

# Codification of a Novel Agile method: Fast Forward

- Master's Thesis -

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This master thesis is the last piece of the puzzle of my Master of Business informatics and also the final step that concludes my role as a scholar.

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## Abstract

The digital technologies aided and enabled the processes such as digitalization and digital transformation. To get ahead of the trends, organizations need to dedicate part of their resources to reshape their operating models. Some of the focus areas of Agile methods are delivering working software quickly, decreasing the time to market, working with small teams and emphasizing frequent contact with members. However, what cannot be found in the Agile methods is the detailed brainstorming and planning of the product and project in general before it is ready to be developed.

This thesis presents an approach for the above-mentioned domain infused with Agile methods called Fast Forward. The nine phases of the Fast Forward (FF) method look into both the technical and non-technical factors. They improve the efficiency of people performing tasks in business processes by identifying possible problem causes of the client. The research method followed in this research thesis is Wieringa's design science method, validated and evaluated with semi-structured interviews. The evaluation indicates the FF method is useful in creating the client's digital concept. Furthermore, the evaluation concluded the FF method is easy to use and efficient. More extensive evaluation to inspect the effects of FF method on the long-term is suggested as a future study.

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# 1 Introduction

Over the past decades, the word “digital” has extended its meaning from addressing types of technology such as digital television or digital camera to addressing processes such as digitalization or digital transformation. Yet, the two meanings are closely related to each other. Berman (2012) uses the word “digital” referring to digital technologies, which is how he connects the different meanings mentioned above. The digital technologies aided and enabled the processes such as digitalization and digital transformation. To get ahead of the trends, organizations need to dedicate part of their resources to reshaping their operating models. According to the report and study by McKinsey Global Institute, countries and industries are still struggling to increase their digital potential (Bughin et al., 2016; Bughin, LaBerge & Mellbye, 2017).

To be more precise this thesis presents a method infused with Agile methods. The aim of this master research thesis is to codify the novel and agile Fast Forward (FF) method into an actionable artifact that will support companies to achieve their digital strategies within the limits of their resources. Fast Forward differs from Agile because the sprints and actual development of the product are in the last phases and there is detailed brainstorming and planning of the product and project in the beginning phases. The main research question arises from this objective and is defined as “*How does the FF method support companies in achieving their digital strategies faster while still remaining within the limits of their resources?*” The validation criteria followed to illustrate the artifact are understandability and completeness. Those criteria refer to making the artifact clear for execution and expected outcomes, consisting of all activities, outcomes, and roles. Usefulness, efficiency, and ease of use are the criteria that are evaluated with customer and user to prove the method maximizes the customer value.

In this thesis, the design science method proposed by Wieringa (2014) is followed to create an artifact that complies with the aforementioned criteria. The artifact is validated and evaluated by means of semi-structured interviews with experts, clients, and participants.

The research approach together with the problem statement, research questions, brief introduction of the FF and literature research protocol are elaborated in [Chapter 2](#). The third chapter provides a literature review with similar methods and method fragments. The final method is presented in [Chapter 4](#). The process of validating the previous method increments is detailed in [Chapter 5](#). [Chapter 6](#) extends on the evaluation and the last chapter, [Chapter 7](#), presents the conclusion of the thesis by answering the research questions.



## 2 Research approach

This chapter outlines the research approach followed in this thesis. As such, this chapter begins with the problems found in current literature and a short description of the possible solution. In Section 2.3 there is a description of BearingPoint, the consultancy company that invented the FF (Fast Forward) method. BearingPoint has a crucial role in this research as they provide practical knowledge about the method. After that, the research questions are defined. In Sections 2.5 and 2.6 the research method and literature research protocol used for answering the project's research questions are described.

### 2.1 Problem statement

Startup resources are limited (Pfeffer & Salancik, 1978) and thus new companies are at increased financial pressure (Eisenhardt & Schoonhoven, 1990). An example of this is the Macedonian platform for online courses called Brainster (see: <https://brainster.co/>). Back in 2015 when they started out, their finances were limited which is why they needed to quickly find a way to advertise their services for free in order to start making revenues. A large number of student organizations in Macedonia were asked to collaborate. They offered various types of advantages and discounts for members willing to attend their courses by promoting these offers on mailing lists and social media (L. Dimovska, personal communication, February 2, 2016). After a little less than two years of existence, Brainster has organized more than 250 courses, and more than 500 projects and workshops (Brainster, 2017). What can be seen from this example is that startups have diverse ideas of how to quickly start achieving their objectives, remain within the limits of their resources, and generate concrete results at a short time.

Based on the example above, the “Fast Forward” (FF) method developed in practice by the consultancy company BearingPoint which involves all activities from establishing the client's goal to implementing the end result, can deliver the client fast and concrete results within their financial limits.

The FF method has already been applied in three client projects conducted by BearingPoint to the satisfaction of the clients. For the last project, the client expressed the method provided her with useful steps that could be taken for further developing the platform (BearingPoint, 2017; L. Dimovska, personal communication, December 20, 2017). However, apart from positive experiences in client projects where FF has been applied, a formal methodological description or codification of the method itself does not yet exist. The aim of this master thesis is to codify the FF method in order to clarify how this approach differs from and builds on existing approaches and to repeat and extend past successes.

## 2.2 About FF

FF is a novel and agile method that involves setting the client's digital ambitions to implementing sprints and achieving value acceleration. *Sprints* is the second to last phase of the FF method. In this phase, the products identified from previous phases are created and tested to monitor their performance. This is done in order to find possible improvement points that can be used for further development, which makes the final result flexible to change and adds to the FF being agile. *Value acceleration* is the final phase of the FF method. In this phase, the outcome from the sprints phase is looked into more closely and decisions are made about expanding or killing the products. The other phases are explained in more detail in Section 3.1. Primarily the approach was created to be used by BearingPoint but looking at the sprints phase, a software developer or designer might be needed because clients usually expect a tangible outcome (BearingPoint, 2017) such as a concept of a website or even a minimum viable product.



Figure 2.1: Fast Forward method (BearingPoint, 2017)

The FF is an outside-in approach, which means the client determines what is needed from their perspective. Other approaches it can be compared to are digital transformation approaches or agile software development methods. The FF

method consists of nine phases that look into both the technical and non-technical factors. Furthermore, it tends to improve the efficiency of people performing tasks in business processes by identifying the possible causes for a client's problem through creating personas and taking them on so-called customer journeys. *Customer journeys* is the fifth phase that involves the whole process a customer goes through from finding the product to actually using it. All the phases will be explained in detail in Section [3.1](#).

## 2.3 BearingPoint

BearingPoint (see: <https://www.bearingpoint.com/en-gb/>) is a multinational management and technology consultancy company. It is headquartered in Amsterdam but it has a direct presence in 22 countries with a total number of 3901 employees. BearingPoint offers various consultancy services. A number of examples of these services include Business strategy and transformation, Supply chain management, Finance/HR transformation, IT strategy and transformation, and Risk and compliance. With these services, they expand in diverse industries such as automotive, banking and capital markets, consumer goods and retail, health and social care, industrial manufacturing, public sector, telecommunications, transport, and logistics. (BearingPoint, 2015, 2018)

<b>Headquarters</b>	Amsterdam
<b>Industry</b>	- Management consulting; - Technology consulting; - Technology services;
<b>Revenue</b>	712 million EUR (2017)
<b>Number of employees</b>	3901 (2018)
<b>Founded</b>	2002
<b>Predecessor</b>	KPMG
<b>Type of company</b>	Partnership
<b>Offices</b>	39
<b>Partners</b>	174
<b>Countries with a direct presence</b>	22

Table 2.1: BearingPoint facts and figures (BearingPoint, 2015, 2018)

## 2.4 Research questions

To achieve the aim of this master thesis, the main research question is:

*MRQ. How does the FF method support companies in achieving their digital strategies faster while still remaining within the limits of their resources?*

To address and expand the main research question, several sub-research questions (SRQ) will be considered:

*SRQ1. What are current approaches for agile software development and digital transformation that are comparable to the FF method?*

Through this question, we provide the basic knowledge of how the FF method came to exist and where it differs from and has similarities with existing approaches. An extensive literature review will be conducted as part of the descriptive research (Collis & Hussey, 2009) to identify existing approaches, methods or method fragments that line up with the various phases of the FF method. To compare existing approaches in a scientifically verifiable way, meta-modeling technique and situational methods are essential (Brinkkemper, 1996).

*SRQ2. How can the FF method be codified?*

To answer the second sub-question, a method engineering approach will be used to develop a situational method displaying the activities to be conducted and deliverables to be produced as part of the approach. A meta-modeling technique will be used to specify and visualize the process, deliverables, and tools. The content of the method will be further explained with activity and concept tables (van de Weerd & Brinkkemper, 2009).

*SRQ3. How to improve the developed FF method after its validation and evaluation?*

Validation, according to Wieringa (2014) is “to justify that it [the treatment] would contribute to stakeholder goals”, whereas evaluation is “the investigation of a treatment as applied by stakeholders in the field”. Looking at this research, the treatment in the definitions is equivalent to the FF method. To validate and evaluate the FF method, semi-structured interviews will be conducted to gather opinions of three groups of people: experts, clients, and practitioners. The experts are professionals experienced in performing different phases of the FF method at BearingPoint, while the clients represent real situations where BearingPoint implemented the FF method. The practitioners are students that have used the FF method in a real project and have experience with the Process Deliverable Diagram (PDD). The idea is that by obtaining access to the perspectives of insiders (Hannah & Lautsch, 2011) we can gain access to alternative ways of seeing the method. Therefore, the feedback from the interviews will be used to improve the FF method (Runeson & Höst, 2009).

## 2.5 Outline of and justification for a chosen research method

Research methodologies get various attention from researchers, which leads to deviation in the views of researchers on research methods and methodologies. For example surveys, case studies, experiments and action research are sometimes indicated as research methodologies (Runeson & Höst, 2009) and other times as

research methods (Sjøberg et al, 2007). On the other hand, Easterbrook et al. (2008) suggest the above-mentioned examples, ethnography, and mixed methods are research methods in software engineering research.

In this research, Section 2.5.1 outlines the research methodology applied - design science research. After that, the data collection method is explained and milestones illustrated. In Section 2.5.4 the research contribution is stated.

### 2.5.1 Research methodology

The research method followed in this research is Wieringa’s design science method (Wieringa, 2014). The objective of design science is to design and investigate an artifact that interacts with a problem context for a certain set of stakeholders. Considering the goal of this research thesis is to codify (design) a method (artifact) that supports clients in achieving their digital ambitions, design science is the appropriate research method.

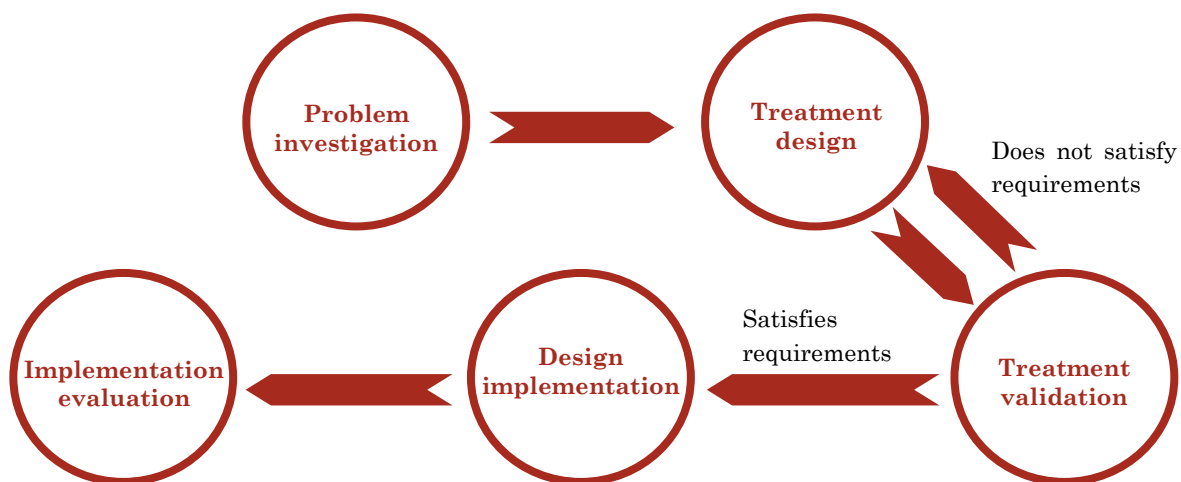


Figure 2.2: The design science method (Wieringa, 2014)

Wieringa’s design science method is also called the engineering cycle. It consists of five phases as can be seen in *Figure 2.2*. The first phase investigates the problem including the stakeholders, goals, effects, mechanisms, goals. During the Treatment design phase, requirements are specified and artifact is designed based on the requirements. Validation consists of investigating the satisfaction of requirements when using the designed artifact. After validating the treatment design, it is implemented in the problem context. Thereafter, the implementation is evaluated to compare the effect of the artifact against the desired effects within the problem context.

The identified problem in this study is that apart from positive experiences in client projects where FF has been applied, a formal methodological description or codification of the approach itself does not yet exist. Additionally, aside from results from existing cases where the approach has been implemented, it is not scientifically proven FF delivers fast and concrete results. Stakeholders are

consultancy companies that had already worked with the approach and that can provide customer cases and expert opinions. The artifact is a method representing the codification of the FF, which can clarify how this approach differs from and builds on existing approaches.

The treatment design will be constructed by means of:

- internal documents, templates, and work products from FF phases
- knowledge acquired from relevant stakeholder experience
- scientific literature

The concept of gaining knowledge will answer the different research questions from [Section 2.3](#) and help towards designing the artifact. The method will be validated with professionals experienced in performing different phases of the FF method. Iterations between the design of the method and the validation will be made until the requirements are satisfied. When the treatment design is finalized, an evaluation will be done by means of interviews with client and practitioners.

### 2.5.2 Data collection method

Semi-structured interviews are used as data collection method. They help in obtaining a clear picture of participant's perspective on the research topic (Denscombe, 2014). This is a useful method as the topic can be explored by asking comprehensive questions (Seaman, 1999). The interview questions, length, and selection of participants will be prepared before conducting the interviews (Runeson & Höst, 2009). As mentioned in Section 2.4, the interview participants are professionals experienced in performing different phases of the FF method at BearingPoint and clients where the FF method has been implemented.

### 2.5.3 Milestones for key phases

To achieve good balance through the research, all activities are organized into four phases:



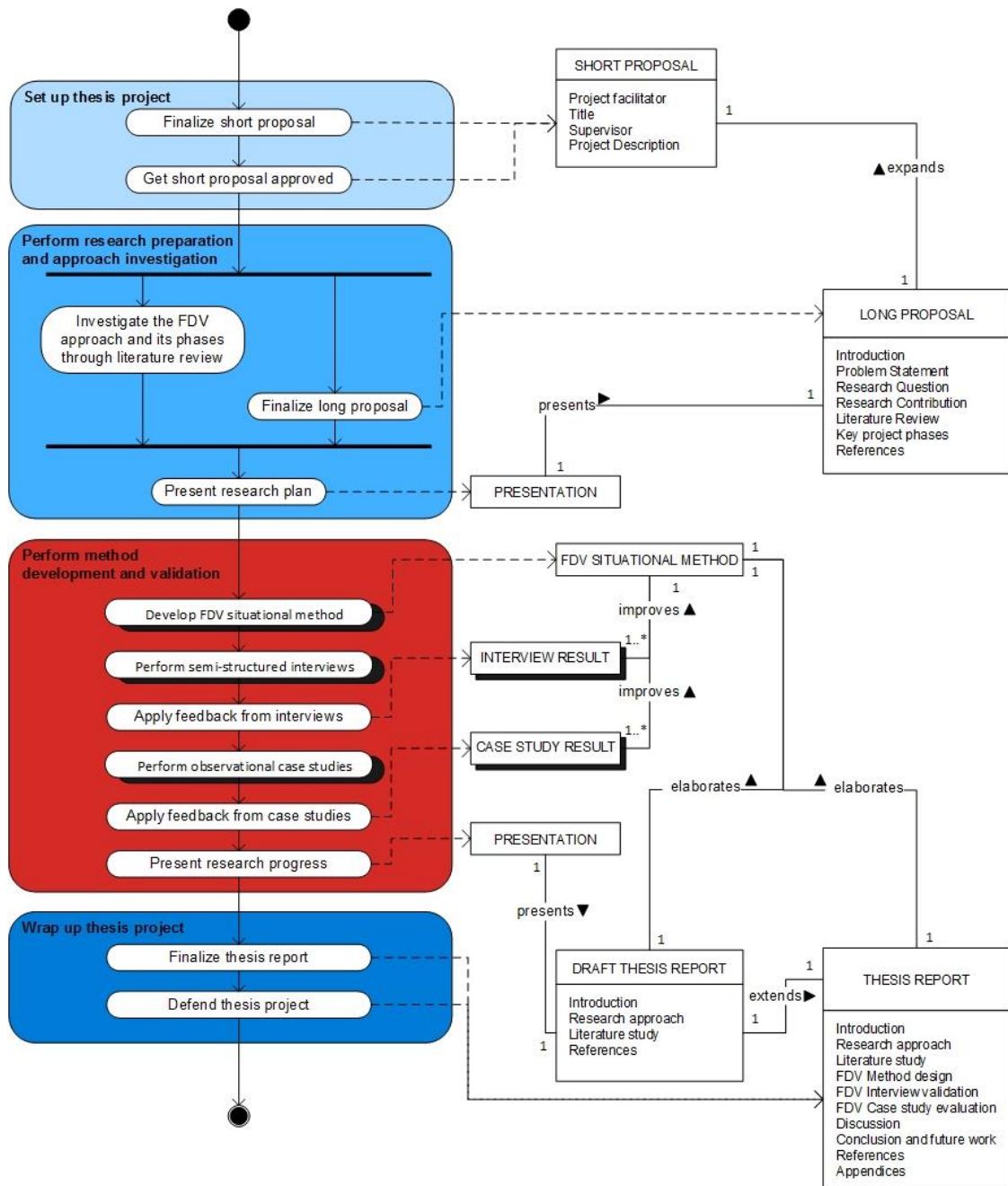


Figure 2.3: Project phases illustrated in PDD

1. Set up phase  
This initial phase is executed prior to officially starting the research. The goal that concludes this phase is getting the approval of the short proposal.
2. First phase (Research preparation and approach investigation)  
During the First phase, an extensive literature review is carried out. The first phase is finalized with the first colloquium presentation.
3. Second phase (Perform method development and validation)  
This is the phase where the interviews are actually conducted, which is the reason why this phase is in a different color. The outcome of this phase is

the second colloquium presentation. To get there, the research is executed following the approach defined in the First phase.

4. Third phase (Wrap up thesis project)

The Wrap up phase includes the finalization of the thesis with the main milestone being the defense of the thesis project.

#### 2.5.4 Research contribution

The result of this research will have both scientific and business contribution. By doing this research, codified knowledge of the FF method will be related to existing methods and approaches that have been studied and possibly implemented by organizations. With this, the theory behind the agile development and digital transformation will also be strengthened by adding an additional approach that can be used. Looking at the business contribution, the organizations will be provided with a codified approach they can use as a guide in consultancy projects.

## 2.6 Literature research protocol

A hybrid literature research approach is used. The main phases of the FF method were laid out from the beginning (*Figure 2.1*). From this, queries and relevant keywords such as phase names, phase methods, phase outcomes, or research topics phases are part of are inserted in Google Scholar. When an appropriate paper is found, snowballing is applied to find other relevant literature. By combining these methods, a broad spectrum of current approaches comparable to FF is acquired.



## 3 Literature review

This chapter untangles how the FF method works and places it in the academic environment by doing the literature review behind it. Section 3.1 elaborates the FF phases, their history, and similar phases. The next section (Section 3.2) lays out a review of the literature about existing methods or approaches that line up with the FF method or multiple phases at the same time. This literature study provides the answer to the first research sub-question.

### 3.1 FF phases

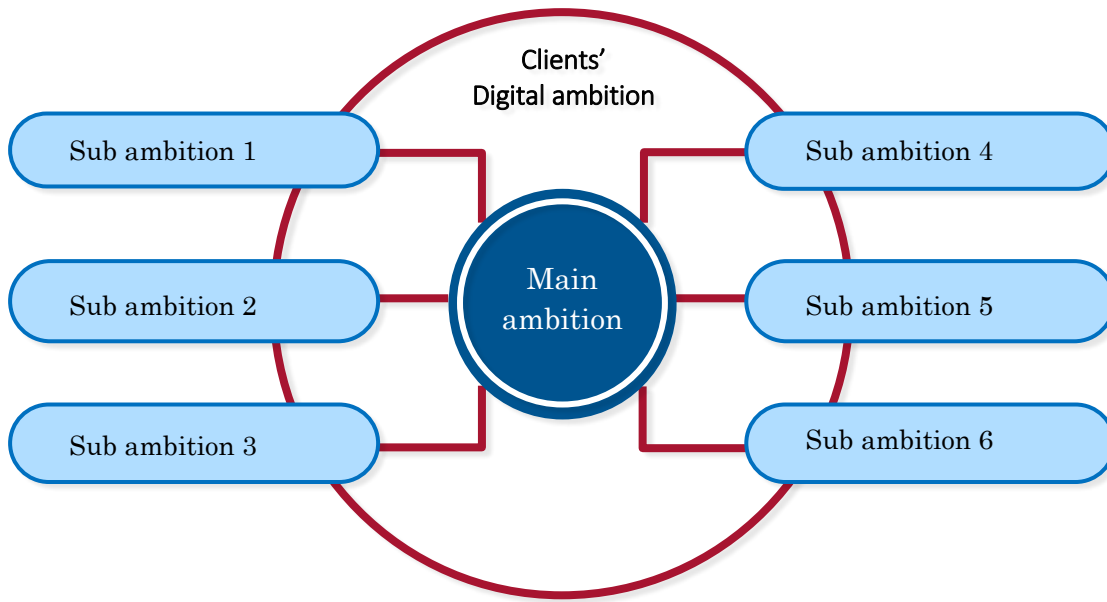
The Fast Forward method consists of nine phases (*Figure 2.1*): digital ambition, differentiators, value drivers, personas, customer journeys, idea selection, capability mapping, sprints, and value acceleration. Each of the phases is explained in the following sub-sections.

#### 3.1.1 Digital ambition

This phase establishes the customer needs or what the customer wants to achieve. By defining the so-called digital ambitions, the needs of the client are concretized and the scope of the project is set.

There are several definitions of what “digital” means (Augria, 2016; Dörner and Edelman, 2015) but here we will resort to the definition by Berman (2012) which states that “digital” refers to digital technologies. Therefore, the term “digital ambition” means ambition regarding digital technologies.

The digital ambitions are worked out using an outside-in approach, which means it is determined what the client requires from their perspective. This phase is conducted in a workshop brainstorming session together with the client. At the beginning, possible causes for the clients’ problem are illustrated in a diagram. A diagram is used to group together all information and avoid large amounts of data, which is why it proved to be more useful than text (Larkin & Simon, 1987). These possible problem causes of the client are the foundation of the digital ambition. After determining the digital ambition and the causes that drive it, other causes are described as sub ambitions (*Figure 3.1*).



**Figure 3.1: Diagram of clients' digital ambitions (Rightbrains, 2017)**

The term “digital ambition” is also mentioned in digital transformation strategies, which are elaborated in Section [3.2.2](#).

### 3.1.2 Differentiators

This phase determines what the client needs to be to customers so their needs that were established in the previous phase are fulfilled. That is done by using the Customer Relevancy Model.

A research conducted among 16,000 customers across nine European countries has proven customers value only the following five key attributes: access, price, service, product, and emotion (Capgemini Consulting, 2016). That resulted in the Customer Relevancy Model ([Figure 3.2](#)).



Figure 3.2: Customer Relevancy Model (Capgemini Consulting, 2016)

However, according to Capgemini's previous research, successful companies dominate on one attribute, differentiate on another and have the industry average on the other attributes. This means the focus areas Price, Service, Access, Product, and Experience are in a 5, 4, 3, 3, 3 scoring, respectively. Any attribute that is less than 3 will cause brand damage. The definitions for this terms as stated in Capgemini's report are:

- Dominate: a company dominates when the customer not only prefers it to the competition but will actively seek it out.
- Differentiate: a company differentiates when the customer prefers its brand to another.
- Parity: a company is at parity when its offering is at the industry par and customers are willing to use them for routine purchases.

The decision on where to dominate and where to differentiate will influence the client's digital strategy.

### 3.1.3 Value drivers

In this phase, the needed value drivers that create the client's benefit are determined. To do that benefit logic is created with the final goal being to create value for the client. The focus areas, differentiators, and digital ambitions from the previous phases are used to complete the value drivers.

By understanding the key customer experience moments and the design science behind them, companies can better provide the value proposition customers need (Norton & Pine, 2013). The value proposition is something the customers' value.

It can be a product, a service or even the experience. The goal is to create value based on all the interactions with the customer. That is done by creating benefit logic.

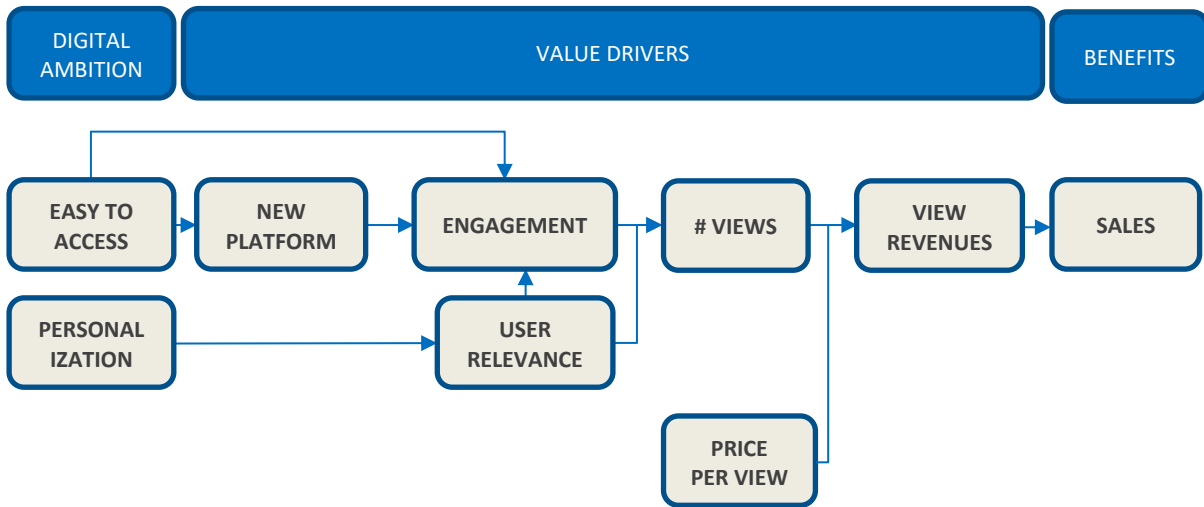


Figure 3.3: Imaginary benefit logic example

Benefit logic enables the client to make choices that are right. It defines how the proposed solution contributes to the maximum positive benefit. This is done by starting with the benefits or results the client wants to achieve and making logical relations with the value drivers to get to the solutions (or digital ambitions). When creating the benefit logic, only the positive value drivers and benefits are noted. Contrary to common sense, when constructing the benefit logic the start is always at the end – benefits/result and we work our way to the digital ambitions. Because of this, the question that is always asked is “what is the cause?” Example benefit logic is illustrated in *Figure 3.3*.

### 3.1.4 Personas

In the fourth phase, personas are defined. Their background is created by interviewing stakeholders and finding commonalities between them.

The concept of persona was first introduced by Cooper (2004) and further developed upon by Pruitt and Adlin (2006), and Nielsen (2004). A persona is a hypothetical archetype of a user, which describes their goals, interests, and aptitudes. This means a persona has characteristics of a typical customer, which allows the customers to easily identify themselves. Additionally, personas are beneficial during the design and development of the product (Nielsen, 2004; Cooper, 2004; Cooper & Reimann, 2003) as well as for communication with stakeholders (Pruitt & Grudin, 2003; Pruitt & Adlin, 2006; Goodwin, 2011; Matthews, Judge, & Whittaker, 2012). Examples of these activities include featuring personas in scenarios, enabling walkthroughs from the persona’s perspective (phase customer journey), guiding the process of prototyping (phase idea selection). This allows personas to be used as a basis for communication both

within and outside the design and development team (Cooper, 2004; Pruitt & Adlin, 2006; Pruitt & Grudin, 2003; Cooper & Reimann, 2003). Examples of communication activities are making decisions about user stories and requirements (capability mapping and sprints phases). Cooper (2004) estimated the number of personas per design problem varies between 3 and 12.

As stated by Pruitt and Grudin (2003), there are four challenges when implementing personas:

1. The personas are not seen as credible (not based on real data)
2. The method of communicating the personas is not understandable
3. Lack of practitioner understanding on how to use the personas
4. High-level support is needed to implement the personas successfully

Looking at the FF method, the first two challenges are answered in this phase (personas phase), the third challenge is answered in phases five and six ([3.1.5 Customer journey](#) and [3.1.6 Idea selection](#)), and the last challenge is answered in phases seven and eight ([3.1.7 Capability mapping](#) and [3.1.8 Sprints](#)).

The number of personas is established by looking at the customers together with the client and merging customers with same goals into one persona. Once the number and types of personas are defined with the client, we move on to gathering persona information. To do that, Pruitt and Grudin (2003) proposed doing rigorous case studies but here the information is collected by interviewing multiple customers of the client. The interviews are conducted following a predefined set of questions allowing the interviewee to dig deeper if new information is brought up or there is no sufficient information. The stated reasons make them semi-structured. That allows for direct interaction by doing qualitative data collecting (Stauss & Weinlich, 1997), and getting a broader sense of the persona character to satisfy the need for a deeper level of familiarity the designers need (Dotan, Maiden, Lichtner, & Germanovich, 2009; Long, 2009; Nielsen, 2004).

The data is noted down in a central document for each persona whereas Pruitt and Grudin (2003) called it “foundation document” ([Table 3.1](#)) because it serves as a storehouse of information per persona. Faily and Flechais (2011) further strengthen the concept of the foundation document by making a tool that directly connects personas to coded user data. Here we will call it a central foundation document. The purpose of the central foundation document is exclusively for supporting documentation when a basic persona description is written. The personas in the FF method are rounded up by finding commonalities between the interview data.

## Overview – Emma (Business Owner)

---

<i>Get to know Emma, her business, and family</i>
<b>A day in the Life</b>
<i>Follow Emma through a typical day.</i>
<b>Work activities</b>
<i>Look at Emma's job description and role at work.</i>
<b>Household and leisure activities</b>
<i>Get information about what Emma does when she is not at work.</i>
<b>Goals, fears, and aspirations</b>
<i>Understand the concerns Emma has about her life, career, and business.</i>
<b>Computer skills, knowledge, and abilities</b>
<i>Learn about Emma's computer experience.</i>
<b>Market size and influence</b>
<i>Understand the impact people like Emma have on the client's business.</i>
<b>Demographic attributes</b>
<i>Read key demographic information about Emma and her family.</i>
<b>Technology attributes</b>
<i>Get a sense of what Emma does with technology.</i>
<b>Technology attitudes</b>
<i>Review Emma's perspective on technology, past, and future.</i>
<b>Communicating</b>
<i>Learn how Emma keeps in touch with people.</i>
<b>International considerations</b>
<i>Find out what Emma is like outside her home country.</i>
<b>Quotes</b>
<i>Hear what Emma has to say.</i>
<b>References</b>
<i>See source materials for this document.</i>

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**Table 3.1: Foundation document - table of contents (Pruitt & Grudin, 2003)**

Prior literature argues that personas are effective, engaging, and predictive because of their unique powers of empathy (Cooper, 2004; Cooper & Reimann, 2003; Grudin, 2006; Long, 2009; Nielsen, 2004; Pruitt & Adlin, 2006). To make personas acceptable to stakeholders, only presenting text or image (Cooper, 2004) is not enough (Pruitt & Grudin, 2003; Matthews et al., 2012). There are diverse approaches to this problem: give story-telling characteristics, personifying details (Nielsen, 2004), posters, flyers, handouts (Pruitt & Grudin, 2003), websites, and real-size cardboards (Pruitt & Adlin, 2006). Therefore, the communication challenge in this research is approached by presenting the personas with power point presentation. Each persona is represented across two slides. The first slide (*Figure 3.4*) has a picture of the persona, short personal background story, the

persona needs, wants, pain points, and preferred communication channels while the second slide presents quotes that were noted down during the interviews.

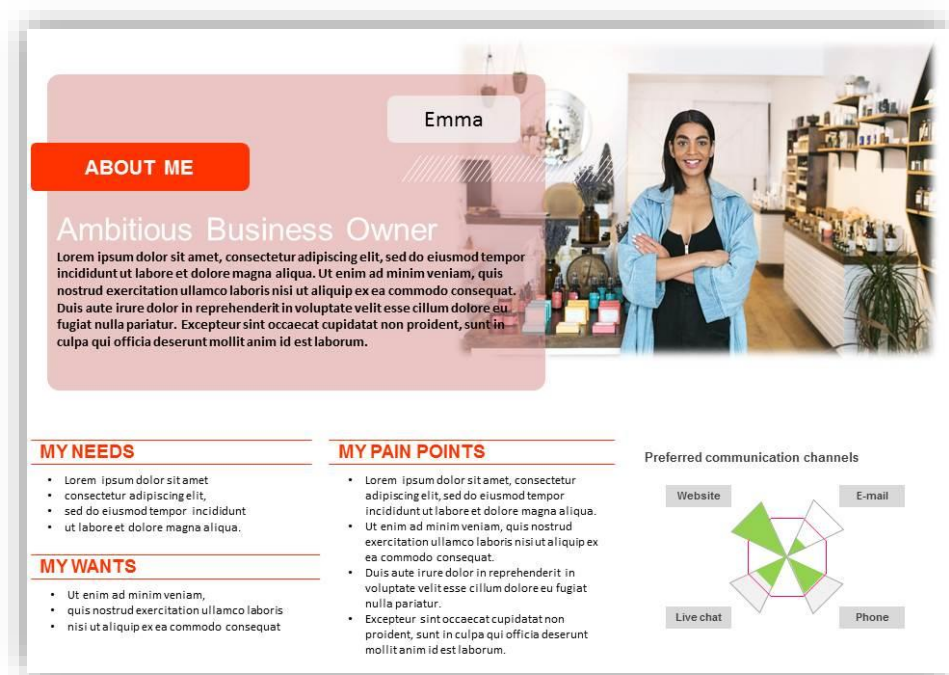


Figure 3.4: Persona presentation example

### 3.1.5 Customer journey

This phase examines the third problem Pruitt and Grudin (2003) defined: lack of practitioner understanding on how to use the personas. The knowledge of customers, by having the personas from phase four, is used to guide the customer journey towards the client's products and services (Berman, 2012). The personas are first taken through the customer journey steps, then the customer lifecycle steps and then the activity "A day in the life of ..." is performed to further extend the persona's background. This phase and the phase idea selection are conducted in one interactive workshop together with the client.

By interviewing the customers in the previous phase, the customer journey becomes customer-centric (Norton & Pine, 2013). The main objective of customer journey phase is to use the personas to describe the entire customer experience as well as to identify key interactions the client has with the customer. The journey should be managed in such a way it maximizes the value both for the customer and for the client. Others (Christopher, Payne, & Ballantyne, 1991; Gordon, 1998) have described this as a customer staircase or ladder but here we will continue using the term customer journey. To get into the customer experience oriented mindset the customer journey is designed across multiple touchpoints (Homburg, Jozić, & Kuehnl, 2017; Edelman & Singer, 2015; Rawson, Duncan, & Jones, 2013).



The customer journey mapping is widely used tool for service design and visualizing intangible services (Yoo & Pan, 2014). It is used to map out customers' first encounters with the clients' brand or service and to demonstrate the different route a client can take having available different touchpoints. Nenonen et al. (2008) summarized the different phases different authors use in customer journey (*Table 3.2*). According to them, by mapping the customer journey clients understand how customers use the various channels and touchpoints.

Customer to commitment perspective	Customer experience perspective	Process perspective
Suspect – could the customer fit company's target market profile	Need – I am considering a purchase – who should I approach?	Orientation
Prospect – customer fits the profile and is being approached for the first time	Enquire – I make general inquiries to possible suppliers	Approach
First-time customer – customer makes the first purchase	Approach 0 I decide to make more specific inquiries to a selected few	Action
Repeat customer – customer makes more purchases	Recommendation – They make recommendations and/or send proposals	Depart
Majority customer – customer selects your product/company as a supplier of choice	Purchase – I decide to purchase and place my order with one supplier	Evaluation
Loyal customer – the customer is resistant to switching suppliers; strong attitude	Experience – They supply and I use the product or service	
Advocate – customer generates additional referral currency	Problem – I have a problem that is reported to and handled by the supplier	
	Reconsider – I am considering purchasing something else – should I go back?	

Table 3.2: Phases of customer journey (Nenonen et al. 2008)

The customer lifecycle steps used in the FF (*Figure 3.5*) extend the customer's feelings, motivations, and questions for each of the previously defined interaction points. In the first step, the customer becomes aware of the client, even though there might have been no interaction. After that, the customer becomes interested in the product or service the client offers because it is a solution to



their problem. Subsequently, the customer might start comparing the solutions of competitors but the final decision is not made until the next step when all information is sufficiently engaging for the customer to choose the client. After making the purchase in step 4, the customer starts evaluating their satisfaction from the interaction with the client. This step enables the client to improve themselves based on the interaction with the customer thus far. The sixth step is not applied to every type of customer because it depends on the customer service or product. Nevertheless, the last step is when the customer becomes loyal to the client and is resistant to switching to other brands.

Even though the names of the customer lifecycle steps differ from the phases in customer journey as summarized by Nenonen et al. (2008), it can be distinguished that there are similarities with the phases from customer to commitment perspective.



Figure 3.5: Customer lifecycle steps (BearingPoint, 2017)

Scholars have proposed different customer journey approaches and frameworks to be followed depending on the domain they are applied in. For example a service delivery network which helps managers make decisions that better serve the customer (Tax, McCutcheon, & Wilkinson, 2013), a customer journey approach that measures return on investment for Customer Relationship Management (Ang & Buttle, 2002), a Customer Journey Map model based specifically focused on eCommerce (Mangiaracina, Brugnoli, & Perego, 2009), a customer journey framework allowing for comparison of individual against planned journeys (Halvorsrud, Kvale, & Følstad, 2016). On the other hand, customer lifecycle is used in customer relationship management (CRM) to describe the customer's spending evolution (Baesens, Verstraeten, Van den Poel, Egmont-Petersen, Van Kenhove, & Vanthienen, 2004) and in marketing to segment the customer for marketing (Berger & Nasr, 1998).

The next activity in this phase is “A day in the life of ...” It is performed for every persona in order to understand the customer journey and create better personas (Pruitt & Grudin, 2003). To construct “A day in the life of ...” scenarios, a set of questions are used to explore customer's behaviors, accomplishments, routines, and processes. The idea is to create more vivid personas by strengthening the environment in which the personas might find themselves during the day. “A day in the life of ...” guides the client to detect when and how they can interact with their customers and locate touchpoints.

### 3.1.6 Idea selection

This phase is an extension of the previous phase with the goal of generating new product ideas. The outcome of this phase is to identify the minimum viable product(s) (MVP) and epics, which can be created later (Ries, 2011). MVPs are created by selecting the ideas that contain enough features to satisfy early customers and that can be developed further in the future. This phase together with the previous is executed in a workshop together with the stakeholders, organized especially to spur creativity and come up with new ideas.

After the activity “A day in the life ...” each persona is taken into another activity called ideation. The ideation method that is followed is customer focus groups for problem detection (Cooper & Edgett, 2008). According to a study by Cooper and Edgett (2008) from a group of eighteen ideation approaches, this ideation method proved to be popular (#5 in popularity among firms) and effective (#3 in effectiveness by users). The main findings from the ideation process are presented as if the persona is looking back on her journey and acquaintance with the client from twenty years in the future. This is where most of the MVP products are discovered and placed in a cost-impact quadrant (*Figure 3.6*). That means every product is evaluated based on the cost for it to be made and the impact it has on the client’s service or product. Additionally, based on the MVP products, high-level user stories or epics are identified (Schwaber, 2004).

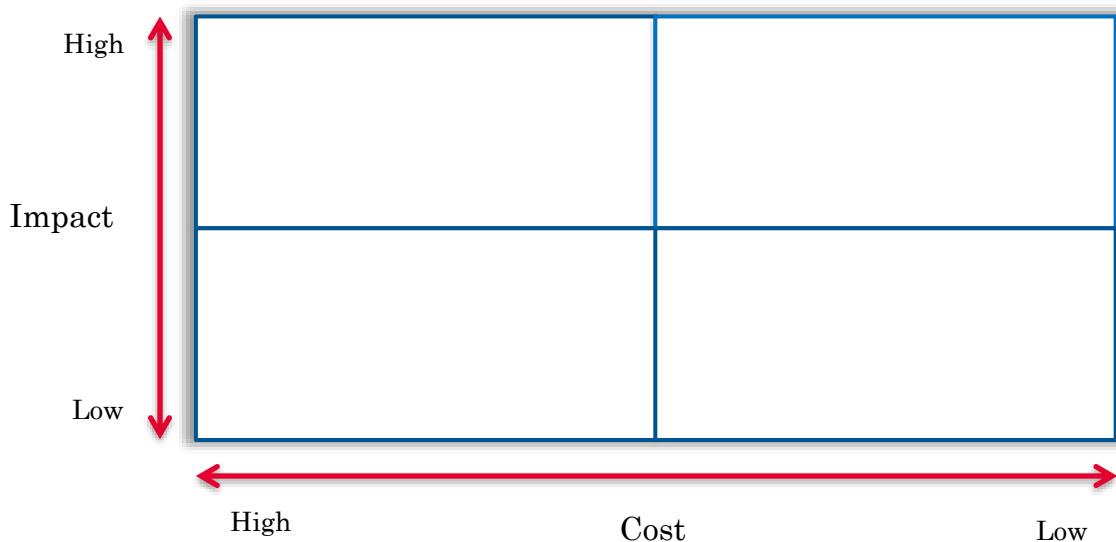


Figure 3.6: MVP selection model (BearingPoint, 2017)

Similar analysis models to this are cost-benefit (CBA) and cost-effectiveness (CEA) analysis. CBA (Boardman et al., 2017) is a systematic approach used to estimate the strengths and weaknesses of product ideas and determine best approaches. CEA (Levin & McEwan, 2000) is economic analysis, mostly used in healthcare (Robinson, 1993; Russell et al., 1996), which estimates relative costs and effects of various product ideas.

### 3.1.7 Capability mapping

This phase examines the fourth problem Pruitt and Grudin (2003) defined: high-level support is needed to implement the personas successfully. That is done by following the capability mapping to identify the capabilities that are crucial in implementing the selected epics. Capabilities are further broken down into four pillars needed to implement the epics: people, processes and organization, information and data, and technology. This allows identifying the minimum requirements needed to come to a successful end result. In the end, those requirements are compared to what resources the client already has.

This phase has two steps: identifying capabilities, and capability mapping. The focus of this phase is the connection of technology to business objectives. In the first step, the epics from the ideation process are taken and capabilities are identified for each epic. Then the capabilities are divided into four pillars that create the capability map (*Figure 3.7*).



Figure 3.7: Capability map (BearingPoint, 2017)

To fill in the pillars correctly, the following questions are answered:

- People
  - Do we have enough people?
  - Do they have the right competencies?
  - Which training is required?
- Process & organization
  - Do we have the right process in place?
  - Are the processes efficient and effective?
  - Do we have the right organizational structure?

- Do we have the right governance?
- Information
  - Do we have the right content and data?
  - Do we have the latest valid version of information across channels?
- Technology
  - Do we have the right technology?

With that, the capabilities needed for implementation are identified. In the second step, the identified capabilities are compared to the resources the client already has at disposal. This way it can be seen which epics need the most attention and for which epics the resources are already present.

Richardson (1972) introduced the concept of organization capabilities, partly based on Penrose’s (1959) earlier work, which rested on three fundamental components: appropriate knowledge, experience, and skills. The capability theory is described more broadly by Williamson (1999) as a composite concept that is related to organizational strategy. Capabilities have also been connected to innovation in organizations (Van de Ven & Poole, 1990; Pardo et al., 2004), and organizational learning and knowledge resources (Helfat & Raubitschek, 2000; Kogut & Zander, 1996).

### 3.1.8 Sprints

In the eighth phase, the epics that were selected previously are implemented using an agile approach. The number of epics varies and depends on the goals from the *Digital ambition* and *Differentiators* phases. That means a backlog is defined consisting of all elements needed to be implemented in the sprints. When the products are done, they must be fully tested (ScrumInc, 2017) and they must be a potentially releasable (Sutherland & Schwaber, 2016).

A *Product Backlog* (example in [Table 3.3](#)) is a prioritized list of user stories, which contains everything that might be needed in the product (Sutherland & Schwaber, 2016). The Product Backlog delivered in this phase is done in accordance with the client because it must correspond to their next steps. Every user story has story points, which represent the estimated effort needed to create a product (Schwaber & Beedle, 2002). Higher ordered user stories are clearer and easier to implement than lower ordered ones. However, the Product Backlog is flexible to changes depending on the development progress and market feedback. According to Sutherland and Schwaber (2016), the requirements never stop changing which makes the Product Backlog a living artifact. The requirements might be for business, technology or even market background.

ID	User Story	MVP/Epic	Story points	Priority
US-1.1	As a user, I want to be able to	User	3	1

ID	User Story	MVP/Epic	Story points	Priority
	edit my profile because I change working places often.	settings		
US-1.2	As a user, I want to make my profile content public because I want to inspire people.	User settings	13	2
US-2.3	As an admin, I want to be able to delete users because our server memory is limited.	Admin settings	8	3
US-2.4	As an admin, I want to be able to merge users because sometimes users forget passwords and create new profiles.	Admin settings	20	4

Table 3.3: Example ordered Backlog

After the initial Product Backlog is done, the refinement process starts. Refinement means that together with the client, all Product Backlog items, which are the user stories, are revised and prioritized. To prevent duplication of work or work in completely different direction, a user story must meet a set of criteria before it is ready for iteration in the next sprint. These criteria are called Definition of ready. One of them is the structure of user stories must be broken down to the acceptable level. An acceptable level is a user story that is estimated with lowest story point. Another criterion is Product Backlog items (PBI) that will occupy the upcoming Sprint must be reasonably done within the defined time limit or Definition of done. PBIs that can be done are marked "Ready" so that they can be selected for the Sprint Planning (Beck et al., 2001; Sutherland & Schwaber, 2016). Preconditions a story needs to satisfy to be "Ready" are (ScrumInc, 2017):

1. Immediately actionable by the team
2. Approved by the product owner
3. Have value
4. Estimable by the team by size

At the end of a Sprint, the PBI must be marked "Done" which means it must meet all conditions, be tested, and it must be a potentially releasable product (ScrumInc, 2017; Sutherland & Schwaber, 2016).

After all previous Sprints are finished, there comes the Sprint demo and retrospective phases. It involves inspecting the process and self-reflection on the work, identifying major successful items and pointing out potential improvements for the next Sprint, and planning the next Sprint (Sutherland &

Schwaber, 2016). After the aforementioned criteria are satisfied if there are no improvement points, the products are rolled out.

This phase is based on Agile software development and Scrum which are further explained in the Chapter [3.2.1](#).

### 3.1.9 Value acceleration

The final phase is where it can be seen that the value is actually created. The products from the previous phase are looked into more closely to decide whether some of them need to be killed or expanded. This phase is closely related to portfolio management (Cooper, Edgett, & Kleinschmidt, 2006) with the accent of how to grow the value of the portfolio as a whole and scale it. However, that is a large topic and is out of the scope of this project.

## 3.2 Methods comparison

This sub-chapter extends to similar or used approaches and methods to FF. As such this sub-chapter begins with agile software development and Scrum as a framework that is part of it. In Section 3.2.2 the Digital transformation strategies are extended upon. After that follows the section empathy mapping which is a tool that entirely replaces the concept of personas'. In all sections similarities with FF are pointed out.

### 3.2.1 Scrum and Agile software development

The term scrum was introduced by Takeuchi and Nonaka (1986) in their article “New Product Development Game”. They described the new approach as commercial product development process performed by one cross-functional team. The cross-functional team manages the entire product development from the beginning until the end. This was contrary to the norm back then when specialized teams were performing specific actions within the development process forcing the product to be passed on to numerous specialized teams until it was completed. Takeuchi and Nonaka argued that their proposed approach positively influenced productivity and quality. Some years later, Sutherland and Schwaber presented Scrum as management framework with the focus on software product development (2016).

In 2001 Sutherland, Schwaber, and a group of software developers created and published the Manifesto for Agile Software Development (2001). The agile development methods are based on Iterative and Incremental practices. The creators of the manifesto have four main values:

1. “Individuals and Interactions over processes and tools”
2. “Working Software over comprehensive documentation”
3. “Customer Collaboration over contract negotiation”

#### 4. “Responding to Change over following a plan”

The incremental iterations allow for quick feedback cycles with the client which enables for changes to requirements if needed. It also assures that at the very least segments of the product with the highest value are regularly finished.

The Scrum framework is an Agile management framework (Schwaber, 2004). It defines specific roles, events, and artifacts. Scrum roles are Product Owner, Development Team, and Scrum Master. The Product Owner is responsible for managing the Product Backlog and maximizing the value of the product. In the FF, Product Owner is the client. The Development Team is the multi-functional team that works on and delivers the products at the end of each Scrum. Compared to FF, not only phase eight but all of the phases are performed with a multi-functional team. In addition to that, the multi-functional team also delivers the outcomes of each phase and workshop. The Scrum Master is accountable for the understanding of Scrum. When following the FF method, there is a person in charge that makes sure for the understanding of how FF works which is similar to the tasks a Scrum Master has. Scrum events are Sprint, Sprint Planning, Daily Scrum, Sprint Review, and Sprint Retrospective. Looking at the FF method, Sprint, Sprint Planning, Sprint Review, and Sprint Retrospective are used in phase eight. Daily Scrum meetings or Weekly Scrum meetings, depending on the type of the project, are also held as part of the FF method. Scrum artifacts are Product Backlog, Sprint Backlog, and Increment (Sutherland & Schwaber, 2016). They are all used in the FF method as explained in phase eight.

### 3.2.2 Digital transformation

In a Capgemini Consulting publication together with MIT Sloan Management (Westerman et al., 2011), digital transformation is defined as *“the use of technology to radically improve performance or reach of enterprises”*. To further understand how digital transformation is achieved, Berman’s (2012) definition is more precise *“To succeed in digital transformation leading companies focus on two complementary activities: reshaping customer value propositions and transforming their operations using digital technologies for greater customer interaction and collaboration.”* Other definitions for the same term were defined by Westerman et. al. (2011), Mazzone (2014), PwC (2013), and Bouee and Schaible (2015).

Digital transformation strategies influence and even reshape other business strategies and models (Downes & Nunes, 2014). They focus on transforming products, processes and organizational aspects given the integration of new technologies. Digital transformation strategies are a blueprint that holds up companies and organizations in controlling the transformations that arise.



Schallmo and Williams (2018) defined the digital transformation of business models because the transformation relates to different business elements, actors, networks, and even whole models. They outline a Roadmap for digital transformation of business models based on three existing approaches (Esser, 2014; PwC, 2013; Bouee & Schaible, 2015). There are five phases to the Roadmap: Digital Reality, Digital Ambition, Digital Potential, Digital Fit, Digital Implementation.

The Capgemini Consulting publication together with MIT Sloan Management (Westerman et al., 2011) argues that based on their case study, executives are digitally transforming the areas customer experience, operational processes, and business models.

Berman (2012) outlines another strategic route to transformation with three approaches: focusing on customer value propositions, transforming the operating model, combining the previous approaches.

Based on the aforementioned it can be seen that not only there is no single, commonly accepted definition of the term digital transformation currently but there is also no commonly accepted approach. The FF method has similarities with certain phases of digital transformation approaches: digital ambitions are defined in the book by Schallmo and Williams (2018), value drivers are part in one of the approaches by Berman (2012), and customer journeys are mentioned in the Capgemini publication (Westerman et al., 2011).

### **3.2.3 Empathy mapping**

Dave Gray (2010) defined a collaborative tool called empathy mapping which replaces the personas in total. It is similar to the activity "A day in the life of..." because it focuses on getting the stakeholders to create a customer profile by filling in a predefined empathy map template. The difference is the empathy map focuses on areas such as "Thinking", "Seeing", "Hearing", and "Feeling".



## 4 FF Method codification

This section illustrates the Process Deliverable Diagram (PDD) of the FF method and a short explanation for it. An explanation that is more detailed can be found in [Appendix D](#). To present this in a more structured way, firstly the knowledge base behind the situational method is explained. Thereafter, the preliminary process deliverable diagram is introduced ([Section 4.2](#)) which answers the second research sub-question: “*How can the FF method be codified?*”

### 4.1 Knowledge base

Before being able to develop the situational method, a knowledge base is created. The knowledge base is composed of BearingPoint’s FF method provided as shown in [Figure 2.1](#), 26 internal documents that included templates and work products, and literature research on FF phases, digital transformation, and agile development ([Section 3](#)). The FF PDD is constructed on the basis of this knowledge base.

### 4.2 FF Process Deliverable Diagram

A PDD is comprised of two meta-models: meta-process and meta-data model. The meta-process model explains the activities of a method and is represented on the left side. The meta-data model explains the rules, concepts, and deliverables of a method and is represented on the right side. Additionally, each PDD is accompanied by activity and concept tables describing the content of the model ([Appendix D](#)).

The PDD illustrates a comprehensive overview of the FF method following its nine phases. It is important to mention that the PDD presented in this chapter is the final outcome of the FF after the validation. This is done because the descriptions in the activity and process tables provided in [Appendix D](#) should explain each activity and each process and the only PDD version that had that was the final. The first PDD can be found in [Appendix C](#).

To improve readability, the following steps have been undertaken:

- The FF phases are split into three PDD models. This means the open activities (Personas, Customer journey, Idea selection, Capability mapping, Sprints, Value acceleration) from [Figure 4.1](#) are further explained in [Figure 4.2](#) and [Figure 4.3](#).
- All the activities from the three PDDs are placed in one table. Same goes for the concepts.
- Both the activities and concepts are placed by order of appearance in the PDDs.

For the PDD to correspond to the FF method, there are two general rules:

1. Every progress from the upcoming activity is based on the previous work and phases.
2. The whole process is iterative meaning the user can go back no matter where in the approach they are located.

Please be aware that the FF can be done with the intent of developing an IT product or from a business perspective such as marketing or sales. For that reason, there are no roles stated in the PDD. Instead, the roles are placed in a separate *Table 4.1* where it is explained what is the focus of each one. The roles are related to phases, which are marked with bold in the responsibilities column.

Role	Responsibilities
Management team	<ul style="list-style-type: none"> <li>– Define the ambition together with the client</li> <li>– Involved in the <b>first two phases</b>, the <b>capability mapping</b> and phase <b>value acceleration</b></li> <li>– Oversee the whole project</li> </ul>
Experience design team	<ul style="list-style-type: none"> <li>– Involved in defining the <b>digital ambition</b> and <b>capability mapping</b> together with the management team and the client</li> <li>– Responsible for gathering data and for customer experience</li> <li>– Defining the <b>value drivers, personas, customer journeys, idea selection</b></li> </ul>
Product owner	<ul style="list-style-type: none"> <li>– Activated in the <b>Sprints</b> phase</li> <li>– Responsible for the product and has the final say, usually appointed to the client (personal communication, September 18, 2017) but if it is more complex project, there is internal product owner that is in constant contact with the client (interviewee5, personal communication, May 17, 2018)</li> </ul>
Development team	<ul style="list-style-type: none"> <li>– Responsible for executing the <b>sprints</b> and developing the product in the Sprints phase</li> </ul>

Table 4.1: Roles and responsibilities in the FF

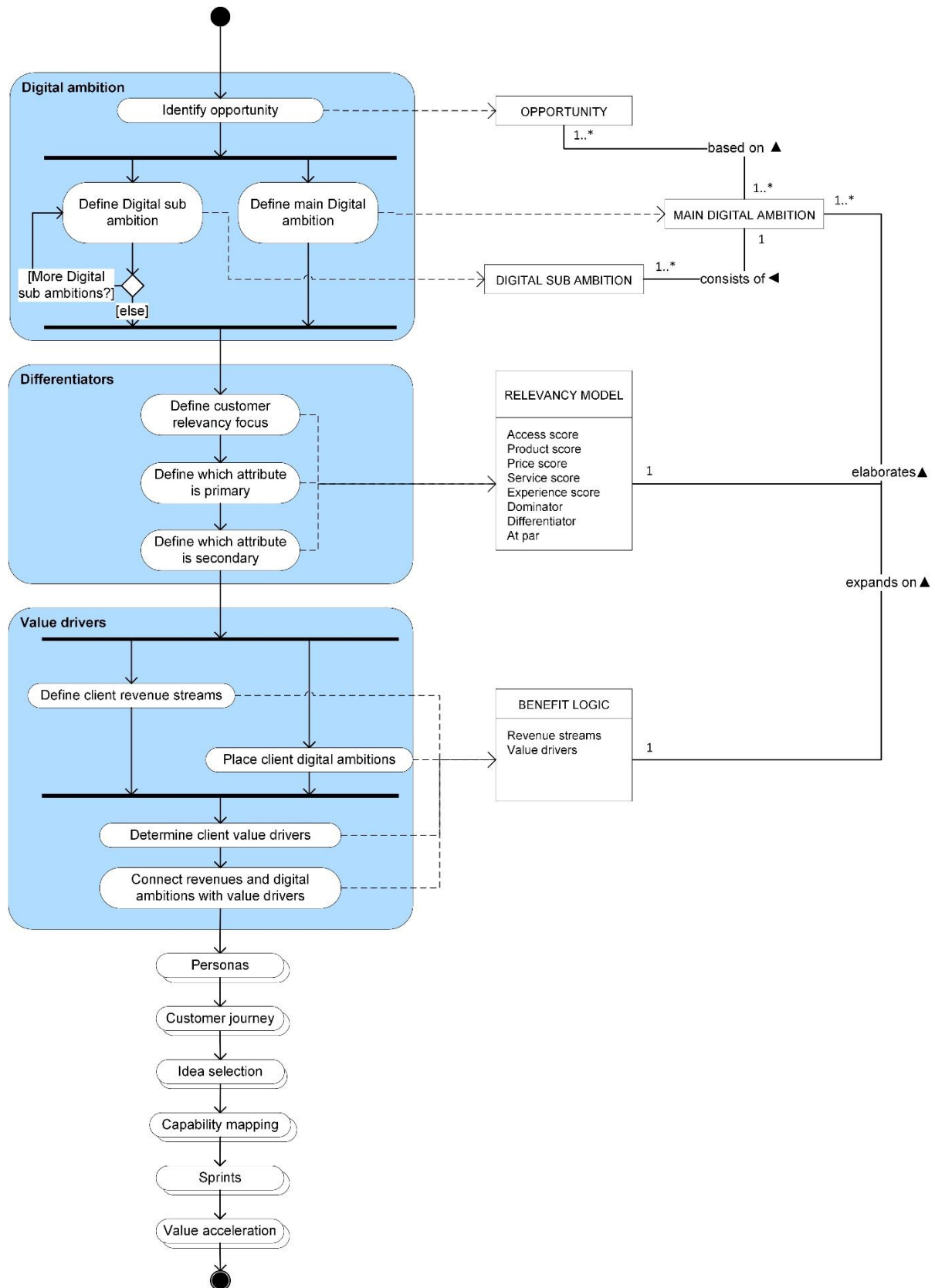


Figure 4.1: PDD of first three stages of FF

In the phase Digital ambition, there are two objectives: identifying the opportunity for improvement the customer has and defining their digital

ambitions. Because the main digital ambition can be very complex and high level, it consists of multiple digital sub ambitions that are more tangible and easy to grasp. The focus of the second phase is to define the Relevancy model, which is ultimately used to elaborate on the digital ambition and what the client wants to achieve by following the FF. These two phases play key role in setting the scope of the whole project and setting the aim of what is expected to be achieved in the end. The phase Value drivers explains what are the steps the client can follow so they can acquire the desired revenues by achieving their digital ambitions.

The next three phases are illustrated in *Figure 4.2*. Before the personas are established, in the phase Personas, the information source needs to be defined. This means that it needs to be defined if other sources, besides the interviews, will be used to gather data about the personas. The persona is the main outcome from this phase. However, the persona information is gathered with the persona questionnaire and stored in the central foundation document. Ultimately, the persona is presented with slides as was illustrated in *Figure 3.4*, which is also the input for the phase Customer Journeys. This phase as well as the next one are executed in a workshop together with the client. In this phase a set of activities are undertaken to understand the persona better and to identify what can be improved. After the personas are presented, the customer lifecycle is defined. This means all the processes a persona goes through from becoming aware about the client's product to purchasing it are defined. After that, all the touchpoints a persona has with the client are identified. That represents the customer journey. Next, taking into account all the information gathered thus far, the personas are taken through the activity "A day in the life of ..." The results from this activity are used to identify WOW moments and broken touchpoints. A WOW moment means the customer recognizes the client's product or service is necessary. The sixth phase is the summing up of all ideas from the previous phase. Firstly, the personas are taken through the ideation process, which is individual brainstorming of ideas and possible outcomes to fix problems identified previously. Afterwards, those ideas are presented to the whole group and possible MVP(s) are identified. These MVP(s) are then placed in a cost-impact quadrant, which helps in ranking them and identifying epics. The MVP(s) and epics are important, as they are the starting point for the last three phases.

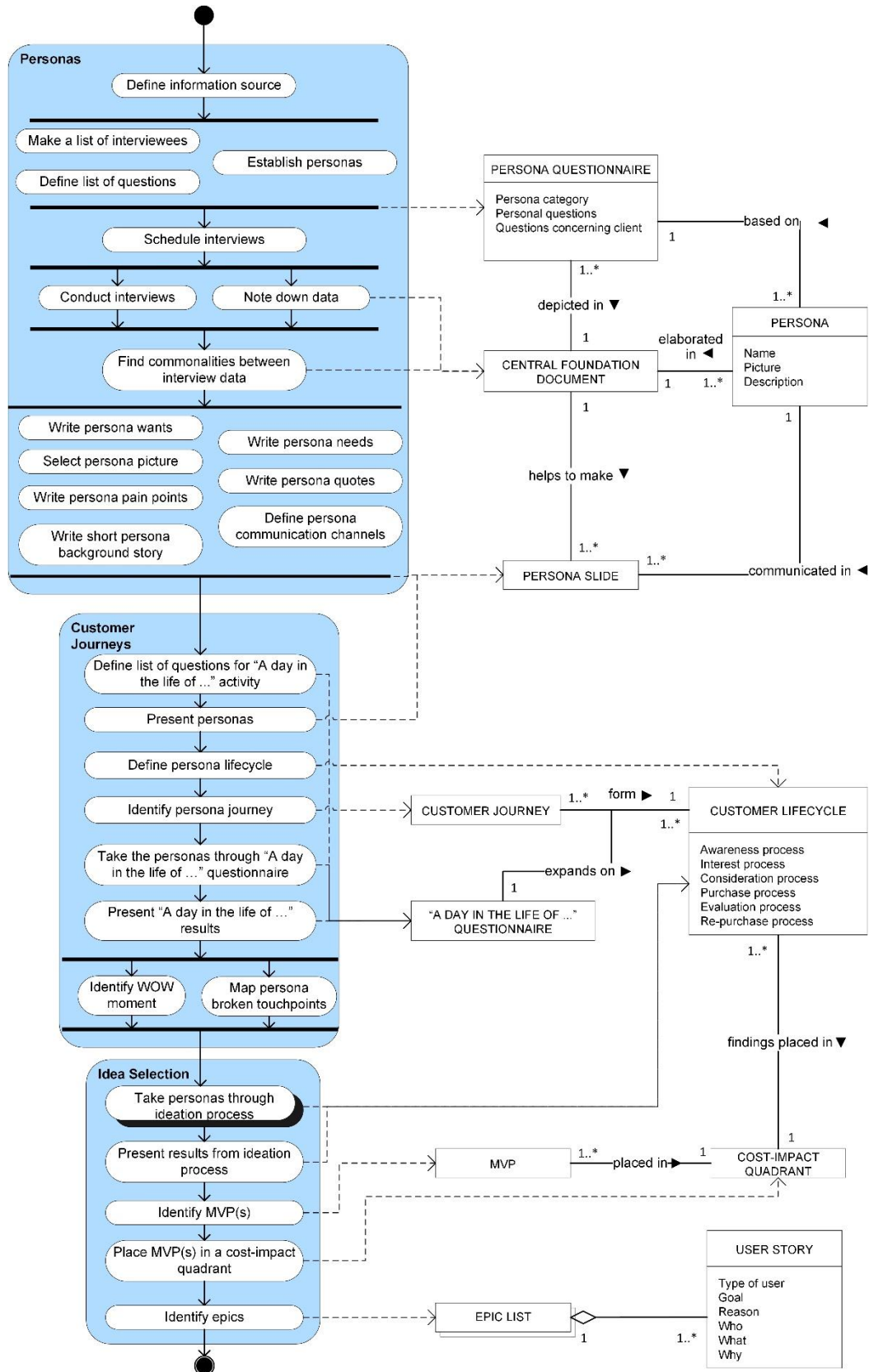


Figure 4.2: PDD of middle three stages of FF

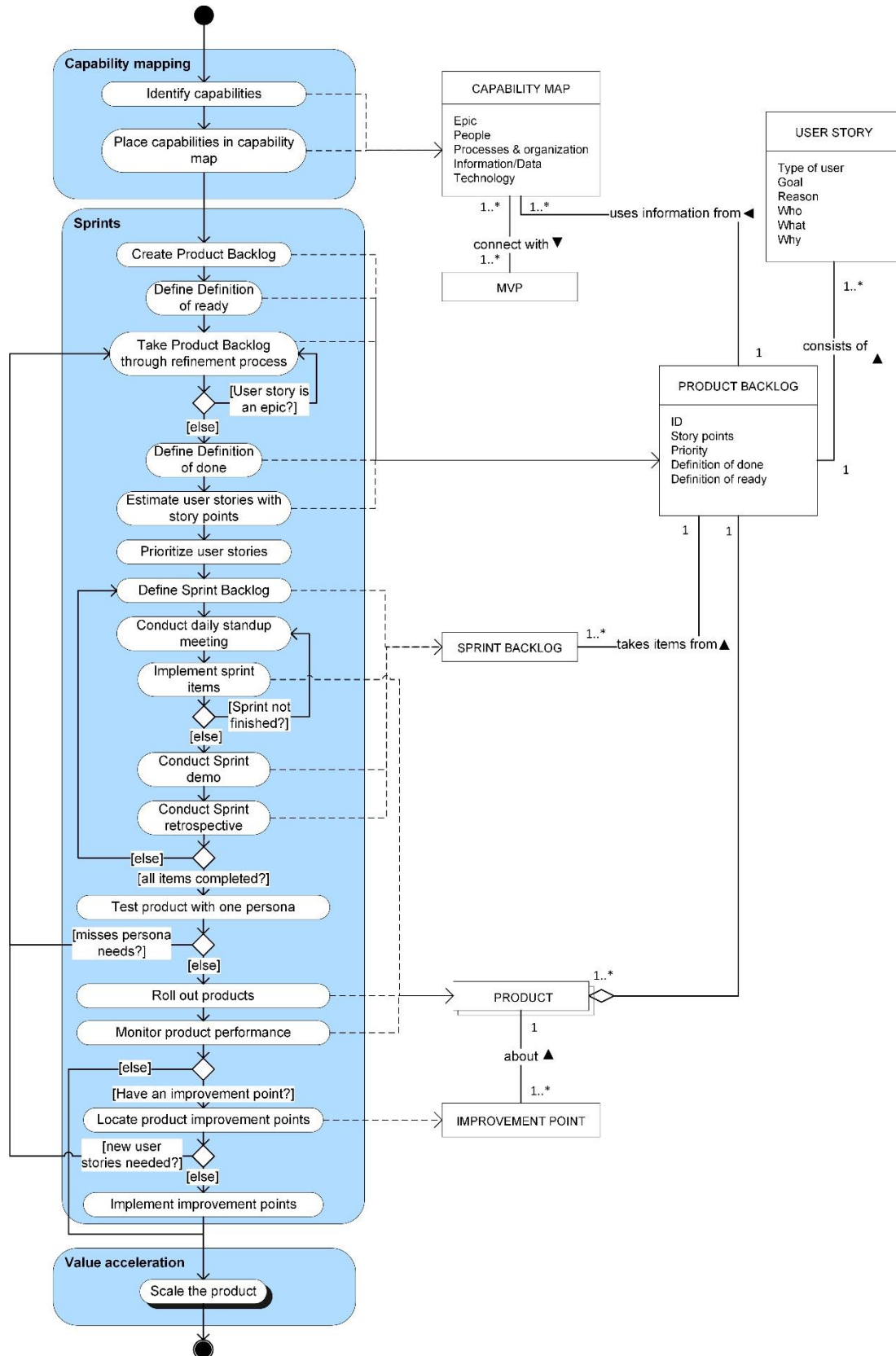


Figure 4.3: PDD of last three stages of FF

The capability map enables us to see what is already available to the client and what is missing or needs to be changed. The capability mapping is focused on the

transition from MVP(s) or epics towards capabilities. That is done by identifying the four pillars: people, processes & organization, information, and technology for every capability needed for each MVP or epic. In the Sprints phase, Agile development is used to develop the product. The main outcomes are the Product Backlog, Sprint Backlog, the product itself, and possible improvement points. Something that differs from Agile is that the product is tested with one persona. This is done to keep it small and to save resources. If the testing is successful, then the product is scaled (personal communication, May 17, 2018). The last phase is deciding which products are worth to be expanded or killed. However, it is a very complex phase and is out of the scope of this thesis.



## 5 FF Interview validation

The following section portrays the method used to validate the artifacts, which answers half of the third research sub-question: “How to improve the developed FF method after its validation and evaluation?”

The knowledge base used for the codification of the FF is further extended by performing semi-structured validation interviews. Semi-structured interviews are the means that suit this research the best. The reason for that is because semi-structured interviews allow for asking additional questions and shuffling their order so the researcher can understand the expert’s perspective. This type of validation method is called expert opinion because the artifact is subjected to experts who conceptualize “how such an artifact will interact with problem contexts imagined by them and then predict what effects they think this would have. If the predicted effects do not satisfy requirements, this is a reason to redesign the artifact” (Wieringa, 2014, p.63). The information gathered from the semi-structured interviews will be taken as a basis for validating the codified method.

During the interviews, the whole process complied with an interview protocol and the participants were given informed consent before the start of the interview, informing them about the research goals and ethics ([Appendix A](#)).

### 5.1 Interviews

Six validation interviews were conducted, each lasting approximately 40 minutes. Based on these interview results, the FF was complemented and validated. The experts consist of two groups of interviewees: business practitioners and scientific practitioners. The business practitioners are from number 3 to 6 in the [Table 5.1](#) while the rest are scientific practitioners.

No.	Expert profile	Background experience
1	Student	Master student who has had method engineering and PDD training. Also worked on one project where FF was used.
2	Student	Master student who has had method engineering training and was a student assistant in that course. Also worked on one project where FF was used.
3	Digital transformation	More than 20 years working in consulting, specifically in digital transformation.
4	Marketing sales and customer experience	Working for 6 years in digital consulting.
5	Digital strategy and customer experience	Working for two and a half years in digital strategy and customer experience.



No.	Expert profile	Background experience
6	Analytics	Working for 27 years in analytics and three of those on analyzing the FF.

Table 5.1: Experts information

The reasoning why the scientific practitioners were interviewed is to obtain feedback from a person who has experience in the domain of method engineering and is familiar with how the FF works. On the other hand, the business practitioners were expected to provide feedback based on real situations.

## 5.2 Validation of interviews

The validation interview started by stating the two main questions after which an explanation of each phase of the method followed. The whole interview process is presented in [Appendix A](#). To validate the contents of the diagram, the following questions were asked:

- [Understandability] What do you think about the understandability of the structure of the diagram?
- [Completeness] What do you think about the completeness of the structure of the diagram?

Looking at the questions above, it can be seen that the words understandability and completeness are in brackets. The reason for this is because they were the validation criteria. The motivation behind them was the paper by Kabaale, Amulen, and Kituyi (2014) that used the same words as validation criteria but in the context of validating a requirements engineering process. However, in this research paper understandability was regarded as the understandability of flow and connections between the activities and concepts. Furthermore, to make sure there are no activities or concepts that are omitted the completeness was adopted as the second validation criteria.

For every interview, the FF diagram was updated based on the feedback from the previous session. The processing criteria that were followed are:

- If one of the creators of the FF proposed a small textual modification, it was processed directly.
- If one or more interviewees proposed a small textual modification, it was processed directly.
- If one or more interviewees agreed on similar reasoning to add, modify or delete an action or a concept, it was added, modified or deleted.
- If one or more interviewees agreed on a new or modified activity, but they were not entirely sure where it should be positioned, the question was added in the following interviews.

- If one or more interviewees proposed opposing modifications, the decision was made based on the creator interview.

This proved to be successful as during the last interview there were no negative remarks.

It is important to mention the first two interviews were conducted as a group interview where the interviewees complemented each other with the feedback. In addition, the interview four and five were conducted with very little time in between to implement the feedback.

### 5.3 Changes from the initial FF PDD

Comparing the initial FF diagram version (*Figure C.1, Figure C.2, Figure C.3*) to the final FF diagram version (*Figure 4.1, Figure 4.2, Figure 4.3*), it can be seen a number of changes were made. The changes are briefly summarized in *Table 5.2*.

What change?	Activity	Attribute (CONCEPT)
Added	<ul style="list-style-type: none"> <li>+ Define information source</li> <li>+ Define persona lifecycle</li> <li>+ Identify WOW moment</li> <li>+ Map persona broken touchpoints</li> <li>+ Identify epics</li> <li>+ Define Definition of ready</li> <li>+ Define Definition of done</li> <li>+ Define Sprint Backlog</li> <li>+ Conduct daily standup meeting</li> <li>+ Implement Sprint items</li> <li>+ Conduct Sprint demo</li> <li>+ Test product with one persona</li> <li>+ Conduct Sprint retrospective</li> <li>+ Implement improvement points</li> <li>+ Scale the product</li> </ul>	<ul style="list-style-type: none"> <li>+ DIGITAL SUB AMBITION</li> <li>+ Dominator (RELEVANCY MODEL)</li> <li>+ Differentiator (RELEVANCY MODEL)</li> <li>+ At par (RELEVANCY MODEL)</li> <li>+ CUSTOMER JOURNEY</li> <li>+ MVP</li> <li>+ COST-IMPACT QUADRANT</li> <li>+ Who (USER STORY)</li> <li>+ What (USER STORY)</li> <li>+ Why (USER STORY)</li> <li>+ Definition of done (PRODUCT BACKLOG)</li> <li>+ Definition of ready (PRODUCT BACKLOG)</li> <li>+ SPRINT BACKLOG</li> <li>+ IMPROVEMENT POINT</li> </ul>
Modified	<ul style="list-style-type: none"> <li>≠ Identify problem causes → Identify opportunity</li> <li>≠ Establish number of personas → Establish personas</li> <li>≠ Present persona journey lifecycle → Identify persona journey</li> </ul>	<ul style="list-style-type: none"> <li>≠ OPPORTUNITY → PROBLEM CAUSE</li> <li>≠ DIGITAL AMBITION → MAIN DIGITAL AMBITION</li> <li>≠ USER STORY LIST →</li> </ul>

What change?	Activity	Attribute (CONCEPT)
	<ul style="list-style-type: none"> <li>≠ Prioritize user stories (moved)</li> <li>≠ Estimate user stories with story points (closed activity → activity)</li> <li>≠ Take product backlog through refinement process (closed activity → activity)</li> <li>≠ Prioritize user stories (moved)</li> <li>≠ Roll out products (moved)</li> <li>≠ Monitor product performance (moved)</li> <li>≠ Locate product improvement points (moved)</li> </ul>	<ul style="list-style-type: none"> <li>EPIC LIST</li> <li>≠ Persona type → Type of user (USER STORY)</li> <li>≠ User story → Epic (CAPABILITY MAP)</li> </ul>
Deleted	<ul style="list-style-type: none"> <li>– Form user stories</li> <li>– Identify MVP for every user story</li> </ul>	<ul style="list-style-type: none"> <li>– Main Digital ambition (DIGITAL AMBITION)</li> <li>– Digital sub ambition (DIGITAL AMBITION)</li> <li>– User story (PRODUCT BACKLOG)</li> <li>– MVP (CAPABILITY MAP)</li> <li>– MVP/Epic (PRODUCT BACKLOG)</li> </ul>

Table 5.2: FF diagram changes

Looking at *Table 5.2* there are four principal changes that were made to the initial diagram. The first activity was illustrated to be the identifying of problems, but the FF creator suggested it should be opportunity instead of problem.

*“...It could be a problem of course but we see it from the bright side. We see a lot of ambition at companies, old companies and also new companies where they can adopt new technologies or introduce new business models but it is an opportunity instead of a problem ... (interviewee3, personal communication, May 15, 2018)”*

Second, the Sprints phase was represented with high-level activities. Yet, input from the validation interviews suggested it should be presented as more tangible and detailed phase as it was proposed to add multiple activities. Third, the Value acceleration phase had a different meaning than what was initially illustrated.

*“... This is value acceleration. This is the next phase. If you deliver an MVP and your solution based on a couple of sprints then we have kind of a product and we test that with one persona or in one Geographic area. If it is successful then you bring the product to a large*

group or different country or whatsoever. Your main activity then is to do more transformation and we call it change management because we bring something successful but we need to do a lot of things around that. And we need to inform the people, we need to set the right starting point, we need to maybe localize in some cases. If you go to another country then probably look at e-commerce and the fulfilment process...it is different from one country to another, the currency for instance is different. You need to do something based on the set of functionality you already delivered because that is the same. And that is the speed aspect in the value acceleration and it is also the essence of the whole approach because the MVP has proven itself and you can bring it very fast ... (interviewee3, personal communication, May 15, 2018)”

“...the value acceleration is not this necessarily. I still see everything that is in here as part of the sprint. Value acceleration is more about: ok you have all these products and this performance and it is a bit of portfolio management. So some of them you are going to kill, some of them you will expand. It is more about making those decisions. It is a bit strategic than just a sprint build. So it is not improvement or continue [from Sprints phase] but it is a bit more: ok what is the value with these things and how can I make this value larger? Maybe it is taking a product and expanding it geographically so you are going to enter more markets with it. It is really how to grow the value of that portfolio as a whole. And after that it is scaling ... (interviewee4, personal communication, May 17, 2018)”

“... I think it is more about scaling... It is more about: ok so if we see the things are working here, how are we going to scale geographically or to other business units or however the company wants to scale? . . . So it is definitely about scaling because if you scale things that work, you create more value. That is the idea ... (interviewee5, personal communication, May 17, 2018)”

The interview input from above was analyzed carefully and it was decided the phase Value acceleration would be represented as a closed concept given that it is a completely different topic and it is out of scope of this project. The last change that is made is to present roles and responsibilities in [Table 4.1](#). It was concluded by two interviewees that four roles would best describe the FF PDD.

“... There are no roles in this but how do you know who does what thing in this diagram? . . . Make it simple then. I would create two groups of people or maybe three. Management team that is involved in the ambition as well, the experience design team is almost like the Consulting team so helping with the ambition but then helping and doing the whole data and customer experience, and here in the sprints is really product owner and Development Team. That should cover it I think. (interviewee5, personal communication, May 17, 2018)”

*“... You can describe what is the role of the person and what is expected of that person to provide . . . maybe a simple table ... (interviewee6, personal communication, May 25, 2018)”*

Based on the input above, the phases are sorted for every role. This way it is more clear who the stakeholders are in implementing the FF method.

## 6 FF Interview evaluation

This section expands on the client and participants point of view with regard to the implementation and outcomes of the FF. Firstly, the evaluation criteria and the argumentation behind them are stated. Subsequently, the evaluation results from the interviews are analyzed. With that the second half of the third research sub question: “*How to improve the developed FF method after its validation and evaluation?*” is answered.

During the interviews, the whole process complied with an interview protocol and the participants were given informed consent before the start of the interview, informing them about the research goals and ethics ([Appendix A](#)).

### 6.1 Interviews

For the evaluation, real users were interviewed in order to get critical evaluation of the FF. The real users are divided into two groups: client and participants. The interviews conducted were between 20 to 40 minutes long. Based on these interview results, the FF method was evaluated.

The client where the FF method has been implemented is RightBrains. RightBrains is a platform with the aim to grow the number of female digital talent. They do this by inspiring, developing and building a network for women with the passion for digital technologies. The carrier possibilities in digital technologies are not clearly recognizable to many young professionals. Therefore, RightBrains offers the place where these women can be inspired, educated, and guided by other female role models or digital leaders. All that is made possible through RightBrains’s Career Guide, and educational programmes.

RightBrains was BearingPoint’s client where the FF method was used with the goal to identify ways to improve their platform and general operations. The project was conducted in the course of ten weeks with the objective to get results fast. The final deliverables of the project were a Product Backlog and a new front-page concept.

The participants interviewed are Master students. They have been actively involved in executing the client’s project with the FF method by taking the different roles from the first until the eight phase. Throughout the project, they were accompanied and overseen by professionals that made sure the correct activities are executed the right way.

### 6.2 Evaluation of interviews

Two constructs from Davis’s (1989) Technology Acceptance Model (TAM) are adopted ([Figure 6.1](#)), which are Perceived Usefulness and Perceived Ease of Use.

With this, the accent of the evaluation will be on the behavioral acceptance or intention of using this information technology (Polančič, Heričko, & Rozman, 2010) as it has already been proven TAM gives guidance in accepting newly designed methods linked to information technology (Koç, Timm, España, González, & Sandkuhl, 2016) or software process engineering tools (Wagenaar, Overbeek, & Helms, 2017). The constructs used in this thesis, are defined by Davis as “the degree to which a person believes that using a particular system would enhance his or her job performance” and “the degree to which a person believes that using a particular system would be free of effort” respectively.

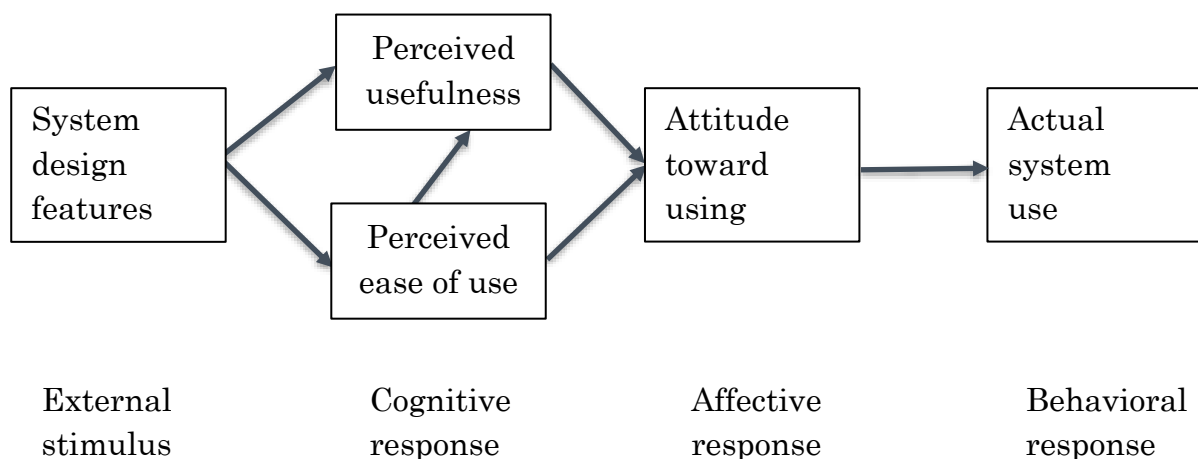


Figure 6.1: Technology acceptance model (Davis, 1993, p.476)

In order to evaluate the method’s internal quality (Brinkkemper, Saeki, & Harmsen, 1999) and whether the method can be performed at minimal cost and effort (Harmsen, 1997), the third objective that is evaluated is efficiency. The results of the evaluation are summarized in [Table 6.1](#).

Criteria	Interview number			Comments
	1	2	3	
<b>Usefulness</b>	n/a	+	n/a	Wanted to develop creative digital concept and that is exactly what was done.
<b>Efficiency</b>	+	+	±	The schedule and resources made from the beginning were honored. More firm lead might improve efficiency and provide faster results
<b>Ease of use</b>	±	±	+	Easy to use. Might be difficult for users without prior experience in similar approaches

Table 6.1: Evaluation summary

+: satisfied; ±: partly satisfied; n/a: no feedback related to criteria



In the next three sub sections, there is broader description of each criteria evaluated through the interviews.

### 6.2.1 Usefulness

The participant found the FF and its outcomes to be useful. Their goal was to develop creative digital concept that would further expand the RightBrains platform. By following the FF, that concept was made clear and with that, the next steps for the company were made clear. Therefore, the FF method enabled RightBrains to become more effective in accomplishing their future goal.

### 6.2.2 Efficiency

The project execution and person-hours were known from the start and were honored. Given the fact that the company is a small start-up, the whole project was performed at a faster rate. Meetings and workshops were planned in accordance with the participant's schedule. Skype was a solution when meeting in person was not possible. However, the workshops could be facilitated better and made more efficient. Other than that, all the interviewees agreed the FF method could be performed at minimal cost and effort, while not cutting back on the crucial activities.

### 6.2.3 Ease of use

The FF method did not require too much effort to understand but it was rather straightforward. The interviewees found it easily understandable, easy to implement, flexible, and agile. However, it is important to mention that all interviewees had either business, agile or marketing knowledge.

## 7 Limitations, conclusion and future work

### 7.1 Limitations

The biggest issue regarding this research is the evaluation. Out of the three interviews, only one was client where the FF method was followed. However, this limitation should not have influenced the overall outcome of the evaluation because two additional evaluation interviews were conducted with participants.

Since the Fast Forward method is implemented by BearingPoint, the client perspective was obtained in an attempt to create a more holistic evaluation and eliminate the risk of bias. The participants, however, were people that implemented the FF method in the client's project. Their involvement implies they have had influence on the final outcome of the project, making it plausible they were satisfied with that outcome. Overall, this should not have too big of an impact on the outcome of the evaluation, because the participants are Master students that are not part of any of the stakeholder organizations part of the project.

It should also be taken into account that the evaluation interviews were based upon events that had taken place into the past. That means the answers relied on the memories of historic events of the interviewees, which may have caused details to be remembered incorrectly or completely overlooked. To counter these issues as much as possible, interviewees were reminded of the phases and deliverables of the project. However, it remains as a weakness in this research.

### 7.2 Conclusion

This thesis described a research that was conducted in the field of agile development and digital transformation. The focus of the research was the codification of the Fast Forward method. This section will first discuss the three sub research questions, after which the answer to the main research question will be analyzed. The answers to these research questions are based on the literature review (Chapter 3 *Literature review*) behind the FF method, the codification (Chapter 4 *FF Method codification*), the validation of the codified diagram (Chapter 5 *FF Interview validation*), and the validation of the FF method (Chapter 6 *FF Interview evaluation*) as planned in Chapter 2 *Research approach*. The research questions were defined to solve the *Problem statement* from Chapter 2. The sub research questions and main research question are listed below, each accompanied by an answer that serves as a conclusion.

- SRQ1. *What are current approaches for agile software development and digital transformation that are comparable to the FF method?*

To answer the first sub research question, extensive research was conducted for every phase and activity of the FF method. Similarities of separate activities were found with individual researches. Examples are customer journey (Nenonen et al., 2008), foundation document (Pruitt & Grudin, 2003), and customer relevancy model (Capgemini Consulting, 2016). However, when looking at the approach as a whole it can be seen that it is based on agile software development and digital transformation. From the first domain, the FF method is closely related to Scrum. Not only is the phase Sprints based on the practices of Scrum, but also the roles product owner and development team are included in the FF method. From the digital transformation domain, the similarities with the FF can be found in the book by Schallmo and Williams (2018) where digital ambitions are defined, in the research by Berman (2012) where value drivers can be found, and in Capgemini's publication (Westerman et al., 2011) where customer journeys are mentioned. Another similarity can be found with Dave's collaborative tool called empathy mapping (Gray, 2010) which has similar focus as the activity "A day in the life of ..."

SRQ2. *How can the FF method be codified?*

The FF method was codified based on a knowledge base, which consisted of 26 internal documents, templates, work products, and literature research on the phases. The codification was executed by using a meta-modeling technique to develop a Process Deliverable Diagram (van de Weerd & Brinkkemper, 2009). That resulted in three PDD models (*Figure 4.1*, *Figure 4.2*, *Figure 4.3*), two general rules, and four roles.

SRQ3. *How to improve the developed FF method after its validation and evaluation?*

This sub research question can be divided into two parts: validation and evaluation. The primary PDD models (*Appendix C*) were validated with six interviews between experts and scientific practitioners. After each interview, a new iteration of the PDD models was generated and the new models were validated in the next interview. The criteria validated were understandability and completeness. Additionally, there were five processing criteria (*Validation of interviews*). The summary of model changes can be found in *Table 5.2*.

The second part of this sub research question was answered by conducting three evaluation interviews. Three criteria were evaluated: usefulness and ease of use as defined by Davis's TAM (1989), and efficiency (Brinkkemper, Saeki, & Harmsen, 1999). The outcome concluded the client found the FF method to be useful in developing RightBrains's creative digital concept in efficient manner. The only concern brought up by the interviewees was that even though the approach was easy to use, users without prior knowledge in similar approaches might find it difficult.

MRQ. *How does the FF method support companies in achieving their digital strategies faster while still remaining within the limits of their resources?*

With the insight of the three sub research questions, the answer to the main research question is rather simple. By following the agile codified FF method, companies are supported in achieving their digital strategies. The FF method involves all activities from establishing client's digital ambitions to implementing and scaling the end result. It is an outside-in approach, which means what is needed is determined by the client himself. The nine phases of the FF method look into both the technical and non-technical factors. They improve the efficiency of people performing tasks in business processes by identifying possible problem causes of the client. This is done by putting the client's customer in the center and identifying potential improvement points by creating personas, building customer journeys, and lifecycles. The act of creating personas helps in making explicit assumptions and decision-making criteria about the target customers. The personas break the cycle of routine feature and implementation decisions made by the development team. From those findings or business objectives, possible products are filtered and developed with Scrum. Optimization of resources and fast achievement of digital strategies can be seen by testing the product with one persona instead of all of them because the intention of the FF method is to keep it small and scale when it works.

### 7.3 Future work

Future work should focus on extending the evaluation of this research. Interviewing more clients where the FF method was used would help towards making the research more generalizable. Furthermore, this research could be more generalizable by looking at other organizations in order to evaluate how they deal with digitally transforming their clients.

Finally, the field of digital transformation is relatively young which makes space for conducting more studies that are theoretical and deepening the scientific knowledge behind it.

## References

- Alan Cooper, R., & Reimann, R. M. (2003). *About Face 2.0: the essentials of interaction design*. Wiley Publishing.
- Ang, L., & Buttle, F. A. (2002, December). ROI on CRM: a customer-journey approach. In *Conference Proceedings of IMP Conference, Perth, Australia*.
- Auriga. (2016). Digital Transformation: History, Present, and Future Trends. Retrieved from <https://auriga.com/blog/digital-transformation-history-present-and-future-trends/>
- Baesens, B., Verstraeten, G., Van den Poel, D., Egmont-Petersen, M., Van Kenhove, P., & Vanthienen, J. (2004). Bayesian network classifiers for identifying the slope of the customer lifecycle of long-life customers. *European Journal of Operational Research*, 156(2), 508-523.
- BearingPoint. (2015). Retrieved from <http://ourjourney.bearingpoint.com/>
- BearingPoint. (2017). Building the RightBrains Platform Track. Utrecht, the Netherlands: Teerlink, M., Dimovska, L., & Scholte, J.
- BearingPoint. (2017). From strategy to results. Retrieved from <https://www.bearingpoint.com/en-gb/about-us/annual-report/facts-and-stories-from-strategy-to-results/>
- BearingPoint. (2018). About Us. Retrieved from <https://www.bearingpoint.com/en-gb/about-us/our-history/>
- Beck, K., Beedle, M., Van Bennekum, A., Cockburn, A., Cunningham, W., Fowler, M., Grenning, J., Highsmith, J., Hunt, Andrew., Jeffries, R., Kern, J., Marick, B., Martin, C. R., Mellor, S., Schwaber, K., Sutherland, J., & Thomas, D. (2001). Manifesto for agile software development.
- Berman, S. J. (2012). Digital transformation: opportunities to create new business models. *Strategy & Leadership*, 40(2), 16-24.
- Berger, P. D., & Nasr, N. I. (1998). Customer lifetime value: Marketing models and applications. *Journal of interactive marketing*, 12(1), 17-30.
- Boardman, A. E., Greenberg, D. H., Vining, A. R., & Weimer, D. L. (2017). *Cost-benefit analysis: concepts and practice*. Cambridge University Press.
- Bouee, C. E., & Schaible, S. (2015). Die Digitale Transformation der Industrie. *Roland Berger Strategy Consultants und Bundesverband der Deutschen Industrie eV, Berlin*.

- Brainster. (2017). If you are wondering what exactly we do in Brainster.  
Retrieved from <https://blog.brainster.co/brainster-skopje-kursevi-obuki/>
- Brinkkemper, S. (1996). Method engineering: engineering of information systems development methods and tools. *Information and software technology*, 38(4), 275-280.
- Brinkkemper, S., Saeki, M., & Harmsen, F. (1999). Meta-modelling based assembly techniques for situational method engineering. *Information Systems*, 24(3), 209-228.
- Brugnoli, G., Mangiaracina, R., & Perego, A. (2009). The eCommerce customer journey. A model to assess and compare the user experience of the eCommerce websites. In *ICEP 2009* (pp. 130-143).
- Bughin, J., Hazan, E., Labaye, E., Manyika, J., Dahlström, P., Ramaswamy, S., & de Billy, C., C. (2016, June). Digital Europe: Realizing the continent's potential. McKinsey&Company. Retrieved from <https://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/digital-europe-realizing-the-continents-potential>
- Bughin, J., LaBerge, L., & Mellbye, A. (2017, February). The case for digital reinvention. McKinsey&Company. Retrieved from <https://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/the-case-for-digital-reinvention>
- Capgemini Consulting. (2016). *Customer Relevancy Model – Live up to your potential*. Utrecht, the Netherlands: Stoffelsen, T., Heinen, M.
- Chang, Y. N., Lim, Y. K., & Stolterman, E. (2008). Personas: from theory to practices. In *Proceedings of the 5th Nordic conference on Human-computer interaction: building bridges* (pp. 439-442). ACM.
- Christopher, M., Payne, A., & Ballantyne, D. (1991). Relationship marketing: bringing quality customer service and marketing together.
- Collis, J., & Hussey, R. (2009). Business research. Palgrave MacMillan. UK.
- Cooper, A. (2004). *The inmates are running the asylum:[Why high-tech products drive us crazy and how to restore the sanity]*. Indianapolis: Sams.
- Cooper, A., Reimann, R. (2003). *About face 2.0: The essentials of interaction design*. Wiley Publishing
- Cooper, R. G., & Edgett, S. (2008). Ideation for product innovation: What are the best methods. *PDMA visions magazine*, 1(1), 12-17.

- Cooper, R. G., Edgett, S. J., & Kleinschmidt, E. J. (2006). *Portfolio Management for New Product Development*. Industrial Research Institute, Inc.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS quarterly*, 319-340.
- Denscombe, M. (2014). *The good research guide: for small-scale social research projects*. McGraw-Hill Education (UK).
- Dörner, K., & Edelman, D., (2015). What does digital really mean?. Retrieved from <https://www.mckinsey.com/industries/high-tech/our-insights/what-digital-really-means>.
- Dotan, A., Maiden, N., Lichtner, V., & Germanovich, L. (2009). Designing with only four people in mind? – a case study of using personas to redesign a work-integrated learning support system. In *IFIP Conference on Human-Computer Interaction* (pp. 497-509). Springer, Berlin, Heidelberg.
- Downes, L., & Nunes, P. (2014). *Big bang disruption: Strategy in the age of devastating innovation*. *Harvard Business Review*, 91(3), 44-56.
- Easterbrook, S., Singer, J., Storey, M. A., & Damian, D. (2008). Selecting empirical methods for software engineering research. In *Guide to advanced empirical software engineering* (pp. 285-311). Springer London.
- Edelman, D. C., & Singer, M. (2015). Competing on customer journeys. *Harvard Business Review*, 93(11), 88-100.
- Eisenhardt, K. M., & Schoonhoven, C. B. (1990). Organizational growth: Linking founding team, strategy, environment, and growth among US semiconductor ventures, 1978-1988. *Administrative science quarterly*, 504-529.
- Faily, S., Flechais, I. (2011). Persona cases: A technique for grounding personas. *Proc. of CHI*. 2267-2270.
- Fowler, M., & Highsmith, J. (2001). The agile manifesto. *Software Development*, 9(8), 28-35.
- Goodwin, K. (2011). *Designing for the digital age: How to create human-centered products and services*. John Wiley & Sons.
- Gordon, I. (1998). *Relationship marketing: New strategies, techniques, and technologies to win the customers you want and keep them forever*. Wiley.
- Gray, D., Brown, S., & Macanuso, J. (2010). *Gamestorming: A playbook for innovators, rulebreakers, and changemakers*. " O'Reilly Media, Inc."



- Grudin, J. (2006). Why personas work: The psychological evidence. *The Persona Lifecycle*, 642-663. Morgan Kaufman.
- Grudin, J., Pruitt, J. (2002). Personas, participatory design and product development: An infrastructure for engagement. *Proc. of the Participatory Design Conference*. 144-161.
- Halvorsrud, R., Kvale, K., & Følstad, A. (2016). Improving service quality through customer journey analysis. *Journal of service theory and practice*, 26(6), 840-867.
- Hannah, D. R., & Lautsch, B. A. (2011). Counting in qualitative research: Why to conduct it, when to avoid it, and when to closet it. *Journal of Management Inquiry*, 20(1), 14-22.
- Harmsen, F. (1997). *Situational method engineering*. University of Twente, Moret Ernst & Young Management Consultants, The Netherlands (Doctoral dissertation, Dissertation Thesis).
- Helfat, C. E., & Raubitschek, R. S. (2000). Product sequencing: co-evolution of knowledge, capabilities and products. *Strategic management journal*, 961-979.
- Homburg, C., Jozić, D., & Kuehnl, C. (2017). Customer experience management: toward implementing an evolving marketing concept. *Journal of the Academy of Marketing Science*, 45(3), 377-401.
- Kabaale, E., Amulen, C., & Kituyi, G. (2014). Validation of a systematic approach to requirements engineering process improvement in smes in a design science framework. *International Journal of Computer Applications*, 108(6).
- Koç, H., Timm, F., España, S., González, T., & Sandkuhl, K. (2016, January). A method for Context Modelling in Capability Management. In *ECIS* (p. ResearchPaper43).
- Kogut, B., & Zander, U. (1996). What firms do? Coordination, identity, and learning. *Organization science*, 7(5), 502-518.
- Larkin, J. H., & Simon, H. A. (1987). Why a diagram is (sometimes) worth ten thousand words. *Cognitive science*, 11(1), 65-100.
- Levin, H. M., & McEwan, P. J. (2000). *Cost-effectiveness analysis: Methods and applications* (Vol. 4). Sage.
- Long, F. (2009, May). Real or imaginary: The effectiveness of using personas in product design. In *Proceedings of the Irish Ergonomics Society Annual Conference* (Vol. 14). Irish Ergonomics Society.

- Matthews, T., Judge, T., & Whittaker, S. (2012). How do designers and user experience professionals actually perceive and use personas?. In *Proceedings of the SIGCHI conference on human factors in computing systems* (pp. 1219-1228). ACM.
- Mazzone, D. M. (2014). *Digital or death: digital transformation: the only choice for business to survive smash and conquer*. Smashbox Consulting Inc.
- Nenonen, S., Rasila, H., Junnonen, J. M., & Kärnä, S. (2008, June). Customer Journey—a method to investigate user experience. In *Proceedings of the Euro FM Conference Manchester* (pp. 54-63).
- Nielsen, L. (2004). Engaging personas and narrative scenarios. Copenhagen, *Samfundslitteratur*. Ph.D. Dissertation.
- Norton, D. W., & Pine, B. J. (2013). Using the customer journey to road test and refine the business model. *Strategy & Leadership*, 41(2), 12-17.
- Pardo, T. A., Cresswell, A. M., Dawes, S. S., & Burke, G. B. (2004, January). Modeling the social & technical processes of interorganizational information integration. In *System Sciences, 2004. Proceedings of the 37th Annual Hawaii International Conference on* (pp. 8-pp). IEEE.
- Penrose, E. T. (1959). *The Theory of the Growth of the Firm*, 1<sup>st</sup>. New York: Oxford University Press.
- Pfeffer J, Salancik GR. *The external control of organizations*. New York: Harper and Row; 1978.
- Polančič, G., Heričko, M., & Rozman, I. (2010). An empirical examination of application frameworks success based on technology acceptance model. *Journal of systems and software*, 83(4), 574-584.
- Pruitt, J., & Adlin, T. (2006). *The persona lifecycle: Keeping people in mind throughout the product design*. Morgan Kaufman.
- Pruitt, J., & Grudin, J. (2003). Personas: practice and theory. In *Proceedings of the 2003 conference on Designing for user experiences* (pp. 1-15). ACM.
- PWC. (2013). *Digitale Transformation - der größte Wandel seit der industriellen Revolution*. PwC, Frankfurt.
- Rawson, A., Duncan, E., & Jones, C. (2013). The truth about customer experience. *Harvard Business Review*, 91(9), 90-98.
- Richardson, G. B. (1972). The organization of industry. *The economic journal*, 82(327), 883-896.

- Ries, E. (2011). *The lean startup: How today's entrepreneurs use continuous innovation to create radically successful businesses*. Crown Books.
- Robinson, R. (1993). Cost-effectiveness analysis. *Bmj*, 307(6907), 793-795.
- Runeson, P., & Höst, M. (2009). Guidelines for conducting and reporting case study research in software engineering. *Empirical software engineering*, 14(2), 131.
- Russell, L. B., Gold, M. R., Siegel, J. E., Daniels, N., & Weinstein, M. C. (1996). The role of cost-effectiveness analysis in health and medicine. *JOURNAL-AMERICAN MEDICAL ASSOCIATION*, 276, 1172-1177.
- Schallmo, D. R., & Williams, C. A. (2018). Roadmap for the Digital Transformation of Business Models. In *Digital Transformation Now!* (pp. 41-68). Springer, Cham.
- Schwaber, K. (2004). *Agile project management with Scrum*. Microsoft press.
- Schwaber, K., & Beedle, M. (2002). *Agile software development with Scrum* (Vol. 1). Upper Saddle River: Prentice Hall.
- Schwaber, K., & Sutherland, J. (2016). *The Scrum Guide*. Scrum Alliance.
- ScrumInc. (2017). Definition of Done. Retrieved from <https://www.scruminc.com/definition-of-done/>
- ScrumInc. (2017). Definition of Ready. Retrieved from <https://www.scruminc.com/definition-of-ready/>
- ScrumInc. (2017). Product Backlog Refinement. Retrieved from <https://www.scruminc.com/product-backlog-refinement/>
- ScrumInc. (2017). Sprint Backlog. Retrieved from <https://www.scruminc.com/sprint-backlog/>
- Seaman, C. B. (1999). Qualitative methods in empirical studies of software engineering. *IEEE Transactions on software engineering*, 25(4), 557-572.
- Sjoberg, D. I., Dyba, T., & Jorgensen, M. (2007, May). The future of empirical methods in software engineering research. In *Future of Software Engineering, 2007. FOSE'07* (pp. 358-378). IEEE.
- Stauss, B., & Weinlich, B. (1997). Process-oriented measurement of service quality: Applying the sequential incident technique. *European Journal of Marketing*, 31(1), 33-55.

- Takeuchi, H., & Nonaka, I. (1986). New product development game. *Harvard Business Review*.
- Tax, S. S., McCutcheon, D., & Wilkinson, I. F. (2013). The service delivery network (SDN) a customer-centric perspective of the customer journey. *Journal of Service Research*, 16(4), 454-470.
- Van de Ven, A. H., & Poole, M. S. (1990). Methods for studying innovation development in the Minnesota Innovation Research Program. *Organization science*, 1(3), 313-335.
- Wagenaar, G., Overbeek, S., & Helms, R. (2017, April). Describing criteria for selecting a scrum tool using the technology acceptance model. In Asian Conference on Intelligent Information and Database Systems (pp. 811-821). Springer, Cham.
- Weerd, I., van de & Brinkkemper, S. (2009). Meta-modeling for situational analysis and design methods. In *Handbook of research on modern systems analysis and design technologies and applications* (pp. 35-54). IGI Global.
- Westerman, G., Calm ejane, C., Bonnet, D., Ferraris, P., & McAfee, A. (2011). Digital Transformation: A roadmap for billion-dollar organizations. *MIT Center for Digital Business and Capgemini Consulting*, 1-68.
- Wieringa, R. J. (2014). *Design Science Methodology for Information Systems and Software Engineering*. Springer Berlin Heidelberg.
- Williamson, O. E. (1999). Strategy research: governance and competence perspectives. *Strategic management journal*, 1087-1108.
- Yoo, J., & Pan, Y. (2014). Expanded customer journey map: interaction mapping framework based on scenario. In *International Conference on Human-Computer Interaction* (pp. 550-555). Springer, Cham.

## Appendices

### Appendix A: Interview Protocol and informed consent

#### Interview protocol

The interview protocol is presented below. Keep in mind that the PDD that was shown to the first interviewee can be found in [Appendix C](#). The PDD that was shown in every interview afterwards was a PDD with implemented feedback from the interview before. Additionally the explanation of the PDD was based on the different PDD iteration that was presented in the particular interview. For this reason, only the explanation of the final PDD will be provided in this thesis.

#### Introduction

My name is Liljana Dimovska and I am following the Master in Business Informatics at Utrecht University. Currently, I am doing my master thesis which is a research project in collaboration with BearingPoint (a Dutch consultancy company). My thesis has the topic of “Codification of a Novel Agile Approach: Fast Forward”. This means that the purpose of this research is to codify the Fast Forward method in order to clarify how this approach differs from and builds on existing approaches and to repeat and extend past successes. A first version of the codification of FF, which will be used to build further upon during this research, is shown in these pictures (give printed out meta-model). As can be seen, this first version of the diagram gives a broad overview of the phases involved in FF.

The diagram is based on UML activity diagrams (point to left) and class diagrams (point to right) and the technique used to model the diagram is called process-deliverable diagram or PDD. The left side shows the flow from activity to activity. The right side shows the concepts or deliverables produced in the process. The second version will be constructed by implementing your feedback from this interview.

The interview will take maximum 45 minutes. During this interview I will first ask you some general questions about you and then questions about the completeness and understandability of the diagram. The information elicited through this interview will be used as a form of input to the second version of the artifact.

Before we start, because of ethical procedures for academic research, the interviewee must explicitly agree to being interviewed and understand how their information provided in this interview will be used. This consent form is necessary so the purpose of your involvement is clear and that you agree to the conditions of your participation.

## Validation questions

### General questions

- What domain are you specialized in/working on?
- How long (years) have you been working in that domain?

### FF questions

To get the best outcome of this interview, I will state the main questions in the beginning and you can provide your answers as I explain every phase separately.

- [Understandability] What do you think about the understandability of the structure of the diagram?
  - Are the activity names appropriately chosen?
  - Is the flow of activities positioned logically?
  - Do the connections between concepts/deliverables make sense?
  - Are the concepts the right input and output of the activities?
  - Would you consider certain steps to be too abstract or too specific?
- [Completeness] What do you think about the completeness of the structure of the diagram?
  - Are all performed activities illustrated?
  - Are all deliverables illustrated?

## Evaluation questions

### General (easy) questions

1. What did you (as a company) wanted to achieve so that you ended up working with BearingPoint and following the FF?
2. How satisfied are you with the outcome of the FF?

### Questions about FF

3. [Usefulness] How has the FF outcome affected you in executing your function within the company?
  - a. Do you think that it affects your productivity? In what way?
  - b. Do you think it enables you to accomplish tasks more effectively?
4. [Efficiency] How long did it take for the execution of the whole project (from the first phase of setting up digital ambitions till the last)?
5. [Efficiency] Did you have a gross/rough estimation of resources that the execution of the project will cost (in terms of man-hours or equipment or finances)?
6. [Efficiency] How were the resources constraints (finances, equipment, people's time) handled within the project?

7. [Efficiency] Do you think that the FF can be performed at minimal cost and effort?
8. [Ease of use] Can you describe the effort that was needed to get used to using the FF outcomes? (Do you find it easy to use?)
  - c. How easy or hard has it been to integrate the FF results with other company activities? (ex: with other software)

### **Questions about phases/outcomes (optional questions to help with the previous)**

9. [Digital ambition, differentiators] How effective was the FF in achieving your digital ambitions?
10. [Digital ambitions, value drivers] How helpful was the FF?
  - a. How did FF help the company meet its business goals (goals or objectives expected to be accomplished over a specific period of time)?
  - b. How has the FF created value for the company?
11. [Personas, customer journey, idea selection] How has knowing your customers (with the help of the personas) in more detail affected the company's work?
12. [Personas, customer journey, idea selection] Do you think that the FF has affected the interaction points you have with your customers? In what way?
13. [Capability mapping, sprints, value acceleration] How has the final product met your company needs?

### **Closing questions**

14. What would you say are strong points of FF?
15. And weak points?
  - a. What phase/aspect of the FF would you improve?
16. Do you have any other remarks or recommendations that you would like to address?

### **Closure**

Thank you for your time and for providing me with the information needed for this phase of the research project. After I have completed my thesis, I will send it to you.

### **Informed consent**

Research project title: Codification of a Novel Agile Approach: Fast Digital Value

Participant name:



Thank you for agreeing to be interviewed as part of the above research master thesis. The interview will last approximately 45 minutes and it will be conducted by Liljana Dimovska from Utrecht University. You will be asked to give your opinion regarding the evaluation of the Fast Digital Value approach. The purpose of this document is to specify the terms of your participation in the research through being interviewed.

- You have been given sufficient information about the research project. The purpose of your participation as an interviewee in this project has been explained to you and is clear.
- You allow the researcher to take written notes during the interview. You also allow the recording (of audio) of the interview. It is clear to you that in case you do not want the interview to be taped you are at any point of time fully entitled to withdraw from participation. The audio file will be deleted at the end of this research.
- You have the right not to answer any of the questions. If you feel uncomfortable in any way during the interview session, you have the right to withdraw from the interview. If you withdraw from the study, you do not have to state why.
- This research is conducted in collaboration with BearingPoint. However, all personal information that could identify you will be removed or changed before files are shared with BearingPoint or any other researchers or organizations. Your participation in this study is confidential.
- The research will be published as academic paper in the Utrecht University online library archive.
- Your words may be quoted directly. With regards to being quoted, please initial next to any of the statements that you agree with:
  - I wish to review the notes, transcripts, or other data collected during the research related to my participation.
  - I agree to be quoted directly.

_____ Participant's Signature	_____ Date
_____ Researcher's Signature	_____ Date

## Appendix B: Coding Scheme

Validation round with practitioners (students) familiar with both FF and PDD (iv1-iv2).

Validation round with expert interviewees (iv3-iv6).

Code	APA reference
<b>iv1</b>	(interviewee1, personal communication, May 10, 2018)
<b>iv2</b>	(interviewee2, personal communication, May 10, 2018)
<b>iv3</b>	(interviewee3, personal communication, May 15, 2018)
<b>iv4</b>	(interviewee4, personal communication, May 17, 2018)
<b>iv5</b>	(interviewee5, personal communication, May 17, 2018)
<b>iv6</b>	(interviewee6, personal communication, May 25, 2018)

**Table B.1: Validation interview codification**

Evaluation round with practitioners and client (iv7-iv9)

Code	APA reference
<b>iv7</b>	(interviewee7, personal communication, May 31, 2018)
<b>iv8</b>	(interviewee8, personal communication, June 5, 2018)
<b>iv9</b>	(interviewee9, personal communication, June 5, 2018)

**Table B.2: Evaluation interview codification**

## Appendix C: First FF diagram version

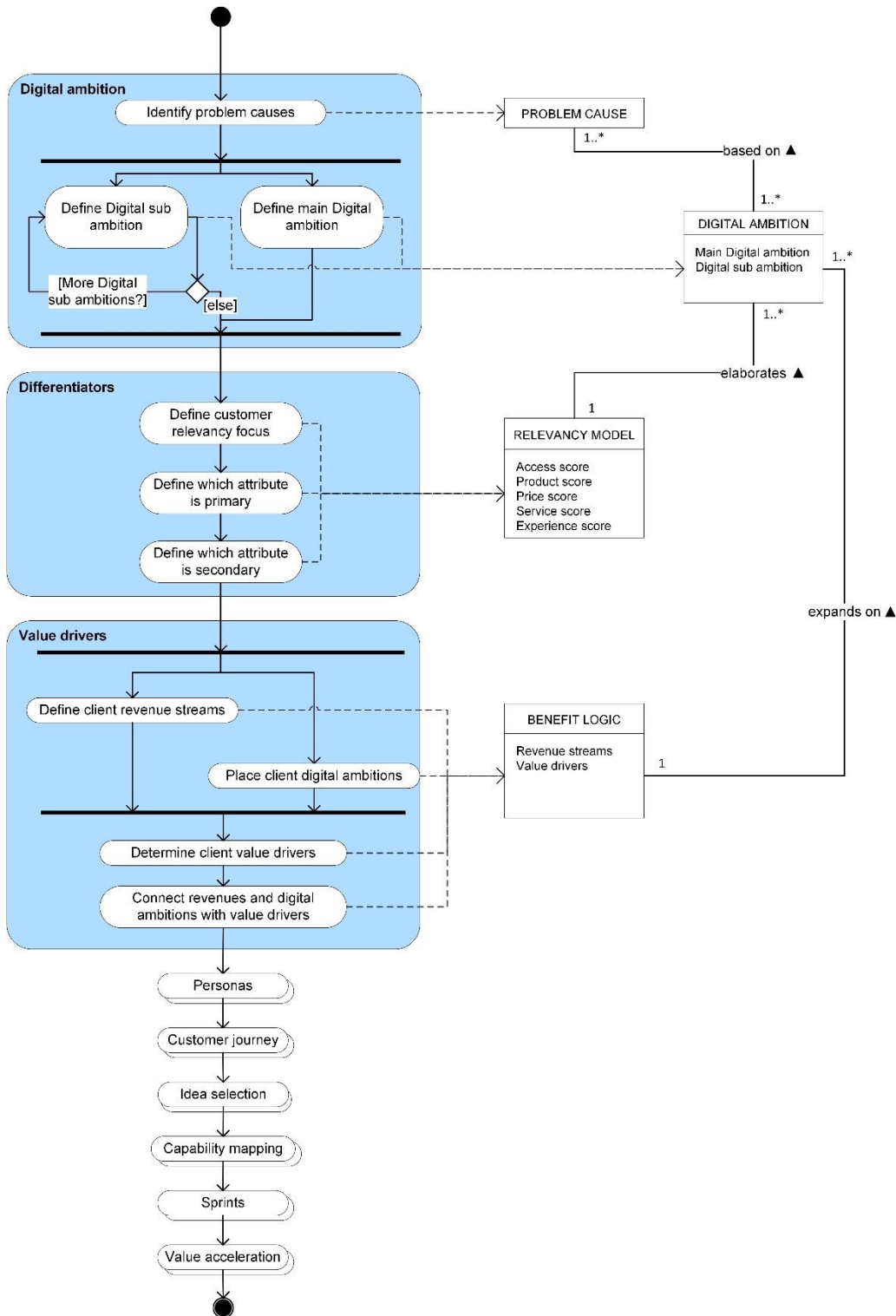


Figure C.1 Initial PDD of first three stages of FF

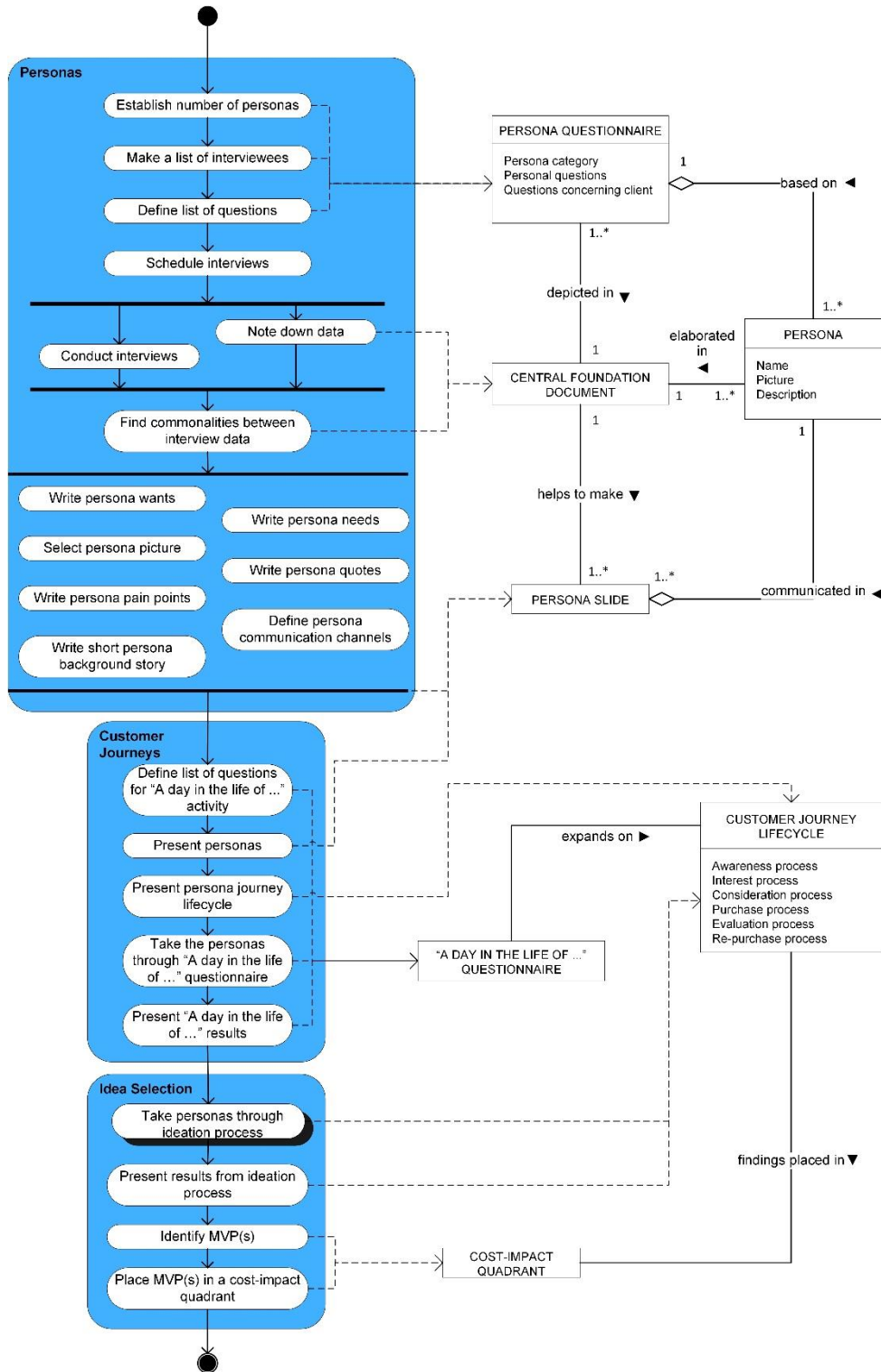


Figure C.2 Initial PDD of middle three stages of FF

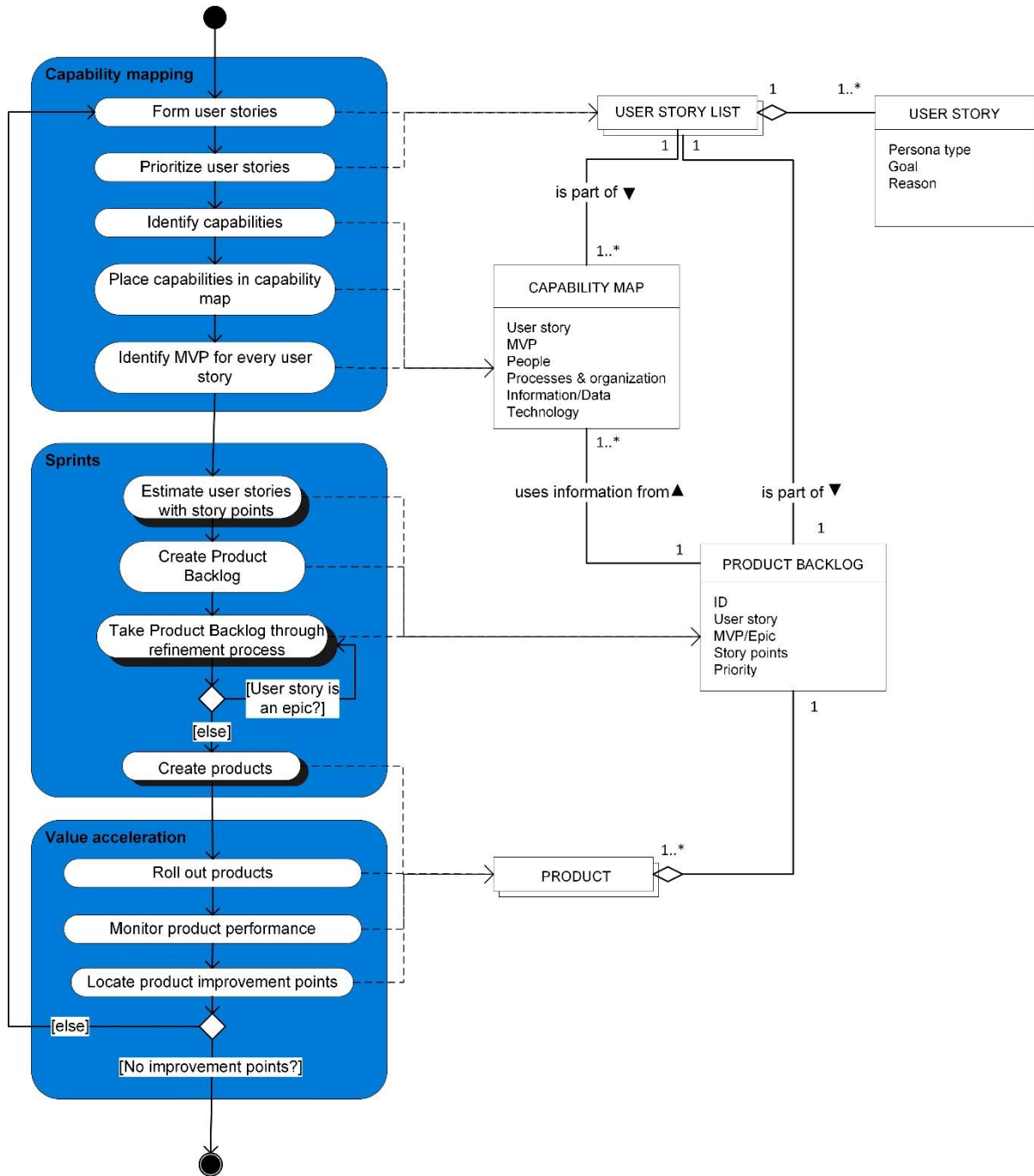


Figure C.3 Initial PDD of last three stages of FF

## Appendix D: PDD Documentation

### Activity table

The activity table below provides a description of the sub-activities. For the three final PDDs, there is one activity table produced.

Phase	Sub-activity	Description
<b>Digital ambition</b>	Identify opportunity	A problem for the client is an opportunity for them to improve the problem. This opportunity is identified in the concept OPPORTUNITY (personal communication, May 15, 2018).
	Define main Digital ambition	In the concept, MAIN DIGITAL AMBITION it is defined where does the client want to be or to be more precise, the strategy and vision of the client. With this, the scope of the project is communicated.
	Define Digital sub ambition	To make the MAIN DIGITAL AMBITION more tangible, it is broken down into multiple DIGITAL SUB AMBITIONs, which ultimately represent the key performance indicators.
<b>Differentiators</b>	Define customer relevancy focus	Set the focus and challenge the customer to choose what is relevant to them from the attributes: access, product, price, service or experience. This is the first step towards filling in the RELEVANCY MODEL.
	Define which attribute is primary	Challenge the customer to define in which area, out of the attributes from the previous activity, they will be the dominator. The decision is noted down in the RELEVANCY MODEL.
	Define which attribute is secondary	Challenge the customer to define in which area they will be the differentiator compared to competitors. The decision is also noted down in the RELEVANCY

Phase	Sub-activity	Description
		MODEL.
<b>Value drivers</b>	Define client revenue streams	The revenue streams are the way the client produces income. They are placed on the right side in the BENEFIT LOGIC.
	Place client digital ambitions	The digital ambitions are already defined in the first phase. They are placed on the left side in the BENEFIT LOGIC.
	Determine client value drivers	The way for the client to logically reach the wanted revenues, starting from their ambitions is determined. However, it is important to mention that only the value drivers leading to positive revenues are noted down.
	Connect revenues and digital ambitions with value drivers	All the outcomes from the previous activities of this phase are put together in one BENEFIT LOGIC.
<b>Personas</b>	Define information source	Define where the information about making the personas will be gathered from.
	Make a list of interviewees	Make a list of interviewees that the project product will be aimed at.
	Define list of questions	Define list of questions that will be used for interviewing and note them down in a PERSONA QUESTIONNAIRE.
	Establish personas	Establish personas in categories and note them down in PERSONA QUESTIONNAIRE.
	Schedule interviews	Schedule the interviewees for conducting interviews.
	Conduct interviews	Using the PERSONA QUESTIONNAIRE, conduct the already scheduled interviews.
	Note down data	As the interviews are conducted, note down relevant information in the CENTRAL FOUNDATION DOCUMENT.



Phase	Sub-activity	Description
	Find commonalities between interview data	When all the persona information is gathered in the CENTRAL FOUNDATION DOCUMENT, analyze the data to find commonalities. This is the beginning in forming the personas.
	Write persona wants	To present the persona through PERSONA SLIDE, write what the persona wants from the product or client.
	Write persona needs	To present the persona through PERSONA SLIDE, write what the persona needs from the product or client.
	Select persona picture	To present the persona through PERSONA SLIDE, select picture that best describes the persona.
	Write persona pain points	To present the persona through PERSONA SLIDE, write what are current the persona pain points concerning the product.
	Write persona quotes	To present the persona through PERSONA SLIDE, choose quotes from the interviews if possible.
	Write short persona background story	To present the persona through PERSONA SLIDE, write a short persona background story that covers their interaction with the product.
	Define persona communication channels	To present the persona through PERSONA SLIDE, if possible define their most used communication channels.
	<b>Customer Journeys</b>	Define list of questions for “A day in the life of...” activity
Present personas		Present the PERSONA SLIDE that was made in the previous phase. This presentation is done to all the stakeholders that are part of the project including the client.

Phase	Sub-activity	Description
	Define persona lifecycle	Define the CUSTOMER LIFECYCLE and all the processes a customer goes through from becoming aware about the product to actually using it and re-purchasing it.
	Identify persona journey	Identify the CUSTOMER JOURNEY for every persona. One CUSTOMER LIFECYCLE can have multiple CUSTOMER JOURNEYS.
	Take the personas through “A day in the life of...” questionnaire	Use the “A DAY IN THE LIFE OF...” QUESTIONNAIRE to answer the questions for each persona to further get familiar with the CUSTOMER LIFECYCLE.
	Present “A day in the life of...” results	Present the results from “A DAY IN THE LIFE OF...” QUESTIONNAIRE. This allows for the customer to experience what a persona goes through (personal communication, May 17, 2018).
	Identify WOW moment	Identify the moments where a difference can be made based on the client’s ambition (personal communication, May 15, 2018). A WOW moment means the customer realizes that the product or service offered by the client is necessary to have so much that it makes them say WOW.
	Map persona broken touchpoints	Pinpoint where the challenges or the broken touchpoints are right now (personal communication, May 15, 2018).
<b>Idea Selection</b>	Take personas through ideation process	Generate ideas of how the broken touchpoints can be resolved and possibly turned into WOW moments. Additionally, identify other common touchpoints that can be turned into WOW moments (personal communication, May 17, 2018). In this activity, it is very

Phase	Sub-activity	Description
		important to define new ideas without boundaries because normally very few end up implemented (personal communication, May 15, 2018). These ideas influence the CUSTOMER LIFECYCLE.
	Present results from ideation process	Present the results from the ideation process with perspective to the CUSTOMER LIFECYCLE.
	Identify MVP(s)	Identify one or multiple MVP from the information from the ideation process. However, the MVP is not finished product yet because it is just a way to bring value to the customer (personal communication, May 15, 2018).
	Place MVP(s) in a cost-impact quadrant	Place the previously identified MVP(s) in a COST-IMPACT QUADRANT. With this, it can be seen what is feasible “because if you want to start quite early and if you need to buy new technology, then it is impediment to start tomorrow so the cost-impact is quite important there” (personal communication, May 15, 2018).
	Identify epics	Identify EPIC LIST. Epic is a large USER STORY that can be broken down into a number of smaller user stories (Schwaber, 2004).
<b>Capability mapping</b>	Identify capabilities	Translate the EPIC LIST towards capabilities to identify what people, processes, information, data, and technology is needed.
	Place capabilities in capability map	After the capabilities are identified, a CAPABILITY MAP is made to see what is already there for the client and what is missing or needs to be changed.
<b>Sprints</b>	Create Product Backlog	Create the PRODUCT BACKLOG by placing the USER STORIES identified thus far in it.

Phase	Sub-activity	Description
	Define Definition of ready	Definition of ready is a set of criteria that a USER STORY must meet before it is ready to be moved from PRODUCT BACKLOG to SPRINT BACKLOG. The definition of ready ensures that user stories are ready to be moved into a sprint so that the development team can complete them (ScrumInc, 2017).
	Take Product Backlog through refinement process	Take PRODUCT BACKLOG through refinement process to break down large user stories into small. This activity is repeated until every epic is broken down to small USER STORY.
	Define Definition of done	Definition of done is a set of criteria that a USER STORY placed in the PRODUCT BACKLOG must meet so that it can be considered done. These are general criteria that apply to every backlog item (ScrumInc, 2017).
	Estimate user stories with story points	Estimate the sizing of each USER STORY from the PRODUCT BACKLOG with story points. Story points are relative numbers that estimate how much time it is going to take for a USER STORY or PRODUCT BACKLOG item to be implemented (ScrumInc, 2017).
	Prioritize user stories	Prioritize the USER STORIES from the PRODUCT BACKLOG by putting on top the user stories that need to be executed first.
	Define Sprint Backlog	Define SPRINT BACKLOG by taking items from PRODUCT BACKLOG.
	Conduct daily standup meeting	As long as the sprint is not finished, conduct daily standup meetings. During the meeting, each team member answers three questions: <ol style="list-style-type: none"> <li>1. What did they do yesterday?</li> </ol>

Phase	Sub-activity	Description
		<p>2. What will they do until the next meeting?</p> <p>3. Are there any obstacles in the way?</p>
	Implement sprint items	As long as the sprint is not finished, implement sprint items.
	Conduct Sprint demo	At the end of the sprint, conduct Sprint demo. This is a review and demonstration meeting to present to all stakeholders the progress of the product development.
	Conduct Sprint retrospective	At the end of the sprint, conduct Sprint retrospective. The purpose of this activity is to look back at the work that was done and inspect good things and improvement points for the next Sprint (Sutherland & Schwaber, 2016).
	Test products with one persona	If all the items from the PRODUCT BACKLOG are completed, test the PRODUCT with one persona. The test is only with one persona in order to keep it small and save financial resources.
	Roll out products	The PRODUCT passed the testing which makes it clear to be rolled out.
	Monitor product performance	The PRODUCT performance is monitored and if there are no improvement points, that is the end of this phase.
	Locate product improvement points	Certain IMPROVEMENT POINTs require new user stories to be implemented. If that is the case, this if statement gets positive answer.
	Implement improvement points	If the if statement is negative, the located IMPROVEMENT POINTs are implemented.
<b>Value acceleration</b>	Scale the product	Scale the product and with that its value.

Figure D.4: Activity table of FF PDD

**Concept table**

The concept table below provides description and definition of the concepts. For the three PDDs, there is one concept table produced.

Concept	Description
<b>OPPORTUNITY</b>	
<b>MAIN DIGITAL AMBITION</b>	The term “digital ambition” means ambition regarding digital technologies (Berman, 2012). A MAIN DIGITAL AMBITION can consist of one or more DIGITAL SUB AMBITIONS.
<b>DIGITAL SUB AMBITION</b>	The term “digital ambition” means ambition regarding digital technologies (Berman, 2012). One or more DIGITAL SUB AMBITIONS make the MAIN DIGITAL AMBITION.
<b>RELEVANCY MODEL</b>	The RELEVANCY MODEL was a model that was the outcome of a research made by Capgemini Consulting (2016) which stated that customers value five attributes: access, price, service, product, and emotion. Additionally, to maintain or create the company brand, they must be a dominator in one attribute, a differentiator in another and be at parity with the rest attributes ( <i>Figure 3.2</i> ).
<b>BENEFIT LOGIC</b>	By understanding the key customer experience moments and the design science behind them, companies can better provide the value proposition customers need (Norton & Pine, 2013). This is done by creating benefit logic and expanding on the main digital ambition by connecting it to revenue streams with value drivers.
<b>PERSONA QUESTIONNAIRE</b>	To gather persona information Pruitt and Grudin (2003) proposed doing rigorous case studies but here the information is collected by interviewing multiple customers of the client following a predefined PERSONA QUESTIONNAIRE (Stauss & Weinlich, 1997). A PERSONA QUESTIONNAIRE consists of personal questions and questions concerning the client. Based on those properties, the questionnaire differs per

Concept	Description
	persona category
<b>CENTRAL FOUNDATION DOCUMENT</b>	The persona data is noted down in a central foundation document ( <i>Table 3.1</i> ). Pruitt and Grudin (2003) called it “foundation document”.
<b>PERSONA SLIDE</b>	Personas are beneficial for communication with stakeholders (Pruitt & Grudin, 2003; Pruitt & Adlin, 2006; Goodwin, 2011; Matthews, Judge, & Whittaker, 2012). This is done through the PERSONA SLIDE ( <i>Figure 3.4</i> ) even though different researchers had different approaches: give story-telling characteristics, personifying details (Nielsen, 2004), posters, flyers, handouts (Pruitt & Grudin, 2003), websites, and real-size cardboards (Pruitt & Adlin, 2006).
<b>PERSONA</b>	A persona is a hypothetical archetype of a user, which describes their goals, interests, and aptitudes. This means a persona has characteristics of a typical customer which allows for the customers to easily identify themselves (Cooper, 2004; Pruitt & Adlin, 2006; Nielsen, 2004). A PERSONA has name, picture, and description properties.
<b>CUSTOMER JOURNEY</b>	The CUSTOMER JOURNEY gets into the customer experience oriented mindset by looking the multiple touchpoints the customer has with the client (Homburg, Jozić, & Kuehnl, 2017; Edelman & Singer, 2015; Rawson, Duncan, & Jones, 2013).
<b>CUSTOMER LIFECYCLE</b>	The CUSTOMER LIFECYCLE extends on the customer’s feelings and motivation for each touchpoint defined in the customer journey. The CUSTOMER LIFECYCLE steps from <i>Figure 3.5</i> : awareness, interest, consideration, purchase, evaluation, and re-purchase, have similarities with the phases in the customer journey by Nenonen et al. (2008).
<b>“A DAY IN THE LIFE OF ...” QUESTIONNAIRE</b>	“A day in the life of ...” is performed for every persona in order to understand the customer behaviors, accomplishments, routines, and processes and ultimately create better personas (Pruitt & Grudin, 2003).



Concept	Description
<b>MVP</b>	MVP means minimum viable product which is created by selecting the ideas that contain enough features to satisfy early customers and which can be developed further in the future (Ries, 2011).
<b>COST-IMPACT QUADRANT</b>	COST-IMPACT QUADRANT is where the MVPs are placed in order to be ranked based on the cost they require to be made and the impact it had on the client. Similar models are CBA (Boardman et al., 2017) and CEA (Levin & McEwan, 2000).
<b>EPIC LIST</b>	Epic is a high-level user story (Schwaber, 2004). EPIC LIST is the enumeration of all current epics.
<b>USER STORY</b>	The user story is a backlog item with format: As <persona>, I want <what?> so that <why?> (Fowler & Highsmith, 2001). The <i>persona</i> is linked with the type of user, the <i>what</i> is linked with the goal, the <i>why</i> is linked with the reason.
<b>CAPABILITY MAP</b>	The capability theory is described by Williamson (1999) as a composite concept that is related to organizational strategy. The CAPABILITY MAP is the decomposition of the epics into people, information, process & organization, and technology ( <i>Figure 3.7</i> ).
<b>PRODUCT BACKLOG</b>	<p>A PRODUCT BACKLOG (<i>Table 3.3</i>) is a prioritized list of user stories which contains everything that might be needed in developing the product (Sutherland &amp; Schwaber, 2016). Every user story has story points which represent the estimated effort needed to create a product (Schwaber &amp; Beedle, 2002).</p> <p>A user story must meet a set of criteria so-called Definition of ready, before it is ready for iteration in the next sprint.</p> <p>Also, a user story must be reasonably done within the defined time limit. This is called Definition of done. Other properties the PRODUCT BACKLOG has are ID, priority.</p>
<b>SPRINT BACKLOG</b>	A SPRINT BACKLOG is an ordered list of the top user stories from the product backlog,

Concept	Description
	that can be completed in a given period of time (ScrumInc, 2017).
<b>PRODUCT</b>	A <b>PRODUCT</b> is the outcome of the product backlog and Sprints phase (ScrumInc, 2017).
<b>IMPROVEMENT POINT</b>	<b>IMPROVEMENT POINTS</b> are possible improvements about the product.

Figure D.5: Concept table of FF PDD

## Appendix E: PDD notation used in FF



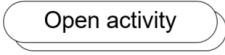
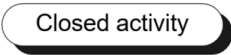
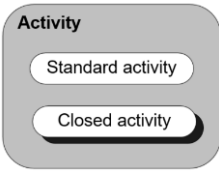



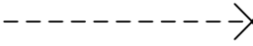

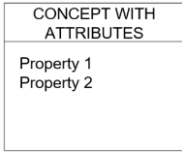


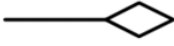

Notation	Description
	Initial state.
	An activity that contains no further activities.
	A complex activity whose activities are expanded.
	A complex activity whose activities are not expanded since it is not known or not relevant in the specific context.
	A complex activity with sub-activities that are depicted inside the activity. However, in this research, the activity represents the FF phases.
	A synchronization bar used to fork or join several activities.
	Conditional activity used to make a choice in which direction to go.
	A notation that explains the transitional flow of the process.
	A notation that connects the activity or process to the concept or outcome.
	A concept that contains no further concepts.
	A concept with properties.
	A complex concept that consists of collection of other concepts that are shown in the same PDD.
	A structural relationship between two concepts with specification how these concepts are connected.
	Aggregation is a specific type of relationship between concepts illustrating that one of them contains the other.
<b>1..*</b>	Multiplicity states how many objects of a certain concept can be connected to another concept.
	Final state.

Table E.3: PDD notation description (van de Weerd & Brinkkemper, 2009)

## Appendix F: Scientific paper

### Codification of a Novel Agile Method: Fast Forward

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**Abstract.** Digitalization and digital transformation are trends that started to be popular in the past decades. They are based on the word “digital” which has to do with digital technologies. To follow and get ahead of these trends, traditional sectors and organizations need to customize their operating models. This research presents an agile method for digital transformation called Fast Forward (FF). FF differs from Agile methods by including detailed project planning to the project development. The FF method has advantage because project planning is missing in Agile methods. The research method followed in this research is Wieringa’s design science method, including a validation and evaluation of the method with semi-structured interviews. The evaluation shows that the FF method is useful in creating the digital concept of the client. Furthermore, the evaluation indicates the FF method is easy to use and efficient.

**Keywords:** agile, design science, digital transformation, fast forward method, method engineering.

## 1 Introduction

Over the past decades, the word “digital” has expanded its range from referring to types of technologies such as a digital clock or a digital camera to referring to types of processes such as digitalization or digital transformation. Looking at Berman’s [1] definition which uses the word “digital” referring to digital technologies, it can easily be seen how the two meanings mentioned above are closely related to each other. Digital technologies enable processes such as digitalization and digital transformation. To remain competitive, industries and businesses need to modify their operating models [2]. According to a research conducted by McKinsey Global Institute, countries and industries are still underperforming when it comes to their digital potential [3]. For example, Europe operates at 12 percent of their digital potential, while United States operates at 18 percent.

This research presents a method for the domain of digital transformation infused with Agile methods. The goal of this research is to introduce the Fast Forward method as a codified and actionable artifact. With that, the theory behind digital transformation and agile development will be strengthened. Fast Forward is different from other Agile methods because it covers the detailed planning of the product and project on top of its actual development. To create the artifact, the design science method [4] is used. The artifact is validated and evaluated by conducting semi-structured interviews with experts, clients, and participants. The validation is conducted by investigating the understandability and completeness whereas the evaluation investigates usefulness, efficiency, and ease of use. By providing a new codified approach, this research has both scientific and business contribution.

## 2 Research method: design science

This research follows Wieringa’s design science method [4] to design and investigate an artifact that supports clients in achieving their digital ambitions by interacting with a problem context for a certain set of stakeholders. The identified problem context in this research is that aside from positive experiences from client projects, a formal methodological description or codification of the Fast Forward method does not yet exist. Therefore, the artifact that is investigated and designed represents the codification of the FF method. The treatment design is constructed with Process Deliverable Diagram (PDD) [5] by using: documents, templates, work products from FF phases, knowledge acquired from stakeholder experience, and scientific literature. Because the FF is a novel method, it needs to be proved that it has scientific contribution. For this reason, a literature research is conducted as explained in sub section 2.1.

The artifact is validated by performing semi-structured interviews with professionals experienced in performing different phases of the FF method. The validation approach is further explained in sub section 2.2. After the artifact design is finalized, evaluation is done by means of interviews with clients and practitioners as explained in sub section 2.3.

## 2.1 Literature research

A hybrid literature research is used to relate the FF method to existing methods and approaches. Queries and keywords such as names of phases and outcomes are used to search for relevant papers. Once an appropriate paper is found, snowballing is applied to search for other relevant papers. This contributes to strengthening the theory behind agile development and digital transformation.

## 2.2 Validation approach

The validation criteria are based on the paper by Kabaale, Amulen, and Kituyi [6] who validated a requirements engineering process. They regarded understandability as understandability of flow and connections between the activities and concepts. The second criterion was to make sure no activities or concepts were missing. The codified artifact presented in Section 3 is the outcome after the validation.

## 2.3 Evaluation approach

The accent of the evaluation is on the behavioral acceptance or intention to use this information technology [7]. For that reason, the constructs Perceived Usefulness and Perceived Ease of Use are adopted from the Technology Acceptance Model (TAM) [8]. This puts the accent on accepting newly designated methods linked to information technology [9]. The third construct that is evaluated is efficiency, which evaluates whether the method can be performed at minimal cost and effort [10].

# 3 Findings

This section has the goal to answer how the FF method strengthens the theory behind agile development and digital transformation, and introduce the codification of FF.

## 3.1 Literature research

**8 Scrum framework.** The FF method is Agile method that works in accordance with Scrum framework [11]. The eighth FF phase is executed following the Scrum framework. Secondly, all the roles that are part of the multi-functional team as prescribed by Scrum, are also adopted in the FF method.

**9 Digital transformation.** Other methods that the FF can be compared to are methods for digital transformation. The domain of digital transformation is a young domain because not only there is no single, commonly accepted definition [12, 13, 14] of the term but there is also no single, commonly accepted method for supporting digital transformation. Having said that, Schallmo and Williams [15] outline a Roadmap for digital transformation of business models, which embraces five phases: Digital Reality, Digital Ambition, Digital Potential, Digital Fit, Digital Implementation.

**10 Empathy mapping.** A collaborative tool called empathy mapping [16] replaces the personas in total. It focuses on creating a customer profile by filling in a predefined empathy map template. The difference is that the empathy map puts the focus on areas as "Thinking", "Seeing", "Hearing", and "Feeling".

## 3.2 Codification of FF

In the first phase, the objectives are to identify the opportunity for improvement the customer has and to define their digital ambitions of the client. To make the main digital ambition more tangible, it is broken down into multiple digital sub ambitions. The phase Differentiators focuses on defining the Relevancy model, which is used to elaborate the relevancy of client's digital ambitions. The model elaborates on the digital ambitions defined from the previous phase. These two phases set the scope of the whole project and set the expectations of what is expected to be the final outcome. The third phase explains the steps that the client can follow in order to acquire positive revenues by achieving their digital ambitions.

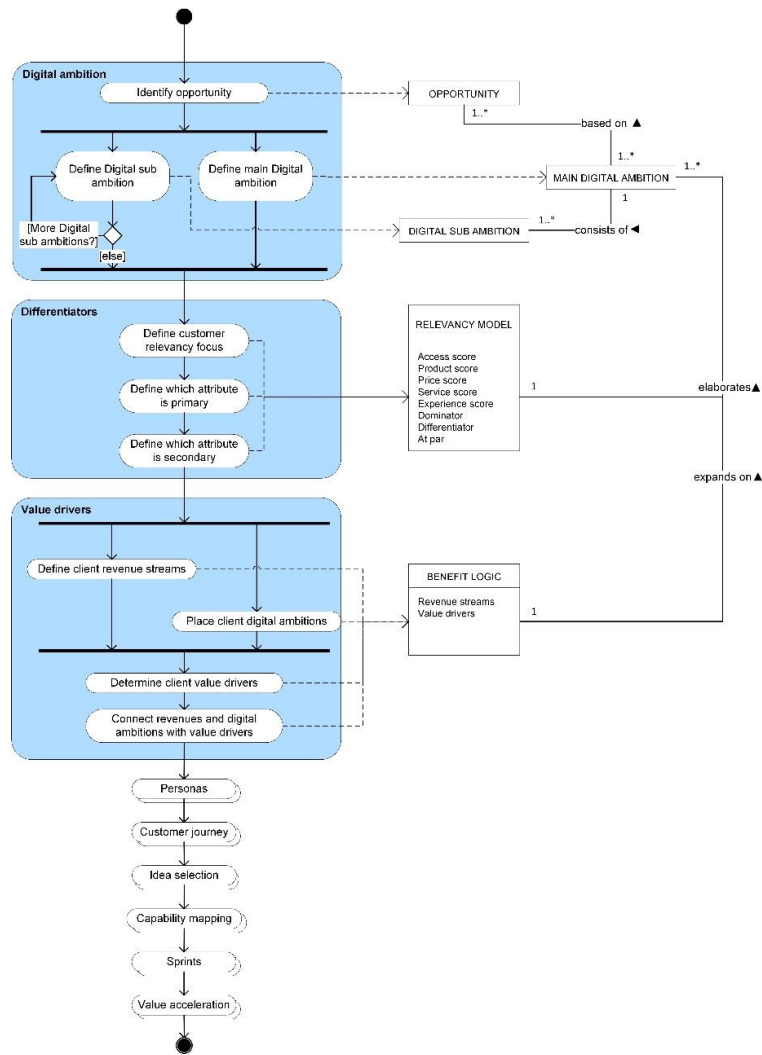


Fig. 6. PDD of first three stages of FF method

The next three phases are illustrated in Fig. 7. The first step in establishing the personas is to define the information source. The information source defines what kind of sources, besides interviews, the persona data needs to be gathered from. Once the persona is constructed, it is presented to all the stakeholders and it is taken into the next phases. The phases Customer Journeys and Idea Selection are executed in a workshop together with the client. In these phases, a set of activities are undertaken to define WOW moments, broken touchpoints, MVPs, and epics.

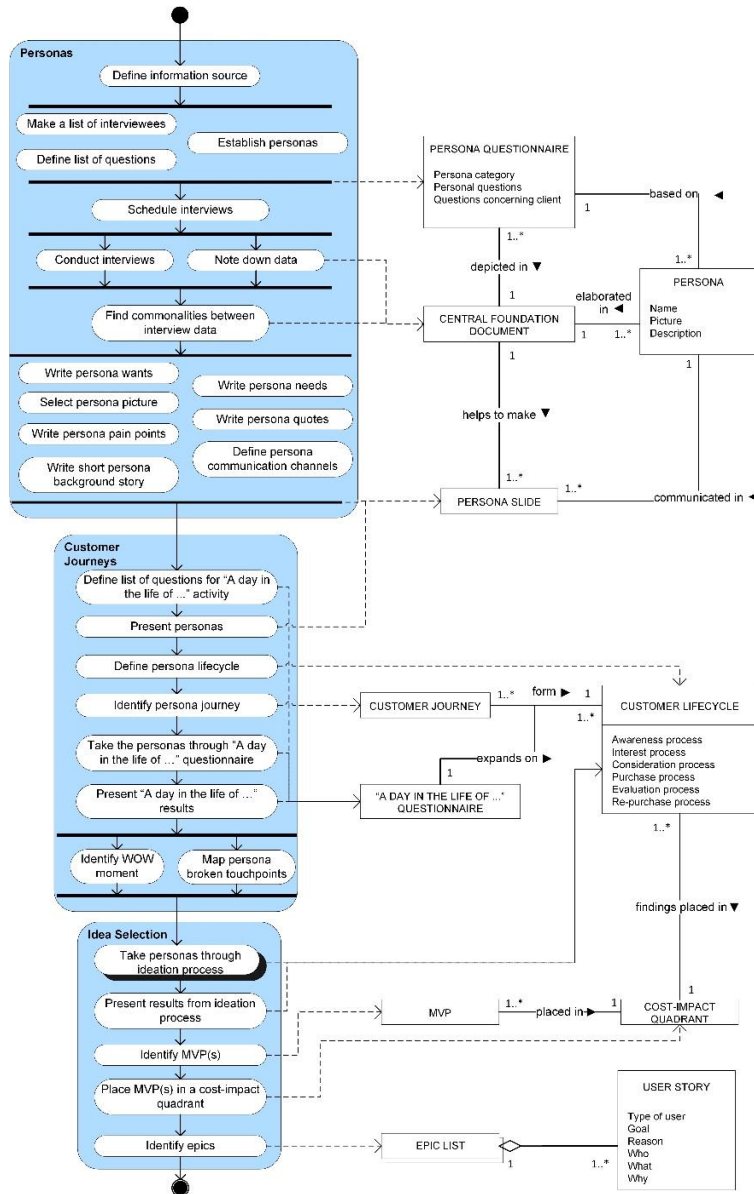


Fig. 7. PDD of middle three stages of FF method

To rank the MVPs, they are placed in a cost-impact quadrant. Together with the epics, they are the starting point for the last three phases. The capability map is the outcome from the seventh phase. It enables us to detect what is already available to the client compared to what is missing or needs to be changed.



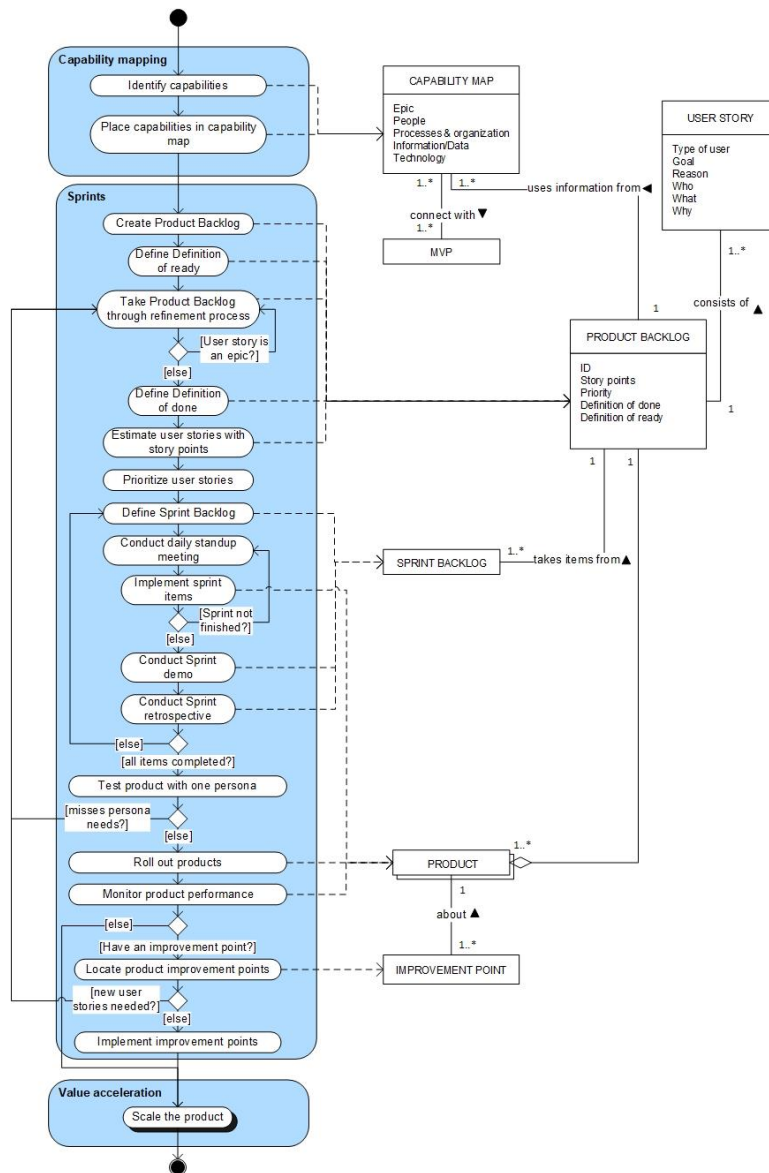


Fig. 8. PDD of last three stages of FF method

The Sprints phase is where the product is actually developed. However, it differs from the normal Agile development because the product is tested with only one persona. The reason behind this is so that the product is kept small and only scaled when it works. The last phase is about product management, which means deciding which products are worth expanding. However, it is a very complex phase and is out of the scope of this research.

### 3.3 Evaluation results

For the evaluation, real client and participants are involved to assess the deliverables and the effect of the Fast Forward method. The client is a start-up owner of a platform aiming to grow the number of female digital talent. The participants are Master students involved in conducting the client’s project with FF method.

Table 4. Evaluation summary

Criteria	Interview			Comments
	1	2	3	
Usefulness	n/a	+	n/a	Wanted to develop creative digital concept and that is exactly what was done.

Efficiency	+	+	±	The schedule and resources made from the beginning were honored. More firm lead might improve efficiency and provide faster results
Ease of use	±	±	+	Easy to use. Might be difficult for users without prior experience in similar approaches

+: satisfied; ±: partly satisfied; n/a: no feedback related to criteria

The client found the FF method to be useful because it provided them with a concept of what needs to be done in the future so they can achieve their goals. The FF method proved to be efficient because the person-hours were honored from the beginning and meetings were conducted with accordance to the primary plan. However, the workshops could be optimized more by having stronger lead and getting outcomes that are more detailed. All of the participants found the method easy to use but some of them had prior knowledge in similar methods. Therefore, it cannot be concluded solely on that experience that the method is entirely easy to use.

## 4 Limitations

Regarding this research, it must be noted that out of the three evaluation interviews, only one was a client where the FF method was followed. However, this limitation should not have influenced the overall outcome of the evaluation given the fact that the two additional evaluation interviews that were conducted were with participants that had knowledge with applying the FF method.

## 5 Conclusion and future research

This research was conducted in the field of agile development and digital transformation. The focus of the research was the codification of the Fast Forward method. The core principle of the method is that it conducts the digital transformation together with the client in an easy and efficient way.

Future research should extend the evaluation by interviewing more clients where the FF method was used, making this research more generalizable. Furthermore, this research could be made even more generalizable by looking at other organizations and evaluating how they deal with digitally transforming their clients.

## References

- Berman, S. J.: Digital transformation: opportunities to create new business models. *Strategy & Leadership* 40(2), 16-24 (2012).
- Downes, L., Nunes, P.: Big bang disruption: Strategy in the age of devastating innovation. *Harvard Business Review* 91(3), 44-56 (2014).
- Bughin, J., Hazan, E., Labaye, E., Manyika, J., Woetzel, J.: Digital Europe: Pushing the frontier. In: McKinsey Global Institute (2016).
- Wieringa, R. J.: *Design Science Methodology for Information Systems and Software Engineering*. Springer Berlin Heidelberg (2014).
- van de Weerd, I., Brinkkemper, S.: Meta-modeling for situational analysis and design methods. In: *Handbook of research on modern systems analysis and design technologies and applications*, pp. 35-54. IGI Global (2009).
- Kabaale, E., Amulen, C., Kituyi, G.: Validation of a systematic approach to requirements engineering process improvement in smes in a design science framework. *International Journal of Computer Applications* 108(6) (2014).
- Polančič, G., Heričko, M., Rozman, I.: An empirical examination of application frameworks success based on technology acceptance model. *Journal of systems and software* 83(4), 574-584 (2010).
- Davis, F. D.: Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS quarterly*, 319-340 (1989).
- Koç, H., Timm, F., España, S., González, T., Sandkuhl, K.: A method for Context Modelling in Capability Management. In: *ECIS*, pp. ResearchPaper43. (2016).
- Harmsen, F., Frank, A., Ernst, M., *Situational method engineering*. University of Twente, Enschede, Netherlands (1997).
- Schwaber, K.: *Agile project management with Scrum*. Microsoft press (2004).
- Westerman, G., Calmėjane, C., Bonnet, D., Ferraris, P., McAfee, A.: Digital Transformation: A roadmap for billion-dollar organizations. MIT Center for Digital Business and Capgemini Consulting, 1-68 (2011).
- Mazzone, D. M.: Digital or death: digital transformation: the only choice for business to survive smash and conquer. Smashbox Consulting Inc (2014).

14. Bouee, C. E., & Schaible, S.: Die Digitale Transformation der Industrie. Roland Berger Strategy Consultants und Bundesverband der Deutschen Industrie eV, Berlin (2015).
15. Schallmo, D. R., Williams, C. A.: Roadmap for the Digital Transformation of Business Models. In: Digital Transformation Now!, pp. 41-68. Springer, Cham (2018).
16. Gray, D., Brown, S., Macanuso, J.: Gamestorming: A playbook for innovators, rulebreakers, and changemakers. " O'Reilly Media, Inc." (2010).