Design for
circular service engagement

A strategic design for consumer
product subscriptions by Bundles.

Graduation Project by Joeri Simonian // final report
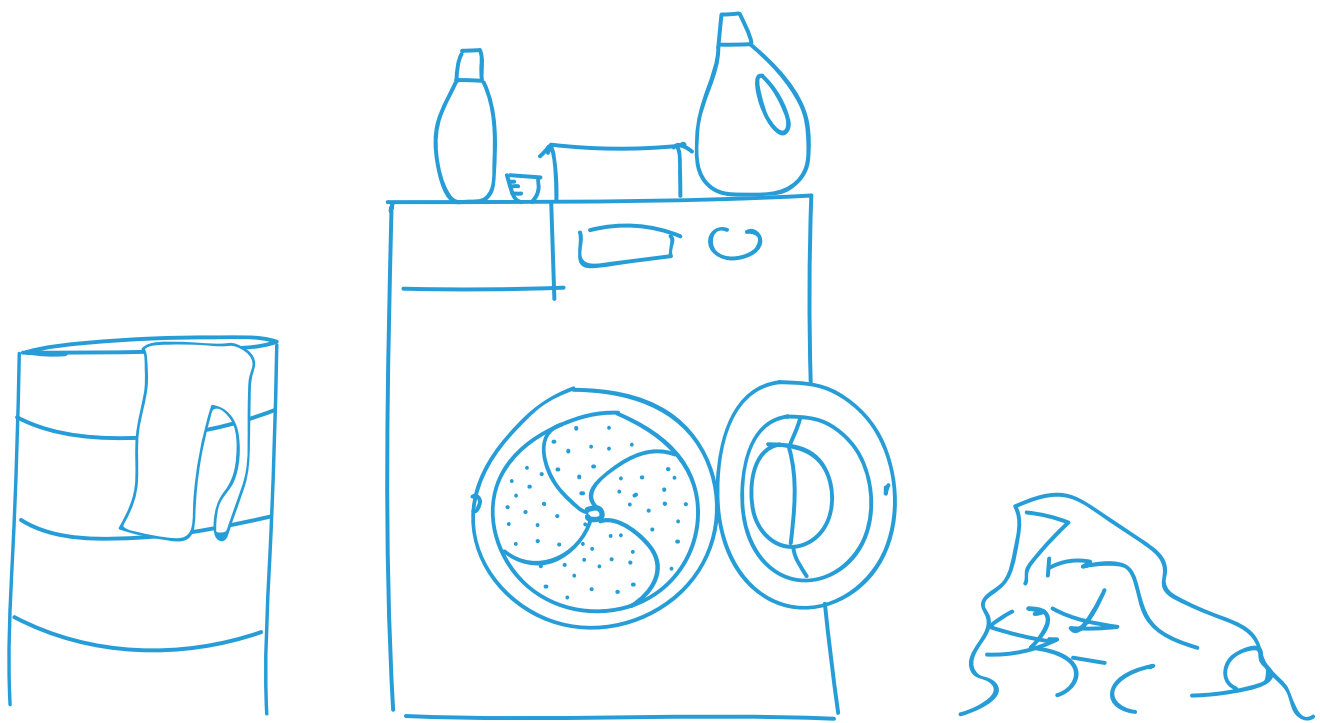4113926

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PREFACE

With this thesis, I conclude the master programme Strategic Product Design. Since the start of my studies in 2010, I have been exploring how I want to contribute to our society. During my minor Sustainable Design Engineering, I became eager to design products and services that are fundamentally better than the status quo.
Not just better for the environment, but meaningful to people and businesses. In my master, I've learned to explore opportunities, and shape innovation. This project explores how we can enrich daily life of people step by step while fostering the planet we share. With this report I hope to inspire Bundles and its partners to jointly innovate for a circular future.

GLOSSARY

Blockchain Technology - A digital concept in which blocks of information are securely linked, updated and encrypted in a network of computers.

Circular Economy (CE) - A model to structure and sustainably design the phases of products (and services) from raw materials to end of life.

Co-creation - A design activity in which different stakeholders (e.g. companies, consumers, organisations) jointly work on creating a solution.

Customer Journey Map (CJM) - An overview of activities a customer experience throughout the interaction with a company and its touch points (products, services, marketing, etc.)

Pay per access -a characterization of a business model in which a customer pays a fixed price to get access to an asset like a washing machine in their house or a shared location.

Pay per use - a characterization of a business model in which a customer pays a variable price based on the frequency of use of a certain product and/or service.

Plug & Play - the ability of a product or service to operate as soon as it is connected to the required resources (e.g. power, water) and turned on.

Product Service Systems (PSS) - A joint offer of products with complimentary services that are supported by one ore more organizations.

RFID - radio-frequency identification is a low-cost technology using a passive identification tag that can be detected by a active scanner.

Sensitizing booklet - a research tool to make people aware of and reflect on their own context, experiences and desires.

Subscriber - a customer at Bundles

White label - a product which is rebranded by a retailer/marketer to be presented as their production.

EXECUTIVE SUMMARY

Traditional business models mostly focus on selling high volumes of products to gain revenue. In the case of washing machines, the product is sold, after which it mostly remains in a fixed configuration. Product or software upgrades rarely happen, if at all, and the interaction between companies and customers are limited to repair issues or up-sales.

In this project, a service design approach is used to explore new value opportunities for consumers in a circular product subscription; based on the data that machines and consumers can give as input to a digital system. The analysis and design is focused on the washing machine PSS by Bundles, a Dutch company that commissioned this assignment.

A clear desire emerged from the quantitative analysis of the review-site klantenvertellen.nl and qualitative sessions with consumers and investors. Consumers want to get more insight in the impact of their use, and more support by data-driven services. Investors, and Bundles, want the company to become more innovative and transform the system-data into sustainable and recurring value.

The literature assessment provided a structure to analyse Bundles. The product-service system (PSS) definitions show that Bundles can benefit from self-learning (feedback) elements, and that more involvement by all stakeholders will benefit the offer. Seven PSS-characteristics by Valencia et al. (2015) along with the theory by Rexfelt af Ornäs

(2009) showed that Bundles can or should invest in making the PSS fit with their customer needs and that they need to show how the PSS will influence the everyday life.

Qualitative research was performed with consumers to explore opportunities to make a positive impact on daily life.

After a brainstorm with Bundles, Miele and Crownstone, three ideas were developed in the following concepts:

A digital laundry planner to integrate the laundry more fluently in personal planning and increase the insights and control over laundry activities. This concept was positively evaluated in three focus groups.

A gamified laundry experience posing challenges and offering activities to increase sustainable impact on consumer behaviour. The underlying activities were positive rated, but all three focus groups did not have the desire to be asked for a competition.

The personal clothing manager this is a long term concept, based on a 5 to 10 year prediction from blockchain and digitalized laundry labels in clothing. During the focus groups, the desirability of the servitization was explored. The majority of the participants perceived the concept as desirable.

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1 INTRODUCTION

This graduation project applies the design theory of product-service systems(PSS) to increase the value for consumers and companies in a circular product subscription. The analysis and design is focused on the washing machine PSS by Bundles, a Dutch company that commissioned this assignment. This chapter introduces the project by challenging the status quo, with an introduction of Bundles and the circular economy, defining product-service systems, assessing trends that drive this project, and finally the purpose and research questions for this project are presented.

1.1 A status quo that needs change

Traditional business models mostly focus on selling high volumes of products to gain revenue. In the case of washing machines, the product is sold, after which it mostly remains in a fixed configuration. Product or software upgrades rarely happen and the interaction between companies and customers are limited to repair issues or up-sales. Supporting optimal use of the machine by the user, or learning from the consumer's personal needs are limited to customer support channels and market research. High-end brands, that offer quality, comfort and long product lifetimes, are challenged by low-end brands that offer products wwith a short lifetime. Low-end products fulfil the core needs, but offer limited comfort in use. Cost cuts in development and production cause shorter lifetimes of products. This results in a need for consumers to invest more often in repairs or in a new product; discarding the old product. Beside the discomfort and extra costs for the consumer, the environmental burdens cause harm on a short and long term perspective. On short-term, the discarding process causes air and/or soil pollution. On the long-term, material depletion will form problem. In a system where companies compete with linear business models, companies need to sell enough volumes of products. A product that lasts too long in a linear business model has undesired consequences for a company its cash flow. Up-sales of products/services or sales of replacing products are common to gain extra revenue.

Traditionally, products are designed for short term linear business models that cause environmental burdens and limit consumer comfort.

But what if products were to designed to last? Designed to be upgraded and repaired to save production costs and energy. In a circular product-service system, it is possible to improve the consumer experience while increasing the profitability from a product and improve the sustainable impact.

1.2 Bundles and the circular economy

This project is commissioned by Bundles, a company that is eager to contribute to the transformation towards a circular economy with product-service systems. Marcel Peters started Bundles in 2014 in The Netherlands; the team has grown to about eight people. The company its offer can be described by the newborn slogan: The best stuff as a service. The current portfolio consists of high-end washing machines, dry tumblers, dishwashers and full-automatic coffee machines. These products are offered to consumers in two subscription forms: pay per use, and pay per access. Bundles remains owner of the device, which eliminates a purchase investment from consumers. Currently, more than 1000 customers use a total of more than 1100 products via a subscription by Bundles; the majority are washing machines.

"By design, circular economy models require companies to become highly involved in the use and disposal of products, finding ways to move revenue generation from selling the physical stuff to providing access to it and/or optimizing its performance along the entire value chain." (Circular Advantage, 2015) Bundles' pay per use business model is data-based: the machines are connected to the internet to track and monetize the consumption. By doing so, they create an incentive for consumers to minimize their consumption. Figure 1.2-1 illustrates the promises to consumers and what Bundles desires from industry partners like Miele. Currently, the industry does not design its products for a circular economy. By proving a business case of circular subscriptions, Bundles aims to convince Miele to become more engaged in the circular economy. One of the advantages in these data-based business models with recurring revenue, is that customers have a more frequent interaction with companies; which enables companies to foster a long term relationship with customers. The data from the appliances and the customers form a great potential source for continuous innovation.

Figure 1.2-1: The circular economy applied to Bundles.
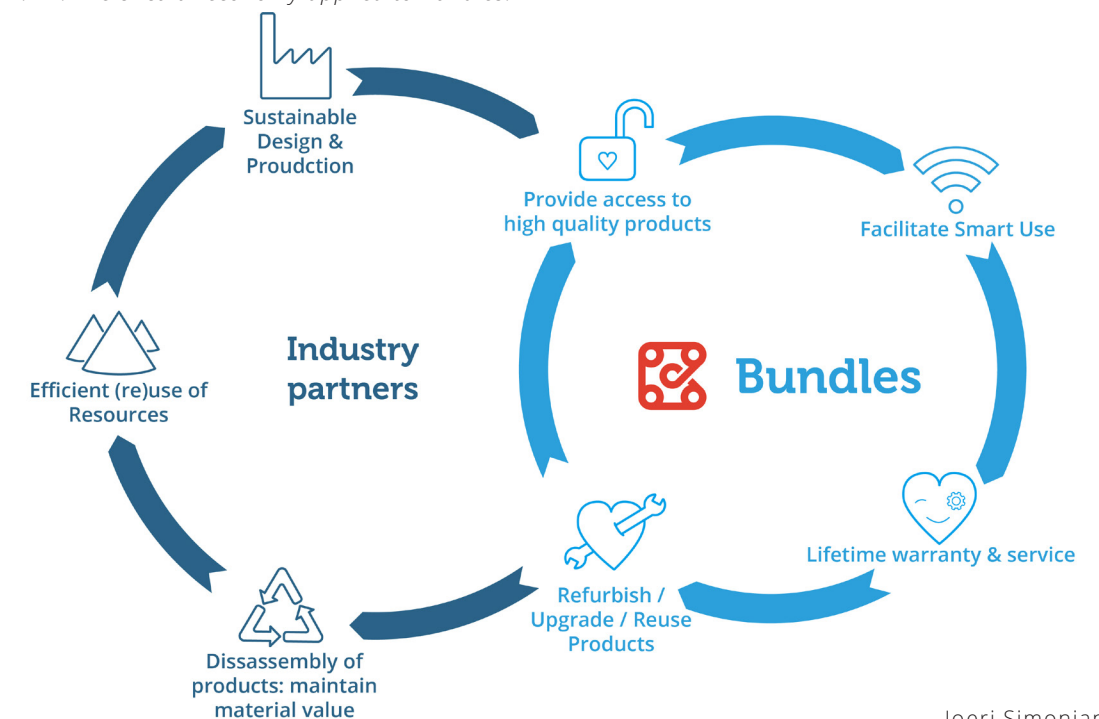
1.3 The basics of a Product-Service System

Understanding the basics of PSS is essential to set the scope of the design process and to analyse the structure of Bundles its proposition. Products can be described as tangible assets that perform a certain activity for the user. Services can be described as intangible activities that are performed by a person or system. In a way, warranties can be seen as a service: the service of repairing/replacing a product when quality issues occur. By law, companies are obliged to offer limited warranties with the products they sell. The question rises, what is meant by a product-service system? A wide used definition in scientific articles is by Goedkoop et al. (1999):

'A product service-system is a system of products, services, a network of "players" and supporting infrastructure that continuously strives to be competitive, satisfy customer needs and have a lower environmental impact than traditional business models'.

This PSS definition suggests that Bundles could or should design the products and services as an integrated whole. However, Bundles has no direct influence on the design of the products. The company can develop touchpoints that interact with the machine, and engage Miele to develop new customer experiences together. This project focusses on the design of services to facilitate smart and sustainable use of the washing machine. More on the theoretical background of PSS and how to design a PSS will be presented in chapter 3.

1.4 Trends and developments that drive this project

Increasing value of offers through servitization.

"Servitization is the innovation of an organisation's capabilities and processes to shift from selling products to selling integrated products and services that deliver value in use." (Baines, Lightfoot, Benedettini & Kay, 2009) The more an offer is servitized, the more the value shifts from product based content to service based content. Many B2B and B2C examples are where performance, access or use is sold rather than solely products. In consumer goods like washing machines, examples of servitization are common. Leasing companies, like Splashlease, offer machines including delivery, installation and maintenance in a monthly price. Bundles and competitor Homie offer a slightly higher level of servitization, both by offering insights about consumption; Bundles includes subscriptions on consumables as well. An example of a highly servitized laundry product is FreshFolds, a Dutch company: it is a laundrette service that picks up laundry, cleans it, folds it and delivers it to the customer.

Increasing connectivity of products

In 2017, 8.4 billion connected products will be in use, it is expected to rise up to 20.4 billion units by 2020. 63% of these devices are used by consumers. (Gartner.com, 2017) Internet of Things (IoT) technologies enable companies to offer experiences supported by or based on data and (artificial) intelligence. These experiences can be personalised and automated to address the needs of the consumer at best. Examples of applications are smart heating systems for at home. Devices like Google Nest or the Toon (for Eneco energy customers) can detect activity and learn from consumer habits to optimize the heating of the houses. Companies like Samsung develop product portfolio's to turn consumer electronics in your home into one connected system that you can remotely control. Smaller companies like Crownstone Rocks enable consumers to transform a set of appliances into a smart system by offering an IoT replacement for the electricity sockets in homes. This IoT solution enables people to manage the use of devices and optimise the use/bill of energy. The fact that Ikea, as a low and medium-end furniture shop, offers connected plugs and wall sockets, is a sign that the development of connected products is penetrating all consumer markets from low- to high- end.

Willingness to share data

Linked to the connectivity of products is the collection of data by companies. With the vast amount called Big Data, calculations and predictions of individual and group behaviour can be made for a layer of intelligence in products and services. According to a study in the US by PwC (a multinational in business services) people are accepting the fact that companies collect data. (Consumer privacy and information sharing, 2012). 73% of the respondents were willing to share personal data in return for benefits like discounts, free products or an ad-free experience. An example is Google maps: ad-free navigation in return for location data. Although this has great benefits for personalising experiences and facilitating automated experiences, there are privacy concerns among people. In a study by Frog Design in 2014 among consumers in the US, China, India, Great Britain and Germany, 97% of the respondents had concerns that businesses or governments might misuse the data shared (Morey, Forbath & Schoop, 2015).

"Transparency and the control over data are important factors for the design of data-driven product/service offers, to gain trust from consumers." - Morey, Forbath & Schoop (2015)

Shifting business focus & metrics

With new business models, the focus of business and design managers shift to a long-term and recurring solution for customers. Fulfilling and excelling their needs either with a product, a service, or a combination of both.

'... we've seen a seismic shift in growth strategies for business brought about by a growing preference on the part of both businesses and consumers to subscribe to services, rather than buy products.' - Tien Tzuo CEO of subscription platform Zuora (Forbes.com, 2016)

Spotify is a well known subscription example where you don't buy tangible music media or single digital copies, but get a subscription to the

music you like. Besides granting access to music, the service helps you explore new music that is tuned to your preferences. This service approach can inspire Bundles for interactions that they facilitate for their users.

With a shift from selling products to product/service subscriptions, companies need to shift their business focus from selling products to cultivating a long term relationship with their customers. Rust, Moorman and Bhalla (2010) propose a new business development perspective and new business metrics as presented in Figure 1.4-2.
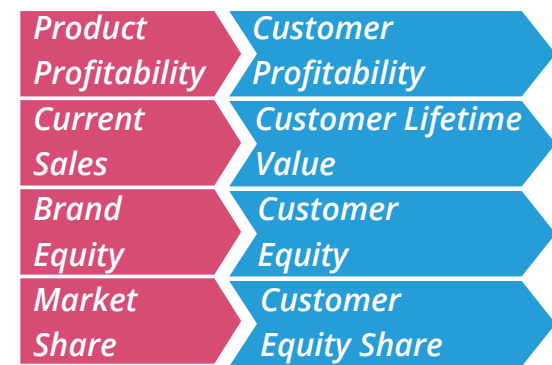
Product Profitability	Customer Profitability
Current Sales	Customer Lifetime Value
Brand Equity	Customer Equity
Market Share	Customer Equity Share

Figure 1.4-2: New business metrics by Rust et al. (2010) for a long-term customer centric business perspective.

With the new business metrics, Rust et al. (2010) introduce the function of a Chief Customer Officer (CCO). The CCO's task is to make sure the customer focus is integrated in the R&D and marketing activities. Consequently these departments will need to work together more closely. For large established production companies, this shift has great impact and is a challenge to implement. Miele NL and Gorenje (AEG, ETNA) both indicated in conversations with Bundles that the shift from producer to service

provider is a challenge for them. Manufacturer organisations lack the experience, organisational structure and mindset that is needed to set up a subscription proposition.

"It will soon be the only competitive way to serve customers." - Rust et al., (2010)

For Bundles as agile service provider, this is an opportunity. They can help manufacturing companies to design the subscription offer, help to set up the refurbishment logistics and offer a possibility to experiment under the Bundles brand and algorithm without the need to engage in contracts with customers or initiate large organisational shifts.

Increasing customer expectations
As technological development enable improved product features and offered services evolve , the customer expectation baseline shifts up. Development in technologies for mobile phones and internet can be used to illustrate this. Where the majority did not see the need for a mobile phone when they were introduced to the mass market, the majority now expects to be able to communicate where, whenever and how they want including the internet. Internet on your phone used to be a luxury, now it is becoming more and more the fundamental technology for mobile communication and gathering information. For businesses that sell or lease washing machines, free delivery is not a unique service any more. As established Dutch retail companies like Coolblue, Bol.com, BCC and Dixons include this

service in their offer, competition is pushed to do so as well. So along with products, evolving service offers increase customer experiences as well.

Increasing demand for sustainable solutions
There is a growing interest as well. In a research among 30.000 in 60 countries worldwide, 66% were willing to pay more for sustainable goods; this is a rise from 55% in 2014 and 50% in 2013. (The Sustainability Imperative, 2015) The interest among Millennials, born between 1981 and 1997, is stronger than the global average, with 73% willing to pay more (The Sustainability Imperative, 2015). As renewable energy is gaining popularity, new concepts like washing when the sun is shining are gaining popularity (Kobus et al., 2013).

1.5 Purpose of project & Research question
The trends that drive this project build up to an opportunity to develop data-driven services, to support the user and increases the sustainability of its use.
The purpose of this project, contributing to the circular economy by exploring opportunities to develop data-driven services. Ultimately to enrich the customer experience and lower the impact of

use. The deliverables of the project are: a design strategy for Bundles to develop these data-driven services and a number of service examples. The deliverable should inspire Miele and Bundles to work together in developing circular subscriptions.

The research question therefore is:
How can Bundles increase the value of their data-driven washing machine subscription for consumers?
RQ1. How is the current proposition perceived by customers?
RQ2. What do customers and investors expect from Bundles?
RQ2. How can design theory of product-service systems help development of Bundles circular subscription?
RQ3. What are problems in daily/weekly laundry activities that Bundles can solve/ease?

Takeaways
The introduced trends and developments in business, society and technology form an interesting opportunity to apply design theory of product-service systems to a circular product subscription. The research question to answer: How can Bundles increase the value of their washing machine subscription for consumers and stakeholders with data from appliances and consumers? An extensive project will be described in this report: analysing Bundles, its customers and competitors and the design theory about product-service systems. The analysis will be used to design prototypes for an improved PSS proposition which will be tested among consumers. Every chapter will end with a block of takeaways to briefly summarize the key facts and project the next steps.

2 COMPANY ANALYSIS

This chapter introduces the company Bundles by their vision, mission and ambition. It gives an insight about the business structure and development process. Next, an update to the existing brand is presented. The PSS offer is introduced including the supporting stakeholders. The chapter ends with an overview of the company its strengths weaknesses and proposes brand pillars.

2.1 About bundles

Vision & mission
The vision that Bundles is driven by:
A circular world in which companies create better solutions, which are accessible for everyone and materials are preserved for the next generation.

To contribute to the vision:
Bundles aims to realize a system change towards a circular economy by collaborating with product companies to offer high value experiences to everyone and optimize their value chain through smart technology.

Target group
The main customer segments Bundles focusses on are based on purchase arguments: low purchase investment, sustainability, flexibility of contract and service.

Business structure
The company aims to reuse assets like the web shop and subscription algorithms. Therefore, a structure of business entities is created, enabling development for multiple product categories; in cooperation with multiple (competing)

manufacturing brands. All while Bundles remains an independent mother company and brand.

Business model
Bundles owns the appliances that they install at the customer's home. Customers/subscribers pay for the use plus a fixed price per month or pay for access to the machine at a higher but fixed monthly cost. Supporting services like delivery, installation, maintenance and tips about the use of the machine are provided with the subscription. Bundles also offers a service for moving the appliance, charging per moving event.

Business Strategy
Bundles positions itself to high quality manufacturer brands as a partner to facilitate the transition towards a sustainable subscription economy. Three main benefits which are offered:
- Developing an environmental and financial sustainable business model.
- Targeting consumers that would otherwise (financially) not be able to buy the product.
- Setting up a direct interaction channel to customers.

The direct channel to customers is partly in place as all subscribers at Bundles receive monthly overview of use and costs. Manufacturers like Miele try to set up a database of customer by offering something in return for registering the product. For example a cash back action or discount/free consumables like detergent. By the subscription model, Bundles already has this data. This enables Bundles to have direct contact with their customers; which is a valuable potential pilot group to Bundles and partners. Bundles aims to use the potential of the direct customer interaction via a personalised digital platform.

Growth Tactics
The growth of business is approached in two ways. The first is extending the base of subscribers per product category, this involves marketing actions via Bundles channels and partner channels like the web shop for customers and non-customers of the NRC (a Dutch newspaper).

The second direction of growth is by extending the product categories in the subscription portfolio. Bundles started in 2014 with wash machines, two years later dry tumblers and dish washers were added. The portfolio growth has the following tactics:
- Form partnerships with high quality hardware companies. (Miele, Siemens, etc.)
- Design a subscription business model for the PSS proposition. (Products, service, price structure)
- Offer subscription via Bundles.nl or a white label channel for the manufacturer.
- Link the products via a smartplug to the Bundles app and develop extra use/service features for products.
- Sell subscriptions via Bundles.nl, or (temporary) partner channels.
- Collect, enrich and monetize data.
- Provide/sell insights of data to stakeholders to accelerate innovation.

For a small company with limited resources, the simultaneous growth of customer base, product/service development, increasing operational effectiveness and portfolio extension is has its downsides.
Bundles desires to stimulate customers in becoming involved in the circular economy. But other than making sustainable machines financially available to people, the promise to minimize waste by facilitating more sustainable habits is not significant. The data-driven services are missing, and customers get only monthly feedback of their use via an invoice. Yet, the company moves forward by extending the product categories. Developing new subscriptions is time taking, as they demand a lot of work from a business and design perspective. This can result in a lack of focus and quality for improving the existing propositions and customer experience. This trade-off is addressed by Porter (1996):

"A company must continually improve its operational effectiveness and actively try to shift the productivity frontier; at the same time, there needs to be ongoing effort to extend its uniqueness while strengthening the fit among its activities".

2.2 Brand positioning

A well defined brand can contribute to a consistent customer experience. By using it as a starting point for everything the company does and creates, the brand values and qualities are conveyed and form the basis of the customer experience. To use the brand as a valuable source for inspiration and innovation, it must be: rare, imperfectly imitable and non-substitutable. (Abbing, 2010). Therefore, it needs to be more than just a name and a logo, it needs to convey a personality and a story.

Bundles is depending on a range of external partners for production and operation, as can be seen from the stakeholdermap in Figure 2.3-4 on page 21. These partners have a strong influence on the experience of Bundles its customers, therefore it is important to convey the brand character to the partners.

Current branding

The Bundles brand is currently based on the circular economy, but what CE is and how Bundles applies this to their offer and operations is unclear on the website. Furthermore, the elements that describe the brand on the website: Quality, Service and Sustainability are too generic and easy to copy. The company gained awareness due to their sustainable business model, which is new to the Dutch market. With the mission to achieve a system change and addressing everyone, Bundles presents itself as a category leader brand. 'Category leaders seek to dominate and appeal to the mass market with bold product initiatives' (Beverland et al., 2010). The current

growth of the subscriptions, however, is not as projected. To convince a larger market, the company needs to enrich the brand and proof how they realise a system change. They need to show how their offer is better than any other lease or retail option. The cumulated cost of the service over the expected lifetime of a product, is higher than purchasing the product. Why is it better to have "the best stuff as a service"? What makes the Bundles experience unique to customers? What does Bundles add to the experience of using the Miele machines?
A brand development method is performed to enrich the brand. The "Dresscode" method by Dutch design agency Van Berlo was selected as it is a quick and holistic way to define a brand. The method is described in Appendix A, the results are as described next.

Market Definition

Although Bundles only offer leaseplans, they also target people who are interested in buying a machine.
Therefore, the two markets for Bundles:
A1. leaseplans for ...
A2. retail of...
... consumer home appliances and consumables.
One could argue that Bundles competes with services like a laundry shop, or laundry service that picks up dirty laundry at home and delivers washed, ironed and folded clothes. This market is further from Bundles its core, nevertheless interesting to include in the competitor analysis in chapter 3.

Internal values

Bundles values: flexibility, transparency and honesty.
Bundles would like to: accelerate sustainable business, inspire people and business, optimise product use, offer quality & comfort.

The values of Bundles' target audience

He/she wants to: have a high quality machine, pay for what they use, a flexible contract, have no worries about maintenance, get the best result from their machine, enjoy a fast, personal and effective service, and contribute to a sustainable society.

Brand personality

The brand personality is explored by discussing which of the 15 character sub-traits found by Aaker (1997) would fit Bundles. The following six were selected to describe the company:
Daring – Bundles wants to challenge the status quo, disrupting current consumers and business habits with positive change.
Up-to-date – Bundles is future

minded, trying to make use upcoming technologies and business models.
Spirited – Bundles is a talented but small and young company that is eager to learn and open for improvement.
Cheerful – The company reasons from an optimistic perspective, aiming to trigger positive emotions among their customers with an informal and helpful communication style.
Honest – Bundles values transparency and incorporates this in the way they communicate and operate with all stakeholders.
Charming – A smooth and personal experience is provided by combining human interaction and backed up by a solid data system.

Core Proposition

A carefree & smart subscription on products and services, supporting sustainable convenience in everyday life.

"Proof" that supports the core proposition.

· Desired but not fulfilled: Data driven/based pricing, use tips, savings (costs, energy, consumables). Providing insight & control for sustainable use.
· Direct & Personal customer support & assistance.
· Flexible 1 month contracts, with a transportation fee (€89) if cancelled within 5 years
· Brand & product curating: Miele for quality & comfort; Seepje as natural/ sustainable detergent.
· Free/included: delivery, installing, maintenance.
· Closing the loop: maintain, reuse, repair, refurbish, recycle. Refurbish and recycle processes are not fully developed yet.

2.3 Current offer

This part describes the current washing machine offer. The essence of the offer is a high quality machine, with a carefree service at a pay per use or pay per access price model. Pay per use subscriptions include a connectivity kit that transmits the use data to Bundles. At this moment, only the frequency of use is measured for the billing process.

The pay per access subscriptions are currently not connected to the internet, due to the extra cost of hardware (+/-€100) for Bundles. The connectivity kit consists of an IoT plug between the socket and the power cord, and a bridge that is linked to the internet modem of the customer.

The services that are included are: delivery, installing and operational support. Via social media and newsletters customers are inspired and stimulated to optimise the use of the machine.

Consumables are part of a circular economy and therefore offered in an additional subscription.

The offered brands are selected

Figure 2.3-3: A carefree Bundles offer by combining products and services.

and stimulated on sustainable aspects: Seepje (100% nature based), Miele (automated dosing to reduce spillage), Ariel (promise to adjust product packaging). The detergent is automatically and periodically delivered at home for free. At a lower product price than the standard supermarket price, but slightly higher than discounted supermarket prices. The customer benefits: automated stock refill, consistent fair price, no need to carry bulk packages.

Besides offering a sustainable machine, Bundles will need to provide better feedback to the user and support him/her to use the machine in a sustainable way: choosing the right program and maintaining the machine.

2.4 Stakeholdermap

The stakeholdermap below illustrates the organizations that are involved in funding, developing and delivering the proposition to the customers. The further the entity is placed from the customer, the less they are interacting with Bundles customers. Miele has a special role in the stakeholder map as it has three types of relations with Bundles. Miele is stakeholder as investor, producer and service partner; these interdependent roles form the need for a close relation between Bundles and Miele. This need for a close relation is supported by Valencia (2017).

Miele is committed to the circular economy by investing in Bundles and using the partnership with Bundles as an experiment to explore the benefits of a subscription business model in the circular economy. Among these possible benefits: recurring revenue, closer and long lasting valuable customer interactions, reaching more customer segments and ultimately improving products by using data from the subscriptions. So far, however, this has not led to an optimal relation between the two parties. Bundles is treated more like a retailer, rather than a partner in business development. This limits the possibilities to experiment with marketing, like promotions or subscription prices, or development of product-service elements. Also, communication is relative tedious which slows down the business development. Other retailers who sell high volumes get a higher procurement discount, making it harder for Bundles to compete with such a proposition on price. The procurement influences the subscription price; consumers compare the payback time of the subscription with purchasing a machine. Therefore, Bundles needs to offer more value in other ways. Improving the customer experience, and providing an unique advantage that no other retailer or lease company can provide.
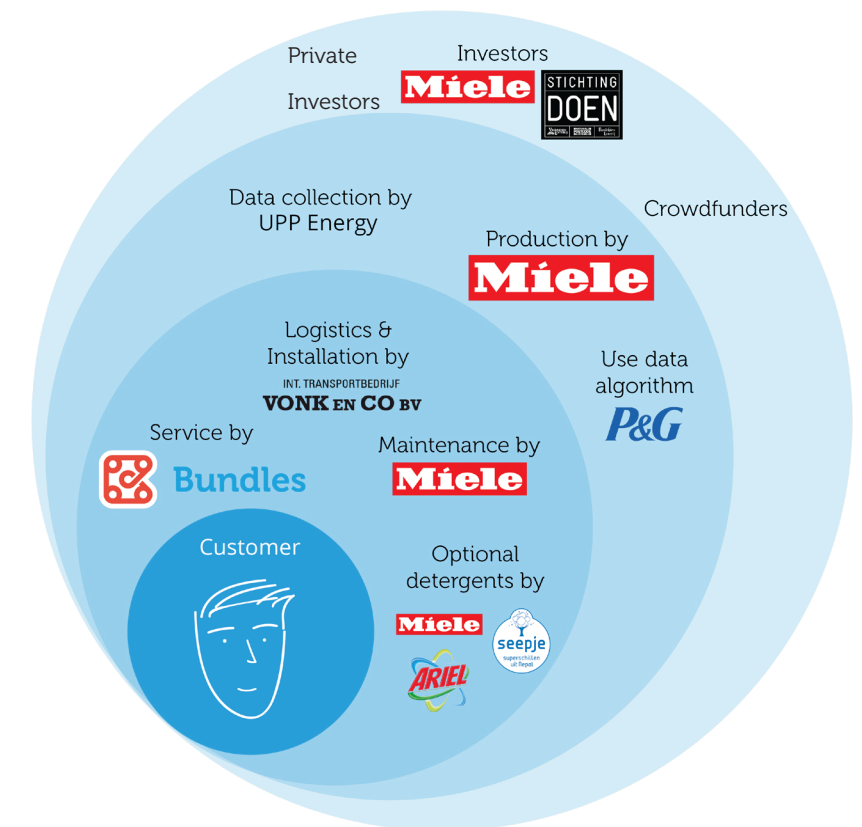

Figure 2.3-4: Stakeholdermap: a network of stakeholders jointly form the Bundles experience.

2.5 Company Strengths VS Weaknesses

This section points out what makes Bundles competent to achieve their mission, as well as the weaknesses of the company that forms a threat to the business development and/or customer experience.

Strengths include:

- First mover advantage, the first pay-per-use subscription for consumer electronics in The Netherlands. Among the advantages: an early customer base who may find it inconvenient to switch to a competitor. Also the technical and business learnings and development puts Bundles a step ahead of new competitors.
- Presented as a pioneer in the media, generating brand awareness. Discussed by: Ellen McArthur Foundation, BNR radio, consumer websites like consumentenbond and several Dutch newspapers.
- Current customer base form ambassadors, also via review site klantenvertellen.nl where the Bundles ratings are very high (more info in chapter consumer research 5).
- Miele as partner builds trust among consumers, and offers a development potential. The relation between Bundles and Miele does need to improve.
- Leveraging experience of partners like Vonk, Upp Data, P&G to build and scale a business.
- A large customer base and database to try out new marketing and develop customer interactions.

Weaknesses include:

- Cost and development dependency on manufacturing partners.
- Current branding, marketing and proposition is not convincing the mass market.
- Current asset-financing, high investment costs for products with high interest on loans.
- Fixed price of pay per use subscription is relative high compared to competitor Homie. See chapter 3 for more info on this.
- The offer and business model is easy to copy by competitors.
- The team is small and although a user-centered design is desired by the company, there is no structural process for such design activities in the proposition development.
- The company is developing multiple propositions at the same time. A lack of focus on developing user experience for each proposition, leads to the fact that the company so far is "just another" leasing company with a new business model and a sustainable ambition.
- The brand is currently focussed on Miele, working with new partners (Miele competitors) might affect the brand credibility as curator as well as the relationship with Miele.
- Although manufacturers like Miele and Gorenje indicated in conversations with Bundles that servitization is challenging for manufacturers. Companies like Bosch Siemens Household (BSH) are developing a direct sales proposition similar to the offer of Bundles.

Implications

The first mover advantages are not to be considered by itself but in context of the market and technology development. Advantages can be short-lived or durable, depending on the pace of technical and market evolution (Suarez and Lanzolla, 2005). Technological improvements are speeding up (e.g. Samsung its smart appliances and door-in-door element), the market evolution is also speeding up with increasing subscription economy. The performance improvement that Bundles adds to the products is low, the current service elements are easy to replicate and so is their business model. Therefore the first-mover advantage might be short-lived if Bundles does not develop a durable unique element in their PSS that continue to bond customers and convince manufacturers that they are the right partner to use as service provider.

2.6 Suggested Brand Pillars

The brand pillars form the base that the brand acts on. The company is still young, and has not lived up to its full potential. These are suggested brand pillars based on this chapter, to enrich the brand and inspire concept development:

Affordable and sustainable convenience

Making high quality products accessible and affordable for everyone, with carefree maintenance support. Engaging companies to benefit from value optimisation of materials by maintaining, updating and reusing products in a circular business model.

A personal and social service

A personalised experience that facilitates a seamless integration of products and technology in the lives of the community. Offering relevant interactions between people, products and businesses when people need it.

Smart subscriptions to empower people

The convenience of a Bundles subscription is powered by a secure infrastructure of data. By providing insights about product use, people are empowered to get the best results and develop convenient sustainable habits. The exchange of knowledge generates insights for innovation processes, optimising products and services continuously.

Takeaways

Bundles has successfully set up an infrastructure to offer PSS subscriptions, they gained attention from the media and companies being a pioneer as service provider with circular product subscriptions. But what is lacking is a differentiating brand; quality, service, sustainability and financial comfort are presented as the core drivers but there is no proof how this adds value to the customer experience. This chapter introduced an enriched core proposition, brand pillars and a brand personality to provide inspiration for concept development. A strategy to develop new and cultivate existing propositions from a customer perspective is not in place. While the business model of Bundles is easily to replicate, a valuable source of data is so far left unused (except for invoicing). Bundles will need to proof to Miele that they can contribute to a better customer experience and develop a strong competitive advantage together.

3 COMPETITOR ANALYSIS

The (potential) advantages over competitors will be assessed in this chapter. The topics of assessment cover the product offer, service offer, price elements and unique proposition elements. The following forms of competition will be discussed: lease companies, direct lease/sales, retail companies and pure service providers.

3.1 Competing with lease companies

An overview of the main Dutch leasing companies is given in Figure 3.3-5. The data on which the competitor graph can be found in appendix B. Prices are based on the offer with the cheapest monthly costs, starting the price range with the cheapest model offered and limiting the range with the most expensive model offered per lease company.

The degree of comfort is based on the score from the product test by the Dutch Consumer Agency and the flexibility of the lease contract. This product test is yearly done in a lab where the machines are tested and benchmarked.

Product offer

The offer of washing machines is very similar among the lease companies, brands from low-end (some white labelled) up to high-end machines. Only Bundles and Homie limited their offer to one brand, of which Homie has chosen a low/medium-end machine by Zanussi. Their Zanussi model scores relatively low in the product benchmarking in the lab of the Dutch Consumer Agency; being noisy, relative slow, poor operation information and not sustainable in use.

Service offer

The service offer among the lease companies is also similar: including delivery, installation and maintenance.

Price & price structure

There are three forms of price structure on the market. The most common is pay per access. The second is pay per use plus a fixed fee, this one is only offered by Bundles. The last is pay per use only, which is the sole price structure of Homie. Except for Bundles and Homie, the leasing companies require consumers to sign a contract for a minimum of one year and offer discounted pricing for long term contracts. Homie has the most flexible contract, with their pay per use subscription starting at €0/month with a minimum of six months and no installation fee. While Bundles has no minimum contract duration, but charges €89 logistic costs upon cancellation within five years and has a minimum monthly fee. The price range for Homie is variable between €0 and most likely an average of around €20 for a family washing four times a week.
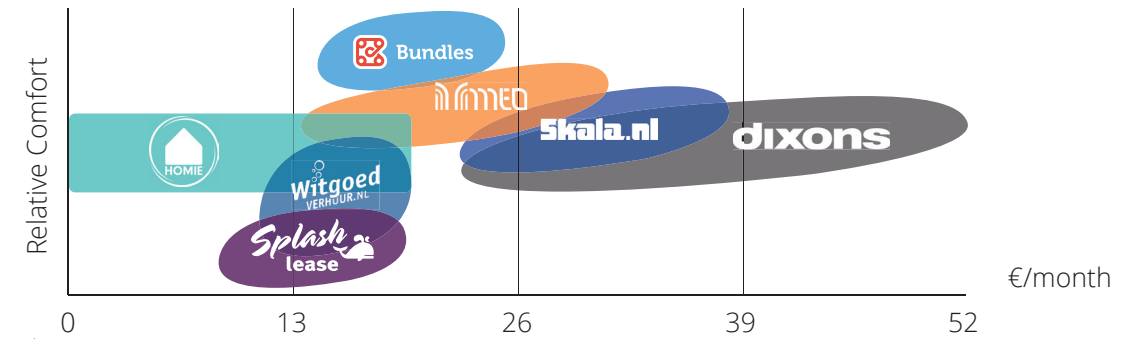

Figure 3.3-5: Lease competitor comparison for washing machines, showing the main competing companies positioned by price and relative comfort of the subscription.

Other companies than Homie or Bundles, compete mostly on price and marketing elements. For example Dixons, formerly a retail offline and online, is now online-only with premium branded lease contracts.

Unique elements

With a variable price depending on the sustainable impact of a program, Homie has a greater incentive for customers to choose the program with the least environmental impact. However, this does add complexity/uncertainty to the projected costs of the service.

The technical limitation (from company perspective) of Homie, is that they adjusted the machines with internal tracking components. This is not a plug and play solution, like Bundles its connectivity kit, and therefore limits speed of growth in sales but also growth to other categories as it demands extensive technical development. But Homie's tracking components give the company the ability to analyse the exact programme settings. Bundles can only extract information, via the IoT plug, from the energy

pattern of the machine which corresponds to the programme settings. This, however, not yet developed. Homie therefore offers a more accurate feedback on consumption.

Overall, Bundles might be perceived by customers as a more experienced company by the following elements: high-end Miele machines vs. a medium end machine, the styling of the website (e.g. professional photography by Miele vs stockimages), the structure and amount of content, the link to external media/endorsements and the order process (a webshop vs a contact form to order).

3.2 Competing with direct sales/lease

Manufacturers seek alternative ways/business models to increase resource efficiency, increase the customer profitability and extent to more customer segments. Bosch (BSH) introduced a direct lease proposition by the end of 2017. Their best offer is similar to the Miele W1, but BSH offers connectivity for remote control and information about laundry programmes. The

service offer is similar to Bundles, except there is no deposit asked and subscription price lower price than Bundles; the minimum contract duration is three months. No pay per use contract is offered by BSH. Miele NL indicated that there are seven countries in which they develop direct sales in subscription form. Rather than globally coordinated, these business are local initiatives. The upside of subscriptions via manufacturers is that these companies have more financial freedom to influence and push the marketing and design elements of the PSS (see chapter 4). The downside of a PSS via a manufacturer, confirmed by both Miele and Gorenje managers, is that they lack the service mindset. An example is the Miele app for their IoT devices, it is an extension of the machines, offering more control and some content (recipes, stain guide). But the interaction design is presumably from a product perspective e.g.: how can we increase the control over the product? A more holistic service perspective could be: How

can we support the customer lifestyle? The subscription offer with a high-end machine by Bosch is a direct and strong competitor of Bundles. As both subscriptions offer performance guarantee, Bundles will need to proof (preferably with Miele) that they can offer a better experience than BSH.

3.3 Retail competition

The retail competition entails both the element of service by the retailer as the product and service elements of the manufacturers. There is a vast offer of products, with a confusing amount of varieties within product portfolio's. Many manufacturer brands like Bosch, Siemens and Samsung offer a range of machines from low to high-end segments. Apart from elements like connectivity (IoT), the door-in-door concept by Samsung or automatic detergent dispensing by Miele, the machines offer similar functionalities and programmes.

The comparison in Figure 3.3-6 aims to show the relative differences between the segments. The scores are based on the benchmarks of the Dutch Consumer Agency in Appendix B. The more stars The criteria of comparison are shortly addressed:

Quality - the functional result of the machines.
Comfort - operation sound, capacity, special features or programmes.
Sustainability - energy and resource consumption during operation

Figure 3.3-6: Comparison of the retail segments. Three stars (★) rating is the most desired score.

	Low-Med (LM) Segment	Med-High (MH) Segment	Bundles Subscription
Quality	★★☆	★★★	★★★
Comfort	★☆☆	★★☆	★★☆
Sustainable	★☆☆	★★☆	★★☆
Service	★☆☆	★★☆	★★★
Short term costs	★★★	★☆☆	★★★
Long term costs	★☆☆	★★☆	★☆☆

and expected lifetime of the machine.
Service - availability and probability of services to resolve quality/warranty issues via the retailer or manufacturer.
Short term cost - the purchase cost.
Long term cost - performance costs, maintenance or replacement costs.

Retailers are currently competing with Bundles by selling machines with optional extra warranty either from the manufacturer, the retailer or an external service partner. Financial services like spread and/or delayed payments are offered already.

Online retailers (like Coolblue and Bol.com) are experimenting with automated repetitive purchases of consumables, this may be extended to similar product subscriptions like Bundles. The advantage of these online retailers is that they enjoy great brand awareness and have a solid business and operational infrastructure to reach a large market segment. The scale of business increases their buying power, which contributes to low procurement costs. Currently Bundles is one step ahead of the retailers as they have a test base of around 1000 subscription for which they can develop added services. Apparent from

the retail comparison, is that Bundles mainly has a higher score in service (by maintenance) and short term costs. Bundles should increase the comfort of the product use, by designing e-services and/or products that enhance the comfort of laundry in everyday life.

PURE SERVICE COMPETITION

Services like FreshFolds and Mr.TimeSaver are full service concepts that include the pickup of dirty laundry at home (or where you like), washing and delivery of the folded laundry to the customer. Presumably, this service is targeted at businesses and a niche consumer market as the prices are high. For example, a regular laundry package of 6kg is €25 per wash at Mr.TimeSaver. The substantial price difference diminishes the level of competition between lease companies and pure service companies. A synergy, however, of a pure service company and Bundles might be interesting for some customers. Expatriates like the Bundles service for the flexible and carefree contract, for busy periods they might like an option to order a single service action from a FreshFold-like company.

Takeaways
For now, Bundles offers more comfort (mainly product based) at a lower price than traditional leasing companies. But a recent market introduction by BSH poses fierce competion, with a direct lease proposition similar to Bundles but with more connectivity features and at a lower price without a deposit. Now that Homie is active on the market as circular pay per use provider, Bundles has a direct competitor on the same sustainability proposition but with a highly competitive price. Apart from the added service in maintenance, Bundles currently has little or no added value to their machines while charging significantly more for the machine over its lifetime in comparison with the retailer. Where manufacturers are too much focused on product centric IoT applications, there is a great opportunity for Bundles to develop IoT based services which support the lifestyle of their customers in a sustainable way.

4 THEORETICAL ANALYSIS

This chapter consists of three main sections: PSS definitions, PSS design characteristics and barriers in innovation diffusion. Each part of theory will be linked to the current and/or ideal situation for Bundles. The definition of PSS will show a learning at fundamental level of PSS literature. The characteristics of PSS design will give a structure to analyse the current PSS and which characterizations can be improved. Finally, the literature about innovation adoption and barriers will form a set of topics or attribute that can be used to explore opportunities to enhance the current PSS and make it attractive to a wider range of consumers.

4.1 What are products service systems?

This paragraph elaborates on the definition by Goedkoop in the introduction and explores what Bundles can learn from other PSS descriptions in literature.

Self-learning - This characteristics implies that the PSS should contain feedback loops to facilitate self optimising processes.

One of the advantages is a lower environmental footprint by using a system of joint products (e.g. washing machines and detergents) and services (e.g. maintenance) compared to the individual product-service components. (The Centre for Sustainable Design, 2001)

A self-learning element could benefit the operational effectiveness and support personalisation features. The latter can contribute to an increased fit between user needs and the PSS, making the customer feel understood and unique. The current Bundles PSS does not contain any self-learning element.

Innovation strategy- A PSS can be perceived as more than just a market offer; it can or should

be used as an innovation strategy (Manzini, 2003). Such a system is more than capable of fulfilling specific client demands, by engaging the stakeholders of the system (including the user) and integrating self-learning elements, it can b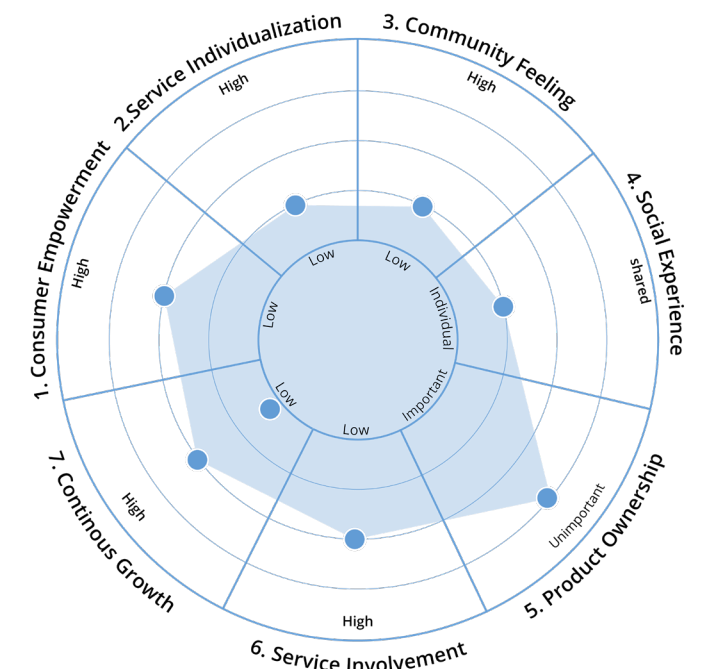e used as a continuous innovation process. This innovation perspective implies that stakeholders like Miele would benefit from an active role as development partner in the PSS; which is supported by Isaksson et al. (2009). Unfortunately, Miele has kept a distant relation so far with Bundles in the development of the PSS. A strategic alignment between the companies is missing. This project engages Miele to co-design a new customer experience with Bundles and a technology partner in a co-creation session. (Chapter 6)

4.2 PSS-design characteristics

The PHD thesis by Valencia (2017) gives seven design characteristics to be considered in the development of a smart PSSs. On the right page, the characteristics of Bundles are reflected using the PSS characteristics as presented by Valencia (2017).

Figure 4.2-7: **The PSS wheel**
The model by Valencia (2017), hereinafter called "the PSS wheel", is a tool to map and compare characteristics of different product-service systems. In this version, the current situation of Bundles is mapped. Currently, two indicators are given in #7: the low growth score corresponds to the innovation growth of products used. The medium growth score corresponds to the evolving service of Bundles.

PSS characteristic	Applied to Bundles PSS
1. Consumer empowerment	Feedback is periodically given via billing, only in pay per use subscriptions. Only the W1 washing machine projects resource use with "eco feedback". Generic tips on saving are mailed. Direct & personal feedback on actions is missing.
2. Individualization of services	Customer support is personal and positively rated in reviews, but the use of the PSS is not personalised.
3. Community feeling	Customers are asked to share their opinion via klantenvertellen.nl, there is a Facebook page but a dialogue is poorly stimulated. Word-of-mouth is stimulated with a friends-discount code.
4. Individual/shared experience.	Apart from a laundrette in a apartment complex in Amsterdam, the Bundles experience is individual.
5. Product Ownership	Bundles is owner and responsible for maintenance/repairs of the product. Customer is responsible for day to day care (cleaning components), content and customer support is provided for this. Ownership of the device would not increase the comfort of use for customers, therefore rated as not important.
6. Service Involvement	Interaction with customers is limited, mainly sales based one way communication via newsletters or social media. Optional detergent subscriptions aim to relieve customers of stocking activities,
7. Continuous growth	Other than commercial development, Bundles envisions little about improving customer experience nor the circular impact that they (aim to) achieve. Innovation of product is low, but service growth is medium scored in the PSS wheel.

4.5 What are consumer barriers for innovation adoption?

In this section, barriers that can limit innovation adoption are presented in the light of Bundles' situation. It will yield an insight to which factors limit the diffusion of the current PSS and how they are relevant to the different target groups. The current customer base of Bundles is segmented by the following buying arguments: low purchase investment, sustainability arguments and flexibility. For this section, a new set of consumer segments will be introduced to discuss the barriers to a wider range of consumers. Using the new set of consumer segments aims to answer the question: how can Bundles convince more people to become part of the circular economy via a subscription from Bundles?

The consumer segments are:

A. People who are able to purchase a high-end device (+/-€1100).

B. People who prefer a low/medium-end device (+/-€300-500).

The PSS of Bundles is an opportunity for Miele to reach customer segments like B. The research by Schmidt, Bauer and Mörtl (2015) provides an overview of product and consumer attributes that form a barrier towards product adoption. However, it would be too simple to neglect any barriers that consumers might have towards a PSS. The attributes of Schmidt et al. (2015) are discussed next. By linking the attributes to the situation of Bundles and PSS literature, it will
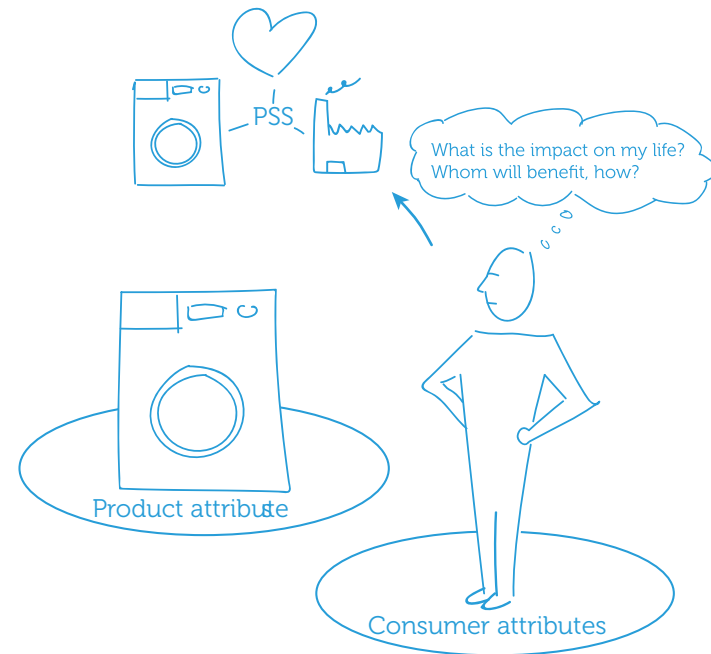

Figure 4.5-8: Schmidt et al. (2015) propose that a PSS can resolve barriers to product adoptions, but the same attributes can form a barrier towards a PSS.

become clear that the attributes are relevant to both segments. For both segments, the PSS should/can be a way to overcome the burdens of ownership, being a combination of financial, social and performance risk. (Schaefers, Lawson and Kukar-Kinney, 2015 and Bauer 1960). The higher the risks of ownership, the more likely a consumer will use an access-based service.

Cost - the overall price of purchase costs, operating costs and disposal costs. Purchase costs and financial and performance risks of maintaining and disposal are reduced to a constant monthly cost by Bundles. For segment A, who can already afford a Miele, the added lifetime costs (about 200% over 10 years) do not weigh up

to the performance guarantee; if you can afford a Miele you can most likely also bear the financial risk of maintenance. For segment B, those who don't see the significance of the added comfort and/or sustainability of Miele, the added lifetime costs are even larger.

The integrated services in a PSS might be perceived by both segments as an excuse to ask more money. (Catulli, 2012)

Reliability & Availability - This barrier includes the stability and privacy issues of the offer. A characteristic that influences performance risk. For a PSS that collects data like Homie and Bundles, privacy and accuracy are major factors that influence the reliability and thereby form a potential barrier.

Complexity - This is about the usability of a product/system, influenced by technology and necessary actions for the use.

For a pay per use PSS like Bundles or Homie, complexity might arise about the variable price structure. The performance guarantee is convenient but sometimes complex: if damage is caused, by who or what is it caused and who will cover the expenses?

The perception of complexity of the solution can form another barrier: consumers might lack a mindset to see the PSS as combined elements in a solution as a whole. (Valencia, 2017) Especially for consumers of segment B, who seek a simple machine that fulfils the core needs of laundry, such a system might seem overrated. Furthermore, consumers often wonder how the

product-service combination will impact their daily life. (Rexfelt and Hiort af Ornäs, 2009)

Interoperability - The interoperability is depending on an infrastructure between the elements, the absence or quality of the infrastructure can form a barrier. This is why Bundles creates a strong closed wireless network for every connected machine, becoming independent of the consumer its wifi signal.

Values & Beliefs - This attribute concerns both people as products/PSS. For example sustainable consumption can be both a personal belief as a characteristic of a car or car sharing service. Thus an observable product or PSS can be used to express personal values and beliefs. Social stigma's can arise, as a sharing service or lease service can cause a judgement by others: assuming that one does not have the money to buy the car.

Although people might have a preference sustainable products, they are often not aware of the (un)sustainability of existing products/solutions.

Unawareness of needs - The consumer might be unaware of his own habits and or needs. Either because he/she doesn't know about the new product and its advantages, or because the consumer is not aware of a problem. For example, many consumers are unaware they use too much detergent which costs them extra money, power and water (due to longer rinse cycles). Currently, consumers have no insights on the consumption patterns and the effects of that. Therefore they

might not be aware of the money and (natural) resources that could be saved with a sustainable PSS like Bundles or Homie.

Irrationalities of consumers - Marketing is very often based on the bias effects that tend consumers to make irrational decisions. The prospect theory has several irrational phenomena; the core is that gains and pains are valued differently. Out of two options with the same effect, one presented with potential gains and other with possible loss, the former is most likely to be chosen by people. Another element of the theory is the mere exposure effect: the more you hear or see something, the more you perceive is correct or the truth.

Trust - Both a distrust towards a product or a company can form a barrier, caused by earlier negative experiences or a company's incompetence. For Bundles, the trust is created by working with a trusted partner like Miele and sharing customer reviews from klantenvertellen.nl A close relation between the suppliers of the PSS and the customers is an important element to build trust. Consumers need to get used to a novel solution like a PSS, compared to a product. The providers need to show in the close relationship how every stakeholder, from companies to consumers, benefit from the PSS. (Rexfelt and Hiort af Ornäs, 2009).

The barriers provide an overview of topics to use while testing new PSS concepts with consumers. The ideal PSS characteristics by Rexfelt and Hiort af Ornäs (2009) form guidelines to prevent the barriers. Their ideal PSS aims to reduce uncertainties and is defined as follows:

- Compatible with (changing) consumer needs, values and habits.
- Supporting customer in desirable activities and avoiding undesired activities.
- Easy to understand the impact on everyday life and supported by reviews from customers.
- Providing desired experience that keep customers coming back and charges goal fulfilment, rather than making commitments.

Implications
The desirable state of Bundles PSS is presented on the right, based on insights from this and previous chapters.
Blue represent the current state, orange the desired state of the laundry PSS. The projection of the desired change is reasoned as follows: The improvement in service individualization and consumer empowerment should enable the consumer to experience positive impact in their day to day life, while improving the sustainability of their use. This added value to the PSS can possible reduce the perceived cost barrier. Feedback interactions with the customer and self-learning elements can facilitate continuous growth in product and service elements for both the consumer and industry stakeholders,

Figure 4.6-9: The desired (orange) vs current (blue) laundry PSS for Bundles.
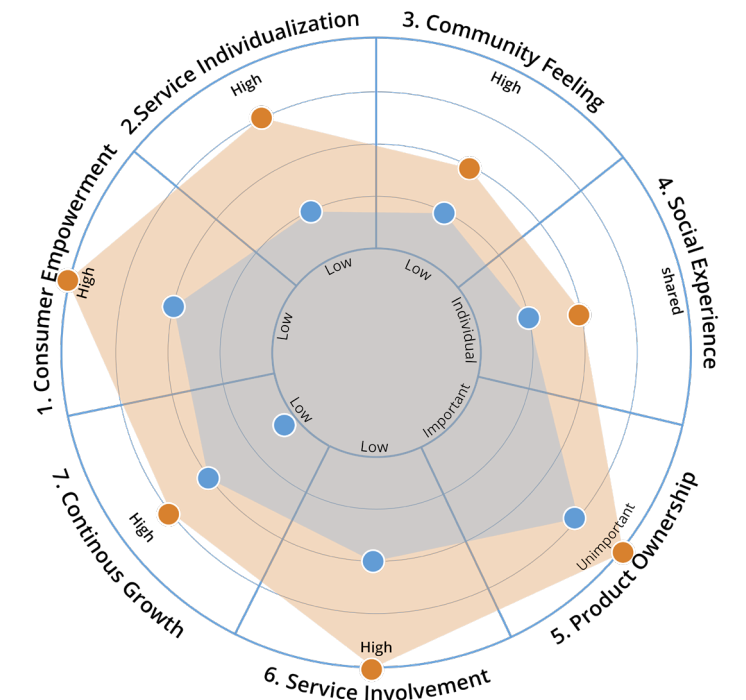
contributing to the optimising of product and material use. Supporting daily actions will increase the service involvement, leading to a competitive advantage over lease companies and adding value to the manufacturer's offer. The increased community feeling and shared experience makes the PSS observable to

non-customers, increasing trust and PSS difusion.
All these projected changes should contribute to the proposed brand pillars in chapter two: affordable & sustainable convenience for everyone; a social and personal service; and smart subscriptions to empower people.

Takeaways
In this chapter, a thorough analysis of Bundles current situation provided insights for improvement and guidance for the design of new proposition elements. The PSS definitions show that Bundles can benefit from self-learning (feedback) elements and that more involvement by all stakeholders will benefit the offer. The seven PSS-characteristics along with the theory by Rexfelt af Ornäs (2009) showed that Bundles can or should invest in making the PSS fit with their customer needs and that they need to demonstrate how the PSS will influence the everyday life. The desired PSS characterisation illustrates how Bundles can stimulate both the industry as consumers in becoming engaged in the circular economy. The next chapter presents an overview of the current service perception and explores directions for Bundles to support their customers in daily life.

5 CONSUMER RESEARCH

By doing various research activities among consumers, customers and investors, three questions are answered. First, (RQ1) how is the current proposition perceived by customers? Second, (RQ2) what do customers and investors expect from Bundles? And finally, (RQ4) what are problems in daily/weekly laundry activities that Bundles can solve/ease? The series of consumer research will be addressed in this chapter in two parts. The first part focusses on the current customer and investor perceptions and expectations, the second will assess a broader consumer context.

5.1 Desk research: customer reviews

Feedback from customers is continuously collected. New customers receive a few weeks after installation an invitation to submit an online review on klantenvertellen.nl. There are four elements to rate: overall experience, quality of devices, service and sustainability. They are asked whether they would recommend Bundles to others, yes or no. Before submitting, there is room for comments at the end of the form. About 20% of the customers submit a review. 183 customers up to May 18th 2017. The results are high, as can be seen from the results in Table 5.1-1. For a comparison with competitors: Splash Lease scores an 8,8 on average and Skala.nl an 8,9 on reviewsite kiyoh.nl. (Kiyoh.nl, n.d.)

Topic	Result
Overall experience	8,8
Quality of device	9,2
Service	9,0
Sustainability	8,9
Recommend Bundles?	183 (Yes)

Table 5.1-1: Rating results of online customer reviews

Although the ratings are positive, there is plenty of information for improvement in the comments. The comments were analysed in three rounds: first negative comments and suggestions were selected, then six topics were defined to categorize the comments and used to colour code the input. Finally the frequency of the topics and concerning issues are presented in the overview in Table 5.1-2. The colours in the table are used to correspond the insights in the customer journey illustrated in Figure 5.1-10 to the categories as presented in the table below.

Category	Comment frequency out of 183	Issues mentioned
Product (Quality, Usability)	11 (6,0%)	Controls/program unclear, colour degrading, unpleasant scent
Service (delivery, problem resolving)	11 (6,0%)	Late delivery, unclear when delivery is arranged
Insight & Control (data transparency, consumer empowerment)	20 (10,9%)	Inaccurate usage data & pricing, lack of transparency, data-driven support missing
Sustainability (product design, consumables, behaviour change)	8 (4,4%)	Products are not different from those in linear business models, personal advice for sustainable behaviour is missing
Communication (concept, processes, products)	11 (6%)	Circularity of concept is unclear, lack of communication about upcoming actions,
Price (subscription design)	5 (2,7%)	Price is too high, buying a machine is still cheaper, price construction not fit for individuals.

Table 5.1-2: An overview of the comment analysis from the online customer reviews.

Figure 5.1-10: Bundles Customer Journey phases and issues from klantenvertellen.nl

1. Learn about Bundles   **2. Order**   **3. Delivery**   **4. First use**   **5. Recuring use**   **6. Track & Pay**   **7. Regular Maintenance**   **X. Repair**

- Delayed
- Controls unclear
- Smell & Colour issues
- How is Bundles sustainable?
- Unclear delivery planning/procedure
- Lack of insight and control over data
- High monthly fee
- No sustainable support
- Inaccurate invoices

5.2 Group discussions with customers and investors

Two sessions were organised where customers and investors were invited. Each session was conducted with a different group of eight participants. During the sessions, the programme consisted of three parts: the reason for subscribing or investing, the Bundles brand experience and a small design exercise for a new subscription.

The reason why people got engaged as customer or investor in Bundles was overall the same in both groups, the core of the Bundles concept: A convenient and service based offer of high quality products in a sustainable business model. Most investors mentioned that they support the sustainable impact on the economy by Bundles, but they would not become customers as they expect that the total costs of owning a machine will be cheaper than a Bundles subscription. Which is interesting, they invest in the movement towards a circular economy but are reluctant to become a customer in the circular economy via Bundles. Some investors are already customer, but they also intend to cancel the subscription over time. What's lacking is the vision of change, how will the subscription change in the feature? Will it become cheaper if a device becomes outdated? Can you upgrade to a new/other appliance? Also, both investors and customers believe that Bundles can do more to support the users in smart and sustainable use of the devices by means of data-driven services that provide insight and control to achieve more convenience while saving costs and resources.

5.3 Customer interviews

Two short (open) customer interviews were conducted with customers.

The first with a new customer, right after the delivery. The customer profile: woman, mid twenties, living in Amsterdam working as legal counsellor in Utrecht.

The predominate reason for subscribing were the factors of convenience, flexibility and quality that Bundles provides. Convenient because of the fast delivery time, installing service, performance guarantee and the selected high-end machines make the need to do a product scout redundant. The flexibility of the lease contract, as she was uncertain where she would live/work a year later. And quality because Miele is a trusted brand, reinforced by the performance guarantee of Bundles. However, the customer was not aware of the circular economy or how Bundles is acting on its principles. Her pay per use subscription did trigger the possibility that her laundry behaviour become intrinsically more sustainable.

The second interview was with a male customer, mid thirties living and working in Amsterdam as marketeer for crowd funding platform Zonnepanelendelen.nl. The interview was conducted during a visit to set up the connectivity of the device.

The sustainable business model in combination with a high quality machine was the key reason for subscribing. As pay per use customer, he was asked whether he would be interested in a mobile app that would provide him insight about his usage and control over the machine and costs. The intrusiveness of the app in one its life would influence the adoption of such a digital service. According to the participant, the ability to do the activities as they please the user, are more important than the need to digitalise the behaviour. According to her, app should rather support desires and the interaction should be tunable to the desired extensiveness (frequency and complexity).

5.4 Generative research

The generative research does not only focus on direct causes and effects of sustainable use, but on the broader scope of improving the customer experience. Bundles aims to provide a full service subscription increasing both the convenience and the sustainable use of products.

To explore the potential added value of the PSS to consumer's daily life, the generative research is performed. First a printed sensitizing booklet was sent and completed by ten participants: male and female from age 25 to 68, customers and non-customers. The booklet contained questions and small assignments about their context of use. The full design of the booklet can be found in Appendix C. A short overview of what is asked in the booklet:
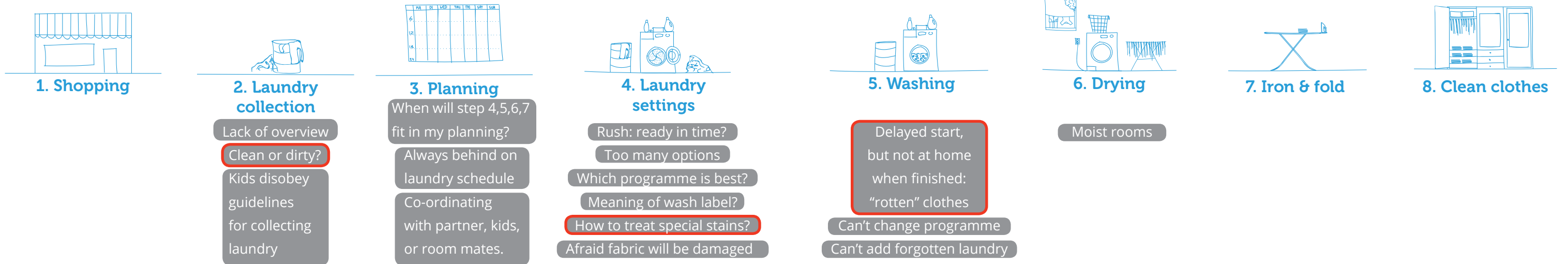
1. The context of the laundry activities.
2. Products used for the laundry activities.
3. Associations and habits concerning laundry
4. What kind of laundry people do and what program and products they use for this.
5. What people find most annoying about laundry and how they try to make it better for themselves.

The second part is a consumer co-creation session, in which six participants of the sensitizing booklet were invited. The group consisted of two males and four females, of which one male and one female were customer at Bundles. The profiles of the participants:

- 44 year old married mother of 2 boys (10yr &12yr), working as office manager. Non-customer
- 32 year old female event marketeer, sharing an apartment with her boyfriend and other couple. Non-customer
- 27 year old male IT solution architect, living with girlfriend in Amsterdam. Non-customer
- 28 year old research manager lead analyst, Bundles customer, living with house mate,.
- 28 year old female, juvenile aid worker, living with her boyfriend, Bundles customer.
- 26 year old female industrial designer, living in Amsterdam with 3 house mates, non-customer.

During the session, participants discussed their experience and explored opportunities to improving the wash journey. Due to time restraints, the focus within the wash journey was on the laundry collection up to the drying part. The main insights of the booklet and the session are presented in Figure 5.4-11 on page 38.

1. Shopping

2. Laundry collection
- Lack of overview
- Clean or dirty?
- Kids disobey guidelines for collecting laundry

3. Planning
- When will step 4,5,6,7 fit in my planning?
- Always behind on laundry schedule
- Co-ordinating with partner, kids, or room mates.

4. Laundry settings
- Rush: ready in time?
- Too many options
- Which programme is best?
- Meaning of wash label?
- How to treat special stains?
- Afraid fabric will be damaged

5. Washing
- Delayed start, but not at home when finished: "rotten" clothes
- Can't change programme
- Can't add forgotten laundry

6. Drying
- Moist rooms

7. Iron & fold

8. Clean clothes

Insights Sensitizing booklets

Overall, the participants described their associations with laundry as a negative activity with a rewarding outcome: fresh looking and smelling clothes. Among the negative associations was the planning: the fact that you have to be at home to start and finish the laundry, and plan the activities before and after using the washing machine. Another element that affects the ease of the wash journey is the dependency on other people (partner, kids or room mates). Co-ordinating who will do what seems to be a factor of annoyance. Questions about laundry routines in relation to activities did not yield specific user patterns. The only commonality is that the participants often postpone laundry to the weekend as it offers more freedom in planning.

Insights Co-Creation

Six participants of the sensitizing booklet were part of the co-creation. This number allowed for everyone to be active in the discussions. The main insights are added to the Wash Journey above. Most of the negative associations relate to the planning (#3) and uncertainty of setting up the machine (#4). Participants shared their uncertainties about choosing the right detergents, selecting the right programme and using the load capacity appropriately.

The participants could vote for three issues they found most influential on the wash journey. The three most voted are indicated with a red border around the insight. The issue at the end of #5, causing smelly "rotten" clothes is linked to the planning issue and found most annoying by the participants.

Co-Creation concepts

The participants of the co-creation session worked on solving the planning issue in two groups of three. The teams were divided equally in male/female ratio and customer/non-customer ratio. Each team could choose the problem they wanted to address, both picked the planning problem. One group addressed the problem more from a individual and systematic approach starting with a flow of digital controls by the user. The other addressed the problem from a social perspective, where an app would enable the user to be alerted of near finished laundry and control the device or alert a house mate or family member to assist.

The input forms a source of inspiration to continue in the design process. But what's more valuable from the session, preceded by the booklet, are the insights about the issues that consumers would like to improve. This is an opportunity for Bundles, providing convenience and facilitate sustainable use by supporting the consumer with selecting the right laundry settings (pre-wash stain care, programme selection, and detergents). The extra water, electricity and detergents that people use to rinse "rotten" clothes can be prevented with a planning solution.

Takeaways

This chapter supports the theoretical analysis in chapter 4, that the company currently lacks the aspect of envisioning facilitating the impact of customers and Bundles on a sustainable future. The group discussions with consumers and investors showed that Bundles needs to become more innovative in improving the use of the appliances with data driven services. The generative research showed directions to support customers in their wash journeys. Supporting the laundry collection, laundry planning and laundry settings with solutions that make sustainable and convenient use of the machines will be the focus for the design phase.

6 INDUSTRY CO-CREATION

The industry co-creation session was organized for Bundles, Miele and Crownstone (a Dutch IoT company) to engage the organisations in developing the PSS jointly from a service design perspective. This chapter will discuss the process of the session, its outcomes and the next steps of design.

6.1 The participants and process

This paragraph presents the set-up of the session with the participating stakeholders and the process. The selected participants and their backgrounds were as follows:

Bundles CEO & founder Marcel Peters; he initiated the co-operation with Miele to develop a circular washing machine subscription in 2014. Marcel designed the PSS as is and has received lots of customer feedback.

Miele Netherlands was represented by Ad Verheijen, laundry care manager, and coordinator market and consumer insights Eva de Boer.

Anne van Rossum was present on behalf of Crownstone, Anne is founder and CEO with a background in computer sciences. Crownstone makes IoT power plugs and wall sockets, a potential partner for the future of Bundles.

Anna van der Togt of service design agency Livework was asked to help prepare and facilitate the session. As graduate student I was participating in the session to share the insights of PSS theory and the consumer research and co-design with the fellow participants.

The ultimate goal of the session was to make the represented organisations and participants active in the PSS development. The desired

deliverables of the session were ideas for concept development and a roadmap to assess and prioritise the ideas.

The sequence of activities in the co-creation were as follows:

1. Introduction of session and participants.
2. Ice-breaker: participants sharing personal favourite services, discussing commonalities to draft service principles that define desired experiences of the ideas to design.
3. Short introduction about PSS theory.
4. Assigning consumer profiles, based on the input from the sensitizing booklets. See Appendix D for consumer persona's.
5. Role-play exercise: each participant envisioned the Wash Journey for his/her persona. Drafting and presenting a line of emotions to express problems along the journey.
6. Two search areas selected from the wash journey, based on step 5, to start brainstorming for solutions.
7. Each participant was asked to pick a solution and draft a storyboard, illustrating how the concept would work for the consumer.
8. The storyboards were presented and assessed on three criteria: benefits for consumer, business value and feasibility.

6.2 The outcomes of the session

The service principles

The service principles as discussed by the group and defined from a consumer perspective:

"I want to be relieved from worries."
"I want insights and help when it suits me, other than that, leave me be."
"Share your expertise as service provider to help me achieve my goals."
"Help me save time, so I can enjoy the most of my spare time."

They resemble two elements of the ideal PSS mentioned in chapter 4 from Rexfelt and Hiort af Ornäs (2009): Compatible with (changing) consumer needs, values and habit. Supporting the customer in desirable activities and avoiding undesired activities.
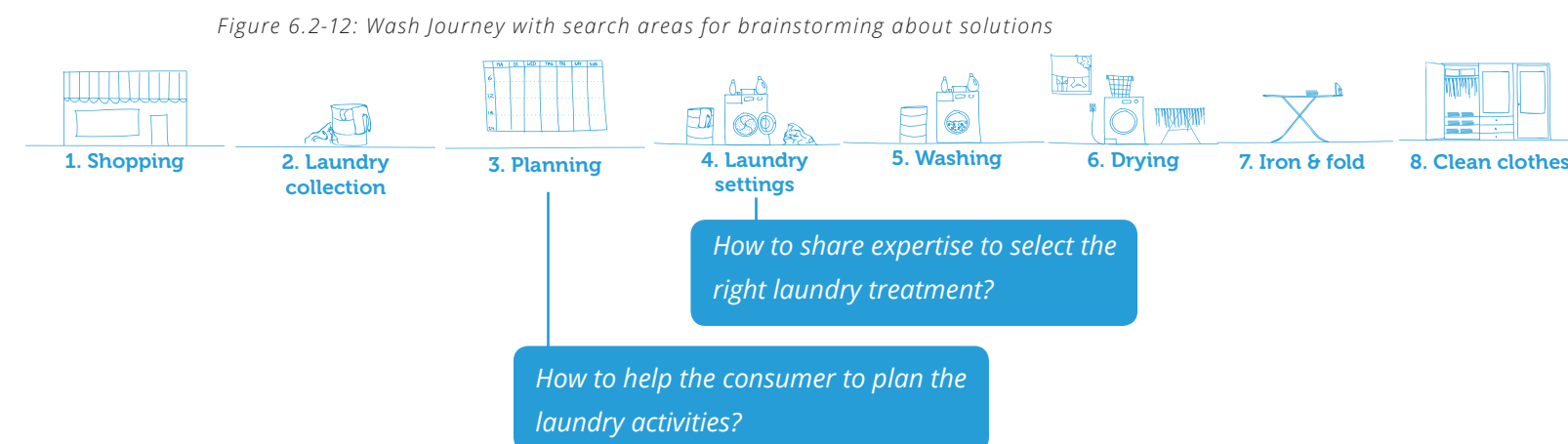
From PSS theory to a role play exercise

To set a scope for the design process, two directions from the design characteristics of Valencia et al. (2015) were selected that fit the opportunity and desire of Bundles to provide data-driven support in sustainable laundry comfort. These two characteristics were presented to be: Service Involvement and User Empowerment

The participants were assigned persona's of these characters to envision the laundry experience:

- Married and working mother (age 45) of 2 boys who never hand in laundry correctly/on time.
- Grandma (age 69) along with a broad range of products, making her own soap.
- Husband (age 36) and father of two girls working as financial expert.
- Young woman (age 21) busy with studying, sports, fraternity and living with house mates.
- Young man (27) working as IT solution architect living with his girlfriend.

From the role-play, the group picked two search areas based on the moments where the most annoyances were expected: the planning and the laundry settings. For each part of the journey, a brainstorm question was formulated by the facilitator as stated below in Figure 6.2-12.

Figure 6.2-12: Wash Journey with search areas for brainstorming about solutions

1. Shopping   2. Laundry collection   3. Planning   4. Laundry settings   5. Washing   6. Drying   7. Iron & fold   8. Clean clothes

How to share expertise to select the right laundry treatment?

How to help the consumer to plan the laundry activities?

Brainstorm output

The output from the brainstorm is clustered in solution directions and presented in the diagrams on this page. The red bordered ideas were selected 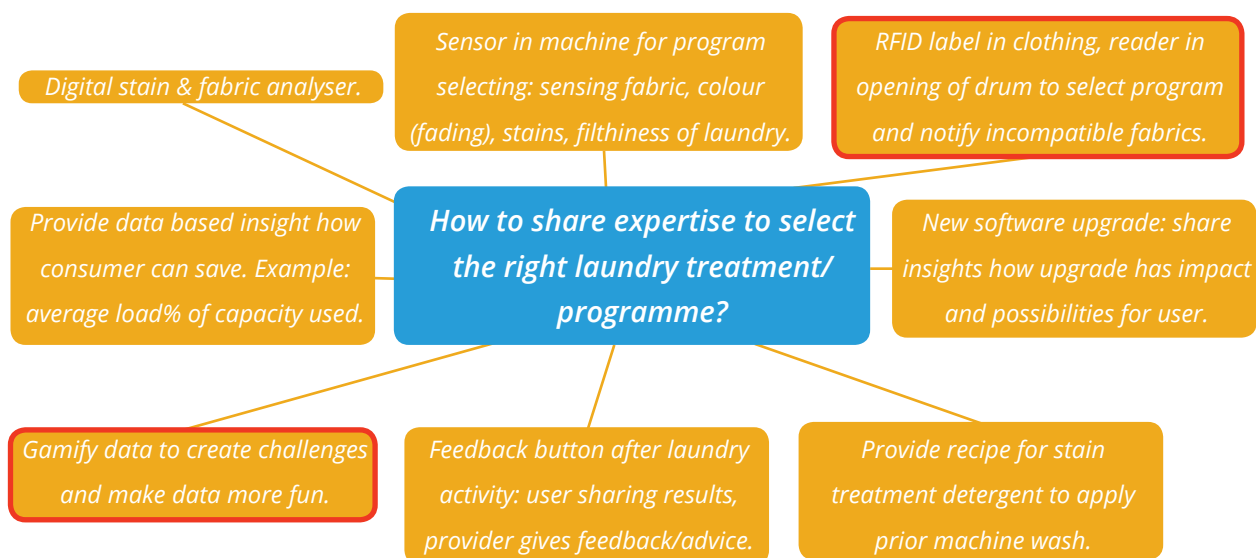by one or more participants as start for their storyboard. Although not all ideas have been used by the participants for a storyboard, they can be of value for the future development of the PSS.

Five storyboards were drafted by the participants and presented to the group.

A copy of the storyboards is in Appendix E The storyboards were then assessed on three criteria: benefits for consumer, business value and feasibility.

The scores of the assessment did not point out a clear difference to place them on a roadmap.

Diagram 1: How to help the consumer to plan the laundry activities?

- Integrate machine control in digital calendar of the user, and family/house mates.
- Predict optimal laundry moment based on: weather, power price & personal calendar.
- Facilitate routine: reminders, reward activities, recurring laundry in planner.
- Laundry machine becomes clothing hub: dirty & clean laundry exchange.
- Make laundry a social event #laundryday to stimulate social interaction and inspiration.
- Integrate laundry bin, steamer 7 dryer washing machine, enable full automatic laundry machine.
- Integrate laundry bin with a scale: indicate load capacity.
- Start full service laundry: pick-up dirty and return clean.

Diagram 2: How to share expertise to select the right laundry treatment/programme?

- Digital stain & fabric analyser.
- Sensor in machine for program selecting: sensing fabric, colour (fading), stains, filthiness of laundry.
- RFID label in clothing, reader in opening of drum to select program and notify incompatible fabrics.
- Provide data based insight how consumer can save. Example: average load% of capacity used.
- New software upgrade: share insights how upgrade has impact and possibilities for user.
- Gamify data to create challenges and make data more fun.
- Feedback button after laundry activity: user sharing results, provider gives feedback/advice.
- Provide recipe for stain treatment detergent to apply prior machine wash.

For the following design process, three ideas are presented next of which the first two are based on the co-creation sessions and the third is a personal choice to continue on. The ideas and reasons to develop into concepts are as follows.

#1. Gamification of laundry statistics

Compete against yourself or against peers. Generating leader boards based on: user profile & laundry activities.

Compare how much water, electricity, money, detergent you save compared to peer washers. Gain a pro-status, win discounts, unlock intelligence to save more, unlock beta-features. Creating a joyful way of tracking use and enabling a touch point to ask for feedback about the activity to enrich the data.

This concept fits Bundles as it aims to engage people in becoming more sustainable in a playful way, based on the appliance data that Bundles collects.

#2. Digital "washistance": your personal laundry planner

Creating a link between a user his/her personal digital calendar and the machine. Plan wash activities and see how long a programme will take. Notifications in advance, reminding you to sort the laundry and put it in the machine for automatic laundry start.

Optional: system proposes wash activities based on use-history or agenda data: work/sports/ leisure/ household activities.

This concept empowers customers to use the connectivity of Bundles to achieve sustainable convenience in daily planning, gaining insight in the ideal and sustainable laundry moment.

#3. Onboarding the service: setting up a personal account

Increasing the value of having an account by sharing what your goals are: financially, environmentally, functionally and how you would like to interact with the system (use support, communication channels, beta-tester). The way how these profiles are created, form the base for personalised experiences. This concept facilitates a personal experience, which is one of the proposed brand pillars. By doing so, the digital services become more compatible with the customers expectations.

Take aways

The co-creation session engaged the participants to think outside their daily context of work and jointly explore opportunities to improve the laundry experience by means of a PSS. The brainstorm output and the directions for prototyping form good base to design new PSS elements. The next step is to iterate on this chapter, create concepts that can be prototyped for a consumer testing PSS elements: engaging customers in optimizing their consumption by providing data, planning assistance, and designing the process of onboarding: setting up a personal account.

7 DESIGN STRATEGY

The design strategy is a synthesis of the prior chapters and aims to support the design phase and assessment of concepts. Although the design strategy is used in this project to design concepts for the subscription of washing machines, it is drafted to be applicable to (ideally) the full portfolio of Bundles. The chapter first gives an overview of the main project insights up to this chapter, secondly the interaction vision is presented after which the Bundles wheel is presented to assess the PSS proposition.

7.1 Main project insights

Bundles current state
Bundles has a sustainable promise: offer the best stuff as a service. A great deal of this is achieved in the current state: a pay per use or access offer of high quality appliances and support services. These services cover: logistics, installation, maintenance, personal and swift customer support. The latter being praised in customer reviews. The company promises personal advice but does not (yet) actively do so. As competition is replicating the business model of Bundles, the company is seeking for unique elements in the proposition.

Desired state
The company and investors desire to include data-driven services in the subscription; addressing user needs more precise, support sustainable convenience and getting better insights in asset use and consumer behaviour. Consumer research in chapter five showed that there is a desire to get more insight and control over the subscription. Specifically more insight in the usage data, more support in making smart and sustainable choices for the best result, more insight in service processes (order and maintenance).

The consumer session and sensitizing booklet were used to explore opportunities for Bundles to add value to the daily use of the appliances. The two main opportunities: facilitating in planning the laundry and insight about the right laundry settings (sorting, detergent, appliance setting, stain treatment) for the best result.

Theory
The theoretical analysis provided valuable insights for the improvement of the subscription offer:
- Make the PSS self-learning and compatible to user needs and context. Support desires and prevent unwanted actions.
- Envision the (positive) impact on daily life.
- Make customers want to stay/come back rather than demanding (financial) commitments.

The PSS wheel by Valencia (2017) was used to assess the current PSS offer. Relevant opportunities to improve the Bundles PSS: Consumer empowerment, individualisation of services, service involvement, continuous growth, community feeling.

The barriers of innovation diffusion form a set of topics to assess the current limits to customer growth, and assess new concepts.
- Reliability & Availability
- Complexity
- Cost
- Interoperability
- Values & Beliefs
- Unawareness of needs
- Irrationality of consumers
- Trust

The cost of a subscription throughout the expected lifetime of the machine, does currently not convince a majority of people who can afford to buy a machine. This is currently a clear and significant barrier. The procurement price of the appliances is limiting Bundles to lower the price of the subscription, therefore the perceived value of a subscription needs to increase with added services.

7.2 Interaction vision
An infrastructure of stakeholders is in place with a growing network of sustainable and connected appliances, it's time to take the next step in the circular economy and deliver a personal and data-driven experience. This should increase the value of the subscription and convince a larger audience; transforming more consumers from low and medium end buyers to subscribers and make customers who planned to be short term subscribers want to stay. The following interaction vision is drafted to describe the experience that customers should perceive when interacting with the improved PSS.

"We want people to experience Bundles as a buddy who is stimulating and helping them to increase comfort and sustainability of daily life."

7.3 Bundles Wheel: Design for sustainable convenience.

The Bundles wheel is a model based on the PSS-wheel; it maps the characteristics that should support the interaction vision. The model offers a method to assess existing and future Bundles concepts. The following characteristics describe the ideal PSS for Bundles.

Social & Community experience

Formerly "Community feeling" and "Shared vs individual experience". Bundles is developing subscriptions for products in consumer homes, be it single person households, couples or student/family homes. Rather than focussing on individual vs. shared use, it is more interesting to focus on the social interactions between people in a subscription and in the community. Therefore *This characteristics focuses on the value that people in the Bundles community can contribute to each other and/or to Bundles as service provider.*
Within a subscription it could be dividing (laundry) tasks between users, in the community it could be sharing advice/reviews or inspiration like recipes (e.g. DIY detergents).

Servitization of customer journey

This characteristic is a combination of service involvement and product ownership. For Bundles it comes naturally that the value of a proposition should be defined by the (recurring) services delivered and the relation between consumers and companies. Therefore, Bundles aims to make the use of a product in a subscription more

valuable than the ownership of a product. Shifting from product oriented to result oriented value of a proposition; focusing on the broad customer journey, thus aiming at high service involvement. A high score on this factor means that:
The complete customer journey is enriched and having the product as a service has become more desirable than purchasing the product.

Brand fit

A concept should fit with the brand its vision and personalities. This characteristic of the Bundles wheel is therefore introduced to evaluate existing and new PSS elements on the contribution to the company its desires.
A circular world in which companies create better solutions, which are accessible for everyone and materials are preserved for the next generation.
The six Bundles personalities: Charming, Up-to-date, Spirited, Daring, Cheerful, Honest.
The current proposition is not really "up-to-date" as the potential of the connectivity and/or data is not used to enrich the customer experience. Honesty is not supported to the full extend as customers have no real-time insight in their user data.

Sustainable impact and growth

Formerly "continuous growth". This characteristic is more focused on supporting sustainable consumption and continuous innovation cycles. Therefore the key characterization of this factor is:

To maintain value of products and services over time; ideally with a self-learning system that stimulates/supports sustainable consumer behaviour.
Ultimately to increase the customer satisfaction, customer lifetime and its business value; as well as the lifetime and value of assets.

Consumer empowerment

Evoke an increased perception of control over the experience of the product and service elements.
Giving users insights and feedback to make the right decisions and enabling them to control the interaction with the product-service elements.

Service individualization

This characteristic aims to offer an experience that feels tailored to the customer.
Let the customer feel unique by addressing him/her as individual and adjusting the content and/or features to personal interests and needs.
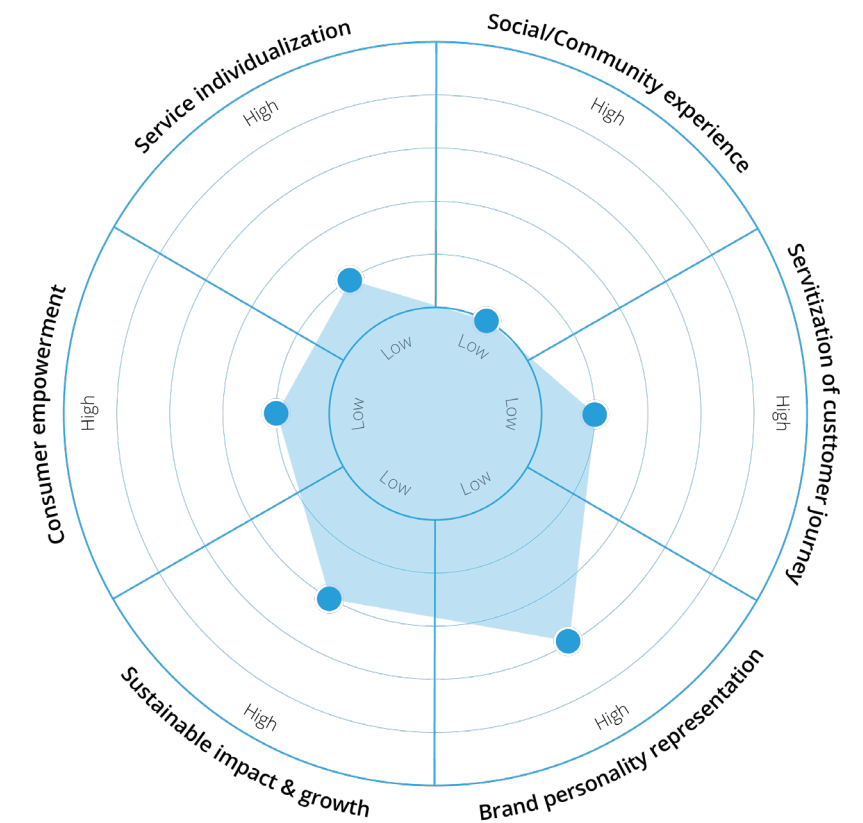

Figure 7.3-13: The Bundles wheel, an assessment tool to reflect existing and new proposition elements. The blue area projects the current PSS, as derived from the analysis with the PSS-wheel in the theoretical chapter.

Takeaways

This chapter created an overview of the project up to now, leading to the interaction vision: "We want people to experience Bundles as a buddy who is stimulating and helping them to increase comfort and sustainability of daily life." The Bundles wheel describes the ideal characteristics of a Bundles PSS and will be used to map the projected improvement by concepts on the current PSS. In the next chapter, the ideas from the Industry Session will be developed into concepts to test with consumers.

8 CONCEPT DESIGN

Three prototype directions were defined from the Industry co-creation session. During the design of the laundry planner, another concept has emerged based on the RFID-storyboard from the co-creation brainstorm. This chapter will present four prototypes: the onboarding process, the laundry planner and the digital wardrobe. The latter is a spin off from the laundry planner and finally the gamified laundry experience is presented. The concepts are reviewed using the Bundles wheel and set of innovation barrier. The graphic prototypes are all in Dutch since they are tested among native Dutch participants.

8.1 Onboarding the service

The goal of this concept is to facilitate a smooth introduction to the Bundles web-app, engaging the (potential) customer to interact with the system. The concept enables people to explore and interact with the digital services; envisioning the compatibility and impact on their lives. It prevents people from having to create an account and/or share data if they don't feel like sharing it.

There are three target groups defined with different goals:

1. Non-customers, who are exploring the Bundles offer to see whether it is compatible with their needs. For these people onboarding would be an acquisition tool. The app would be loaded with demo data to demonstrate the features that enrich the subscription experience.

2. New customers, have just ordered a subscription and want to be up to date of their order process and delivery planning. As the order is placed, personalization of the service can start with pop-ups as customers explore the features of the app.

3. Existing customers, this targetgroup has been using one or more Bundles subscriptions and can see the history of their data. Customers can be triggered to share data by offering more accurate insights and advice. Such data about their reasons for using Bundles and the configuration of household (size of family, flat/house sharing, couple, individual).

Onboarding guidelines

There are many blogs from UX designers that provide inspiration and guidance for designing the onboarding experience. Two sources (uxdesign.cc, 2017; UX Planet, 2017) were used to compile these 8 guidelines and applied in the onboarding design.

1. Focus on user goals; avoid (long) tutorials.
2. Use customer journeys.
3. Focus on what really matters, explain why you need data.
4. Introduce features interactive, one by one.
5. Let them play - include a skip button to let users explore for themselves.
6. Tailor onboarding to different user goals - "Some features are dedicated to advanced users and should be promoted only to them (it doesn't mean they shouldn't be available to everyone). As a result, users will have a less steep, longer learning curve and won't be overwhelmed by options." (uxdesign.cc, 2017)
7. Make use of blank screen space.
8. Spread some love: thank the customer or celebrate an achievement.

The two main elements of onboarding are: explaining/introducing features and starting service individualization. A few examples are given in this chapter.
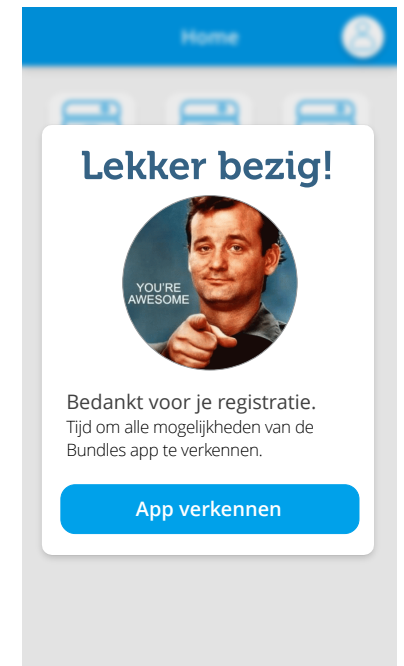
Figure 8.1-14: Thanking the user for creating an account at Bundles in a spirited/cheerful way.

1. Learn about Bundles
Gr. 1 start from website

2. Order
Gr. 2 start from check-out

3. Delivery

4. First use

5. Recuring use
Gr. 3 start from email

Introduction examples

The invitation email is targeted at a test panel of existing customers. It shows screenshots of what to expect from the app

Interface elements are introduced with pop-ups like in Figure 8.1-17 Users can choose to skip these introductions if they feel like it.

Service personalising

The user is asked to share his/ her preferences to adjust the content to it. The personal interface settings have impact on the way of presenting content; for example to push advice based on consumption data or let them find advice from an overview by themselves.

Personal data is asked close to the result, like the household configuration makes comparing households more accurate.

8.2 Laundry planner

The goal of this concept is to support the user in planning and executing laundry activities more efficiently: saving time, money, energy and resources.

The concept is for people who have a planning in which laundry limits them to do their desired/ obligated activities freely; and/or people who would like to improve sustainability of laundry. This feature enables customers to link and adjust the laundry planning to their personal digital planning, receiving notifications/reminders about required activities in order to get the best results. It gives the user more remote control and prevents them from a need to be at home to adjust laundry timing.

Concept basics and design factors

The planning tool is located on the laundry dashboard in the web app. It informs the user of upcoming activities: delivery of consumables, laundry sorting, time of laundry completion and maintenance appointments. The interaction has three stages: planning, preparing and executing. The following design factors are drafted upon the recommendations of Kobus, Mugge and Schoormans (2013) from their consumer research with a smart laundry PSS, which was designed to develop sustainable user habits.

Feed-forward: (e.g.) predicting and sharing the knowledge when renewable energy is available. Bundles can predict the ideal laundry moment based on: available renewable/cheap electricity,

ideal weather conditions for drying and the user's calendar.

Autonomy vs manual control: the system can give the user better insights for planning and facilitate remote and autonomous control. As this feature might be irrelevant or to technical to some customers, there should be an option to bypass the digital interactions and execute the laundry straight forward.

Rewarding feedback: performance information can learn the user about the impact of use. The effectiveness of feedback can be increased by offering the opportunity to personalise the type of feedback (financial, environmental or practical) and reward them for their achievement. The personalisation of feedback is not yet included in the concept.
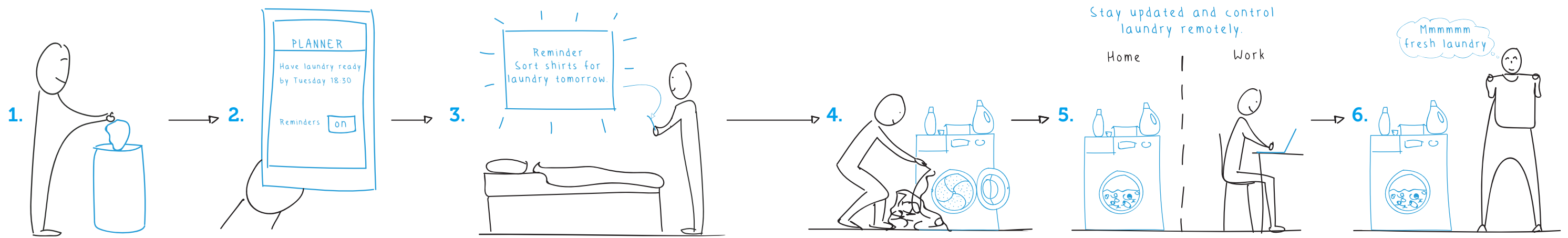
Figure 8.2-22: Storyboard laundry planner.

User interaction

The storyboard has the following six steps **1.** laundry collection as usual.

2. selecting the laundry moment and program in the app, with feedforward about expected availability of cheap/renewable energy and projected consumption of time, energy, water and detergents. The laundry program can be selected via the embedded Miele stainguide (depending on type of fabric/clothing; colour; degree of filth) or select their own settings. Users can link their personal calender en turn on notifications for optimal planning.

3. The app can give notifications at user-defined moments to remind people to prepare the upcomming laundry activity.

4. Setting up the machine, inserting laundry and selecting the desired program. In the near future, Bundles customers would have to select the program by hand. Ideally the system would be also programmable from the app when a laundry activity is planned.

5. Users can get insights about the state of the machine and progress of the program. If the user's planning is changed the laundry can be postponed; either by postponing the full program or the final sequence of rinsing and centrifuging to prevent laundry from getting smelly and wrinkled.

6. The user is notified about the finished laundry activity. The notification gives feedback about the consumption of the machine; an eco score indicates the sustainability of the finished program compared to other programs. The environmental impact of the user is also presented in perspective of the average consumption of Bundles' community members.

Figure 8.2-19: Start the planner from the laundry dashboard.

Figure 8.2-20: Green forecast of abundant renewable energy. Blue blocks are planned laundry tasks.

Figure 8.2-21: Use embedded stainguide by Miele or choose your own programme.

Figure 8.2-23: A notification ▶ empowers the user to control and postpone the laundry finishing time if necessary.

Figure 8.2-24: A feedback page ▶▶ learns the user about his/her environmental impact and links the user to information on how to lower the impact

8.3 A personal clothing manager (p.c.m.)
Servitizing the clothing

This concept is initiated while designing the laundry planner, based on the RFID-laundry tag from the Industry session and inspired by the opportunities of blockchain technology. It started with automating the complete process of laundry planning, but has greater potential in a broader perspective of clothing managing. The consumption of clothing is growing, while resources are becoming scarce and margins are decreasing; the Global Fashion Agenda (GFA) and Boston Consultancy Group (BCG) project that fashion consumption will increase with 63% by 2030 compared to 2015. (Kerr and Landry, 2017) A group of fashion companies like H&M, Adidas, Asos other leading brands and corporations committed themselves to set up strategies for increased circularity by 2020. Such commitments and the introduction of circular clothing subscriptions, like Dutch company MUD Jeans, form a trend of a more servitized fashion industry. As clothing might remain a fashion company its asset in the future, it would be valuable to track the asset with technology like RFID, woven with e-threads or embedded in other ways like buttons which are already available. As these RFID-tags can link the fashion item to the blockchain, a vast range of opportunities is unlocked for consumers and companies.

The automated laundry planning

The fully automated laundry planner is just one example of how RFID-tags in clothing (subscriptions) can be of value. For this concept it is assumed that in five to ten years all fashion items are sold or leased with an RFID-tag that links the item to the global fashion blockchain; companies like Bundles could then integrate the blockchain in their system. Customers could add RFID-tags to old items, linking them to the digital wardrobe manager of Bundles. By tracking items going in or out the laundry bin, the manager knows how many and what kind of items are collected for laundry. The system can propose the ideal laundry sorting and moment based on the availability of renewable energy and personal planning.
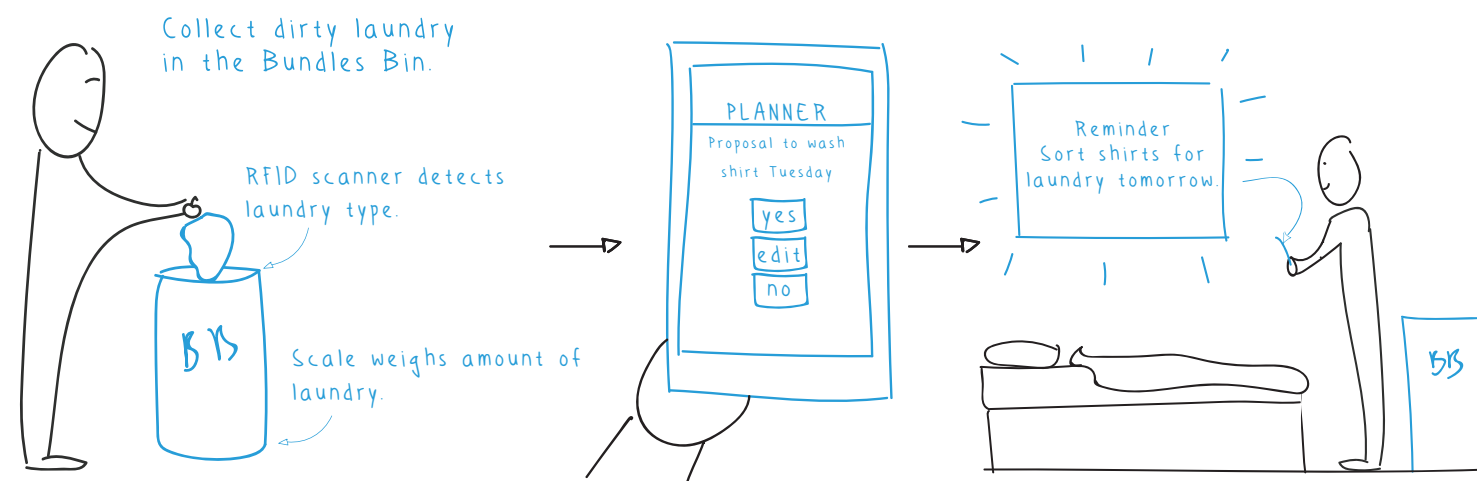
Exploring opportunities of a personal clothing manager

In Figure 8.3-26, a mind map is presented of a brief brainstorm about the opportunities of a personal clothing manager to enrich the customer experience of a Bundles subscription. A clothing manager based with the projected RFID-technology is depending on a big change in the fashion industry, and possibly the laundry industry. The opportunities presented in the mind map can, however, be used to explore an utopian experience. Such an utopian experience can then be decomposed, into solutions that are based on radical societal and technological changes but transformed into incremental innovations that are most advanced yet acceptable (MAYA). The MAYA principle was introduced by Raymond Loewy, aiming to make radical innovations compatible to existing socio-cultural habits. (The Interaction Design Foundation, 2017)

Figure 8.3-26: Opportunities of a digital and personal clothing management system for consumers.

Figure 8.3-25: Digital wardrobe planner
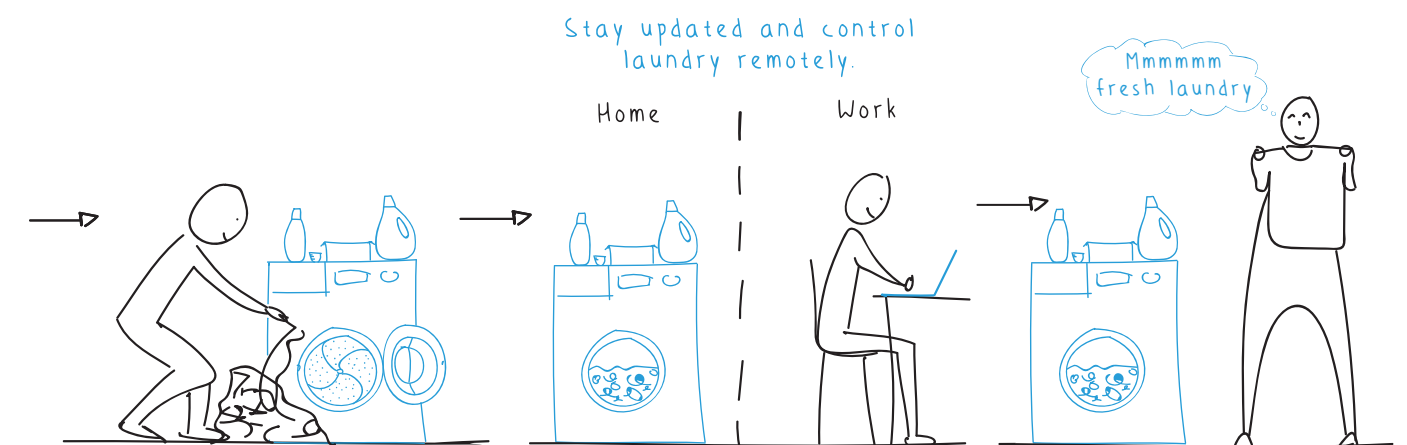
8.4 Gamify the laundry experience

This concept aims to engage customers in the laundry activity, to stimulate them in becoming more aware of their behaviour and learn what actions and PSS features can help them to achieve their goals. The user goal(s) can be driven by budget, functional or service needs, a desire to have a sustainable lifestyle, or a combination of these drivers. On short term, a goal can be influenced by a shift of priorities: for example a high need for fresh laundry in a short time can make a sustainable minded user choose a shorter but less sustainable programme.

To get a better understanding of design elements for gamification, a theoretical analysis by Stemmerding (2015) is studied. The analysis yields a brief overview of design factors for this concept and future development of gamification in the app.

What is gamification?

' "Gamification" is an informal umbrella term for the use of video game elements in non-gaming systems to improve user experience (UX) and user engagement.' (Deterding et al., 2011)

Motivation is an important element for successful gamification (Przybylski et al. 2010). These are extrinsic and intrinsic motivations. Extrinsic motivation is triggered by a rewarding outcome, in contrast, an intrinsic motivation causes someone to perform an activity because it is inherently joyful (Ryan & Deci, 2000). For behaviour/attitude change to result from gamification, the user should be intrinsically motivated by things that fulfil his/her intrinsic needs (Przybylski et al., 2010). There are three main human needs that build intrinsic motivation as described by Ryan & Deci (2000) and Nicholson (2015):

- A need for competence, a desire to be in control of an outcome and thereby experience mastery.
- Autonomy, enjoying a certain freedom and being empowered to use your own will.
- Relatedness, the feeling of belonging to a group by social connections.

Gamification elements to trigger **a need for competence**:
- Pose **challenges** that are **compatible skill and abilities** of the user; evolve the difficulty along with an increasing skill level (Przybylski et al., 2010).
- **Information** how to achieve the goal (Nicholson, 2015). and **rewarding feedback** about the progress of mastering a challenge (Przybylski et al., 2010)
- **Mastery of control** entails the learning process how to achieve a challenge (Przybylski et al., 2010). A learning process with a steep curve might demotivate people to remain engaged.

Gamification elements to trigger **a need for autonomy:**
- A feeling of autonomy can be created by **offering choices and multiple routes** to achieve something. (Przybylski et al., 2010, Nicholson, 2015). The freedom of choices and can contribute to an increased feeling of personalisation (Nicholson, 2015). A challenge can become personal by letting a user define a goal, or select the means to achieve the goal. Such a personalisation element would need a certain infrastructure, defining the goal and the input of the actions to provide feedback and accomplish the challenge.
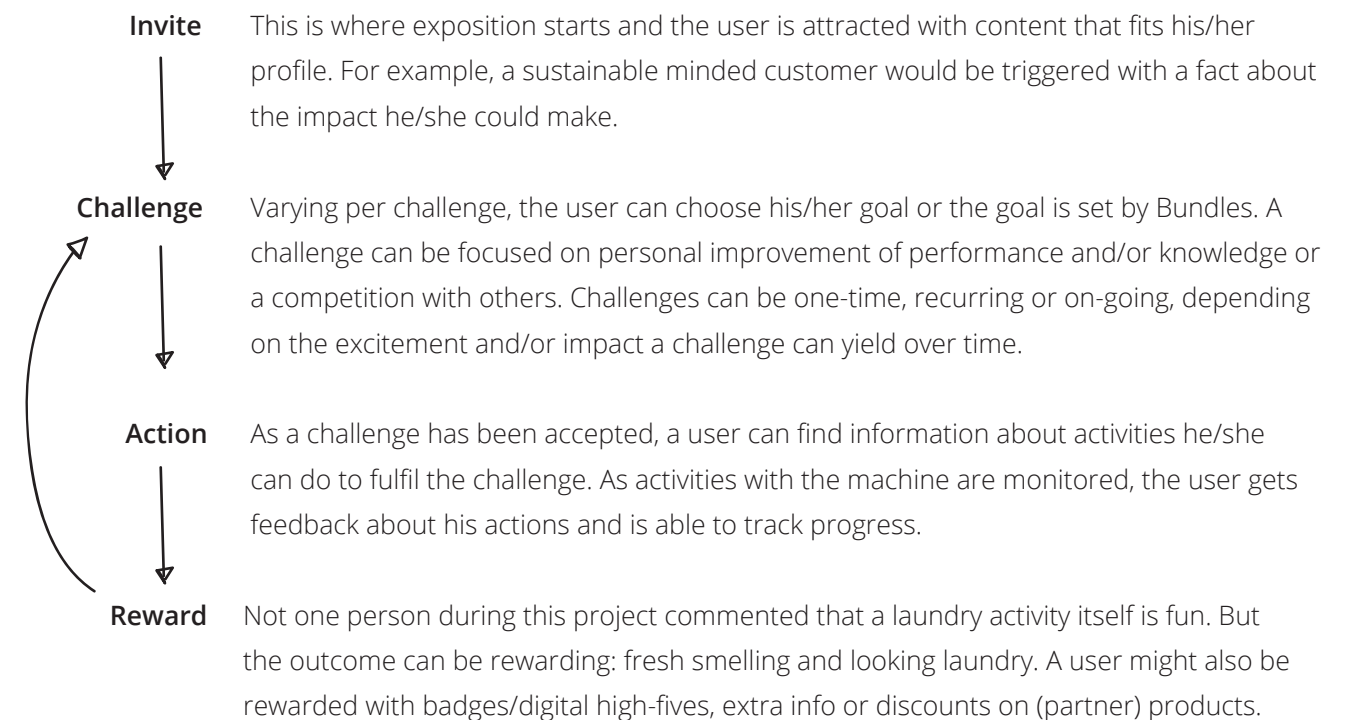- **Exposition**, is the comprehensive element of games. Creating and presenting narratives to the game environment explain something or to increase user's cognition and comprehension. Mirroring situations from the real world or analogies are examples how the user can relate the game world to the real world.

Gamification elements to trigger a need for relatedness:
- **Communication** Social interactions via a game environment can fulfil the need for relatedness. Chats and discussion boards can facilitate communication within the community of users.
- **Competition and cooperation** can trigger a sense of relatedness; either by competing solo against the system/users or in cooperation with other users.

Interaction loop

The insights from the gamification theory are transformed in an interaction loop that sets the structure for the user interaction. Ideally the user would become motivated to learn/do more after a challenge.

Invite This is where exposition starts and the user is attracted with content that fits his/her profile. For example, a sustainable minded customer would be triggered with a fact about the impact he/she could make.

Challenge Varying per challenge, the user can choose his/her goal or the goal is set by Bundles. A challenge can be focused on personal improvement of performance and/or knowledge or a competition with others. Challenges can be one-time, recurring or on-going, depending on the excitement and/or impact a challenge can yield over time.

Action As a challenge has been accepted, a user can find information about activities he/she can do to fulfil the challenge. As activities with the machine are monitored, the user gets feedback about his actions and is able to track progress.

Reward Not one person during this project commented that a laundry activity itself is fun. But the outcome can be rewarding: fresh smelling and looking laundry. A user might also be rewarded with badges/digital high-fives, extra info or discounts on (partner) products.

Game elements for Bundles

The challenges are not a compulsory part of the user interaction. Users can choose freely to join in or start a challenge, or turn off challenges in total. The challenges are accessed from the laundry dashboard via the icons of the themes of the challenges as introduced bellow. The menu shows a list of offered challenges, accepted challenges and progress and a tip section

The "Master" challenges are aimed at exploring the full potential of the devices and subscription. Rewarding them for using (e.g.) the laundry planner or making their winter coat water-resistant again.

The "Hero" challenges are social minded, rewarding people for helping out. For example, sharing ideas/experiences or testing a beta-feature or have a friend/relative join as customer.

The "Eco Boss" challenges people to improve the sustainability of their behaviour. For example by doing a quiz, using settings/content indicated with a green leaf, icon setting a personal goal or join in a community challenge to reduce the environmental impact during a month.

Completed challenges are rewarded intrinsically, for example: feeling good about helping out someone else, gaining skills/knowledge. For some people saving money and/or resources is a joyful act itself and therfore intrinsic. For others it is extrinsic just like a reward can be introduced by offering a discount. For example, giving the monthly top 100 most sustainable users (+/- 10% of customer base) a discount for that month.

A challenge might be classified in multiple themes. For example, a winter challenge to make a coat water repellent again, would serve in the master theme as you explore functionality of the machine but it is also eco friendly as it elongates the lifetime of your jacket. The examples presented next are primarily meant to be presented as eco challenge.

Figure 8.4-27: The challenge menu presenting an active challenge. Sliding to the right or left shows completed challenges and available challenges to start.

EXAMPLE1: Month Challenge

This challenge is introduced via a newsletter and/or the monthly invoice. The goal is to achieve a minimum reduction of 10 % of consumption, comparing the total consumption of the month of the challenge with the average consumption of the last 3 months per participant.

Challenge of the month
"Are you joining the new year challenge in January? Save at least 10% compared to your average consumption of the last 3 months.

Track progress
The progress bar shows how much you've used cumulative, and how much this is in perspective of the goal.

Get advice, share advice
Read and rate advice/life hacks in the challenge section. Share your advice with the community to get some love.

Feedback
The user gets feedback after every laundry activity and upon succeeding a challenge. The impact of activities/challenges is presented using analogies to comprehend the "real life" impact.

Figure 8.4-28: Notification and feedback after a laundry activity.

Figure 8.4-29: Notification of completed challenge, luring the user to start a new challenge.

EXAMPLE2: Social challenge

This challenge enables a user to dare a friend or relative who is also a Bundles customer, in battling who gets the highest Eco score.
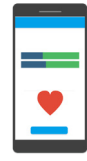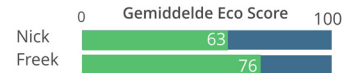

Challenge or get challenged
Compete against each other or cooperate to compete against the community. Get the highest average eco score per laundry activity. Decline or accept.

| Niet nu | Kom maar op! |

Track progress
Once the other user has accepted, both users can track their average eco score during the month.

Get advice, share advice
Read and rate hints in the challenge section. Share your advice with the community to get some love.

| Deel een tip +30 ♥ |

Feedback
Feedback after every activity is similar as the previous challenge. The Eco score is the most important metric for this challenge. A link to a section with advice how to get a better Eco core.

Figure 8.4-30: Notification and feedback after a laundry activity. ▶

Figure 8.4-31: Notification and feedback after a laundry activity. ▶▶

EXAMPLE3: Sherlock // Action based challenge

Sherlock is an example of an action based challenge. These challenges are single or series of actions that stimulate the user to explore (new) features of the product and service and/or to increase the sustainability of use.

Scouting with Sherlock
Help us to help you! Let's find out together how you can make laundry easier and more sustainable with these actions!

| Niet nu | Kom maar op! |

Weigh your laundry
Use a scale to measure the weight of your laundry and check in the app if you're under or over using your machine capacity.

Laundry tracker (pop-up)
Track the type of laundry you do and the selection of programme in the pop-up at the start of an activity. We'll let you know how you can optimise the laundry!

Try the laundry planner
Save time and have your laundry done at the right moment with the planner feature. Extra valuable if you have renewable energy or variable energy prices!

Earning the badge
Once challenges are completed, the Sherlock badge is added to the profile. Besides a decoration, the badge is a link to an overview of input from the activities and feedback by Bundles as a result from the actions. The overview can later be consulted by a user.

The action challenges have names that correspond to the activity, in this example Sherlock. As entertainment element, the reward is enriched with a trivial fact. For instance, content about the laundry history around the time of Sherlock. Such background information may not directly support sustainable laundry comfort but might enrich the exposition element of the interaction.

8.6 Comparing the concepts in the Bundles wheel

While assessing the concepts it became clear that onboarding is more a prerequisite for an optimal digital introduction to Bundles, than a stand alone concept. It facilitates service individualization for the range of concepts by empowering the customer to share data and control interaction elements. As it is not a question if onboarding is desired but how it can best be done, it will not be taken in comparison with other concepts but is rather given as a recommendation for further design of the digital experiences.

Social & Community feeling

In the current state there is no interaction facilitated between users. The only concept that improves this factor is the gamification concept by facilitating exchange of knowledge and introducing cooperation and competition. Although not at the core of the laundry planner, there is an opportunity to explore among consumers how they would like the planner to play a role in shared households.

Servitization of customer journey

Currently, only maintenance and automatic replenishing of detergents enriches the customer journey compared to a purchase option. The gamification challenges make people aware of habits and offer content and interactions to increase the sustainability and comfort. The planner specifically supports the customer journey in helping customers to improve their planning, thereby scoring a bit higher than the gamification. The personal manager scores naturally the highest on servitization as it takes laundry care to the next level: from buying a washing machine, to using the machine, to a service that helps to maintain a closet with fresh items that fits a customer's lifestyle.

Brand fit

The p.c.m. contributes to a radical system change towards circular clothing care, with maximum user support. The brand personalities are best supported in contrast to the other concepts, especially daring and up-to-date are two personalities that are significantly presented in the concept. The downside however is that the concept is not feasible in its current setting depending on a big technical and societal shift. Compared to the current situation the planner and gamification do increase the honesty in the experience with more sustainable feedback.

Sustainable impact & growth

Both the planner as the gamified interactions facilitate more sustainable behaviour and thereby they have a more sustainable impact. The p.c.m. has maximum impact by defining the optimal laundry planning, machine settings and sorting. The data that is generated with such a digitalized laundry concept is extremely valuable to the laundry industry as it provides detailed usage information and enables manufacturers to update their machines with software that is tailored to the use of the consumer.
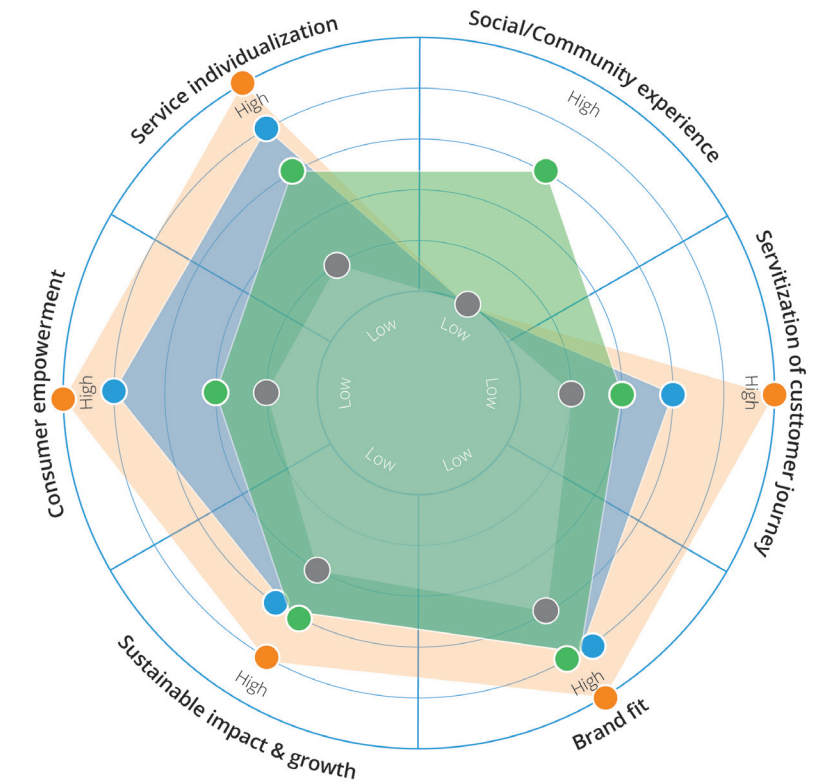
Consumer empowerment

In the current system, the only feedback on use is monthly via invoice. The gamification provides more content and feedback for users to make their decisions. The laundry planner offers feedforward and feedback thereby scoring relative high. As the p.c.m. provides more accurate insights to the user, he/she will be even more empowered to make the right decision.

Service individualization

The personal assistant has the potential to score maximum with a personalized planning and wardrobe management system. The laundry planner enables the user to integrate the laundry activities in their own planner, therefore scoring second best. The gamification concept can serve as a way to explore personal habits and preferences, therefore improving this characteristic with the current situation.

Figure 8.6-32: Comparing the concepts in the Bundles wheel. ●Current PSS state, ●Laundry planner, ●Personal clothing manager, ●Gamification

Takeaways
This chapter entails four potential improvements for the Bundles proposition: the onboarding process, the laundry planner, the personal clothing manager and the gamified laundry experience. The insights from onboarding design are recommended to design further details of the concepts. The clothing manager scores the highest compared to the others, but on short term this is not feasible. The other concepts can however take on desired elements of the concept like the planner is now already a feature in the manager. Before designing the details of the concepts can be designed, a test with consumers is necessary to validate the desirability of the concepts and to explore interesting insights for further development. This will be presented in the next chapter.

9 FOCUS GROUPS

The designs that followed from this project are to be tested among consumers before more resources are invested in further development. The concepts are in an early stage of development and offer relative new experiences compared to the current market offer. Therefore, three qualitative research sessions took place in a format of small focus groups to validate desirability of the concepts. This chapter describes the research method and the insights that the sessions provided and a synthesis of the session insights.

9.1 Methodology
Purpose of sessions

The sessions were organised to explore the overall desirability of the digital services among consumers. In more depth, how would the concept fit in their lives? What do they find interesting about the offered interactions, what is valuable to them and why? The insights gained from these topics, form input for further development of the concepts, if they are desired at all.

Participants

Three groups were recruited: one consisting of consumers not related to Bundles and the others a selection of customers/investors. The two other groups were recruited by sending invites among Bundles customers and investors to become member of a Bundles Community Panel and/or to be among the first to test the new Bundles app.

Session flow

The sessions were facilitated by the author at Bundles its office; in the evenings on a Monday, Tuesday and Wednesday from 18:30 until around 21:00. The focus group started with a short dinner, during which participants introduced themselves to each other. As a sensitizer, the participants were asked questions prior to the session via mail. A question about which apps make their life easier and how, focussing on topics like planning, health, sports, financials and energy use and/or generation. Concerning laundry habits, participants were asked how they try to keep their laundry sustainable. Participants shared the answers to this with the group during the introduction.

The session was kicked off after dinner by introducing the purpose and programme of the session. An emphasis on welcoming an open discussion was presented by assuring that any question or remark is valuable to share with the group. The concepts were presented one by one, discussing each concept right after presenting it. The session was closed with a brief recap of the discussed concepts and insights, asking if there are any questions or remarks left.

Stimuli

The concepts were presented with a slide show on a projector screen, using a combination of textual information with icons and screenshots of the designs. The personal manager is introduced with a short envisioning exercise: participants have to close their eyes, the facilitator takes participants back 5 years by sharing events from the past, then the present is addressed with recent events, finally the participants are taken to a future context by presenting technological and societal predictions, trends and developments as facts. Then the eyes are asked to be opened again. The personal clothing manager is presented with the advanced laundry planner as example. An overview of the opportunities as presented in the design development chapter.

Each participant was given a hand-out of the slide contents to look up any information and to offer the possibilities to add notes or questions.

Data processing

The sessions were audio recorded, the facilitator took notes of important insights with the corresponding time of recording. The recordings and notes have afterwards been analysed and presented as insights in the following sections. The language during the session was Dutch, since all participants involved were Dutch native speaking. The quotes are translated to English by the author.

9.2 Session 1: Non-customers
Participants

Group 1 This group of people, who are not related to Bundles via a subscription or investment, was selected to evaluate whether the concepts would make the Bundles offer attractive to them as non-customers. The group was formed by: Emmy (45), mother of two and working as office manager. Nick (28) working as IT solution architect, Leroy (27) working as retail service employer, Laura (26) student anthropology. Nick and Emmy

Figure 9.4-33: Discussing the concepts in focus groups at the Bundles office

participated in the consumer sessions in shared insights about their annoyances in laundry.

Insights Laundry Planner

The basics of the app were well perceived, all participants would be interested to use the app in combination with a subscription. The laundry planner was positive evaluated by the group for several reasons:

- The **notifications reduce negative emotions** and prevent the laundry from having to be washed multiple times. Leroy (27) *'...the most annoying part of laundry, forgetting you did or have to do it. Sometimes I'd forget to take it out the machine, and had to redo the laundry, occasionally up to three times.'*
- **Feed-forward of renewable energy triggers a desire** to do laundry when it saves money and the environment. Nick (28): *'I would see it as a game to make the most use out of our solar panels and reduce costs.'* Though fresh laundry is more important, the laundry moment is therefore still bound to personal planning. The "spoelstop" can only bridge a certain time, not a full day.
- There is a **desire to get feedback about the ideal load capacity and programme selection**, Nick (28) *'we do the laundry when the need is high and fill up the machine as much as possible, not knowing if it is too much laundry and how much detergents is needed'.*
- Participants are **willing to share data**, like household composition, in order to get more accurate insights and advice how to improve the laundry and how to save money. Emmy

(45) *'It's similar to a services like travel agencies, first you share your information about your desires and family to get travel suggestions that fit you.'* More precise, the participants would be willing to get **suggestions/proposal from the system to do laundry** if it would be able to learn from consumer behaviour: type and frequency of laundry, inactivity/absence (holidays). The latter to prevent irrelevant messages.

- The group would desire to have the **laundry planning accessible to fellow users**. For families to keep each other up to date and plan laundry together. Emmy (45) *'it would be similar to the way we use the (rev. digital) family calendar.'* In case of sharing a machine in an apartment complex to check availability and reserve a laundry slot.

Insights Personal Clothing Manager

The group was overall enthusiastic about the possibilities, it took a view moments to envision the impact on their lives. The following aspects make the personal clothing desirable to the group:

- **Modularity of the concept** was proposed by participants to use it for specific items. For example a closet area with sports clothing. Leroy (27): *'Sometimes I forget about dirty clothes in a bag and find out too late about it. Maybe the app would need to know if it is clean instead of dirty somewhere else.'* Emmy (45): *'There would be no more children who forgot to turn in their sports laundry.'*

- The group proposed a few advising features: **Warnings to prevent wrong sorting and programme** selecting if a machine could detect what's the input. **Weather based proposals** Laura (26) *'Be aware: it will get colder next week, prepare your clothes!"* **Maintenance care**: offer products and content to maintain quality of clothing.
- **Getting sustainable shopping insights** about the durability of a clothing item. Interesting note: participants were more driven by personal impact (shop less frequent) than environmental impact.
- **Styling advice**: Emmy (45) *'try to combine these items from your closet" or "you haven't used this item for a long time!'*
- The impact of this concept can be described by the following. Leroy (27): *'Laundry should be as simple as possible, it's just not a fun activity to do and there's nothing that will make it fun'* Laura (26) **'But this concept makes laundry a no-brainer.'**

Insights Laundry Planner

Participants just discussed a concept with a high level of servitization and system autonomy. The gamification felt in general as unnecessary interactions.

- About energy input vs result output, Nick (28): *'Can the most sustainable program achieve the most clean laundry?'*
- **Shared opinion: It would be OK, not desired, to be challenged occasionally.** Linking the challenge to a charity goal would be a motivation to participate in the challenge.

- A comparison made with fitbit/sports challenges: **how do you remain engaged?**
- Important feature: reject a challenge or opt-out for all.
- Getting supported with reminders/notifications would be fine, ideally **the system should be protectively sustainable**. Leroy (27): *'I would like to use the app to do less laundry activities, not more."* Nick (27) *"you already have so many apps to interact, I think the interactions should be very simple and concise."*
- Offering discount as **reward can feel unfair** to people who don't (want to) participate. Leroy (27): *'You're paying for the winners if you don't participate or "lose" a challenge.'* Laura (26): *'Isn't it similar to actions at Albert Heijn? (rev. supermarket who offers loyalty programs, saving for discounted products/events)* Leroy (27): *'That's the reason I don't prefer Albert Heijn, because indirectly you pay for such marketing.'*
- **Challenging a friend is not desired by the group.** If there would be someone to challenge, it should be a random Bundles client.
- **Activities are OK to propose, but don't have to be framed as challenge.** Nick (28): *'It's a good way to keep people engaged in the beginning."* Emmy (45): *'I don't want an action to be a challenge, but a clear instruction what to do.'*
- Non-sustainable oriented content or in the broader perspective of household would be a fun way to remain/become engaged with the app.

Reflecting on session flow

The group dynamics were vibrant during the discussions, participants were contributing to each others ideas and overall good insights were taken as input for the next focus group. The laundry planner with notifications and feedback was positive evaluated. The participants were eager for a clothing manager. The interoperability barrier is significant for what people want: a system to make accurate decisions based on the real-time situation of clothing status. The accuracy of real world input in the system is depending on sensors like in the machine, closet and/or laundry bin.

9.3 Session 2: Bundles Participants

Group 2 Consists of 4 males and one female. Marcelino (m 40+) investor not customer. Rob (m end 20's) working in the transition towards a circular society. Erika (m 40+) freelance communication professional and Bundles fan, Kees (m 40+) Bundles fan and professional in educating about sustainability. Jelle (m, end 20's) young engineer at Tata steel and participated because he is interested in the development of apps. A fifth, father of a newborn baby, cancelled his participation.

Insights Laundry Planner

The laundry planner was not as desired in this group compared to group 1, except for Jelle (end 20's). These are the main insights:

- **Tracking energy is more important** than planning. Rob (26) *'Advice about programs is fine for the beginning. Laundry is not fun, it's a necessity; wasting time of extra settings doesn't make it better. Insights about consumption, compared to other devices would make it interesting.'*
- Erika (40+) ***'I'm obsessed about fresh laundry, but I use the same settings always: cotton 40˚, I don't know about the sustainability impact.'***
- **Quick vs. Advanced settings** Kees (40+): *'I guess are two types of users: those who want two buttons, and those who want to control all details. I'd like two buttons.* Rob (26): *'If I could save my settings, that would save time.'*
- The laundry feedback has good insights, but it would be valuable to **present the total cost** including cost of water, electricity and detergents.

Insights Gamification

The order of presenting concepts is adjusted to prevent users from judge the gamification in relation to the high servitization and autonomy of the personal clothing planner. The result, however, did not show a difference in evaluating the gamification.

- **The real-life meaning of saving resources is important.**
- Comparison with running app Rob (26): *' 'It's similar to Runkeeper app, it's nice to track your performance but you don't run for a challenge.'*
- **Present impact positive and on larger scale than single household.**
- The Eco Score is perceived as a good feedback metric and stimulates to do better.

- Challenging someone else is again not desired. Only Erika(40+) would be willing to challenge a random Bundles client.
- The proposed activities in the Sherlock challenge would be suitable to offer to new customers, and remain them available in a tip section.

Insights Personal clothing manager

There was one male participant who had to leave the session before presenting this concept. The group, 4 people, was not very excited about this concept. The participants had trouble envisioning a positive impact on their daily life. The improved laundry planner was perceived as a nice to have addition to the app.

Kees (40+): *'Mud Jeans offer a subscription on jeans, it could be a valuable cooperation (rev. to get advice about the best care for your jeans).'*

The desired short term opportunity that a clothing manager could offer, without the need for a radical system change, was asked. This would be to get insights about the durability and sustainability of clothing.

Reflecting on session flow

The group dynamics were relative passive; it was a challenging group to facilitate, as answers to questions would quickly stray off into conversations that had little valuable output compared to the first group. Although ultimately participants could see the potential of concepts, they mostly were evaluated as complex (e.g. the planner) or irrelevant(friend challange).

Although the consumption data was presented among the core functions of the app, comments about the need for an overview of consumption data were repeated.

9.4 Session 3: Bundles Participants

Group 3

This group originally consisted of 6 people, two males cancelled on short notice, bringing the group size down to 4 women. Afra (end 20's) freelance communication professional; Linda (in 30's) filmmaker; Reineke (in 50's) teacher; José (in 50's) e-commerce sales employee.

Insights Laundry planner

Before presenting the laundry planner, a few more screens were presented in this presentation showing a tip section in the app and a chart of consumption patterns. The presentation seemed to be more convincing to this group than to group 2, participants were enthusiastic about the concept including the laundry planner. The main insights from the discussion:

- Afra (20's): *'I'd like to do laundry as sustainable as possible, and this feedback challenges me to do so."*
- Participants think the app addresses a wide range of customers drivers: budget, eco or more connectivity.
- Selecting laundry based on sustainability, speed or clothing type could be nice.
- Linda (30's): *'I really don't want to do laundry at 60C˚ because I think it has too much Eco impact.'*

Insights Personal clothing manager

As the shift of order did not have effect on the perception of gamification, the clothing manager is put back to second in presenting order. The exercise of envisioning such a radical future concept is hard to do when energy is low near the end of a session, which seemed to be a problem for participants of group 2.

Group 3 was enthusiastic about the clothing manager, as the following insights show:

- Track laundry activities to predict end of lifetime of clothes, **propose/order automatically sustainable products** (towels, socks, detergents).
- **Notifications** to add more items to laundry for optimal loading. **Warning** to prevent incompatible items washed together. Or **proposal** in the evening "change your worn sweater for a fresh one to reach the optimal laundry capacity tomorrow".
- **Help decide when to put items in laundry**, when is it justified/necessary to wash?
- Integrating the laundry bin with the machine, **fully automatic system**.
- Sorting boxes with a scanner, after scanning an item the right box will open to facilitate optimal sorting.
- Social interaction: having a laundry activity together with a housemate.
- Provide **insight about optimal amount of clothing to buy for optimal use** of machine's capacity, depending on lifestyle, household composition.
- Reuse the water for other applications.

Insights Gamification

In the first two sessions people were not enthusiastic about the challenges in the competitive way they were presented. The activities to cut down consumption, becoming aware of habits and exploring functionalities were positively evaluated. Therefore the third group were not introduced to challenges, but to activities to stimulate the user/community.

- The Sherlock activities were perceived as a good way to learn more about the functionality of the machine, but would only be desirable occasionally and with a clear goal and easy activity.
- Impact of savings as a community, including individual contribution, is preferred over a personal focused impact.
- Three rewards were presented: save for discounts, have Bundles & Miele donate to charity, or donate your savings to charity via Bundles (idea from session 2). It's preferred not to pay via Bundles to charity but with a direct payment link to the charity (via iDeal). There was not one concession about which reward participants would prefer, in fact the group was in doubt whether the rewards were necessary at all.
- People want the choice to do nothing with savings. Linda (30+): *'Stick to your core, savings don't have to be transformed in charity.'* Reineke (40+): *'I think it would be inspiring to see sustainable products that I would otherwise not see.'*
- The friend challenge is perceived as an

undesired interaction. The participants would rather get personal (periodical) advice about potential savings than competing to be the most sustainable.

Reflecting on session flow

The setting with this group was a lot better than with group 3; participants were more open towards each other. Facilitating went much smoother than in group 2. Presumably because the presentation and concepts were improved, which made presenting and discussing concepts easier.

9.5 Synthesis of session insights.

This paragraph briefly presents the main insights from the three sessions together.

The laundry planner was perceived as a good add-on by the majority of the participators. Gaining knowledge about which programmes would be ideal for sustainability, speed and or special laundry items. The increased connectivity and link with renewable energy was perceived as an added value to the proposition. The complexity and interoperability barrier is, however, significant: the app should be able to control the settings of the machine directly.

Most participants expected to be stimulated in becoming more sustainable by the feedback after an activity, which can be given also without use of the planner.

The gamification element in the service was in general not perceived as an added value to the subscription; at its best as a nice to have. People can feel judged or distracted by being offered challenge. The feedback on laundry activities with personal tips would be stimulating enough for people to explore possibilities for behaviour improvement. Occasional activities like saving as a community or periodical activities to explore the product/features would be acceptable, if the goal/purpose is clear and the activity simple to execute. Offering the choice (autonomy) to participate in a challenge/activity or opt-out completely is crucial to prevent people from deleting the app.

A learning from the gamification concept, is that the app should be more like a personal assistant with tailor-made advice than someone who is challenging to perform better. Multiple participants from group 1 and 2 referred to the servant interactions from the clothing manager as more desired while discussing gamification. The personal clothing manager yielded an insight in the desired/accepted servitization in the laundry experience. Given the projected technical development, the majority of participants would welcome an assisting system that would give more insight and support in maintaining a carefree and sustainable wardrobe.

Takeaways

This chapter provided an in-depth overview of consumer feedback on the concepts for an improved proposition for Bundles. The focus groups showed that there is a desire for a PSS that makes it easier for consumers to make optimal use of their machine and renewable energy. A high level of servitization would be , extending to the management of a sustainable wardrobe. Although the management concept is far fetched, it does offer inspiration for new services like (a catalogue with sustainable products)within the digital interface that Bundles will offer.

10 DESIGN RECOMMENDATIONS

This chapter integrates the findings from the focus groups in the designs. Potential design recommendations are presented with digital prototypes; figure captions indicate minor design alternations made in between sessions. The clothing manager is a holistic concept is presented with an updated mind-map as no screen designs are made yet.

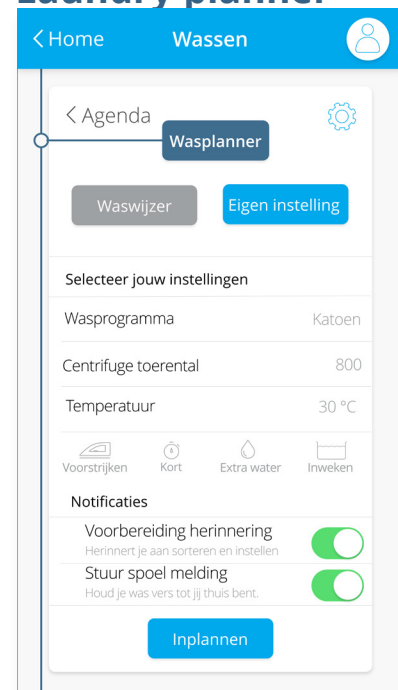## 10.1 Design improvements
Laundry planner

Figure 10.1-34: Program selector in laundry planner, without recommendations integrated.

Include user profile
Enable users to define preset laundry settings for their frequent used programme.

Project Eco Score upfront
Show the impact of programme and option selection with a responsive Eco Score indicator in the program selector

Include social reminders
Enable multiple users within one subscription to create shared laundry activities with responsibilities and reminders.

Enable recurring events
Facilitate the input for recurring (laundry) events to prevent running out of crucial items. For example, a reminder right after a sport event. The system could propose complimentary types of clothing and ideal settings

Figure 10.1-35: Laundry feedback, recommendations from focus group 2 integrated. Positive evaluated from focus group 3.

Show the total cost of laundry
Include the total cost of power, water and detergents. Asking a user for its energy provider and preferred detergent products for more accurate price feedback; information which is valuable as market research.

Personal clothing manager

The personal clothing manager is a concept that is recommended to use as inspiration for service development. Several advisory elements can be included in the soon to be app of Bundles with help of partners like Miele and fashion brands. The exploration prior to and during the focus groups offer plenty of business opportunities to start affiliate business models. It would need more time and resources to explore which elements are most valuable and feasible. The mind-map below illustrates the opportunities, of which the grey branches are generated prior to the focus groups the coloured representing consumer input from the focus groups. Arrows indicate a flow of input, a line with a dot at the ends indicate a two way flow of data.

Figure 10.1-36: Opportunities of a digital and personal clothing management system for consumers.
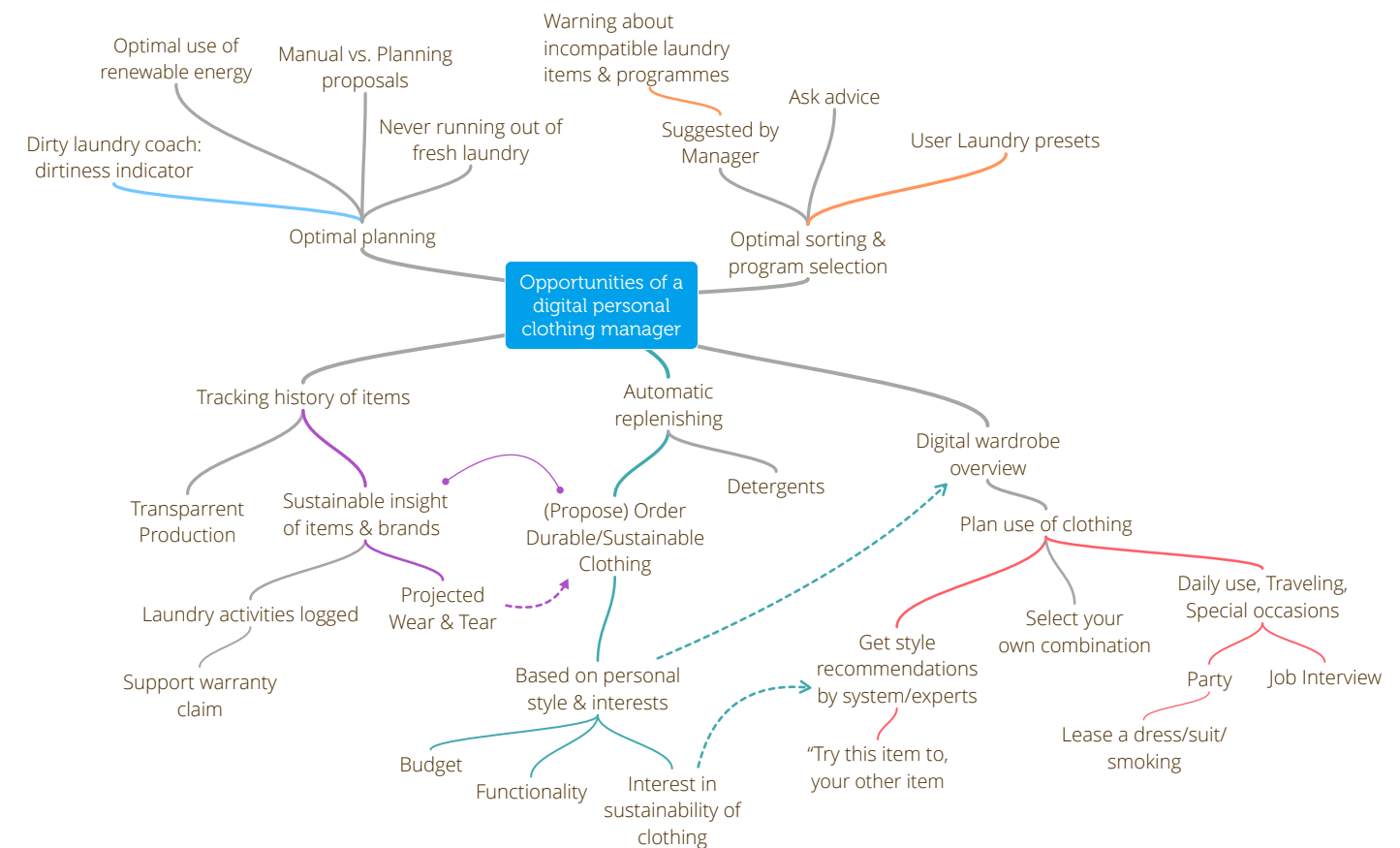
Gamifying the laundry experience

Some of the activities in the gamification were in general well perceived by customers, but not in a competing way. Laundry is, to most participants, not a game or competition but a necessity. There are, however, opportunities to make the concept relevant for the Bundles app.
A view recommendations for further design:

Reconsider concept wording
Instead of challenges, offer activities and give them a name that prevents any feeling of pressure or judgement by Bundles. A suggestion could be to name them 'Bundles lifehacks', an optional tip to make (sustainable) laundry easier.

Reduce/remove competition elements
The focus groups showed that there is not a desire to make a competition out of laundry. The laundry feedback itself stimulates a desire to perform better. People would like to be stimulated to perform better by **personal feedback** based on their laundry behaviour and preferences. A suggestion for customers who would like to set a personal goal: offer an integrated real life progress tracker in the overview of laundry statistics as illustrated in Figure 10.1-39.

Tune offered activities to personal preference
In general people showed an interest to share data in order to get the advice. Ask data and show how you will empower the user.

Show positive community impact.
Foster the community feeling and show the cumulative impact that Bundles can have on people's lives.

Make activities time depending
Offer the activities at the apropiate timing, depending on the season, user behaviour and/or experience of a user with Bundles.
For example, awareness about consumption behaviour would be relevant for people who are new to the app. The interactions enable users to become aware of possible improvements, and enable Bundles to build a relation with the user by sharing data/insights with each other.

Validate desirability of rewards
The focus groups did favour a discount on the Bundles invoice as reward for sustainable behaviour, it would give the impression that you're paying too much for the service if you wouldn't succeed in saving. Also participants did not expect a start-up to give such discounts. If a reward would be given at all, they would prefer external discounts on sustainable products or to participate in charity actions. This would require new partnerships, therefore the desirability should be validated first.
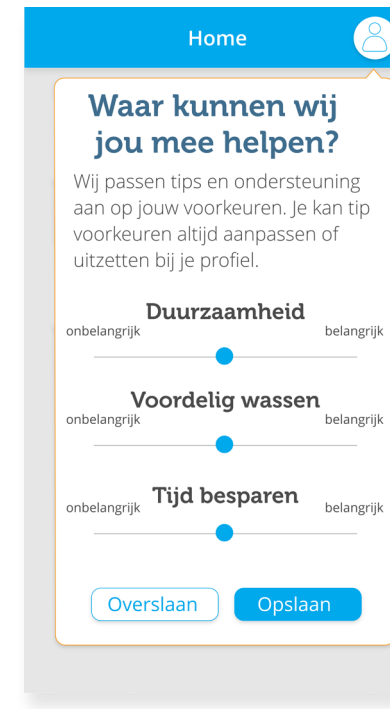

Figure 10.1-38: An example to ask for consumer goals/motivations.

Figure 10.1-39: An example to integrate a personal saving goal in the app.

Figure 10.1-37: Updated feedback design

Takeaways
This chapter illustrated a synthesis of the concept design and insights from the focus groups, including prototypes to envision how and where the design recommendations can be applied in further development. Ideally, Bundles would be able to develop their app to communicate with the machine via an application programme interface (API). Such an API would enable Bundles to provide more accurate consumption insights and enable users to control the machine right from the app either manually or via a concept like the laundry planner. Such an API would also allow Bundles and/or Miele to track the quality of the machine and its components, enabling them to prevent/predict maintenance or update the machine with newer and more sustainable programme settings.
The full project will be evaluated in the following chapter, with a discussion, conclusion and reflection.

11 TO CONCLUDE

This is the final chapter of the report and concludes the project with a discussion, conclusion and brief reflection.

11.1 Discussion
Defining the direction

In this project, a service design approach is used to explore new value opportunities for consumers in a circular product subscription; based on the data that machines and consumers can give as input to a digital system.

A clear desire emerged from the quantitative analysis of the reviewsite klantenvertellen.nl and qualitative sessions with consumers and investors. Consumers want to get more insight in the impact of their use, and more support by data-driven services. Investors, and Bundles, want the company to become more innovative and transform the data into sustainable and recurring value.

The industry co-creation was a qualitative method to engage Miele as stakeholder in the design of new experiences, using insights from customer research and jointly defining service principles to generate ideas for concept development. This was the first time Miele and Bundles performed design activities to explore new customer interactions. Although participants were enthusiastic about the session, it has so far not lead to a new vision on how to jointly design a PSS proposition.

Design Strategy

The design strategy is offers a new way of evaluating the subscriptions of Bundles. The strategy is based on consumer insights, company characteristics and design theory. The brand fit in the Bundles wheel is a way to represent the core values and personalities in the concept evaluation. Measuring the representation of personalities is, however, a subjective element and thereby hard to measure. The other characterizations in the Bundles wheel in fact already represent the company as presented in chapter 2. One could therefore argue that the brand fit is either redundant or that the definition of the brand fit should be revised. Instead, the innovation barriers might be added to the wheel as they are currently a separated criteria set but would be valuable to be included. Nevertheless, the Bundles wheel can be used as a new tool to define customer interactions with partners.

Supporting literature

This project focused on the potential impact of a PSS on daily life, as proposed in the assessment by Rexfelt and Hiort af Ornäs (2009). The feedback from the focus groups indicate that this service approach would make the system more desirable than current washing machines. It does, however, not eliminate the cost barrier. The feedforward of renewable energy was welcomed by all participants, thereby this project supports Kobus et al. (2013) and is potentially a new commercial application of their research project "Washing when the sun is shining".

Business value

The business value of the proposed concepts is data focused: the fact that consumers are willing to share personal data offers a vast opportunity for market research; more over, the reason why consumers are willing to do so is because they perceive the service in return as an added value to their subscription. This service interaction can contribute to a long-term relation between the customer and the business stakeholders. The research value and long-term relationship as result from the data interactions can enable Bundles and stakeholders to use the PSS as a continuous innovation strategy as proposed by Manzini (2003).

11.2 Conclusion
Value of the project

As a result of this project, the brand got an update. The design process made the company more user centric and the concepts improve the customer experience to foster a close relationship. The design strategy enables Bundles to evaluate and improve existing propositions and to design new subscriptions. Also, there are is plenty of brainstorm output left from the focus groups and industry co-creation to use as inspiration for new services.

What's next?

The concepts can be further developed in the following order:

Bundles life-hacks: the life-hacks can be introduced on short notice with content from Bundles and partners.

Laundry planner: A simple version of the planner can be introduced: providing feed forward, machine status and remote control (on/of), and of course the laundry feedback. The full interoperating potential of the concept can be developed together with a renewable energy partner like Qurrent and Miele.

Personal clothing manager: This concept serves as an inspiration for future product-service development. The future perspective enables Bundles to become the market leader in circular product subscriptions for consumers.

The next step is to make the circular future happen and work closer as partners to continuously deliver the best consumer experience. Bundles can use the concepts as a starting point to define shared circular visions with partners like Miele, Procter & Gamble, Seepje, Qurrent and potentially in the future with fashion industry.

This project illustrates how the customer experience can be designed from a service perspective. For further research, it would be interesting to explore how Bundles, Miele and potentially other partners could work together. Focussing on the improvement of value chain and integration of services with the products.

11.3 Reflection

Graduating for a start-up is fun and a challenge. The impact that the project can have is exiting and rewarding. The challenge is to find a focus in the midst of an organisation that is very dynamic with a lot of uncertainties.

The beginning was hectic as we worked in a public and noisy space. The new office had positive effect on the way how the team worked. As I agreed with Bundles, the graduation project was applied in a lean way to the company. The risk of such an approach is that you get drawn into projects that are not really your graduation. The app will be the medium to which my design apply, but it is not the core or the goal of the graduation to design an app. That's the challenge, finding the balance between graduation work and learning about the company and helping them to become better.

It was very insightful to be in the middle of Bundles and companies like Miele, Moyee coffee and Siemens. The enthusiasm that you get from customers, investors and partner companies is a great experience and is often energizing.

I learned a lot about planning, and my writing which are both not my strongest points. I underestimated many times the work, for writing the report, arranging the focus groups, reflecting on designs and on the report. Ultimately it was rewarding to get such positive reactions to the concepts. To me this project does not feel complete, but I wonder: will it ever? I look forward to develop a circular economy together.

"Never let well enough alone"
Raymond Loewy

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