, New Service Development became an important concern for many companies to achieve. Company Z, which is a product-oriented corporation, continuously improved its New Product Development processes to successfully launch technology-driven product innovations. Aware of the current importance of service offerings, Company Z has integrated New Service Development into their processes but still faces challenges while developing their services. A key role in developing and launching services plays the recently established service development team.
The aim of this project was to identify the pitfalls of the current New Service Development process of the Service Development team of Company Z and identify opportunities for overcoming them to create an improved process framework that fits the flexibility required for services.

The development and delivery stages of the New Service development process of Company Z were reviewed and literature was researched about services and New Service Development. It was found that New Service Development in order to be successful require, compared to NPD, a different mindset, high customer involvement and flexibility. However, product-oriented companies tend to keep elements of their old New Product Development approaches for certainty reasons and due to the rather less researched field of modern New Service Development.
Comparably, internal company research revealed that Company Z develops and delivers its service offerings with a service-oriented process which to a large extend is product-oriented. Based on the literature and qualitative research it was identified that this product orientation causes sometimes fragmentation and overstretch in some parts of the process. This lead in some cases to an increase of bureaucracy, inconsistent early customer involvement, and minor flaws in the team collaboration. In order to address any of these issues in the long term, a service-logic in some parts of the process need to be increased.

To find a solution, in this rather academically unexplored research area, a Delphi study with several experts was conducted. Based on the Delphi study and literature it was discovered that an incremental change towards a service-logic can be fostered by establishing a high level of customer-centricity within the current New Service Development process. A solution was created that enables customer involvement within the New Service Development process of Company Z via early service prototyping to foster a service-oriented way of working. Finally, a Roadmap was created that describes in three horizons how service prototyping can be implemented into the current way of working.

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Contents

Introduction

Due to the continued economic development in the last decades, there has been a transition from an industrial into a post-industrial era. This transition caused a shift from a manufacturing economy to a service economy, also called knowledge or information economy (Brandt, 1999; Dentico, 1999; Buera et al., 2009), in many places in the world. A manufacturing economy is based on the exchange of mass-produced tangible products out of tangible resources such as raw materials (McDowell, 2009), whereas the service economy is driven by leveraging intangible resources such as knowledge to produce intangible economical value (Brinkley, 2006).
This shift caused a significant growth in the service industries. In 2019, services accounted for 69 per cent of the GDP of the EU, up from 59 per cent in 1991 (World Bank, 2020). In contrast, the Industries contribution to the GDP of the EU declined from 28 per cent to 22 per cent in the same time period (World Bank, 2020).
To satisfy the growing needs of customers for services, many product-based manufacturing organizations started to move towards more service-based business models that increased the service component of their offerings. One of the most prominent examples is the company IBM, who has entirely transformed itself from a product-based company into a service company by providing its personal computers and server systems to Lenovo (Lenovo, 2004; IBM, 2014). Similarly, SKF, the Swedish manufacturer of ball and roller bearings, which started offering subscription-based diagnostic and predictive maintenance services (SKF, 2014).

In recent years, manufacturers from various industries have started switching their focus from selling products towards selling the solutions that their products offer instead. The object of the transaction is no longer the tangible product but rather the use of the product. Due to this trend called "Servitization" (Stahel, 1994), NSD became more and more an important concern for firms to achieve and sustain competitive advantage (Jaw et al., 2010). Some even argue that NSD is essential for organizations to survive the competitive economic climate. (Smith et al 2007). However, many traditional Product-oriented companies seem struggling to adapt the shift towards services and fail to compete against new established service-oriented organisations (Oliva & Kallenberg, 2003; Gebauer et. al., 2005). This might be because services are developed with traditional rigid and linear structured development processes from the manufacturing era where heavy control over the production process is exerted to efficiently produce tangible products.

In contrast, NSD processes follow ideally a loop structure in which a service is continually evaluated and adapted to remain innovative and keep the customer attached.
Hence, there is a need for flexibility in NSD to handle the imprecision and ad hoc characteristics which are needed for developing Services. (Montoya-Weiss and O'Driscoll, 2000). The traditional development processes are generally highly defined, polished and well embedded in the business structure and company culture due to their long duration. New ways need to be found, how to enable incrementally more flexibility and adaptation to change, without disturbing the highly synchronized and standardized proceedings of the organization.

Problem Definition

Company Z is currently facing a big transformation from a product-based,- towards a service-based business source. Company Z has successfully developed products for quite a while. Switching now the mindset towards services is one of the biggest challenges they currently face. Located at the frontline of this transformation, is the Company Z's Service Development team. The team fulfils the function of developing and launching a new service out of a service proposition, therefore plays a key role in providing new service propositions. The Service Development team now faces several difficulties in its current way of working, since its NSD process does not fit optimally with the agility and flexibility required for services.

Key Words

New Service Development (NSD)
NSD is the process of developing and launching a service offer.

New Product Development (NPD)
NPD is the process of bringing a new product to the market

Internal Service Development Process (ISDP)
The IDSP refers to the internal NSD process of Company Z

Service dominant logic (S-D logic)
The S-D logic is a theoretical framework for value creation through use of goods.

Goods dominant logic (G-D logic)
The G-D logic is a theoretical framework for value creation through exchange of goods.

Aim and Approach

In my thesis, I want to review the pitfalls of the current New Service Development Process of the Service Development team of Company Z and how to overcome them to create a faster and better development process that fits optimally with the agility and flexibility of services. This results in the broad Research Question:

> *"What are the problems of the current Service Development Process of Company Z's Service Development team and how can they be overcome to create a faster and better development process that fits optimally with the agility and flexibility of services?"*

In order to answer this research question, the approach will be split into a research phase and a development phase. The first part of the research phase starts with an initial literature review to understand the fundamentals of services and what makes them so different from products. This leads to the first Sub-Question:

> *Sub-Question 1: "What is a service and what distinguishes it from a product?"*

Building upon that, reasons need to be found why big product-oriented organizations are facing so many difficulties when they perform a transition towards service development. This results in the second Sub-Question:

> *Sub-Question 2: "Why do big product-focused organizations struggle to successfully implement New Service Development?"*

Building on the gathered theoretical fundament, the second part of the research phase will be about discovering the context of Company Z. Starting with understanding the current team structure and the internal NSD process in use through qualitative research and company internal sources. To deal with the complexity and vast size of such processes, a specific process section will be framed for a more in-depth analysis. The section will be based on the level of impact and value design tools and methods are able to provide. The phase concludes with a proposed design direction which is based on the knowledge gathered from the literature review and the unveiled pitfalls of the current NSD process.

In the second phase, the beforehand defined design direction will be developed into a design concept of an improved process framework that improves the current way of working within the framed NSD process and makes it fit the agility and flexibility required for services.

Chapter 1: Literature Review

This chapter presents a Literature Review in order to understand why many product-oriented organizations seem to struggle when switching from products to services.
The review starts with understanding the fundamentals of services and how they differ from products. Secondly, it examines the differences between New Service development (NSD) and New product development (NPD) and why a switch seems so difficult for product-oriented corporations.

Services and Products

To understand the differences between products and services, one needs to understand the definition and classification of products first. The definition and attributes of products are clearly defined and accepted among the majority of academics. Based on early definitions from Adam Smith in 1776 and Nassau Senior in 1863, The System of National Accounts (1993) defined products as physical objects for which a demand exists, over which ownership rights can be established and whose ownership can be transferred from one institutional unit to another by engaging in transactions on markets.
The attributes of products were collected and summarized by Parry et al. (2011):
(1) Physical objects for which a demand exists, (2) Their physical attributes are preserved over time,
(3) Ownership rights can be established, (4) They exist independently of their owner, (5) They are exchangeable, (6) Unit ownership rights can be exchanged between institutions, (7) They can be traded on markets, (8) They embody specialised knowledge in a way that is highly advantageous for promoting the division of labour.

In comparison to products, services seem to be more difficult to define and classify which might make it complicated to find distinctions between both. Therefore, some different perspectives on services are explored.

Stoshtack's evidence for services

In breaking free from product marketing, Shostack stated in 1977 that services are different to products and therefore need to be seen as two different subjects from a marketing perspective. Shostack stated that in contrast to a product, a service is innately intangible and therefore cannot be touched or described as precise as a product. She describes that most market entities are never fully intangible or tangible. Hence, most goods and services are located somewhere between the two extremes. To tackle the intangible abstractness of a service towards the customer, physical evidence needs to be placed into the delivery of the service. She distinguished between peripheral and essential service evidence. The peripheral evidence is a tangible possessive element with a low value for the consumer, while the essential evidence has a high value for the consumer and therefore has a more important role in evaluating the service.
The overall service proposition then consists of the sum of several tangible service elements and intangible service processes. To map these different elements she later introduced a flowchart technique called the Service Blueprint (Shostack 1984). In this framework, the tangible service evidence (front-office) becomes departure points for the service production activities (back-office) that are not visible for the consumer or below their "line of visibility" while using the service (Shostack 1984). Now each piece of visible and invisible service evidence is mapped out to create a comprehensive overview of the entire service.

The IHIP characteristics

Younger service marketing research defined the so-called IHIP (intangibility, heterogeneity, inseparability and perishability) characteristics to classify Services.

1. Intangibility states that services are performances, rather than objects and can only exist in connection to other things. They cannot be seen, felt, tasted, or touched in the same manner in which products can be sensed (Shostack 1977).
2. Inseparability of production & consumption describes that services are produced and consumed at the same time, whereas products are first produced, then sold and then consumed (Say 1836).
3. Heterogeneity concerns the high potential for variability in the performance of services. The quality and essence of a service can vary from producer to producer, from customer to customer and from day to day. (Langeard et al. 1981)
4. Perishability means that a service can not be saved or stored in inventories for potential future sales (Thomas 1778; Bessom and Jackson 1975; Hill, 1999; Gadrey, 2000).

From 1980 onwards these characteristics were widely accepted to classify traditional non-digital services. At this time the internet and digitization were still in its infancy and not implemented in daily life, therefore the support of the IHIP characteristics faded by time (Lovelock and Wright, 2001; Gummesson, 2000; Vargo and Lusch, 2004).
Lovelock & Gummesson (2004) as well as Rust (2004) state that some of the IHIP characteristics for services, but especially perishability and inseparability, can be overcome with the help of new technology-based communication and thus are not generalizable to digital services. For instance, storable, web-based lectures in distance learning. These lectures can be stored digitally and thus consumed separated from their production. Moreover, Salminen (2014) states that the IHIP characteristics, except intangibility, do not fit well to digital services but he further argues that digital services might not even be comparable with traditional non-digital services due to inconsistencies in the

definition of services in the current paradigm of service marketing. Hence, it might be questionable to adapt the IHIP characteristics to modern digital services the same way than on traditional services.
On one hand, this could imply that some of the IHIP characteristics are not suited anymore to classify services and thus should be reconsidered. On the other hand, it could imply that digital services, in particular, should not be classified as services at all but rather as digital products or something of their own.

Overall it can be said that the IHIP characteristics seem to be often challenged in literature and also interpreted differently across professional backgrounds. Therefore they should not be used to classify all services and thus can not be used to distinguish products from services in general. Nevertheless, Lovelock & Gummesson (2004) argue that each of the IHIP characteristics taken separately might be still valuable for further research on services.

Gallouj and Weinstein's service characteristics

Gallouj and Weinstein (1977) argue that a service does not exist as a single autonomous entity and thus can never exist independently from its producer. A service is intangible and is identical with its producer and consumer. On the other hand, goods are tangible and can exist independently from its producer and consumer. The authors developed an overarching vector-based innovation model. This model represents a service and consists of four interrelating characteristics: *Service characteristics* (Y), these are the characteristics perceived from the customer point of view (user experience). The *technical characteristics* (X), those can be tangible technical characteristics (ICT, logistics technology,...) or intangible technical characteristics (methods, models, etc.). The *competence characteristics* (C), which represents the knowledge competencies of the provider being explored during the process. And finally, the *customer competence characteristics* (C'), which represents the competencies of the customer including its co-production capabilities.
Overall, the model provides argumentation for the characteristics of a service and its creation process. It shows that the outcome of service characteristics depend on the providers and customers combined knowledge competencies. Hence, the co-production capability of customer and service provider is an important part of a service.

Edvardsson and Olsson's customer processes

According to Edvardsson and Olsson (1996), the distinctive character of a service is the participation of the customer in its production process as a co-producer. Hence, the customer and its needs are placed in the central role of service development, since a service and its value can only be perceived with a participating customer. They state that a service is constructed out of three elements. *The customer outcome, the customer process and the service prerequisites.*
The *customer outcome* is the outcome of the service, thus its perceived value through the customer.
The *customer process* is the active participation of the customer in the service production process. The *service prerequisites* are the required resources for creating the service.
For instance, a repair service for a bike: The prerequisites offered by the company would be a workshop, technician, spare parts and tools.If no customer breaks his bike, the service and its perceived value do not exist. For the creation of a service, a company will only offer the service prerequisites to the customer and he or she will create their own service outcome. This means that a company is not able to sell services itself but rather opportunities for services. Thus the company central aim should be to provide the best possible service prerequisites for its customers. Therefore Edvardsson and Mattsson broke the service prerequisites down into 3 parts: the *service concept*, which is defined as a set of customer needs and how they are satisfied in the form of the content of the service. The outcome the customer perceives determines the customers' perception of the quality of the service. *The service process* is a chain of activities which are needed to deliver the service concept. And the *service system* constitutes the required resources to generate the service process: company staff, customers, physical/ technical environment, and organization & control (Edvardsson and Gustavsson 1990).
The company staff is seen as the key resource if not as part of the service because the quality of the service depends to a great extent on how the customer perceives the staff. Thus, motivated, trained and properly educated staff should be considered as a part of the service. Moreover, they state that a service system should be designed in a way that the customer is able to steadily contribute to it. To achieve that, several points should be controlled while developing a new service: The customer relationship with the company's organizations, the interaction between customer and staff, the interaction between the customer and physical/technical environment. Further, a service must work within the existing technical environment. Finally, the company's interaction with customers and other partners must be controlled by planning how to receive and handle feedback and complaints.

Service as a process

For Ramaswamy (1996), a service is a non-physical methodological and structured framework that consists of an organized sequence of activities. This process consists of the two main phases of service design and service management and is based on the field of service engineering, which is the systematic development and design of services using suitable models, methods and tools.
A process is hierarchically divided into several sub-processes and sub-subprocesses which are made up of several parts or service elements that get iteratively developed and refined. For every developed element, certain alternatives are tested until the best possible outcome is determined. Hence, service development seems highly fragmented and bureaucratic where the service is divided into several pieces that get individually developed and tested.

The service triangle

Hill (1999) claims that a service is produced by one economic unit for another, but is not exchanged between them. Based on that Gadrey (2000) defined a service as a change in the conditions of a person or a good belonging to some economic unit, which is brought about as the result of the activity of some other economic unit with the prior agreement of the former person or economic unit. He further states that a Service is a set of activities that involves a triangular relationship between the three elements *Service provider, service user* and a *status change of a medium*. The Service provider carries out a set of activities that were requested by the service user to bring a change in a medium that is also owned by the user. No ownership rights are exchanged but the value is created for the user and the provider. The lack of ownership in services was already stated by Rathmell in 1966. According to Rathmell (1966), unlike products, a service is an act rather than a thing. When purchasing a service the customer pays without establishing an ownership right of an asset. In contrast, when a product is purchased the customer establishes an ownership right of an asset. Hence, it is difficult to establish ownership rights over services and by the time their production is completed they must have been provided to the consumers.

Are products services?

So far it was found that there is a large discussion about what exactly distinguishes a service from a product and what exactly defines a service. Most of the service characteristics seem to often overlap on one hand with products but similarities are often neglected on the other hand.
So it might be that there are actually not many pure products and services but rather a spectrum of product-service variations that can be placed in between.
Vargo and Lusch (2004,2006,2008) took this further by stating that all products and services only realise their value through their use and both products and services exist to provide a service to a customer. They developed the service-dominant (S-D) logic which is based on the value-in-use meaning of value (Vargo and Lusch, 2008a). This means that value is always co-created in interactions between providers and users through the application of resources for the benefit of both (Vargo & Lusch, 2004, 2008). The service provider can invite the user via a proposition that the user will turn into value through usage (Lush & Vargo, 2014).
In contrast, the goods-dominant (G-D) logic is based on value-in exchange-meaning of value (Vargo and Lusch, 2004). This means the value is created and exchanged on the market in the form of products. A dominant logic is represented by a common mindset of how an industry basically works, as well as the accepted tools and approaches used by the 'dominant coalition' in their decision making (Prahalad and Bettis, 1986). In the view of the S-D logic, all exchange is based on a service. If goods are involved they are only a tool to deploy a service, or in the words of Bettencourt and Ulwick (2008): products are hired by customers to get jobs done.

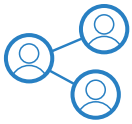
Since services and products overlap and its boundaries seem to blur, there is a shift from the G-D logic towards the S-D logic (Ng et al. 2014). The thinking shifted from separate products and services towards a product-service combination called a product-service system (PSS). The term product-service system has been defined by Goedkoop et al. (1999) as "a marketable set of products and services capable of jointly fulfilling a user's need. The product/service ratio in this set can vary, either in terms of function fulfilment or economic value". In other words, PSS offers value-in-use (Baines et al. 2007). This shift can be seen by various trends like the leasing society, the change from consumer attitudes from sales to service orientation, repair society, and the sale of products instead of the product itself (Mont 2002).

Summary & Insights

Many attempts to characterise Services have been proven to be false. For instance, the four IHIP characteristics (intangibility, inseparability, perishability and heterogeneity) which got often challenged and criticized to be wrong. Therefore it is tricky to define what a service is since many classifications were often counter-argued. Interestingly, Shostack's (1977 & 1984) research on services still seems strong in place since many contributions have been made to her work. So it might be that there are actually not many pure products and services but rather a spectrum of product-service hybrids that can be placed in between and having variations of joint characteristics. It seems that the existence of products and services are intertwined. Products are beginning to behave like services and, in return, services behave like products.
The focus seems to shift from a pure product or pure service focus to a combination of both named product-service systems. Companies tend to offer a combination of products and services to better provide value to their customers and thus might generate higher revenues. This can be seen in the trends of servitization, where product-oriented companies increase their revenue by offering service options in addition to their products (Vandermerwe and Rada 1988; Oliva and Kallenberg 2003), and productization, where service companies adding tangible products to their core services to better fulfil customers needs (Leonie, 2015).

Even if it is not easy to define what exactly distinguishes Services from products there seem to be some service characteristics that continuously appear in most of the articles and seem not to be counter-argued so far and can be seen as elements of distinction: (1) The user is an essential element of a service, (2) A service is innately a collaborative effort between many Stakeholders and users, (3) Services are based on value-in-use logic, (4) Standardization of service performance is difficult to achieve (5) It is difficult to own and store a Service.

1. The user is an essential element of a service.
The service provider can only invite the user via a proposition that the user will turn into value through usage. Without someone using the proposition, there will be no Service further less a novelty and value determined. Hence, the user is the central point of every Service creation. Compared to a product, a Service can not exist without someone using the offering.



2. A service is innately a collaborative effort between many stakeholders and users
Services are co-created in use between users, technologies, resources and a network of Service prerequisites providers performing different actions at different times with the aim to create mutual value. Their coordinated and collaborative interactions are crucial for the existence of the service.
Due to too many stakeholders involved, this can easily lead to a clash of opinions, interests, world views and values between those. The strongest decision-makers in the whole service ecosystem may have a huge impact on the shape of the service. Therefore creating a Service can become highly political due to its potential complex network of human-relations during its creation. The attempt to fully control this vast amount of human relations and interrelations with resources and technologies by the service provider could potentially lead to an extremely complex and obscure situation.

3. Services are based on value-in-use logic
Where is value created? Is value created while goods are exchanged or while they are used? Is the value created by selling products or is value created by using the product? From a Service perspective, value is always created in use. The user is allowed to use the service prerequisites and resources from the service provider to create value for him and others. Thus, if a service provides value is determined by its users and not the producer. In products, the manufacturer is able to determine whether his released product is innovative or not by using innovative technologies in the production process of the offer. In Services, only the users can truly evaluate

the value and novelty of a service offering and not the provider. Value comes from usage and cannot be embedded in the production of a new good as it works for products. The service offering can entail several innovative technologies or methods and still not be perceived as innovative by its users. This fundamental switch in value perception and creation is key to understand for product-oriented companies that want to become successful solution providers. This can lead to tricky situations for many product-based organizations since their traditional quality measurement procedures and tools are not suited for service offerings.

4. Standardization of service performance is difficult to achieve

There is a high attempt to standardize service operations and service experience to create reliability, effectiveness, transparency & trust, and improved economic efficiency. However, each customer is different and can behave in unpredictable ways and situations. Therefore, each unit of the same service delivered might differ in output quality to the other service units. Service providers with a high focus to standardize the delivery and user experience of its service offerings should acknowledge that it might come with a potential loss in provided value.

5. It is difficult to own and store a Service

A Service can not be stored for later use, since it is co-created in use between many stakeholders at the same time. This leads to a weak level of ownership for the service provider, which makes it difficult to protect the intellectual property of the service and easy to copy for competitors. The service provider should consider to design and provide the service prerequisites in a unique way so that a particular superior service will only be possible with a special set of protected service prerequisites.

NSD and NPD, its differences and why do big product-based companies struggle implementing NSD?

> The last part defined services and its differentiation to products. It became clear that services are complex entities where the roles of user, provider and other elements play an essential and intertwined role in creation and consumption of the service. Moreover, it was found that the boundaries between services and products seem to blur and that the thinking shifted from a pure product and pure service focus towards a combination of so-called product-service systems.
>
> To explore how services are created, this section focuses on the development processes of services and products, its differences and why it seems so difficult for big organizations switching from one to the other to become services and solution providers.

New Service Development (NSD)

NSD describes the entire process of developing service offerings from idea to market launch (Goldstein et al., 2002; Johnson et al., 2000; Mager, 2004). The growing customer demand for services or complete solutions instead of single products made many successful good manufacturers realize that they need to add services and solutions to their offers if they want to stay competitive on the market. (Smith et al., 2007; Jaw et al., 2010). Hence, many product manufacturers transition to service or solution providers (Gebauer, Gustafsson, and Witell, 2011; Oliva and Kallenberg, 2003). Due to the strong focus on product offerings in the past, NPD has been researched for several decades resulting in a large amount of well-documented knowledge about the NPD process and its key success factors (Brown and Eisenhardt, 1995; Hauser, Tellis, and Griffin, 2006; Henard and Szymanski, 2001).
The increasing importance of the service economy has sparked many studies on NSD and service innovation in the last decade (Kitsios et al., 2009; Zomerdijk & Voss, 2011; Papastathopoulou & Hultink, 2012). Despite that, the knowledge on NSD is limited and the literature is fragmented and does not provide a standardized set of generally accepted tools and guidelines for guaranteed success in developing services (Biemans et al., 2016).

The field of research about service innovation is comparatively new in comparison to product innovation and has grown fast in the recent years (Biemans, Griffin, and Moenaert, 2015; Kuester, Schuhmacher, Gast, and Worgul, 2013; Papastathopoulou and Hultink, 2012). Many scholars see service innovation as an outcome of the process that created value for all stakeholders involved through new and/or improved service offerings, service processes, and service business models (Ostrom et al., 2010; Witell et al., 2016). In other words, the process of developing new service offerings is NSD and the outcome of the process is service innovation. Moreover, Gallouj and Weinstein (1997) argue that Service Innovation can be seen as any change that affects one or more service characteristics. In general, two broad ways of thoughts are existing in relation to service innovation. The first way assumes that there are significant differences between service innovation and product innovation. The second way emphasizes the similarities between service innovation and product innovation. The insights from both ways are valuable, however, both have been criticized for being too narrow and biased towards technology-based innovations (Ordanini and Parasuraman 2011; Szymanski et al. 2007). Therefore, some argue for an integrative approach towards service innovation (Gallouj and Savona 2009; Ordanini and Parasuraman 2011). However, Lusch and Nambisan (2015) argued that also these integrated approaches are still too narrow because they still rely on the traditional context that a service is produced and consumed, therefore rely on the Goods-Dominant (G-D) logic.

New Product development (NPD)

Due to the large knowledge base of NPD, many models have been proposed to facilitate success and efficiency. The most important contributors are Booz, Allen and Hamilton (1982) who created the seven-step model (BAH model) of NPD, which sets the standards for most other NPD models. These contributors described NPD as an organised linear process made up of well-defined steps that flow from initial idea to launch. This peaks in the Stage-gate model of Cooper (1990), on which most theoretical and practical models are still based.

The Stage-gate process and its evolvement

The stage-gate system is a conceptual and operational model for moving a new product from idea to launch. It is a blueprint for managing the NPD process to improve effectiveness and efficiency (Cooper 1990). The process is divided into a number of stages. Between each stage is a gate or checkpoint that controls quality and the production process. Every gate has some criteria the product must pass and deliver before it can continue to the next stage. The stages are where the work is done in form of several activities and the gates ensure the quality (Cooper 1990). Gates are manned by a gatekeeper group which is experienced enough to decide if the project passes the gate (go decision) or gets stopped (kill decision). Normally a project leader takes the project from stage to stage and is aware of which inputs are required to pass the next gate. The modern stage-gate differs somehow from the original stage-gate model from 1980, however it works still after the same core principles.

Depending on the individual needs of each company, there are several different variants of the stage-gate ranging from modular models to only three-stage models. However, the basic modern stage-gate process, , which can be seen in figure 1, consists of the five stages: *1) Idea generation 2) building business case, 3) development, 4) testing & validation 5) launch* (Cooper 2008). Many criticized that the process is too structured, linear, inflexible, too controlling and bureaucratic, loaded with paperwork and full of too much non-value-adding work. This makes it difficult to handle more innovative and dynamic projects (Becker 2006 ; Lenfle and Loch 2010). Reacting to that, the stage-gate process was combined with elements from the Agile approach to make it more flexible and iterative (Cooper and Edgett, 2016).

Agile

Agile emerged in 1990 in software development. It was a new way, including new methodologies, to execute projects. This was summarized in the Agile Manifesto in 2001 (Beck et al., 2001). The Agile Manifesto emphasizes individual collaborations and interactions over processes and tools, many short iterations with functional and visible results over comprehensive documentation, customer collaboration over contract negotiation, fast responding to change instead of following a plan, and flat team organization and distributed decision making instead of hierarchical responsibilities. All four principles are depicted in figure 2 on the next page.

The most popular version of Agile in conjunction with stage-gate is Scrum. Scrum is an implementation project management framework that follows agile principles and moves forward via a series of short iterations named sprints. The basic idea is to do things in small increments and fast iterations, with emphasis on reviewing work to help the team move towards the goal (Schwaber & Sutherland 2013).

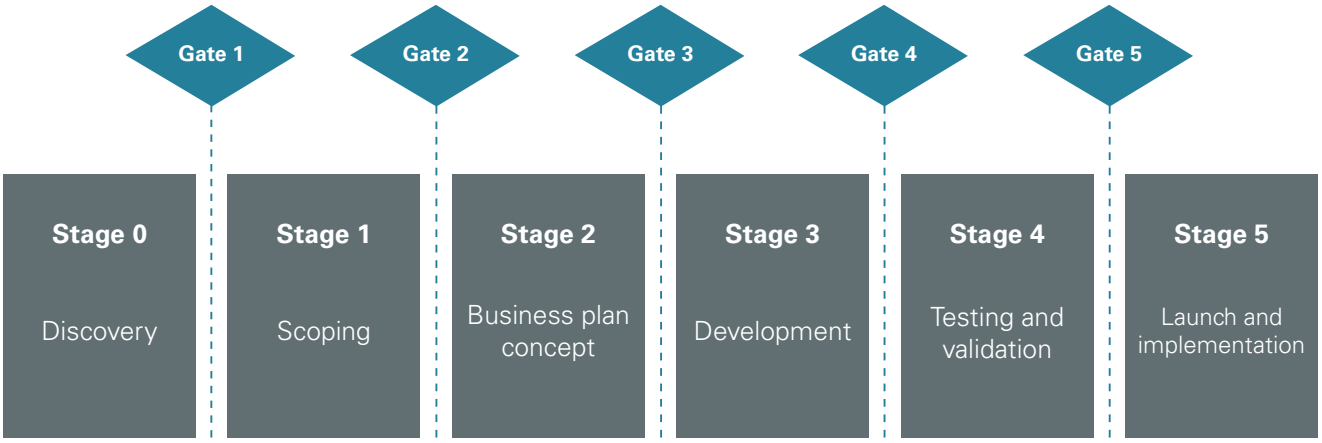


Figure 1: The graphic shows the basic stage-gate process principle by R. Cooper.

Agile principles within the Stage-gate process

The so-called "Agile-stage-gate hybrid model" integrated principles and methods from Agile project management, mainly Scrum, into early and late phases of the Stage-Gate model. This is depicted in figure 3. It basically implemented multiple spirals or iterations that involve the customer in every stage of the process by keeping the typical stage-gate structure. The value of the model is not completely proven yet, however it seems that some early adopters of the model measured better team communication & moral and faster product development in comparison to their traditional stage-gate models (Cooper 2016). Overall, it can be seen as a try to implement some methods from Scrum, like time-boxed sprints with minimal viable prototypes (MVP's), into the stage-gate process in an attempt to remove some of the bureaucracy. It should be also noted that the early adopters developed mainly tangible products instead of service solutions, therefore the effect on NSD is still questionable.

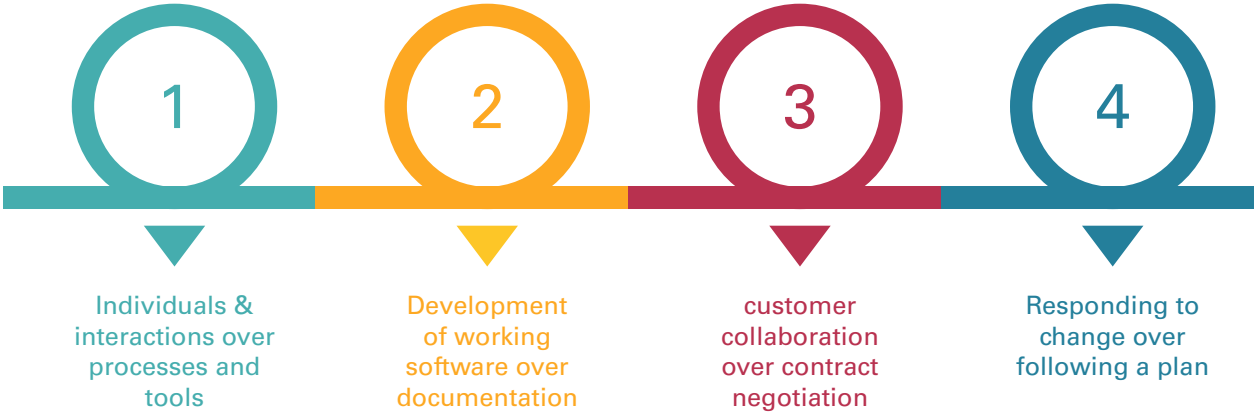


Figure 2: The figure depicts the four principles of the Agile Manifesto.

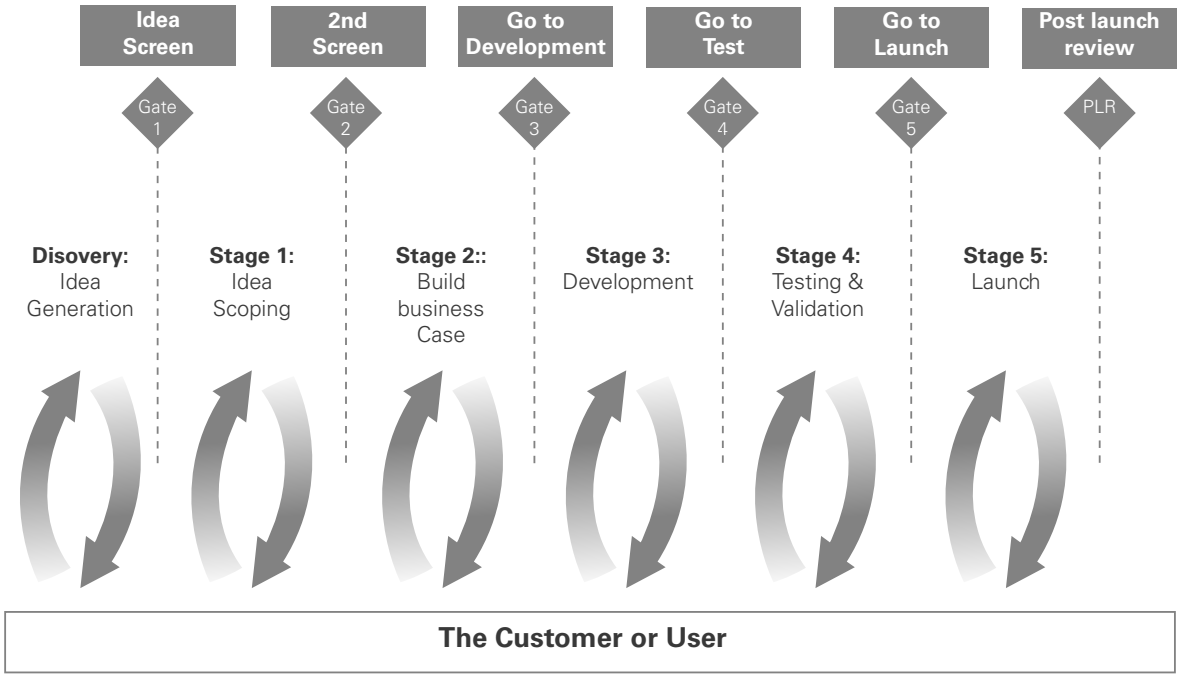


Figure 3: This figure shows the Agile-stage-gate hybrid model by R. Cooper (2014)

Process models of New Service Development (NSD)

The first NSD models consisted of about 15 linear stages from strategy development to commercialization with associated actions for each stage (Cooper and Edgett 1999; Scheuing and Johnson 1989). Later, much shorter, more iterative, cyclic, and nonlinear process models were introduced (Johnson et al. 2000; Stevens and Dimitriadis 2005; Kim and Meiren 2010). As well as Specific circular NSD processes for manufacturing firms have been suggested, however, many firms are still using NSD models developed over a decade ago and tend to use them with a NPD perspective and mindset (Kindström and Kowalkowski 2009; Alam, 2014). The modern model from Johnson et al. (2000) is considered somehow generalizable since it is used in different industry and firm contexts (Froehle and Roth 2007). The model is depicted in figure 4 and consists of only four stages: *design, analysis, development, and full launch*. *Design* is about creating service concepts and generating ideas, *analysis* includes business analysis and project authorization. *Development* relates to designing service processes and systems, and *full launch* includes launch and post-launch review.

Scholars argue that linear and rigid NSD processes models with a clear start and end point perform slow in adapting to project-specific features, create excessive bureaucracy and ignore many organizational aspects that play a role from the first until the last stage of NSD (Bullinger et al., 2003). Too much formalization is devastating for creativity and innovation (Edvardsson et al., 1995; Bodewes, 2002). Thus, a balance between organization and freedom should be found.

The NSD process should be applied in a more flexible and circular manner in which a service offering is launched, continuously evaluated and continuously adapted to react ad hoc to the changing needs of the customers, technology and the competitive environment. Further, it is argued that a NSD process should be adapted according to the situation, market condition and types of services being developed (Sundbo 1997; Alam 2014; Sundbo 2001; Drejer, 2004; Gremyr et al., 2014). Further Alam (2014) suggests, instead of linear models, an overlapping, phase-wise, informal and shorter NSD process model. Moreover, Alam (2014) states that an ad hoc and unstructured NSD process can also work for several firms. In contrast, Witell et al. (2014) and Alam and Perry (2002) state that following a formalized development process based on a stage-gate model should improve the performance of a NSD project.

NSD in product-oriented companies

Some models for NSD were proposed in the last decades. However, the existing "one" model, which fits in different industrial sectors, is missing. This is due to the immaturity of the NSD field but also because of rapid changes in information technology, globalization and changing customer needs (Kitsios & Kamariotou, 2019). If there is not yet a standardized NSD model, how do product-based companies introduce NSD? Research from Witell et al. (2014) shows that NSD introduction is often treated poorly in manufacturing firms. A proper NSD process is often not used but rather just adopted from the existing NPD process and a service development strategy is often not in place. Witell et al. (2014) & Gebauer et al., 2008 further states that the possibility of succeeding with service innovations under such conditions on long term seems not realistic if considered that service innovation builds on a different logic than product innovation.

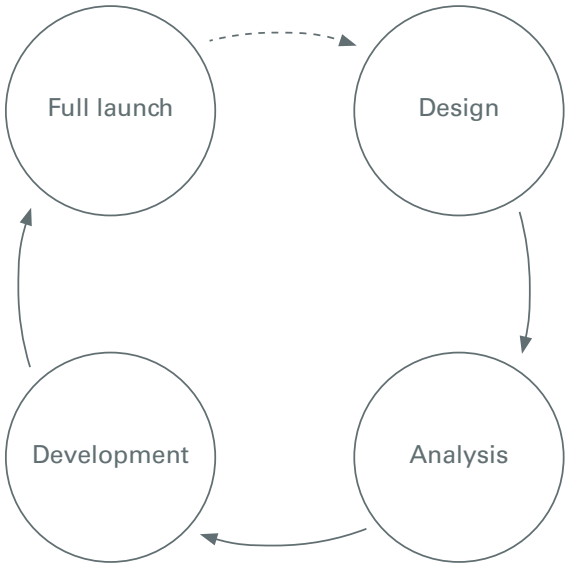


Figure 4: This figure shows the schematic NSD model of Johnson et. al (2000), which still serves as a foundation for many modern NSD models.

Product-based companies build on a long tradition of developing products. Over the years, they built high experience in executing and optimizing their NPD processes. Switching now from a linear NPD process towards a full iterative NSD process would create strong disorientation and conflicts in the established processes, structure and culture of the organization. Hence, a large product-based company should keep a certain level of formalization in their NSD processes, but allow for more flexibility and customization within and between the different steps of the process by slowly implementing NSD elements into their existing processes. Further, it is argued, that the NSD process should ideally be adapted according to the situation, market condition and types of services being developed, however, the effective development of new services in each industry sector has not been addressed by scholars yet.

Service Design, NSD and Service implementation

Service Design is a multidisciplinary, human-centred, participatory approach (Holmlid, 2009; Meroni & Sangiorgi, 2011) that brings new service ideas to life

(Ostrom et al., 2010). It also provides visualization tools that support participation and collaboration among different stakeholders (Holmlid & Evenson, 2007; Holmlid, 2009). Stickdorn et al. (2018) proposed six principles of Service Design:

Human-centred
The experience of all people affected by the service should be considered.

Collaborative
Stakeholders with different backgrounds should be involved in the design process.

Iterative
Service Design is exploratory, experimental and iterative by nature.

Sequential
The service should be visualized and orchestrated as a sequence of interrelated actions.

Real
Research and prototyping should be conducted in reality and intangible values should be evidenced as physical or digital reality.

Holistic Services should address the needs of all involved stakeholders

NSD processes can be described as formal and rigid, whereas the Service Design processes are more flexible and dependent on a project's context (Stickdorn & Schneider, 2010; Zomerdijk & Voss, 2011). Service Design uses, in general, the double diamond model from the Design Council, which consists of four main phases: discover, define, develop and deliver. The process involves exploring design opportunities together with people, generating ideas and solutions, developing the concepts, and producing actionable outcomes for delivery (Design Council, 2020). Meroni & Sangiorgi (2011) pointed out similar stages: Analyzing, generating, developing and prototyping. The majority of these processes ranging from idea generation to delivering an end design, however, do not reach further into service implementation. Service Design is basically the outside-in perspective on NSD and innately human-centred and participatory and concerned with systematically applying design methodologies, tools, techniques and principles to specify the structure and infrastructure or concepts of a service. On the other hand, NSD describes the entire process of developing service offerings (Goldstein et al., 2002; Johnson et al., 2000; Mager, 2004). Hence, Service design is more considered as certain activities in a particular phase within NSD as it works on the service prerequisites (service concept, service system and service process) for achieving service quality (Edvardsson, 1997). However, current research points out that Service Design shifts from a narrow stage of NSD towards a way of service innovation. So, to a way of thinking that can be transferred to a wide variety of practices for service innovation (Stickdorn & Schneider, 2010). However, this contribution of Service design to service development in terms of its capabilities and competencies is not systematically explored yet and remains unproofed (Stigliani & Tether, 2011). Moreover, Service designers have been often criticized for their low attention towards viable solutions and their general lack of knowledge in service implementation (Mulgan, 2014, p. 4).

Recent Service Design literature focuses mainly on the earlier stages of NSD and few design agencies include final service implementation as a part of their work or deliverables, therefore it is little known about how the methods and tools of Service Design can be better linked to the later stages of the NSD process (Yu & Sangiorgi, 2014; Mulgan, 2014). Hence, implementation of services is not yet an integral part of service design, neither in practice nor in service design research. Therefore it can be concluded, that the aspects of success for the late stages of NSD are still unaddressed, therefore the role of frontline employees, the participation of customers, the support of management and the organizing of the process have to be studied further (Biemans et al., 2016; Kitsios & Kamariotou, 2019). On the other hand, many authors argue that customer involved throughout the entire NSD process creates value, therefore product-oriented organizations need to increase their customer orientation to achieve a successful transformation towards a service and solution provider (Alam & Perry, 2002; Hipp & Grupp, 2005; Binder & Brandt, 2008; Secomandi & Snelders, 2011; Steen, 2011; Polaine et al., 2013).

General characteristics which differentiate NSD from NPD

Several factors that distinguish NSD from NPD can be found in the literature so far. However, it should be noted that these characteristics are only adaptable to the earlier stages of NSD and thus provide no evidence for success in the later stages . However, they should be seen as a starting point based on the more ad hoc characteristics of services. An overview is provided in figure 5 on the next page.

Loop process structure versus linear process structure

The NSD process should be seen more as a continuous loop than a linear process in which a service offering is launched, continuously evaluated and continuously adapted to the changing needs of the customer (Sundbo 1997).

Adaptiv process versus fixed process

It is argued that the NSD process should ideally be adapted according to the situation, market condition and types of services being developed, however, the effective development of new services in each industry sector has not been addressed by scholars yet.

Multidisciplinary approach versus Silo

(Sleeswijk Visser, 2013) argues that with services comes a more huge and complex solution space, due to the multifaceted nature of services. It is difficult to develop

a service "over-the-wall" like it is often done in NPD. Therefore, efficient NSD derives from the competence of a company to apply a functional integrative perspective. The organization should be less formal, there should be more cross-disciplinary communication and knowledge and decisions should be shared (Hart and Service, 1993)

Co-Design and co-production versus design by experts

Many researchers emphasize the importance of co-design and co-production in NSD. These are approaches in which the different stakeholders drive and become part of the design process (Alam & Perry, 2002; Hipp & Grupp, 2005; Binder & Brandt, 2008; Steen, 2011; Polaine et al., 2013). Four main benefits derive out of that for Service businesses: (1) it increases the likelihood of success through better consideration of customer needs and wants (Joshi & Sharma, 2004; Polaine et al., 2013), (2) by listening to the voice of the customer and reacting accordingly the company can generate customer loyalty (Malleret, 2006; Alam, 2002). (3) It enables continuous innovation (Hooley et al., 2003; Jaw et al., 2010). (4) The managers may be able to reduce the overall service development time by involving users (Alam, 2002). Product-oriented companies usually have a few fixed points in their NPD processes in which they test their ideas and products with customers. Between these points, customer involvement is generally absent. They often face problems integrating a constant customer relationship into their current processes, since it requires them to change the mindset from an inside-out technology-driven one to an outside-in customer-driven one (Polaine et al., 2013)

Dynamic Leadership versus fixed leadership

Harborne and Johne (2002) and Stevens and Dimitriadis (2005) state that, in comparison to the fixed leadership in NPD, NSD typically benefits from a dynamic leadership that can change over time, according to changes in the direction of the project. Leaders with different competencies could rotate in leadership during the project. Dörner et al. (2011) found five common problems that managers often face in NSD projects and could be overcome with an NSD affine leadership: (1) problems in gaining the required investments for their projects because the service concepts are too hard to protect and they failed to prove the benefits. (2) weak decision making due to a lack of organizational anchoring. (3) Project leaders have difficulties coping with the ad hoc characteristic of the NSD process. (4) Poor customer involvement during the process. (5) weak ideas were not consistently eliminated.

Low R&D intensity versus high R&D intensity

Service-oriented companies tend to show a relatively lower R&D intensity than product-oriented companies (Hipp & Grupp, 2005). Product-oriented companies create a competitive advantage because of their high R&D intensity and the development and patenting of new core technologies. Hence, the stronger the R&D, the stronger the competitive advantage. In contrast, Service innovation does not strongly relate to new technology inventions. For instance, it can derive from a new service concept, client interface or delivery system. Hence, it might require different resources to sustain a competitive advantage with a service. These resources might not be valued high by product-based companies and therefore hinder service innovation to happen (Sundbo, 2001; Drejer, 2004; Hipp & Grupp, 2005).

Traditional NPD	Early stages of NSD
- Linear process structures	- Loop process structure
- Fixed process	- Adaptiv process
- Silo	- Multidisciplinary approach
- Design by experts	- Co-Design and Co-production
- Fixed leadership	- Dynamic Leadership
- High R&D intensity	- Low R&D intensity

Figure 5: The table shows factors that differentiates NPD and early stages of NSD

Summary & Insights

It is not a matter of small changes that allows product-oriented corporations to properly integrate NSD into their organization. NSD processes are innately iterative and ad hoc in comparison to the linear and rigid NPD processes. This makes NSD processes hold in general more uncertainties than that of NPD. Hence, to be successful with services requires a completely different mindset and process structure. However, many companies tend to keep their product-oriented mindset and use a slightly adapted version of their old NPD process for service development. Scholars argue that successful service innovation on the long term seems unrealistic with that kind of approach. That is because in services are often no clear boundaries between design, production and consumption (Sleeswijk Visser, 2013), mostly because services are co-created in use (Normann and Ramirez, 1993; Vargo and Lusch, 2008; Grönroos, 2006) and because they cannot be fully designed, produced and stored beforehand (Lovelock and Gummesson, 2004). This suggests that services cannot be developed and implemented in the same way as products are. In order to be successful, It is suggested that companies need to switch their mindset and adopt several changes.

First they need to switch from linear and fixed waterfall processes to iterative adaptive process models that allow more flexibility. Moreover they should dissolve their silo-thinking and over-the-wall processes and foster multidisciplinary team collaboration. They should adopt an outside-in perspective by involving customers throughout the entire process via Co-Design and Co-production to continuously test their service offerings. Another success factor seems to designate several leaders for an NSD project that rotate in leadership according to the requirements of the project. This helps to deal with the comparably low experience in the area of Service innovation among many leaders. Finally, companies should spend fewer resources in their R&D departments because Service innovation does not strongly relate to new technology inventions. Instead more resources should be spent in client interactions and testing new service concepts.

Even if all of the found factors listed above seem promising to achieve successful NSD, they only apply to the early stages of NSD. There has been not much evidence provided so far that these factors also provide the same value in the later stages of NSD. Hence, the characteristics for success in the early NSD stages are clearly defined from a Service Design perspective. In contrast, the aspects of success for the late stages of NSD are still unaddressed. Moreover, the effective development of new services in each industry sector has not been addressed by scholars yet, therefore NSD processes should ideally be individually adapted according to the situation, market condition and types of services being developed. There is no universal NSD process model yet in place that has successfully proven its value across industries. That might be a strong reason why product-oriented companies hesitate to replace their old product processes.
On the other hand, many scholars strongly argue, that proper customer involvement throughout the entire NSD process creates value, therefore product-oriented organizations, which usually have a few fixed points in their NPD processes in which they test their ideas and products with customers, need to increase their customer orientation in order to achieve a successful servitization process (Alam & Perry, 2002; Hipp & Grupp, 2005; Binder & Brandt, 2008; Secomandi & Snelders, 2011; Steen, 2011; Polaine et al., 2013).

Overall, it can be stated that a NSD process model should be created strongly based on the individual context of the company, industry and type of service being developed. Proper customer involvement via co-design and co-production seems to be the only generalizable factor that is supported by many scholars that lead to a better NSD, and thus servitization, process. Hence, instead of creating service innovations inside-out, they have to start from the customer needs and be shaped through close interactions between the company and the customer.

Later NSD stages (develop and deliver) are little explored from a design perspective.

NSD process model should be adapted according to context and type of service being developed.

Customer involvement seems promising also in later NSD stages.

Chapter 2: Company Review

This chapter aims to give an overview of the Context of Company Z and its Service Development team in which the project was conducted. First, a company overview is provided and how the Service Development team is embedded in its structure. Second, the service development process is described and framed.

The Service Development Team and its function

Company Background

Company Z is a technology company that addresses global challenges by developing innovative solutions. In order to adapt to the changing market landscape, Company Z aims to take an incremental shift from a product seller towards a solution provider. That means to drive an organizational transformation from product solutions towards product bundles, devices, systems, software and services to sell benefits to customers and consumers instead of products themselves. The executive leaders of Company Z see the key to become a truly world-class technology company, that is agile, quality-driven, entrepreneurial and responsive, in a shared mindset of continuous improvement and customer-focused execution.

Team overview and composition

The Service Development Team is part of the Services Development function which itself is a part of the Services department. This department operates across several business clusters in international markets.
The Service Development team consists of two main groups of responsibilities. The User interactionists and the Service Builder as well as some hybrids, data analysts and management roles. The User interactionists are responsible for eliciting the user needs and translating them into input information that Service Builder need to work with. The User interactionists are in general responsible to deliver the user needs and values and the overall user experience of the service. The Service Builder translates the information about the user into implementable service solutions. They make sure that the different requirements are fulfilled, test and validate the solutions by developing user interfaces, flowcharts, dashboards, etc.

Team composition

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The team in general consists of permanent members with full employee status and contingent members that get booked for certain projects or responsibilities.

Team role

The role of the Service Development team is to take part among other teams in developing an idea or Value Proposition into a finished service that Company Z can release to the market and hand over to the customer. The process can be roughly separated into three overlapping parts. The first part of this process is to transform this idea into a service concept. The second part tests and validates the service offering in all aspects. And the third part consists of arranging all necessary elements within Company Z (stakeholders, platforms, systems) to support the full-scale delivery of the Service to the customer.

The internal NSD process

To develop and deliver the service, the Service Development team applies an internal service development and delivery process which will be called ISDP from now on. The ISDP framework is an integrated stage-gate process that develops, produces and launches a service offer in a structured and documented way. A stage-gate framework is a linear process where the project has to pass several gates and milestones in a row. More about stage-gate processes can be found in chapter 1.
The ISDP is a continuous process but can be roughly separated into three major sections: The developing part, the final test and validation part and full-scale launch. The ISDP and its separation is depicted in figure 5. Once the Value Proposition arrives at the ISDP it gets developed and finalized, then piloted, tested and verified before it gets launched.
So basically, the ISDP develops an idea or Value Proposition into a service offering that Company Z can hand over to the customer. The process can be seen as an execution machine where several teams develop together an, as detailed as possible, idea into a working service solution. The different teams involved are organized in different responsibilities along the process based on their set of competencies.

The design objects of the ISDP

Edvardsson and Olsson (1996) claim that companies are not able to offer a service itself to the customer but rather the prerequisites for services can be designed. (service concept, service process and service system.) Hence, these elements are discussed in relation to the ISDP. A service concept is often only understood as the business proposition or components of the service offering. However, Edvardsson & Olsson (1996) define service concept as a defined set of customer needs and how they are satisfied with the content of the service. Clark et al. (2000) later described the main components of the service concept as the values customers are paying for, how the service looks and operates, how customers experience the service, and what are the outcomes of the service. Goldstein et al. (2002) argue that these components should be clearly defined and shared with stakeholders before the process proceeds because well-defined service concepts can help organizations translate abstract ideas to concrete operational information.
Hence, an interesting point to review would be the service concept of the ISDP and thus the Value Proposition and check if the above-mentioned components are well defined or if it just entails the business proposition. This approach is a schematic visualized in figure 6.

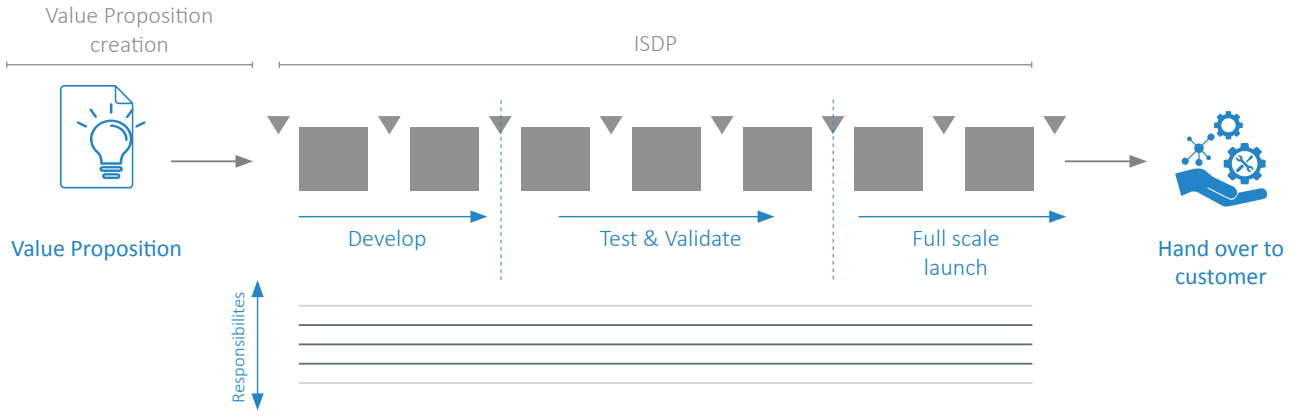


Figure 5: The graphic depicts a visualization of the ISDP. The squares are depicting the stages and the triangles depicting the gates. The horizontal lines below represent the different responsibilities within every project.

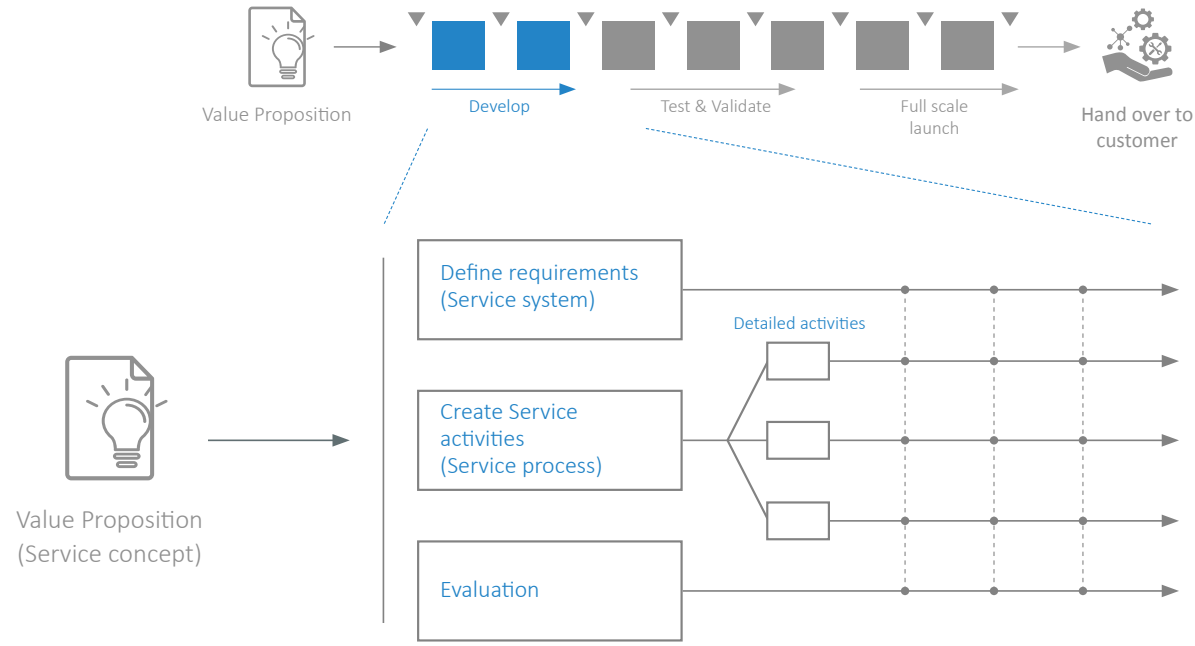


Figure 6: The graphic depicts a detailed schematic view about the general repetitive approach of the first two stages within the ISDP.

The process from a double diamond perspective

As found earlier in literature, Service Design methods are usually applied within the double diamond model. To define the area of the process where service design can contribute, it should be identified where in the process the four steps of the double diamond are applied.
Observing the service development process of Company Z from a double diamond perspective seems difficult since the stages of the process are linear instead of iterative and divergent and convergent does not seem to happen within the ISDP. However, when looking at the four main activities of the double diamond approach, it becomes clear that the first diamond activities discover & define are done before the ISDP and the second diamond activities develop & deliver at its very beginning. A high-level schematic visualization of the service development process and where the stages of the double diamond are located is shown in figure 7. It seems that both diamonds are separated from each other through a gate and team responsibilities. Thus interaction between the diamonds in an iterative manner can not happen since it is blocked by the gate and the responsibility barrier in between.
Since there is not much research yet that proves the value of service design approaches or tools on the later stages of NSD, the area which should be focused on are the first two stages of the ISDP since they are more or less located in the second diamond. Therefore the first stages of the ISDP should be further investigated since an intervention for improvement seems most promising there.

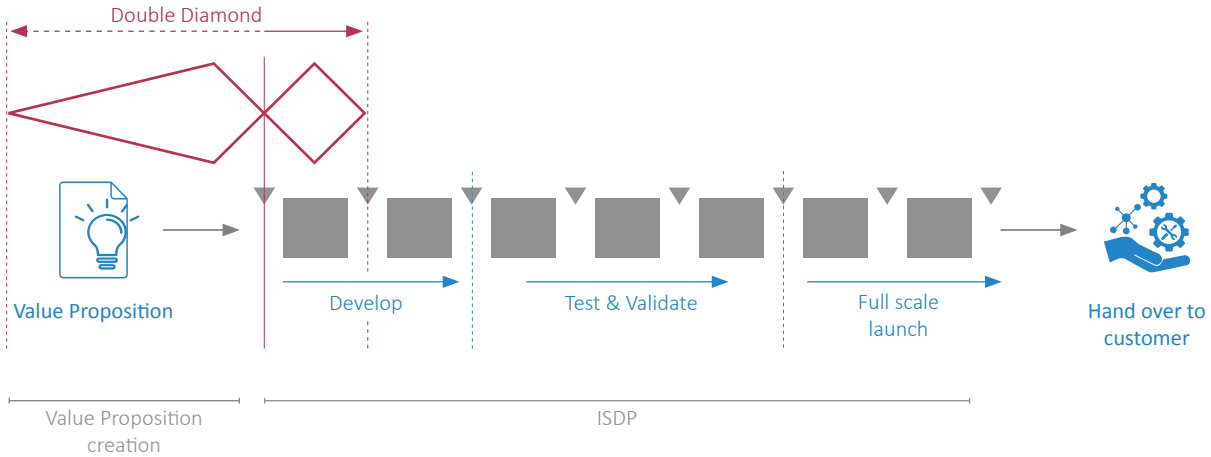


Figure 7: The visualization depicts a high-level schematic view of the ISDP of Company Z and compared against the double diamond.

Detailed view of the first stages of the ISDP

Since the stages of the double diamond are located at the beginning of the ISDP it was decided to investigate these phases further and zoom into both stages. It was found out that in order to move the project forwards and reach the next milestone, the team needs to deliver several documents. This sequence of documents is depicted simplyfied in figure 8 below. The documents fulfil the purpose of reporting and structuring the process. It should be considered that these are only the documents which are filled in and mainly owned by the Service Development team. Overall, there are more documents which need to be done along the ISDP by teams with other project responsibilities. It seems that most of the teams fill in their documents individually without involving the teams from other responsibilities. However, it can happen that a certain document needs input from other teams in order to be completed. A schematic view of the overall situation is depicted on the next page in figure 9.

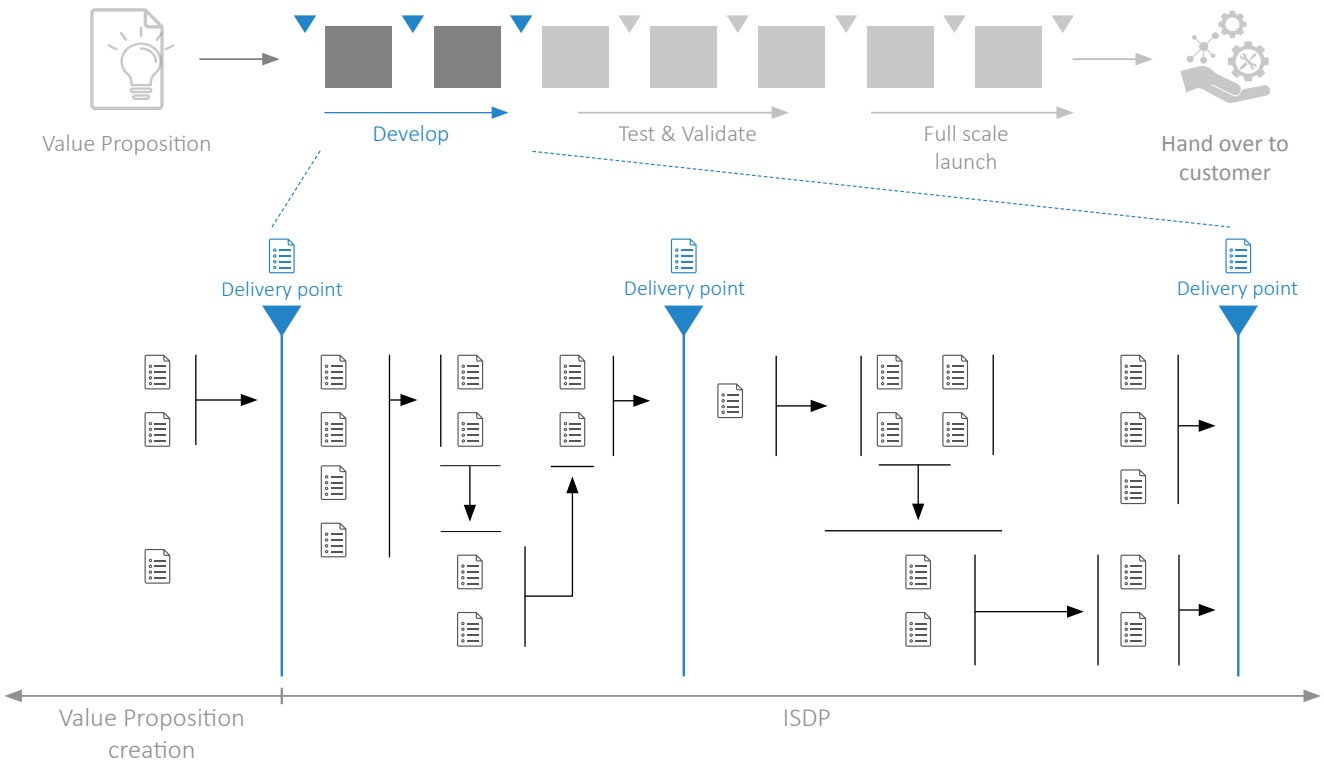


Figure 8: The graphic depicts the sequence of documents.

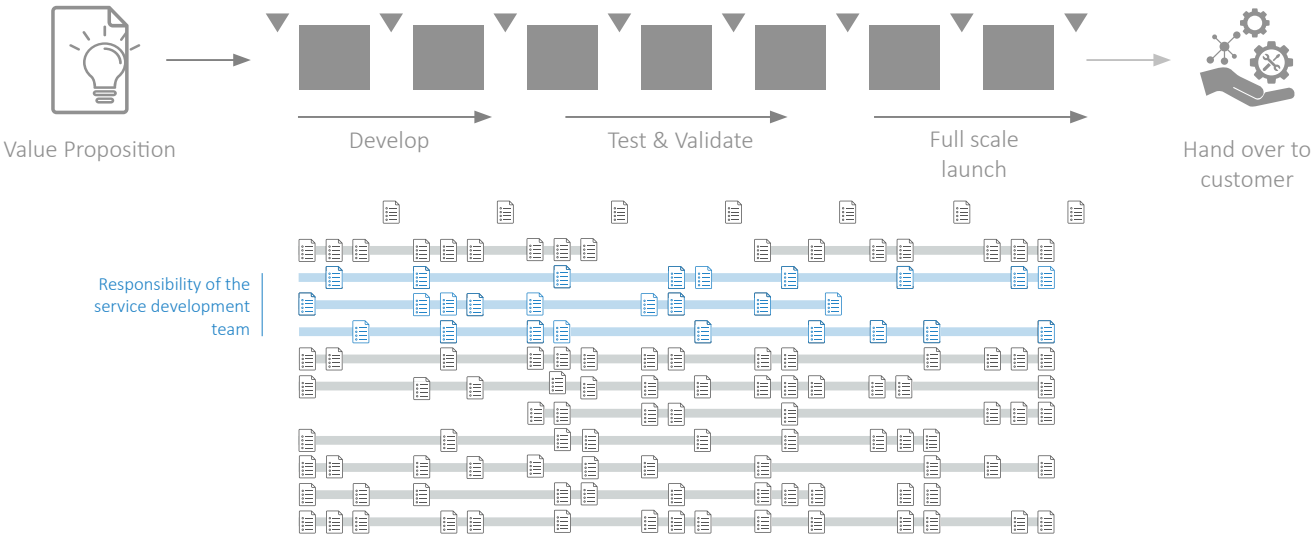


Figure 9: The graphic shows a schematic overview of all the documents the different responsibilities need to deliver. The documents which are delivered by the Service Development team are highlighted blue.

The Value Proposition

The Value Proposition is created before the ISDP by mainly the marketing team and once it is finished, works as a starting point for the Service Development team to develop the service within the ISDP. The Value Proposition consists of several presentation slides which provide the team with information about the service offering. It describes the service and each of its modules and why it is important for Company Z to launch this offer to the market. It also provides a rough project plan and an overview that sums up the Value Proposition as depicted in figure 10. This overview describes via text the project case from the business, service and customer perspective.

A Value Proposition summarizes why a consumer should buy the product or service offered by the company. It plays a critical role in communicating how Company Z aims to provide value to customers and business partners (Boha, 2018).

It seems that the Value Proposition answers why Company Z should develop the service but not why the consumer should buy the service from Company Z. There seems to be no perfect overview provided on how the offering will address the customers needs and pains.

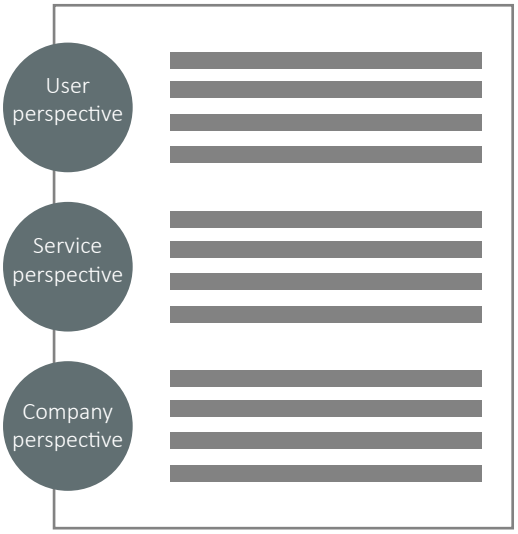


Figure 10: This graphic shows a schematic visualization of the summarized Value Proposition document

Summary and insights

The chapter showed an overview of Company Z and the function of the Service Development team. The composition of the team was described and its responsibilities for the development of the service. It was showed that the Service Development team uses among other teams a linear stage-gate process named ISDP to develop a Value Proposition into a services solution.

It was discovered that the ISDP is an execution machine for developing, producing and launching services. The creation of the Value Proposition happens in a stage before the ISDP and the Service Development team is sometimes not enough involved in this certain stage. Also, it became clear that the Value Proposition focuses strongly on the business perspective but provides a bit less customer and user insights. It is interesting to see that a linear process is followed where the testing with the customers and users happens inconsistently at the beginning. Observing the service development process of Company Z from a double diamond perspective seems difficult since the stages of the process are linear and divided by gates. However, by adapting the double diamond to the ISDP, an area before and at the very beginning of the ISDP was framed where the use of service design methods and tools seems most promising to add value.
By zooming-in deeper into the framed stages, it was found that the service offering gets developed in a highly controlled way. To divide responsibilities, the different teams are organized in several responsibilities along the process. Not every responsibility is involved in every part of the process, this might lead to a situation where the individual faces difficulties in understanding the overall process logic and the work from other responsibilities, due to its limited involvement in the whole process.

It was discovered that the framework from the ISDP seems similar to a product development process in some cases. In comparison to products, Company Z has relatively low experience in developing services. Hence, using elements from a product-based development process seems not unlikely. If the service development process follows a product approach then the Value Proposition creation phase might do the same. However, it could be that the process is applied differently in reality and that the team follows slightly different approaches. Therefore, it should be investigated what problem the team faces while performing their activities within the ISDP framework.

Mostly Business-driven Value Proposition

Value Propostion creation and service development are separated phases

User involvement happens at the end of the ISDP

Team structures are sometimes separated

Linear service development approach. Iterations are not possible between stages

Chapter 3: Exploration

In the previous chapter, the internal service development process (ISDP) which is applied by the Service Development team of Company Z to develop and realize a service offering out of a Value Proposition, was reviewed.
This chapter aims to find the current pitfalls of the ISDP by researching the pains and needs of the Service Development team to find opportunities for a design direction.

Company Research

To explore the pitfalls in the way of working of the Service Development team, qualitative field research as a source of data collection was conducted. Field research is a qualitative method of data collection that aims to observe, interact and understand people while they are in their natural environment.
The research was conducted for two reasons: First, get a more realistic perspective on the current way of working beside the abstract process review. Second, Discover the needs and pains from the perspective of the Service Development team within their NSD process, to find potential opportunities for a design direction.

Qualitative Interviews

In order to define the current issues of the Service development process of Company Z, it was decided to conduct semi-structured interviews as a method for qualitative data collection. This choice was made to have a similar set of questions prepared for each participant but keep it flexible and open enough to give the interviewee the possibility to reflect about its answers to derive relevant latent knowledge (Garrette et al., 2018; Saldana, 2015).
To gather insights from as many different perspectives as possible, a sample strategy was followed to take an approximately equal distribution of participants from each team role as well as the manager and special roles like hybrids or data analysts. An overview of all participants is seen in figure 11.

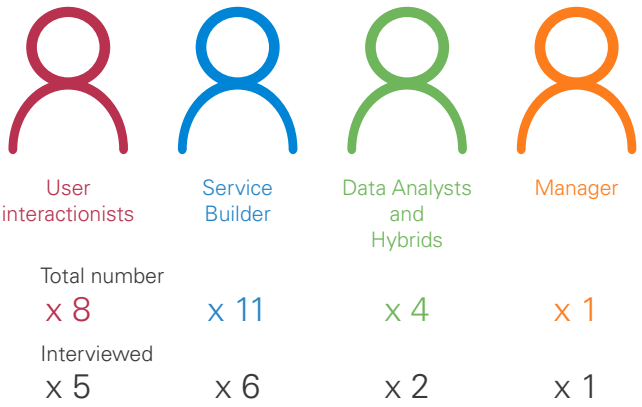


Figure 11: This graphic shows the interviewed participants

To prepare the interviews, a semi-structured interview guide was created. The objective of the interview guide is to lead the conversation towards the Pain Points of the current way of working but also provide enough freedom to encourage the participant to think more in-depth about the root causes of the mentioned Pain Points. It might happen that some participants are afraid of naming sensitive Pain Points due to political reasons or giving too technical answers. To prevent that, the interview guide was tested several times beforehand to make sure that the question wording will not pressure the participants to give superficial answers.
The Interview guide which can be found in Appendix A consists of two main questions with several probes and follow-up questions each. The first main question aims to find out about the interviewee's role inside the team and the level of experience within the current way of working. The second main question is about finding out what the participants like and dislike about the current way of working. The average time of the interviews was set to 45 minutes. However, some interviewees brought more time and extended the interview session from their site or agreed to schedule a follow-up session on another day. All of the interviews were conducted remotely with Google Hangouts and recorded on the spot by handwritten notes.

The interviews were analyzed through an analysis-on-the-wall (Visser et al.,2005; Sanders & Stappers, 2012). The raw data that was gathered from the interviews were filtered on interesting and expressive quotes. All quotes gathered from the Interviews were collected on a digital list. In addition to that, every quote was assigned to a colour to show which team role the quote originated from. This was done to consider the different perspectives the participants might have due to their role. To prepare the data for clustering, every quote got noted down on a piece of coloured paper (post-it) fitting to its role. Next, all quotes were put on a table and clustered into similar categories. This was an iterative process where the clusters got rearranged and renamed with the aim to find a pattern that unites the quotes and clusters into a narrative. This was inspired by Hekkert's & van Dijk's ViP worldview approach (Hekkert & van Dijk p.152).

Parallel to the standardized interviews, informal conversational interviews in the form of remote conversations (introduction calls, virtual coffee breaks and onboarding sessions) with different team members were conducted. The sessions were, besides the interviews, very helpful to collect more latent knowledge and better understand the mindset, day-to-day routines and broader situation of the way of working. The notes that were taken during these sessions were also included in the coding process

Insights Interviews

After the final iteration, the insights were finally clustered into four categories named the *Paper work, The Customer, Project Documentation Mindset,* and *Limited Team Collaboration*. This can be seen in figure 13 on page 32 and 33. Each of those categories consists of several subcategories and every subcategory is made up of several interview quotes.

The Paper work

The Paper work refers to the overall strong focus on fragmented and heavy paperwork within the service development process. There are slightly to much deliverables which needs to be finished in too less time. The team puts a lot of pressure on themselves to deliver the documents to the milestone on time. This results in a situation where no one really assesses the content of the documents but rather if a document is finished in time or not.

[redacted]

Some items remain open after the milestones which the team still need to finish in the next phases of the process. This often leads to a messy situation where the team loses the overview of the open items from previous phases.

"There are open items from previous milestones and we lose track of them"

"The focus is on delivering something instead of the activity itself"

The process complexity makes the process very difficult to understand especially for its newer users. Hence, the value and sense of some documents get sometimes questioned by team members. On the long term, this could impact the work climate and morale of the team.

"It took me several ISDP cycles to understand most of it"

"If you are a new team member it is hard to understand what depends on what"

As the project continued, the management team agreed to reduce the number of documents from over 200 to about mandatory 28 documents. The leadership tried to change the mindset and brought more clarity to the team.

The Customer

Due to some fragmentation of the process and fixation on documentation, the customer does not consistently play the important role. This makes it difficult to react flexibly on customer feedback at later stages since the milestones for the Value Proposition and concept development are already passed.

"I feel the process is sometimes the goal instead of the customer"

This is also due to the logic of the overall NSD process. Customer needs are meant to be derived from another team before the ISDP. As described before, another team creates a Value Proposition based on customer needs, which works as a starting point for the Service Development team to develop & deliver the service. The customer is not consistently involved in Service Development which causes handover issue.

[redacted]

It is important to mention that the Service Development team in some cases faces not perfect formulated Value Propositions. Hence, they say the Value Proposition is too focused on market needs and a bit too less on user needs.

The Project Documentation Mindset

The team pointed out that the current way of working is too rigid and linear. Some even argued that the current waterfall method is maybe not future proof. Instead, they would prefer more "agile, iterative and modern" approaches.

"I am not sure how future proof this current way of working is"

"I would prefer a more agile and iterative way of working"

It seems that there is no misunderstanding between the two roles and that both roles have a clear understanding of what the others are doing and which problems they face. There is a broad recognition among both roles that the current way of working does not always seem appropriate for services but provides the steps it needs to develop and deliver a Service.

"We should create our own values which should incorporate Agile."

"It's good to have a structured framework but we lose too much time and energy due to fragmentation."

It can be stated that there are sometimes different perspectives on service development between individuals in the Team. It also became clear that not everyone in the team understands clearly the current approach and its benefits. Hence, the team has difficulties in finding their own values and communicating those to other Company Z stakeholders. However, the majority of the team members are sure that the current way of working is not always optimal suited for services and therefore could be altered in some details.

"We got pushed by other departments because we did not communicate our values to them properly"

Disturbed team collaboration

The overall team collaboration seems sometimes limited because many face difficulties in understanding the process, question the sense of certain documents, question the linear approach and feel lost in fragmentation. This might lead on a long term to some resentment among the team since they are aware of the flaws but not able to make effective changes due to the high fragmentation. Also, the absence of a clear vision out of this situation does not strongly encourage the team to find their own solutions. Knowledge is in some cases lost between process stages or if new people join the project. This results in the team missing important information from previous phases and they are not able to understand why certain decisions were made before. It happens that workers get involved in the project at later stages to develop a certain piece of software but they are not provided with a holistic context of the project. All the information they have is in the form of detailed descriptions inside different documents. Therefore, they face difficulties assessing their work against the broader context of the project.

The process is by internal definition a cross-functional process where different disciplines work together on the documents. However, there are different documents for different responsibilities and the different teams create their documents separately and update them later with the content from the other team.

Also, the time pressure seems sometimes a little bit too high so that every team focuses on finishing documents as fast as possible without considering reflecting with other disciplines about the quality of the content. If communication happens, then mostly in the form of documents or around a certain document. Hence, many discussions are about details within documents and not about how to build the best service solution. When a milestone comes close and the time gets tight, some members complain about tensions within the team meetings. Moments of team reflection are provided in retrospective team sessions where the team has an opportunity to think outside the documents, however, reflection sessions about the content of the work do not happen always. Moreover, the overall way of thinking and approach to problem solutions is framed by the document logic. This leads to a very controlled, predictive and safe way of working. Many team members seemed to be overwhelmed by this approach and sometimes questioned the value and sense of their wo

Limitations of Interviews

To get a detailed primary data about all the facets of the current way of working, one should conduct a mix of observation and interviews techniques to elicit tacit and latent knowledge (Sleeswijk Visser, 2009; Visser, Stappers, van der Lugt, & Sanders, 2005). However, due to the COVID-19 situation, ethnographic methods which include all sorts of face-to-face contact with participants were not possible. Therefore, it was decided to conduct remote interviews with the team members via video call. Interviews via video call have certain limitations and increased change in creating bias. Bias is understood as any influence that provides a distortion in the results of a study (Polit & Beck, 2014). Certain communication barriers can occur due to potential low voice quality and limited visibility of body cues, which easily leads to misunderstanding and misinterpretations of participants.

Synthesis

Summarizing the clusters lead to the following problem statement:

> "During the service development process, the team loses track of building the service proposition for the **customer**, because the **mindset** and team **collaboration** is in some cases focused on satisfying **The Paper Work**. This means the attention of the current way of working drifts sometimes away from the user towards documentation and process adherence."

The Service Development Team of Company Z wants to develop a service out of the Value Proposition but can not do so because the Paper work claims all of their attention. This leads to a general imbalance between the aim of building a high-quality service and documenting the process. This imbalance fosters a "Project Documentation Mindset" which lets the team perceive every project as a big list of deliverables to tick. Checking the completness of this list seems sometimes more important than thourouhly reflecting on the content of each deliverable.

"I feel the process is the goal instead of building a service proposition"

This "Project Documentation Mindset" strongly influences the team collaboration and overall way of working & thinking. It seems that sometimes the focus shift more towards the process or method instead of the customer. This is seen in figure 12.
The Paper work keeps the team in a constant loop of some bureaucracy, control and inflexibility. It should be emphasized that removing the Paper work does not mean removing all the documentation and structure from the current process. Compliance is necessary due to many regulations and norms, therefore a general focus on documentation seems comprehensible. It is not a question of removing all of the documentation but rather shift the balance of attention more towards building the service to establish a balance between freedom and formalization inside the process. Creativity and Innovation only happen if freedom in work is ensured (Edvardsson et al., 1995; Bodewes, 2002). One may argue that there is no need for creativity and innovation in a plain service development process which is set up as an execution machine. However, even an execution machine should execute with a critical mind to allow continuous internal process improvement happen through creativity. Proactive and responsive creativity makes employees actively and voluntarily search for problems to solve within their environment (Unsworth, 2001). Moreover, innovation is the core of Company Z business strategy and may occur at any point in the NSD process and start spreading across the organization. Rogers (2003) describes this as diffusion of innovations, where innovation is communicated over time among the participants in a social system until a critical mass is achieved and the innovation gets widely adopted.

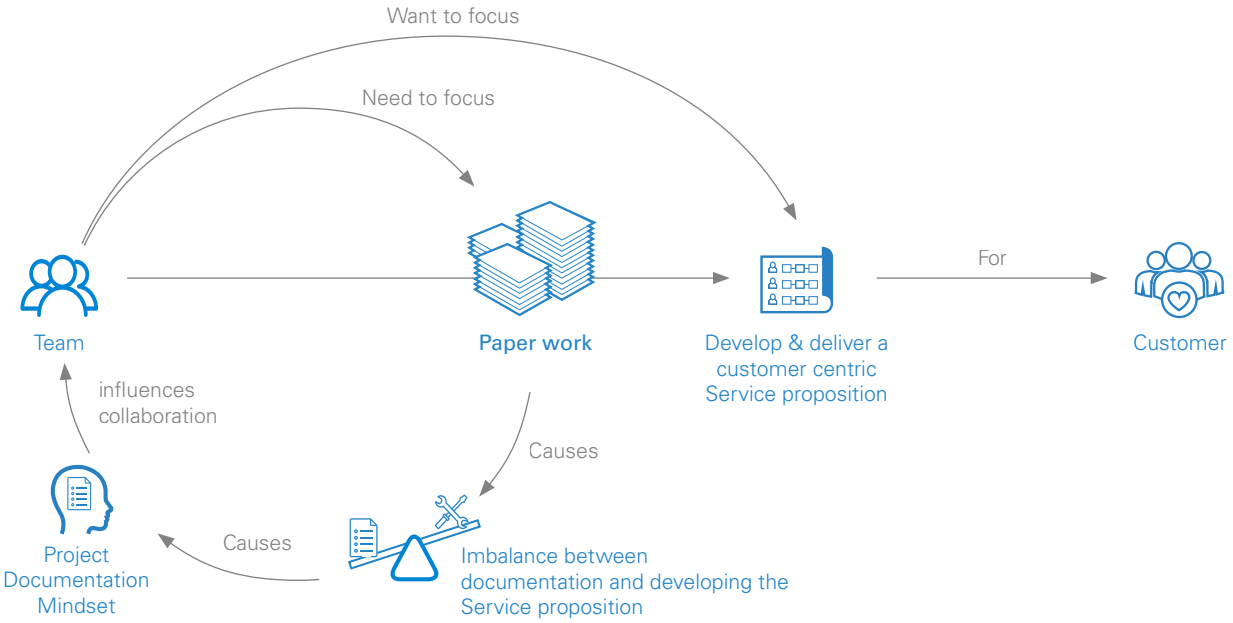


Figure 12: The figure is a visualization of the problem statement.

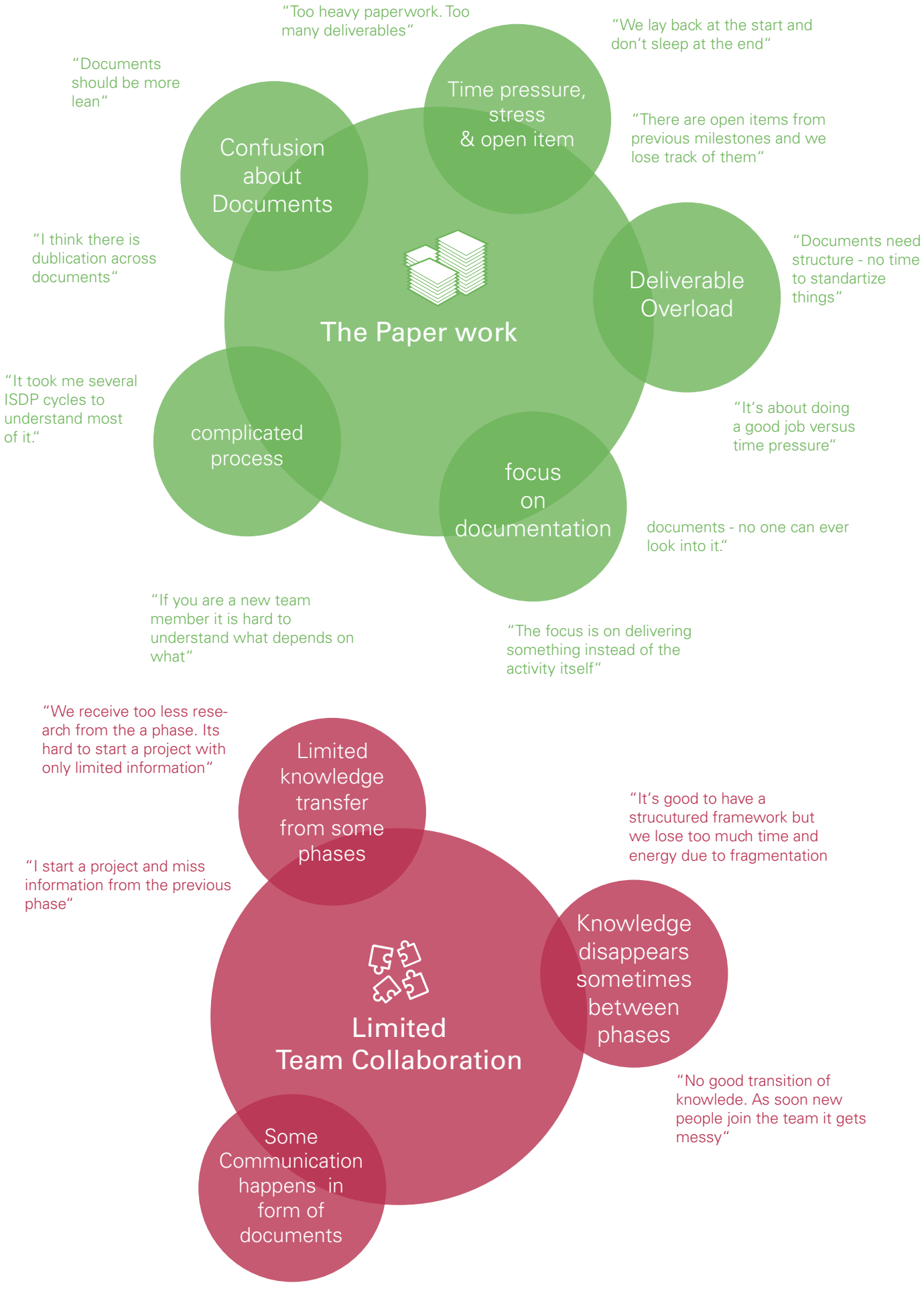
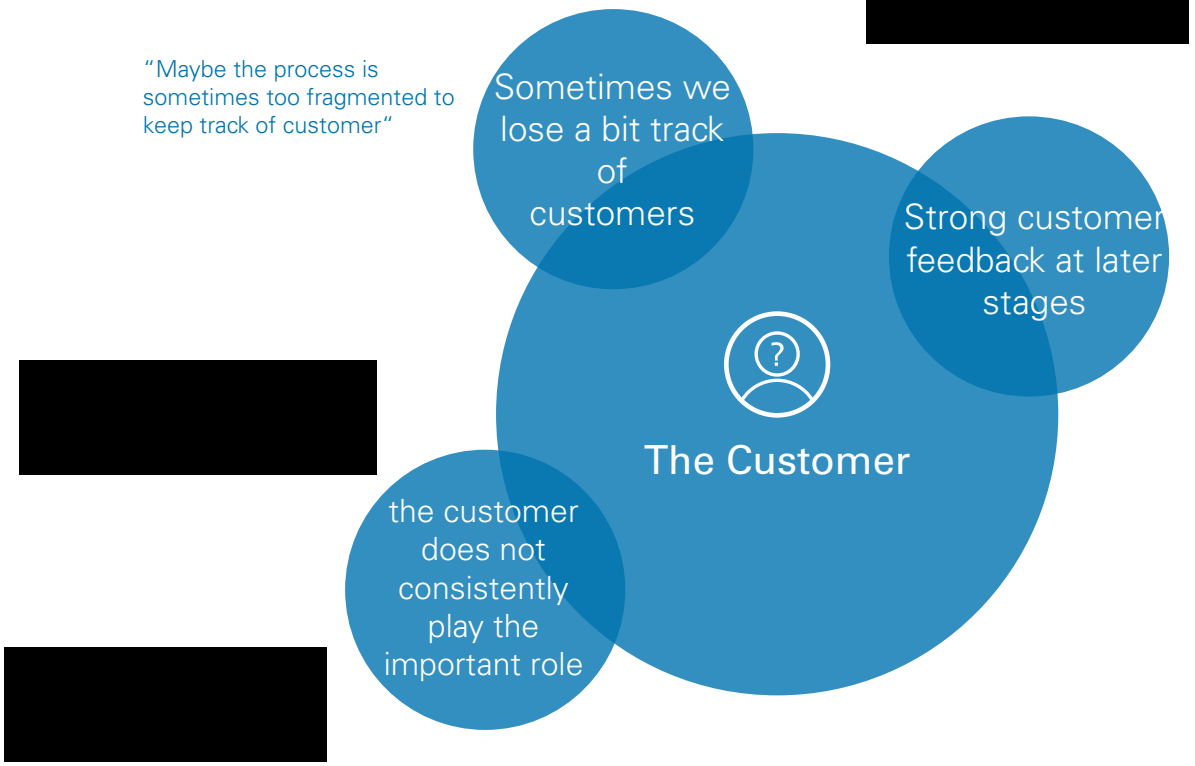


Figure 13: The Problem Clusters depict the insights of the internal interviews

"We lose track of our customer during the process"

"Maybe the process is sometimes too fragmented to keep track of customer"

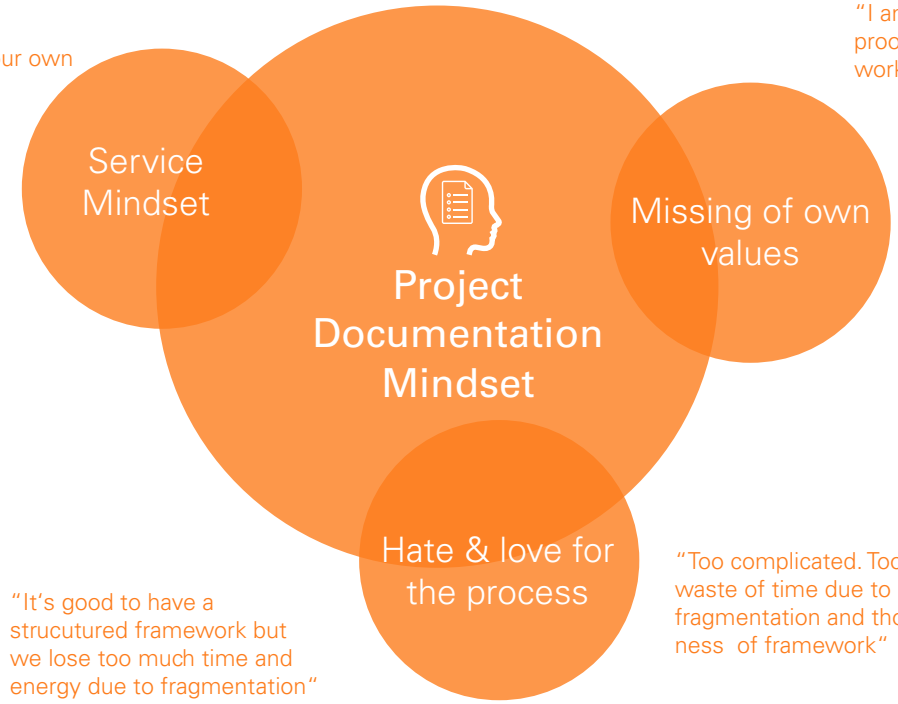


"I feel the process is the goal instead of the customer"

"Focus is on delivering something instead of thinking about the activity"

"We should create our own values which should incoroporate Agile"

"I am not sure how future proof this current way of working is"



"It's good to have a strucutured framework but we lose too much time and energy due to fragmentation"

"Too complicated. Too much waste of time due to fragmentation and thourough-ness of framework"

"I would prefer more agile and iterative way of working"

The Root cause

What causes the Problem Clusters?
By comparing the ISDP, against the identified characteristics of NPD from Chapter 1: Linear & fixed process design, fixed team structure and limited communication flow, Fixed Leadership, Design by experts, and R&D intensive, several similarities between those and the current way of working appear. All characteristics which define a NPD process fit the current ISDP process of Company Z. Additionally, the current activities which are executed by the Service Development team are mostly activities that originated from a NPD process. There are some additional typical service design activities used by the team like a Customer Journey and the Service Blueprint, however, these activities are performed and delivered by other teams or seem to be fragmented. It seems that there is an attempt to use Service Design tools but they are not properly integrated in the process yet.

1) Linear & fixed process design
The ISDP structure, as explored in Chapter 1, follows a stage-gate framework that does not allow lots of variation within the phases. The same documents for all kinds of services need to be delivered to the same milestones in the same sequence. If gates are passed once, there is no fast and bureaucracy-free possibility to move back to prior phases.

2) Fixed team structure
The teams are multidisciplinary organized. This means the project teams are officially classified as cross-functional and required to have different disciplines in a team. This happens to some extent that a team consists of different roles. However, in practice, every team delivers its content as fast as possible without using the different perspectives from other responsibilities effectively since they have other documents to deliver. Collaboration and communication across responsibilities are very often limited to finish and combine certain content of documents.

3) Fixed Leadership
The steering comitee is often defined at the beginning of a project and remains the same throughout the project.

4) Design by experts
The service development but also the Value Proposition are created in some cases with an inside-out perspective. This means the customer value of a global service offering is mainly determined from an internal expert perspective instead of an outside-in perspective where all customer groups get strongly involved in the process. Value Propositions for global service offerings get mainly validated by internal experts or one to five customers. However recently this shifted towards a more outiside-in perspective.

5) R&D intensive
Projects are delivered from different pipelines. However, it seems that Company Z still spends a lot of resources on their R&D department that researches new technologies and market needs to spark the base for new service offerings.

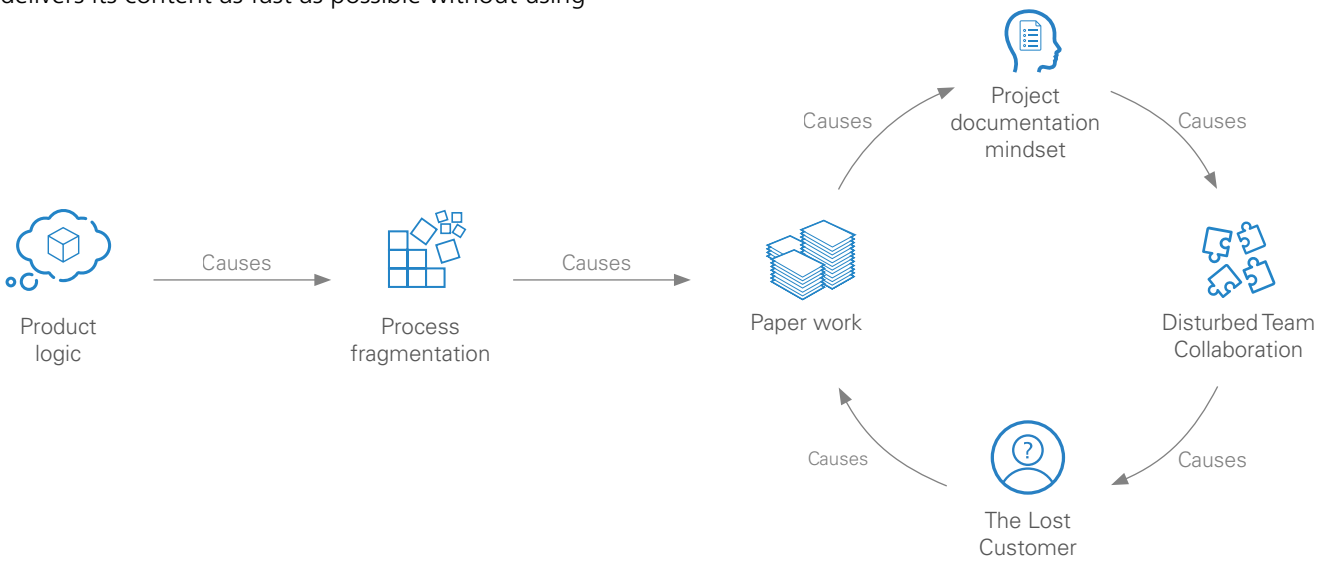


Figure 14: The graphic shows the causal chain of all problems. It shows that the four Problem clusters are caused by a process fragmentation which is caused itself by a Goods dominant (G-D) logic.

Discussion

The comparison of the NPD characteristics against the process showed that the ISDP follows a NPD process structure. Hence, it can be concluded that Services are developed mainly with a product approach. Many scholars state that services should optimally not be developed with a NPD stage-gate approach (Nijssen et al., 2006 & Overkamp and Holmlid, 2016). The Stage-gate process got criticized for being too structured, linear, inflexible, too controlling and bureaucratic, loaded with paperwork and full of too much non-value-adding work. This makes it very difficult to handle innovative, dynamic and complex service development projects because it produces a massive amount of fragmentation within the projects (Becker 2006; Lenfle and Loch 2010).

To argue further that Services should not be developed with a product approach and mindset, one needs to look at the fundamental differences between a product and a Service which are described in Chapter 1 and the assumption on how value is created in the first place. Developing a product and developing a service are based on two different fundamental economic logics of how value is created, either in exchange or in use (see chapter1, S-D logic). For instance, is the value created by the product itself, or is the value created by using the product. Finding the organizational switch from a G-D logic towards the S-D logic is the key point for successful service development. If the ISDP develops services with a G-D logic there is a high chance that the Value Proposition Creation phase and probably also other prior process steps doing similar. If that is the case then there is a chance that Company Z does not succeed with Service Innovations on long term (Witell et al. 2014 & Gebauer et al., 2008).

> So it seems that Company Z sometimes follows a G-D logic and thus uses some elements from a product process for NSD.

To create a sustainable and long term solution, there should be investigated why Company Z does sometimes not completly switch from a G-D logic towards a S-D logic on a holistic level, rather than aiming for smaller incremental improvements at the end of the NSD process.
Achieving this fundamental switch is a very complex, time consuming and incremental process because all the procedures, routines, and the way people make sense of the things around them are strongly connected to this fundamental view on how value is created. Therefore, it is disadvantageous to change the existing deeply embedded and highly standardized process structures of Company Z from the bottom. Due to its complexity and regulations, improvements should only be made by keeping the current overall process structure and procedures. However, diving deeper into this topic to find out why the switch does not happen from the top would be an interesting area to investigate further.

The Causal chain

To conclude, it was found that Company Z uses a service-oriented process, which to a large extend, is build upon NPD due to her strong orientation towards product innovation in the last century. This appraoch causes sometimes fragmentation within the service development due to their inflexible, controlling and bureaucratic nature. This Paper work creates sometimes too much documentation that the team not always

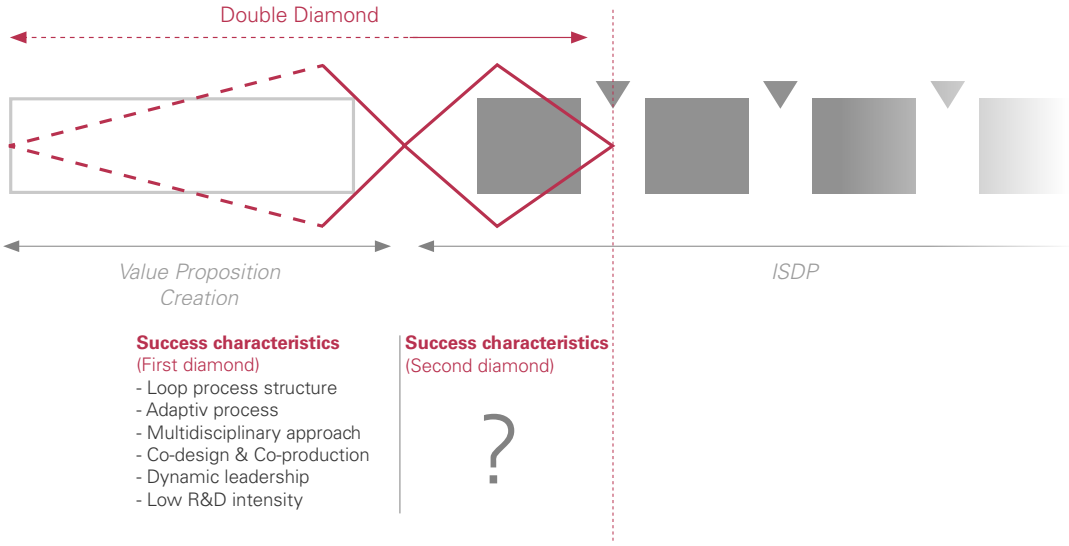


Figure 15: The graphic shows the lack of NSD success characteristics for the second diamond (develop & deliver) and thus for the first stage of the ISDP.

manages to get finished in time. Thus the team spends their collaborative effort in finishing the paper work to pass the next milestone instead of building a great service that provides as much value as possible to their customers. This chain of causes is depicted in figure 14 on page 34.

The implementation of a Service logic into the current NSD Stage-gate process (ISDP)

To improve the ISDP in the long term, ways need to be found to replace the current prevalent G-D logic with a S-D logic.
To implement a S-D logic-based approach into the current setting one could use the general success factors of NSD which were defined in the initial literature review (Chapter 1) named Loop process structure, Multidisciplinary approach, Co-Design and Co-production, Dynamic Leadership and Low R&D intensity projects. Then comparing them against the ISDP and use them as fundamental guidelines to improve current practices by implementing a Service Design approach. However, Most of the literature found about NSD from a Service Design perspective focuses mainly on the first stages of the NSD process, hence on the first part of the double diamond which is about exploration and idea generation. Therefore it is dangerous to use the NSD characteristics above as guidelines to improve the current way of working of the Service Development team because the ISDP focuses on the development and delivery stages of the overall NSD process and therefore fits closer to the second diamond of the double diamond approach. The development and delivery stages are not yet an integral part of service design, neither in practice nor in service design research. It can be concluded, that the success characteristics of NSD, especially the later stages, are still unaddressed, hence the role of frontline employees, the participation of customers, the support of management and the organization of the process has to be studied further (Biemans et al., 2016; Kitsios & Kamariotou, 2019). However, some literature emphasizes that user involvement, even if it's more useful in early stages, can also provide some value in the later stages besides the final test and pilot runs at the end. For instance, in reviewing the service blueprints or involved in training the service delivery workforce (Alam, 2002). However, all of the points are based on the assumption that users were already involved in the early stages of NSD and therefore only used to check-in with the users from time to time and make sure that their needs are still addressed. Hence, NSD characteristics need to be found that truly apply for the development and delivery phase for Services in a Stage-gate setting. Figure 15 depicts the NSD success characteristics for the first diamond.

Summary

It was found that the ISDP is by definition a NPD process. Moreover, Company Z uses a service-oriented process, which to a large extend, is build upon NPD. This leads to the defined problems Paper work, Project Documentation Mindset, Disturbed Team Collaboration, and Customer.
A product development process for service development is in place because Company Z still follows a G-D logic which seems originated from their long tradition in product and technology innovations. Thus to create a long-term solution, ways need to be found to implement a S-D logic into the current ISDP environment.
It is clearly defined what makes the early stages of the NSD process successful and how Service can contribute to that, unfortunately, there is not much research yet about the later stages. Hence, there are no insights of how Service Design can add value within the ISDP. Characteristics of success need to be found for the later stages of NSD. Guided by those characteristics, concepts for improvements of the ISDP can be developed.

Chapter 4: Ideation

In the previous chapter, four big categories of issues were identified with the help of qualitative research. In combination with literature, it was found that a a service-oriented process, which is to a large extend, is build upon NPD is causing these problems.
In this chapter a Delphi Study with several experts is conducted in order to find an appraoch of how a service oriented way of working can be implemented into the current stage-gate setting of the ISDP.

Delphi study

To find a feasible solution within the ISDP of Company Z ,which is a rather unexplored research area, a Delphi study was conducted. The aim of the study is to find general success characteristics of the later stages of NSD that could be used as a fundament for improvement of the current service development process.
The Delphi technique is a tool to explore an area of future thinking that goes beyond the currently known or believed through multiple rounds of anonymous feedback, or iterations (Geist, 2010; Martin & Frick, 1998). The Delphi method is particularly useful in areas of limited research and it is suited to explore areas where controversy, debate or a lack of clarity exist (Hasson et al., 2000). Moreover, the method can be used for structuring group communications so that the process is effective in allowing a group of individuals, as a whole, to deal with a complex problem (Linstone & Turoff, 2002, p.3). The numbers of rounds are determined whether the study aims for consensus or measures the participant's opinions on the topic. If the Delphi process is a means of measuring opinions, fewer rounds are generally acceptable.

Research design
It was decided to conduct a two-round Delphi study (Petry et al., 2007) since the aim was to measure the opinion of certain experts on how to implement a service-centred approach into the development and deliver stages (ISDP) of the NSD process of Company Z. In the first round, the participants got asked general questions with the aim to derive certain success characteristics for NSD processes. In the second round, more detailed questions about the found characteristics were asked to explore possible solutions together with the participants. To make sure the participants are able to understand the complexity of the project context, each participant was given a brief introduction about the role of the Service Development team and the structure of the ISDP. In both rounds, semi-structured Interviews to derive the needed information were conducted. Every Interview lasted about one hour. Due to COVID-19, the interviews were conducted via Skype and Teams and recorded to be transcribed. Overall six participants were interviewed. Three of them were external experts without connection to Company Z and knowledge about the ISDP and the other three were internal experts that conducted projects already within the ISDP framework but were not part of the Service Development team. The semi-structured interview guides were slightly adapted for the internal experts due to their prior knowledge of the ISDP. The interview guides consisted of six main questions and several follow-up questions each. The first set of questions aimed to find out about how NSD is approached in the company of the interviewee. The second set of questions was about what makes NSD successful. The Semi-structured interview guides can be found in Appendix B. Each Interview was transcribed directly after the session. Important quotes from all interviews were collected in one document and manually coded into categories.

After conducting the first interviews it was noticed that the participants already gave detailed suggestions and ideas of how to improve the current process after they mentioned a general NSD success characteristic. For instance, if a participant was told that the current NSD process follows a stage-gate approach with fixed stages and each containing several documentation deliverables, participants recognized immediately a NPD process and started talking about the fundamental differences of products and services. This consumed a lot of time and led to identical theoretical and hypothetical answers. To avoid duplication and too much abstraction in responses, it was decided to iteratively update and adapt the interview guide after each interview to provide the next participant with the insights from the previous interview. To keep the initial context description similar for every participant and avoid leading the participant, the additional information was included in follow up questions and elaboration probes. A participant with prior knowledge of the ISDP was always provided with insights from an external participant without knowledge about ISDP. Following this structure, it was possible to test the suggestions of the participants without prior knowledge directly with an ISDP experienced person. The strategy is shown below in figure 16.

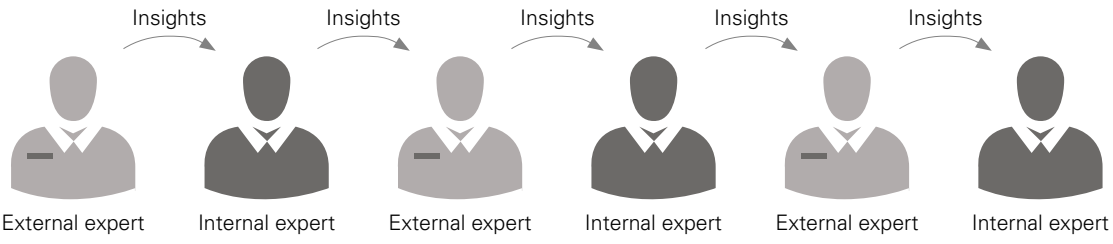


Figure 16: The graphic shows the interview strategy of the Delphi study.

Insights

The transcripts of each interview were filtered on expressive and rich quotes. All of these quotes were collected in one document. The quotes from the internal experts were coloured blue and the quotes from the external experts were coloured black. This was done to find potential dichotomies between internal and external experts. The quotes were then iteratively clustered into several categories and subcategories of success characteristics for the delivery and development phases of NSD in a stage-gate setting. All interviewees also mentioned possible solutions during the interviews. These solutions were filtered out from the transcripts and added in another colour to the corresponding category.

Several success characteristics were found:

1. The optimal process input from earlier stages
2. Early testing and validation iterations with End-user and upkeep of gathered user insights along the process
3. Different processes for different types of services
4. Align teams structure across early and late NSD stages
5. Free flow of communication and knowledge across stages & team members and alignment of language
6. Strong project ownership and vision
7. Balance of freedom and control

The found characteristics were compared to the current situation within the ISDP and translated into Pain Points. This was done with the help of the earlier insights from the Problem Clusters. The categories of the NSD success characteristics and the ISDP related Pain Points are described below:

A visual overview of all characteristics and Pain Points can be found on page 46 & 47.

1. The optimal process input from earlier stages
Hence the ISDP is an execution machine, the quality of its final outcome, the service offering, depends strongly on its input (Value Proposition). It is crucial that the Value Proposition provides the optimal input for the process and synergizes with the competencies of the Service Development Team. If the input of the process has not the optimal shape, it will become very difficult to improve the quality of the output in the long term.

"...If the first diamond is not doing the right things or not enough, then it will be a poor implementation and we don't discover new things."

"Actually what you need to look down the line back towards early design Diamond if you like and say, what organizations are involved in this service ecosystem that were designing heald for and what they think, should be in relation to this problem. And if you can't get consensus, then you'll end up trying to implement a launch service that people think is not valuable."

Pain point: - The Value Proposition does not fit the needs and competencies of the development team and does not provide a clear vision and guidance.

"We still need to have a clear Value Proposition I think. Most times it is about making our lives easier. it's not necessarily making people's lives easier, which is what you need to be able to sell and make money."

"What can we actually do, what are we good at? And based on that, let new Value Propositions be developed. to get everyone on the same page like: hey, what is it actually that we're doing?"

"Change should come from the beginning because the implementation is not the difficult part, you know, the implementation is just to put the processes together. And that's it, but to be sure that you are delivering what's expected should be coming from the previous face."

Pain point: - In-depth user insights do not enter the ISDP process

"The problem is the lack of customer research. That is supposed to be coming from the VPC phase and the VPC phase is made by the marketers. So, the marketers put a different focus on that type of research, because they do market research - they are analyzing the willingness to buy the service and not why the customer should buy the service!"

2. Early testing and validation iterations with End-user and upkeep of gathered user insights along the process
Before spending high efforts on developing and delivering the service offering, a minimal version of the services should be tested and validated with the end-user to detect major flaws early and reduce the number of issues in the final validation. Moreover, early validation will spark understanding and ownership among the whole development team since they physically experience the final service right at the beginning.

"The value and the concept of services is created in the interaction. So, it makes no sense to go from a drawing or a book about what things should be and what is needed and then completely roll it out until the final product. There need to be moments in between where you together co-create and test partly designed prototypes. And Even explore at this point still - What is the value that people can get from this?"

"Can we throughout development check in with consumers

by acting out, by role-playing, by whatever, visiting other places that are doing a similar thing? To get some user insights and bring it into our development process."

Pain point - Customer validation happens at the end of the process

Currently, the Service is fully developed before it gets finally tested and piloted at the end of the development process. Important insights from this testing can not be used to make changes in earlier stages due to the milestones. If there needs to be a change in an earlier phase all delivered documents need to be changed as well which is a time and resource-consuming process.

"I would say that the customer should be involved throughout the process, to give feedback on the sort of initial experimental prototypes of the service."

"if they are only validating and not exploring then maybe you can start by just helping them doing initial exploratory experiments and taking an initial MVP, so the simplest version of what the product could be and taking that to the customer and get feedback on that."

Pain point - The User Experience of the front office of the Service is not deeply validated with customer groups

If there are only limited user insights available, the user experience of the front office of the service would theoretically crafted internally on paper. This means there is no validation happening with the different customers and users of the service, instead of on assumptions of how the user behaves.

"Services don't fail in the validation phase but the customer is not happy. They just have to play with what is there. But on every customer research, I have been involved. I always heard from the customers a lot of Pain Points, a lot of complaints of all this."

"Something that is very surprising to me is that also validation activities are based on one customer. How can you validate a global solution with one customer is just not possible?"

3. Different processes for different types of services

The NSD process must be adapted according to the situation, market condition and types of services being developed. There should be different documents, tools and levels of freedom provided for different kinds of service offerings.

Pain point - Different approaches for different services

At the moment different types of services are developed with the same gates, milestones and documents. This sometimes leads to unnecessary and miss fitting steps during the process development.

"..a [service type] Service, for example, is a completely different kind of thing. So those I think, should have different stage gates, different documents, more freedom…"

"At [my company] there were a lot of different service development processes at the same time."

4. Align teams structure across early and late NSD stages

Service value is always created in interaction between user and provider. developing a new service out of a drawing book, as it more or less works for tangible products, will lead to value decrease or even to a complete mismatch with the user's needs. Hence, the idea generation team and the development team should be closely connected across the early and late stages of NSD to prevent a loss of knowledge and misinterpretations between early and late stages.

"When there is a separate idea generation department, or organizational unit, and a separate development delivery unit that to me already sounds problematic when you think about how services are innovated."

"In your product-oriented mindset, you see a pretty clear dichotomy between production and consumption. Services do not have that clear distinction between being made and it is consumed. It's consumed in use. It's like a temporary moment, isn't it?"

Pain point - Knowledge gap between idea generation and development

The current situation seems quite complex due to the vast and fragmented responsibilities within the process framework. The initial idea generation team seems to be a little bit distanced from the service development and delivery. It might be that the initial idea of the projects was created many months earlier by another team. When the idea finally arrives in the ISDP the idea generation team might work already on another idea. People from the initial idea generation might be part of the gate team but not the development team itself. This makes it really difficult to combine early and late teams and spark real project ownership for projects among the development team.

"It all starts that idea generation and development are separated."

5. Free flow of communication and knowledge across stages & team members and alignment of language

Allowing a free and right flow of communication allows the team to work more efficiently and more effectively. There should be different kinds of communication channels for different types of information. For instance, there should be communication happening via documents, if the communication is about procurement contracts or legal topics. But if it is about development and creation deliverables there should be a face to face communication to reduce potential misunderstandings. Moreover, videos are well suited to pass fast and effective lots of knowledge from person to person.

Alignment of a common language is the fundament for all types of communication.

"Many terms have a wildly different connotation across those departments."

"if you're talking about developing a new service for someone and you are still trying to figure out what the value should be and who should be involved. I think a lot of the communication would be better served in personal meetings and multidisciplinary teams and in team gatherings where you together discuss what it is you're actually making."

Pain point - Lots of communication happens via documents

Currently, it can be observed that lots of communication between the team and between responsibilities happen in the form of documents. During team meetings, there are also really often presentations from team members which are often about the documents itself or how to fill in the documents more effectively. Knowledge is passed in the form of a document and a verbal presentation. The team continually aligns the language and terms they use with the help of presentations and documents. The general knowledge is stored in the form of a document on a digital platform. Communicating mainly via documents and storing knowledge via documents increases the Paper work and fragmentation significantly during the day-to-day work of the team since it permanently needs to work on documents and look up knowledge inside documents and pass their knowledge via a document.

"But different kinds of communication rely on different kinds of information. Right? So there is a time to communicate via documents, and there is a time to communicate in person."

Pain point - Cross-functional teams are not always achieved properly

By looking at the responsibilities of the current ISDP structure then it becomes clear that cross-functional teams are applied at current projects. However, by looking into day-to-day practices it can be observed that cross-functional team approaches are not often achieved. Due to the tight time planning, the bureaucratic process, teams prefer finishing certain documents in a short amount of time instead of spending time in cross-functional teams and debate about the best possible content for the documents. Moreover, different responsibilities need to complete different documents which often means that documents are done only by one team. Hence, this issue is not easy to overcome by, for instance, rearranging the team structure or adding more cross-functional team meetings by not changing the process structure itself.

"ISDP should be a multidisciplinary effort. So, the design of the service should come from at least four people working together looking at this same problem from different perspectives. But then, as an output, we have different documents. if we have a short time to produce all of the documentation, then people tend to cut short the time that we should spend in collaboration."

6. Strong project ownership and vision

The development team should be aware throughout the process how the final service will look like, progress status, and why the final service will provide value to the customer and why it is better than the solution from competitors. This aligns the team behind the project goal, let them easier assess the value they create during development and makes sure everyone understands their own contribution to the overall solution. If there is no feeling of ownership and vision of the final service among the team, employees will easily lose the overview about the process and will face difficulties in assessing the quality of their own work against the demands of the final service offering.

"if people don't get off and start feeling a sense of ownership for their work, then you pretty much lose as an organization, right? Because it becomes more of a place to get together and to report to each other and keep each other busy and have these endless meeting cultures and talk about doing work rather than doing work."

Pain point - Little idea & project ownership of the development team

One person described the current way of working with the words:

It seems the process and project development is too fragmented to allow strong ownership among the whole team. Without a strong feeling of ownership for the developed solution, the team will lose the overview of the bigger picture and the ability to assess the value of their own work. This results out of a missing project vision throughout the process. Team members described, especially in the stages where the development of the service is on a very detailed level, that they often do not understand why they need to create a certain thing and how this fits into the overall picture of the service solution.

7. Balance of freedom and control

To allow potential innovation inside the development and delivery stages of NSD happen, there should be a balance between formalization and freedom. The current ISDP process became a bit bureaucratic which bets on high control.

"if you want to realize innovation there needs to be a bit of flexibility and risk-taking and collaboration and freedom and a bit of trust."

"So you don't want to change processes, but you want innovation. So how could innovation be without improvement?"

Pain point - Focus on input (documents) instead of output (document content)
The team needs to strictly follow the process and deliver all necessary documents in time to proceed to the next milestone. The finalization of deliverables is used as a measure of success. They do not focus on the number of documents per se. This leads to a culture where everyone is just filling in the documents as fast as possible without having time questioning their value or even focusing on the best input possible.

"It is a little bit like someone that is driving, but not knowing exactly where we will end up until we are at the end. Or why are we driving? Why are we not cycling, for example? Or why did we choose the car and not the boat?"

"So, it is like looking inside all the time and we should watch or look outside and say okay, what is the output? What is the goal that we are pursuing?"

Pain point - Mindset of Control and risk avoidance
A mindset of permanent control de-risking does not align with the flexible and to some extent uncertain nature of Services. If the mindset is not slowly changed from the top it will become very difficult for the team to work in a more service-oriented way because the process and methods work against them.

"It's a process-oriented company. And to go from a process to be customer-centric means to also change the mindset, we cannot work for milestones, we cannot work for deliverables. It's a process of iteration. So you can fail but you learn from it and you iterate based on failure."

"So what I think the challenge is, that you have to convince intellectuals of the intellectual superiority of pragmatism."

Additional insights and discussion

It was interesting to observe that internal and external experts were quite on one page and pointed to the same problem areas. However, the difficulty seems not to find Pain Points or ideas for improvement but rather working around the internal hierarchy and interest between all the stakeholders.

"Other organizations who are part of that service delivery, it might be that they have a different viewpoint on how the world ought to be. And fundamentally, this can make the implementation of services very difficult, because you end up getting into a political fight, you know, a politicized fight about what is valuable and what is not. And so there is actually no real quick and fast solution to this. It's more like a lot of cooperation and collaboration between certain organizations."

It seemed unnatural for many participants to see the early and late stage of NSD as two separate entities. While participants talked about the development and delivery of services they also referred to the early stages of service development. It seems that linear stages are not the optimal way for NSD, which was also found in the literature. Hence, an optimal NSD process should find a way to combine the idea generation unit and the development unit. If there is no way around a fragmented linear process with many different teams then there should be made sure that the interfaces between the phases and the different approaches should be perfectly aligned. Moreover, it needs to be sorted out that some of the documentation that is currently done within the ISDP could have been created already in earlier stages.

It was mentioned several times by the internal experts that the end-users is sometimes considered to less in the Value Proposition creation phase. This results in a Value Proposition which does not entail enough insights from End-users. The missing of some key information about the user is not compensated in the early stages of the ISDP and thus leads to an incomplete service concept. In case there is a quantitative and qualitative lack of in-depth insights of the different user groups in the Value Proposition, it is not possible to design a Customer Journey that is validated. In case that happens there is a risk that the whole User Experience of the front office of the service offering is mostly based and validated on internal insights, rather than external end-user insights. This issue also created a lot of friction between the development team and the teams from the prior ISDP stages. It seems difficult for the ISDP team to communicate their needs to the prior stages. However, it is in the strong responsibility of the ISDP team pointing that out otherwise the prior team will never notice the pitfalls of their output. Many Pain Points that appear during the ISDP are actually created earlier in the overall process. To find a real solution for the Pain Points within the ISDP, the entire NSD process should be analysed and not just the development and delivery stages. For instance, it seems that many of the compliance documents which are done within the ISDP could be already done earlier in the process.
Moreover, the general characteristics of a service should be understood and deeply rooted in the way of working of the team. This means the overall internal approach to NSD should slowly shift from a process-driven G-D logic to a user-driven S-D logic. This mindset shift is nothing that can be achieved within the ISDP alone. Servitization is a huge collaborative effort across departments and many stakeholders and needs to be guided on a higher management level.

Categorization of the Pain Points

The Pain Points are combined and sorted in three categories: (1) Nonoptimal process input, (2) Limited early user validation, (3) The Problem clusters The Pain Points of category 1 refer to the process input, Category 2 refers to the earliest moments within the ISDP process and Tier 3 refers to the Problem Clusters Pain points (Paper work, Project Documentation Mindset, The Customer, Limited Team Collaboration) that occur in

several stages during the process. The categories were chosen to cluster the Pain Points in terms of similarity and process location. Which Pain Points originated from which NSD success characteristic, belong to which category and its location within the ISDP can be seen in on the next page in figure 17.

Tier 1 - Nonoptimal process input
Tier 1 describes the Pain Points which are related to the input of the ISDP. They are not originated within ISDP, however, they have a tremendous impact on the way of working, execution and quality output of the ISDP. The Value Proposition does not deliver all necessary information of the user and does not align perfectly to the core competencies of the development team, therefore the execution of the Value Proposition starts with too little information. This initial lack of certain information affects the whole service development and thus the quality of the final offering.
A Value Proposition plays a critical role in communicating how Company Z aims to provide value to customers and business partners (Boha, 2018). Hence, Only if the Value Proposition provides a rich user perspective next to the business perspective, OpEx can be achieved in the long run within ISDP.

Tier 2 - Limited early user validation
Tier 2 describes all issues regarding the earliest stage of the ISDP. Overall it describes a lack of End-user insights entering the process and the resulting difficulties for the team to create the best possible User Experience of the service front office. Due to this incomplete user insights, all activities related to the user are based on limited insights. It is crucial that the team gets the possibility to walk in the shoes of the user to derive authentic insights to craft the best User Experience possible.
The service offers gets not always tested and piloted prior to the launch at the end of the process when the service is already completely developed.

According to a study by Accenture (2015; in cooperation with Forrester), improving the Customer Experience received the most number one rankings when executives were asked about their top priorities for the next 12 months. Many companies, such as KPMG, Amazon and Google, implemented chief Customer Experience officers, Customer Experience vice presidents, or Customer Experience managers responsible for creating and managing the experience of their customers. The Marketing Science Institute (2014, 2016) views Customer Experience as one of its most important research challenges in the coming years. A service experience can be prototyped by simulating the user interactions with the service touchpoints Dan Saffer (2007). This can be done with several different methods and tools. For instance, Co-creation workshops, Service Blueprints, Experience prototypes, Customer Journeys, Service Staging, Contextual interviews and Scenarios. Only implementing Customer journey programs can provide improvements of 20 to 40 points in customer advocacy scores, cost reductions of 15% to 25%, and revenue increases of 10% to 20%. (Boston Consulting Group ,2020). On the other hand, Companies that resist the implementation of customer-centric changes might save money in the short term but can result in declining market share and lower profit in the long term.

Tier 3 - The Problem Clusters
The Tier 3 Pain Points can not be sorted to a specific stage of the process, they are rather universal and strongly represent the problem clusters in Chapter 3. However, it seems that they accumulate and occur more often and intensely at later stages of the process

Overview of Pain Points and Needs

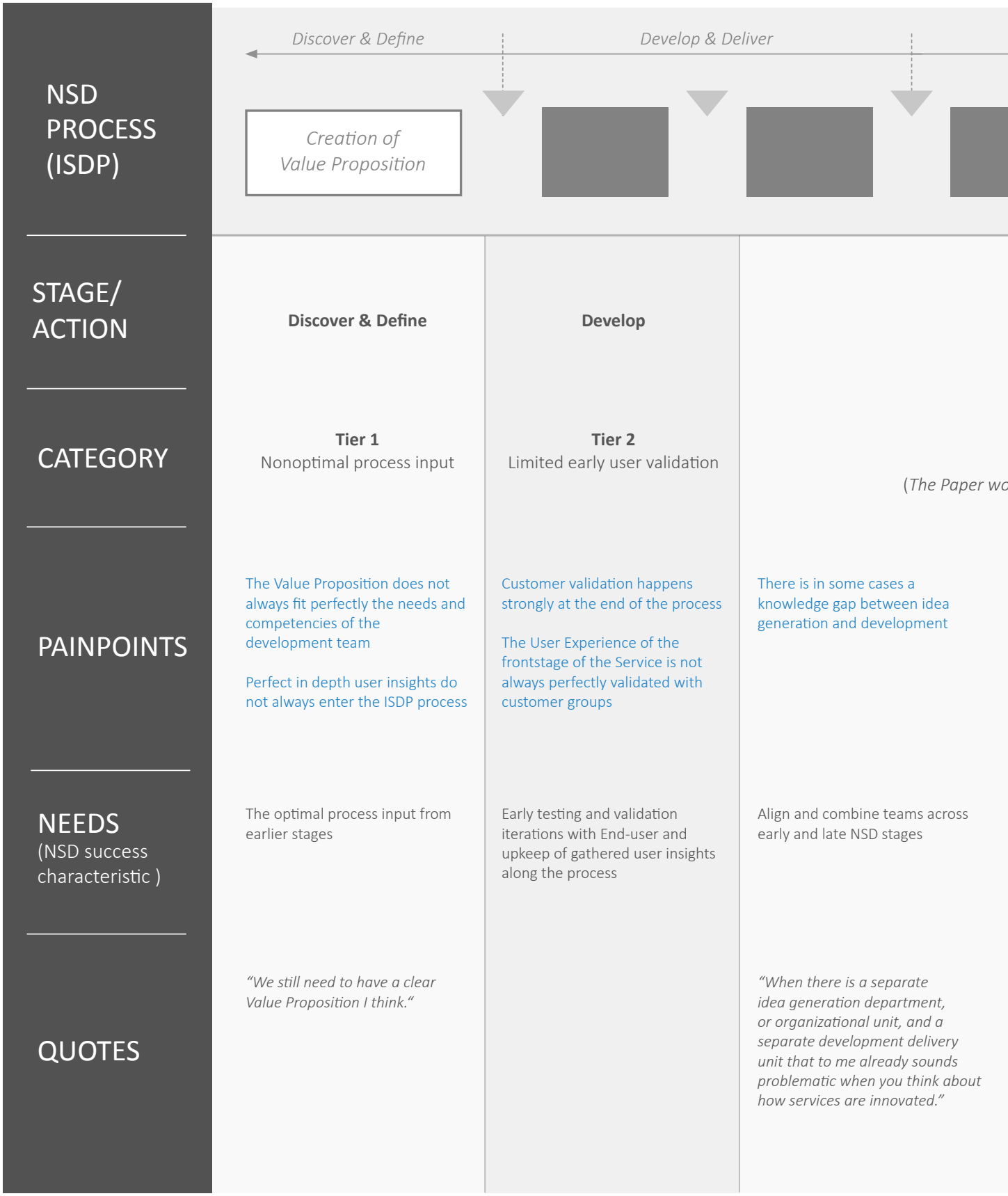
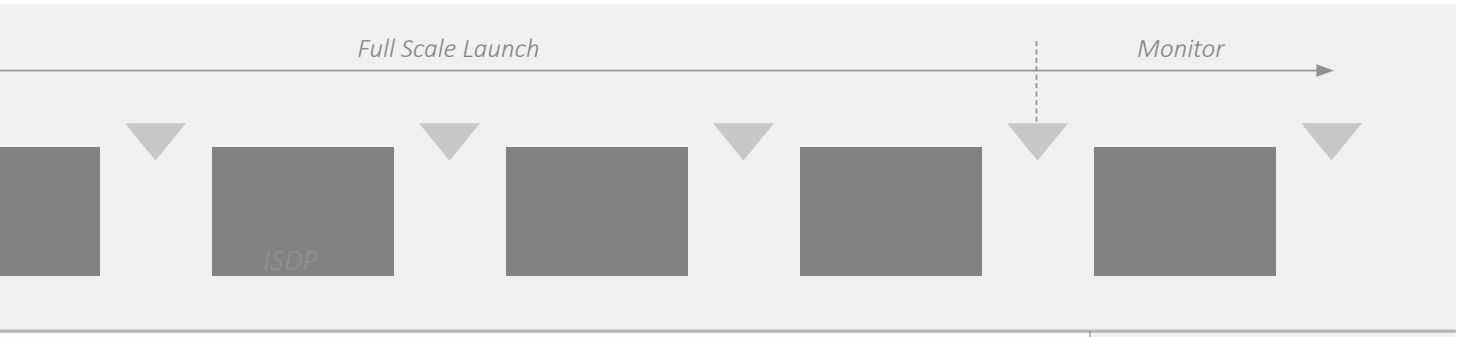


Figure 17: The graphic depicts an overview of all Pain Points, from which NSD success characteristic they are originated, and their categorization.



Develop & Deliver

Develop & Deliver

Tier 3

The Problem Clusters

rk, Project Documentation Mindset, Disturbed Team Collaboration, Customer)

Other

Some communication happens via documents

Cross functional teams are not in every case perfectly achieved

Sometimes there seems to be not enough idea & project ownership

Sometimes it seems there is a litt-le bit too much focus on the input (documents) instead of output (document content)

Mindset of Control and de-risking

Different approaches for different types of services.

Free flow of communication and knowledge across stages & team members and alignment of language

Strong project ownership and vision

Balance of freedom and control

Different processes for different types of services

"if we have short time to produce all of the documentation, then people tend to cut short the time that we should spend in collabo-ration."

"A value added Service, for example, is a completely different kind of thing. So those I think, should have different stage gates, different documents, more freedom"

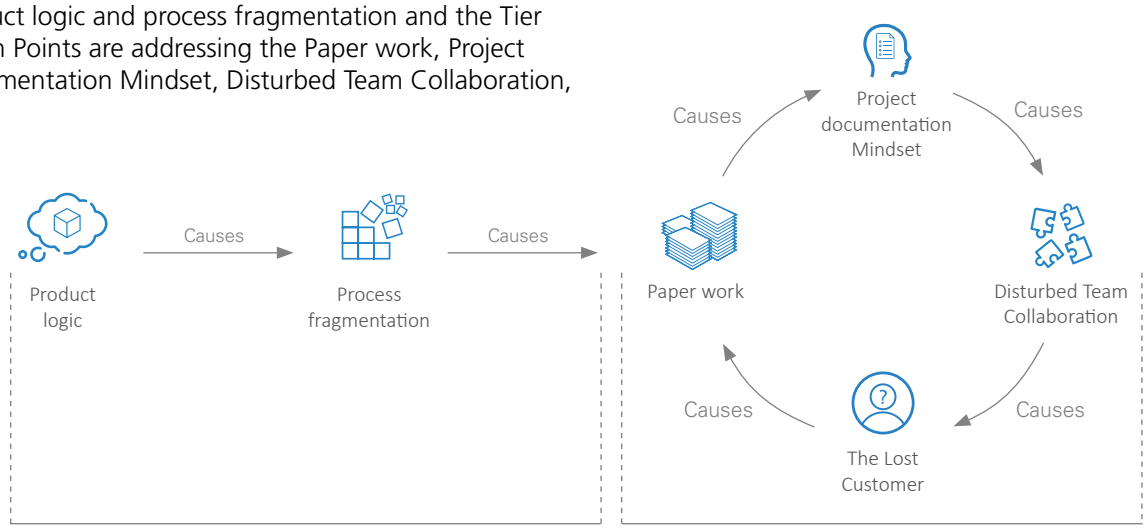
Pain Point selection and ranking

Several Pain Points were defined and put in the three Tier levels: *Nonoptimal process input, Limited early user validation, and The Problem Clusters*. Next, they got ranked on their impact on the current way of working to define the most important Pain Points to address. This was done by sorting each Tier level to the elements of the causal chain from Chapter 3. This is depicted in figure 18 below. It can be seen which category of Pain Points addresses which part in the causal chain. The Pain Points from Tier 3 address the problem clusters at the end of the Causal chain whereas Tier 1 & 2 addresses problems earlier in the chain. The later a pain point is placed in the Causal chain, the less improvement will be created on the long term by solving it, because the same Pain Point will be caused again earlier in the Causal chain.

To better illustrate these causal dependencies the problem hierarchy pyramid that is shown in figure 19 on the next page was created. The pyramid consists of four layers that are vertically ordered to depict the hierarchy of the Causal chain. Every layer stands for one or several problems of the Causal chain and each layer is caused by the layer above. On the top of the pyramid is the product logic, which causes the process fragmentation, which causes some bureaucracy (the Paper work) which causes the initially found problem clusters: Project documentation mindset, Disturbed Team Collaboration, and Customer.
The Pain Points of Tier 1 & 2 address the issues of the product logic and process fragmentation and the Tier 3 Pain Points are addressing the Paper work, Project Documentation Mindset, Disturbed Team Collaboration, and Customer. The Pain Points from Tier level 1 & 2 are more relevant to solve since they are located on higher layers. This implies that the Tier levels should be tackled in a strategic order starting at the top of the pyramid at Tier 1 and ending at the bottom at Tier 3. By not addressing Tier 1 Pain Points first, it will become very tedious or even impossible to solve the other Pain Points in the long term, since the potentially solved problems will be caused again from the higher-level problems. For instance, to solve the knowledge leak between phases (Tier 3), truly cross-functional teams can be empowered to increase the project ownership among the team. However, the attempt of creating cross-functional teams will be overshadowed by the time pressure caused by the Paper work.

Conclusion

The current approach is overstretched by the complexity of services and evolves into a highly fragmented process. The fragmentation produces documentation, which the developers can barely produce or even review. Success is measured, how fast all mandatory documents can be delivered to a certain milestone. Therefore, value is, on a high level, not continuously perceived in collectively producing a high number of documents as fast as possible, instead of spending time in cross-functional problem solving. Hence, the process needs to be improved on the highest point of the pyramid to achieve permanent improvement. By solving the issues from the bottom-up, one ends up in



Tier 1 - Nonoptimal process input

- The VP does not fit to the needs and competencies of the team.
- VP does not deliver rich user insights
- VP does not provide vision and guidance to the team

Tier 2 - Limited early user validation

- User Experience is not validated with users
- Customer validation hap pens at the end of the ISDP

Tier 3 - General

- Losing track of customer
- Little idea and project ownership
- Tacit knowledge leak between phases
- Fixation on documentation
- Theoretical cross functional teams
- Mindset of cotoll and risk avoidance

Figure 18: The graphic shows the Causal chain of all Problems. It shows that the four Problem clusters are caused by a process fragmentation which is caused itself by a Goods dominant (G-D) logic.

an infinitive resource-intensive reaction loop where the solved problems are caused again by a higher layer.

Addressing the product logic is just partly possible because this needs optimally a complete architectural process change towards services across the organization, instead of just a minor modular process change within ISDP. So an alteration of the configuration in the whole system of how components interact is needed. This is a very time and resource-intensive transformation and the company might not see enough potential in it yet. Nevertheless, it is crucial to acknowledge the high-level problem and develop a long term strategy that incorporates a range of solutions that helps to shift the organization slowly towards a S-D logic.
The most important point to tackle would be to adapt the input of the ISDP and align it with the demand from the development team. This means improving the Value Proposition in a way that the team has enough information about the user to design an optimal user experience of the service front office. This incorporates an in-depth flow of customer insights into the process and makes sure that these insights are considered throughout the process.
On the other hand, to sustainably solve the current issues, the main question to address should be why Company Z still uses sometimes a G-D logic for services if they aim to become a solution provider. Or in other words, why following a value-in-exchange logic instead of value-in-use logic? There are probably many answers to this question, however, one reason could be what Sull (2005) described as active inertia. Big organizations respond to market shifts by accelerating activities that succeeded in the past. When the world changes, organizations trapped in active inertia do more of the same. The organization prefers its old commitment which creates their success in the first place, rather than creating new commitment. Making new commitments does not allow Company Z adapting to change.
Another reason could be that many services Company Z develops are dependent on products. Hence, Company Z might still perceive its established tangible products and technology as the main value producers and profit sources. New services work as support material for their products. Therefore, it might not be viable yet to invest in an architectural change of their internal processes.

Summary

In this chapter, a Delphi study with internal and external experts was conducted to define general success characteristics for NSD in the develop and deliver stages. The characteristics were compared against the current process and translated into several Pain Points. The Pain Points were clustered into three categories (Tier 1 - Nonoptimal process input, Tier 2 - Limited early user validation, Tier 3 - General), located in the ISDP, and ranked on their impact with the help of the Causal chain from Chapter 3. The outcome was visualized in a problem hierarchy which showed that in order to create a long term solution, the Nonoptimal process input (Tier 1) and the Limited early user validation (Tier 2) should be addressed before any Problem Cluster Pain Point from Tier 3. Otherwise, potentially solved Pain Points will be caused again by a higher problem in the hierarchy.

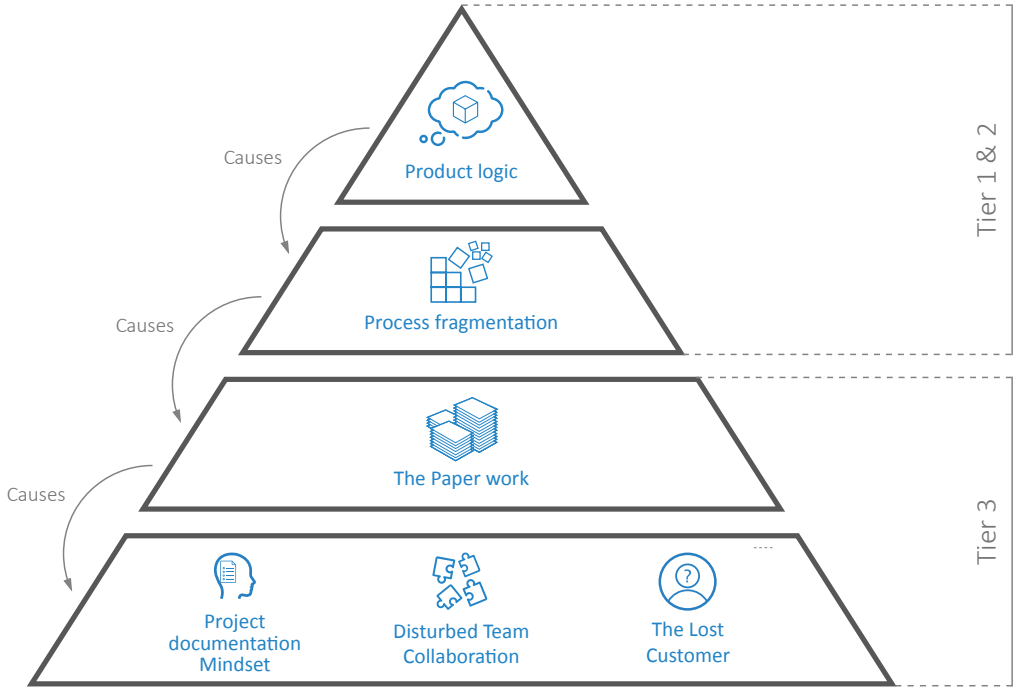


Figure 19: The graphic is a further development of the Causal chain (figure 22). It shows the hierarchy of issues and where the different Tier levels are located within.

Chapter 5: Concept creation

In the previous Chapter several opportunities were found of how a service-oriented way of working can be achieved within the current stage-gate setting of the ISDP.

In this chapter, a concept, that consists out of two parts, is created that aims to implement a user perspective into the current way of working by implementing a service Prototyping process at the very beginning of the ISDP. This allows the Service Development team to test and validate the Service offering together with the users early on to build a better service front office and a better User Experience.

Concept

To structure the concept it is separated into two different parts. This was done because both concept parts provide different interventions but should be seen as one entity. The concept is depicted in figure 20. Part one, the early Service Validation is shown in blue and part two, the Value Reflection, in red.

Part one - Early Service Validation

Part one wants to foster a user-centred approach into the ISDP by implementing an early service validation possibility at the very beginning of the ISDP. As described, the Service as a whole is not thoroughly tested and piloted with End-users before the validation and testing phase at the end. A minimal viable version of the Service as a whole should be already thoroughly tested before the ISDP, However, this is not the case. As found out before by the Interviews, the Value Proposition creation is very market-driven and often based on products rather than services. Hence, early service validation is not properly done and therefore no rich end-user insights are collected. Therefore, an early service validation phase at the earliest point possible within the ISDP should be integrated. This allows the team to walk in the shoes of the user to derive authentic insights to craft the best user experience possible. This will help to rapidly test and validate the service proposition with the End-user early on.
The gathered insights from the Service Prototyping will be used to update the Value Proposition.
This will allow the team to detect major flaws of the service proposition early on, understanding better the sense and value provided to the customer and spark initial strong project ownership among the development team which will lead to better service quality at the end.
The Prototyping process consists of five phases: Ambition creation, Prototype Planning & Creation, Prototype Testing, Prototype Reflection, and Process Reflection.
The process is inspired by the Scrum sprint structure to help the team to standardize the Prototyping and make sure its performance gets permanently assessed, improved and adapted to changing situations. The process should be understood as an independent black box unattached from the ISDP documents. Only the output of the process is important. The team is provided with the goal and a direction of how to get there.

Part two - Value Reflection

The Value reflection is an exercise with the aim to keep the gathered user insights from the prototyping cycle within the process. If the user insights are not valued throughout the process it might happen that the user insights disappear and make the whole prototyping cycle obsolete. This exercise is not meant to gather new insides about the End-user or the project itself but rather to put the nose out of the process and the documents and focus on the big picture and overall aim of the project.
To make sure the user insights are used properly among the process, two reflection points are established where the team is able to look back to the initial service prototyping and make sure the solution still provides value to the end-user. The reflection points need to be as short and efficient as possible to not provide more bureaucratic paperwork to an already overloaded process. Hence, the exercise will not be a document but rather attached as requirements for the milestones. The requirement will be that the team should conduct the Value Reflection exercise at least once in stage one and two of the ISDP.

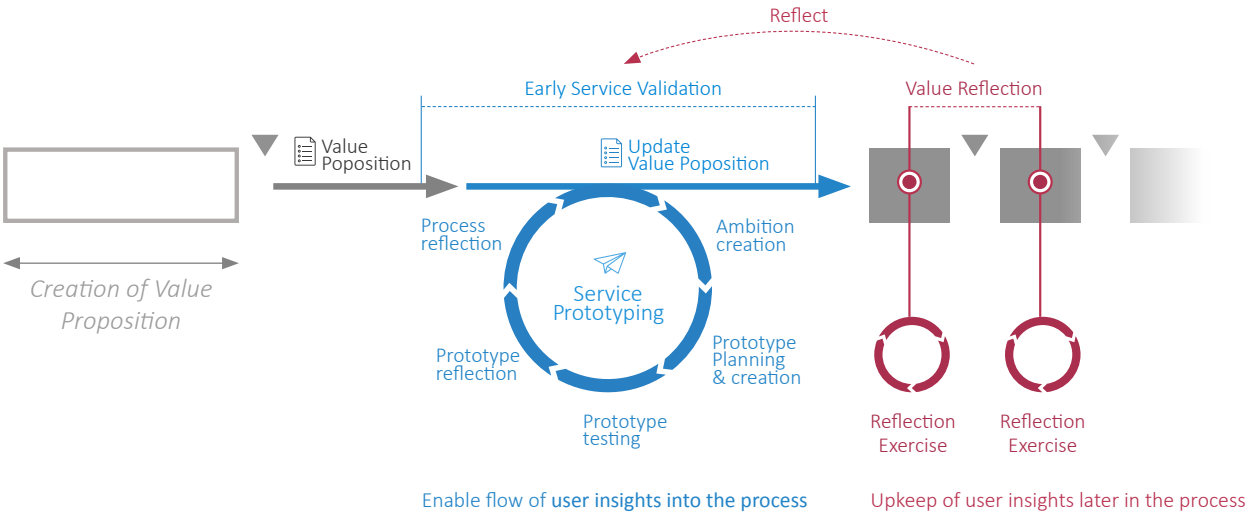


Figure 20: The visualization shows both parts of the concept. The Early Service Validation is coloured in blue and the Value Reflection is coloured red.

Concept integration

The detailed integration of the concept is depicted in figure 22 on the next page. In the first line, the overall ISDP is shown. The second line shows a detailed view of document structure in the first stages of the ISDP. In the third line, it is depicted how the concept is integrated into the document structure of the ISDP. Part one of the concept is depicted in the colour blue and part two of the concept in the colour red.

Part one - Early Service Validation
The Service Prototyping process (part one) is integrated at the very beginning of the first stage of the ISDP, once the Value Proposition is delivered to the service development team and the project is initiated. The team validates the Value Proposition with the help of Service prototyping. This means the team builds the content for the Customer Journey and the Service Blueprint right at the beginning together with the end-users by using the method Service staging.
This allows the team to create and validate the front office of the service offering at once right at the start of the project in a very short amount of time. With the gathered information the team can now assess and update the content of the Value Proposition and proceed with the ISDP documents and collecting requirements.

Part two - Value Reflection
Once the user insights entered the ISDP via service prototyping, the team needs to conduct the Value Reflection exercises (part two of the concept). The Reflection exercises will become part of each milestone by adding it as a new requirement to the gates. The development team needs to conduct the reflection point before the milestone is reached and only one exercise per milestone is allowed. The exact point of reflection can be chosen by the development team. This will foster slightly flexibility among the process and shift their focus partly away from documentation.

Implementation Barriers:
There are several barriers that complicate the implementation of service prototyping into the ISDP structure. First, it might create friction between the interface of the ISDP and the creation phase of the Value Proposition because everything related to user needs is not owned by the service development team. Service Prototyping is a "black box" inside the ISDP which makes it difficult to control and to measure with the current KPI's. This means the benefits of service prototyping are difficult to quantify by the team and thus convince decision-makers of its value. It is very likely that decision-makers from a higher level will not agree for such a big change without quantitative measurements. Another important barrier is the KPI's time to market. A Service offering should be as fast as possible developed and launched to count as a success. By adding more exercises and thus increasing the initial investment of time and resources seems a serious concern for implementation.

Bypass the implementation Barriers
To bypass the implementation barrier the Service Prototyping needs to be simplified as much as possible. This is done by using the already existing Customer Journey. The Customer Journey is created by another team and delivered to the service development team. However, the Customer Journey sometimes does not get perfectly validated with the end-user and thus is partly created internally on paper.
Once the Value Proposition is delivered to the service developmentteam and the project is initiated. To achieve Service Prototyping the team needs to receive the Customer Journey which is delivered by another

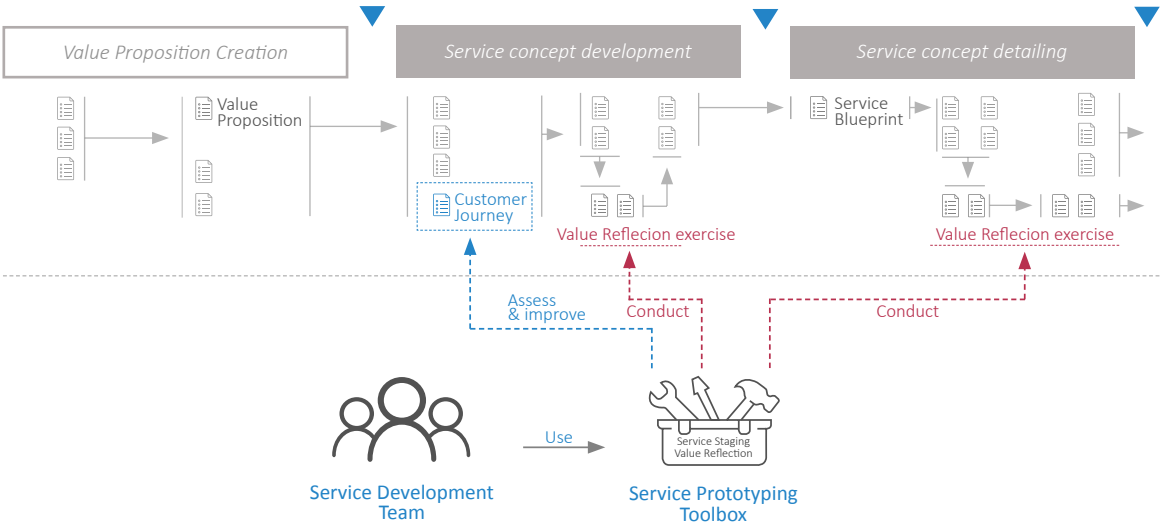


Figure 21: The graphic visualized how the toolkit can be used by the team to assess the Customer Journey and conduct the Value Reflection exercise

team.
The Customer Journey, which is created at the very beginning of the ISDP is by definition already a service prototype for the service front office. However, validation of the service prototype (Customer Journey) does not happen yet. Therefore all it needs is to achieve adequate service prototyping is to use the existing Customer Journey. Once the stages of the Customer Journey is validated with the users, a simple form of early service validation through service prototyping with low entry barriers is achieved. Since the access to users is limited for the service development team, it was decided to use service staging as a prototyping tool to assess the User Experience of the different stages of the Customer Journey. Service staging is a way of reviewing and assessing the User Experience of specific touchpoints of the service proposition. With service staging a defined service scenario can be physically acted out by the service design team alone or together with customers. Communicate the User Experience to other stakeholders and allow the service design team to test and refine their solutions with potential users. The exercise should be conducted as soon as the Customer Journey is available for the team.
Both, the early service validation assessment tool as depicted in figure 21 on the previous page and the reflection exercise are provided in the form of a toolkit. The toolkit should be a simple playbook that intuitively provides the team with the necessary steps and templates to conduct both exercises. This is done because the team is properly experienced in applying and maintaining all kinds of tools.

Summary

This chapter introduced a concept that consists of two parts. Part one of the concept implements an opportunity to early validate the service via service prototyping to foster a user-centred approach and improve the User Experience of the service offering.
To bypass the high implementation barrier for a full-scale prototyping process, an assessment tool is provided to allow the service development team to assess and validate the content of the Customer Journey with the help of service staging. Part two consists of a Value Reflection exercise that makes sure that the gathered user insights are still considered at later development stages. Both exercises are provided in the form of a toolbox that can be applied by the team. However, an assessment tool for a Customer Journey that is created by another team is no reliable long term solution for a user-centred approach. Hence, a strategy needs to be created on how to achieve user-centricity within ISDP in the long term.

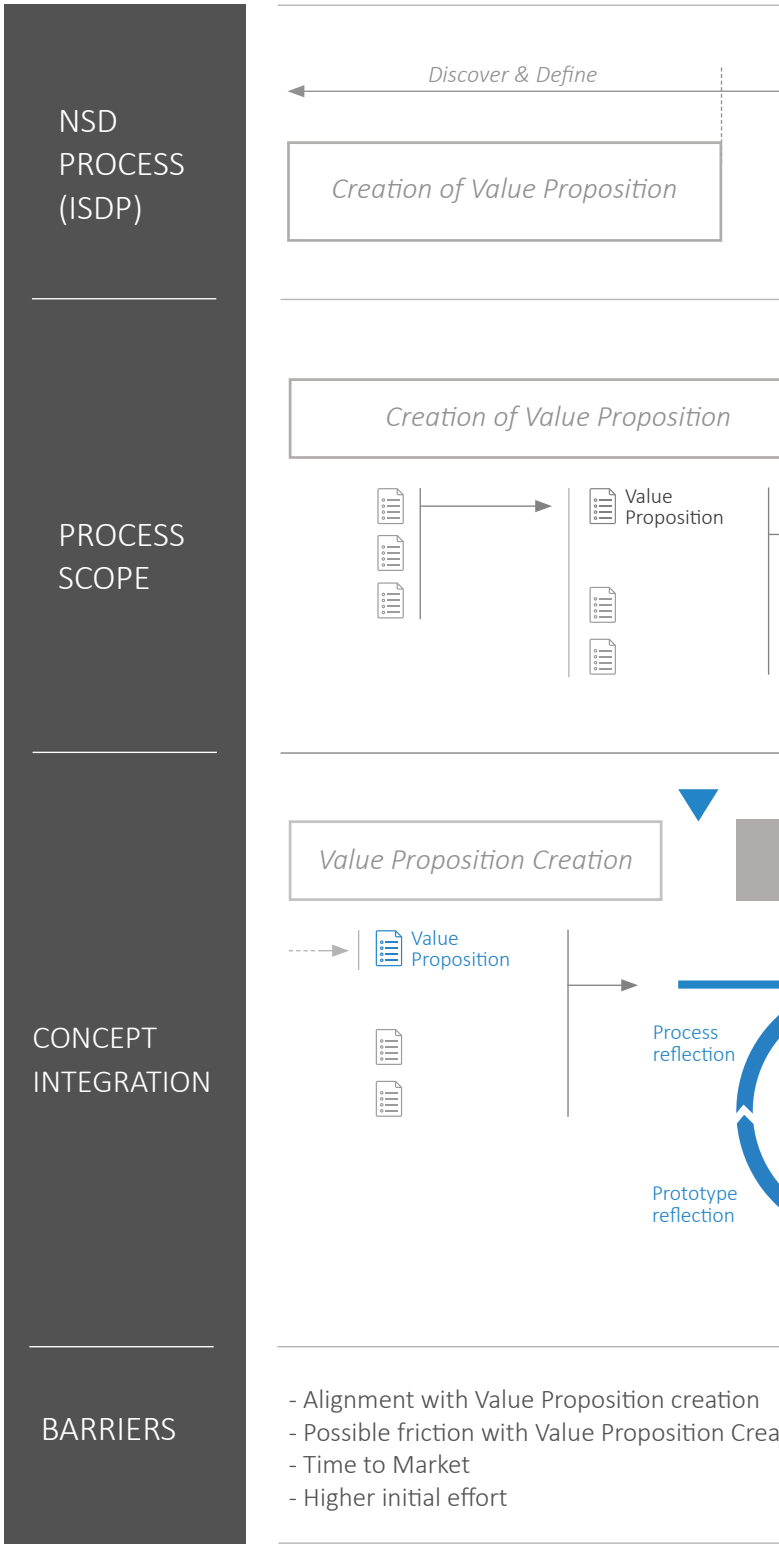
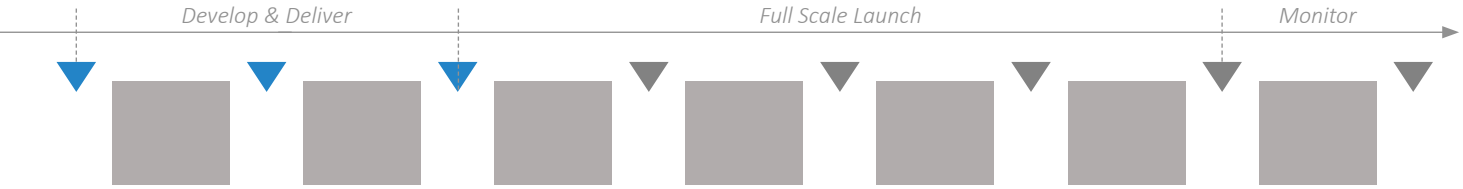
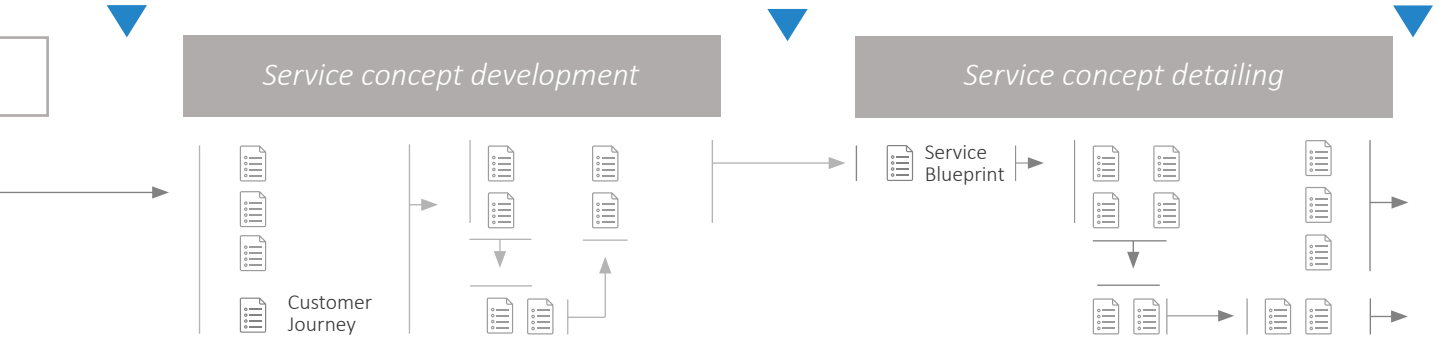
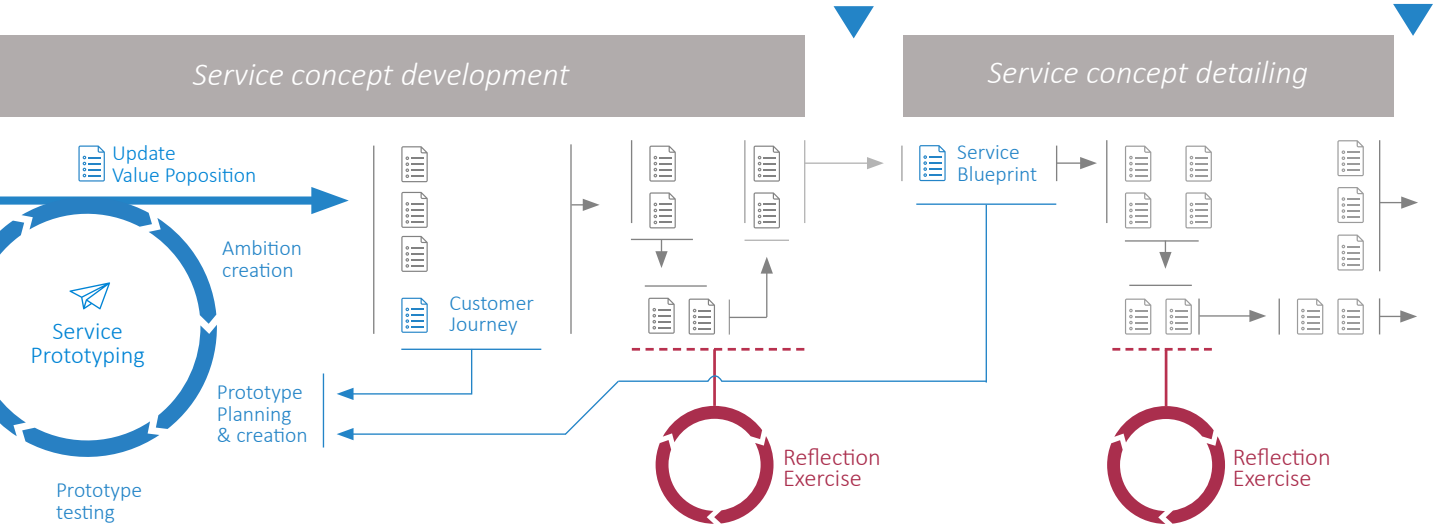


Figure 22: Shows the detailed integration of both parts of the concept in the document structure of the ISDP. The highest layer shows the overall ISDP process, the second layer zooms into the creation phase of the Value Proposition and the first two stages of the ISDP. The third layer shows the changes made in order to implement both parts of the concept. Beneath the general logic and barriers are described.







tion

- Time pressure for the team
- Team commitment- “Just another meeting“
- Different way of working

Chapter 6: Implementation

In the previous chapter a concept was created that implements an opportunity to early evaluate the service offering via service prototyping to foster a user-centred approach.

This chapter provides a strategy that describes in three horizons how the concept can be implemented and scaled within the organization to achieve a service-oriented way of working within the ISDP.

Implementation Strategy

As found earlier the most urgent Pain Points to tackle are the ones related to the process input (Tier 1). Thus improving the process by implementing an improved Value Proposition. The toolkit introduced in the last chapter however only allows the team to assess the User Experience of the Customer Journey. This means they react on the input (Customer Journey) from another team rather than actively creating their own input. This form of prototyping is highly fragmented and tentative and thus not suited for long term use. However, it is the simplest form of early service prototyping and therefore a good initial door-opener for Service Design methods and thus a service-oriented way of working. The next logical step would be, once the tool is used, to upgrade it into a full-scale prototyping process (the concept). The strategy of how the tool will be upgraded into a full service prototyping process and finally lead to an improved Value Proposition.

Overall Strategy

The vision of the Strategy is an improved Value Proposition that delivers rich user insights to the service development team so that they can build the best possible service front office. This vision is achieved via three horizons. In the first horizon, the toolkit gets created and implemented to assess and improve the current value provided for the users. At the same time, the environment gets already prepared for successful future intervention in the Value Proposition creation phase. In the second horizon, the toolkit gets upgraded into an integrated service prototyping approach to improving the current value creation within the ISDP. In the third horizon, the service prototyping will be scaled into the Value Proposition creation phase and finally get merged with the Value Proposition creation. The strategy is depicted in figure 23.

Strategic Roadmap

The Strategic Roadmap which is depicted in figure 24 on page 60 and 61 translates each horizon into several sub horizons and concrete steps to execute. In addition, it shows which service prototyping tools are used or introduced in every horizon and which upskilling activities for the workforce are necessary. Finally, the time pacing strategy is shown which depicts the strategic life cycle of each horizon.
A more in-depth description of each activity is found in Appendix C.

The vision

The vision of the Roadmap is to optimize the Value Proposition to improve the input of the ISDP and thus addressing Tier 1 Pain Points to achieve long term improvements. The Value Proposition needs to deliver rich user insights into the ISDP and perfectly so that the service development team is able to develop the best service front office possible. This can only be achieved if the Value Proposition creation phase adopts a user-centred perspective within the Value Proposition creation activities. This will be achieved by implementing step by step service prototyping within the ISDP, and once it proved its value, will be expanded into the Value Proposition Creation phase.

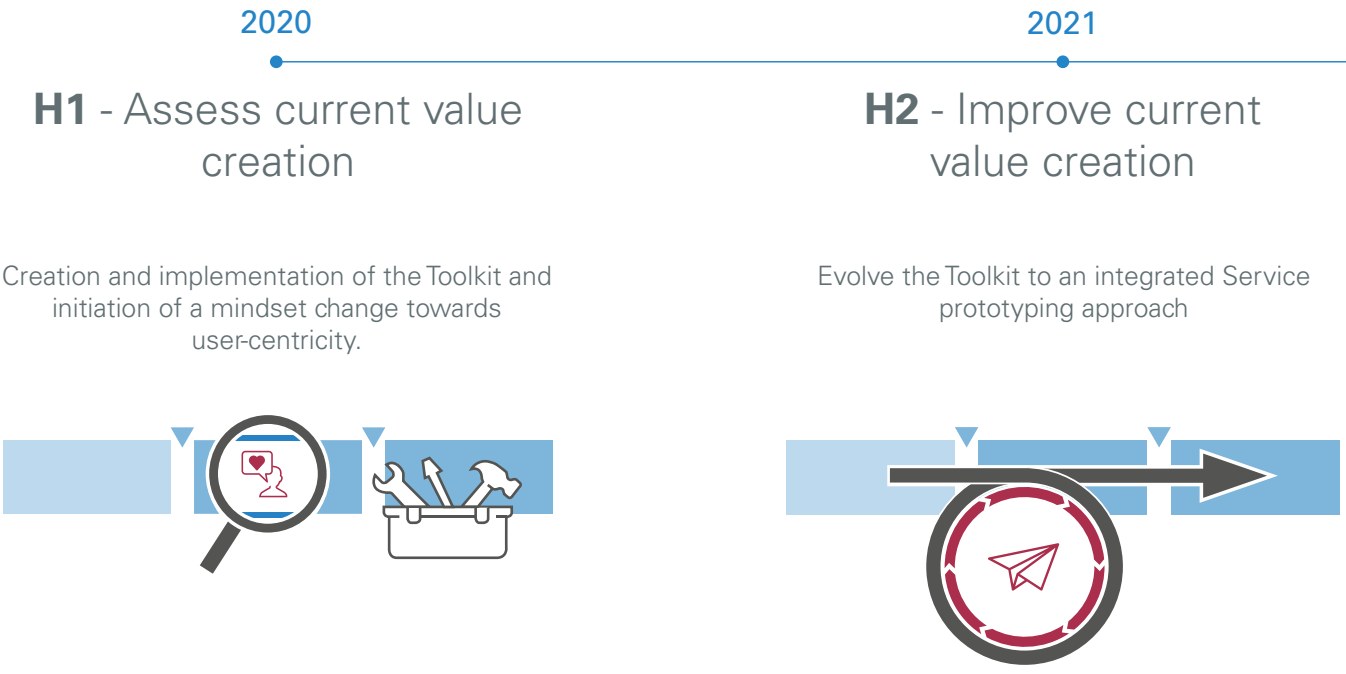


Figure 23: The graphic shows all three horizons of the strategy to achieve the vision of an improved process input.

Characteristics for a successful customer-centric Value Proposition:
It needs to be emphasized that an own and individual Value Proposition should be developed that fits the personal needs and competencies of the Service Development team. The following points are guidelines based on Osterwalder et al. (2014) success characteristics for a Value Proposition. These points or templates should not be blindly copied and applied to the current situation but rather used as a starting point for addressing rich customer needs in the current Value Proposition:

- Shows what matters most to all customer groups on functional and emotional levels
- Focus on few but very important pains Aligns with how customer perceive success
- Differentiation from the competition (why is the service better for our customer than others)
- Difficult to copy

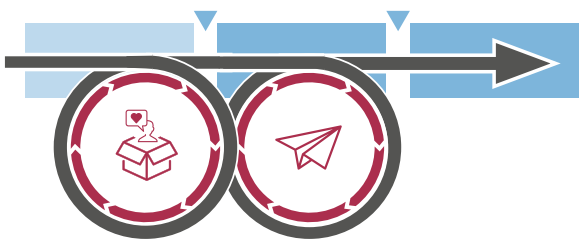
Horizon 1
The first horizon concentrates on assessing the content of the Customer Journey by establishing the toolkit. The toolkit provides the service development team with the ability to prototype and test the different steps and interfaces of the Customer Journey with the help of service staging.
Once the team successfully applied the toolkit, it needs to focus on adding more prototyping tasks to the toolkit and train their skill in service prototyping. To achieve adequate prototyping in the future the end-user needs to be involved in the activities, therefore the user ambassadors of the team should be empowered to convince decision-makers that access to the end-users is needed early in the process to unlock the full potential of the prototyping activities. After that, the user ambassadors should already start establishing deep connections with the end-users of running project to easier get customer access in later horizons.
At the end of Horizon one, the team should have successfully assessed the Customer Journey by utilizing the toolbox.

Horizon 2
Horizon 2 is all about implementing a full-scale service prototyping process into the first stage of the ISDP to initiate the switch from assessing the Customer Journey to actively co-create an own service prototype. This is achieved by evolving the toolkit into a stand-alone service prototyping process and the value reflection exercise, as it was described in the previous chapter. The aim is now to actively create the Customer Journey and the Service Blueprint together with customers. Also, the Service Blueprint should now be created in the first stage of the ISDP during the service prototyping process, instead in the second stage of the ISDP.
The team should focus on becoming excellent with service staging by trying new tools and approaches that will improve their prototyping capabilities. The customer satisfaction and the performance of the service prototyping should be thoroughly recorded to build a story of proof which will be needed in the next horizon to convince decision-makers to support a scale of service prototyping. Next to that, the team

2021

H3 - Optimize and scale improved value creation

The Service Prototyping process gets refined and scaled into to earlier stages of the New Service Development process.

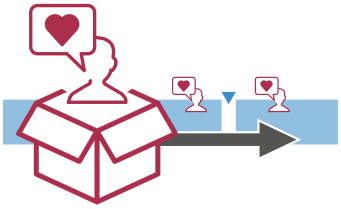


2022

Vision

Improved Value Proposition

Improve the process input by implement an improved Value Proposition that delivers rich user insights into the service development process to achieve the best Customer Experience of the service front office as possible.



should design an improved Value Proposition template that will be used to support the story of proof and increase the chance to convince the decision-makers.
At the end of the horizon, the team should be experienced in service prototyping so that the provided value to the users is measurable and enough proof is collected
to scale prototyping into the next stage

Horizon 3
In Horizon 3 the prototyping process will be scaled to the Value Proposition creation phase. To make this scale possible the Service prototyping team needs to demonstrate its value and use the story of evidence and the improved Value Proposition template from the last horizons to convince high-level decision-makers that service prototyping is the key to a user-centred Value Proposition. Once service prototyping and the Value Proposition creation is merged, an early service prototyping process that can flexibly react and influence the Value Proposition is achieved. At this point a stand-alone cross-functional service prototyping team should be created that conducts every prototyping activity for the development teams. Finally, the team needs to build up an internal service prototyping laboratory that provides all facilities and items to conduct high-quality service prototyping across the organization.

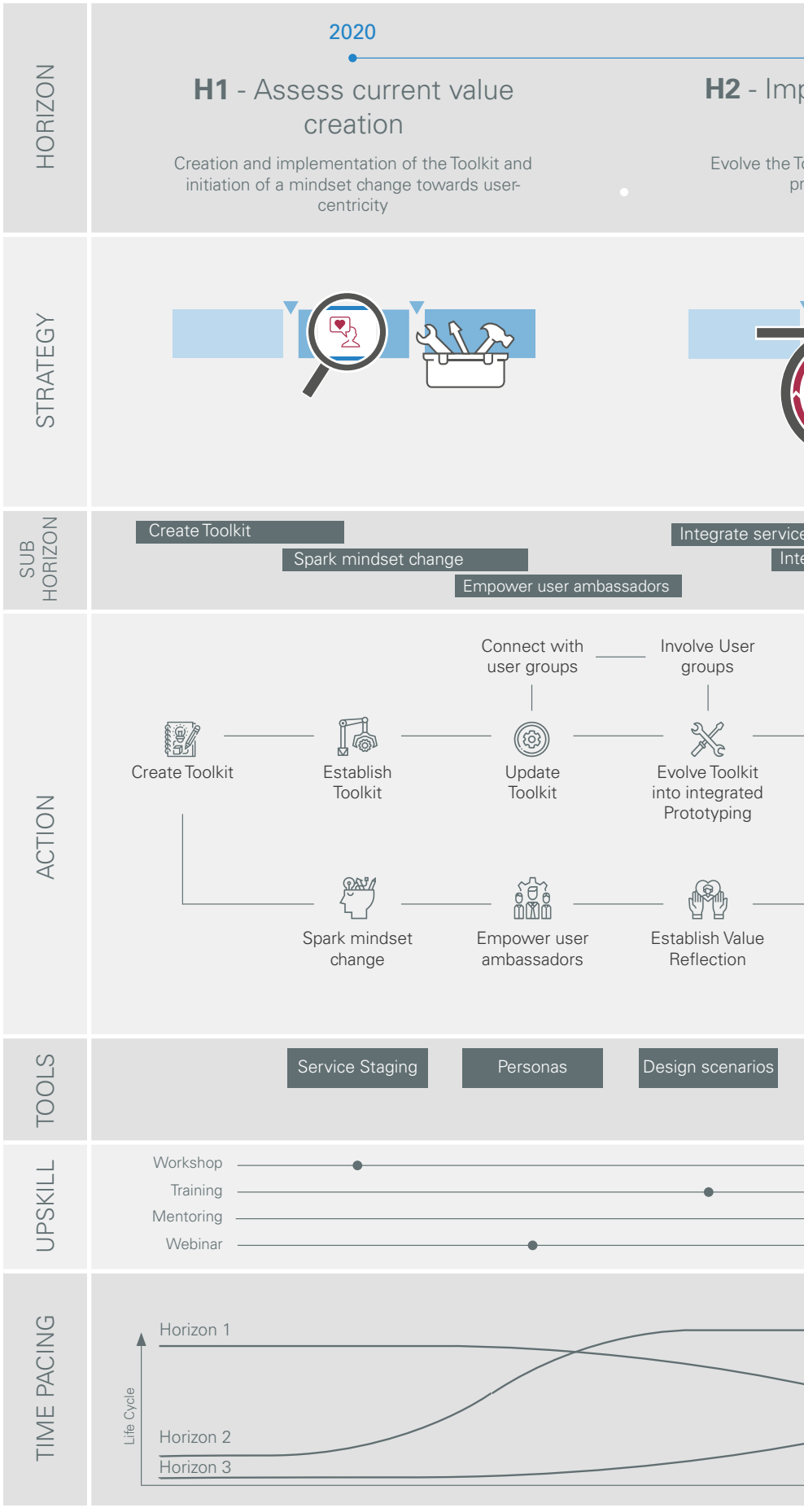


Figure 24: The visualization depicts the Strategic Roadmap

2021

prove current value creation

oolkit to an integrated Service rototyping approach

2021

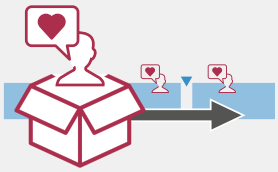
H3 - Optimize and scale improved value creation

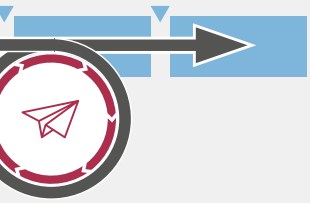
The Service Prototyping process gets refined and scaled into to earlier stages of the New Service Development process.

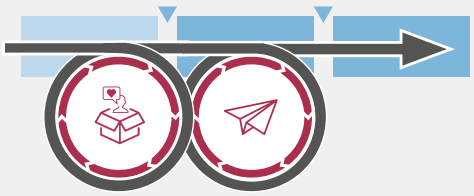
2022

Vision

Improve the process input by implement an improved Value Proposition that delivers rich user insights into the service development process to achieve the best Customer Experience of the service front office as possible.







e Prototyping
egrate CJ & Service Blueprint
Develop new methods
Establish Prototyping team
Scale into VPC phase
Establish prototyping space

Integrate Customer journey & Service Blueprint

Explore & experiment with new methods

Scale into Value Proposition creation phase

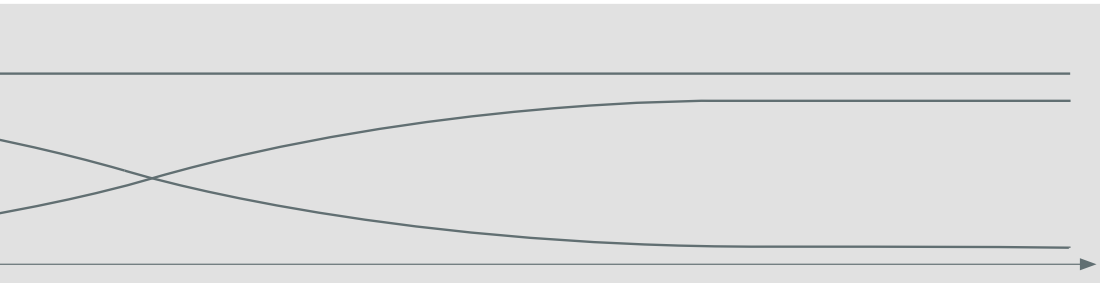
Establish cross-functional team

Establish Service Prototyping space

Create Story of proof for improved Value Proposition

Develop & standardize a new Value Proposition

Service Blueprint
Customer Journey
Service Roadmap
Service Image
Value Proposition canvas



Improved Value Proposition

Provides:

- Rich insights from all customers
  - What matters most to customer (Functional & Emotional)
  - Pain and gains
  - Perceived success
- Guiding vision
- Fit to team competencies
- Differentiation from competition

Chapter 7: Evaluation

In this chapter the project is evaluated. It provides a reflection about the solution, gives recommendations and a personal reflection about the project.

Evaluation

Project evaluation

The strategy shows a possible way to foster a Service logic in a product-oriented stage-gate structure located in the development and delivery stages of NSD by using service prototyping as a door opener for a human-centred approach. But how high is the chance that the strategy will succeed? This can be found out by assessing its feasibility, desirability and viability.

Desirability

Service prototyping and a human-centered approach in general seems to be desirable for the majority of the development team, because the wish among the team for a service-oriented approach, instead of excessive documentation, seems rather high.

Feasibility

Service prototyping seems also to be feasible because it gets implemented by assessing an existing document within the process. This requires no major changes or high investment of time and resources which increases the chance for a possible pilot run.

Viability

However, if the tool will be measured and evaluated with the current product-oriented KPI's the chance is high that the assessment tool will fail without strong support from the team because it adds more work to the already overloaded and slow process. This failure will block the other horizons to happen, therefore Service Prototyping can only succeed if the tool is not evaluated with the current KPI's. However changing the KPI's would also mean that the process model itself has to be replaced on the long term which requires lots of resources. Therefore, Service Prototyping does not seem to be viable in a compliance handling stage-gate process. If Service Prototyping is not viable in this context, is it then even useful for the process? I think the main benefit of Service Prototyping within ISDP is to better bring the user-perspective inside the development process and let it spread into the Value Proposition creation phase. Besides that, the implementation of early service validation within the ISDP adds certain additional benefits to the way of working:

Direct Benefits

Better team communication and collaboration
Service prototyping is an interactive way of working that removes abstraction and makes the Service offering tangible and understandable for the development team in an intuitive way. This simplification and transparency of the content will make the communication and collaboration between the development team, SMEs and other stakeholders much easier.

Improved project ownership among the team
With the help of service prototyping, the team is able to physically experience the quality of the service offer. This will make the development process much more rewarding and thus allow the individual team members to develop strong personal excitement for the project. This results in increased project engagement by the broader team and a higher capability to assess the value of their own individual work throughout the project. Teams will be able to better understand the bigger picture which creates a stronger sense of project ownership and allows the different teams to act more flexible and independent.

Reduced time
Initial time spending in service prototyping reduces major flaws in the development process and thus leads to fewer flaws and failures in the final services validation phase. Therefore less time and resources are needed to validate the service.

More accurate user requirements
Prototyping improves the quality of the specifications and requirements provided to customers. With prototyping, customers can anticipate higher costs, needed changes and potential project hurdles and potential end result disasters. Strong prototyping can ensure product quality and savings in the long term.

A tool for bargaining
Service Prototyping can be used to permanently collect evidence that more user insights are required within the ISDP. With the help of the evidence a strong argumentation can be created to convince decision makers that changes earlier in the process are needed in order to increase the performance of the ISDP.

Recommendations

The project clearly defined the Pain Points of the current situation within the ISDP and provided the knowledge that is needed to further integrate a flexible service-oriented way of working into the Service Development team and further into the Value Proposition creation phase.
The research and the strategy should be used as a fundamental to create a sequence of assignments that will lead to a user-centred Value Proposition and help to buy-in decision makers .

Personal reflection

When I accepted the project, I expected it not to be easy because of the broad scope and it is not the field where strategic designers usually play. The explorative research approach was really strong in understanding the highly complex situation from an unfamiliar topic and turned out to be very precise in framing the problem behind the problem. To really understand the overall context and find a direction for a solution was still a very iterative and fuzzy process with a lot of literature, interviews and discussions involved.
Once the problem was framed it became very difficult to find a solution. The environment was strictly regulated so that it was only possible to fix smaller issues within the process structure that would not have a big impact at all. Tackling the bigger picture, zooming out of the process and creating a long term solution was not possible from my current position within the ISDP. This put me in a dilemma of knowing the problem, but lacking the possibility to solve it properly. At the end I had to choose a path in between by creating a holistic strategy that aims to improve the bigger picture but also entails smaller tools to fix current issues in the short term. This makes the solution neither fully holistic nor specific and tangible. I think this could have been avoided by discussing the possible room of action of the assignment with the client more in depth beforehand. However lots of prior knowledge about NSD and processes would have been needed to judge the situation beforehand.
Nevertheless, I learned a lot about how big organizations think and work and why innovation is so difficult to achieve within high fragmented and structured environments that do not provide much freedom. I think in services it is not enough to create a view innovation departments that are provided with more freedom to "produce" certain innovations for the company. Instead companies should foster an innovative mindset across the organization and combine it with proper idea management that provide many incentives for its employees.

The role of strategic and service design in late NSD
During this project it became clear that applying (service) design methods face several limitations in companies that use product processes for NSD. Even if Service Designers are very suited to recognize the bigger picture and pinpoint the problem, they seem to have difficulties solving issues within a strictly framed environment and limited possibilities where zooming out is not possible and the field of play is very limited. This can become a serious concern for Strategic and Service Designers in big corporations where solutions need often to be found on very tactical levels. To solve these smaller issues data analytics or coding skills would have been helpful to, for instance, digitize and automatize the massive amount of documentation and thus create improvement within the existing set of KPIs.

But are Strategic and Service Designers even supposed to play in that field? Is a highly controlled process environment that is used to produce service innovations not already a contradiction and thus unsuitable for Strategic and Service Designers?
The problem hierarchy pyramid showed that many of the current problems of the NSD process are actually caused on the highest levels and thus need a higher level treatment. To tackle the issues from a higher level one needs to convince high level decision makers from the viable superiority of, in that case, a service-logic. However Strategic and Service Designer often do have limited knowledge and possilities to convience the right decision makers if they have a contrary mindset. So if Strategic designer want to succeed in that field they need to place themselves at the top decision levels or learn more administrative business skills.

How Strategic and Service designers in general can contribute to the later NSD stages strongly depends on the performance of earlier NSD stages. If the user is not enough considered in the early stages, the late stages might start gathering user insights on their own until the early stages adapt their own approach. Within this timeframe there seems to be a place for service designers where they can contribute. This time frame can be used by pioneers to get a foothold in the later stages to test and expand their methodologies and spread their influence.

The problem hierarchy pyramid
The pyramid visualizes the Causal chain that a product logic causes if applied to NSD. The model could contribute to servitization literature by developing it further into a generic framework for analysing and assessing NSD processes within organizations. However, there needs to be further research if the model is generalizable to other contexts and companies. Moreover, it could be the fundament to further investigate if there is a possibility to achieve a S-D logic in a organization by starting at the bottom of the pyramid.

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Appendix A
Initial Interview guide

Orientation Interview

Type: Semi-structured, time: 00:30 - 00:45

INTRODUCTION

- Introducing of Interviewer
  - Background
  - Scope of task
- Introducing Interviewee
  - Background

1. Can you tell me about your current role in the department?

- What are you usually doing here (in the department)?

  - Where are you located in the process (participant can point on the ISDP graphic)

  - What are your responsibilities within the department?

  - With whom do you work together inside the department?

    - With whom do you work together outside the department?

2. How do you feel about the current way of working in the department?

- What do you like the most about the current way of working?
  - Why/elaborate

- What do you don‘t like the most about the current way of working?
  - Why/elaborate

CLOSING
- Schedule follow up meeting if necessary
- Did I forget anything asking you?

Appendix B
Interview guides - Delphi Study

Purpose: Find and assess general success characteristics for the development and delivery stages of the New Service Development (NSD) process in organizations.

External experts

Approach Message external expert (email, social media, other)

Hello [Name of Panellist]
I'm currently writing my MSc. Thesis at TU Delft together with Company Z about improving the way of working within the New Services Development (NSD) process to make it better fit the requirements for services.

I want to find out what general characteristics make a NSD process successful with emphasis to the development and delivery phases. Therefore, I want to explore opinions from experts and companies on successful New Service Development. I think your perspective and input will be very valuable to my study and I would be very happy for an interview opportunity with you.

Best regards,

INTRODUCTION
Aim: Make the Panellist familiar with research purposes.

I'm Tim - student at TU Delft and I'm doing my graduation at the Service Development team at Company Z and it is about improving the way of working in the Service Development process.

We are responsible for the development and delivery phase of new service development. That means we receive a Value Proposition,in other words an idea, and need to develop it.

Therefore I want to find the general success characteristics for the develop and deliver phase of New Service Development. Or basically, which elements lead to a successful new service development way of working mainly in a stage-gate/OpEx setting.
These characteristics then can be used as a theoretical fundament to improve the process.

Because most of the current researched success characteristics for New Service development (For instance, how the process is organized, customer participation, frontline employees, etc.) are focused on the initial stages of New Service development (e.g. what does the customer want, idea generation, so basically everything that comes before the development and delivery of the service.)

So my mission is now to ask experts like you about success factors in NSD in regard to developing and delivery phases.
I hope that you can help me with that due to your experience from your work with [company] but also with your personal expertise.

QUESTION ROUND 1/2 - GENERAL INTERVIEW GUIDE
Aim: Generate success characteristics

What are your responsibilities in company x?

What kind of service(s) do you develop, deliver at company x?

How does New Service Development (NSD) in general work at your organization (with emphasis on developing and delivery stages)?
- What model/process/approach do you use when it comes to developing & delivering services? (def. delivery:

realize the service and put it out on the market)
- How do you feel about the current way of developing services?

Why do you think organizations struggle to develop and deliver services?
- Why does this particular approach/logic not work for big organizations?

What should organizations/your organization change or do to achieve successful Service development and implementation?
- Why should they change that?
- How could a concrete/feasible solution look like

What do you think is the most important thing that leads to successful Service development and implementation in big organizations/ in your organization?
- Why exactly that?
- What happens if big organizations/your organization don't implement/apply/consider that particular thing?

QUESTION ROUND 2 - SPECIFIED QUESTION SET
Aim: Validation of characteristics and find concrete solutions/applications for each of them

Do you think that the implementation of [characteristic x] will lead to a better service development process?
- Why/why not?
- What would a feasible solution look like?
- What could be a possible alternative
- Will it be still working in the future?

Internal Experts

Approach Message internal expert (email, social media, other)

Hello [Name of Panellist]
I'm currently writing my MSc. Thesis at TU Delft together with Company Z about improving the way of working within the New Services Development (NSD) process to make it better fit the requirements for services.

I want to find out what general characteristics make a NSD process successful with emphasis on the development and deliver/launch phases. Therefore, I want to explore opinions from experts and companies on successful New Service Development. I think your perspective and input will be very valuable to my study and I would be very happy for an interview opportunity with you.

Best regards,

INTRODUCTION
Aim: Make the Panellist familiar with research purposes.

I'm Tim - student at TU Delft and I'm doing my graduation at the Service Development team in Best and it is about improving the way of working of Service Development so within ISDP.

And my aim is to foster a service-oriented way of working in the current stage-gate service development & deliver process setting.

Therefore I want to find the general success characteristics for the develop and deliver phase of New Service Development. Or basically, which elements lead to a successful new service development way of working in a stage-gate/OpEx setting.
These characteristics then can be used as a theoretical fundament to improve the process.

To get those success factors/characteristics I ask experts on their opinion.

I hope that you can help me with that due to your experience from your work with [company] but also with your personal expertise.

QUESTION ROUND 1/2 - GENERAL QUESTION SET
Aim: Generate success characteristics

What are your responsibilities at your company?
- In which projects were you involved?
- Which type of Service project was it?

How does New Service Development (NSD) in general work at your company (with emphasis on developing and delivery stages)?
- What model/process/approach do you use when it comes to developing & delivering services?

~~What do you think about the current performance of the ISDP?~~
- How do you feel about the current way of developing services?

What should the organization change or do to achieve successful Service development and implementation?
- Why should they change that?
- How could a concrete/feasible solution look like

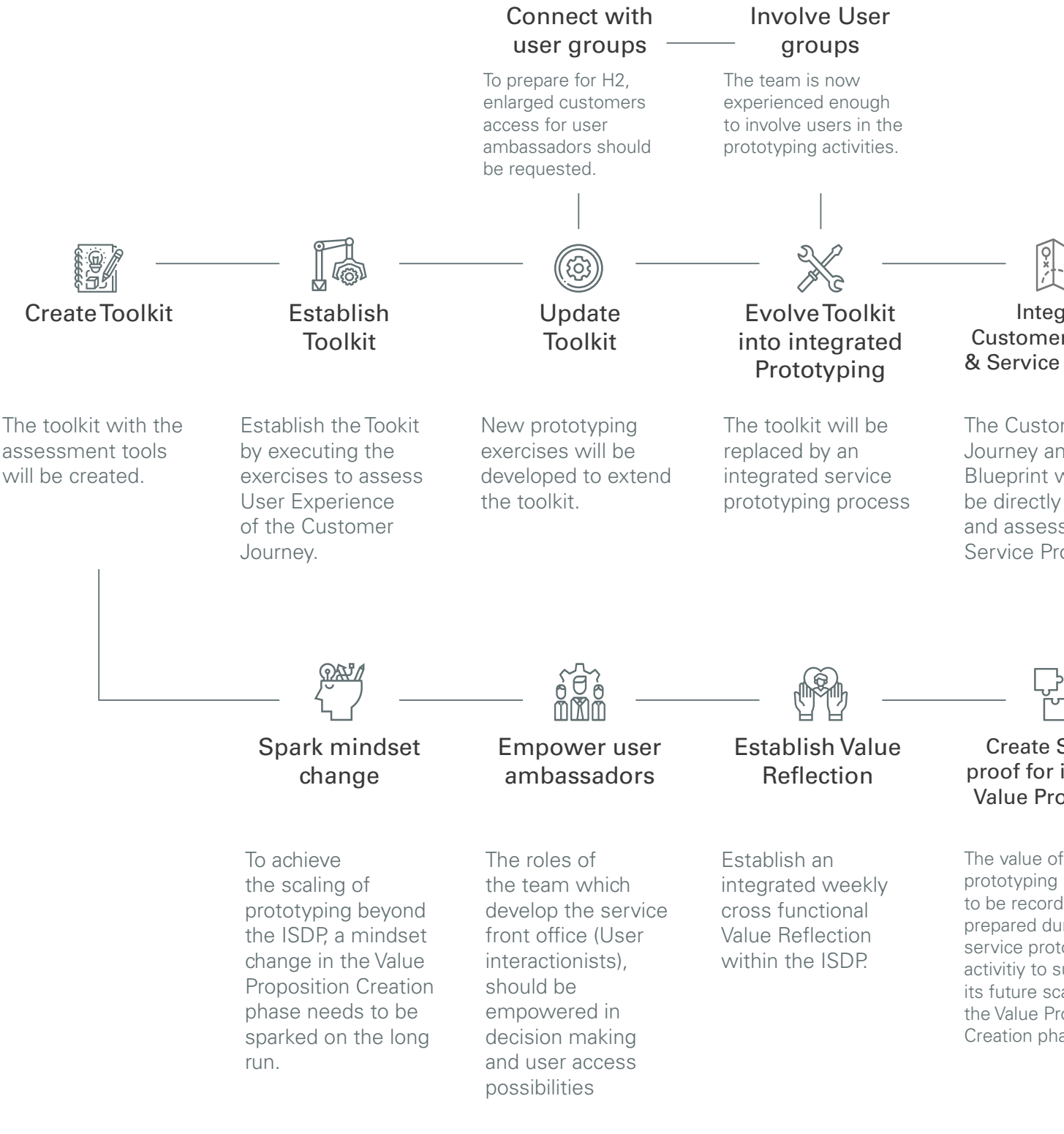
What is the most important thing to change right now to achieve successful Service development and implementation?
- Why exactly that?
- What happens if big organizations/your organization don't implement/apply/consider that particular thing?

What do you think is the most important thing that leads to successful Service development and implementation in big organizations/ in your organization?
- Why exactly that?
- What happens if big organizations/your organization don't implement/apply/consider that particular thing?

QUESTION ROUND 2 - SPECIFIED QUESTION SET
Aim: Validation of characteristics and find concrete solutions/applications for each of them

Do you think that implementation/doing of [characteristic x] will lead to a better New service development?
why/why not?
- What would a feasible solution look like?
- What could be a possible alternative
- Will it be still working in the future?

Appendix C
Roadmap activities



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ototyping.

Explore & experiment with new methods

New Tools and methods for Service Prototyping will be discovered and tested by the team.

Scale into Value Proposition creation phase

Once Service Prototyping proofed its value, it will be scaled into the Value Proposition creation phase by using the story of proof.

Establish cross-functional team

A full time cross functional service prototyping team will to be established

Establish Service Prototyping space

Once Service prototyping is fully embedded in the Value Proposition Creation phase, it will be updated into a prototyping facility.

Story of
improved
position

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position
ase.

Develop & standardize a new Value Proposition

The team is now experienced enough in service prototyping and learned how to improve assess and update the Value Proposition. Now its time to standardize the Value Proposition template to support the scale