Definition, ideation and validation of the ‘Bucketlist’

The enterprise design framework applied to develop a new concept for Achmea as part of the Human Media Interaction Master Thesis project

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Preface

This report is written as part of the Human Media Interaction (HMI) graduation project. HMI is a master study at the University of Twente. The programme combines theory, technical expertise and skills from computer science, electrical engineering, interaction technology, user-oriented design methodologies and psychology (University of Twente, 2017).

With this graduation report I finish six years of studying. I started at the Hague University of applied sciences the study Human Technology in september 2010. I passed my propaedeutic exam which allowed me to apply for the bachelor study Creative Technology at the University of Twente. Moving to Enschede was one of the best decisions I ever made. I enjoyed my student time where I loved to live in student house 'the Roompot'. During my student life I participated in many extra-curricular activities, for example being board member of the computer store on campus and a study tour to Silicon Valley. In 2015, I obtained my bachelor degree in creative technology and I started studying HMI. In 2016, I won the Dutch national 'IT-Talent games'. As a prize, I graduated at the innovation and experience center of Achmea. At Achmea, I had the freedom and challenge to define my own graduation assignment. During the 'research topics' stage of graduation I discovered that saving for important future life events is a complex event for millennials. I wanted to solve this problem on the intersection of the business (Achmea), people (customers of Achmea), and technology. The result is this graduation report of which I am proud of.

There are two colleagues from the innovation and experience center that I would like to thank especially. Marijn Tange was my Achmea supervisor. I would like to thank him for his expert advice and encouragement throughout this project. I appreciated that I could always ask him for help. Next to Marijn, I would also give my special thanks to Guus van der Weijden for his effort to apply me for the management IT traineeship and his contribution to my professional development. Guus has the brilliance to know something about everything which has been very valuable the last seven months. I would also like to thank the directors of Achmea IT: Ton van der Linden, Dimitri van Dyck and René Wissing. I found it very special that I as an intern could always reach them.

Secondly, I want to thank my supervisors from the University of Twente. Dennis Reidsma provided me with useful advice to fill the blank spaces in my mind. He was always there for me to help. One month before graduation for example, when my report became corrupted. Dennis was so kind as to debug the XML files of the word file which enabled me to get access to the missing content. In addition, I would like to thank my second supervisor Mariët Theune for her feedback and quality assurance.

Last but not least, I would like to thank my family. First of all, my boyfriend Leo for his support throughout this research. I would also like to thank my father who inspired me to do things differently than others. He gave me my creative mindset which has been useful throughout my entire study (and will be useful in the future as well). Finally, I have to thank my mother, who unfortunately passed away when I was fifteen years old. She gave me the motivation to continue life and to live up to all my dreams. Obtaining my master's degree is one important step forward.

Zoë Meijer, Apeldoorn 26th of January 2017

Management summary

Financial planning is difficult for Dutch millennials. They want to live an optimal life in the now, however millennials also have to save money for important future life events (for example buying a first house, getting married and getting retirement). If it is possible to enable for financial planning what a FitBit has done to increase the intrinsic motivation to stay fit, this would be a solution to help millennials with their financial life planning. For that reason, the research question of this report is: *In what way can social graphs and gamification contribute to the behavior of millennials' towards financial life planning in order to help them live an optimal life?*

As a methodology to answer this research question the enterprise design framework is applied to investigate the problem on the intersection of human needs (people), the needs of Achmea (business) and technology. The people aspect describes 'optimal life of millennials' as customers of Achmea. The business aspect describes financial life planning and the selected technologies are social graphs and gamification.

The outcome of this research shows that millennials are mistrustful regarding financial institutions and brands. In addition, they find it very difficult to act in a future-oriented way. Many millennials have the tendency to favor short-term rewards instead of long-term rewards. Although they are very sensitive to advice from family and friends, they do not want to share their financial situation with them. Based on findings from psychologist Abraham Maslow, this research suggests that millennials first have to be able to finance deficiency needs (food, water, shelter and insurances) before they are able to consider growth needs (aesthetics, retirement, estate planning). If Achmea wants to help millennials to fulfill growth needs such as retirement, they first have to motivate millennials to fulfill their deficiency needs.

As the chosen research methodology, this report uses design methods to develop a proof of concept that solves the research question. The resulting concept is called 'the Bucketlist'. By means of gamification and social graphs the Bucketlist-app will help millennials on reaching their life goals (Bucketlist-items). The app gives millennials the instruments that they need to manage their income and expenses in an easy and appealing way. The structure of the Bucketlist is based on Maslows' principles and helps to first commit to deficiency needs before spending money on growth needs. With these features, it is expected that millennials will gain insight in what is needed to live the optimal life on the long term. This concept is designed and validated in collaboration with 62 millennial employees of Achmea. Achmea is currently reviewing delivery plans on launching this concept as a proposition for her retirement services business unit.

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List of abbreviations

HMI	Human Media Interaction
CB	Centraal Beheer
IEC	Innovation and Experience Center
ODV	Business unit retirement services
CBS	Statistics Netherlands
UI	User Interface

1 Introduction

1.1 Problem statement

People are living longer than ever before. The life expectancy of humans increased the last century. The age of sixty five figuratively became the new fifty five. In the early 1900s it was relatively uncommon to reach your 60th birthday. But with more years to live, financial life plans must be made with a longer future in mind (Hershfield, 2011). Although the additional years that people on average live now can be explained by human innovation and technological progress, there is a downside. The ageing population will have a major impact on the pension schemes in the Netherlands (Dutch Association of Industry-wide Pension Funds; Dutch Association of Company Pension Funds, 2010). In the Netherlands, the average person spent approximately 18,8 years in retirement in 2014, compared to 13,9 years in 1960 (Centraal Bureau voor de Statistiek, 2014).

Maintaining a certain lifestyle as an elderly person is difficult for many people in the Netherlands. Next to **saving for retirement**, millennials have to **finance major life events** such as buying a house and getting married. They also need to be prepared to finance negative life events such as losing a job. Finally, people also want to **enjoy life now**. In 2012 the Dutch National Institute for Family Finance (Nibud) found that many people in the Netherlands have problems with managing their financials. 20% of the Dutch citizens have savings of less than 2000 euros (Nibud, 2012). Another 20% does not save at all. If it is possible to realize for financial planning for the future what a FitBit has done to increase the intrinsic motivation to stay fit, this would be a solution to live an optimal life now and save for later. For that reason, the research question of this report is: **In what way can social graphs and gamification contribute to the behavior of millennials' towards financial life planning in order to help them live an optimal life?**

1.2 Achmea and Centraal Beheer

The research is conducted for one of the largest insurance companies in the Netherlands: Achmea. The sub-brands provide insurance in the areas of healthcare, pension and life, and property and casualty. This research has been commissioned by the Innovation and Experience center (IEC) of Achmea for one of the core power brands Centraal Beheer (CB). CB is active in two of the three business units of Achmea: 1. Non-life and income protection and 2. Pension and life. The focus of this research is in the domain of pension and life. This business unit within CB's enterprise is called retirement services (ODV). The CB enterprise addresses its customers from a personal perspective where they consider everything from a problem solving mindset. Their goal is to be recognized by their customers as an easy, appealing, sincere, and accessible enterprise (Centraal Beheer Achmea, 2015). What makes CB unique is its ability to provide its customers with alternative solutions. For example, CB provides insurance that enables its customers to rent their houses on Airbnb in order to enable them to save extra money. In addition, they stimulate customers to share their cars. Although CB will not collect more premiums with this advice, this example represents how they spread their societal vision.

1.3 Method

1.3.1 The enterprise design framework

The enterprise design framework approach (Guenther, 2013) is the design method used in this research. The enterprise design framework is a set of twenty interrelated aspects relevant to strategic design work, bringing together different levels of thinking with conceptual and applied elements of the design process. The aspects that are represented in Figure 1 help to identify all relevant aspects regarding this research. The twenty aspects are captured in the stages 'Big Picture', 'Anatomy', 'Frames', 'Design space', and 'Rendering'. Guenther related these stages to a design process. Mostly, a design process does not follow a well-defined route. To cope with this, lean and agile principles are used to constantly adjust the process to its environment without losing sight of the strategic intent behind this project. Figure 1 shows the twenty aspects in the stages. In addition, Figure 1 shows how the different stages fit within the steps of the design process. The colors in the different stages of the design process represent the colors of the addressed stages of Guenther.

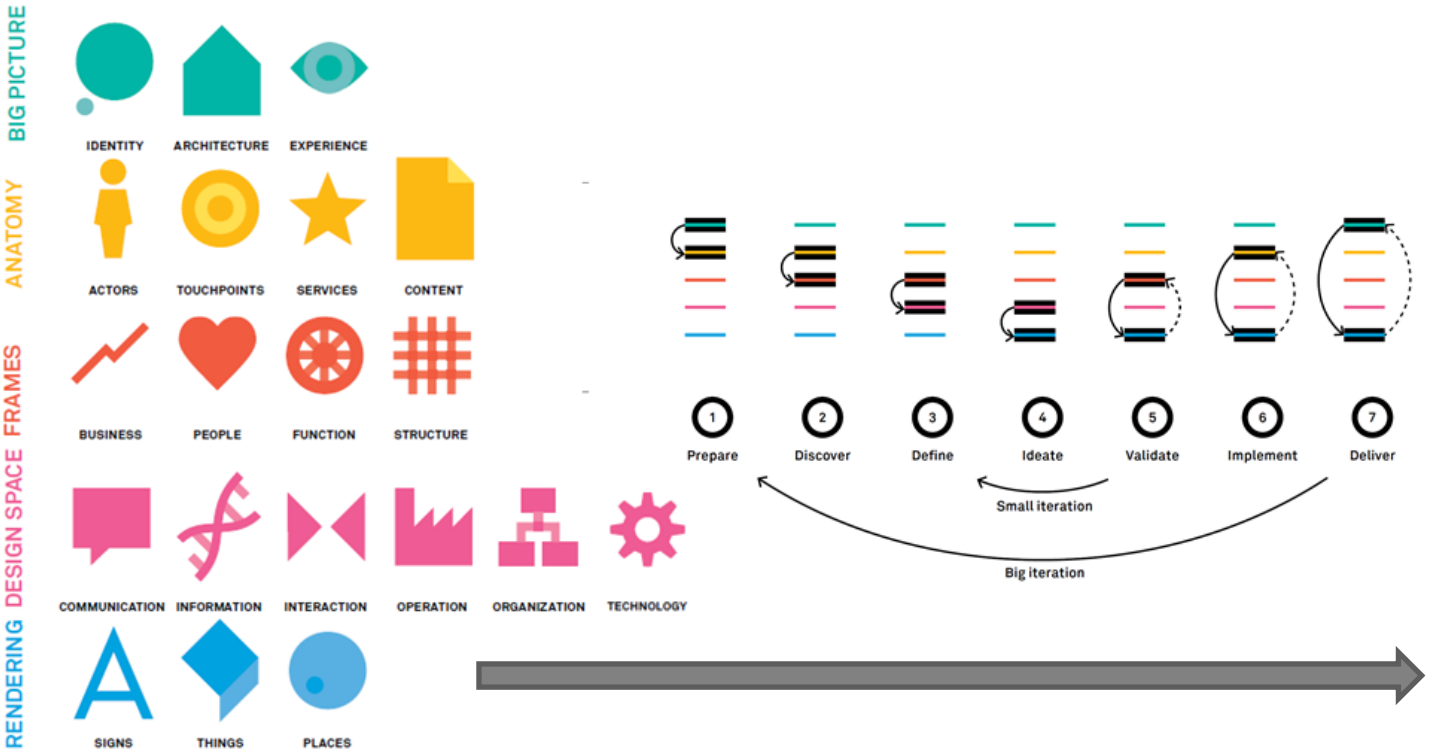


Figure 1 Aspects of Guenther and the different stages in the design process (Guenther, 2013)

The design process that Guenther describes has many similarities to best practice design methods. Like Jesse James Garett describes in the elements of user experience, the enterprise design framework first defines the problem space on a strategic level before it continues with tactical and operational design. The process ideates, specifies and solves the defined problem space like the design process of creative technology is also doing (Mader & Eggink, 2014). The design process of creative technology includes design methods that are not described in the enterprise design framework method of Guenther. For that reason, in some cases methodologies of Mader and Eggink

are applied in this research to enhance the enterprise design framework. Also added to the enterprise design framework are converging and diverging techniques from the 'double diamond model' (UK design council, 2005). Since the enterprise design framework uses the same generic steps in the design process as the 'double diamond model', the double diamonds are applied by Guenther to the enterprise design framework (Guenther, 2013) (UK design council, 2005). The diamonds have the function to add ideas to solve the problem space and the design space. Then, by focusing on user and business needs, low- and high-fidelity prototypes are created from best ideas to synthesize and validate the problem- and design space.

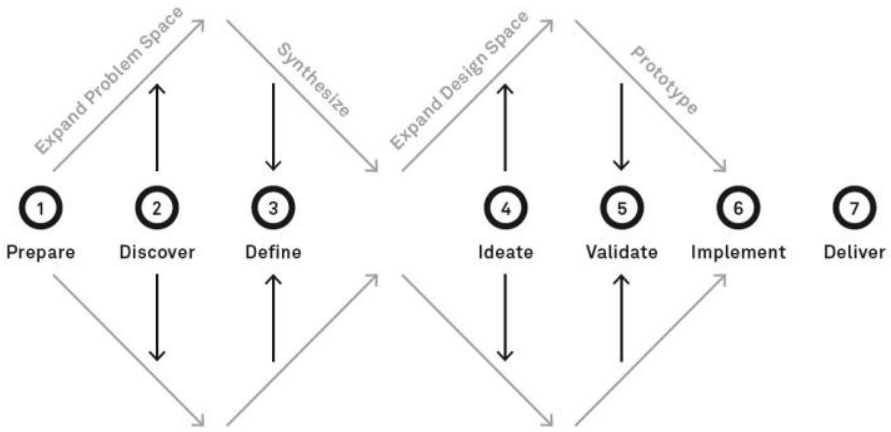


Figure 2 Design process (UK design council, 2005)

The enterprise design framework is unique since it defines, ideates and validates the problem space on the intersection of people, business and technology. The research question can be divided in these three categories. The people aspect describes the optimal life that millennials envision to live. Complementary, the business aspect describe the component of the research question related to financial life planning. Finally, the enterprise design framework describes the technologies that have the ability to solve the problem space. This research describes the selected technologies gamification and social graphs.

This remainder of this method section describes the activities that have been used to research the stages in the enterprise design framework.

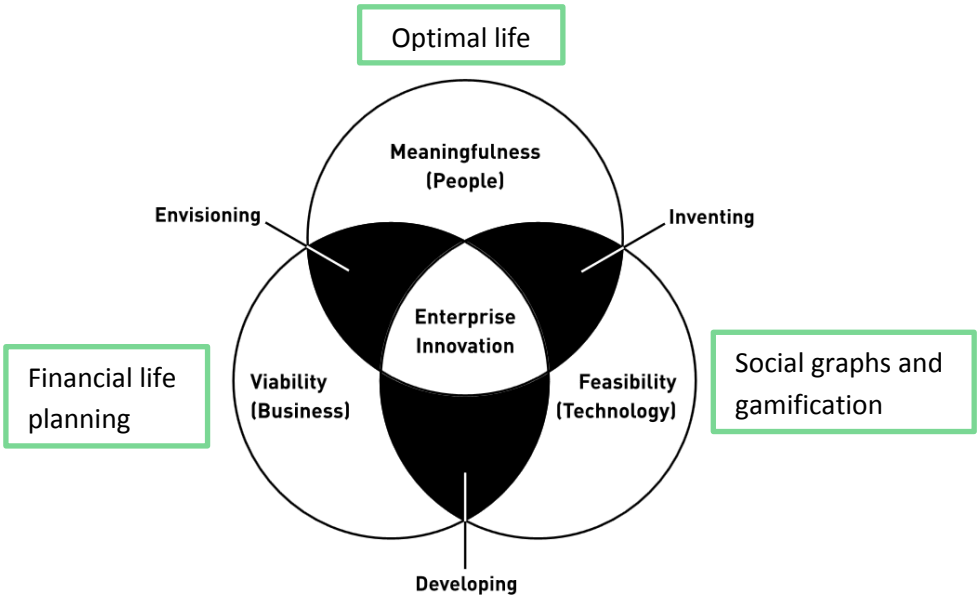


Figure 3 Research question answered on the intersection of people, business and technology (Guenther, 2013)

1.3.2 Prepare and discover

The first two stages in the enterprise design framework are the prepare and discover stages. These stages have been researched as part of the research topics phase of graduation (Meijer, 2016). The most relevant aspects of the intersection between the people, business and technology that are related to the problem are identified. Research topics is a course given at the University of Twente to prepare students for the master thesis project. In the context of this course, the 'bigger picture' and 'anatomy' of Achmea and CB have been analyzed in order to study the problem statement. The outcomes have been translated to the following research question: *In what way can social graphs and gamification contribute to the behavior of millennials' towards financial life planning in order to help them live an optimal life?* The outcomes regarding interrelated aspects of identity, architecture, experience, actors, touchpoints, services and content (figure 2) are intertwined throughout this report. Readers can find the research topics results in the research topics report (Meijer, 2016).

1.3.3 Define

Due to its inherent complexity, exploring the enterprise Achmea as a field for design requires looking from different angles (Guenther, 2013). In design theory, this activity is known as framing (section 2). The framing aspects (people section 2.1; business section 2.2; function section 2.3; and structure section 2.4) used in the Enterprise Design framework suggest a set of fundamental perspectives which have their origins in design and systems thinking. The function and structure sections form the fundament of 'technology' that is later described in the design space (section 3). All aspects in this stage together (people, business, function and structure) guide conceptual modeling and help when deciding on a direction according to strategic choices.

1.3.4 Ideate

After the first boundaries have been set in the define stage, the ideation phase starts on a conceptual level that is grounding in strategical thinking, research activities, and systematic modeling. The framed aspects described in the define stage need to be delivered in a final concept. In a design process divergent and convergent methods can be used to expand the design space. In the end the aspects of framing are used as a converging method in order to reduce the design space until a solution is reached. The results are concrete ideas about the potential outcomes of the design process (section 3 and 4).

1.3.5 Validate

The deep understanding of the environment that is discovered during framing is used to reduce the potential outcomes. The outcomes of ideation are validated using a low fidelity prototype. Low fidelity prototyping is a method which enables validation of the 'frames' section in an early stage. Validation is important to indicate inconsistencies or deviations from the problem space in an early stage. The validation step is also described in the 'validate stage' of the 'double diamond model' of the UK Design Council (UK design council, 2005) and it is described as 'specification' in 'a design process for creative technology' (Mader & Eggink, 2014) . The prototype will be used to discuss the potentials and shortcomings of the 'rendering' stage (section 5).

1.3.6 Implement

Goal of the 'implement' stage is to turn the outcomes of the research into documentation that can be shared with people within Achmea's enterprise. It entails refinement of the prototype a conclusion (section 6) and a discussion of strong points, limitations and future work (section 7).

1.3.7 Deliver

In the 'deliver' stage the finalized outcomes are made available to Achmea. Delivering a working concept is out of scope of the graduation research. However, in case Achmea is enthusiastic about the results, delivering can become part of future work.

1.4 Related work

Living an optimal life is closely related to personal finance. Financial resources are required to finance all life events that millennials encounter. Currently there are already many online tools available that help millennials on their financials. This section focusses on the services available in the Netherlands and start-ups that have interesting features regarding their financial planning products.

Almost every bank in the world has at least one digital application that assists customers in personal finance. In the Netherlands, banks such as ING, Rabobank, ABN Amro, SNS and Knab offer customers applications to **manage household expenses**. In addition, the applications are able to give customers insights into income and expenses and to help them reach saving goals. The ING has an application that is called 'financieel fit'. By addressing four financial themes from a positive perspective (income & expenses; living situation; estate; retirement) ING offers customers **financial advice** using gamification elements. From ING we can learn how their gamification elements create awareness regarding unconscious expenses. One of the features is a 30-day challenge where the app challenges users to structurally set money apart in savings. ABN Amro bank has an app that is called 'Tikkie'. Tikkie makes it very easy to share a bill together with friends using WhatsApp. GRIP is the financial planning app of ABN amro that assists customers on budgeting. In the Netherlands there is a bank that executes its business activity fully digital. This bank is called 'Bunq'. At Bunq, millennials can open up to ten bank accounts online and for free.

Next to banks in the Netherlands large software companies develop products for **financial life planning**. Software company AFAS has the largest financial life planning product in the Netherlands called AFAS Personal. It is an advanced application that customers can use to manage their income and expenses. This application does not make use of gamification elements or social graphs. However, this application is interesting since it makes use of default smartphone functionalities. Users can for example import a photo of a cash receipt in the application, which eases managing household expenses. AFAS Personal is offered on a fremium model. Most of their users are using the free version. A small user group works with a paid version that is developed in cooperation with Nibud.

Finally, there are multiple start-ups active in this field. One international start-up to look out for is 'The Moneyer'. Next to all standard features (income, expenses and goal tracking) the Moneyer has algorithms that **calculate feasibility of goals**. Another interesting feature is that the Moneyer enables clients to simulate their **financial future**. The Moneyer already uses social graphs for **peer comparison**.

Other start-ups make **saving money easier** for millennials. Start-up 'Digit' analyzes spending habits of their customers. If customers can afford it they move a few dollars from their checking account to their savings account. Another service that makes saving money easier is 'PLSA' of 'KapitalIM'. Their mission is to provide millennials the **financial tools** they need to live life the fullest. The product includes short- and long-time financial goals. It aligns individual needs in an educational and rewarding environment. As an example they enable students to **win money** by paying off student loan debt and by **testing their knowledge**.

Finally there are start-up initiatives (Acorns; Quapital) that **round off pin transactions** and save the rounding differences on a savings account. Achmea is currently collaborating with a start-up called BeSparta to investigate whether such a product is interesting for Achmea.

1.5 Reading guide

The paper is structured following the enterprise design framework of Guenther (Guenther, 2013). The outcomes of the 'big picture and anatomy' stages are described in the research topics report (Meijer, 2016). The first stage described in this report is section 2 'frames'. In frames the problem space is described from people, business, function and structure aspects. The first ideas are validated in section 3 and 4 'design space' from people, business and technology. Section 5 'rendering' turns all information into concrete results that answer the research question visually. In section 6 conclusion, the research question is answered theoretically and finally, section 7 describes the limitations and future work of the research.

The double diamond model including the steps of the design process is added throughout the report to remind the reader in which step of the design process the outcomes are.

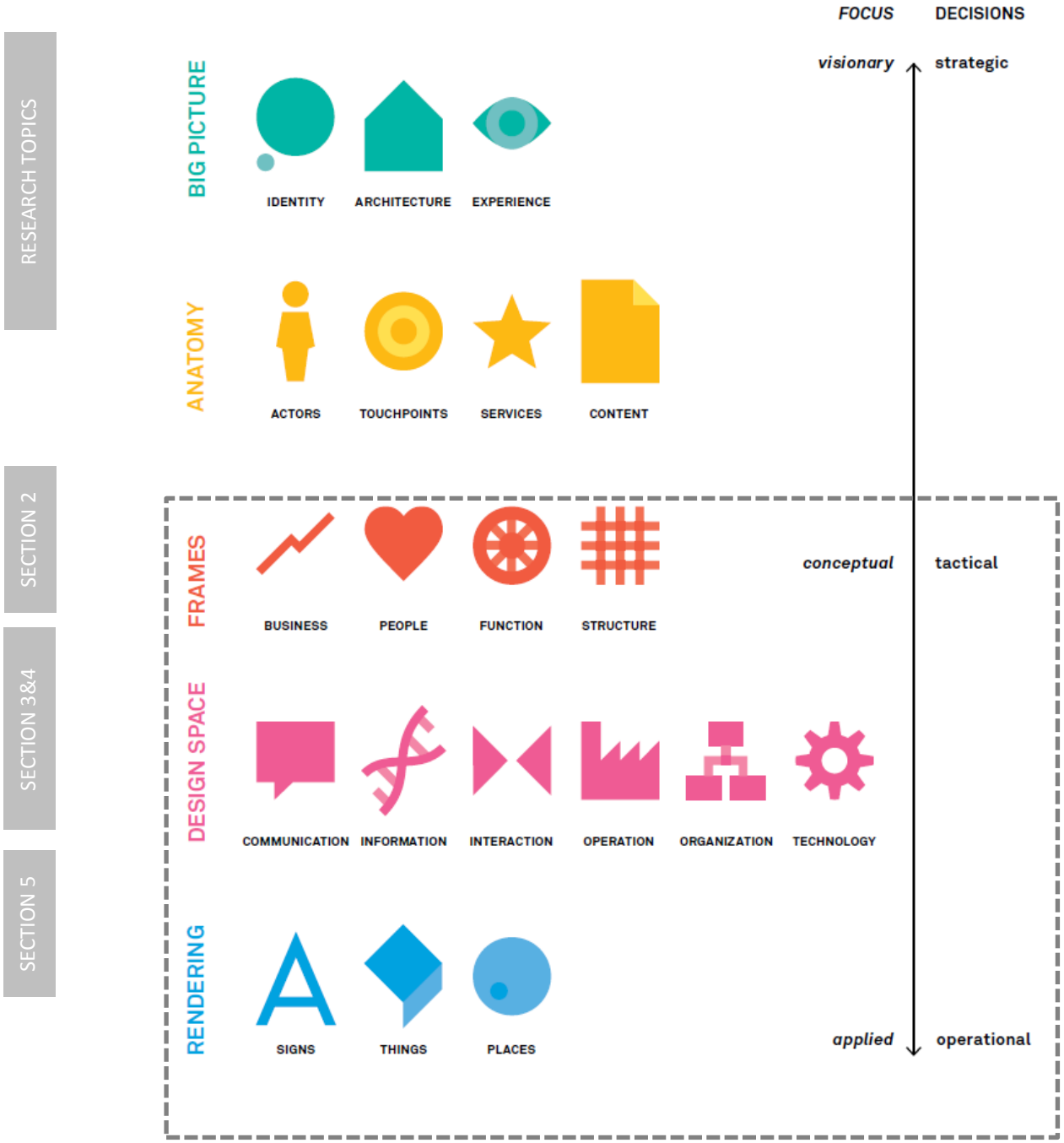


Figure 4 Enterprise Design Framework **(Guenther, 2013)**

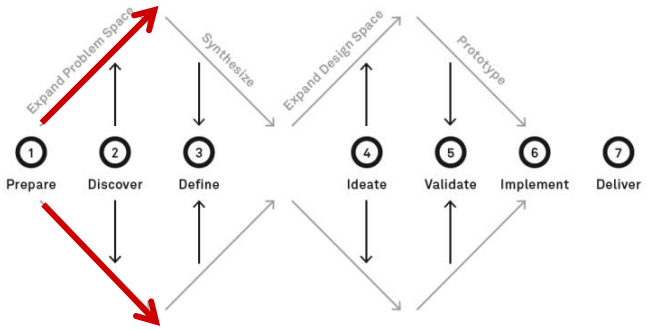


Figure 5 Reminder that 'frames' starts with expanding the Problem Space

2 Frames

This research is characterized by an inherent complexity between the user needs, business needs and technological capabilities. Therefore, it is important to see Achmea as a field for design. This requires to look at Achmea from different angels. In design theory, this is called ‘framing’ (Guenther, 2013). In framing, the given context is described from the people, business, function and structure aspects. Researching the function and structure aspects form the fundament of the investigation of ‘technology’. The insights are used to make thoughts and ideas explicit and to envision related elements.

2.1 People

2.1.1 Millennials

Millennials, also known as Generation Y are the demographic cohort following Generation X. There are no precise dates for when this generation starts and ends. Most researchers use the early 1980’s as starting birth years and ending birth years range from the mid 1990’s to early 2000’s. For this research millennials are defined as the generation born between 1982 and 1993. The pension and life domain of Achmea finds it very important to make especially this target group aware of the importance of saving money for retirement. Most of the millennials do not know that they already need to start saving. In addition, they find financial life planning difficult and associate it as an unhappy activity. Next to saving money for retirement, millennials will face important life events in the near future. Examples are buying a first house, getting married and having a baby but also divorce or losing a job (Meijer, 2016).

Former research is geared towards the characteristics of millennials. CB (Centraal Beheer Achmea, 2016) found that millennials strive to **live an optimal life** without worries. In their daily life, they **work digitally**. For example, sending WhatsApp messages fits into their culture. Millennials are sensitive to **positive reviews**, **advice from friends**, and **opinions from their networks**. In addition, solutions developed for millennials need to be **socially responsible**. Another characteristic of millennials is that they are **seeking for honest, authentic, and creative content**.

PewResearchCenter (PewResearchCenter, 2014) found that millennials **grew up in the financial crisis** and in a period of economic recovery. The result is that this group is **mistrustful** of established

financial institutions and brands. In addition they found that less than a third of the millennials believe that they will be able to save enough money for retirement.

Innovation group Scratch (Scratch, 2014) performed a three-year study of millennials including results of over 10,000 surveys from 73 companies in 15 different industries. They found that millennials do not believe that their bank offers different products and services than its competitors. In addition, they found that 71% of the millennials prefer going to the dentist over their bank. Finally, Scratch found that 73% would be more excited to contact new financial services from Google, Amazon, Apple, PayPal, or Square than from their own nationwide bank (Scratch, 2014).

Humphries (2015) found that millennials trust technology more than human beings. This makes this group vulnerable to cyber-crime. Millennials often generate and share data freely, and they may confront trust challenges in the field of information and identity *.

Research of McAuley (McAuley, CFA, & Weiner, 2015) shows that millennials believe that innovation will come from outside of the industry. In addition they found that millennials have more trust in technology than in human beings and face-to-face communication. McAuley found that digital communication is the second nature of millennials as technology is integrated into their daily lives. For example, this group easily transfers money using online banking.

Finally, research center GfK (GfK, 2015) found that millennials do not care much about money. They found for example that only 6% of millennials finds it important to know how much money they have

* the outcomes of the low fidelity prototype test in section 3.2 indicate that millennials do not want to share information related to their finances with friends

2.1.2 Persona

A persona is a fictional character created to represent a typical user group. The creation of personas is a very common method to understand customer segments and communities. Sanne and Alexander are the personas in this research. They will be used to consider the goals, desires, and limitations of millennials in order to help to frame decisions in the design process. Sanne and Alexander are synthesized from the study of the research topics (Meijer, 2016). In the persona the usual financial behavior patterns, life goals, skills, attitudes, and environment of millennials are represented (Goodwin, 2008). They help to outline the needs of millennials. To make it easier to remember these people, a stockphoto is used to give Sanne and Alexander an identity. In all decisions to be made it is possible to consider questions such as “Would that work for Sanne”? “How would Alexander react to it? “

Sanne and Alexander are 26 and 27 years old. They **recently finished school** and now they committed to their **first job**. Sanne is in accounting at a large company. Alexander works as a physiotherapist. Together, they earn 69.000 euros gross annually. They **do not have children yet**, however they hope to have children within 5 years. Their current state pension age is 72. Currently they rent a property of 1050 euros monthly. They have the **ambition to buy a house** of 185.000 euros. The mortgage loan interest rate is currently low which makes buying a house an interesting investment. However, it is difficult to find a house since houses in this price range are very popular among millennials. Sanne and Alexander **find it difficult to save money**. The last years they were able

to save 6000 euros. Next to their savings they have 25.000 euros of study debt. They did not start with paying off this debt yet.

Reason that Sanne and Alexander find it difficult to save money is that they **want to live an optimal life** now. They love to go on a vacation or to visit festivals. These people **grew up in the financial crisis**. This is the reason why they are mistrustful regarding their bank. They will be more exciting to receive an financial product from Google than from their own bank. Next to that they seriously consider switching to a digital bank. They ask their **parents and friends for advice** when they have financial issues.

Sanne and Alexander have several **dreams** they have to save money for. The first dream is **buying a house**. This will cost them 10.000 euros. The second dream is **getting married** and going on a honeymoon. This will happen in 2019 and requires a saving of 15.000 euros. But negative life events happen to Sanne and Alexander as well. Sanne will **lose her job** in 2021 and it is doubtful if she will find a new job. Only one year later Sanne and Alexander **become acquired for parenthood.**

All these positive and negative life events require to save 59.000 euros over a period of 25 years. This means that they have to save 1420 euros monthly. Sanne and Alexander are seeking a product that contribute to personal finance in order to reach their goals. This product needs to be **socially responsible**. Since they are used to work **digitally**, they want to do their financials digital as well. Sanne and Alexander are not aware that they have to work until their 72th birthday. They **do not save for their retirement** on their accounts.

This is also visible in their skillset. Sanne and Alexander have as a result, low knowledge on financial planning. However the digital skills of Sanne and Alexander are on an excellent level. They are open to advice and they are greatly influenced by their peers. They do not care about saving for retirement and only save for retirement via their employer.

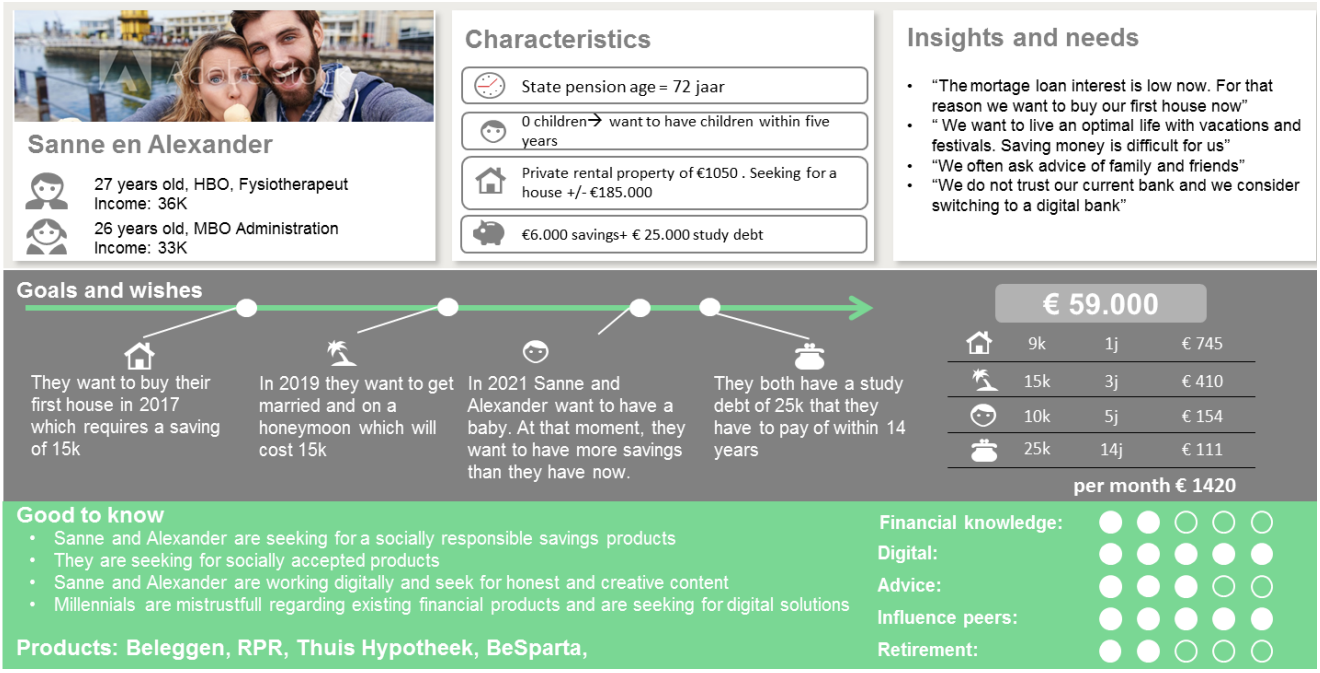


Figure 6 Persona Sanne and Alexander

2.1.3 Future self predicts

It is not striking that Sanne and Alexander do not care about saving for retirement. Research shows that people think about their current selves and their future selves as if they are different people (Pronin & Ross, 2006) (Wakslak, Nussbaum, Liberman, & Trope, 2008). Hence millennials find it difficult to identify with themselves 20-years older compared to a closer one, such as their 3 months older self (Frederick, Loewenstein, & O'Donoghue, 2002) (Hershfield, 2011). Hershfield argues that people tend to **consider themselves in the future self as a stranger**. This means that on an emotional level they feel like another person. In the domain of financial life planning, the result is that if the future self is lacking in continuity with the current self, a given individual may be equally inclined to save money for their future selves than to give that same money to a stranger. The vividness of future self predicts means for this research that Achmea should **motivate individuals to act in a more future-oriented way.** The more a person shares with his future self today, the more that future self feels like a direct extension of who he currently is.

2.1.4 Human needs and financial life planning

In order to understand what 'optimal life' means to individuals, human needs in relation to financial life planning has been researched. One of the most acknowledged research regarding human needs is research conducted by Abraham Maslow. Maslow postulated a hierarchy of human needs based on two groupings: **deficiency needs** and **growing needs**. This model with layers conceding human needs is called 'Maslow's pyramid of needs' (Maslow, 1998).

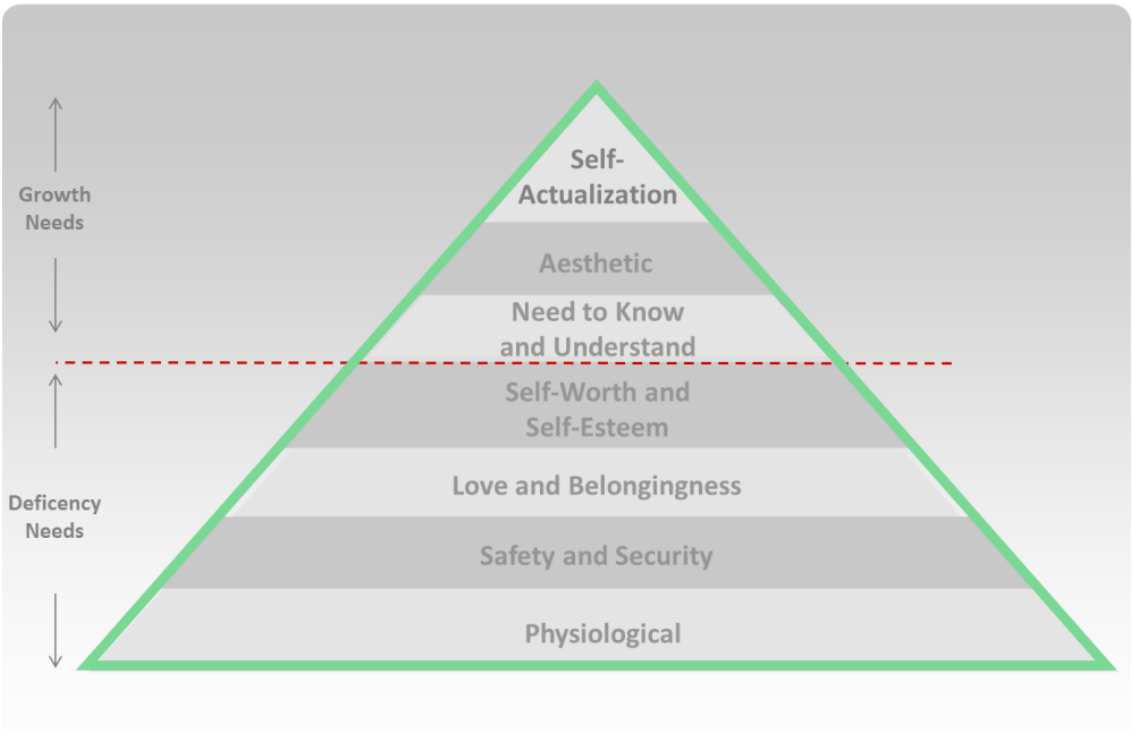


Figure 7 Pyramid of Maslow (Maslow, 1998)

The pyramid describes seven categories of basic needs common to all people. Maslow describes with the hierarchy of the pyramid that individuals must meet the needs at the lower levels of the pyramid

before they can successfully be motivated to tackle the next level. The lowest four levels represents deficiency needs, and the upper three levels represent growth needs. The human needs and elements of personal financial planning are related to each other. The Financial Planning Standards Board (Financial planning standards board, 2015) described the key areas of personal financial planning. Interesting is that the lowest levels in this overview also represent deficiency needs, and the upper levels growth needs.

2.1.4.1 Deficiency needs

Deficiency needs are basic needs arising from being deprived of something. Maslow suggests that the first need is the need for survival. Their **physiological** requirements to fulfill this need are food, water, and shelter. We can learn that people should therefore focus on a basic financial position in order to be able to finance these needs. They need to be able to buy food to eat, have water to drink, and they need to be able to pay their rent or mortgage to have a place to call home before they can afford to purchase anything else.

After physiological needs have been satisfied, people need to meet their needs for **safety and security**. Safety means that people have the feeling that no harm will befall them, physically, mentally, or emotionally. This requires adequate protection. In financial planning adequate protection is usually an insurance. Insurances help individuals to protect a household from unforeseen risks. These risks can be divided into liability, property, death, disability or health purchase. Security is the feeling people get when their fears and anxieties are low. In personal life planning, security means that people should have the feeling that they are able to pay for example their bills. Taxes are for many individuals a threat. The income tax is the single largest expense in a household. Managing taxes is not a question whether or not taxes will be paid, but when and how much. If individuals do not understand how to take advantage of their taxes this can make a major impact on one's personal financial situation.

After the physiological needs and the needs for survival and for safety and security are met, an individual will be motivated to meet the needs represented at higher levels of the pyramid. The third level is associated with **love and belonging**. These needs are met through satisfactory relationships, relations with family members, friends, peers, classmates, teachers and other people with whom individuals interact. Under millennials we see that these needs are met digitally more often. For example as described in section 2.1.1 sending Whatsapp-messages fits into the culture of millennials.

Once individuals have met their need for love and belonging, they will begin to develop positive feelings of **self-worth and self-esteem**. In financial life planning we see that people start dreaming about life-events. Achieving these goals requires projecting what they will cost, and when one needs to withdraw funds. A major risk here is that people find it difficult to make investment goals over a longer period of time. Such goals include purchasing a house or car, starting a business, paying for education expenses, and saving for retirement as examples.

2.1.4.2 Growth needs

Growth needs arise as a desire to grow as an individual. The fifth level of Maslow's pyramid represents an individuals **need to know and understand**. According to Maslow, this motivation cannot occur until the deficiency needs met an individual's satisfaction. In personal financial planning this means that an individual understands its financial situation. Another element of 'understand' is

the process of understanding how much it costs to live at retirement, and coming up with a plan to distribute assets to meet any income shortfall. Finally it involves planning for the disposition of one's assets after death. We call this estate planning.

If someone arranged their personal financial planning sufficiently in the previous levels they can think about **aesthetics**. Aesthetics refers to the quality of being creatively, beautifully, or artistically pleasing. For example, decorating the living room, washing and waxing a car, and keeping up with the latest styles in clothing and all ways of expressing aesthetic sense. Although according to Maslow people are motivated to meet this need only after the previous five needs have been met, we see that many millennials spend money on aesthetics in the lower levels of Maslow pyramid.

At the top of the pyramid is the need for **self-actualization**, which can be described as a person's desire to become everything he or she is capable of becoming to realize and use his or her full potential, capacities, and talents. The upper levels of the pyramid describe a person's growth needs. Growth needs can never be satisfied completely. Contrary to the deficiency needs, for which motivation diminishes when a need will be satisfied. The more growth needs are satisfied, the more people want to pursue them. It is expected based on findings of Maslow that the more an individual understands about personal financial planning, the more one's motivation to learn increases.

2.2 Business

Bianca Tetteroo, member of the board of directors of Achmea, is responsible for retirement services at Achmea. Recently, she shared the problem that Achmea is currently facing in an interview with management magazine Scope (Tetteroo, 2016). In this interview she explains that Achmea sees that millennials are very mistrustful regarding retirement services. Next to that, Tetteroo envisions that societal changes will irrevocably reform the current pension schemes for years to come. Although the Netherlands is a progressive country worldwide in innovation, innovation is one step behind in the financial sector. In order to innovate, Tetteroo wants to create a trustful environment for people. To create this trust, she wants to give people comprehensive solutions addressing the needs that people have, instead of pushing separate products. Tetteroo argues that the responsibility to save for retirement and the complementary risks shifts towards individuals. One of the strategical clusters of Achmea is that people start saving for retirement at an early age. In order to help millennials, Achmea wants to provide them instruments to make it easier to make financial decisions.

2.3 Function

This subsection represents a selection of requirements. According to Guenther, requirements engineering is an approach to systematically manage functional and non-functional requirements (Guenther, 2013). It has its origins in technology-driven disciplines. This section records the needs and conditions that the outcomes of this graduation project must meet in order to be successful. It is an integral part of this design process, with the goal to create a common understanding when the outcomes of this research will come to a practical setting.

The requirements can be used to collaborate with different parties of Achmea. Secondly, these outcomes can be used to give value to other initiatives that relate to saving money for later by millennials. Finally, these requirements can be a source of inspiration to solve the problem in future projects from other perspectives.

2.3.1 Requirements

R1	Users need to be engaged in participating with, and monitoring their financials online (Financial Planning Standards Board, 2016)
R2	The concept must improve financial literacy (Financial Planning Standards Board, 2016)
R3	Users need to be able to track success with achieving their goals (Financial Planning Standards Board, 2016)
R4	The product must enable real-time positive reinforcement for current behaviors (Financial Planning Standards Board, 2016)
R5	Gamification and Social graphs must be used as supporting technologies (Meijer, 2016)
R6	In line with the identity of CB the product must be easy appealing, sincere, and accessible (Centraal Beheer Achmea, 2015)
R7	Customer contact must be digital since millennials work digitally and trust technology more than human beings (Centraal Beheer Achmea, 2016)
R8	The concept should reward users for good financial behavior (Financial Planning Standards Board, 2016)
R9	The product must be social proof (friends/network/reviews) (Centraal Beheer Achmea, 2016)
R10	The features within the concept have to steer on easiness of use (Meijer, 2016)
R11	The user needs to have the flexibility to give purpose to his or her own 'optimal life'
R12	Alternative solutions to save money should be proposed to the client (Centraal Beheer Achmea, 2015)
R13	The content needs to be honest, authentic and creative (Centraal Beheer Achmea, 2016)
R14	The concept should support the user to create a plan where deficiency and growth needs are prioritized (Maslow, 1998) (Financial planning standards board, 2015)
R15	The brand-identity should differ from CB's in order to generate trust by millennials (PewResearchCenter, 2014)
R16	The customer must be centralized and must be addressed from a personal perspective (Centraal Beheer Achmea, 2015)
R17	Millennials should be able to receive advices and opinions from their network (Centraal Beheer Achmea, 2015)
R18	Since millennials often generate and share data freely, it is important to protect their data and identity (Humphries, 2015)
R19	The concept should support millennials to act in a more future oriented way (Frederick, Loewenstein, & O'Donoghue, 2002) (Hershfield, 2011)
R20	Millennials must be able to have an overview of their insurances (Financial planning standards board, 2015)
R21	Users must be able to make investment goals over a longer period of time (Financial planning standards board, 2015)
R22	It should not be possible to spend money on aesthetics when deficiency needs cannot be payed
R23	To create trust, the solution needs to be comprehensive and demand-driven instead of pushing separate products (Tetteroo, 2016)

2.4 Structure

2.4.1 Key areas

If we want to help people with living an optimal life, it is important to help them to spent their money as efficient as possible in order to enable them to finance as much as possible life-events and dreams. The following six key areas of personal financial planning are suggested by the Financial Planning Standards Board (Financial Planning Standards Board, 2016). These key areas have been

related to human needs in section 2.1.4. We learned that people first have to commit to the lower levels of Maslow's pyramid in order to fulfill deficiency needs. For that reason, key area one till four of the product will assist people in meeting their deficiency needs and level four till six will support people to manage their growth needs.

2.4.1.1 Deficiency key areas

1. **Financial position:** The user should learn to understand personal resources by examining net worth and household cash flows. Net worth is a user's personal balance sheet, calculated by adding up all assets under that persons control, minus all liabilities of the household. From this analysis the concept has to be able to determine to which extent a user's basic financial position is reached.

2. **Adequate protection:** It is important to show the user how he or she protected assets. Here we can apply the expertise of CB in order to show the user alternative solutions.

3. **Tax planning:** We found that for many people it is not a question whether or not taxes will be payed, but when and how much. It is relevant to give insight when people have to pay their taxes.

2.4.1.2 Key areas for growth

4. **Investment and accumulation goals:** Both deficiency- as growth needs have to be managed. It concerns how to accumulate enough money for large investments and life events. Some saving goals refer to deficiency needs, for example, saving for a house. Other saving goals refer to growth needs for example buying a game console. Achieving these goals require to project what they will cost, and to ascertain if one really needs to have it.

5. **Retirement planning:** Many millennials do not know what the costs-of-living are during retirement. To achieve this goal, users have to make a plan on how to distribute assets to meet any income shortfall.

6. **Estate planning:** Estate planning involves planning for the disposition of the user's assets after death.

2.4.2 Activities

The following activities that are described by the Financial Planning Standards Board (Financial Planning Standards Board, 2016) can give meaning to key areas described in section 2.4.1.

1. **Assessment**: A person's financial situation can be assessed by giving them simplified versions of financial statements including balance sheets and income statements. A personal balance sheet lists the values of personal assets (for example, car house, clothes, stocks, bank accounts), along with personal liabilities (for example, credit card debt, bank loan, mortgage). A personal income statement lists personal income and expenses.

2. **Goal setting:** People have multiple life goals. Usually, these goals include a mix of short- and long term goals. For example, a long-term goal would be to "retire at age 65", while a short-term goal would be to "save for a game console in the next three months". Giving a financial value to life-events or dreams makes it easier for people to meet specific financial requirements.

3. **Plan creation:** The financial plan enables people to detail how to accomplish their life-events and how to fulfill their dreams. It could include, for example, reducing expenses in higher levels of Maslow's pyramid, advices to increase income, or investing in the stock market.

4. **Execution:** Execution of a financial plan is for many people difficult. It requires discipline and perseverance. Many millennials obtain assistance from family and friends.

5. **Monitoring and reassessment:** Through the time, people monitor their financial plan and make adjustments and reassessments.

2.4.3 Combinations of key areas and activities

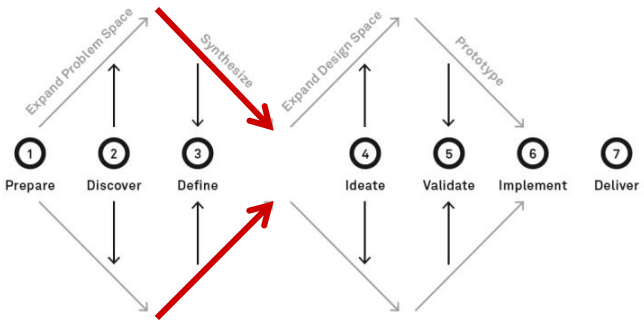


Figure 8 Key areas and activities synthesize the Problem Space

The result of synthesizing the problem space is described in Table 1. This table describes interesting key areas and activities that have the potential to solve the problem space. The table closes the first diamond of the Double Diamond model resulting in a consolidation of potential solutions.

	Assessment	Goal setting	Plan creation	Execution	Monitoring and reassessment
Financial position	■	■	■	■	■
Adequate protection	■			■	■
Tax planning	■			■	■
Investment and accumulation goals		■	■	■	■
Retirement planning	■	■	■	■	■
Estate planning	■		■	■	■

Table 1 Possible combinations of key insights and activities, own interpretation

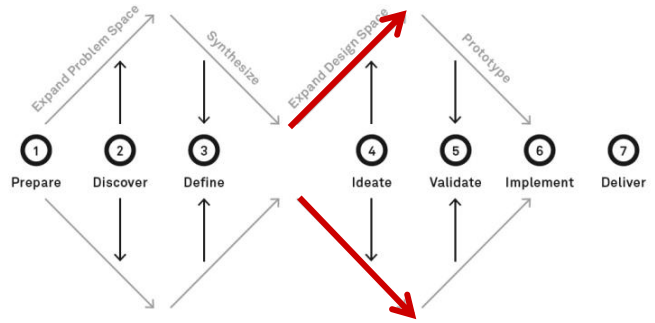


Figure 9 The Design Challenge expands the Design Space

2.5 Design Challenge

A design challenge expands the design space and opens the second diamond of the double diamond model. This phase is used to generate ideas and options independently of constraints and limitations. However, there is always a risk that it becomes more difficult to solve a problem when the exploration of the problem space becomes too large. The method used to manage this process is called 'convergent and divergent thinking' (In the enterprise design framework, the same process is called 'explore and synthesize'). This extra iteration methodology is executed within the ideate stage. In the design challenge, workshops with children and students have been used as a method to open the design challenge (divergent thinking). This subsection describes the outcomes of divergent thinking. In addition, this subsection reduces the problem space from multiple purposes using the aspects from the frames section (convergent thinking; ideation). Section 3 of this report describes the outcomes of 'specification'. Finally, section 5 shows the realization in the form of high-fidelity prototypes.

2.5.1 Divergent thinking

Two workshops were organized to brainstorm with children and students about how an app could contribute to make financial life planning more fun for adults. The first workshop was organized for two classes of a primary school. The children were in the age of 10 till 12. The second workshop was

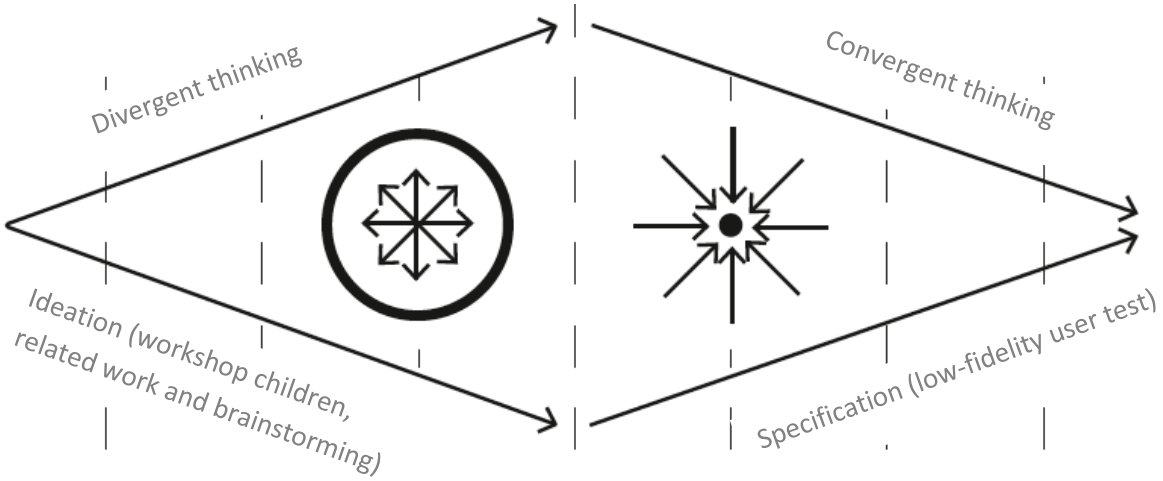


Figure 10 Process of divergent (explore) and convergent (synthesize) thinking (Guenther, 2013)

organized during an inhouse day at the head office of Achmea for thirty first-year students from Saxion University of Applied Sciences. The idea to involve children in the design challenge came from Tom Wujec who showed in his TED talk 'the marshmallow challenge' that children are better in performing at design challenges than adults are (Wujec, 2010). In his marshmallow challenge study, both children and adults had to build a tower of spaghetti with a marshmallow on top. The group with the highest tower was the winner. Where the adults started planning, thinking and calculating how to build the highest tower, the children started building immediately. What Wujec saw in the end was that most of the adult towers collapsed in the final stage of the challenge and there was no time left for rebuilding. The children already fixed the weak points in the beginning of the challenge resulting in them winning.

The method used during the two workshops is called 'rapid prototyping'. This method is in line with what Wujec found in that it is important to fail fast to be able to succeed in a short period of time. The goal of both workshops was to teach the children and the students the relevance of rapid prototyping. The case of the workshop was inspired by the research question of this research. The results gave first insights in ideas to solve the main research question of this research independent of constraints.

2.5.1.1 Workshop primary school

The children from the primary school started of a short warming up where they had to consider the important points of an app for financial life planning. Examples of things that children said to be important were 'no hackers'(security), fast processing, game elements, receiving real money while playing a game, appealing, free, aesthetics, exciting, should be able to play without WiFi and battery saving. After this 'warming up', the children started with their design challenge. 'Design an app that makes financial life planning fun for your parents'. All designs that the children made were out of the box and had gamification elements such as a quiz or a money factory. One of the most funny ideas was of a boy who found that his daddy would only be allowed to play FIFA when he would transfer money to his saving account.

2.5.1.2 Workshop inhouse day Saxion students

The Saxion students also had the task to design an app to make financial life planning more fun for adults. The warming up was a brainstorm about the relation between financial planning and living an optimal life. The students had to put down their thoughts on a post-it. The second assignment in the workshop was inspired by the Design-Sprint method of Google (Google, 2015). The students had to consider '3 ideas to solve the design problem in 5 minutes'. For the students, this method helped to solve the design challenge fast. In the third assignment the students had to work out their best idea. Finally, four students were chosen to pitch their ideas to the group. The results of the students often included assessments of income and expenses. Other ideas described graphs to measure performances, daily financial advices and a quiz.

Achmea filmed the entire inhouse day including this 'innovation workshop'. The link to the video is included in the references (Achmea, 2016).

According to Mader and Eggink, creative ideas have different sources. Alongside the outcomes of the workshops, outcomes of the research topics have been a source of inspiration. (Meijer, 2016). Other ideas came from a flash of inspiration or have been the result of brainstorming techniques.

Figure 11 Example results of divergent thinking

2.6 The Bucketlist: outcome of convergent thinking

The converging phase is described by Mader and Eggink as the process to reduce the design space, until a certain solution is reached (Mader & Eggink, 2014). The reductions are based on outcomes of the four aspects (business, people, function and structure) described in the frames section (section 2).

The outcomes are first ideas for a concept that is called **'the Bucketlist'**. Goal of the Bucketlist is to give millennials instruments to live life to the fullest. This includes financial planning for both short- as long-term saving goals. In addition, millennials can see how they are doing compared to peers. The structure of the Bucketlist is based on Maslow's principles where the app helps to fulfill deficiency needs first before spending money on growth needs. In addition, it gives millennials insight in occasions that can hinder reaching saving goals, like taxes. With these features it is expected that millennials will gain insight in what is needed to live the optimal life they envision.

The next section researches the driving factors behind the Bucketlist concept on the intersection of aspects described in 'frames' (section 2).

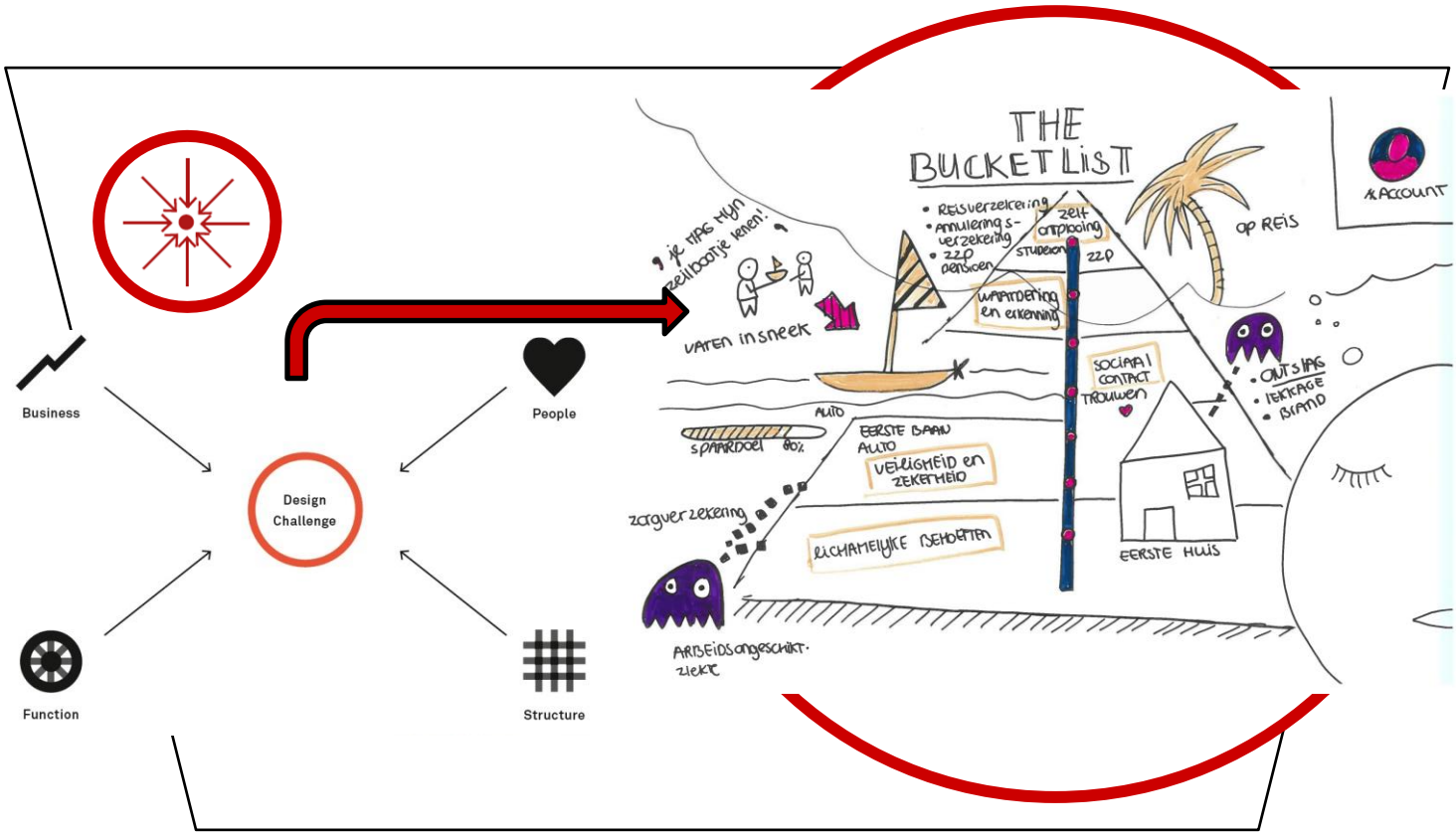


Figure 12 Frames used to converge the design space to the Bucketlist **(Guenther, 2013)**

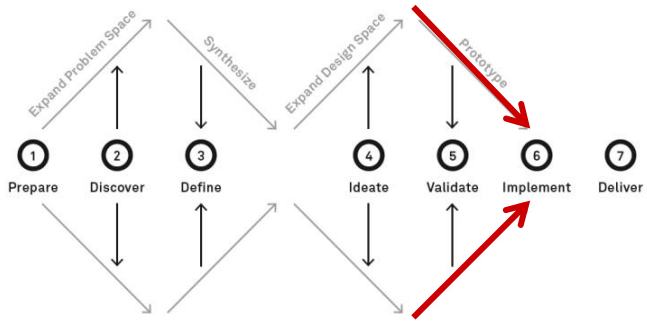


Figure 13 Low fidelity prototyping is used in this section to converge the Design Space

3 Design Space 'people' centered

The design space describes six interrelated aspects which together represent the space of conceptual decisions about a potential future of how Achmea ODV can address millennials. Three of these aspects are related to people. These aspects are information, interaction and communication representing fields of innovation in strategic design. The aspects related to 'business' and 'technology' are described in section 4.

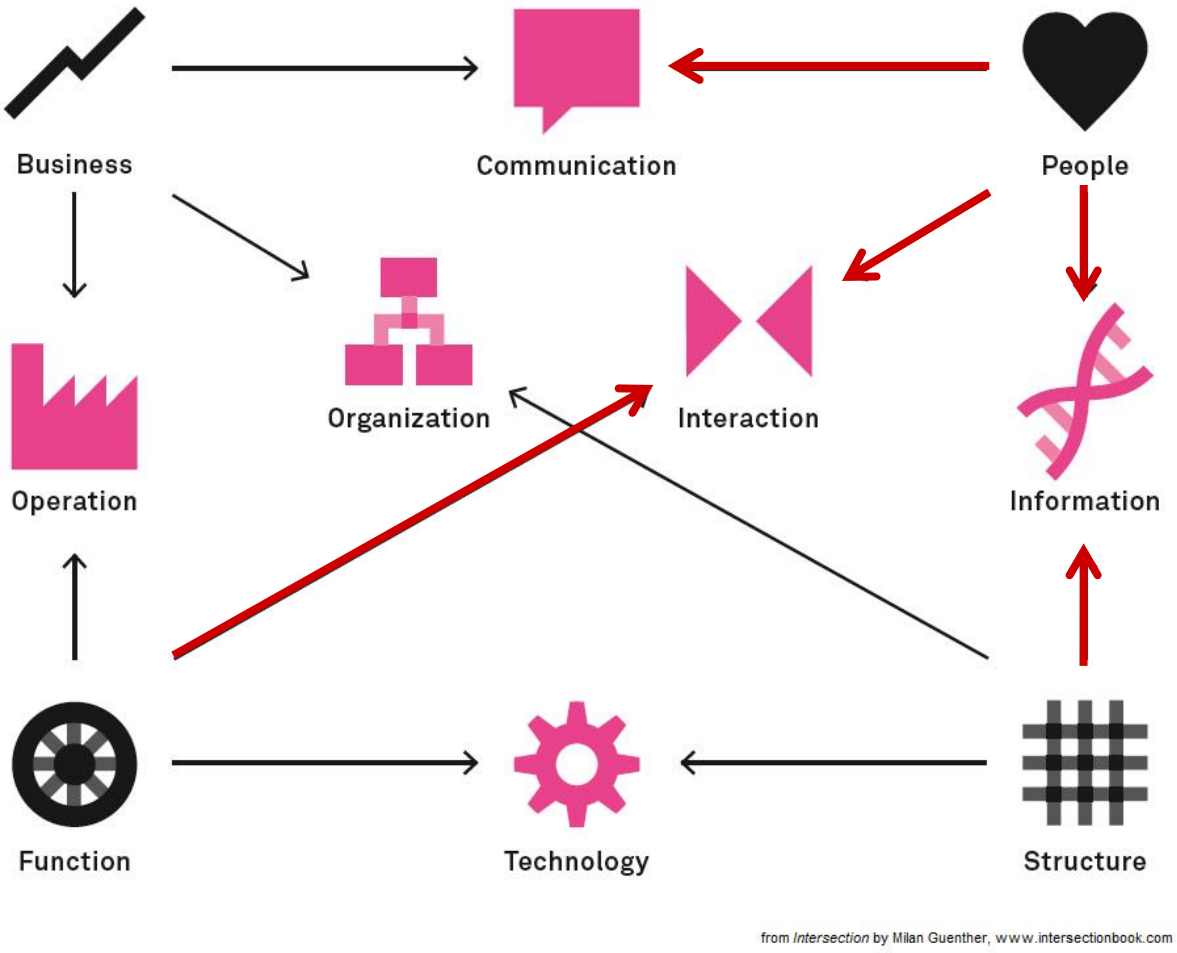


Figure 14 Design Space 'People' centered (Guenther, 2013)

3.1 Low fidelity prototyping

Characteristic of the design space is 'specification' whereby prototypes are used to explore and synthesize the design space (Mader & Eggink, 2012). The method used for 'specification' is called '**low-fidelity prototyping**'. Low fidelity prototypes enable early validation of the design space. The low fidelity prototypes are made in the form of a wireframe. Wireframes are simple black and white layouts that outline the placement of elements, features, conversation areas and navigation of a concept. They are devoid of color, font choices, logos or any real design elements that take away from purely focusing on the possible fulfillment of concept activities.

As already described, every key area can be fulfilled with different activities. Two wireframes have been designed concerning different key areas and activities. Using the wireframes millennials gave their opinion to the activities that achieve according to them the best outcomes related to key areas. In the results that start from section 3.2, only wireframes with the highest rating are displayed. The wireframes that have not been selected are attached to the digital appendix. The table below overviews the designed wireframes.

Wireframe 1	Wireframe 2
A - Flexibel	B - Statisch
A - Notificaties	B - Gevaar
A - Bucketlist en maak een plan	B - Bucketlist en social support
A - Score en tips	B - Jouw positie

Figure 15 Wireframes designed to research the value of different key areas combined with activities

3.1.1 Validation of survey

A survey including wireframes is chosen as a qualitative method for the evaluation and quality assurance of the wireframes. This survey is sent to millennials working at Achmea. The survey is designed to get insights in the communication, information and interaction of the Bucketlist.

3.1.2 Survey questions

The survey included 22 questions. In the first two questions the participants had to select their age in the range between 23 and 34 and the department where they work at Achmea. Question 3 till 10 described a problem solved with two different wireframes (describing different key areas and activities). In these questions the participants had to rate in which extend both wireframe solve the described problem. In addition, they had the possibility to a write comments to substantiate their rating. The outcomes of these answers helped to select the wireframes that have been used as starting point for rendering. In some cases it was better to combine wireframes or to make a redesign. The last questions (11 till 22) elaborated on the participants opinion regarding the information, communication and interaction of all wireframes.

3.1.3 Analysis

In total, 62 millennials that work at Achmea filled out the survey. The outcomes were analyzed using a annotation method whereby each answer was tagged with a communication, interaction or information label. Answers that describe aspects from 'people' about the 'business' frame received label 'communication'. Answers on the intersect of 'people' and 'function' frame received the 'interaction' label and answers on the intersect of 'people' and 'structure' frame were tagged with an

‘information’ label. Some answers received multiple tags. The labels made it possible to filter answers related to information, interaction and communication in an easy way. The outcomes of annotation are described in the following subsections. All annotations are described in the digital appendix.

3.2 User study results for ‘Information’

The section information describes the outcomes of the survey on the intersect of ’people’ and ‘structure’. Designing information is about providing the right things to the right people at the right time, also influenced by the development of digitalization and difficulties of drawing out meaning and gaining knowledge from an ever more quickly growing mass of data (Guenther, 2013). The low-fidelity prototype test gave guidance to what kind of information meet the needs of people. The following wireframes are chosen as starting point to fulfill the key areas of financial planning.

3.2.1 Determine financial position

The outcomes from the research topics aimed to design a concept that is easy to use. Next to that, it aims to consider the problem space from a positive perspective (Meijer, 2016). The feature explored here will help millennials to create in an easy and fun way a financial plan. The goal is to give the user insights in his or her income, expenses and debts. In addition, the functionality ‘determine financial position’ gives the user an overview in insurances.

Two wireframes are compared (‘A-Flexibel’ and ‘B-Statisch’). A-Flexibel (see Figure 16) appeared to be the best wireframe to fulfill this need. In this design suggestions help millennials to create flexible a financial plan. The wireframe below only shows step 2/4. In the other steps, users can add their incomes, (variable) expenses and debts to their financial plan. Finally, this feature gives the user suggestions based on missing components in the plan.

Figure 16 Wireframe 'A- Flexibel'

Users rated the 'A-Flexibel' wireframe with a 3.73 out of 5. The **flexibility** in this plan and the **suggestions** were appreciated by the participants. What participants missed in this design was a feature to fill out the overview **automatically** for example, with a csv-extract of their bank account.

3.2.2 Insight in when to pay or receive taxes

The Financial Planning Standards Board describes that many people want to pay their taxes but find it difficult to foresee when they have to pay for taxes (Financial Planning Standards Board, 2016). The payment of taxes forms for many people a barrier to save money.

The wireframes 'A-Notificaties' en 'B-Gevaar!' (see Figure 17) have been compared in the user-test. **A-notificaties** gives the user information via notifications. This can include positive messages (for example, a friend reached his saving goal), but it can also include information about taxes. These notifications do not only show that the user has to pay taxes, but it also indicates when the user has to pay.

Next to A notifications, **B-Gevaar!** Is focusing on the boundaries of financial planning using gamification. This version does not show "positive events".

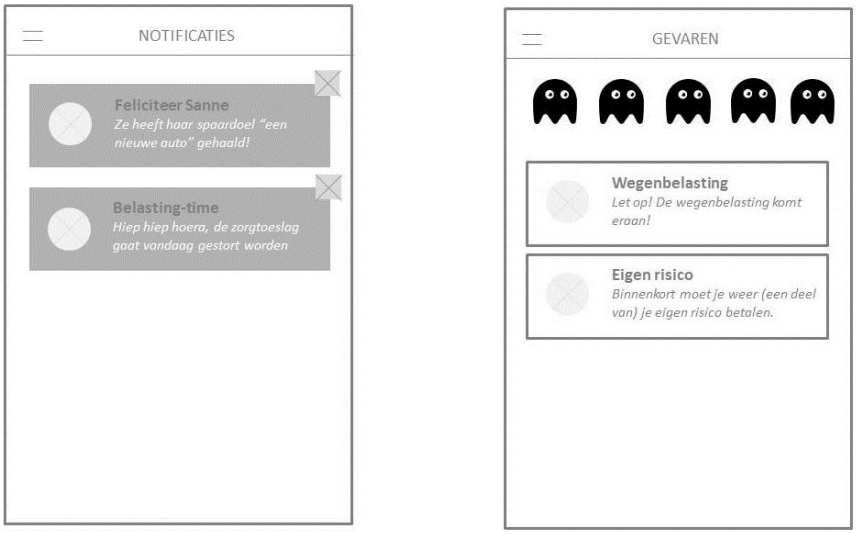


Figure 17 Wireframes 'A-Notifications' and 'B-Gevaar'

Participants rated 'A-Notificaties with a 3.25 out of 5. Overall, they mentioned that they find **it useful to receive a notification** at important events. In addition, they note that **flexibility** of choosing what kind of notifications they want to receive is important for them. 'B-Gevaar!' was rated by the participants with a 3.02 out of 5. Participants noticed that they expect to **see dangers within 'A-notifications'**. They like the aspects of **turning something negative into something positive**. We can learn from 'A-Notifications' and 'B-Gevaar!' that it is expected to be beneficial to combine both wireframes.

3.2.3 Creation of saving goals

Maslow and the Financial Planning Standards Board (Maslow, 1998) (Financial planning standards board, 2015) describe that financial planning is important to live a good life. Therefore, it is important that individuals understand how to spend money. If someone spends money on aesthetics and growth needs, it becomes harder to finance deficiency needs such as a house.

Again, two wireframes have been compared using the survey. ('A – Bucketlist en maak een plan' and 'B- Bucketlist en social support'). The result was that '**A- Bucketlist en maak een plan**' is expected to give users the best overview of defined savings goals. The two screens under "jouw plan" help the user to create a saving plan. The IDEAL icons enable to deposit money to a savings account.

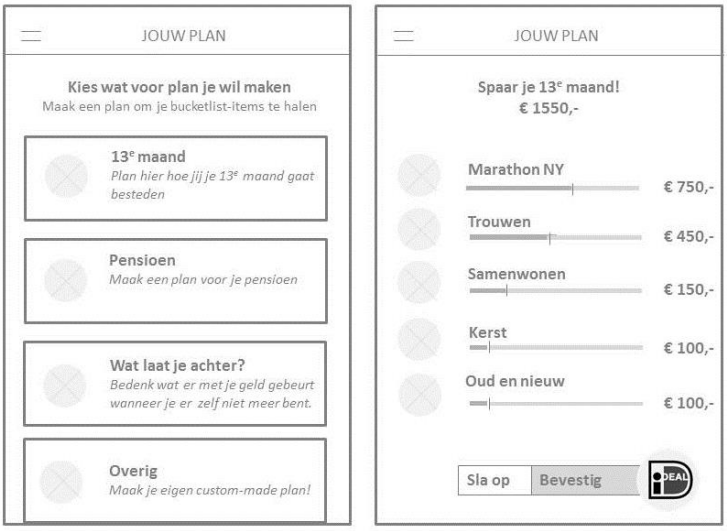


Figure 18 Wireframes 'A- Bucketlist en maak een plan'

This feature was rated by participants with a 3.73. One of the participants even called the planning feature 'phenomenal' and wants to have this feature in his daily life. Many of the users stressed the effectiveness of the **IDEAL button**. Participants think that the IDEAL button will **avoid procrastination**.

3.2.4 Compare performances with peers

Section 2 "frames" showed that human beings have psychological needs for experiencing relatedness (Maslow, 1998), (Deci & Ryan)

'A - score en tips' have been compared with 'B- jouw positive'. '**A – score en tips**' gives the user a financial score. In addition, the screen gives users feedback on how to improve their financial score. Next to that, users can see how they compare related to peers with the same profile.

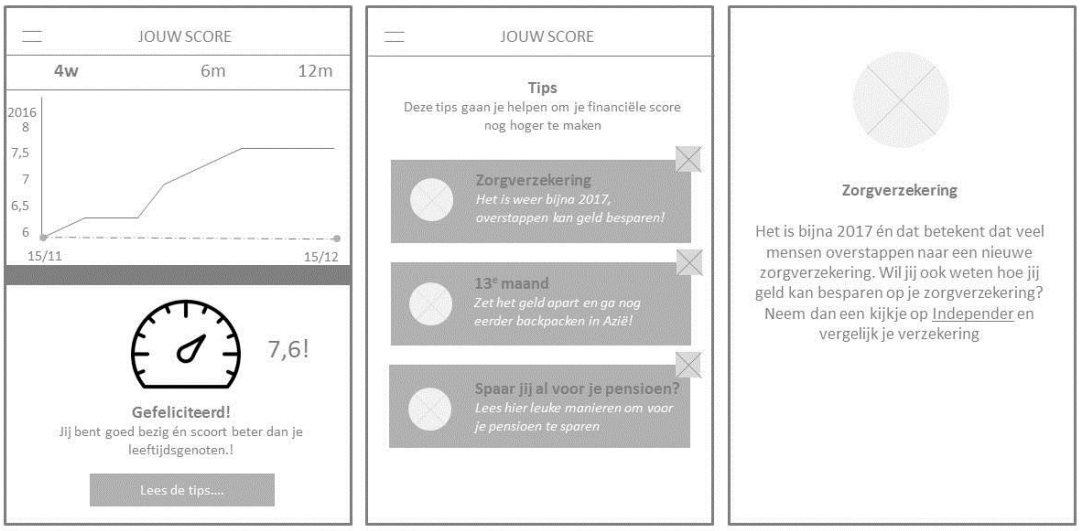


Figure 19 Wireframe 'A-score en tips'

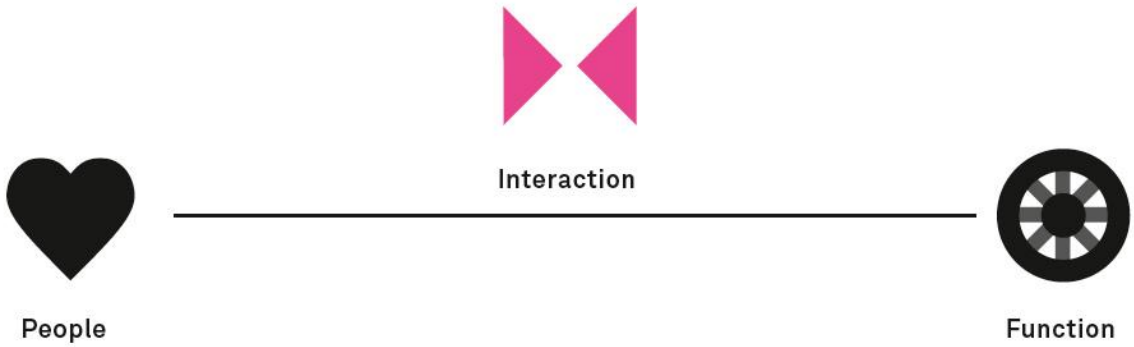
This design was rated with a 3.35 out of 5. According to most participants the strong point of this information design is the score. A challenge for the implementation of this concept is that many external influences can affect a financial situation which makes it difficult to make a financial score.

3.2.5 Key areas, Activities and Wireframes

The outcomes of the survey offer valuable insights into suitable activities that have the potential to fulfill key areas of financial planning. Although many combinations of key areas and activities had the potential to be addressed in the Bucketlist (Table 2), the following combinations were outstanding. These combinations are supported by the described wireframes. This table forms starting point for most of the design activities in the stage 'Rendering'.

Table 2 Selected wireframes for Key areas and Activities

Level	Key area	Wireframe	Activity
1	Financial position	• A – Flexibel • A - Score en tips	• Assessment • Execution • Monitoring and reassessment
2	Adequate protection	• A - Flexibel • A – Bucketlist en maak een plan	• Assessment • Execution • Monitoring and reassessment
3	Tax planning	• A – Bucketlist en maak een plan • A - Notificaties • B - Gevaar!	• Assessment • Execution
4	Investment and accumulation goals	• A -Notificaties • B - Gevaar!	• Plan creation • Execution • Monitoring and reassessment
5	Retirement planning	• A – Notificaties • A – Bucketlist en maak een plan	• Execution • Monitoring and reassessment
6	Estate planning	• A – Notificaties • A – Bucketlist en maak een plan	• Execution • Monitoring and reassessment



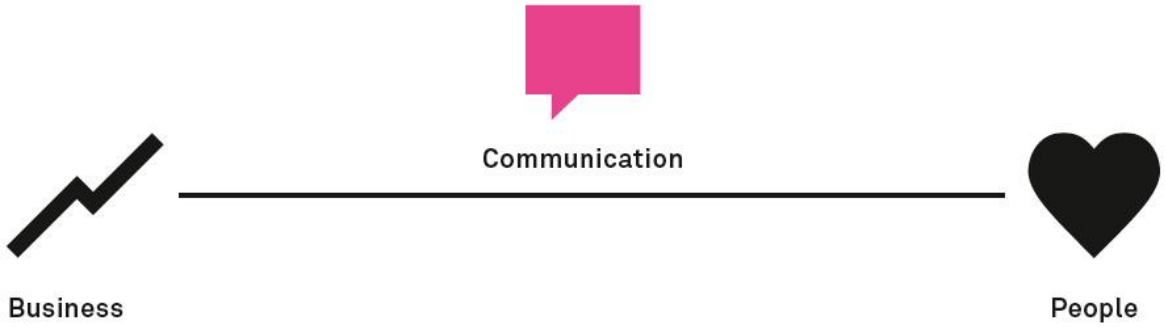
3.3 User study results for 'Interaction'

Guenther (Guenther, 2013) describes interaction as connecting people to functions they are using. Customer interactions at Achmea are omnipresent in 2020, where virtually no activity is carried out without the help of digital technology and tools (Achmea, 2016). Shaping interactions as behaviors therefore is a basis to define and design useful features. This section gives an overview of the features of the Bucketlist. The features are retrieved from the outcomes of the survey and categorized using the MoSCoW prioritization technique. This technique is usually used in for example business development, project management and software development to reach a shared understanding of the requirements that needs to be delivered.

Must haves		Requirements
M1	**Assessment**	
M1.1	Users must be able to create an overview and monitor their fixed charges	R1; R14; R20
M1.2	Users must be able to create an overview and monitor their variable charges	R1; R14
M1.3	Users must be able to create an overview and monitor their income	R1; R14
M1.4	Users must be able to create an overview and monitor their debts	R1; R14
M2	**Notifications**	
M2.1	Positive behavior must be rewarded	R4; R6; R8
M2.2	The user must be notified when he shows suspicious behavior	R13; R14; R22
M2.3	The user must be notified when his financial score changes	R3; R13
M2.4	Notifications must help users to get insights in when he or she can expect taxes	R2; R13; R19
M2.5	Notifications have to warn users that they have to save money for special events such as Christmas	R13
M3	**Plan**	
M3.1	It must be possible to create a custom plan for retirement, estate, 13th month and special events	R11; R16; R21
M4	**Financial health indicator**	
M4.1	The financial position of a millennial needs to be displayed	R1
M5	**Other**	
M5.1	The Bucketlist must be able to predict future important life events	R19
M5.2	Users must be able to deposit money to a private bank account	
M5.3	Users must be able to deposit money to an Achmea bank account	
M5.4	The media platform of the Bucketlist must be an app	R7
M5.5	Users must be able to manage deficiency saving goals and growth saving goals	R2; R5; R6; R11; R14; R22

Should haves		Requirements
S1	**Integration with bank**	
S1.1	The user should be able to automatically import their financial data from a csv-extract	R6; R10
S1.2	IDEAL should be used to enable credit transfer from someone's debit account to a saving account of choice	
S2	**Collectivity**	
S2.1	It should be possible to create collective saving goals with friends	R9
S2.2	Users should be able to add friends to see their saving goals	R9; R17
S2.3	It should be possible to add for example a partner to fixed and variable charges	R9
S3	**Personas**	
S3.1	Users should be able to compare themselves with one of the predefined persona's	R5

Could haves		Requirements
C1	Automatic integration with a user's bank	R6; R10
C2	Users could be able to learn from others how to deal with a particular financial situation	R9
C3	PSD2 integration to generate automatically an overview of income, expenses and debts	R1; R6; R10
C4	The Bucketlist could have references to recognized Dutch financial institutions for example Nibud, Geldwijzer or the consumentenbond	R13;
C5	It could include a quiz where people can assess their financial personality	R5; R13 R16
C6	Users could have the possibility to select what kind of notifications they want to receive	R11
C7	The Bucketlist could donate 1 euro to charity for every 100 euro someone saved on a Bucketlist saving account instead of giving rent.	R5; R12; R13



3.4 User study results for 'Communication'

Communication is described by Guenther as the ongoing exchange between people in a business context (Guenther, 2013).

3.4.1 Selected Media

Multiple participants in the survey argued 'less is more'. Therefore the decision is made to keep the selected media in the first version of the Bucketlist very simple. In this design media is addressed to the people in a personal manner. The participants also mentioned that media must be designed in a trendy manner. This is in line with the findings of CB which argues that millennials are seeking for honest, authentic and creative content (Centraal Beheer Achmea, 2016). Finally, the participants argued that they find it important that the Bucketlist is easy to use, which is in line with the design theme 'easy' formulated in the research topics (Meijer, 2016).

3.4.2 Formulation of messages

The formulation of messages is one of the learning points that came out of the low fidelity test. People consider financial planning as a very serious event. This makes that terminology is a very critical point that can make the difference of whether the Bucketlist will become successful or not. The messages should be formulated serious, easy to understand and 'appealing'. It is very challenging to write messages in a form that they are considered appealing, instead of childish. In addition, it is a challenge to address users in a formal manner without using business language.

4 Design space ‘business’ and ‘technology’ centered

The outcomes of operation and organization are retrieved from interactions with managers of ODV and the founder of Achmea’s corporate start-up ‘Roadguard’. Finally, technology is retrieved from literature-research related to function and structure aspects.

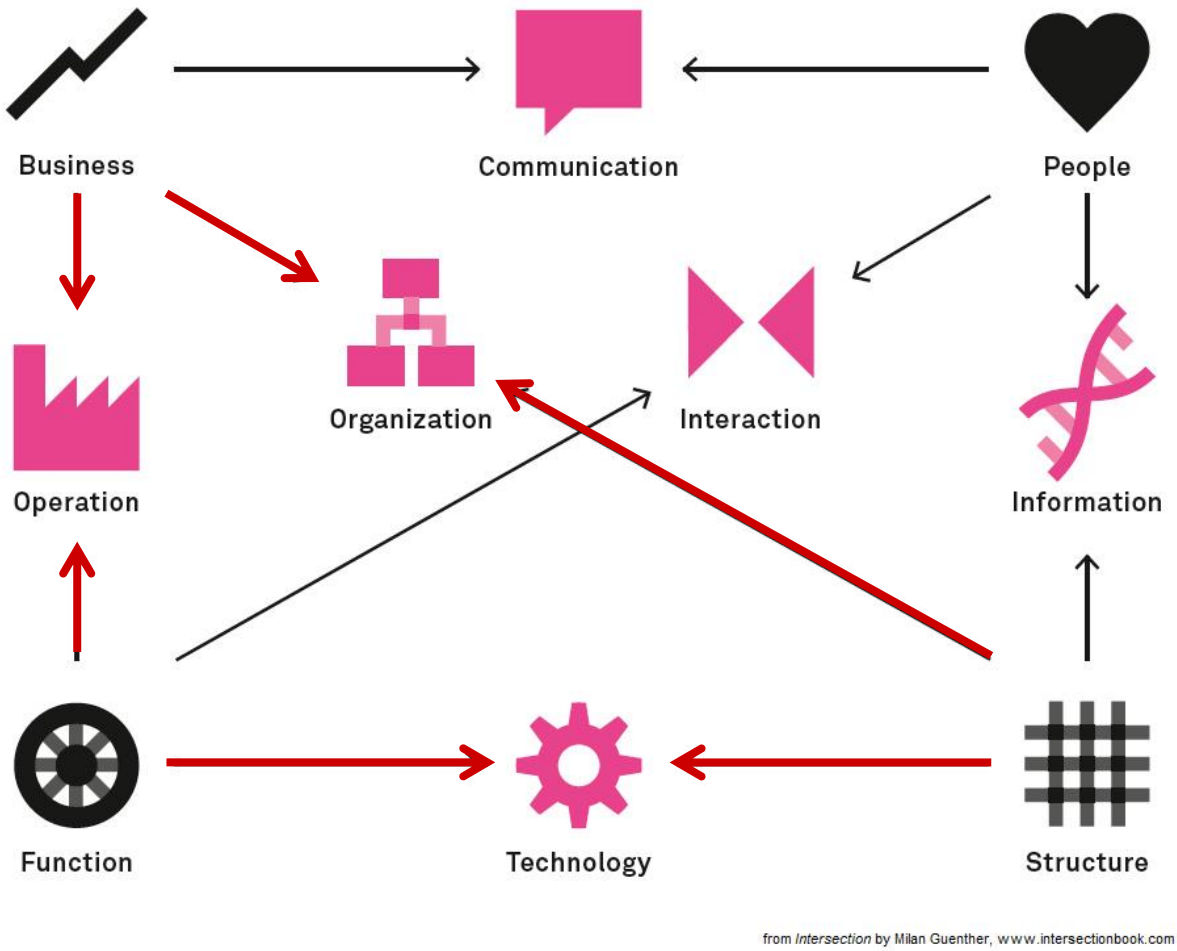
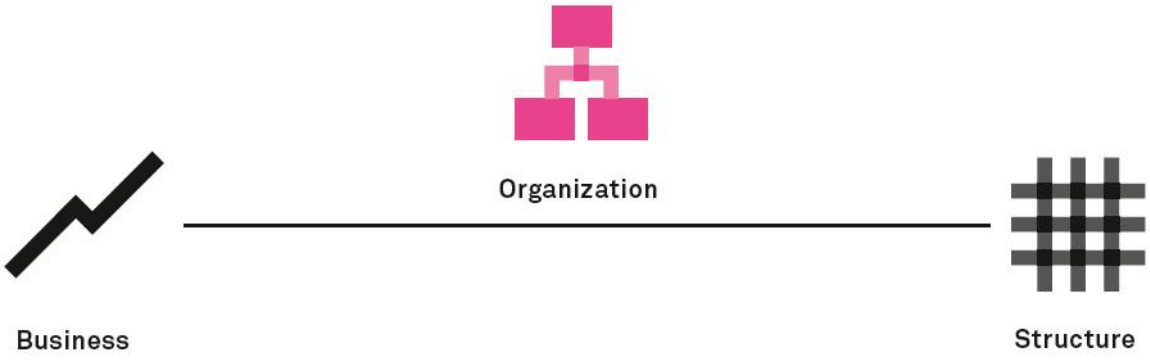


Figure 20 Design space 'Business and Technology' centered (Guenther, 2013)

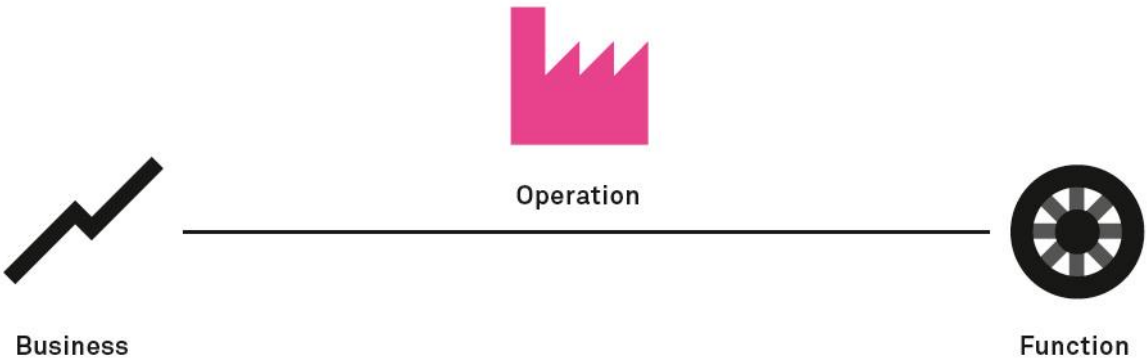


4.1 Organization

This is referred by Guenther (Guenther, 2013) as the structure of a business that allocates responsibilities and tasks across organizational units and roles. For a large company such as Achmea, it is important to take into account its existing organizational structures, skills and competencies, and their influence on the culture and working habits.

Achmea, including powerbrands and brands offer Dutch people a large variety of products. People can close up almost any variable charge imaginable at Achmea. For example mortgages, retirement plans and insurances in every category. Next to that, Achmea offer financial services as well, for example bank accounts and investment services. The products that Achmea offer can contribute in making this ambitious project successful.

The size of Achmea also has a downside that can delay the delivery of this product. Often there are many people involved in decision making, which makes it a challenge to get anything done in a short amount of time. In order to be able to develop fast, the Bucketlist could start as a corporate start-up. Examples of corporate start-ups that are already operational at Achmea are RoadGuard (an application for roadside assistance) and Actify (an online lifestyle platform).



4.2 Operation

Operation refers to the way Achmea works and carries out its activities, making use of the functions as capabilities playing a role in ongoing business processes. This aspect is about designing both automated procedures and human work striving to rethink the way work is being done in terms of both internal efficiency and customer value. It concerns defining the flows and drivers of the work processes.

4.2.1 Business model canvas

A method to innovate business models is business model canvas (Osterwalder, Pigneur, Clark, & Smith, 2010). This method applies entrepreneurship to a business idea within a viable business model (Guenther, 2013). Achmea uses the business model canvas method to analyze, design, prototype, and introduce new and evolved projects, with a focus on achieving viability and value creation.

4.2.1.1 Key partners

The following partners within Achmea are involved to make the Bucketlist operational:

- Of Achmea ODV (IT & Business) - Erik Roeten, Erwin Kersten and Marc Baan
- Of Achmea IM&IT -Ton van der Linden, Dimitri van Dyck, René Wissing and Guus van der Weijden

4.2.1.2 Key Activities

The ‘key activities’ describe the important actions that Achmea must take to operate successfully. First Achmea has to agree to continue this concept. Therefore, it is important that the right managers are committed. A team that will work on the realization of the Bucketlist has to be formed and the distribution channels have to be selected.

4.2.1.3 Key Resources

The ‘Key Resources’ are the most important assets required to make the Bucketlist concept operational. First of all, this project needs an agile development project team for delivery. To align this project to Achmea as an enterprise, procurement and legal departments of Achmea should be involved. For the protection of a user’s data, it is essential that the security department of Achmea

executes penetration test to detect security issues at an early stage. In the distribution of the premium feature of the Bucketlist, the Bucketlist should integrate with 'Achmea bank'.

4.2.1.4 Value propositions

The Bucketlist addresses the customer segment group millennials. In the Netherlands there are four million people born between 1981 and 2000. From this group of people, only 158.000 people are currently a customer of CB. This group has the highest customer engagement value. 86% is a customer for more than a year on end (Centraal Beheer, 2017). The research already illustrates that millennials have difficulty with insurances and financials. The low number of millennials that are customer at CB can be explained. The financial industry has the highest risk of disruption under millennials (Scratch, 2014). Millennials prefer products from for example Google or Amazon over products of existing financial services and brands. The Bucketlist is for this reason positioned independently of Achmea.

4.2.1.5 Customer Relationships

Millennials are mistrustful regarding current insurance companies. By positioning the Bucketlist independently of the CB brand it is expected that a new target group that is influenced by technology will be engaged.

4.2.1.6 Channels

- Millennials are mistrustful regarding financial institutions and brands. For that reason, the Bucketlist should be positioned independently of existing Achmea brands.
- The Bucketlist should be so accessible that it is even possible to do financial planning in for example a train. Therefore, it is advised to choose an app as channel.

4.2.1.7 Customer Segments

The customers are millennials. Their needs are described in the people section (section 2.1).

4.2.1.8 Cost Structure

The following costs are the most important costs that are expected in the operation of the Bucketlist.

- Development
- Hosting
- Updates
- Maintenance
- Security tests

4.2.1.9 Revenue Streams

The Bucketlist will use a fremium business model. Millennials can download the Bucketlist for free in the app store. For extra functionalities, like integration with Achmea bank millennials have to create a premium account. In both versions the Bucketlist helps millennials to get insight in their income, expenses and in how they protected assets. The Bucketlist gives millennials suggestions on what is missing in the financial plan. Although cross-selling is not the core activity of the Bucketlist, it is expected that the data retrieved from the Bucketlist contributes to customer acquisition. In addition, this concept contributes to the societal vision that Achmea has. Contributing to this vision cannot be economically quantified.

4.3 Technology

According to Guenther (Guenther, 2013) technology means to enable the delivery of enterprise functions, facilitated by the structures put in place to support them. Any design project depends on a creative usage of technology, playing a vital role in most human activities to be addressed. Designing technology means leveraging technical possibilities for human usage, and shaping it in a way it fits.

4.3.1 Gamification

The first technology selected in the research topics is 'Gamification' (Meijer, 2016). Gamification refers to service design aimed at providing game-like experiences to users, commonly with the end-goal of affecting user behavior (Huotari & Hamari, 2012). Maslow's pyramid describes that people are often ridden with a tendency to favor short-term rewards instead of long-term rewards. This cognitive bias is also known as hyperbolic discounting (Ainslie, 1975). Gamification will be used in the Bucketlist to avoid that people save money on aesthetics in lower levels of Maslow's pyramid. Although there are many gamification techniques, badges are the selected gamification elements. Hamari (Hamari J. , 2015) describes in his research that badges indicate the element (the visual and textual cues of the badge), rewards (the earned badge), and the fulfillment conditions which determine how the badge can be earned (Hamari, 2013) (Hamari & Eranti, 2011) (Jakobsson, 2011) (Montola, Nummenmaa, Lucerano, Boberg, & Korhonen, 2009). These characteristics of badges make that this method can be effective to reduce hyperbolic discounting.

In the Bucketlist people could unlock badges related to 'growth needs' by fulfilling 'deficiency' actions and tasks within the service. Furthermore, because of their visual element (the badge itself) and the included descriptions regarding the goal and how to unlock a badge, they will also be related to challenges that have been found in financial life planning to increase intrinsic motivations (Malone, 1981).

4.3.2 (Social) information graphs

Van Delden and Reidsma describe people's needs to feel connection to other people, preferably in a reciprocal way to be a very strong need in life (van Delden & Reidsma, 2013). Festinger found in 1954 that individuals with performance goals (goals over a short period of time) should primarily rely on social comparison information (e.g. "How did I do relative to others?"; Festinger, 1954). Social proof theory (Cialdini, Harnessing the science of persuasion, 2001a) (Cialdini, 2001b) predicts that individuals are more likely to engage in behaviors which they perceive others are also engaged in (Cialdini, 2001b). In theory, badges can facilitate the need of feeling connected to others by providing

means for users to observe the activities of others, and indicating which behaviors they have been rewarded for. Cialdini describes that people view a behavior as correct in a given situation to the degree that they see others performing it (Cialdini, 2001b). In addition, in practice we see social comparison information already in a variety of applications. Social graphs have been popular in the energy sector to reduce energy consumption for years. In sport applications, like Strava, social graphs have been used effectively to increase sport performances. These kind of motivations are called 'performance based goals' (Zell & Alicke, 2009).

The low fidelity prototype outcomes indicate that performance based goals are not expected to be effective in the financial industry. Many participants responded that they want to keep their financials private which is striking with the characteristics of millennials that describe that millennials share their data freely (Humphries, 2015) and that they are open to advice of family and friends (Centraal Beheer Achmea, 2016). For that reason, this research anonymizes Peer to peer comparison data is retrieved from benchmark research of Statistics Netherlands (CBS).

5 Rendering

The previous sections described the intangible dimensions of this strategic design work. In these sections the design space was relatively abstract. In this section, this abstract information is turned into concrete results that answers the research question in a visual manner.

This section describes the features of the Bucketlist. The features are based on the outcomes of the 'Design Space' (section 3 and 4). In addition, research of van Delden and Reidsma (van Delden & Reidsma, 2013) is applied to explain how the described features contribute to meaning in life of millennials.

5.1 Menu

Description	The menu gives overview to the navigational structure of the Bucketlist
Interaction	Although the menu does not directly contribute to interaction elements, the menu enables users to navigate through different screens intuitively
Key areas	-
Activities	-

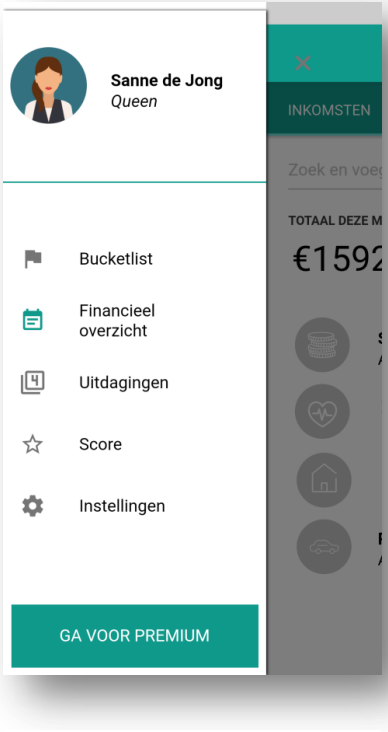


Figure 21 Feature 'Menu'

5.2 Financieel overzicht

Description The goal of this feature is creating a financial plan. A financial plan contributes to the financial moral values a millennial lives by. The design is based on the design of the wireframe 'A-Flexibel'. It consists of three screens 'inkomen'(income), 'uitgaven' (fixed charges) and 'variabele' (variable charges).

Income – this feature contributes to M1.3 'Users must be able to create an overview and monitor their income'.

Fixed charges – Fixed charges monitors the fixed charges that someone has to pay this month, and it also indicates the fixed charges that a millennial can expect in the next months. This feature contributes to 'M1.1 Users must be able to create an overview and monitor their fixed charges'. In this screen it is also possible to add debts (M1.4 Users must be able to create an overview and monitor their debts).

Variable charges- this feature contributes to M1.2 'Users must be able to create an

	overview and monitor their variable charges and M1.4 ‘Users must be able to create an overview and monitor their debts’ Both in the screen ‘fixed charges’ as in the screen ‘variable charges’, it is possible to add friends to share mutual expenses (S2.3 It should be possible to add for example a partner to fixed and variable charges).
Interaction	• M1.1 Users must be able to create an overview and monitor their fixed charges • M1.2 Users must be able to create an an overview and monitor their debts • M1.3 Users must be able to create an overview and monitor their income • M1.4 Users must be able to create an overview and monitor their debts • S2.3 It should be possible to add for example a partner to fixed and variable charges
Key areas	• Financial position • Adequate protection • Tax planning
Activities	• Assessment • Execution • Monitoring and reassessment

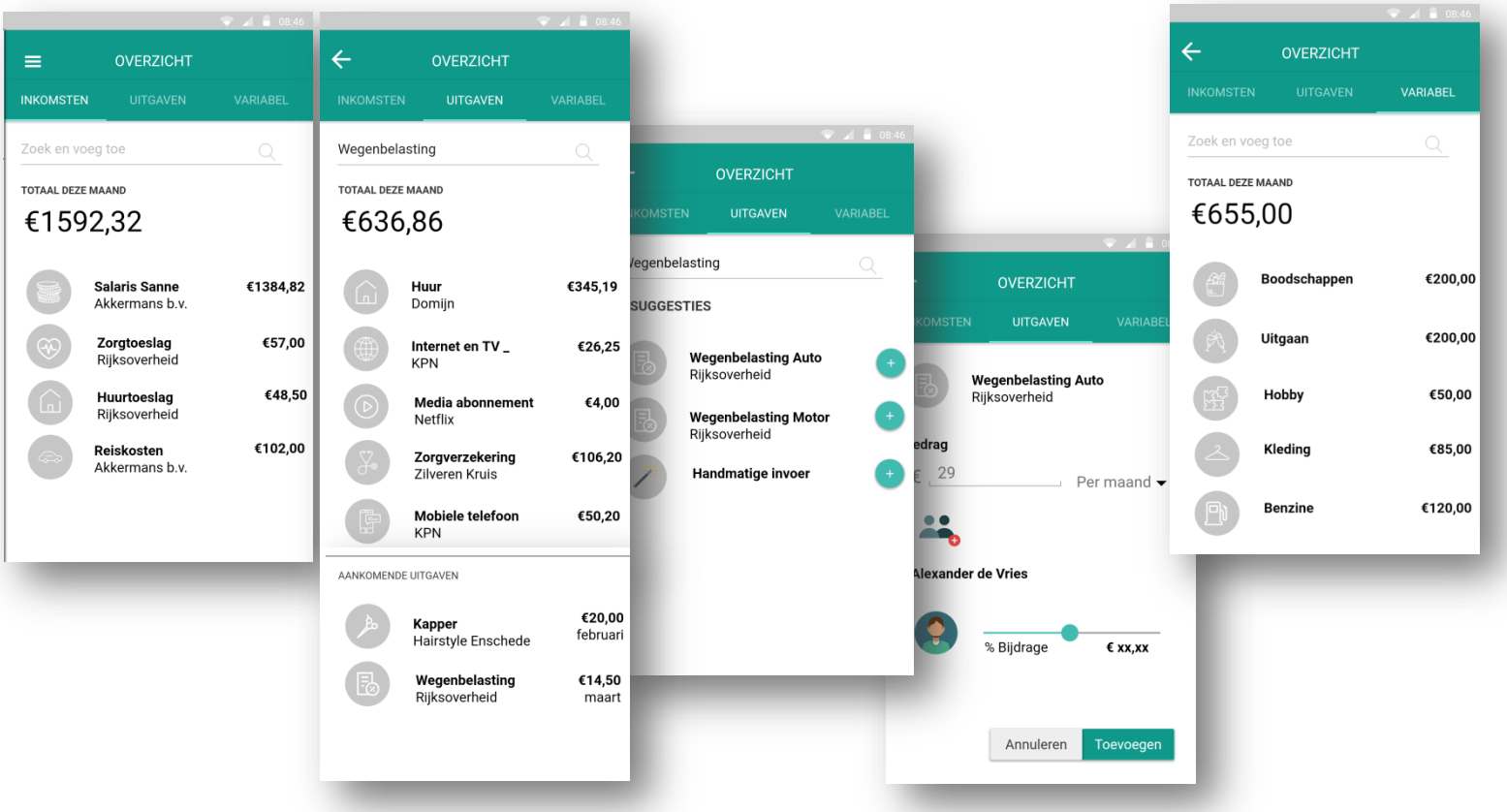


Figure 22 'Financieel overzicht' feature

5.3 Bucketlist

Description	This feature aims to help the user to manage deficiency needs and growth needs (section 2.1.4). The first screen gives overview to life goals. The other screens describes how a user can create a new saving goal. The creation of own saving goals contribute to the need to be self-consistent (van Delden & Reidsma, 2013). Millennials can create their own goals that fit into their identity. In addition, they have the freedom to come up with their own plans to save for these goals. The only rule that the app has is that users first have to fulfill deficiency needs, before they can 'unlock' growth needs. To make saving more fun, the gamification badges have been used to increase the experience. The badges increase saving performances and enjoyable memories. In addition, the badges are used to learn users how to deal with financial threats. Learning to deal with such threats can increase someones feeling of safety and security (van Delden & Reidsma, 2013). Millennials can create mutual saving goals. Saving together for a mutual goal contributes to the need for social relatedness.
Interaction	• M2.1 Positive behavior must be rewarded • M5.1 The Bucketlist must be able to predict future important life events • M5.2 Users must be able to deposit money to a private bank account • M5.3 Users must be able to deposit money to an Achmea bank account • M5.5 Users must be able to manage deficiency saving goals and growth saving goals • S1.2 IDEAL should be used to enable credit transfer from someone's debit account to a saving account of choice
Key areas	• Investment and accumulation goals • Retirement • Estate planning
Activities	• Plan creation • Execution • Monitoring and reassessment

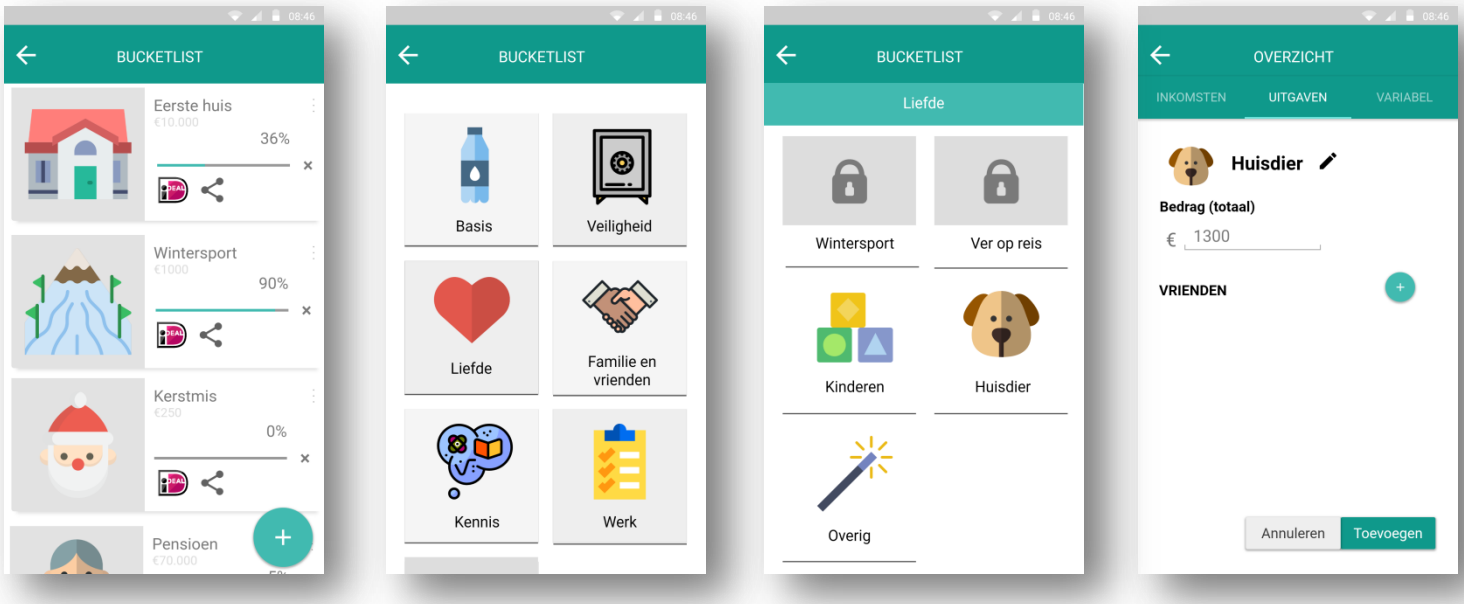


Figure 23 'Bucketlist' feature

5.4 Challenges

Description	The goal of this feature is to challenge users to fulfill deficiency needs. This feature includes rewards and notifications to stimulate the user. The feature is a redesign of wireframes 'A notifications' and 'B-Gevaar!'. The feature adds to the human need purpose (to do things for a reason) (van Delden & Reidsma, 2013). Millennials can for example save their 13th month to achieve Bucketlist-items faster or they can challenge themselves to save money on their groceries.
Interaction	• M2.1 Positive behavior must be rewarded • M2.2 The user must be notified when he shows suspicious behavior • M2.3 The user must be notified when his financial score changes • M2.4 Notifications must help users to get insights in when he or she can expect taxes • M2.5 Notifications have to warn users that they have to save money for special events such as Christmas • M3.1 It must be possible to create a custom plan for retirement, estate, 13th month and special events • M5.1 The Bucketlist must be able to predict future important life events
Key areas	• Adequate protection • Tax planning • Retirement planning • Estate planning
Activities	• Execution

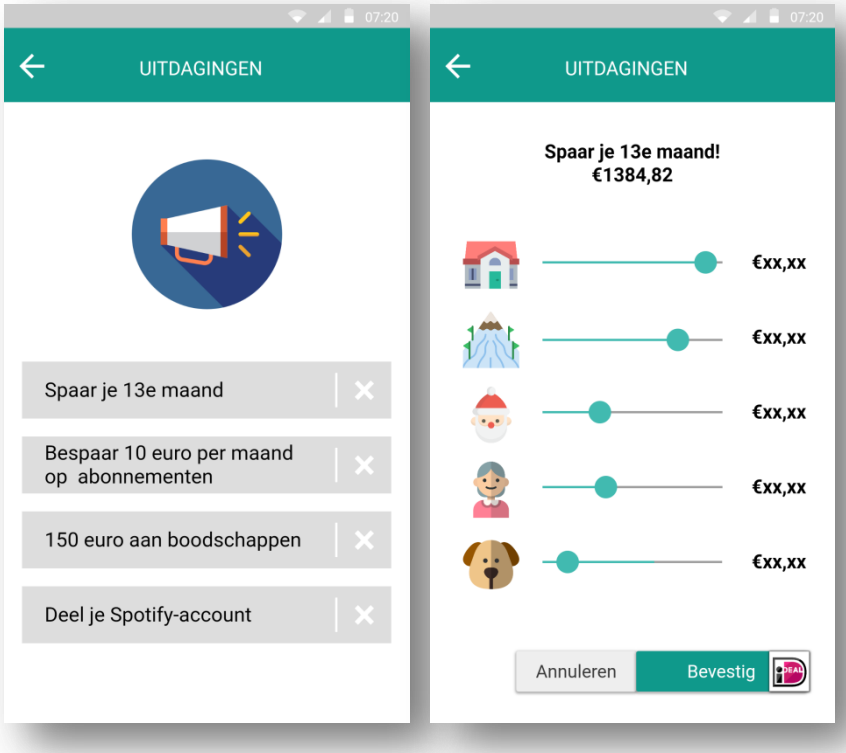


Figure 24 'Uitdagingen' feature

5.5 Score

Description	'Scores' monitors the financial position, and investments goals. The design of this feature is not based on the wireframe 'A score – and tips'. This decision was made in order to fit user needs retrieved from the low-fidelity user test. The screens show millennials achieved life events and it predicts future saving goals (for example retirement and estate planning). In addition, it indicates how a user performs in respect to its peers.
Interaction	• M4.1 The financial position of a millennial needs to be displayed • M5.1 The Bucketlist must be able to predict future important life events • M5.5 The user must be able to manage deficiency saving goals and growth saving goals
Key areas	• Financial position • Investment and accumulation goals (including Retirement planning and Estate planning)
Activities	• Monitoring and reassessment

Figure 25 'Score' feature

5.6 Validation of high-fidelity prototype

A high-fidelity user test is performed to identify the strong points and limitations of the Bucketlist. Goal of the test is to validate to which extend the renders of section 4 add value to the the defined problem space. The high-fidelity user-test is addressed by five millennials since Nielsen and Landauer found in their research that the amount of five participants gives the best outcomes in user-testing (Nielsen & Landauer, 1993). The test was taken in an intercity train between Enschede and Amersfoort and from Amersfoort to Enschede. Reason for the choice of the location is that one of the participants of the low-fidelity user test described that financial life planning should be so easy that it should be possible to do it in the train. Another advantage of user-testing in a train is that many people have twenty minutes time to help. The participants have been selected at random. Since financial life planning is an event that people tend to keep private, the participants of this user-test performed this test anonymous. For that reason it is not sure to which extent the participants represent the Dutch millennial target group. Furthermore, there is no relevance of personal data in this user test.

In the high-fidelity user test the participants had to imagine that they were the persona Sanne from section 2.1.2. In the described scenario she has dreams that she wants to live up to. She wants to buy a house and a dog with Alexander. She wants to go on a holiday in the snow with friends and recently they bought their first car. For this expenditure they used the Bucketlist.

The participants were asked to complete the tasks and contributing questions below:

Task	Tag	Description and contributing question(s)
1	M1.1;M1.2; M1.3;M1.4; S2.3;	1. Sanne and Alexander have bought their first car. The taxes for this car are currently not in their financial plan. Please add 'wegenbelasting' to 'uitgaven'. Alexander pays 50% of the costs. ○ Do you have the feeling that this app gives you an overview of your income, expenses and variable expenses? ○ What do you think of the functionality to add a friend or partner to a savings goal?
2	M5.2; S1.2; M5.5;	2.1. Sanne and Alexander wants to buy a dog. This dog is very expensive and will cost 1300 euros. They already want to start saving. Alexander pays again 50% of the costs. Add this saving goal to the 'Bucketlist'. 2.2 Next to saving for a house, winter sport and a dog Sanne wants to go on a summer holiday with Alexander. Add this savings goal as well. ○ What do you think is the reason that some 'Bucketlist-items' are locked in the app? ○ What is your opinion about this? ○ Do you think that the functionalities in the Bucketlist have the ability to help you with reaching important life events faster? ○ If you would use this app in practice, do you want to use IDEAL to transfer money to your own savings account? ○ Do you think that it will become easier to save money for a goal when the money will directly be transferred to the goal using a 'Bucketlist saving account? '.
3	M2.5; M5.1;	3. You received your 13th month. The app asks you to participate in the challenge to save your 13th month.

	M3.1; M2.2	○ Do you think that challenges can help you to become more aware of the importance of saving for events such as Christmas, retirement or other important life events? ○ Do you think that challenges help you to get insights in important future life events that you did not consider yourself? ○ Do you want to receive notifications when your financial situation is differently from peers?
4	M2.1; M5.1	4. View in your profile how you relate compared to others ○ Do you have the feeling that positive behavior is rewarded? ○ Does the app provide you insights in future life events where you have to save money for? ○ How do you like the functionality that enables to you compare yourself with peers with the same profile?

The results of the high-fidelity user test are described as strong points and limitations. For analysis, the outcomes are related to the described 'interactions' from section 3.3.

5.6.1 Strong points

Render	Strong points	Interaction(s)
Financieel overzicht	• Suggestions given in the 'search' feature	M1.1; M1.2; M1.3; M1.4;
	• Adding a friend to an expense or saving goal	S2.3;
Bucketlist	• Showing that users can only spent money once	M5.5;
	• Achieving Bucketlist-items faster by spending money wiser	M5.3;
	• Bucketlist-bank account increases intrinsic motivation	
	• Gives a realistic indication of the progress of Bucketlist-items	M5.5
	• Insights in saving goals	M5.5
Challenges	• Challenges give insight in unexpected future life events	M2.5;
Score	• Shows that people have to save to retirement for example in order to reach a higher score	
	• Positive behavior will be rewarded	M2.1;

5.6.2 Limitations

Render	Limitations	Interaction(s)
Financieel overzicht	• Difference of income and expenditure is missing	*M1.5*;*
	• Design of 'search' feature is unclear	UI1;
	• Scrolling bar does not work user-friendly	U2I;
	• There is not an integration with banks	S1.1; C1
	• The feature 'variable' is not clear. It can describe variable incomes as well.	UI3;
	• Income and expenditures are not categorized	UI4;
Bucketlist	• Difficult to find Bucket-list items in the Maslow categories	M5.5;
	• Not always clear when it is possible to unlock a Bucketlist-item	UI5;
	• It is not possible to add the most important Bucketlist-item first in the list	UI6;
	• It is not possible to set a deadline regarding a saving goal	UI7;

Challenges Score	• A user cannot see what type of goals other people have • Slider in saving 13th month is not automatically 'tuned' • Not everyone wants to be compared with other persons • Not possible to see in score how the user performed over time. • The name 'score' does not describe its features • Not possible to see in which extend challenges are achieved • Users can only see that they are scoring higher or lower than others do, but it is not clear why.	*S2.4*;* UI8; M4.1; *S2.5*;* UI9; UI10; UI11;

* new requirement retrieved from outcomes high-fidelity user test

5.6.3 Quotes

The participants mentioned the following quotes during the user test. The quotes describe the experiences of users in relation to the Bucketlist.

"I manage my financial planning in the notes of my phone but this is easier! "
Participant 1

"The Bucketlist will help me to remind that I have to save for retirement"
Participant 2

"Talking about financial life planning is a taboo in the Netherlands. I like that the Bucketlist gives insights in expenditures of others"
Participant 3

"This solution is more complete than all the apps banks offer"
Participant 3

6 Conclusion

The central research question of this report was *'In what way can social graphs and gamification contribute to the behavior of millennials' towards financial life planning in order to help them live an optimal life?'* This research question was answered using the enterprise design framework that answers the research question on the intersection of **people, business** and **technology** as described in the introduction. The 'people' aspect describes the **optimal life of millennials**. The 'business' aspect describes Achmea as enterprise where Achmea wants to help millennials with financial life planning. Finally, **Social graphs and gamification** have been chosen as contributing ''technologies.

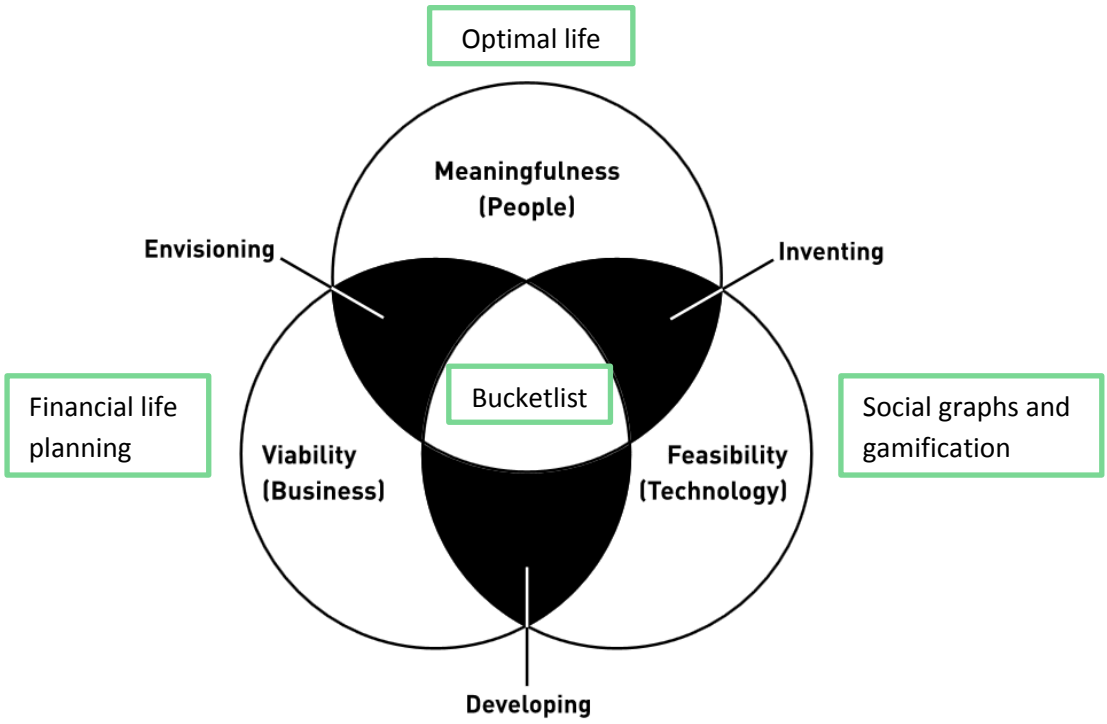


Figure 26 Enterprise Innovation and its relation to People, Business, and Technology (Guenther, 2013)

6.1 Millennials and Achmea

Envisioning is the term that Guenther uses to recap the outcomes on the intersection of people and business (Guenther, 2013). Millennials grew up in the financial crisis and in a period of economic recovery. For this reason, millennials are mistrustful of established financial institutions and brands. Millennials also believe that innovation will come from outside the financial industry. Only 6% of millennials find it important to save for retirement (section 2.1.1). Financial life planning can be related to human needs. There are two types of human needs; deficiency needs and growth needs. In order to live life to the fullest, it is suggested that millennials first have to be able to finance deficiency needs before it is wise to spend money on growth needs such as saving for retirement or aesthetics (section 2.1.4). Millennials identify their twenty-year older self as another person, therefore Achmea should help millennials to act in a more future oriented way (section 2.1.3).

6.2 Achmea and technology to support saving for life events

Developing is the term that Guenther uses to recap the outcomes on the intersection of business and technology (Guenther, 2013). Achmea wants to have instruments that make it easier for millennials to save for important life events, like retirement (section 2.2). The selected instruments are social graphs and gamification (Meijer, 2016). The key areas and activities described by the financial standards planning board described in section 2.4.1 and section 2.4.2 can give an interpretation to these technologies. The technology section (section 4.3) describes that gamification badges have the potential to reduce hyperbolic discounting (the tendency to favor short-term rewards instead of long-term rewards) (section 4.3.1).

6.3 Millennials, social graphs and gamification

Inventing is the term that Guenther uses to recap the outcomes on the intersection of people and technology. Millennials want to live an optimal life without worries. They work digitally and are very sensitive to reviews, advice of friends and opinions from their networks (section 2.1.1). Although, literature suggested that millennials share all their data freely with friends, the low-fidelity prototype test showed that financial data is an exception. The result is that social graphs related to financial data should present anonymous data in order to increase millennials' performance based goals (section 4.3.2). The second gamification element applied are 'badges'. Gamification badges work for people in general. The high-fidelity user test shows that badges do not surprisingly also work for millennials (section 5.6).

6.4 Enterprise innovation: The Bucketlist

The research question was: "*In what way can social graphs and gamification contribute to the behavior of millennials' towards financial life planning in order to help them live an optimal life?"* Section 5 describes the answer visually as the 'Bucketlist'. The Bucketlist is a concept that captures all outcomes of this research on the intersection of people, business and technology. It has been designed, prototyped, and validated. The result is that people are enthusiastic about the concept. Additionally, Achmea is currently reviewing delivery plans on launching this concept as a proposition for her retirement services business unit.

7 Limitations and future work

This study cannot encompass all requirements. Limitations of interactions are described in this section together with items that are relevant for future work.

7.1.1 Practical constraints

Due to practical constraints, this research did not provide a comprehensive implementation of S3.1 'Users should be able to compare themselves with one of the predefined persona's. Although asking a millennial to compare himself with a predefined persona is one of the resulting ideas of the low fidelity prototype test, the decision was made to include only functionalities in the Bucketlist that directly contribute to performance based goals of millennials. For the same reason none of the all 'could have requirements' have been taken into account .

7.1.2 Social constraints

The outcomes of the low-fidelity prototype test resulted in not including R17 'Millennials should be able to receive advices and opinions from their network (Centraal Beheer Achmea, 2015). The reason is that people indicate that they consider their financial situation as a private event that they do not want to share with family and friends.

7.1.3 Validation of renders

The renders are validated using a high-fidelity prototype in section 5.6. This user test gave insights in the strong points and limitations of the Bucketlist. Now, it is possible to understand from people's perspective what is needed to improve the functional and non-functional elements of the bucketlist. The outcomes are suggestions for improvement described in this subsection. The suggestions are categorized in features regarding the functionality of the bucketlist (must, should, could). In addition, to a set of non-functional functionalities regarding the UI of the bucketlist.

Must	Suggestion for improvement
M1.5*	Showing in 'financieel overzicht' how much money is left or missing initially
M5.5	Future research is needed to determine how life events exactly fit in the categories of Maslow
M4.1	Keep the function to compare to others optional

Should	Suggestion for improvement
S1.1	Importing csv files
S2.4*	New feature where people can become inspired by savings goals of other people
S2.5*	Adding a 'history' feature where a user can measure how he performed over time

Could	Suggestion for improvement
C1	PSD2 integration

UI	Suggestion for improvement
UI1	Showing search results when the user is typing its request
UI2	Redesign scroll-bar
UI3	Two categories (inkomen & uitgaven) in 'financieel overzicht' instead of three ('Inkomen',

	'uitgaven' and 'variabel')
UI4	Dividing income and expenditures in categories
UI5	Describing what is needed to unlock a Bucketlist-item
UI6	Enabling to prioritize Bucketlist-items
UI7	Add deadlines to savings goals
UI8	Redesign of sliders
UI9	Changing the name 'score' in challenges
UI10	Adding a progress bar to challenges
UI11	Describing in which directions people score higher or lower than others do

7.1.4 Future work 'People'

A research question for future work is: "*In what way can technology contribute to the investment behavior of millennials' in order to help them live an optimal life?".* This future research builds on the design theme 'from savings to investments' described in the research topics (Meijer, 2016). During research topics, design themes were used to define the problem space from different perspectives. The design theme 'from savings to investments' proposes to change the saving mindset of millennials to an investment mindset. The purpose of 'from savings to investments' lies in the domain of how millennials can increase their rate of return from their investments. In the end, this will also contribute to living an optimal life.

7.1.5 Future work 'Business'

Delivering the Bucketlist was out of scope of this research. Achmea as enterprise finds the outcomes of this research interesting resulting in future work opportunities. Future work includes deployment of the Bucketlist. To make the Bucketlist ready for deployment, the design space must be opened up again by researching current investments, resources and challenges for innovation in the retirement services business unit of Achmea.

7.1.6 Future work 'Technology'

Next to 'people and business', technological developments also open up the design space for future work. In 2018 the European Union will introduce a new EU directive that is called 'PSD2' (Payment Service Directive 2) to regulate payment services and payment service providers throughout the European Union. The purpose of this directive is to increase competition and participation in the payments industry also from non-banks (European commision, 2016). This directive generates future work opportunities to realize S1.1, C1, C3.

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