

# SURFBOARD AS A SERVICE

*a novel kitesurfing experience*

Mathijs Terranea

for



APPLETREE





# Surfboard as a Service: a novel kitesurfing experience

Designing a Product-as-a-Service model for Appletree Surfboards

Master thesis by Mathijs Terranea

September, 2019  
Haarlem, The Netherlands

**Graduation Project** Master Design for Interaction  
Delft University of Technology  
Faculty of Industrial Design Engineering

**Author** M.P. Terranea (Mathijs)  
*Student number* 4277880

**Supervisory team**  
*Chair* Dr. ir. Diehl, J.C. (Jan-Carel, 'JC')  
*Mentor* Dr. ir. Kobus, C.B.A (Charlotte)  
*Company mentor* Buurma, W. (Wieger)



**Delft University of Technology**  
Faculty of Industrial Design  
Engineering  
Landbergstraat 15  
2628 CE Delft  
The Netherlands  
[www.tudelft.nl](http://www.tudelft.nl)



**Appletree Surfboards**  
Haarlemmerstraat 5  
2182 HA Hillegom  
The Netherlands  
[www.appletreesurfboards.com](http://www.appletreesurfboards.com)



# Acknowledgements

Here, I want to take a moment to thank everyone that helped me during the course of the project.

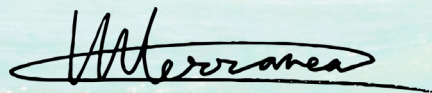
First of all, a big thank you to the supervisory team from the faculty. Thank you Jan-Carel for helping me to set up the project and the clear directions you gave me when I needed it. Your inexhaustible energy always helped me to take action and think positively. In the end, it was your course on sustainable product-service systems that really inspired me to follow this path. Thank you Charlotte for the critical look at my approach, research and writing. Thanks for the time and effort you took to guide and support me. Your feedback on the details helped me to make it a much more coherent story.

A gazillion thanks to Appletree for accepting my project, even though I came from nowhere. Thank you for giving me so much freedom to explore all the opportunities. I understand that there was not always a lot of time for me and the project, but the trust was there. I really appreciate that! Wieger, thank you for all your input. It was necessary to keep the project realistic and down to earth. Marit, thank you for your input as well, after listening to my thoughts and ideas. I wish the company good luck for the future. You make an awesome product. I hope this project contributes to your innovative and sustainable ambitions!

I want to thank my family and friends for supporting me, especially my father who gave tips for textual adjustments. I want to thank Julia for keeping me positive during the times i needed it. I want to thank Bob for borrowing his Appletree board to shoot the concept videos with. A million thanks to all the participants of the research interventions. Thank you coffee, for being there and thank you Khruangbin for being the soundtrack of the project.

And finally: thank you, the reader, for reading this report. I hope the story is clear and that you learn something about sustainability and kitesurfing!

*Mathijs Terranea*

A handwritten signature in black ink, reading 'Mathijs Terranea', with a long horizontal flourish underneath.

# Content

Abbreviations	7	<b>4. Development</b>	<b>49</b>	<b>7. Project evaluation</b>	<b>109</b>
Glossary	7	4.1 PaaS model structure	50	7.1 Discussion	110
Project summary	8	4.1.1 Idea generation	50	7.2 Contribution	111
		4.1.2 Overall model construction	52	7.3 Personal reflection	112
		4.1.3 Design measures	55		
<b>1. Introduction</b>	<b>11</b>	4.2 Trial concept structures	56	<b>References</b>	<b>113</b>
1.1 Setting up the project	12	4.3 Conveying experience	60		
1.2 Project assignment	12	4.4 Provoking behaviour	63	<b>Appendix</b>	<b>118</b>
		4.5 Improving interaction	64	A - Surfboard Creation	119
<b>2. Project context</b>	<b>15</b>	4.5.1 Current & Desired interaction	64	B - Research questions interview	124
2.1 Wave kitesurfing	16	4.5.2 Designing the interaction	68	C - Ideas	126
2.2 Appletree Surfboards	18	4.5.3 Storyboards	71	D - Harris Profile	138
2.2.1 Company	18			E - Value Proposition Canvas	139
2.2.2 Product	20			F - Concept wireframes	140
2.3 Sustainable models	21	<b>5. User testing</b>	<b>77</b>	G - User test related	144
2.4 The Value Hill	24	5.1 Assumptions before testing	78	H - User test data	146
2.5 Holistic overview	26	5.2 Research goals and questions	78	I - List of requirements	148
		5.3 User test setup	79	J - Project brief	149
<b>3. Explorations</b>	<b>29</b>	5.4 Results	82		
3.1 PSS model cases	30	5.5 Study evaluation	93		
3.2 User research	34				
3.2.1 Setup	34	<b>6. Final design proposal</b>	<b>95</b>		
3.2.2 Results	36	6.1 Adjustments	96		
3.2.3 Conclusion	44	6.1.1 Experience to convey	96		
3.3 Personas	46	6.1.2 Trial attributes	96		
		6.1.3 PaaS attributes	98		
		6.2 Additional elaborations	100		
		6.3 Recommendations	103		
		6.3.1 Disregarded matters	103		
		6.3.2 Product design	105		
		6.3.3 Implementation	106		

# Abbreviations

**PaaS** - Product-as-a-Service

**PSS** - Product Service System

**CE** - Circular Economy

# Glossary

**Board end-of-life:** A board reaches this point when it is damaged and beyond repair.

**Conditions:** The weather, wind and water conditions. All surf spots are highly dependent on these conditions and for that reason the forecasts are monitored closely.

**Durable:** Long-lasting.

**Quiver:** The collection of boards someone owns.

**Shaper:** A shaper is someone that produces surfboards by hand.

**Stoked:** An adjective the surf community uses commonly. It means being excited or euphoric about something. Examples are: "I am so stoked about this surf session", and "I let beginners try my board, to share the stoke of surfing".

**Sustainable:** Environmentally sustainable.

**Wave kiter:** A wave kitesurfer surfs the waves, making use of a wave kiteboard.

# Project summary

This report describes the process of the graduation project: 'Surfboard as a Service: a novel kitesurfing experience', which was carried out from February to September 2019. The assignment of the project is to design a custom Product-as-a-Service (PaaS) concept for Appletree Surfboards, which: reduces environmental impact, benefits the company and its products, and gives the end-users (wave kitesurfers) a great experience.

In the beginning of the project, research is done about the current context. Company activities and product properties that already contribute to sustainability are investigated. Besides, the theory behind sustainable models is consulted. After this orientation, some targeted exploration is done. Takeaways from interesting company cases and results from interviews with eight wave kitesurfers, result in the distinction of three different end-user groups and inspiration for idea development.

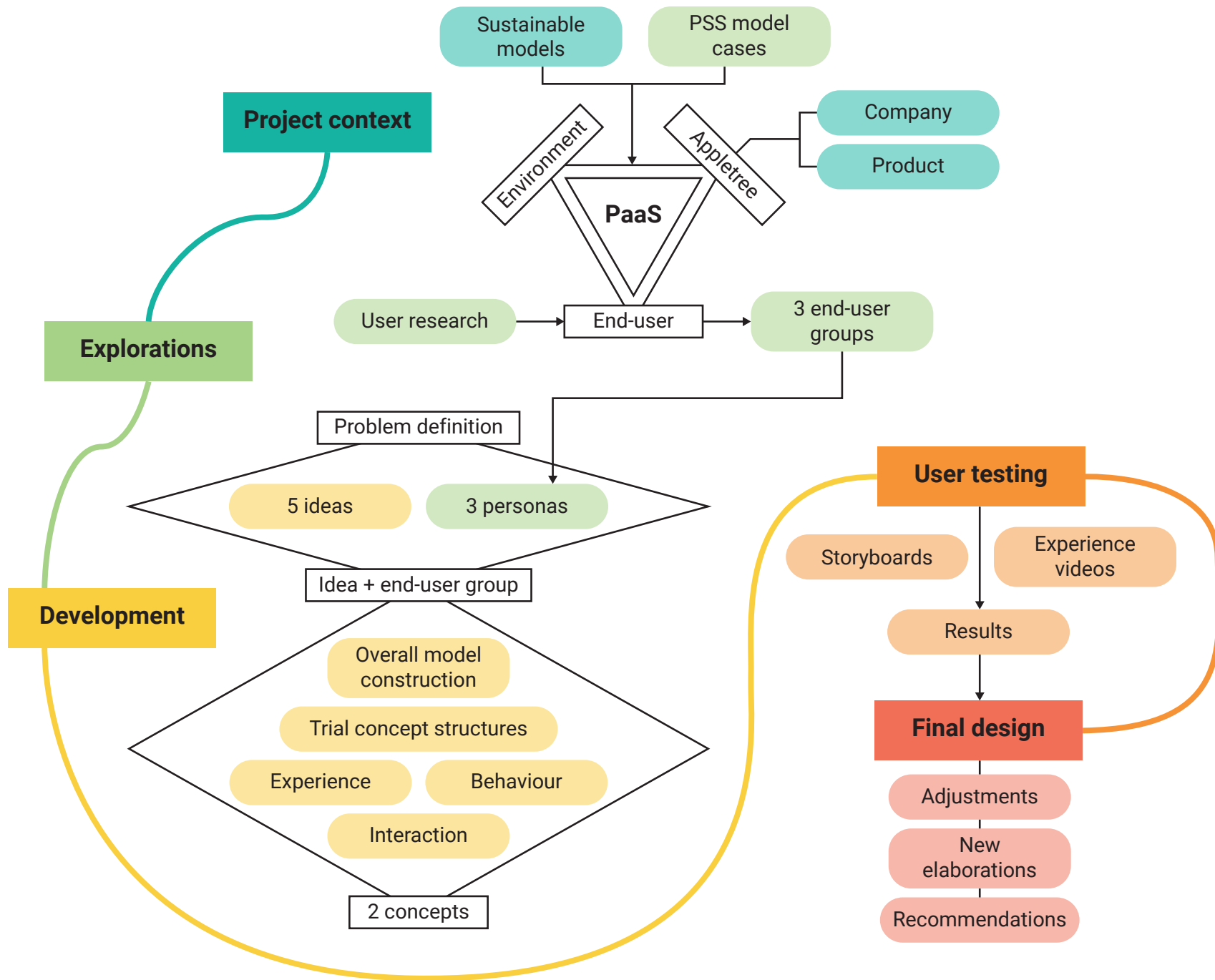
Ideation is then started and the first structural PaaS model ideas are developed. One of these ideas is chosen for further development. This decision leads to a focus on the end-user group of 'potential customers that want to try out Appletree boards before acquiring one'. This direction leads to a certain model construction and the development of a board trial service. Two trial structures are then elaborated into two different concepts, with a different aim on experience, interaction and intended behavior.

Findings from an extensive user test with ten participants, result in a final design proposal. The best of two concepts is merged together, and the last adjustments are made. The final design consists of a trial service and a PaaS-lease service, that can be set up alongside the company's current activities.

The last part of this report describes the features of the final design and presents a few additional elaborations. Recommendations for further development and suggestions for implementation are provided as well. Finally, there will be discussed how the design may contribute to wave kites, Appletree and sustainability.

## **Project overview visual**

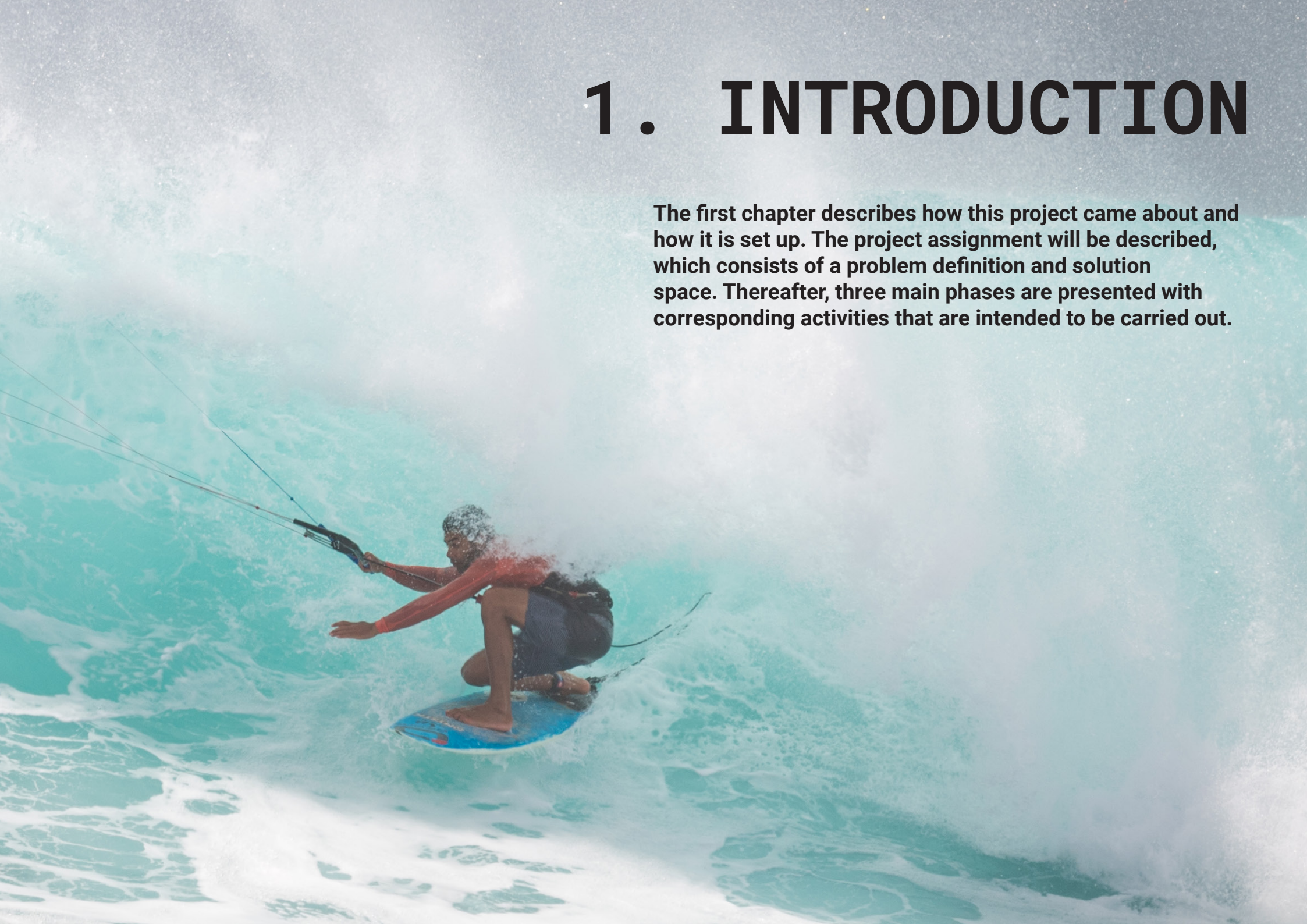
To provide an overview of the project, the visual on the next page was made. This visual shows the steps that were taken and how they influenced the process. It starts with the project context (chapter 2) and ends with the final design (chapter 7). The most important activities of the project are added chronologically, so the visual can be consulted while reading this report.





# 1. INTRODUCTION

The first chapter describes how this project came about and how it is set up. The project assignment will be described, which consists of a problem definition and solution space. Thereafter, three main phases are presented with corresponding activities that are intended to be carried out.



# 1.1 Setting up the project

In the summer of 2018, the stress to come up with a graduation project was torturing me for months already: I wanted to start my graduation as soon as possible. During the internship I did during the first quarter of the following academic year, someone asked: *“what is your favourite thing to do? In your work, you should experience this same feeling, because this is what you’re excited to wake up for everyday”*. Without hesitation my answer was ‘surfing’. Together with my interests in product-service system design and sustainability, I practically had all the ingredients to start the eventual project that lies in front of you. Though, at that moment my head was too full and unfocused to find a tasty recipe.

After my internship, almost two months of emptiness went by. During that period, I held the book ‘Material Matters’ by Thomas Rau closeby, for it had my full interest. This is where my obsession for the Product-as-a-Service model began. A business model that facilitates ‘the end of possession’.

There was something else that stuck with me from the conversation I had before. I was advised to go surf or to reunite with the beach, trying to understand what I really wanted. Then, after a solo walk on the beach, I was able to regain the ingredients, and I began to experiment with several directions. Shortly after, I had a clear vision of what I wanted to do for my graduation project. From that moment on, my mind was set.

Appletree Surfboards grabbed my interested when I noticed that the company pursues sustainable ambitions. I was very lucky that I was so well received by the company with the ideas I had back then, even though they were still very vague at the time. Together with the company mentor and a strong supervisory team from the IDE faculty, I managed to give life to the project and form the Project Brief, which can be found in appendix J. From that moment the project was ready to begin.

# 1.2 Project assignment

**The Product-as-a-Service (PaaS) model is a novel kind of Product Service System (PSS). This model, based on product use instead of ownership, has proven to be adaptable for all kinds of products (e.g. bicycles, washing machines, jeans, lighting). The graduation project assignment is to design a custom PaaS model concept for Appletree Surfboards: a Dutch (kite) surfboard manufacturer.**

Surfers are quite conscious of the environment; it is in the dna of the surf community and lifestyle. The surfer’s sense of belonging to nature, produces respect towards nature and a corresponding environmentalist ethics (Taylor, 2007). Besides, all surf sports are dependent on the environment’s well-being: clean waters and steady, returning surf conditions.

The surfboard industry is trying its best to be more sustainable with new innovations. For instance, recycled materials are used to shape boards, and waste materials from this process are recycled. This is done by Appletree Surfboards as well. Though, typically surfboards are not completely made with sustainable resources. The end-of-life of surfboards is still a big challenge. Fully recyclable surfboards exists, yet they are still low-performance products. The quality is not comparable with high-end surfboards.

Applying the PaaS model would be a novel, contemporary manner to close the loops of circularity within this industry and improve sustainability. When using PaaS model properties, less boards will be produced since one board will be used by multiple users. This results in benefits for the environment, manufacturer and end-user.

## Company

Appletree Surfboards is dedicated to minimise its ecological footprint. They produce strong, durable surfboards with the use of sustainable materials and manufacturing processes. Their main interests in the project are: the great value of research within this direction and the possibility to build on their ideas to provide customers with an opportunity to try and discover their boards.

## Problem definition

To give the project a direction and to clearly indicate what issues should be addressed, the following problem definition was defined in the early stages of setting up the project:

*How to create a PaaS model for Appletree Surfboards with benefits for the company and the environment, while giving the target group a positive experience?*

### Solution space

Parallel to this problem, a solution space was set out to highlight the aimed solutions for the environment, the company and the end-user.

- *Reduce environmental impact, by using the sustainable properties of the PaaS model. A transition from a linear (and reuse) economy, to a more circular economy.*
- *Make this model beneficial for Appletree Surfboards and its products.*
- *Give the target group a positive experience during product use, with this sustainable alternative and its intangible added value of product experience.*

## Activities

The 3 main phases of this project were determined as:

1. Research the current context (literature, company, target group, market).
2. Develop and evaluate custom PaaS model ideas.
3. Work out concept(s), test and finalize.

The three phases brought up initial questions and intended actions to address. These activities provided a direction to the approach and are listed next per phase.

### Research the current context

- How does the company currently operate and what are its needs? How does the industry and its market look like?
- How does the company's target group (kitesurfers) behave and what are their goals, motivations, meanings, (latent) needs and practical matters? Will there be a new target group? Understand their perspectives and translate their experience in a desirable design solution. How to engage the target group into an environmentally conscious, positive experience?
- Explore existing literature on PSSs and the PaaS model. Explore and compare existing PaaS model based companies (case research).
- Gather criteria and work out a list of requirements.

### Develop and evaluate custom PaaS model ideas

- Diverge: what PaaS model constructions are possible? What scenarios (e.g. normal use, travel, testing)? How does the service and its revenue model look like? Will it change product properties and maybe even ask for a new design? Does it need a collaboration? How does the experience look like? Make customer journeys of ideas.
- Evaluate ideas and their experience by testing requirements. What contributes to a optimal experience? What are desired interactions?

### Work out concept(s), test and finalize

- Take the ideas through a new iteration step and test these concepts. Design the user experience (e.g. a comprehensive customer journey) and possibly an user interface prototype. Evaluate the final design, formulate further research and recommendations.



# 2. PROJECT CONTEXT

**In this chapter, the context of the project is explored. Wave kitesurfing is explained, and Appletree Surfboards and its products are examined. After that, the theory of sustainable models is presented and the current company activities are placed on the Value Hill, leading to circular strategies. Finally, a holistic overview is made of the project's context.**



## 2.1 Wave kitesurfing

The focus of this project within the world of kitesurfing, originates from the products that Appletree Surfboards mainly manufactures: wave kiteboards. Logically, it was decided together with the company to design a PaaS model for the corresponding target group of 'wave kitesurfers'. In this paragraph, wave kitesurfing is explained.



Image 1: Early development of kitesurfing

### A brief history of kitesurfing

Like every boardsport, kitesurfing originates from surfing. Surfing itself began with the ancient Polynesians, popularised during the 50's and 60's in California and has grown globally ever since.

The expanding sport was accompanied by new boardsport innovations. For example, surfers invented skateboarding to 'surf on land' for when there weren't any waves. At sea, a new surf sport using a small sail on a surfboard, windsurfing, became highly popular in the 80's. In contrast to surfing, windsurfing is more dependant on wind instead of waves.

The knowledge that was gained with windsurfing laid the foundation for the sport of kitesurfing to build on. The development of kitesurfing began in the late 20th century, when people began to experiment with kite designs (image 1). It started to get popular during the late 90's, when windsurf equipment manufacturers began to produce kitesurf material as well. The entry of this new exciting surf sport converted many windsurfers to kitesurfing. By 2012, the total numbers of kitesurfers worldwide were estimated by the ISAF and IKA at 1.5 million (International Sailing Federation, 2011). No further information about the quantity of kitesurfers is known. Although, this amount should have risen increasingly today, taking into account the risen popularity.

### Kitesurfing 101

Kitesurfing is exactly what you would expect it to be: surfing while being dragged by a huge kite. Kitesurfers use the wind and face the elements at sea or inland waters. It is a young water sport done globally, which became very popular in the Netherlands. This section is to clarify the reader what this sport is about.

#### Kiteboarding

Most kitesurfers ride with a twintip board (image 2). This type of board has a lot of similarities with a wakeboard. It usually has two foot straps and it can be surfed in both directions. Kiteboarding has styles dedicated to high jumps and freestyle disciplines.

#### (wave) Kitesurfing

Wave kitesurfers ride with a wave kitesurfboard, also called a directional (image 3). This type of board has a construction similar to a normal surfboard, designed to handle hard impacts. These boards are surfed with straps or strapless. Wave kiting is a style dedicated to riding waves, so it is usually done at sea. Though, a freestyle discipline called strapless freestyle is done at flat waters as well sometimes.

#### Kite foiling

One of the newest developments in kitesurfing is foiling (image 4). A kite foilboard has a hydrofoil attached on the bottom which lifts the board above the surface. Due to less friction, it is possible to kite with even lower wind speeds.



Image 2: Kiteboarding



Image 3: (wave) Kitesurfing



Image 4: Kite foiling

### **Kite, bar and harness**

Most power kites are made of strong polyester and have inflatable parts, which give them their shape. Via lines, a kite is maneuverable with a control bar. The rider holds on to this bar and is able to control the kite with it, using steering gestures. A kitesurfer wears a harness that attaches the body to the kite. This harness spreads the kite's pulling force across the core area.

### **Kitesurf conditions**

Wind is the most important weather condition for kitesurfers. A kite can only be used within a specific range of wind speed, considering the weight and experience of the kiter. That is why most kitesurfers have a couple of kites (mostly 2 or 3) within the range of 6 to 14 square meters. In this way, a kitesurfer is able to surf within a wider range of wind speeds. Kitesurfing is only allowed at designated places at beaches and inland waters.

### **Kitesurf culture**

Kitesurfing in general is a fairly new addition to the global surf scene and culture. Little is known about kitesurfing as a separate subculture, as the sport is still young. Although, some things about environmentalism in the overarching surf culture are known. This will be discussed next, for it might be an important value for the end-user, and relevant information for the project.

## **Environmentalism in surf culture**

Surf culture is environmentally conscious; it is in the dna of the surf community and lifestyle. Presumably because their sport is dependent on the environment's well-being. Taylor (2007) implies that the sense of belonging to nature and the sea in particular, represents an important part of surfing experience and produces respect towards nature and a corresponding environmentalist ethics. Nowadays, this feeling inspires environmentalist values and action among surfers. Taylor (2007) calls surfing an 'aquatic nature religion', which is growing globally and becoming increasingly intertwined with environmental activism. The segment of surfers and surfing communities with this spiritual connection through the practice, rise up to defend the environment with a focus on protecting marine ecosystems (Rachel Carson Center, 2014).

The above mentioned is debatable. Although the surf culture is environmentally conscious from within, most individuals are full participants in a technological society, with the majority travelling to the beach by car, riding on boards made from hazardous chemicals and materials, whilst wearing petroleum-based neoprene wetsuits (Rodgers, 2017). This is without even considering all the extra equipment that is needed for kitesurfing, compared to normal surfing.

## 2.2 Appletree Surfboards

In this paragraph, the history, product range, technology and current customer of Appletree Surfboards are presented. After that, the unique (sustainable) characteristics of their boards are explained.

### 2.2.1 Company

#### Company history

Appletree Surfboards is a Dutch surfboard and wave kiteboard manufacturer founded by two brothers: Wieger and Jorrit Buurma. They started producing their first handmade surfboards in a shed around 2005, and their first wave kiteboards a few years later. The knowledge acquired in building surfboards was used in making wave kiteboards, which became their main focus. During the first ten years they refined surfboard shapes and came up with a new production method that is unique in the world. In 2016, the company moved to a bigger production facility and they launched their best performing boards to date. In February, the company moved their production to Portugal, where they plan to expand even more.

Right now they have two self-built shaping (milling) machines and a 10+ people staff. A third of their sales goes to the Dutch market, the rest to every corner of the world. About 90% of the company's sales are wave kiteboards.

#### Product range

- **Surfboards:** Appletree specialises in making surfboards for the North Sea conditions: boards that surf well on small waves. Though, they perform equally in bigger, more powerful surf.
- **Wave kiteboards:** With the North Sea's heavy storm conditions, waves can reach respectable heights. Consequential, some of the best kitesurfers in the world are from the Netherlands. Appletree's wave kiteboards perform in all conditions: from small waves and flat water, to big stormy conditions where control and trust in equipment is vital.
- **Foilboards:** Appletree creates boards for both kite foiling and surf foiling, built with the same craftsmanship they put any other Appletree board.

Due to the focus on wave kitesurfing, the 'normal' surfboards and foilboards are disregarded for the rest of this project.

#### Technology

##### Durability

Fed up with kiteboards breaking, denting and generally lasting no more than one season, the company started to research if they could make a board that would be stronger and more durable. After 3 years of research and testing, they developed a board construction that is better than any other wave kiteboard on the market today. Eventually, they completely reinvented the way wave kiteboards (and surfboards) are made. All boards are custom, handmade products, which makes each one of them unique.

##### Sustainable approach

Appletree is dedicated to minimise the ecological footprint of their surfboards. A simple way to do this is to make products that last longer. They do this by producing the strong, durable boards they are known for. Besides, they reuse excess foam as packaging material and any waste foam is recycled. The resin they use has a high percentage organic material.

#### Current customer

The primary focus of the company is directed to kitesurfing and their main target group is kitesurfers. The experience of the company within the kitesurf equipment industry tells that about 80-90% of all kitesurfers are men. This is comparable with their own sales and analytics, of which 80% are men.

The current customer is a man between 30 and 45 years of age. An intermediate kitesurfer with a decent income, spending money on high-end kitesurf gear and trips abroad. His goal is to make a transition to (strapless) wave kiteboarding.



**APPLETREE**

**Mission**

Custom build surf, foil and kiteboards that last forever. Strong, light and incredibly well designed. Without producing unnecessary waste.

**Vision**

We want to become known as the go-to brand for strong and durable boards. A modern and high-tech brand. We want to become big, grow world wide, but still be personal. The new factory in Portugal is going to be the first 'clean' shaping bay of Europe.

**Values**

DURABLE - last forever and break boundaries

CUSTOM - cause no one wants to end up in the mainstream

TRANSPARENCY - sharing our story without any secrets

TECHNOLOGY - always push our technologies to the max

CRAFTSMANSHIP - handmade, with love

*"Break limits, not boards."*



## 2.2.2 Product

The purpose of this section is to explain the characteristics of Appletree's process and materials, and how these result in durable and sustainable benefits. For an elaborate explanation of how surfboards are created, consider reading appendix A. This shows how the Appletree process differs from regular surfboard creation, using a visual with manufacturing steps.

### The Ecoboard Project

All Appletree boards hold an 'Ecoboard Level One verification', which means they produce with reduced environmental and toxic impacts, through the use of sustainable materials and manufacturing processes (The Ecoboard Project, n.d.). For instance, the epoxy resin that is used has a 40-50% organic content.



### Extruded Polystyrene

The first major difference in comparison with other wave kiteboard shapers, is the type of blank Appletree uses: XPS (Extruded Polystyrene) instead of the common used EPS (Expanded Polystyrene). The game changing difference between these polystyrene foams, is that XPS doesn't contain the beads that EPS has. This makes the material waterproof. When the skin of the board is punctured or damaged, water can't penetrate. This is certainly the case with EPS boards: water seeps through, worsening the damage. For boards with a XPS core this means they are easier to fix when any damage occurs. This characteristic leads to higher durability and longer use.

### Fusion tech

XPS is notoriously hard to laminate, but the technology that Appletree mastered makes this possible. This is what they call the 'fusion tech', which they are really proud of. They are able to inject the epoxy resin while the board is drawn vacuum. The result is a board with less epoxy resin, but a stronger construction than a regular board. The lamination process in detail is a big company secret. For others this is the part where they use their 'Appletree magic'.

### Honeycomb layers

Appletree produces both fiberglass and carbon fiber laminated boards, of which the latter is the strongest and lightest construction they produce. The boards feature a thin, lightweight PET honeycomb layer on the top of the board. This gives the deck good resistance against impact and its signature look. The wave kiteboards have an additional XPS honeycomb layer under the front foot to minimise heel denting, because boards endure heavy forces at this part of the surface (e.g. with jumps).

### Packaging

The package that Appletree ships their boards in, is made from the negative of the board's original foam blank, covered in a cardboard box. In this way, the board is protected sufficiently during transport; especially the edges. Reusing this piece of leftover foam for packaging makes the use of a lot of extra packaging materials unnecessary.



Image 5: Luke's leaf, glass (green tint) and carbon (red tint)

## 2.3 Sustainable models

A literature review has been done to gain knowledge of sustainable models. The model of the Circular Economy, as well as theory behind Product-Service Systems and the Product-as-a-Service model are discussed in this paragraph.

### Circular Economy

Today, we live in the so called 'take, make, dispose' society. This linear economy creates products from raw materials, that after their use end up as waste. To clarify what a Circular Economy (CE) is, a brief summary of what the Ellen MacArthur Foundation (EMF) brought forth seems most appropriate. This charity is the pioneer in spreading the vision of a CE and is accelerating the transition to a CE. According to the Ellen MacArthur Foundation (2015), "a circular economy is one that is restorative and regenerative by design and aims to keep products, components, and materials at their highest utility and value at all times". It is based on three basic principles (Ellen MacArthur Foundation, n.d.):

- Design out waste and pollution
- Keep products and materials in use
- Regenerate natural systems

The EMF created a famous infographic, known as the 'butterfly diagram', to visualize the flows of the CE (see figure 1). The tighter the loop, the better utility and value of resources are sustained. For this project, the right side of this diagram is more applicable. This side includes the four technical cycles for finite materials (e.g. metals, plastics, etc). Wave kiteboards boards consist of these materials.

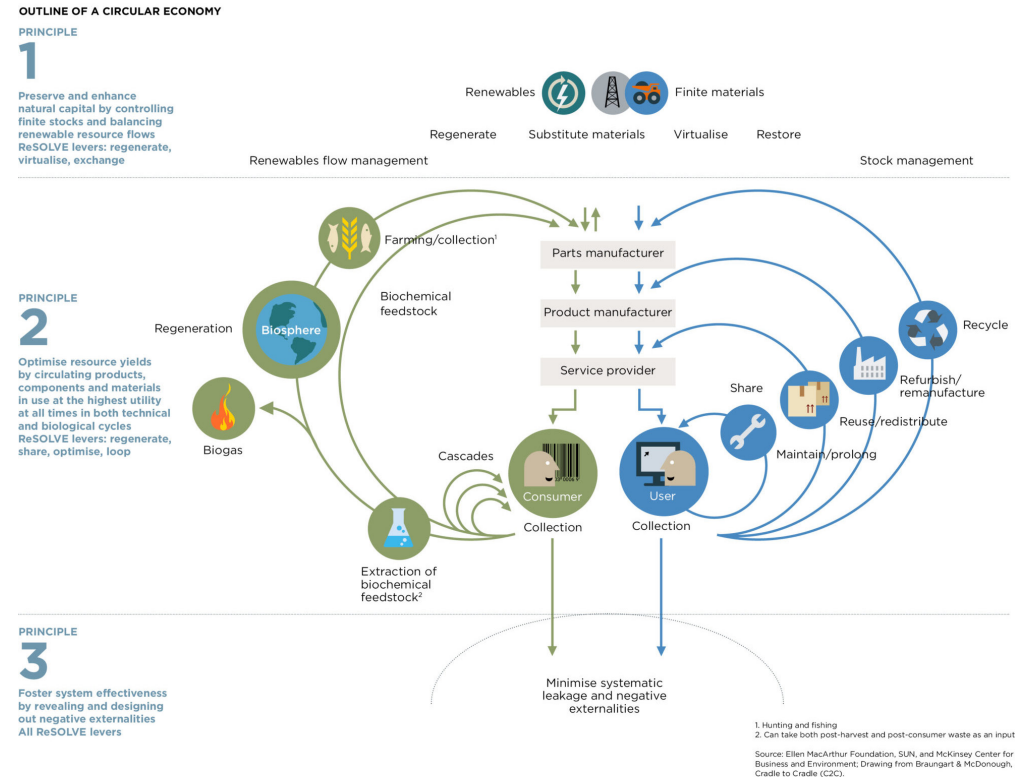


Figure 1: Circular Economy System Diagram by the Ellen MacArthur Foundation

## Product-Service System

A Product-Service System (PSS) can be defined as “tangible products and intangible services designed and combined so that they jointly are capable of fulfilling specific consumer needs” (Tukker, 2004). These systems come in many forms, of which Tukker made a distinction into three main categories:

The first main category is product-oriented services. Here, the business model is still mainly geared towards sales of products, but some extra services are added.

The second main category is use-oriented services. Here, the traditional product still plays a central role, but the business model is not geared towards selling products. The product stays in ownership with the provider, and is made available in a different form, and sometimes shared by a number of users.

The last main category is result-oriented services. Here, the client and provider in principle agree on a result, and there is no pre-determined product involved. (p. 248)

These main categories are shown in figure 2. Each of these categories consist of different subcategories of PSSs, which are shown in this figure as well.

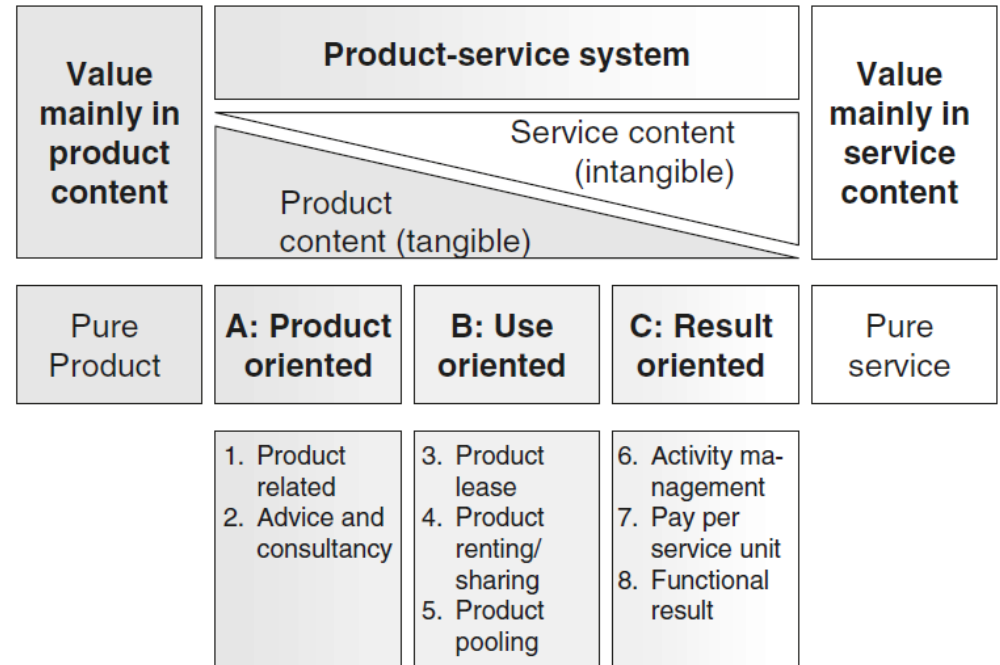


Figure 2: Main and subcategories of PSS (Tukker, 2004)

## Product-as-a-Service

The Product-as-a-Service (PaaS) model is a novel kind of Product Service System (PSS). This model is based on product usage instead of ownership and has proven to be adaptable for all kinds of products (e.g. bicycles, washing machines, jeans, lighting).

Current PaaS model examples tend to share properties with the use-oriented and result-oriented PSSs. Mainly subcategories like: leasing, functional result and pay per unit use. These kind of PSSs, where the provider remains owner, have certain properties that show potential to contribute to resource-efficiency and a circular economy (Tukker, 2015). The PaaS model, as defined by Fischer & Achterberg (2017), shares these properties:

In PaaS models, the service provider retains ownership of and responsibility for the product, which incentivises the design of high quality, low maintenance and durable products. Moreover, retaining ownership of the product facilitates take-back and the reuse or recycling of materials and components, which leads to improved resource efficiency. (p. 4)

The service provider uses its service as a tool to gain control over the product in a way that provokes correct use and contributes to life-extension.

## PaaS frameworks

A PaaS model can take several forms. Achterberg, Hinfelaar, & Bocken (2016) provided clear definitions of three different kinds of PaaS model frameworks:

### Product leasing

Delivers access to a product rather than the product itself so that the service provider retains ownership of the product. The primary revenue stream comes from payments for the use of the product and a single user uses the product at any given time.

### Product renting

Delivers access to a product rather than the product itself so that the service provider retains ownership of the product. The primary revenue stream comes from payments for the use of the product and different users use the product sequentially.

### Performance provider

Delivers product performance rather than the product itself through a combination of product and services, where no predetermined product is involved and the service provider retains ownership of the product. The primary revenue stream is payments for performance of the product, i.e. pay-per-service unit or another functional result. (p. 14)

## 2.4 The Value Hill

All aforementioned sustainable models do not say anything yet about how Appletree might benefit from them sustainably, considering the possibilities that these models might offer. The Value Hill is used to place the company in a sustainable context and to validate that creating a PaaS model is indeed a strategy with a great potential.

Appletree's current business model is basically linear: the company creates products that are discarded as waste at their end-of-life. Though, they are environmentally aware and have done some great efforts towards sustainability. These efforts relate in particular to the production process, the used materials and product durability. To get an overview of the current circular and sustainable company properties, the company is placed in a circular context using the Value Hill (Achterberg, Hinfelaar, & Bocken. 2016).

The purpose of the Value Hill is actually a means to develop company strategies for a circular economy. Though, for this project it provides some interesting angles on how Appletree currently operates in terms of sustainability and how to put the company in a more circular context. The Value Hill will be explained next by using the principles of the Circular Economy.

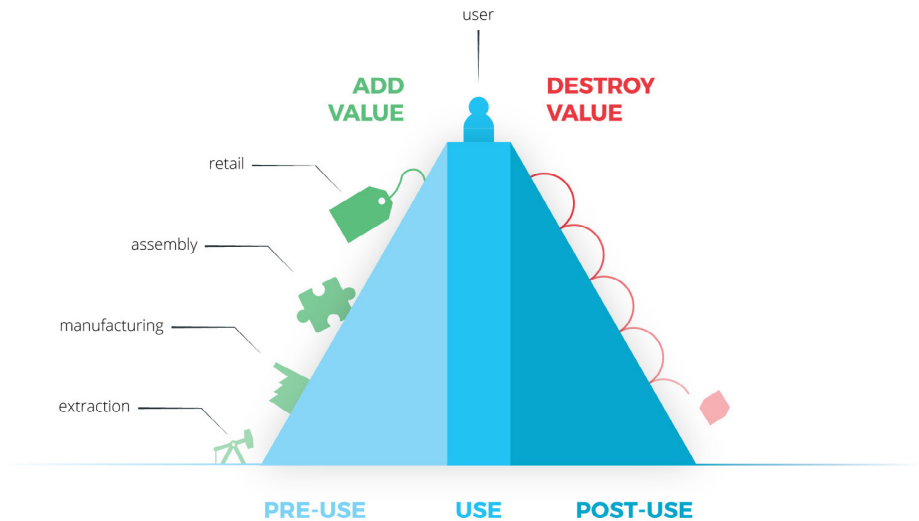


Figure 3: The linear Value Hill (Achterberg, Hinfelaar, & Bocken, 2016)

### Linear economy: Destroying value

Product value is created before usage, by extracting resources from the earth, refining them for manufacturing, assembling them into products and distributing them to consumers (Achterberg et al., 2016). During use, the value of the product is at its highest. However, in a linear economy, products are discarded after use as waste, and the value is destroyed (see the figure 3).

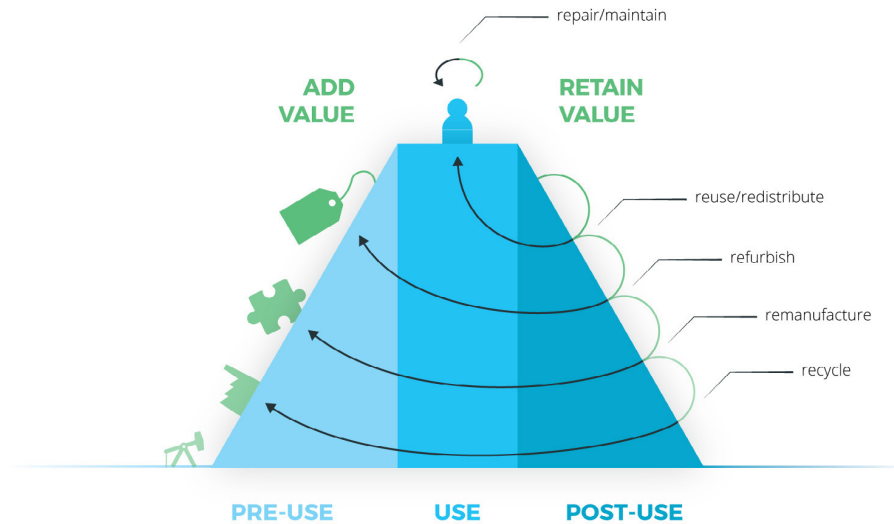


Figure 4: The circular Value Hill (Achterberg, Hinfelaar, & Bocken, 2016)

### Circular economy: Retaining value

In a circular economy, product value during use is retained as long as possible with high durability or easy maintenance through circular design. After usage, the value of the product's resources is kept as high as possible by bringing it back to previous (pre-use) phases (see figure 4). Within the Value Hill, the product makes the same exact same loops as the technical cycles in the butterfly diagram by the Ellen MacArthur Foundation (paragraph 2.3). How tighter the loop, the more value is retained.

## Placing Appletree on the Value hill

Any way you slice it: Appletree's current business model is linear. Although, their products are known for a high durability and long life. Therefore, the company has a model comparable to the 'Classic Long-Life' model (Bakker et al., 2014). The durable product design is able to retain value at the top of the hill for a long time.

Within the use phase Appletree offers reparations due to manufacturing errors, within their warranty on manufacturing errors of 1 year. They repair outside the warranty as well, for a fee at the customer's expense.

Concerning the post-use phase, the company doesn't have any activities. A PaaS model could potentially help Appletree to be more circular within this phase, by closing the loops to retain value. Besides, it might benefit the use phase more extensive as well, by providing more active repair and maintenance services.

## Recommendations on improving circularity

Currently, Appletree loses control over their products once they are sold to a customer or reseller. Right now the end-user is the one that discards the product at its end-of-life (e.g. when it is broken or beyond reparation). Furthermore, the company does not actively offer repair outside of their warranty. However, this obstructs optimal product use through controlled product maintenance by the manufacturer itself. A PaaS model, with its shift of ownership to the company, could stimulate intake of used and broken products, so that their value can be retained by Appletree.

A more tangible example to recover value is by offering second hand and refurbished boards. Boards at their end-of-life can be disposed responsibly by the company itself or in collaboration with new and existing partners. At the moment, remanufacturing or recycling processes are too complex for Appletree. Just like the whole industry, they do not have the technology or facilities yet to make this happen. Designing a more circular product, with reusable materials would solve this problem in the pre-use phase. Though, this project is focused on creating a more circular business model rather than changing the product design to a more circular one. Of course, for the latter recommendations can be made.

## 2.5 Holistic overview

Prior to the start of this project, three main factors that influence the PaaS model were already identified: the company (Appletree), the end-user and the environment. To put all main factors in a holistic perspective, an overview was made to clarify how they influence the PaaS model and each other.

What is influencing the shape the PaaS should have, and what will be influenced by the PaaS? That is the question that came up while putting everything in context. Figure 5 below is a visual structure of influencing factors within the scope of this project. This abstraction of the context scope was very useful at the start of the project. Hopefully it serves as a clarification for the reader. The visual will be discussed next.

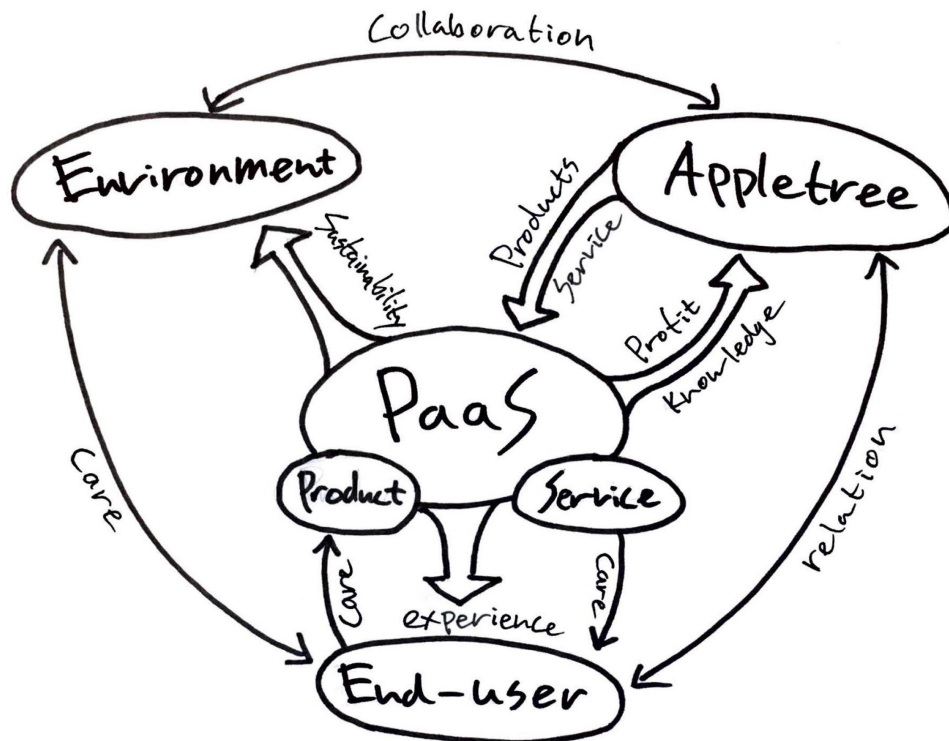


Figure 5: Holistic overview of influencing factors

### The PaaS model

As mentioned earlier, the PaaS model is intertwined with the three main factors. The output that the model has for the environment is sustainability in the form of resource efficiency. The company brings products and service into the equation, and will receive profit and useful knowledge in return. The PaaS, with its product and service, influences the user experience. The service will care for the user and the user is expected to care for the product. Next, the mutual connections between the three main factors will be explained.

### Environment - Appletree

Beginning with the connection between the environment and Appletree, it can be seen that the environment (for the sake of humanity) expects the company to contribute with sustainable behaviour. The Earth provides the resources to make products. In a ideal situation, the company will manage these resources in a responsible and sustainable way, without wasting them.

### Appletree - End-user

Between the company and the end-user a relationship exists. The company provides products and services and the end-user has needs and expectations concerning these matters. To maintain a good relation, the company has to meet these needs and expectations.

### End-user - Environment

Regarding the worldwide ecosystem, everyone has the obligation to care for the environment like the environment cares for us. By making use of the PaaS, the user contributes to a higher level of sustainability. In this way, the user will care for the environment.

## Scenarios

A question that came up while creating this visual representation was: what different scenarios will be created in this structure with different types of end-users? The end-user is the only factor that is unclear, as the environment is a solid factor and the company's needs are known. In consultation with Appletree and following their interests for the project, the end-user domain of 'wave kitters' was divided into three end-user groups with potential:

- Appletree's current target group
- Young wave kitters (age 20-30) - a group they would like to appeal to
- Travelling wave kitters - a group with potential international activities

**Current  
target group**

**Young  
wave kitters**

**Travelling  
wave kitters**

These abstract groups were set to stimulate thoughts of different possible PaaS solution spaces, assuming these groups have different needs. Changing the end-user group changes the relationships between the factors and influences the holistic structure.

In paragraph 3.2.1, these groups will be presented in a revised and more structured way.



# 3. EXPLORATIONS

**This chapter is an exploration of 'what's out there' and the needs of wave kites. To find inspiration for PaaS model structures, four interesting company cases are reviewed. After that, results are presented from interviews with different types of wave kites. These results lead to the distinction of three potential end-user groups.**



## 3.1 PSS model cases

**Initial desk research was done to discover what kind of PSSs exist and to find inspiration for PaaS model structures. Four different company cases with interesting and inspirational characteristics were reviewed for this purpose.**

The chosen companies involve the use of products with a usage and performance somewhat similar to wave kiteboards. In this way, it is easier to imagine the applicability for a wave kiteboard compared to the products within these PSSs. Besides, the cases involve 2 companies within the world of boardsports with interesting service structures.

These companies are selected because of their inspirational characteristics, mutual differences and the author's interests. Next, the companies are labeled with what PSS they manage, using the main and subcategories of Tukker (2004) which can be found in paragraph 2.3. In addition, they are labeled with a PaaS framework as well.

Swapfiets: fast growing company that uses a PaaS model

- PSS: result-oriented (8. functional result)
- PaaS framework: performance provider

MUD Jeans: inspirational company with a versatile business model

- PSS: product-oriented (1. product related), use-oriented (3. product-lease)
- PaaS framework: product leasing

Awayco: upcoming PSS in the world of surfing

- PSS: use-oriented (4. product renting)
- PaaS framework: product renting

Signal Snowboards: a boardsport brand with inspirational services

- PSS: product-oriented (1. product related)
- PaaS framework: none

For each company case the concept is explained and the underlying model is investigated. Interesting points that occurred during this investigation are noted and translated to takeaways for the rest of the project.

## Swapfiets



### Concept

Swapfiets offers a lease subscription on a bike. For a fixed monthly fee you are provided with a working bike. If something is broken, they will come and fix or exchange (swap) the bike within a day.

### Model breakdown

This PaaS-lease model thrives on continually maintaining and repairing their products. A huge amount of bikes with many of them in use by customers, creates a very complex system. With all their activities, they must deliver a continuous high standard of customer service.

In each active city, the logistics are locally organised with a warehouse for stock. This warehouse is where bike repairmen fix the incoming broken bikes as well. Next to that, in the city centre a Swapfiets store functions as a place for service and appointments. Although, for an appointment they can also come to you by car. This car also functions as a shuttle for bikes between the warehouse and store: working bikes go to the store, broken bikes go to the warehouse.

Swapfiets keeps track of all their bikes and actions. They use a database system that not only provides them with info about bikes, customers, spare keys and appointments; but also what breaks often, who does this, et cetera (7DTV, 2018).

### Interesting points

- Local logistics: The company has local systems, which enables them to act fast and control stock.
- Database: The logistics, products and actions are supported by a database, that provides them with all the info they need.
- Repairation: Professional bike repairmen are hired to repair and maintain. Product value is sustained with controlled maintenance.
- Customer service: Swapfiets is able to exchange a broken bike within a day. They have a stock of working bikes at all times to live up to this promise.
- Deductible: the user agrees to pay a deductible when the bike is lost. Besides, the user pays for damages due to improper use.

## Main takeaways

A local system in which everything is logistically controlled is ideal to act fast and deliver a great customer service. A database with all the information about wave kiteboards and their corresponding users is inevitable. With a database Appletree would be able to keep track of all their existing PaaS users and their subscriptions. Local systems would enable the whole operation to get users back in the water as soon as possible when a board is damaged. To achieve a fast but controlled reparation, the company should appoint local repairmen with the skills to repair boards to an Appletree standard. These reparation stations should be provided with all the original materials of course. A deductible and standard fines for improper use could be a great solution to discourage reckless use of a wave kiteboard.



Image 6: Swapfiets bikes

## MUD Jeans



### Concept

MUD Jeans offers 'Lease A Jeans', which shifts the ownership of these circular jeans to the company. The company stays responsible for the raw materials and deals with the recycling after use. After a 12 month lease, the customer may choose to keep the jeans until they are worn out, or switch for a new pair of MUD Jeans and keep on leasing.

### Model breakdown

The PaaS-lease construction consists of a one-time-only subscription fee and 12 monthly payments. The subscription fee makes the customer a member of the MUD Jeans community and enables to lease 3 products simultaneously. With the jeans they give customers a folder with on the back the option to sign a 'gentleman's agreement' (te Grotenhuis, 2018). With this fake agreement, users promise to send the jeans back to the company after use. The jeans are returned to the company, where they will be upcycled to a vintage collection or recycled to become new jeans. Moreover, the company also offers a discount for sending old jeans from any other brand to collect forgotten resources.

The company has partner factories that are socially and environmentally responsible. They keep a short supply chain and fair conditions. The circular jeans are designed without leather and consist of (as an addition to bio-cotton), between 23-40% post consumer recycled denim (MUD Jeans, n.d.). Besides, the collection is made to stay, so they won't have to waste outfashioned leftovers.

### Interesting points

- Options: The company enables their customers to still buy jeans next to the lease construction.
- Take-back: The company facilitates the return of its circular products in a logic and understandable way. The gentleman's agreement functions as a means for this.
- Upcycle: Worn jeans in a good condition are added to a collection of vintage (second hand) products.
- Collection: The company accepts products from any other brand to save resources from ending up as waste.

- Storytelling: MUD Jeans is very transparent about their whole operation. Everything about this company is right. On their site, all their sustainability and circularity is brought forward along with their impact.

### Main takeaways

A model that offers to pay for products in a variety of ways is beneficial for a variety of customer needs. Provided that customers in any situation are linked with the company in such a way, that wave kiteboards are returned for repair, end-of-life or after use. A certain agreement can be made for this. Used kiteboards could be taken care of, or bought back, to be added to a second hand collection for a lower price than brand new ones. In this way, Appletree boards will be available for people looking within a lower price segment. Storytelling can function as a glue to hold it all together, and present the PaaS in a way that will accomplish a positive experience with a sustainable touch.



Image 7: MUD Jeans

## Awayco



### Concept

Awayco is a rental-based platform to reserve the best surf (and snow) equipment at key destinations around the world. Partner affiliates carry an array of equipment to be used by Awayco members, who can travel light and try out the world's best gear.

### Model breakdown

This company's PSS functions as a kind of third party service (middle man) between 'rental place' and surfer. Members are able to reserve and pay for the chosen gear online. After this process, they can go to the local Awayco Affiliate (shop, hotel, resort, etc.) to pick up the reserved surfboard. Prices vary based on inventory and location, but booking up in front saves costs. A regular 'flex' membership is free. They offer a 'prime' membership as well that provides better insurance and some small vantages.

The platform has a few benefits. First of all, their members are able to travel without equipment. That means no more board baggage fees, damages and any other struggles caused by travel. Next to that, they are able to use the world's best gear. This enables members to try before they buy.

Whether the service is more sustainable or not, is debatable.

### Interesting points

- Local affiliates: The company has partnerships with local venues that offer the gear.
- Quality gear: Members are able to rent the world's best gear for a good price.
- Insurance: Awayco covers damages resulting from normal use. A paid prime membership covers all damaged, except lost or stolen boards.

### Main takeaways

To achieve something like local depots and logistics, Appletree could create partnerships with local surf clubs, surf schools, surf shops and beach clubs. They could set this up in the Netherlands and abroad. A good starting point would be that Appletree continues to promote their products as high-performance and quality gear. Another thing to consider is how the customers are insured, whatever form the PaaS model takes.



Image 8: Awayco boards



Image 9: Signal snowboards

## Signal Snowboards



### Concept

Signal Snowboards is a snowboard manufacturer that offers a monthly payment program next to buying a board. An extra paid membership makes sure the board is insured for everything.

### Model breakdown

This company provides two extra services to their customers. The first is their monthly payment program. This payment construction enables customers to pay off their snowboard. The second is the 'Signal Care' membership that makes sure that (with a yearly payment) the snowboard is protected for just about anything, along with some other perks. Signal has these activities under its own control and sells products as well in contrast to Awayco.

### Interesting points

- Options: The company enables their customers to buy boards next to twelve monthly payments.
- Insurance: A membership deal at Signal protects the customer for any damages on top of normal warranty.

### Main takeaways

This company has some similarities with the aforementioned cases. They offer payment options, which establishes some flexibility for their customers. A reoccurring thing when examining the two boardsports companies is a yearly membership, mainly consisting of an insurance agreement with some extra perks. Different levels of insurance is something to consider.

## 3.2 User research

Interviews were taken to explore potential end-user groups, associated PaaS model directions and differences between the chosen wave kiter groups that were divided. Insights in their needs and accompanying design opportunities were identified.

### 3.2.1 Setup

#### Research questions

The research questions derive from: the project assignment, the holistic overview and other questions that came up during the project. The underlying questions are presented as subquestions in the interview sheet, which can be found in appendix B.

- **R1:** What is the current general behaviour of wave kitesurfers?
- **R2:** What product experience do end-users have with their wave kiteboard?
- **R3:** What relationship and expectations exist between end-users and company (services)?
- **R4:** What intentions and concerns do end-users have for the environment?
- **R5:** What opinions do end-users have on different PaaS constructions?
- **R6:** Appletree users only: How do existing Appletree users value the company and its product?

#### Dividing end-user groups

After visualising the holistic overview in paragraph 2.5, three end-user groups with potential were set in consultation with Appletree. A more structured way came about to divide these groups. When preparing the interviews the structure in the table 1 below was made.

		Age-range	Budget
AGE GROUP	Current	30-45+	High
	Young	20-30	Low
ROLES	Traveller	n/a	High
	Club member	n/a	Collective

Table 1: End-user groups

As can be seen, an end-user has an age that fits within either the current or young age group. Besides, they might have an extra role as kitesurf traveller or club member. In this way, interviewees could be selected for their differences in age, and for an extra traveller or club member role (if this was applicable).

#### Selecting participants

The participants were selected following the table. A variety in wave kites was achieved by categorizing them in the different groups and roles of the second column. The main objective was to recruit the same amount of wave kites for each age group. This ensured interviews within the current target group of Appletree (30-45+ years), and younger wave kites, assuming that there were differences between these two. The possibilities that someone has frequent travel experience or a club membership were also taken into account. A small priority was given to wave kites having one or two of these extra roles.

### Acquiring participants

Participants were acquired with the use of the author's own network and relevant Facebook pages and groups. The latter was used especially to look for young wave kites, for they were really hard to find. The final participants are presented in table 2 below, with their gender, age, roles and Appletree ownership if applicable.

	Gender	Age	Club member?	Frequent travel?*	Appletree owner
P1	m	55	yes	no	no
P2	m	47	yes	yes	no
P3	m	52	yes	yes	yes
P4	m	23	no	yes	yes
P5	m	22	no	no	no
P6	m	52	yes	yes	yes
P7	m	28	no	no	yes
P8	f	23	no	yes	no

\* More than 1 time per year

Table 2: Interview participants

### Method

The interviews were structured: interviewees were presented with questions in the exact same order. Only current Appletree product owners were asked some extra questions concerning the company and product. The average duration of the interviews was approximately 60 to 90 minutes. Audio was recorded to listen back later, so that the focus could be placed on the conversation with the participant. Important findings were noted during the interview and were derived later from the recordings.

### Stimuli

The stimuli used for the interviews were sub questions of the research questions, helping to answer the latter. The complete sheet with questions can be found in ppendix B. Prior to research question 5, a short explanation was given about what a PaaS model is. This was done to provide the user with information to think and answer in the right direction. Examples of PaaS constructions were given as well.

### Environment

The interview was either held at the interviewee's home or a coffee place. One interview was taken using Skype. All interviews were done in a one-on-one setting, with the author being the interviewer.

## 3.2.2 Results

In this section, the research questions are answered by findings from the interviews. The elaboration of information derived from the interviews is divided in smaller subsections that extent the same research subject.

### R1: What is the current general behaviour of wave kitesurfers?

#### Getting into wave kitesurfing

In almost any case, a beginning wave kiter already has some experience with kitesurfing, riding a twintip board. Almost all kitesurfers begin riding a twintip, because it is easier to learn it with and kitesurf lessons are given with it. Wave kiting is a step one later might take, because he or she wants to change style. To get into strapless kitesurfing for instance, which is usually done with wave kiteboards.

A second reason to choose for a wave kiteboard is a physical one: twintip kitesurfing is really hard on the knees. There are kitesurfers making the step to wave kiting, because of this reason. Even some young professional kitesurfers are dealing with knee problems and make the transition to wave kiting. Initially, this might explain why wave kiting is represented by an older generation of kitesurfers.

*"If your knees deteriorate, then it quickly becomes really stressful for your knees. Then wave kiting is a very nice way (safe for your knees) to have a fun time on the water. That is why more older people are wave kites." - P4*

Another reason that argues this assumption, is that a lot of older kitesurfers have a history with windsurfing. A lot of windsurfers made the transition to kitesurfing when this new surf sport became popular. Kitesurfing with a wave kiteboard is more similar to windsurfing than kiteboarding with a twintip.

#### First wave kiteboard

A beginning wave kiter's first wave kiteboard is often bought second hand. Second hand or new, experienced or inexperienced: kitesurfers want to try before they buy. Typically, they try out the boards of people they know and vice versa. Kitesurf buddies and fellow club members provide this opportunity to each other with their own boards. Providing this opportunity is a great way to sell an old board and to spread the stoke that they had with it.

*"Anyone can grab my board. If it is a new board it depends on who, of course, but if it's a buddy then it's ok." - P6*

Three interviewees began with wave kitesurfing, using a normal surfboard. One still uses a normal surfboard every now and then.

*"I have 1 board and occasionally I take an old surfboard, but only for light weather." - P1*

*"In Cape Town, I first bought a surfboard on which I began wave kiting." - P4*

## Sharing

Boards are shared with others as well: they are even bought together sometimes. Although, wave kites are careful with who (e.g. family or a good friend). Though, lending an old board to a skilled wave kiter is typically alright with its owner. When they're borrowing a board from someone, wave kites are extra careful with it because it not theirs.

*"A buddy and I borrow from each other sometimes. He takes my board for example. That's ok, because I know how he handles my gear. If people ask me to try something, I don't mind that." - P2*

## Club or home based

A difference exists between kitesurfers that store their equipment at a club on the beach and the ones that don't: home-based kitesurfers. Club members are somewhat bound to the spot where they store, but don't have the struggle of taking their gear every time they go kitesurfing. They also benefit from the club as a place where they connect with other club members, from whom they can try out new boards. In contrast, home-based kitesurfers are dependent on their kitesurfing friends and the quiver they have. Ultimately, having your gear at home enables going to another spot every now and then.

*"I have one at the club and I store the other two separately here (at home). When I go to the sea I can always take one extra with me." - P3*

## Travel

It is not unusual to take all the kitesurf gear to a destination abroad. The newest board in the quiver is typically the one that is taken on a trip. Bringing this gear to kitesurf spots far away comes with a price (plane fee), struggle and fear of damages. Damages are not unusual. Though, kitesurf rentals are usually too expensive and you are not certain about what you will expect over there.

*"When I picked up my board (at the airport) it was damaged. I found that out later, when I checked my gear. I saw that there was a very large dent in my board. Then I just knew for sure that happened during transport. They simply throw with it." - P3*

Something else that came up during two interviews was a board that was bought specifically for a destination abroad. These were even stored over there all year round. This situation implies that a board is not only bought for a specific preference or style; the conditions of kitesurf spots vary and demand different board specifications.

## R2: What product experience do end-users have with their wave kiteboard?

### Considering a board

When buying a brand new board, wave kitesurfers consider a few attributes: price, shape, weight, durability, flex, upwind properties and looks. What really comes forward is: a durable board with a light, but strong construction and a shape that fits their needs. During their progression in kitesurfing, they gather knowledge and develop a feeling for these attributes, which makes them more able to choose boards for a personal style. Young wave kites are not likely to buy a brand new board, but second hand board, for they have less money to spend.

### Ownership

Money and age are factors that affect board ownership. The older generation is more used to own boards and they will keep these if they see any use in it, even if this means a board will not be used for a long time (e.g. it is used once per year during a kitesurf trip). The emotional value for them tends to be somewhat higher than youngsters, probably because they bought it new, cherished it for years and created a relation through product attachment and trust (Bakker et al., 2014). If the board is durable and they really like it, they will use it for years and repair it if it's damaged.

*"My board is like my baby. You get it from your car, brush it for a moment, check it at home. It is not like I throw it in my shed. I maintain it very well." - P7*

*"It is the only gear I have ever bought that I haven't destroyed yet. I am really grateful for that. I know that if I grab that board I have a nice session." - P4*

The younger generation with less budget is more likely to buy and own second hand kitesurf gear because of the expense. They tend to sell this gear directly when they will not be using it anymore, to earn back some money (for a new board for example). The relation they have with boards for them (the value they attach) is weaker.

*"It is a bit of an old guy sport. I think that's just because it is so expensive. That is really the only reason I can think of. If you have to pay for lessons already; it's just not doable." - P8*

### **Quiver**

Having multiple boards gives a freedom of a choice. This is beneficial when the kitesurf conditions you are dealing with differ. If you normally use a strapless board, having another board with straps will be useful to keep it with you when the waves are high. More boards equals a broader range of conditions, equals more opportunities to kitesurf. Though, usually one board is the favourite: the newest addition to the quiver. Old boards are kept as a substitute or backup board for when the primary board isn't available (in repair for example). Having multiple boards is a luxury deriving from doing the sport for some time already. Therefore, it applies more to the older generation. In comparison with youngsters, more of them are used to own more than one board.

*"You should never discard a board. Why would you throw it away or sell it? There is always a moment that you could use an old board, or need it or whatsoever." - P3*

### **Usage and durability**

Overall, wave kitesurfers expect to use a board about 3 years. The interviewees answered this specific amount one after another. Change of style, trying something else and damaged boards are factors to take into account. They expect a board to last far longer than that, with possible reparations considered.

*"I expect a board to last 3 years, any longer than that is great" - P2*

*"I think I will not use this board longer than 3 years. Why? Because it is nice to have something else every now and then." - P5*

### **Reparation**

While some experienced kitesurfers do their own small reparations, once a board is damaged it is taken to a repairman. Ideally, reparation is done local and as soon as possible, so the board will be back in time for the next session. If one doesn't own a second board, he is not able to kitesurf during the time the board is damaged and in repair. Local repairmen are really important, but there are some doubts if they will be there in the future.

A board that feels good and is cherished, will be repaired many times before it finally reaches a point that it is damaged beyond repair, and the end-of-life is in sight.

## **R3: What relationship and expectations exist between end-users and company (services)?**

### **Purchase considerations**

Buying a brand new wave kiteboard from a manufacturer or retailer is expensive: the newest models cost around 500 to 1100 euros. Therefore, wave kitesurfers are always in search of a good deal and a way to try it out, like discussed earlier. They might find a good deal through connections, or abroad during a trip. Personal contact with a retailer or manufacturer is really important to gain a sense of trust and a helping hand in confident decision making.

The young generation has the tendency to put price over everything when they consider to purchase a brand new board. The old generation is more likely to go for quality, which comes with a price they are able and willing to pay.

### **Try before you buy**

Trying a board before purchase is considered as essential. When a board is not available among connections, lending a test-board from a kitesurf shop is another way to try boards. A few shops have a board rack with several test-boards from different brands. Though, these boards are not up for grabs to use for a whole day. That's why test-events, that board brands organize, are better opportunities for trying a board. Though, these events are not held frequently and depend on the conditions of that particular day.

*"Only a donkey buys something of this amount while he has not fully tested it." - P7*

*"If you buy something in a store: when you use it, you can't actually return it. If you don't like it, that's just unfortunate." - P8*

### **Second hand**

When buying a secondhand board, knowing its current state and if it was used properly is valued. If a board isn't used that much, then these requirements weigh less. Used boards are bought from acquaintances, or at platforms like Marktplaats and Facebook.

*"If you haven't got much to spend and you are just beginning this sport, then it's a nice outcome if you can buy second hand items for a slightly lesser quality. The products will still have a good life then, you know." - P8*

### **Warranty and service**

*"It is not a bicycle where a light can be broken, it's not a car that has to go to the garage every 100.000 kilometers. When you buy a board, good luck. Something can go wrong and then you're hoping that there is some kind of warranty on it." - P3*

When a board is damaged, its user might still be able to claim a warranty. This is done when the board's quality is being questioned. Manufacturers usually put a warranty on their boards for manufacturing errors within a year after purchase. They won't reimburse damages due to improper use. Though, for the customer it is hard to draw a line between what is proper and improper use. For instance, Appletree has to deal with customers that try to claim warranty but have no right. As an example: damages related to hard impact from high jumps, while it is not advised to do this with these kind of boards: they are made to ride waves, not for massive jumps.

*"Of course I expect warranty, you would expect that with something that valuable. A warranty for construction, not wrong use." - P2*

*"I have the feeling that when a board gets damaged it is your always own fault." - P8*

*"Everyone wants money: nobody wants to pay for something they have done themselves." - P7*

A manufacturer or retailer is expected to be reasonable and deliver some extra service for (regular) customers that come with a problem or a bad experience. This concerns service separate from any warranty (e.g. discount on a new purchase in the shop). By creating personal connections with customers, they gain a trust that 'it is going to be alright'.

### **Local repair**

Claiming warranty is a long process and a hassle, so wave kites rather depend on their local repairman if a board is damaged. It goes even further: they would rather go over there with any damage, even if the manufacturer has its own repair service. The biggest reason for them to do this is that this repairman is able to fix the board quicker. Letting the manufacturer do the repairation would take to long, especially when they have to check the warranty claim as well. A great example why a local repairman is king: he can give priority to a board repair for a customer that wants it back as soon as possible, because the conditions will be good within a few days. After good experiences, the repairman gains the customer's trust for years.

*"I think it's important that it is a very well-built board. I don't need any warranty. You need warranty when it's not a well-built board. If it is broken I got my own contacts to fix it, I wouldn't return it to the company where I bought it." - P1*

### **Insurance and deductible**

You need to keep the costs low when something has to be repaired. It was discussed that insurance payments from users could cover reparations in a PaaS model. In addition, reparations shouldn't be a free service: this could provoke careless use. Paying a certain deductible could prevent this.

*"We get iPads from the company on a lease basis: every 3 years we get a new one. One of the guys executing this project wants that they are ours, because many iPads are getting damaged (people drop them). If these iPads are personal, this will change their use. I think that as well, I'm certain it will." - P2*

## R4: What intentions and concerns do end-users have for the environment?

### Environmentalism

Overall, all interviewed wave kites are environmentally conscious. The participants generally do not just throw away something and they often take the bike. A few eat vegetarian food a couple of days a week and one of them drives a hybrid. An example of someone who is actively working on his sustainability was participant 1:

*"I am limited in car use and quite limited in flight movements, I try to keep my house as energy-efficient as possible, I have solar panels, I sell solar panels, I separate my waste, I eat organic bread, all those kinds of things actually." - P1*

Though, they are not really sustainable within their sport. Only if it comes to reparation and maintenance of their quiver. Besides, they will sell their equipment (especially kites) on the secondhand market if they are not using it anymore.

### Durability over sustainability

Wave kites expect boards to live far longer than they will be using them. This can only be achieved when they use it properly and handle it with care. Wave kitesurfers that keep their boards in a good condition are able to sell it through the second hand market. Though, this is easier with a durable board. Theoretically, such a board is able to change user several times.

Having a well-crafted, durable board is more important than a board consisting of any sustainable materials. Recyclability, of course, is

preferred over anything ending up as waste. They want sustainability but not for a higher price and with the same performance and durability as a 'normal' board. Sustainability is not an attribute they look for, when buying a board.

*"Performance is really important to me. Performance is more important than sustainability." - P4*

Two of the interviewees actually had the same thoughts about bio-materials. They both said that bio-based resin or not: it is still plastic that ends up as waste. If materials are not recyclable or biodegradable, board durability seems the most sustainable option nowadays. Their argument was that a great durability would result in producing less boards, and less boards produced equals less waste.

### End-of-life

After (re)using a board until its end-of-life, and attempts to upcycle a board (e.g. wall decoration or coffee table), the board will be discarded at a waste deposit. This is the case when the board is snapped in half, beyond repair or too old to function well. Yet, none of the interviewees had ever thrown away a board. When a board reaches its end-of-life, the fin boxes and strap plugs (if it has straps) could be retrieved from the board.

*"I really wonder how many boards are thrown away. I think you will always find someone who is still happy with it." - P8*

### Ecoboard

The only interviewee that knew what the Ecoboard logo stands for works in a surf shop. The others (even the two Appletree owners) didn't know what it was or what it stands for. They did not recognise it.

## R5: What opinions do end-users have on different PaaS constructions?

Prior to this part, a short explanation was given to the participants about what a PaaS model is. Examples of PaaS constructions were given as well. Possibilities were discussed with the participants and a scope of opportunities resulted from their opinions.

### **Lease construction: single user, long-term**

Not having to buy a board would be a financial benefit for young kitesurfers. This could be achieved with a lease model using monthly payments, instead of paying a big amount of money at once. This direction is a great opportunity for youngsters and beginners, because kitesurf gear is pretty expensive. With a lease model you keep the freedom and feeling of having a board that belongs to you. For example, the end-user might want to take it on a trip sometime.

Another nice opportunity with a lease construction is to try out boards: try before you buy. Trying a board for a longer time in different conditions. A distinction came up between a short term (eg. every month the possibility to change boards, for a few months) and a long term (eg. switch a board every year) construction. An option to buy a new board and sell it back after use could be an opportunity as well. Currently, acquaintances, surf shops and Marktplaats are used as a kind of 'sell-back vehicles' to earn some money back to buy new gear.

*"When you see kites buy new gear every year, it is purely because they have cashed a lot once. The years after that they keep selling it. Then you don't have to pay much: if you add €150 every year, you have new gear every year. That's how friends of mine do it." - P7*

Long term lease subscriptions could be divided into different time-spans. Participants thought it was logic that the longer you lease, the lower the payments. This idea has similarities with a subscription that most gyms manage. In addition to timespan, a subdivision in quality can be used as well. For instance, a gold-level subscription on the newest boards and a silver-level subscription on used boards. An insurance should be added to this and quality controls are needed before second use.

### **Rent construction: sequential users, short-term**

Access to a variety of boards is a good way for beginners to try out different boards (beginners and seekers). A depot with boards at a kitesurf spot would give the wave kiter an option to choose a board, taking into account the conditions at that certain moment.

Example: when you live in Amsterdam, you could go kitesurfing in Zandvoort. When you arrive at this spot, you could check the conditions first and pick up a board model that you would favor at that moment.

Considering a rent or pay-per-use subscription construction, the kitesurf conditions will be a big factor. There is not a continuous demand for kiteboards, like there is a continuous daily demand for bikes and cars for example. Kitesurfing is highly depended on weather conditions and

kitesurfing styles, thus board stock and models. You would need a lot of boards and a variety of models on a good day. When there isn't wind to kitesurf with, no one will rent a board. In addition, users are fixed to spots that have this service.

*"You know for sure that what is yours is available. When you rent or use shared boards, then you are dependent on availability." - P1*

*"When a depot is in Zandvoort you'll have to go to Zandvoort." - P5*

This kind of construction will have a higher frequency of sequential use. Continuous checks are important, preferably after each use, so a board can be repaired immediately when damage occurs.

*"Keep in mind that everything that is rented will be worn-out. 'Don't be gentle with your rental'." - P7*

### **Seasonal use**

Some kitesurfers only kite a certain time of year, when it is high-season. The rest of the year their gear remains untouched. A situation where they pay for a board during the months they need it, could be an opportunity. Though, the idea of providing a board for 'a couple of months' seems too far-fetched.

*"It would be ideal to have a board for the months you surf, instead that its lying in a shed the rest of the year" - P3*

### Worldwide use

Not having to take a board to a kitesurf destination saves money (no board baggage fee), takes away any fear of damages caused by transport and redeems the struggle of carrying it around all the time. Only having to pay for the days you use a kiteboard at a destination, is a benefit as well: imagine there are a lot of windless days. This scenario works for a short amount of time (e.g. not more than a week):

*Example: You will go on a trip somewhere for 5 days. Only 2 days are forecasted to have good conditions. You fly to your destination and pay €50 for the board baggage fee. Then it is way more ideal if you can rent a similar board those 2 days over there for €50. What if it is not windy at all?*

The struggle of carrying a board everywhere is something a kitesurfer might be willing to pay for to get rid of. Travelling light without any hassle.

*"If I don't have to struggle and pay for the plane, that I only pay for the times that I use it? I can certainly do something with that when I travel." - P2*

*"I have been in Cartagena for 3 days and kite-foiled 2 days. If there was a foil board over there with nice quality, and I can see through an app where it is, and I can reserve it when the conditions are good, I would use it." - P2*

Renting boards abroad is considered as expensive and the gear is worn-out. Using the same board that they have at home would be really nice. As a kitesurfer abroad you seek comfort in gear. That is why they prefer to bring their own gear.

Another scenario for worldwide use is a substitute board when your own board is broken or when it needs reparation. At some destinations there is no repairman at all. Lending a board from someone else could then save a kitesurf trip.

Worldwide use can't cover every surftown in the world according to the participants. Only the biggest spots with a lot of kitesurf movement. Travelling kitesurfers that act as nomads along the coastline are the hardest to provide service for.

### Club use

Some of the interviewees were part of a kitesurf club. The scenario was suggested that the club would have a subscription on boards. They were very critical about this theory of 'using boards that the club provides'. The main reason: people have different standards of use. If there are shared boards, then a standard of proper use is needed. This direction seemed impractical and unreachable for them.

*"If it's common property than you also have to use it in a common way. If you have to pay attention to that and apply it within your club, then you will have to regulate a lot." - P1*

## R6: How do existing Appletree users value the company and its product?

Appletree is known for high performance, strong, durable boards. Wave kites purchase an Appletree board because of these important attributes. Word of mouth plays a big role in their marketing. Trying an Appletree board proves to be a great way to persuade potential customers. Existing users would recommend quality and non-users know the brand for this. They choose this brand over others for this reason. Some of the Appletree owners made known that they would like some kind of community; a stronger connection to the brand.

*"If you have driven in a fast car, then you want that fast car. All other cars you have driven before are not interesting anymore. That's what I experienced with this Appletree board as well." - P3*



## 3.2.3 Conclusion

Following the needs of the interviewed wave kites, several interesting opportunities were found for possible PaaS structures. These are considered as possible design directions. In consultation with Appletree, the directions were sharpened narrowed. Besides, three interesting end-user groups were identified to design for.

### Design directions

After doing the interviews, lease constructions tend to have the most potential. Leasing gives feeling of using a board that belongs to you, and gives the freedom to take it where you want. Long-term constructions could provide a financial benefit for younger kitesurfers. A distinction can be made between different levels in quality (new or used) and timespan (lease duration). Fluctuations in seasonal activity could be solved with year-round contracts. Other seasonal-based constructions will probably be a disaster considering availability (stock) and year-round revenue, as the demand will peak during high-season. Short-term constructions could offer a good way to try out boards. Other possibilities are: pay off a board, sell a board back.

Considering rent constructions, there is an opportunity as well. Instant access to a variety of boards is a good way to try out different boards for beginners and boards seekers. Renting a board on-the-spot gives the user some freedom to take into account the conditions at that certain moment. A board choice can be made based on that. This is a direction with potential, especially for board trial. Feedback from the customers that try out boards could give Appletree a lot of customer info and data about their products. If the board users would be given the chance to give proper feedback, it might give them the feeling they can think along with product development.

When the PaaS idea was taken to a worldwide level, the interviewees saw opportunities taking away many struggles. Not having to take a board to a kitesurf destination for instance, saves money (no board baggage fee), takes away any fear of damages caused by transport and redeems the struggle of carrying it around all the time. Only having to pay for the days you use a kiteboard at that destination, became a highly favored opportunity for short-term trips. Other opportunities were: a lease board for the time you're there, and a substitute board service for board disasters.

### Stopped directions

Setting up an operation abroad turned out to be too ambitious and complex for this project and Appletree's interest. This direction, aforementioned 'worldwide use', will not be covered anymore. Serving a specific spot locally is too dependent on seasons to generate revenue: for each kitesurf spot there is only a few months of good conditions with high activity. This direction lacks potential of a steady year-round revenue and asks for local knowledge. Therefore the company is not interested in exploring opportunities within this direction. The aim for the PaaS model is thereby narrowed to serve the Dutch market.

In addition, the interviewees were very critical about the idea of clubs having a subscription on boards. Therefore this direction will not be taken into account anymore as well. Clubs serving as logistic vehicles for the PaaS is still an option.

## End-users groups

During the interviews it became clear that a PaaS model has the potential to serve different end-user groups. The biggest advantage that a PaaS model would bring for these groups is convenience. Ideally, the PaaS should serve as many different wave kites as possible, because the market is too tiny to focus on a really specific user group.

The model could potentially benefit three end-user groups of wave kites:

1. Potential customers that want to try out a board or several boards before they acquire one.
2. Wealthy wave kites that want another board every now and then, on a long-term or seasonal basis.
3. Wave kites with a low budget, like youngsters.

The focus lies on these three end-user groups from now on. In paragraph 3.3 persona's are created for these groups, to highlight their different characteristics and needs.

**1**

**Potential customers** that want to **try** out a board or several boards before they acquire one.

**2**

**Wealthy** wave kites that want **another** board every now and then, on a long-term or seasonal basis.

**3**

Wave kites with a **low budget**, like youngsters.

## Limitations

The quality of the interviews depended on the author's modest skills in interviewing. The results are qualitative and from a limited number of participants. No quantitative information was gathered during this research, about any frequency of needs or opinions.

It was hard to discover opinions about the PaaS as a model itself, because the participants were not really up-to-date with this novel business model structure. Examples had to be given, which led to thinking patterns.

## 3.3 Personas

Information and insights about end-user characteristics were collected by doing user research. Personas are created to cluster and summarise findings about potential end-user groups. These representations of end-users will also inspire idea development.

Personas are archetypal representations of intended end-users and help to be aware of who to design for. The needs and values of the interviewed participants lie at the basis for this. Three different end-user groups with potential have been identified in the previous paragraph:

1. Potential customers that want to try out a board or several boards before they acquire one.
2. Wealthy wave kites that want another board every now and then, on a long-term or seasonal basis.
3. Wave kites with a low budget, like youngsters.

For each of these groups a persona was made. They are presented on these two pages. The numbered groups above correspond with the persona numbers. Per persona, a few demographics are presented first, followed by a fictional quote that describes what matters to them the most. The text that then follows, neatly describes the situation that a persona is in, and what he thinks of sustainability.

### Persona 1 - The Seeker

- Name: Bram
- Age: 32
- Job: physiotherapist
- Status: in a relationship
- Budget: fair



*"I want to try before I buy"*

Bram is an intermediate wave kiter that wants to buy his first new Appletree wave kiteboard. He is kitesurfing for 6 years already, but last year he made the transition to wave kitesurfing. During that year he rode a second hand board he bought from a friend. He recently sold a twintip board and saved some money to buy a brand new wave kiteboard. He knows the brand Appletree Surfboards via kitesurfing friends and is eager to try out some of their boards. Although, Bram can't make a confident choice, because he doesn't know what shape is best for his style and skill. Besides, he first wants to test some shapes that have his interest thoroughly in different conditions, instead of going to a test-event for just one session.

Bram wants a board that fits him, to build on. An investment that he is able to use for the coming years. Sustainability is not a specific attribute he is looking for, yet durability is. Though, he is aware that there are boards with sustainable properties.

## Persona 2 - The Flexible

- Name: Martijn
- Age: 45
- Job: pilot
- Status: married
- Budget: high



*"I like to keep trying new gear"*

Martijn is an experienced wave kiter that would prefer a different board every year. He likes to keep on trying new and customized shapes in the never ending search of the perfect board. Kitesurfing is his foremost hobby, and because he is wealthy enough he is able to invest yearly in new gear and trips. During his 12 years as a wave kiter he has ridden about 7 boards, both new and second hand. Preferably, he would like to ride a new board every year and last few years he almost did so. Although, Martijn is tired of buying and selling his boards. He would like the convenience to switch every year, without any hassle. Besides, he would like to understand all the specifications about what a board is good for.

Martijn does not think about sustainability when buying new kitesurf gear. He is not even aware of sustainable alternatives, he just wants the best board available that fits his needs. He always wants new products.

## Persona 3 - The Budgeteer

- Name: Jasper
- Age: 23
- Job: student
- Status: single
- Budget: low



*"I am on a budget"*

Jasper is a young wave kiter that doesn't have a budget for high-performance, high-quality boards. He started kitesurfing 5 years ago, but after 1 year of riding a twintip he quickly made the transition to wave kitesurfing. Because he is a young and fit guy, he is pushing his limits at sea. The low-performance second hand board he uses has to endure a lot of damages for that reason. He really wants a high quality board with a strong and durable construction, that is able to withstand his high-performance kitesurfing. Although, Jasper doesn't have the money to purchase a board with these characteristics, for these boards are too expensive for his student budget. He doesn't mind buying a second hand board, but even this is a big purchase. He is already struggling to save money for a trip this summer.

Jasper really wants to be sustainable, but he is forced to put price above everything. He never really thought about buying a sustainable board, because his budget wouldn't let him. He is in fact a bit sustainable, because he uses second hand equipment.

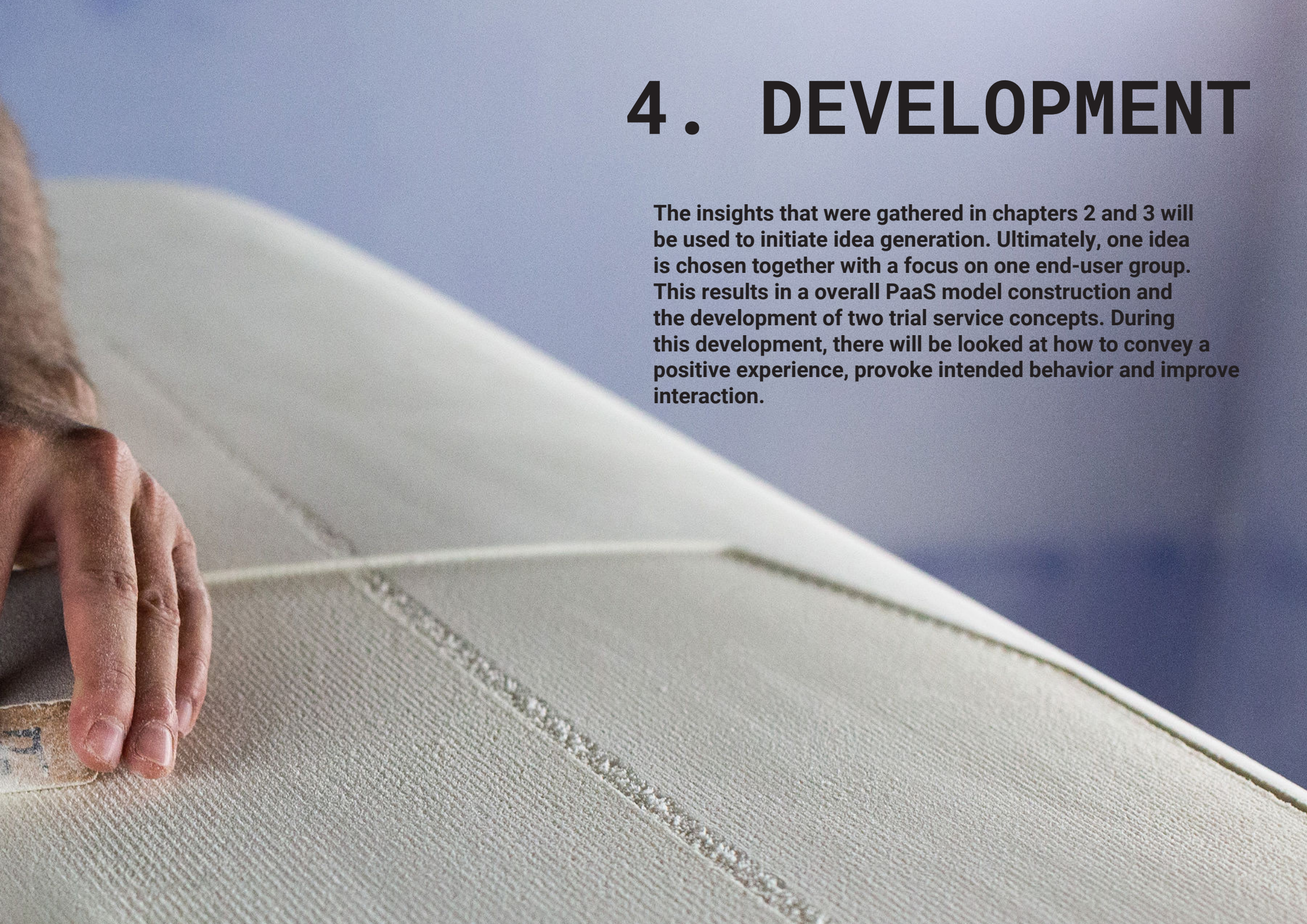


THE LITTLE R

1000 TOOLS  
SADDLES  
2000

# 4. DEVELOPMENT

The insights that were gathered in chapters 2 and 3 will be used to initiate idea generation. Ultimately, one idea is chosen together with a focus on one end-user group. This results in a overall PaaS model construction and the development of two trial service concepts. During this development, there will be looked at how to convey a positive experience, provoke intended behavior and improve interaction.



# 4.1 PaaS model structure

The problem definition and accompanying solution space of this project, were the starting point of setting up the first design directions and criteria. Together with other insights, gathered through PSS company cases and user interviews, idea generation was ignited.

## 4.1.1 Idea generation

At the very beginning of the project (paragraph 1.2), a problem definition and solution space were created. This first section will highlight this solution space again, but in more detail. Design goals are derived from it and an explanation is given of how and to what extent ideas will be developed.

### Problem definition

*How to create a PaaS model for Appletree Surfboards with benefits for the company and the environment, while giving the target group a positive experience?*

### Solution space (project goals)

The solution space is defined into three parts, following the three factors that were put into the holistic overview (paragraph 2.5) as well: the environment, Appletree and the end-user. These parts are considered as project goals.

1. Reduce environmental impact, by using the sustainable properties of a PaaS model.

- Support a transition from a linear economy, to a more circular economy.

2. Make this model beneficial for Appletree Surfboards and its products.

- Create a PaaS model that is interesting for the company.
- Retain the value of products by using them more efficiently.

3. Give the end-user an increased experience.

- Introduce a convenient solution to the end-user's current problems, and use the intangible added value of service to increase the overall experience.
- Make the end-user feel good about using a service that is a sustainable alternative.

### Design goals

Following point 1 and 2 of the solution space, some fundamental PaaS model design development was started. Two design goals were brought about:

- **D1:** To serve the needs of both the company and the targeted end-user group in a PaaS model structure.
- **D2:** To enhance the sustainability of the company and their end-users using the PaaS model, during and after product use.

Point 3 of the solution space is mainly about the experience of the end-user. This area will be dealt with later, during concept development.

### End-user groups

The three earlier presented personas were used as end-user group representations during idea generation. Their different needs and potential use scenarios inspired the development of several PaaS structures and mutual structure combinations.

### Extent of elaboration

The first ideas were created with only one of the end-user groups in mind. Later, ideas were created that serve multiple end-user groups. The elaborate presentations of all six ideas can be found in appendix C. Each idea is introduced with an explanation of the model construction with an accompanying visual. Then, the question 'what is in it for ...' is answered for the end-user, the company and the environment respectively. After this, pros and cons for the idea are stated. Finally, some future points of attention are recommended, for when the idea will be developed further.

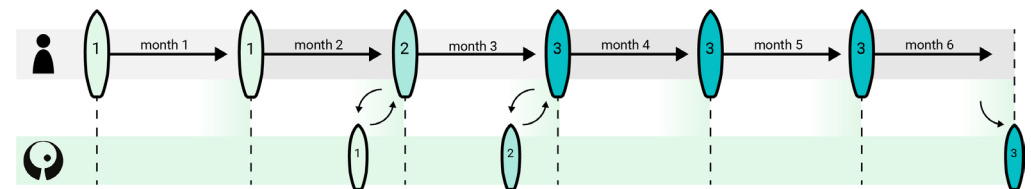


Figure 6: Visual of idea 1.1

## Evaluation and decision

The generated ideas proved to be a great fundament, or backbone structure, to build further on. The ideas were presented to the company and evaluated by weighing them against: the goals of this project, their 'pros and cons' and design criteria (wishes) that emerged during development. The latter is plotted using a Harris profile, which can be found in appendix D. For a full list of design criteria, see appendix I.

### Company input

The ideas were presented to the company to provoke some critique and new opinions to take into account for further development. A preference for Appletree as a small company concerns starting up the PaaS model. It should not take a massive budget to set up the whole operation. A big threshold is pre-financing the assets for the model. Think of all the production and shipping costs of boards to create a sufficient board stock: a lot of time and money would go into these activities. That is why they favored the ideas that grow evenly through asset input from the factory, which is driven by user demand.

After doing interviews with wave kilters, three end-user groups were determined. A wish from the company was to serve as many of these end-user groups as possible. Despite their differences in needs, some ideas have succeeded in combining them. Logically, the company favors these ideas for further development. Though, one end-user group is chosen as a focus for further development: that will be discussed next with the idea decision.

### Idea decision

After taking into account the evaluation and Harris profile, idea 5 was chosen as overall model construction, considering both idea 1.1 and 1.2 as 'trial phase' directions in further development. These two directions have the potential to flourish, once they are inserted in the trial phase of idea 5.

As this trial phase is chosen as main focus for further development, it was decided to maintain serving end-user group 1 (persona: The Seeker), as the idea of a trial was created to serve their needs. Again, this group consists of: 'potential customers that want to try out a board or several boards before they buy one'. Choosing one end-user group should lead to a clearer focus later on, considering the user experience development (point 3 of the solution space).

Serving the other two end-user groups is left out of the project's focus. Although, at the end of the project, recommendations will be made on how to serve these groups at later stages of development. For now, the overall model construction already has some core properties that serve end-user group 2 (persona: The Flexible). It offers them ways to ride a board every year for example.

The next step is to work out the trial phases on more elaborate (concept) level, with an emphasis on user experience. First, the overall model structure will be explained in more depth.

## 4.1.2 Overall model construction

The visual representation on these two pages was made to understand and follow the explanation of the overall model construction. The sequential steps in this structure will be explained next, following the flow of this visual. The model has three entry moments:

- Trial, followed by either buying or leasing
- Buy a board
- Lease a board

### Trial

The model starts with a paid trial period, in which the user is able to try out different board models. This trial structure is either the 'term trial' or 'windy days trial', which distinguishes the core difference between the two idea-combinations that are chosen for further development. These will be presented in detail after introducing the overall model structure. After the trial period, when the user has made a decision on what board is favored, two options are offered: buy a board or lease a board. Entering a trial will result in a discount on a lease subscription.

The boards that are used in the trial are previously used boards. As the visual implies, a stock of used boards will be created in this model, of which the individual boards will be used in different ways. In what manners these boards will be used exactly and how this stock is provided with incoming boards, will be clarified later in this section.

### Buy a board

After doing the trial, the user will still be able to buy a new board from Appletree the normal way. This concerns regular board models and boards with favored customisations on request. An immediate and radical transition to a model without the current way of selling boards, would be a radical implementation step that isn't favored by Appletree. Buying boards will remain an option next to the new PaaS model, which is considered as 'linear leakage'. Getting rid of the option of buying, might be a implementation step to consider at a later stage.

Appletree's experience with lending out test-boards learns that (sporadically) some of these customers want to buy that particular test-board, because they are satisfied with it. This other 'current way of selling boards' is beneficial to sustainability and revenue, as this means these multiple used test-boards will be reused properly by selling them to an individual. Therefore, this will be offered as an option as well, but with a small alteration. To avoid these boards from leaving the company completely for once and forever, an agreement will have to come into existence to ensure that boards are brought back to the company after use. For more info on this agreement, see paragraph 4.1.3.

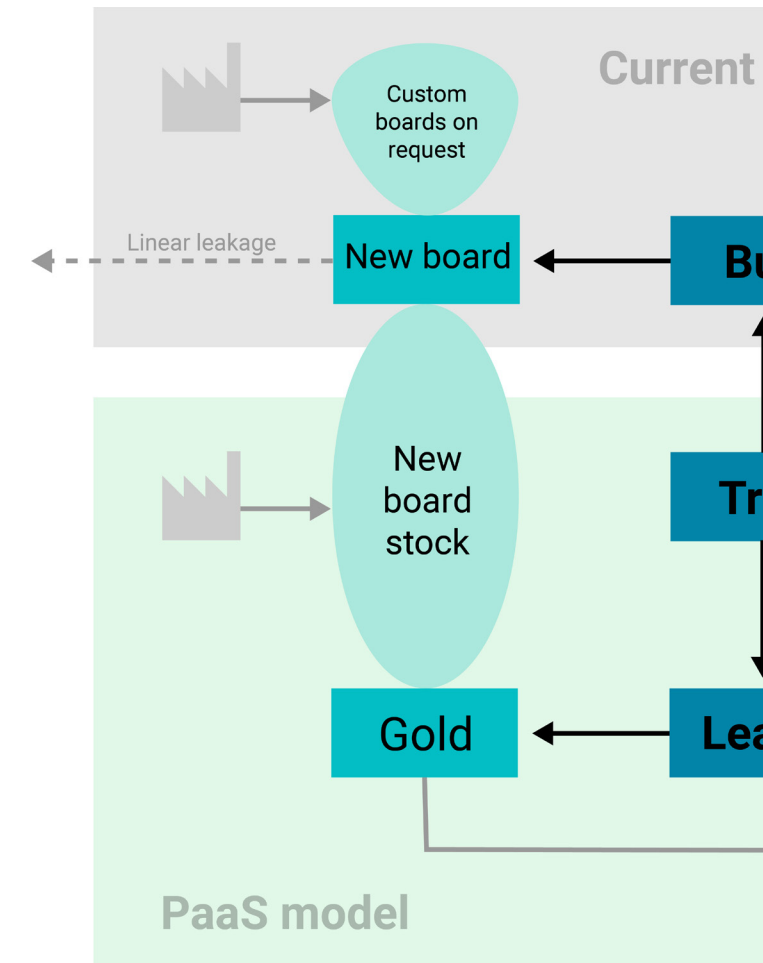
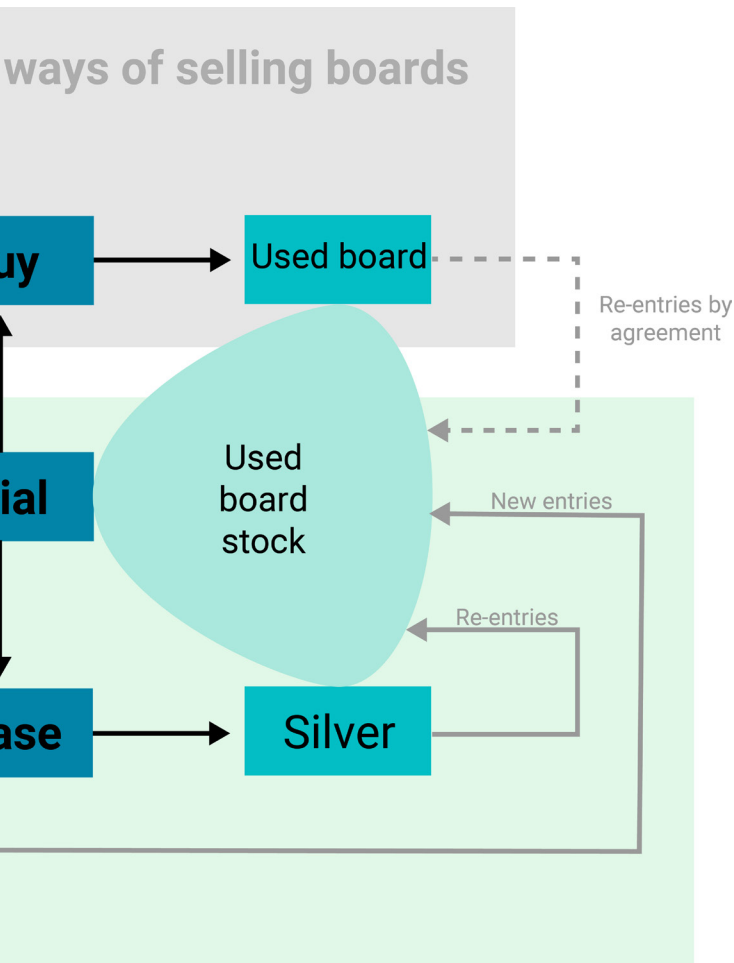


Figure 7: Overall model construction



### Lease a board

The other option for the user after the trial is to lease a board. Leasing consists of more options to choose from. Two subscription levels exist:

- Gold-level subscription: lease a new board.
- Silver-level subscription: lease a used board.

Both levels have the option to lease for either 1 or 2 year(s), of which the latter has a lower monthly price, for the agreed lease term is longer. These subscriptions will have ongoing contracts with fixed monthly payments. For more info on subscription length, see paragraph 4.1.3. All assets that are used in the PaaS-part of this model are standard, glass laminated wave kiteboard models without any custom alterations. For more info on the product properties of the assets, see 4.1.3 as well.

### Gold-level

When choosing for the gold-level subscription, the user will receive a brand new board. When the lease term is over, the user has the right to choose another brand new board, if a subsequent lease term is chosen for. The other board will be a new entry within the 'used board stock'.

### Silver-level

When choosing for the silver-level subscription, the user will receive a used board. When the lease term is over, the user has the right to choose another (used) board model, if a subsequent lease term is chosen for. The other board will re-enter the 'used board stock'. This subscription level is a more affordable and sustainable option, in comparison with the gold-level.

### Substitute

When damage occurs, the asset will be repaired and maintained by company standards. The user will receive a substitute board to use, through customer service, to get in the water as soon as possible. The silver-level boards will function as substitute for when a gold-level board is in repair, waiting to get back to its user. Within silver-level subscriptions, damaged boards will just be substituted.

For more info on damage, maintenance and control, see the recommendations in paragraph 6.3.1.



## 4.1.3 Design measures

In this paragraph, some other design measures will be presented. Most of these measures are already mentioned earlier, but require some extra explanation. Besides, future points of attention (FPA) are given to consider during further development.

### **Subscription length**

During the interviews it was discovered that wave kitesurfers expect to use a board circa 3 years. Change of style or wanting to try something else, are factors that have to be taken into consideration. Therefore, the length of (the ongoing) lease subscriptions is set to 1 or 2 years. This is done to prevent the user from getting bored with it.

The reason to choose for terms in years, is to prevent fluctuating demand over a year due to a certain kitesurf season. In this way, the company is ensured that lease customers will stay all year round, instead of risking high activity during high-season and low activity during off-season.

*FPA: How do end-users feel about this yearly subscription?*

### **Product properties**

The boards used in the PaaS model only consist of fiberglass laminated wave kiteboards in standard sizes. These boards are more allround and have a higher demand than carbon laminated boards. Besides, glass boards are easier to fix without leaving marks of repair.

To ensure that boards do not differ from each other, only standard wave kiteboard models are used, without any custom alterations. In this way, it is ensured that a customer will receive the board that is wished for. This standardisation means that custom boards that are sold currently can't enter the PaaS model.

*FPA: What opinions do end-users have about board colour?*

### **Stock**

For the PaaS model, two different stocks have to be regulated constantly: a stock of new boards and a stock of used boards. New boards are manufactured for the 'new board stock' to meet the demand of gold-level subscriptions and buyers. These boards enter the 'used board stock' after use in the gold-level, and will loop between the trial, the silver-level and buyers of used boards. The stock of used boards will have output, due to boards that reach their end-of-life.

*FPA: Where will these stocks be stored?*

### **Agreement**

In the overall model it is possible to buy used boards. Ideally, these boards stay linked to the company in such a way, that their buyers will return them when they are done with them. After all, this will ensure that Appletree can reuse or dispose them responsibly. A certain agreement can be made to ensure this. This could be done with a strict agreement or a gentleman's agreement, based on good faith.

*FPA: What kind of agreement will ensure that users return purchased boards?*

### **Disregarded matters**

This project has a certain scope, which means that some facets can't be treated due to time and relevance. During research and idea generation, a number of matters were encountered that were not touched upon (fully). These are matters like: pricing; deductible, fees and insurance; logistics; damage, maintenance and control; tracking; customer service. This will be discussed later at the end of this report, in paragraph 6.3.

# 4.2 Trial concept structures

In this section, the trial concepts are presented. These concepts are trial phase possibilities within the overall PaaS model. First, the structure of each concept is made clear. This is followed by extended causal loop diagrams that visualise extra components of each concept. Finally, the value propositions are presented.

## Term trial structure

### Trial construction

The term trial is based on temporary 'lease' of trial boards. During a period of 2 weeks, the user is able to try the board without any rush, when (favored) kitesurf conditions occur. At the end the period, the user has two options. The first option is exchanging the board for another model within the exchange window. This extends the trial with a new period. The other option at the end of a period is to stop the trial (and make a decision).

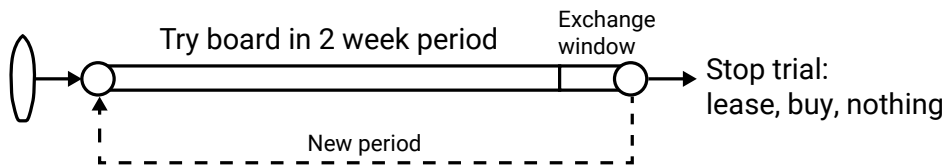


Figure 9: Term trial structure

### Payment structure

The user pays for the first period no matter what. Any subsequent period hereafter begins with a new payment. The amount of periods increases the reduction on subsequent lease or purchase.

### PaaS model logistics

With this concept, the whole PaaS operation will have a central logistic point to store, maintain, ship and receive boards. The board will travel between this point and users during these exchanges. Before use, the board is sent to the user in a board case. After use, the user will send the board back to Appletree in this same case, using standard mail. Picking up a board and bringing it back is also possible and a good moment for getting advice. When the user is satisfied with the board that was used last in the trial, the board can stay with the user if a lease or purchase arrangement is made.

## Causal loop diagram

For both trial concepts, extended causal loop diagrams are visualised. The extra components that each concept adds to the overall PaaS model, is made clear with black arrows. In this concept there aren't a lot of components that will be added to the whole system structure. More logistics have to take place, because this trial concept potentially has a lot of board exchanges.

### Pros and cons

- + Try a board where and whenever you want (during a period)
- + Favored conditions might not occur during the trial period
- Many logistic movements are unsustainable

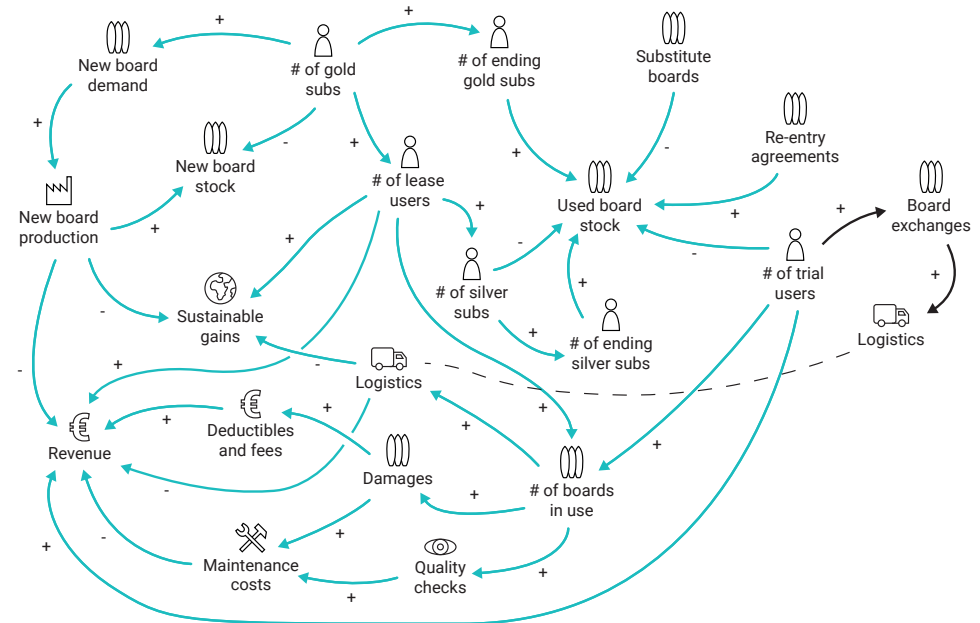


Figure 10: Causal loop diagram: Term trial

## Windy days trial structure

### Trial construction

The Windy days trial is a day-based 'rent' of trial-boards, in partnership with local venues at kitesurf spots. These venues will have a small stock of all the Appletree board models. The user reserves a board at one of these venues, aiming at a day when the kitesurf conditions are good. The user is able to try a board at that location for a day, a few sequential days or at separate days. With the flexibility of this concept, the user is able to try a board model, or several models at the moment there are favored conditions.

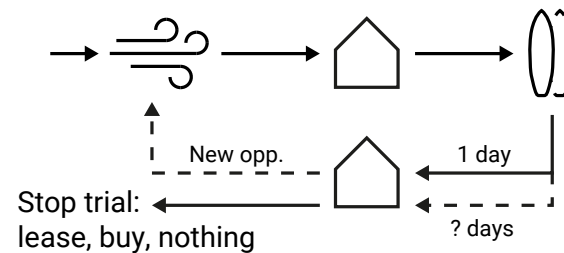


Figure 11: Windy days trial structure

### Payment structure

The user has the option to choose how many days and boards, based on a credit system. Credits can be bought in packages like 10, 20, 50 and 100 and will be spent like this:

- 1 board for 1 day = 10 credits
- 1 board for 2 days = 25 credits (adding days to the a board is 15 credits)
- 2 boards on 1 day = 15 credits (adding boards to a day is 5 credits)

The amount of bought credits increases the reduction on subsequent lease or purchase.

### Pros and cons

- + Try a board whenever you want (at a venue)
- + Working with venues reduces logistics
- Bound by the nearest venue
- Board availability at venue could drop with good conditions
- Working with venues requires a gain for them as well
- Venue stocks are quite big, due to different board models and sizes

### PaaS model logistics

The venues are provided with stock for trial only. A reserved board is picked up and retrieved at the same venue. There, the staff will check and prepare the board for the next user. Damaged boards will be repaired and substituted by Appletree. Trial users won't be able to lease or buy boards at the venues: that activity will be handled the same way as proposed in the Term trial.

### Causal loop diagram

For this concept, some extra components within the whole system are added. The main reason for this is that the venues have to be taken into account. This asks for other logistic flows and local board stock. Together with the kitesurf conditions, it also has its influence on board availability.

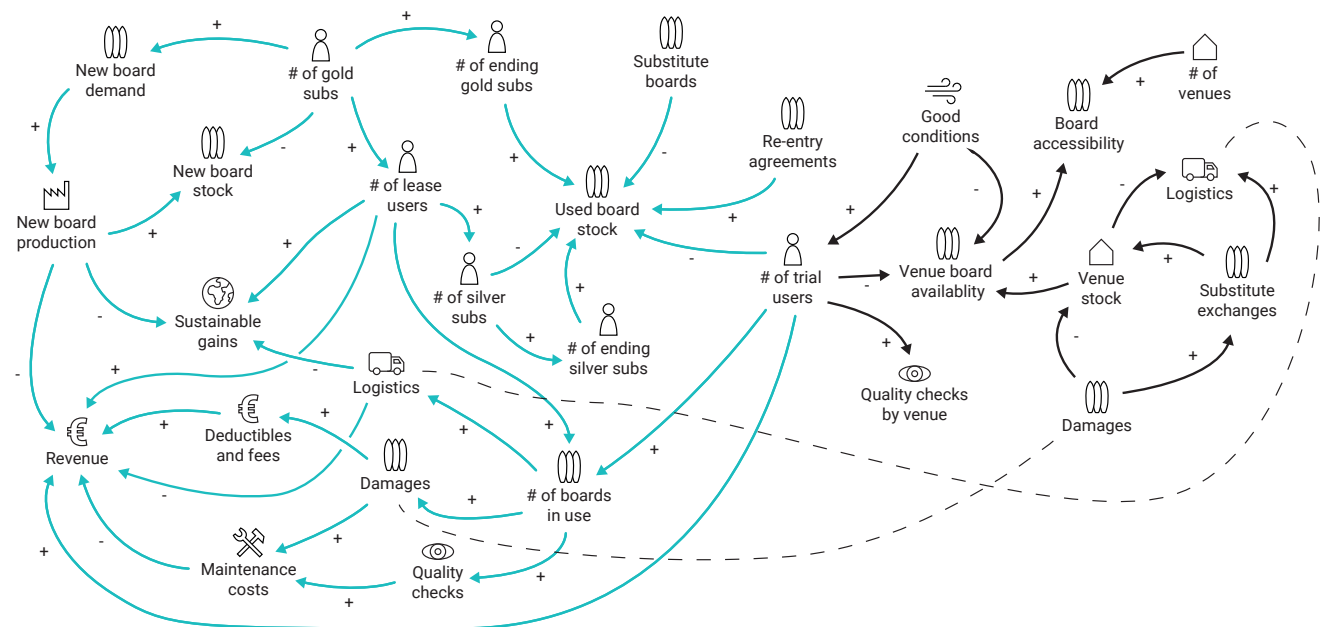


Figure 12: Causal loop diagram: Windy days trial

## Value propositions

To be able to summarise what the end-users can expect from the concept services, the value propositions are identified. The most important benefits that the concepts radiate will be addressed, to get the end-users excited about these designs. The value propositions will be used to convey these benefits quick and efficiently.

### Value Proposition Canvas

In search of the true value propositions of each concept and their mutual differences, the Value Proposition Canvas was used (figure 13). Some definitions of canvas components will be clarified first.

The value proposition itself describes the benefits customers can expect from products and services; the 'Value map' describes the features of a specific value proposition in a more structured and detailed way; and the 'Customer profile' describes a specific customer segment in a more structured and detailed way (Osterwalder et al., 2014). The latter is of course the intended end-user.

In appendix E the canvas is filled in with the customer profile and value map details that will be presented next, together with a small explanation of each of the six different fields. Considering the customer profile, the persona of 'The Seeker' was kept in mind together with regular wave kitesurfer attributes.

## Value map

Concept specific: Term trial

Concept specific: Windy days trial

### Products & Services

- Wave kiteboards
- Trial
- PaaS lease
- Local venues

### Pain Relievers

- Extended testing time
- Helps making a better decision
- Substitute boards
- Switch boards yearly
- Company stays owner
- Try a board where you want
- Try a board whenever you want (during a period)
- Try a board whenever you want (at a venue)

### Gain Creators

- The option of a extensive trial
- Amount of periods decides the reduction on board
- Amount of bought credits decides reduction on board

## Customer profile

### Customer Jobs

- Acquire a board that fits preferences
- Try boards in favorable conditions
- Try boards before acquiring one
- Find the right board
- Kitesurf when possible
- Improve kitesurfing
- Fix a board rapidly when damaged
- Resell a board after use

### Pains

- Limited testing time
- Make a bad board choice
- Downtime during repair
- Fear of missing out (on good conditions)
- Not finding a buyer when selling

### Gains

- Testing possibility
- Personal advice
- Ride the best board
- A good deal
- A durable board

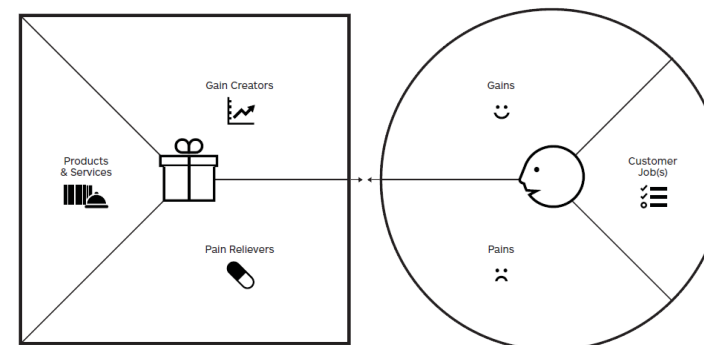


Figure 13: The Value Proposition Canvas (Osterwalder et al., 2014)

### **Value proposition proposals**

The most distinctive value proposition details were put together to form small 'value proposition summaries', addressing the most important benefits the end-user can expect from Appletree.

#### Term trial

*"Try our wave kiteboards where and whenever you want in favored conditions. Take two weeks to make the right decision, and ride the perfect board. Enter a lease subscription and never experience downtime anymore."*

#### Windy days trial

*"Try our wave kiteboards whenever you want at a designated trial venue, in favored conditions. Take your time to make the right decision, and ride the perfect board. Enter a lease subscription and never experience downtime anymore."*

## 4.3 Conveying experience

**While looking back at the preliminary project goals and point 3 of the solution space, a design goal came about that should help to create a great experience for the end-user. Storytelling theory is used to convey this experience.**

The design goal is stated as follows:

- **D3:** To convey a positive experience to wave kitesurfers they can identify with, while using the trial and lease services.

To reach this goal, an emphasis will be placed on the experience attributes of these services. Experience attributes can only be accurately evaluated after the product has been purchased and used for a period of time (Ford, Smith & Swasy, 1988). For example: you only learn for sure whether a razor blade is sharp, after you buy it and drag it across your skin. For this reason, it is important to present a clear intended experience to the target group, so that they can imagine what it will be like.

Storytelling will be used, in order to give users a look into the experiences that each concept conveys. First, a distinction will be made between the concept experiences, which is used later on to examine which one is preferred.

### **Sustainability versus convenience**

The question that kept coming up during the project was: what message will address the end-user with power, conveying a great experience? The initial aim of the project was to give the end-user an experience, with the design being both a convenient solution and a sustainable alternative (see the solution space in paragraph 4.1.1). These subjects came forward together, as the main message to convey the experience with. Although, these two subjects feel like they differ greatly from each other when it comes to picking one the intended user can identify with the most. Theoretically, sustainability should focus on benefits for the environment, whereas conveniences should focus on benefits for the end-user. Therefore, the subjects have been pulled apart to later test which one addresses the end-users more, leading to a better user experience. Ultimately, an emphasis on one of the subjects, or a proper ratio between both of them can be formed.

Considering the two messages, the assumption is made that end-users are drawn more to the convenience of the PaaS model experience, rather than the sustainability. Insights gained from interviewing the target group imply that this subject should appeal to them much more. For them, the sustainability that the PaaS model could bring just seemed like 'a nice side effect'. To test this assumption, each concept will convey a different message: the Term trial will have a focus on sustainability, whereas the Windy days trial will have a focus on convenience. By dividing these subjects, the concepts will convey different PaaS experiences.

### **Storytelling**

Storytelling is used as the foundation to convey these concept experiences. The narrative foundations are laid, using the company's current brand persona and a storytelling archetype.

#### **Brand persona**

According to Herskovitz & Crystal (2010), when it comes to creating a powerful brand narrative, the brand persona has to be determined first: this is the articulated form of the brand's character and personality. It provides continuity for the overall brand message, offers a point of reference that audiences can relate to (regardless of the specific story or message) and it reflects the audience's understanding of the brand's values and behaviors (Herskovitz & Crystal, 2010).

The core persona of Appletree tends to be that of an 'innovator', as the current story the company tells is about their innovations and technology. From building their own surfboards in a shed in their parent's apple orchard, to developing a unique production method leading to strong, durable and sustainable board properties. Relevant values that come forward in their core persona as innovator are: high-performance, well-designed, durable and sustainable.

#### **Archetype: Hero**

An important part of persona-based storytelling is quick and easy recognition, which comes from drawing on archetypal personas whose value is seen through long use and familiarity (Herskovitz & Crystal, 2010). Appletree's company archetype was identified as 'hero', considering the 12 major archetypes expressed most often in commercial activity today, identified by

Archetypes and Their Primary Functions in People's Lives		
Archetype	Helps people	Brand example
Creator	Craft something new	Williams-Sonoma
Caregiver	Care for others	AT&T (Ma Bell)
Ruler	Exert control	American Express
Jester	Have a good time	Miller Lite
Regular Guy/Gal	Be OK just as they are	Wendy's
Lover	Find and give love	Hallmark
Hero	Act courageously	Nike
Outlaw	Break the rules	Harley-Davidson
Magician	Affect transformation	Calgon
Innocent	Retain or renew faith	Ivory
Explorer	Maintain independence	Levi's
Sage	Understand their world	Oprah's Book Club

Table 3: The 12 archetypes by Mark & Pearson (2001)

Mark & Pearson (2001). See table 3 above for the 12 archetypes, their primary functions in people's lives, and a existing brand example.

The Hero archetype has the goal to exert mastery in a way that improves the world (Mark & Pearson, 2001). Looking at Appletree's core values, the company wants to be seen as a high-tech, durable brand that makes boards for high-performance wave kitesurfing. The company is founded by two brothers, who love surfing and wanted to create stronger boards and better designs. With the durable aspects of their products and manufacturing process, the company even contributes heroically to 'saving the planet'.

The company's slogan "Break limits, not boards" even has a heroic taste to it as well. 'Breaking limits' promotes the heroic virtue of the courage to act, like Nike has with its slogan "Just do it" for example. Appletree customers are individuals that have a product to their use, to act on heroic levels of physical performance. The 'not boards' part implies to the company's mission to build strong, durable boards, so their users will not break or damage them fast. This results in their boards lasting long, which is their current means to contribute to sustainability.

## Experience narratives

The concept message narratives will have a similar foundation. Both stories bring forward the core persona of Appletree as innovator, as people naturally connect and identify with a believable and consistent brand persona (Herskovitz & Crystal, 2010). The hero archetype is used throughout the storytelling of both concepts for that reason too.

However, as the concepts will convey different messages, they will touch upon either sustainable or convenient attributes. The attributes below are gathered to function as an inspiration source to build the narrative around.

### Term trial: sustainability

Building on sustainable attributes from:

- the whole PaaS model: used boards, resource efficiency, efficient use till end-of-life, sequential and multiple use, controlled maintenance.
- the Term trial: try with used boards, make a better decision (leading to longer active ownership).

### Windy days trial: convenience

Building on convenient attributes from:

- the whole PaaS model: use instead of possession, simple exchanges, substitutes, switch without a hassle.
- the Windy days trial: try when you want, try in favored kitesurf conditions, reduction on board.

### **Narrative proposals**

For each concept a narrative is proposed, since a sufficient amount of storytelling ingredients have been gathered. All these ingredients served as building blocks to write the two narratives on the next page.

### Term trial narrative

*Appletree Surfboards is always innovating. That has brought the company from a shed in an apple orchard, to developing the strong, durable boards we are known for today. Our unique production method with its environmental benefits, has already decreased our ecological footprint. Now, the durability of our products inspired us to create new services, which will reduce this environmental impact even more, by wasting less, and by making more efficient use of the boards, so they don't end up being unused. While pursuing this, we provide you with a high-performance board to boost your kitesurfing to its best. Break your boundaries and decrease the impact on our planet, together with Appletree.*



Two short videos were made as a means to deliver these narratives to wave kitesurfers participating in the user test in chapter 5. The videos provide visual support to the narratives. The author narrated the videos, using the text above. Some stills of these videos that had keywords in it are presented here.



### Windy days trial narrative

*The Buurma brothers who founded Appletree Surfboards started building their own boards at the time, because they were done with surfboards breaking and denting. Since those early days at the apple orchard, the company has made innovative leaps in construction and design. This led to the board durability and performance we are known for today. Now, together with local venues, we introduce a new service to provide you with the perfect board. Then we will make sure you will never experience downtime again. Because we want you to keep kitesurfing no matter what, so you can keep chasing your goals and dreams. Ride the best and never stop kitesurfing with Appletree.*



## 4.4 Provoking behaviour

**Throughout the project, an idea was formed about an intended behaviour of the end-user. In this paragraph, previous efforts and an extra concept adjustment are presented to show how this behaviour could be provoked.**

While developing the whole PaaS model structure, a goal for an intended user behaviour was identified that would enhance sustainability. This goal includes making the lease construction the most favorable option after trial. The following behaviour goal came about:

- **B1:** To simulate wave kitesurfers to choose leasing over buying, after doing a trial.

### Provoke subsequent lease

After doing a trial, the user should lease a board, instead of buying or doing nothing because:

- a new lease customer counts as a conversion for the company.
- continuing in the PaaS system (by leasing) is more sustainable than buying, for it stimulates take-back and reuse, which leads to a higher resource efficiency.

### Commitment

Ideally, the user is kept within the PaaS system, as this has benefits for the company and the environment. Paying for the trial and subscribing as a user, will serve as some first small commitments that the user has to make. Once these steps are taken, there should be a natural tendency to behave in ways that are consistent with it (Cialdini, 1987). After doing the trial, the threshold to apply for a lease subscription (or to buy a board) should theoretically be lower.

A way to encourage the end-user to lease after trial, is to offer a better deal than there will be if one buys a board. This could be realised by applying some kind of reduction on subsequent lease. For example: receiving the trial costs back as reduction on the lease subscription, or no entry fee for entering the lease subscription. This also works backwards as a promotion to enter a trial first.

### Package versus default

The assumption is made that trial and lease as separate services are preferred by the end-users. Therefore, the Term trial concept will have these two services combined as one package. The 'Design with Intent' toolkit by Lockton (2010) was used as a source of inspiration to guide the behaviour within the Windy days trial concept. In this toolkit, relevant examples are presented of design patterns that could guide a user's choice. A pattern of this toolkit that proved to be an inspiration is called 'defaults'. By setting the 'trial and lease combination' as a default, the users should be guided in such a way, that they will see a subsequent lease as a normal continuation.

### Concept differences

- The Term trial will have 'trial and lease' combined as a package. The more trial periods, the more reduction on the subsequent lease.
- The Windy days trial will present 'trial and lease' as a default combination. They still remain separate services. The more credits spent, the more reduction on subsequent lease.

# 4.5 Improving interaction

To improve the interaction between Appletree and the end-user, current test-opportunities will be reviewed in order to form a view on the current interaction. This will lead to a vision of a desired interaction with an accompanying interaction goal. At the end of this paragraph, touchpoints will be presented that were designed to reach this goal.

## 4.5.1 Current & Desired interaction

### Current interaction

In the course of the project, an image was formed of the current interaction that wave kites have with Appletree's offering to test boards. Considering the chosen end-user group, the interaction was investigated within following situation:

*'Wave kites using Appletree's test-opportunities, during their search of the right board model'.*

The view on the current interaction was formed with insights gathered from sources like: former experiences of Appletree owners, observations within the company and learnings of company activities. Specific examples of this are: (hearing) conversations with visitors at the office, observing a test-event (image 10) and asking the company about their view on the current interaction within the chosen situation.

### Storyboard

A storyboard was made (figure 14) to visualise the main phases, within the situation of 'wave kites trying boards from Appletree before they buy one'. The actions of the wave kiter that surround this current interaction with Appletree are captured.

1. The wave kiter is in search of a new board, wanting to try different Appletree board models. He wants to try several models before he chooses one.
2. He is able to try Appletree boards by attending a test-event or by borrowing a board from the company directly.
3. He has to arrange his availability (for a testevent) or make small arrangements (for borrowing).
4. He tries the board model(s) he wants. His decision making has to be substantiated based on the conditions of that specific moment or day.
5. He asks for and relies on the product knowledge and experience of experts.
6. When a board choice is made, the wave kiter orders a board. The new board is manufactured and delivered to its user-to-be.

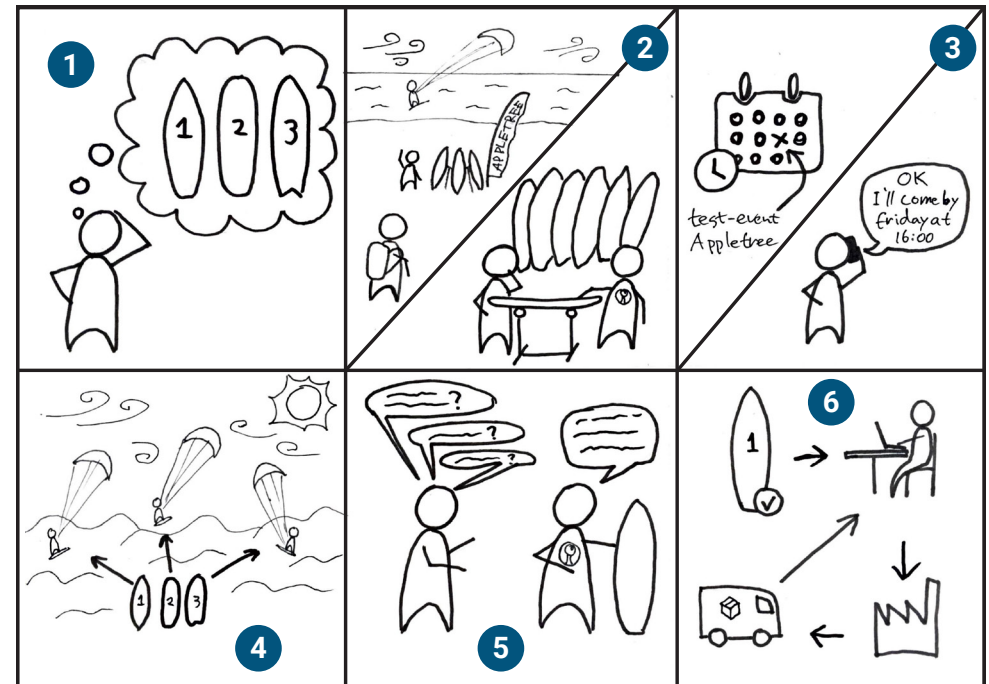


Figure 14: Storyboard current interaction

The scope of the current interaction that will be improved in further designing for the sake of the chosen end-user group, lies within storyboard points 2 till 5 (text made blue). Therein exists the sole problem right now, looking at poor interaction between the wave kiter and Appletree. First, this section of the storyboard is further detailed to a broader description and deeper interpretation of the interaction that currently takes place. The 'character of interaction' will be described hereafter, using keywords.

### Scope interpretation

Appletree has a small stock of test-boards, which they use at test-events and lend to potential customers. At test-events, usually all board models are available to try. This is great for orienting the company's products. Though, these events are not held frequently and can be (almost) windless, making kitesurfing and thus testing impossible. Board availability depends on how crowded the event is and the product experience is restricted by the conditions of that particular day. The wave kiter must have the opportunity to be present as well.

Borrowing a board from Appletree is a great way to test a board somewhat longer. Though, the test-boards are mostly unavailable, as they exist in really small numbers. Besides, these boards have to be returned soon (e.g. after just one weekend), so it is pretty unlikely to try a board in favored conditions. Besides, the wave kiter has to arrange things with Appletree to acquire a board to test, by picking it up at the office in Hillegom.

Viewing the overall picture, the wave kiter only has relatively small time frames to try boards, so the testing itself is quite rushed. Decision making then has to be substantiated based on the conditions of that specific moment or day, which might not even be favored conditions.

An extra factor to this all is: the wave kiter relies on some extra expert knowledge about the different model specifications during his contact with the company. Apparently, there is a heavy need for this piece of personal advice. Currently, this is a time intensive activity for Appletree. Apart from testing, people (re-)contact the company with emails, calls, texts and visits. They do this during their hesitance, presumably trying to take away doubts or to justify a possible decision.



Image 10: Appletree boards at a test-event

### **Core interaction**

The chosen scope has a great potential to be improved by altering this poor interaction to a better one. The scoped section's core interaction that currently takes place can be stated as:

*'Wave kites using Appletree's inadequate test-opportunities, during their search of the right board model.'*

### **Character of current interaction**

Four qualities, describing the character of interaction are presented on the right with a plus or minus sign. This indicates whether it is a positive or negative quality. For each quality, a small explanation is given where it is derived from. This concerns the various inadequacies within the scope that were discussed earlier.

#### **- Uncertain**

Impressions of a board while trying, are dependent on the conditions of that one specific moment or day. The wave kites need to be available, and board availability is not guaranteed. They are not in control of the situation, which results in an uncertain interaction.

#### **- Inconvenient**

The wave kiter has to arrange a lot of things in order to try boards. It is almost impossible to try board models thoroughly in the same, favored conditions, which is theoretically needed for a fair comparison. Big efforts and unframed situations make this interaction inconvenient.

#### **- Hurried**

There are only small time frames to try boards, and boards have to be returned immediately or as soon as possible. This results in wave kites testing boards rapidly and stressfully. They are not able to take the time they need, because the interaction is hurried.

#### **+ Personal**

The wave kites rely on expert knowledge and personal advice, helping to make a decision. It seems like they are doubtful about their own knowledge to make a good decision. Appletree answers their questions and gives them advice on the spot or by other contact. This attention to individuals, makes the interaction personal.

## Desired interaction

Through the course of the project, a vision was formed of what form desired interactions should take within the trial phase. The 'current interaction' is used as a basis to give form to this desired interaction, and an accompanying character. In the desired situation, the wave kiter has an ongoing interaction with the company during the trial. The desired interaction is:

*'Wave kites using Appletree's trial service to try boards, helping them sufficiently in choosing the right model.'*

### Character of desired interaction

Four qualities, describing the visioned character of interaction are presented on the right with a small explanation what deflections will give form to this character.

### Interaction goal

Following the vision of the desired interaction, an interaction goal was formed:

- **IG:** To provide the end-users with the intended desired interaction, between them and the company's trial service.

As the desired interaction has to meet the underlying character of interaction, each individual quality has to be met as well. Therefore, each quality will be covered in the next section, where new design efforts will be presented.

### + Controlling

The end-users should have a sense of control while they: plan their test moments, determine the duration of the trial, and select boards to try. Besides, the end-users should know when and what to expect, within a framed situation provided by the trial structure.

### + Easy

The end-users should be able to perform the trial with ease. For them, it should feel like a low threshold in acquiring a board to try, without having to arrange a lot.

### + Confident

At the end of the trial, the end-users should be able to choose a board with confidence. Therefore, the steps that are taken during the trial should take away doubts they might have.

### + Personal

While selecting boards for trial and evaluating them leading up to a decision, the end-users rely on personal advice. To relieve Appletree's current efforts to communicate this, this should be delivered with more structured means.

## 4.5.2 Designing the interaction

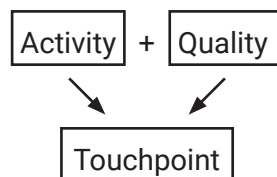
This section will present new design efforts to reach the set interaction goal of the previous section. In the next four subsections, all four interaction qualities will be touched upon, looking at what may evoke them. To clear up the exact meaning of the qualities, a proper dictionary description of the keyword will be given at the beginning of each paragraph. Besides, the quality is explained again for the reader's convenience. Then, new concept attributes are presented with the help of end-user goals. The aim of these attributes is to strengthen the desired interaction qualities. The structural differences of the concepts lead to some minor differences in these attributes.

### End-user activities

The end-user's main activities before acquiring a board were identified by taking into account Appletree's experiences with (potential) customers and insights from the interviews held during the exploration phase. A chronological sequence was made of these activities:

1. Investigate what board models are interesting
2. Get recommendations by the company
3. Select the board model(s) with potential
4. Arrange a moment for testing
5. Test the board model(s)
6. Evaluate the experience(s)
7. Get advice from the company
8. Make the right decision

Each activity is assigned to an desired interaction quality, as these activities require interaction with the company's trial service at some point. Each activity will have an emphasis on the quality to which it has been assigned to. The activities with underlying actions will be taken into account, while designing new attributes in the form of touchpoints that evoke the intended qualities.



## Controlling

*"Determine the behaviour or supervise the running of" (Control, n.d.).*

The end-users should have a sense of control while they: plan their test moments, determine the duration of the trial, and select boards to try. Besides, the end-users should know when and what to expect, within a framed situation provided by the trial structure.

### Select the board model(s) with potential (3)

When the user (in this section a 'he') knows which board(s) he wants to try, he has to select the board(s) for trial. Currently, the company has control over what boards are available for testing. Giving the user control over this, he should be able to select the board that he wants to test each time, instead of testing what is made available.

*Touchpoint: Select board(s)*

### Arrange a moment for testing (4)

After the user selects a board for trial, a timeframe (moment) in which the user will be testing has to be arranged. With a selection of multiple boards this might even lead to multiple test moments. Here, a shift in control has to take place as well, as the company mainly has its saying now about these moments (test-events, lending test-boards): the company is in control. When the user is given the freedom to plan a moment individually, it should enable him to be more in control of the situation.

To support the user in planning and reserving this test moment, he should know something about the board availability over time. A smart agenda could help him making this reservation. For the Term trial this reservation means a two-week period, for the Windy days trial one or a few days at a venue. Considering these differences, the smart agenda will have slightly a different setup per concept.

*Touchpoint: Reserve period / Reserve moment(s) at venue*

## Easy

“Achieved without great effort; presenting few difficulties” (Easy, n.d.).

The end-users should be able to perform the trial with ease. For them, it should feel like a low threshold in acquiring a board to try, without having to arrange a lot.

### Investigate what board models are interesting (1)

Before physical product testing, the user does some product orientation and board model comparison first. He wants to find out what board(s) could be great potential candidates. Currently, he is able to read and see some board specifications online (image 11). Besides, he can actually see and touch the boards at test-events or by visiting the Appletree office. The user is thus able to gather comprehensive board model information in both digital and physical ways. Though, he is not able to make an easy comparison on different board specifications in detail.

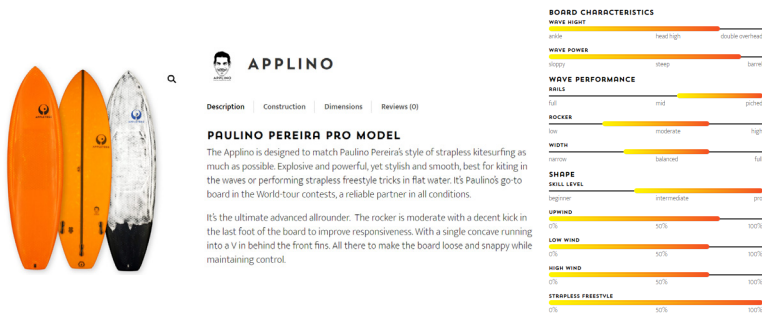


Image 11: Online board specifications

A digital tool could help to make this comparison a lot easier. The tool is a means to compare boards on their specifications and mutual differences in detail. Then, the user is able to form an idea of which board(s) he would like to try. This tool will be touched upon further in the subsection 'Personal'.

Considering the investigation of the boards in a physical way, there will be a structural difference between the concepts. Within the Term trial, users are able to see the boards at the Appletree office in Hillegom (HQ). Within the Windy days trial, users are able to see the boards at the designated venues along the Dutch coast.

Touchpoint: Board display at HQ / Board display at venues

### Test the board model(s) (5)

After making a reservation, the user has to somehow: acquire, try and return the board(s). The concepts differ in this regard, as the Windy days trial has venues to support these actions. The 'try-part' will be done by the user himself, logically. For the board receipt and return actions, some touchpoints have to be designed. The user should be able to carry out these actions with ease, and the concept logistics have to go hand in hand with it simultaneously.

Within the Term trial this will be realised by receiving and returning the board in a case. This will be done by either mail or 'pick-up and drop-off' at the office. For the Windy days trial this will be realised by receiving and returning the board at a venue. This will be done at the counter of the venue.

Touchpoint: Receive and return by mail or pick-up and drop-off / Receive and return at venue

## Confident

“Feeling or showing certainty about something” (Confident, n.d.).

At the end of the trial, the end-users should be able to choose a board with confidence. Therefore, the steps that are taken during the trial should take away doubts they might have.

The core aim of the trial is that the user will be able to make a better decision. Before going in depth, a theory is presented on how to make a good decision, followed by how current design efforts already follow this theory.

Making a good decision is a difficult process. Schwartz (2004) indicates that most good decisions involve these steps:

1. Figure out your goal or goals.
2. Evaluate the importance of each goal.
3. Array the options.
4. Evaluate how likely each of the options is to meet your goals.
5. Pick the winning option.
6. Later use the consequences of your choice to modify your goals, the importance you assign them, and the way you evaluate future possibilities.

When selecting a board to try, a first decision has already been taken. By trying the board, the user is able to evaluate his choice, and therefore a better future decision can be made (step 6). For example, after trying, the user might discover that a bigger size or another board model turned out to be more favorable than first was considered. When trying the board in practise, factors might be weighed differently. Within the trial service, the user is able to try boards until a perfect fit to needs and preferences is found.

### **Evaluate the experience(s) (6) & Make the right decision (8)**

After testing, the user is left with experience(s). When multiple boards are tested, their experiences will be weighed against each other to identify which one meets the user's preferences the most. To assist the user in this evaluation process, it will be captured with the help of an evaluation tool. Hopefully, this tool will strengthen his certainty and boost his confidence when making the final decision.

After trying a board, users should be able to capture the evaluation of their experience right away. They will rate the board on several attributes, so that a comparison can be made when other boards are rated in a similar way later. This should help them to identify a winner.

In the case of trying just one board, the user should still evaluate it. In this way, they are still able to get an idea of how they actually experienced the board. Besides, it will serve as input for the evaluation report: this will be discussed in the next subsection.

*Touchpoint: Evaluation tool*

## **Personal**

*"Belonging to or affecting a particular person rather than anyone else" (Personal, n.d.).*

While selecting boards for trial and evaluating them leading up to a decision, the end-users rely on personal advice. To relieve Appletree's current efforts to communicate this, this should be delivered with more structured means.

The personal approach that the company currently aspires, will stay the same in the desired situation. Although, Appletree has a desire to let potential customers make more autonomous decisions in order to relieve the company's current workload regarding this. Therefore, the aim is to make more use of digital means.

### **Get recommendations by the company (2)**

Before the user selects board(s) that he wants to try, he relies on some personal recommendations by the company. The earlier presented tool for board comparison in the subsection 'Easy', should help him already to a certain extent, but it lacks a recommendation for him individually. This could be achieved when the user conveys his board preferences, so a recommended board-match can be presented to him.

Building further on this comparison tool, the user will have the option to enter some personal properties and the board specifications he is looking for. These are variables like: weight, height, skill level and style. Theoretically, this can be much more extensive. The boards will be ranked hereafter, with number one being the board that matches the most.

*Touchpoint: Matching and comparison tool*

### **Get advice from the company (7)**

During the evaluation process, the user might want some extra company advice on what board he should pick. The earlier presented evaluation tool in the subsection 'Confident' should help him to make a structured evaluation and identify a winner. If the user is not certain yet, he should convey this in a structured, digital way to Appletree.

Building further on this evaluation tool, the user will be able to send a report to an Appletree expert, together with preferences and an explanation on his doubts. The expert will then give advice based on this personal evaluation report: per email for example. The feedback will serve as final input in the user's decision making process.

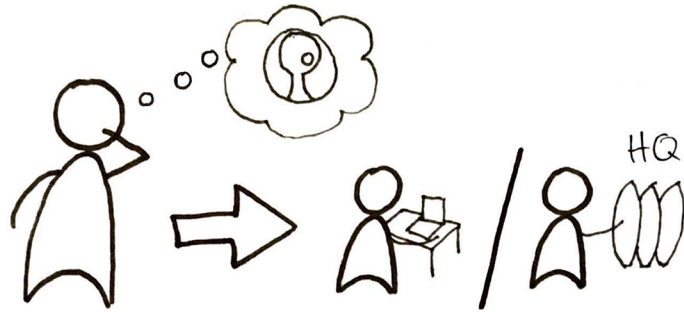
*Touchpoint: Evaluation report*

## 4.5.3 Storyboards

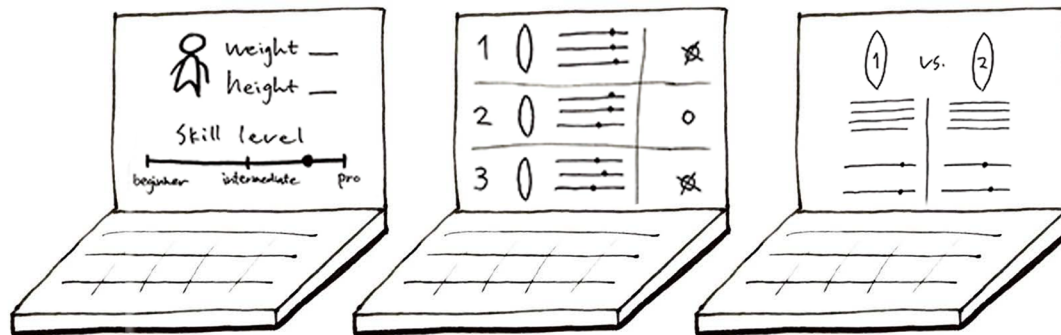
New touch points were designed that must evoke the intended qualities. Together with existing concept structures, these touchpoints were put together in wireframe visuals. These wireframes are presented in appendix F.

The wireframes formed the basis for creating storyboards that focus on the interactions that a user will have with the trial service concepts. The storyboards will be used during user testing, to provide participants with a concept walkthrough. That is also the reason why they are written in Dutch. The storyboards are presented on the next pages.

# Concept 1: Term trial

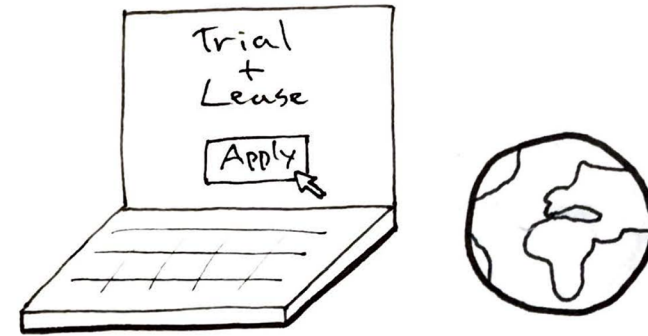
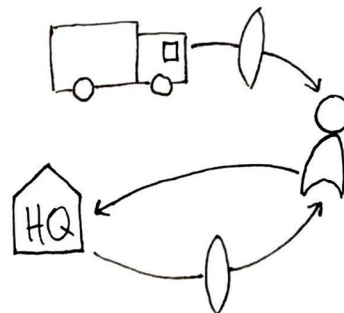


**1** Kai, een wave kitesurfer, overweegt een Appletree board. Hij oriënteert eerst wat het merk te bieden heeft. Dit kan via de website, of door het kantoor (HQ) te bezoeken om de boards te zien.

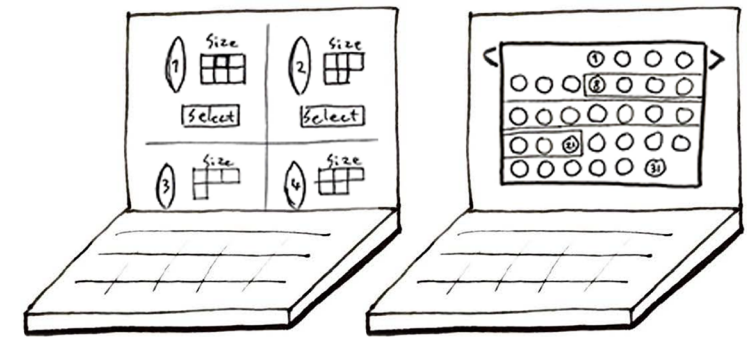


**3** Een 'board matching tool' op de website geeft Kai aanbevelingen op basis van zijn persoonlijke eigenschappen (lengte, gewicht) en voorkeuren (skill level, style). Het is ook mogelijk om deze boards in detail met elkaar te vergelijken.

**5** Voor de ontvangst van het test-board kan Kai kiezen tussen: laten opsturen of zelf ophalen.

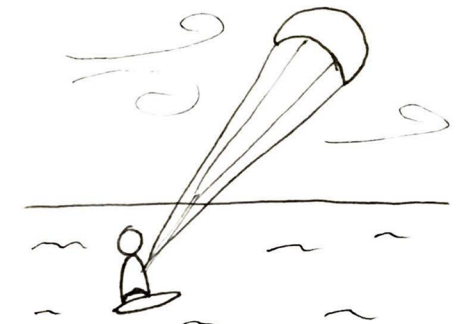


**2** Kai is geïnteresseerd en registreert zich voor het 'Trial & Lease' pakket, wat hem de mogelijkheid biedt om boards eerst uit te proberen, voordat zijn lease abonnement begint. Daarnaast heeft dit pakket bepaalde eigenschappen die de impact op het milieu verminderen.



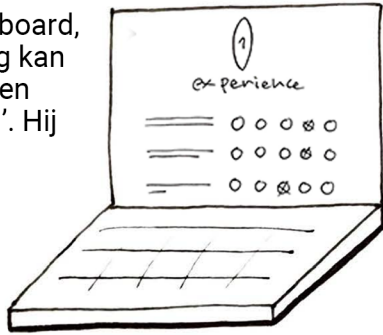
**4** Kai selecteert het board met de meeste potentie en reserveert een periode (2 weken), waarin hij deze zal uitproberen.

**6** Wanneer het test-board ontvangen is, heeft Kai 2 weken de tijd om deze op zijn gemak uit te proberen. Hij kan tijdens deze periode gaan en staan waar hij wilt.



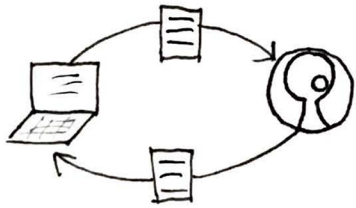
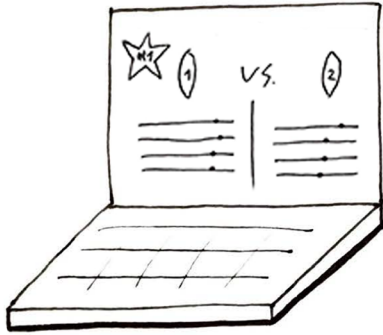
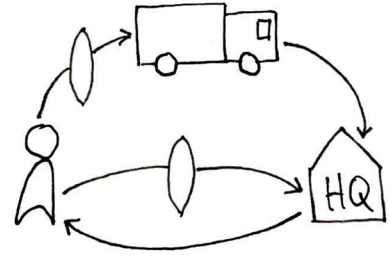
7

Tijdens en na het proberen van het board, vormt Kai een mening. Deze mening kan hij uiten door het board te beoordelen met behulp van een 'evaluation tool'. Hij beoordeelt het board hiervoor op verschillende eigenschappen.



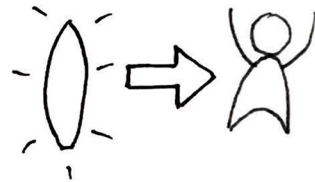
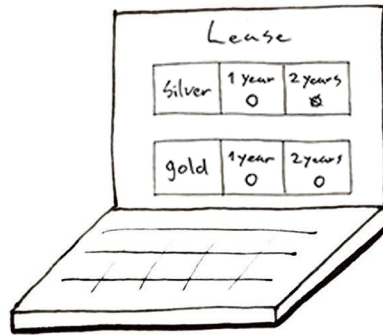
8

Voor de teruggave van het test-board kan Kai kiezen tussen: opsturen of zelf brengen. Na teruggave van het test-board, kan Kai er voor kiezen om nog een ander board uit te proberen. Hier zijn wel extra kosten aan verbonden. Hij selecteert in dat geval een ander board en reserveert een nieuwe periode.



9

Door elk board te evalueren krijgt Kai een beeld welk board er bovenuit steekt. De vergelijking van zijn ervaringen wordt duidelijk weergegeven in een 'evaluation report', ook in het geval wanneer er maar 1 board getest is. Daarnaast kan hij, als hij nog twijfelt, dit rapport opsturen naar Appletree. Zij kunnen hem dan extra advies geven.

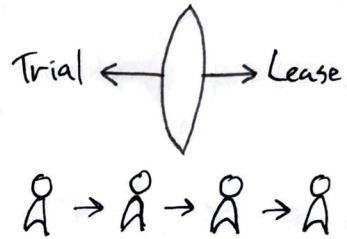


10

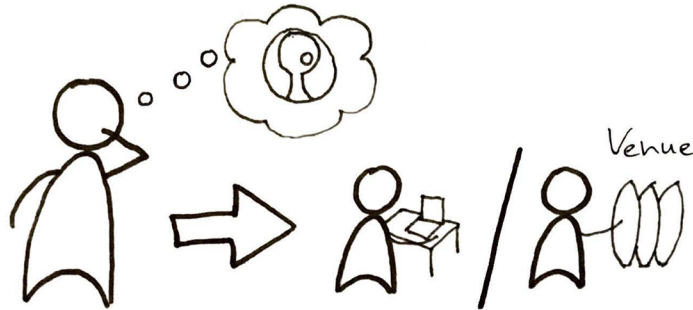
Wanneer Kai in staat is een juiste keuze te maken, selecteert hij een lease abonement dat bij hem past. Daarna ontvangt hij zijn gekozen Appletree board. Kai kiest voor het leasen van een gebruikt board.

11

Appletree zorgt er voor dat boards worden hergebruikt als test- of lease-board, tot ze op zijn. Dit efficiënte gebruik van Appletree's duurzame boards leidt tot een gereduceerde impact op het milieu.



# Concept 2: Windy days trial

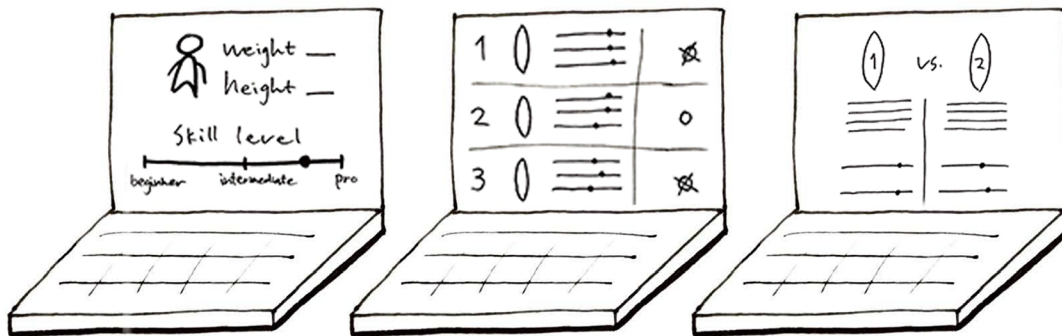


**1** Kai, een wave kitesurfer, overweegt een Appletree board. Hij oriënteert eerst wat het merk te bieden heeft. Dit kan via de website, of door een locale venue te bezoeken om de boards te zien.

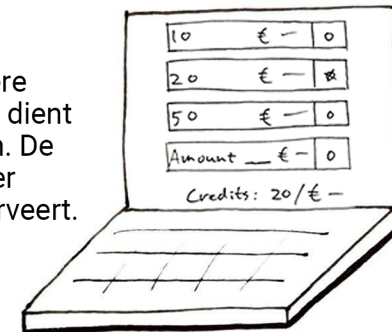


**2** Kai is geïnteresseerd en registreert zich voor de 'Windy days trial', wat hem de mogelijkheid biedt om boards eerst uit te proberen, voordat hij beslist om een board te kopen of leasen.

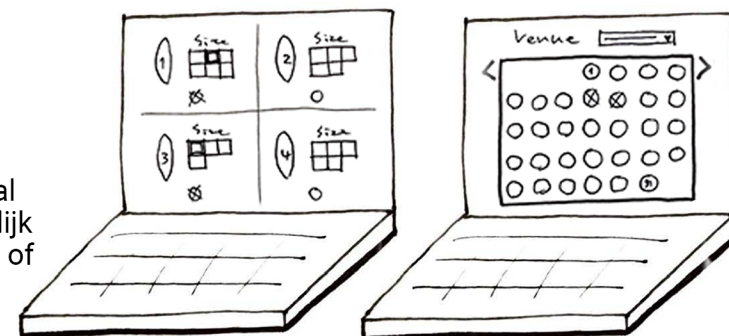
**3** Een 'board matching tool' op de website geeft Kai aanbevelingen op basis van zijn persoonlijke eigenschappen (lengte, gewicht) en voorkeuren (skill level, style). Het is ook mogelijk om deze boards in detail met elkaar te vergelijken.

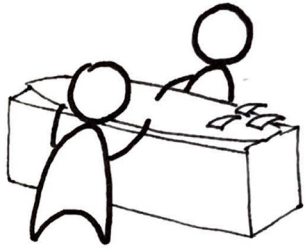


**4** Voordat Kai 1 of meerdere boards uit kan proberen, dient hij eerst credits te kopen. De credits spendeert hij later wanneer hij boards reserveert.

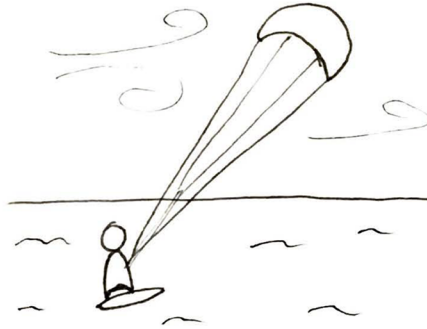


**5** Kai selecteert het board met de meeste potentie en reserveert een of meerdere dagen waarin hij deze zal uitproberen, bij een venue in buurt. Het is ook mogelijk om meerdere boards te reserveren op dezelfde dag, of verspreid over meerdere dagen.

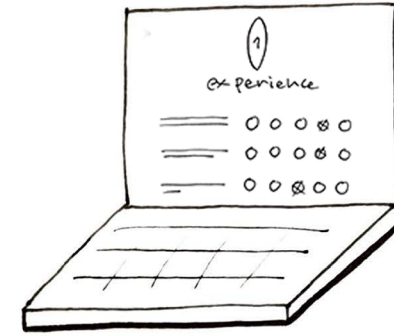




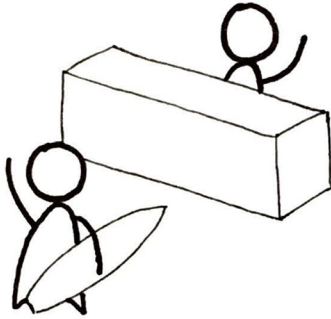
**6** Kai heeft een moment uitgekozen met kitesurf-condities die ideaal zijn voor hem en haalt het board op bij de geselecteerde venue.



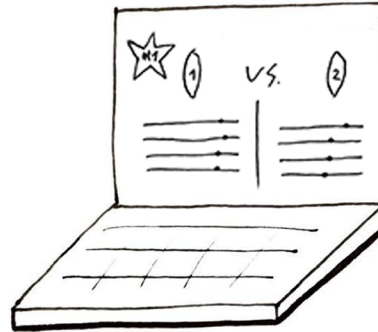
**7** Wanneer hij het test-board heeft opgehaald, heeft Kai de tijd om deze op zijn gemak uit te proberen tijdens die dag(en).



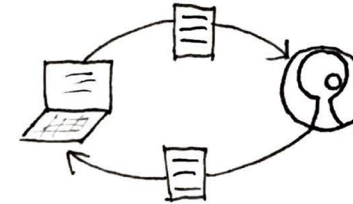
**8** Tijdens en na het proberen van het board, vormt Kai een mening. Deze mening kan hij uiten door het board te beoordelen met behulp van een 'evaluation tool'. Hij beoordeelt het board hiervoor op verschillende eigenschappen.



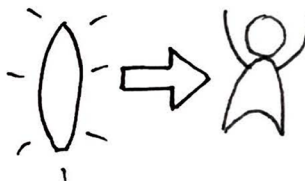
**9** Kai brengt het board terug bij de geselecteerde venue. Hij kan er voor kiezen om nog meer boards uit te proberen. Hij maakt in dat geval nieuwe reserveringen met de credits die hij nog heeft. Hij kan ook meer credits kopen.



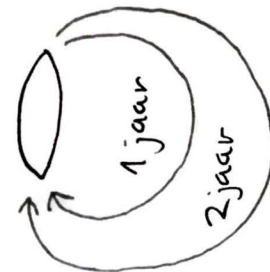
**10** Door elk board te evalueren krijgt Kai een beeld welk board er bovenuit steekt. De vergelijking van zijn ervaringen wordt duidelijk weergegeven in een 'evaluation report', ook in het geval wanneer er maar 1 board getest is. Daarnaast kan hij, als hij nog twijfelt, dit rapport opsturen naar Appletree. Zij kunnen hem dan extra advies geven.



**11** Wanneer Kai in staat is een juiste keuze te maken, selecteert hij een lease abonnement dat bij hem past of koopt hij een board. Echter, op leasen ontvangt hij een fikse korting dankzij de credits die hij heeft gependend. Kai kiest daarom om een board te leasen.



**12** Appletree zorgt er tijdens de trial voor dat Kai een goede keuze maakt. Daarna zorgt het lease abonnement er voor dat hij altijd een board onder zijn voeten heeft. Kai betaald ondertussen voor gebruik i.p.v. bezit en kan elke 1 of 2 jaar van board wisselen als hij dit wil.





A close-up photograph of a hand holding a brush with a wooden handle and a blue metal ferrule. The brush has light-colored bristles and is being used to apply a thick, yellowish substance to a bright blue surface. The background is a plain, light-colored wall.

# 5. USER TESTING

Now that the two concepts have taken shape, they will be presented to the target group. The aim of this user test is to form a great experience, evoke desired interactions, identify end-user values and understand end-user preferences. The results will serve as a new input to adjust the design and to form a final concept.

## 5.1 Assumptions before testing

In the paragraph, assumptions that were made by the author will be presented. These assumptions will be evaluated after the user test.

During concept development, assumptions were made about hypothetical concept preferences of the intended end-user. The first two assumptions result from concept differences, created in chapter 4. The other two assumptions were made considering the trial structures.

### Assumptions

- **A1:** The end-users are drawn more positively to a convenient experience than a sustainable one, for the convenience of the service appeals to them much more.
- **A2:** The end-users prefer trial and lease as separate services, rather than combined.
- **A3:** The end-users perceive more leeway and flexibility in the structure of the Term trial than in the Windy days trial.
- **A4:** The end-users prefer the Term trial for trying one specific board and the Windy days trial for trying multiple boards.

### Concept differences

Main differences value proposition:

- Term trial: *Try a board where and whenever you want (during a period)*
- Windy days trial: *Try a board whenever you want (at a venue)*

#### Term trial

1. Experience focussed on sustainability (A1)
2. Reserve period
3. Board display at HQ
4. Receive and return by mail or pick-up and drop-off
5. Has 'trial and lease' combined as a standard package (A2)
6. The more trial periods, the more reduction on the subsequent lease.

#### Windy days trial

1. Experience focussed on convenience (A1)
2. Reserve moment(s) at venue
3. Board display at venues
4. Receive and return at venue
5. Presents 'trial and lease' as the default combination (A2)
6. The more credits spent, the more reduction on subsequent lease.

## 5.2 Research goals and questions

In this paragraph, the research goals and questions for the user test are presented. These goals and questions together form the foundation of the user test setup.

### Research goals

The main goal of the study is to get the best out of both concepts. The best concept (details) then will be used for further development. Sub-goals have been defined to clarify what information will be gathered:

- **G1:** Discover how end-users feel about the two different concept experiences, to form a proper ratio between sustainability and convenience.
- **G2:** Discover which trial attributes evoke the desired interaction effectively.
- **G3:** Identify underlying values end-users have considering a trial service.
- **G4:** Understand why end-users prefer certain trial service attributes, to test the validity of assumptions that were made.

### Research questions

From the goals stated above, the following research questions have been derived:

- **R1:** How do end-users feel about the two concept experiences?
- **R2:** What is a proper ratio between sustainability and convenience in conveying the PaaS model experience?
- **R3:** Which trial attributes evoke the desired interaction qualities effectively?
- **R4:** Which key concept differences do end-users identify?
- **R5:** Which concept attributes do end-users prefer and why?
- **R6:** What kind of values do end-user link to trial service attributes?
- **R7:** Are end-user thoughts and opinions in line with prior assumptions?

# 5.3 User test setup

In this paragraph, the user test setup is presented. The setup is divided in several steps, with accompanying stimuli and methods.

The user test setup consists of both stimuli to convey the designs and methods to gather information. The stimuli are presented in table 4 below, together with the accompanying method(s). The PrEmo tool and the Interaction quality scales are supported by questions to ask further, so that the participants are able to convey the reasons for choices they make.

- In order:
1. Introduction
  2. Experience videos
  3. PrEmo
  4. Storyboards
  5. Interaction quality scales
  6. Laddering
  7. Open discussion

Stimulus	Method
Experience videos	PrEmo
Storyboards	Interaction quality scales, Laddering
Open discussion	Semi-structured interview

Table 4: Stimuli and methods

## Introduction

At the beginning of the session, a small introduction will be given to explain the approach of the project and what the designed outcome is (in a nutshell, without giving away too much). The participant will be asked to provide some minor personal details like age and experience. The participants remain anonymous, which will be made clear to them.

## Experience videos: PrEmo

To test R1 and R2, the participants will watch the two videos that were made to convey experiences (paragraph 4.3). The order in which they are displayed will vary per participant. After seeing each video, PrEmo will be used to discover how the participants feel about the concept experiences. PrEmo is a non-verbal self-report instrument that measures 14 emotions that are often elicited by product design; of these 14 emotions, seven are pleasant and seven are unpleasant (Desmet, 2003). An analogue version of the PrEmo2 self-report instrument (Laurans & Desmet, 2017) will be used to form an image of the emotions each experience elicits, together with additional differences or similarities.

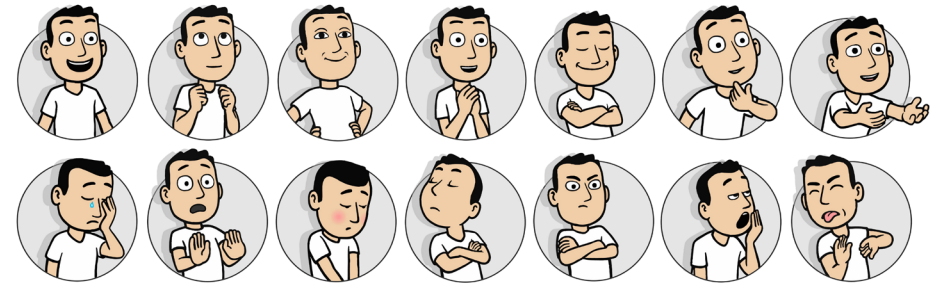


Figure 15: The 14 cartoons of the PrEmo2 self-report instrument by (Laurans & Desmet, 2017).

Directly after showing each video, participants will be asked to choose one or several emotions (cartoons together with words) that the presented experience evoked. Dutch words were added to avoid confusion. To what extent the emotion was felt will be captured using a 3-point scale (from 'felt it lightly', to 'felt it', to 'felt it intensely'). While they fill in this sheet (see appendix G), they are encouraged to think out loud. When the substantiation isn't sufficient enough, they will be asked why they made their choice(s).

## Storyboards: Interaction quality scales & Laddering

A walkthrough of concept storyboards (paragraph 4.5.3) will be done to present the concepts in greater detail. The course of interactions that take place will be emphasized, in order to test which trial attributes evoke the desired interaction qualities effectively (R3).

After presenting each storyboard, the desired qualities will be assessed by the participants. The order in which the storyboards are displayed will vary per participant. By means of 5 point bipolar scales, the participants give a rating per concept to what extent each quality comes up:

- control - no control*
- easy - difficult*
- confident - unconfident*
- personal - impersonal*

The words were translated to Dutch. While they fill in the scales (see appendix G) the participants are encouraged to think out loud. When the substantiation isn't sufficient, the participants will be asked to substantiate their ratings after they are done: what triggered them to give this rating?

## Laddering

After both concepts are rated with scales, the participants are asked to name distinctions between the two services (R4) and what they prefer (R5). To identify end-user values, participants will be asked to name attributes that are important to them (R6). A series of “why” questions (laddering) will be used to discover their underlying values. Laddering is “a personal interviewing technique used to understand consumers’ knowledge structure regarding a particular product (category)” (Van Kleef et al., 2005).

Example questions are:

- Which product characteristics are important to you?
- Why is this important to you?

## Open discussion: Semi-structured interview

Assumptions that are not touched upon yet, will be tested in a discussion with the participant (R7). The open discussion is supported by some guiding questions to lead the discussion. This is done in order to discover what can be improved for further development.

For the user test procedure that the author used to guide the user tests, see appendix G.

## Participants

The intended end-users are: ‘potential customers that want to try out a board or several boards before they acquire one’. Ideally, the participants of this test are wave kites in the exact situation as the intended end-user. Though, most wave kites that are in possession of an wave kiteboard, have already been through this process and can relate to past experiences. To not limit the search for participants, there was searched for: ‘wave kites who already own a wave kiteboard or consider to buy one’. As most Appletree customers are between 30 and 45 of age (with many outliers above this age), the aim was to look for participants within this range. Participants were gathered mainly by asking club members at Surfclub Bloemendaal. The final list of participants is shown in table 5 below.

This participant list shows minor participant details: male or female, age, years of wave kite experience and current appletree ownership (yes or no). Besides, the table indicates which concept experience video and storyboard was presented first.

Participant	1st video	1st storyboard	m/f	Age	Exp.	AT?
P0	Term	Term	m	55	10	No
P1	Term	Term	m	45	3	No
P2	Windy days	Windy days	m	44	6	No
P3	Term	Term	m	49	3	No
P4	Windy days	Windy days	m	53	11	Yes
P5	Term	Term	m	54	11	Yes
P6	Windy days	Windy days	f	51	3	No
P7	Term	Term	f	27	2	Yes
P8	Term	Term	m	35	3	Yes
P9	Windy days	Windy days	m	52	1	No

Table 5: Participant list

## Pilot

With a pilot test, the whole test setup was evaluated to improve it for further testing. Only the major user test improvements will be discussed next.

After showing and evaluating the experience videos, the pilot test participant was asked if he could make a distinction between the two videos. He then answered: "In my experience, the first was more about the brand and the way it was made, and the second it was more the story behind". This indicated that the brand and its story were too present. Therefore, it was chosen to highlight the subjects 'sustainability' and 'convenience' with more power, using keywords in the videos. An extra emphasis is placed on these subjects by doing this.

How the interaction quality scale rating exactly worked was difficult to understand. The participant tried to imagine a scale in numbers himself. Pluses and minuses were added to the scale to prevent this in the future user test. Another problem occurred while he was rating concept 2, as he rated concept 1 before already to the maximum. He wanted to show his preference for the second concept by rating it higher, but he couldn't do this anymore. Therefore he changed his ratings for concept 1 to lower ones, to justify concept 2. To solve this problem to some extent, the 5-point scale was upgraded to a 7-point scale, as the scale seemed to small in this process. In this way, participants should be able to give a more specific rating.

Ultimately, some qualitative input the pilot participant gave is still used, for it proved to be useful. The pilot participant is marked as 'P0'.

# 5.4 Results

In this paragraph the four research goals that were set before testing, will be treated and underlying research questions will be answered. New findings in this chapter will present themselves by evaluating the results. These findings will serve as new input to adjust the design and to form a final concept.

The sessions with the participants were intended to last about 30 minutes. Because the participants were very enthusiastic about the concepts and had a lot to say, this generally became a bit longer. The 9 sessions took approximately 45 to 60 minutes each and were executed by the author. Most of the sessions were held at home with the participant. Audio was recorded to listen back later, so that the focus could be placed on the conversation with the participant at all times.

G1: Discover how end-users feel about the two different concept experiences, to form a proper ratio between sustainability and convenience.

## Emotion profiles and frequency

The participants had to choose emotions that the presented experiences evoked on a 3-point scale. The data of the scores that were given on the PrEmo sheet can be found in appendix H. The average concept ratings over the 9 participants are visualised on the right in the figure 'Emotion rating'. The limited sample size makes statistical analysis impossible, but this overview gives an idea of participant opinions. Besides, this figure will be used for the discussion coming up next.

The second figure on the right 'Emotion frequency', is a visualisation of the frequency an individual emotion was felt. The vertical axis represents the number of participants that felt the emotion.

Emotion rating

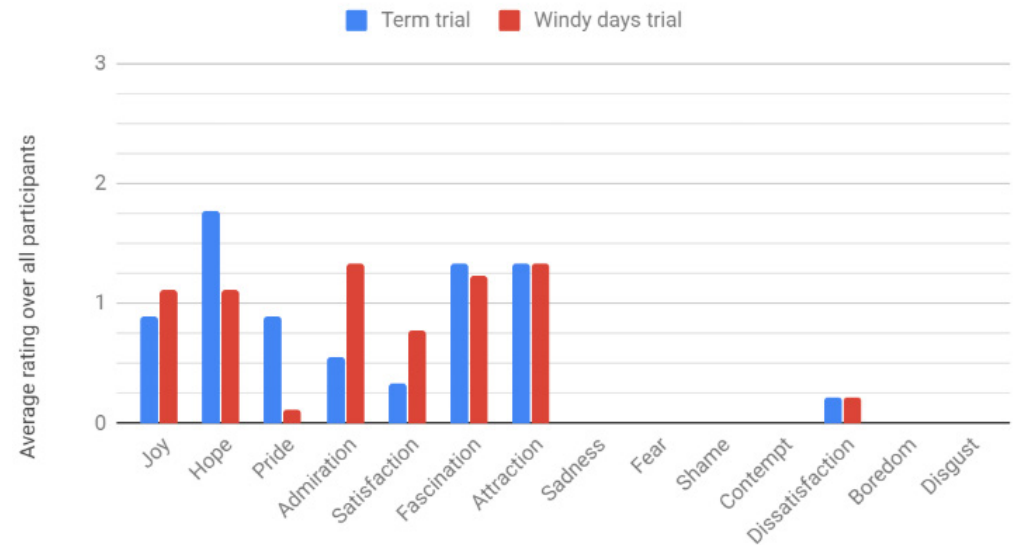


Figure 16: Emotion rating

Emotion frequency

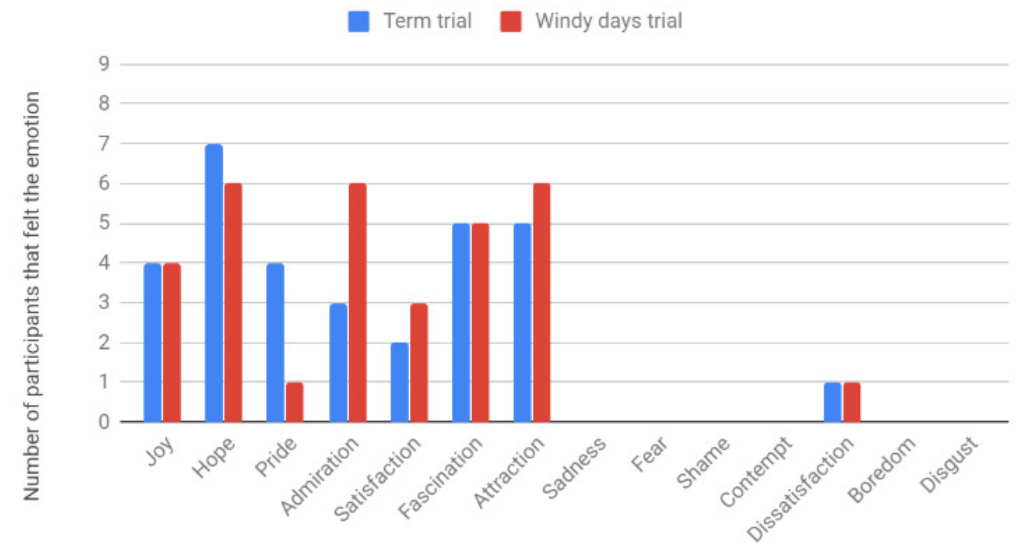


Figure 17: Emotion frequency

## Emotion discussion

In this paragraph, the substantiations that the participants gave along with PrEmo ratings will be discussed. The order of emotions presented in the spider plot will be followed and touched upon shortly. Overall, both concepts were scored on positive emotions only.

### Joy

The concepts scored almost equally on the positive emotion joy. Though, the joy that was felt for both concepts differs. For concept 1 they felt joy for sustainable attributes like: no overproduction, board efficiency, sustainable thinking and the sustainable message. For concept 2 they felt joy for more practical things like: supporting the sport kitesurfing, the feasibility of the concept and the brand being innovative.

*"I always get happy from a company that not only has an economic interest, but also thinks about the importance of the planet." - P6 on concept 1*

*"In the end, it makes me happy if it works as it should work." - P3 on concept 2*

### Hope

As can be seen in the tables, hope was felt quite strongly for the Term trial in comparison with other PrEmo ratings. For both concept this emotion was related mainly to 'the hope that the idea will work out' and that other companies will follow. For concept 1 this was also related to a 'hope for a better future'.

*"I hope it actually works. That other companies also adopt." - P2 on concept 1*

*"I hope that such a trend continues, that everyone thinks for a moment about what we are going to make." - P8 on concept 1*

*"I hope it works out well. And that there are brands that continue there." - P8 on concept 2*

### Pride

The participants only felt pride for concept 2 to some extent. Their substantiations mainly mentioned a pride for 'Appletree being a Dutch

company taking leading steps in innovation'. Which is a nice given for the company, but not an outstanding result. Though, this factor weighs quite heavily: it is also the main reason they felt admiration, which will be discussed next.

*"I think the environment is very important and I think it is great that a Dutch company takes the lead in this. I also think that it is admirable that they do so." - P5 on concept 1*

### Admiration

As mentioned above, the admiration for both concept derives from Appletree being a Dutch company. Both pride and admiration were thus chosen as a way to communicate this for concept 1 and admiration individually for concept 2. This mutual difference in which emotion was used to convey (almost) the same message, is not really remarkable. In addition, these positive emotions are felt for the company, so it doesn't suggest anything that might be felt different for the concept services.

Especially for concept 2 participants shared some extra thoughts about the company that left an impression. They mentioned the company: having guts, keep trying on their own, being the first and focussing on local activity. Concept 1 was admired because the company started out of nothing, and that they still keep chasing sustainable goals.

*"They already make a good product and they are already doing well with the environment, and you are now also considering how you can implement it even further." - P9 on concept 1*

*"Nice that they try to put something together that can transcend the established order if possible." - P2 on concept 2*

*"That it is set up with locals, instead of setting up a whole service center. So that local suppliers might also have an advantage." - P7 on concept 2*

### Satisfaction

Satisfaction wasn't felt that often for any of the concepts. When it was felt it was mainly for the brand Appletree and that the presented services sounded good. Appletree owners felt this more strongly.

*"The entire appletree brand. The idea behind it already gives me a good feeling." - P7 on concept 1*

### **Fascination**

The concepts scored equally on fascination. The fascination for concept 1 was mainly about the mere idea of such a service and the curiosity of how it would look like: it raised questions about sustainability. Concept 2 was considered as very novel. Participants mentioned that they find it fascinating that the company is exploring this direction.

*"I am fascinated, especially for the sustainability goal. A kind of curiosity also arouses: how do you do that? Because it does contain polyester and rubbish, so to speak." - P3 on concept 1*

*"I would like to know more about it. Why durability and all its benefits? Also curious how that system could be designed." - P7 on concept 1*

*"It is something new, so it is fascinating that they go that way." - P5 on concept 2*

### **Attraction**

The emotion attraction was scored equally for both concepts as well. However, concept 1 didn't really have outstanding findings. The attraction was merely due to the company's (beautiful) products and the curiosity for something cool. In contrast, concept 2 provided a certain call to action. Participants got activated as they felt that this concept was more feasible and applicable to their situations.

*"I would like to try such a board!" - P2 on concept 2*

*"That might apply to me." - P5 on concept 2*

### **Dissatisfaction**

The only negative emotion was given by P6 as she felt that there was information missing in both experience videos. She was sceptical about the presented experiences for having a lack of information.

## **Conclusion**

### **R1: How do end-users feel about the two concept experiences?**

Based on the PrEmo ratings and substantiation, there is not a concept that stands out as a clear winner. That was not the intention of this study of course. To get the best out of both concepts, the general (similar) and individual strengths will be set out next. These strengths are thoughts and attributes that conveyed positive emotions effectively.

#### **General strengths**

A strength that came forward in general is the idea that Appletree is an influencer, or trendsetter in innovation. Participants really hoped this direction would start a movement in the surfboard industry. Besides, they reacted really positive, with pride and admiration on the company being Dutch.

#### **Concept 1 strengths**

Thoughts and attributes that evoked strong positive feelings were:

- Efficient use of boards
- Sustainable thinking and message
- A look into a better future
- Growing company that still keeps chasing sustainable goals
- Curiosity of how it would be sustainable

#### **Concept 2 strengths**

Thoughts and attributes that evoked strong positive feelings were:

- Company with guts, trying innovative things
- Focus on local (Dutch) activity
- Support of the sport
- Novel, but feasible idea
- Applicable and activating: call to action

### **R2: What is a proper ratio between sustainability and convenience in conveying the PaaS model experience?**

The findings above imply that nice balance between sustainability and convenience is best to convey the experience to the end-user. The results imply that the assumption that end-users are drawn more positively to a convenient experience than a sustainable one (A1), is unlikely to be true. Both convenience and sustainable service attributes appeal to them.

G2: Discover which trial attributes evoke the desired interaction effectively.

## Concept quality ratings

The participants had to rate both concept walkthroughs, in order to test which trial attributes evoke the desired interaction qualities effectively. This data can be found in appendix H. The pluses and minuses on the scale were converted to a range from -3 to 3.

For the reader's convenience, figure 18 was created to show the average concept rating per interaction quality. Just like the visuals presented in the previous section: the limited sample size only gives an idea of participant opinions. The figure suggests that the Windy days trial is preferred on all interaction qualities. How this came about will be discussed next.

### Average concept rating per quality

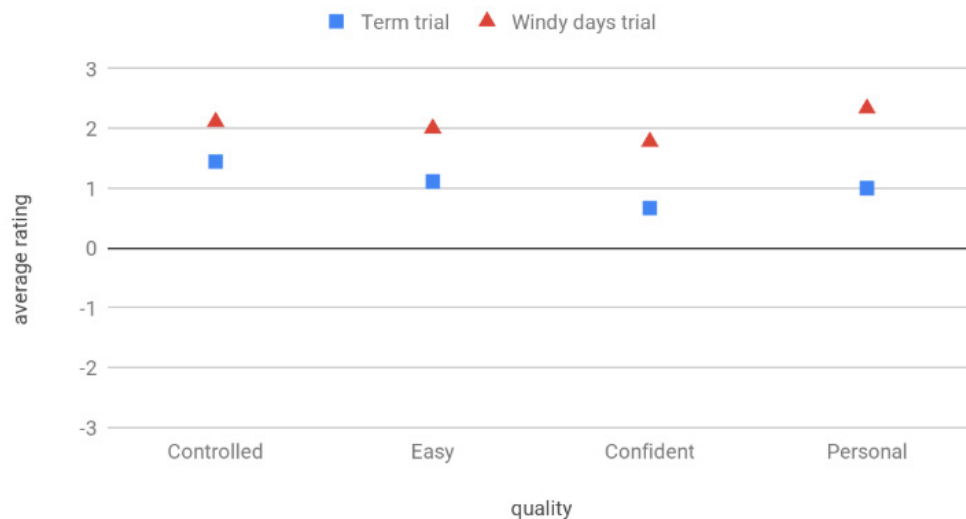


Figure 18: Average concept rating per quality

## Quality discussion

In this part, the substantiations that the participants gave while filling in the interaction quality scales will be discussed. There will be searched for similarities in participant opinions and thoughts for both concepts. Each quality will be touched upon shortly.

### Controlled

#### Term trial

For the Term trial, participants mentioned that they like that they are able to decide themselves what to do. This refers to being able to consult comparisons and recommendations, fill in things on their own and switch boards if they want. In general, these attributes are quite similar in the two concepts.

*"Normally it is out of the blind when you buy a board: you have no idea at all. They mention some technical terms how it is made, and you judge a bit what you hear from your friends and what you see in the magazines or on the site. For the rest, you are just blind in your purchase. Now you gain control over your purchase." - P0*

*"Personal? Yes, of course, you can make comparisons through a website and recommendations before you make a choice." - P5*

There were some mixed opinions about the 2 week term, whether it provided control or not. On one hand, the 2 week term provides you with the flexibility to determine when and how often you want to try. On the other hand, if the wind disappears during the term, you are dependent on windy days (if these occur).

*"I think you have a lot of control over the process, because you can determine how often you try something and you always have plenty of time for it." - P7*

*"If you are going to start next week and there is no wind you will be disappointed." - P6*

### Windy days trial

The mentioned opinions and thoughts about the Windy days trial suggest more control over the whole process than the Term trial has. The participants felt they had more control over: what they actually wanted, the choices they had to make, where they could test and the use of test material.

*"More control over the process. You can go to a center nearby to swap boards. You can make your own choice faster and better, so more grip, more control over the process." - P0*

*"Maximum control over what you want. You can try 1 or more boards and compare them with each other. That's the control you have over the material." - P4*

*"The control is one hundred percent, because I can say for example: I see that a southwest wind will blow on Saturday; I pick up 2 boards or 1 board, and I'm going to see how they work in those conditions." - P5*

## **Easy**

### Term trial

The interactions in this concept are considered as fairly easy. The process is clear. The option to let the company ship a board is received as a nice incidental convenience for most of the participants. No explicit examples were mentioned further.

*"It's super easy: everything can be sent, you can pick it up, you can have contact." - P5*

### Windy days trial

The participants had a higher sense of ease for the windy days trial. This had mainly to do with being able to test more boards more rapidly, and testing multiple boards on one day. The proposed credit system was considered as an easy addition as well.

*"If I can pick up 2 boards and I can reserve them today or during the week, that makes it very easy for me." - P5*

*"Try another board more easily. I think those credits are a nice system." - P8*

The question arose how many and especially how far the venues would be on average. If this range is a short drive to a city along the coast, it shouldn't be a problem.

*"Where are those venues? It depends on where those will be." - P5*

*"Kiters are a bunch of lazy people, I wonder if they take the trouble to go somewhere. If it's close, it's not a problem, but it depends on that." - P4*

## **Confident**

### Term trial

The majority of the interactions in the Term trial resulted in a confident feeling about the concept. Though, these feelings mainly arose from the attributes that the Windy days trial has as well: being in control over the process, being able to consult the company.

*"You build your own opinion, you are well supervised, you can actually ask anything you want. So that gives a confident feeling, yes." - P3*

Some attributes were considered as unconfident: delivery or pick-up, choosing the wrong board, and the fact that a 2 week term is not certain to have windy days.

*"I find receiving or picking up more complicated. That makes me uncertain." - P6*

### Windy days trial

The Windy days trial was overall received as more confident. The participants had the feeling they could make a more confident choice, as they are able to test more boards in a shorter amount of time and even in the same session. Besides, this concept has way more wind certainty for them.

*"I think you make a more confident choice than with concept 1." - P0*

*"It is nice to be able to test a few boards in a session during constant wind." - P6*

## Personal

### Term trial

For this quality, the concepts had the most distinguishable difference. Both were considered as personal in general, mainly because the end-user will be supported by recommendations and advice. Though, the Term trial was considered as less personal in comparison. This was mainly due to the Windy days trial having an extra contact point with its venues.

*"Yes it is personal. Of course you fill in everything yourself, but you can still send evaluations for advice. So I think it's pretty personal." - P3*

*"I find it a lot less personal, you are doing much more on your own." - P6*

*"Much less personal, because you don't really have contact with anyone. Has a less personal aspect. It would be nice for me to go through 'what style and what level' together with someone in the initial phase." - P7*

### Windy days trial

The Windy days trial was in comparison with the Term trial considered as way more personal. This resulted out of the attribute of having 'real-life' personal contact at a venue. Picking up a board at a venue felt more personal, as the participants would like to have conversations there about boards with someone that knows something about it as well.

*"I think it's super personal, because you can personally experience what something is like when you order it somewhere online. You will also receive feedback on your evaluations. That is very positive." - P6*

*"More personal, because you can go to such a venue and have more personal contact." - P7*

## Conclusion

### **R3: Which trial attributes evoke the desired interaction qualities effectively?**

From the ratings and discussion above, the conclusion can be drawn that in general the Windy days trial concept has more attributes that evoke the desired interaction qualities more effectively. Next, the findings from the discussion will be summarised, to indicate what attributes should be used for further development.

### **Controlled**

Participants liked that they are able to make decisions on their own, while consulting the comparison and evaluation tool recommendations. The flexibility of planning when, where and what to test, gave the participants a higher sense of control. They can then try what they want and choose more effectively.

### **Easy**

The process was very clear for both concepts. The participants thought the process was really easy when they would be able to reserve and test multiple boards more rapidly. How far a venue will be is a serious factor that has to be taken into account: the closer, the easier. The option to let the company ship a board was seen as a nice convenience. The credit system was considered as a clear and logical way to facilitate the trial payment.

### **Confident**

Confidence came forward out of individual control over the whole process. When uncertain, end-users are still able to consult the company before the end of the trial. Being able to test boards in a short amount of time, or even the same day, gave the participants a high sense of confidence. They would be able to form better opinions in this way, by testing boards in the same conditions. Besides, they would be more certain of wind during the trial.

### **Personal**

Both concepts were considered as personal, despite that they consisted of digital tools as a replacement for direct contact. Although, the participants like to have direct personal contact at some point during the trial. This doesn't have to be an Appletree representative, it can also be someone that has knowledge about boards and board characteristics in general.

### G3: Identify underlying values end-users have considering a trial service.

The results of the laddering technique are used to form a means-end chain. The means-end chain provides information about the specific linkages between product characteristics (attributes) and consumers' value orientations (Van Kleef et al., 2005). Preferred service attributes in this case lead to benefits, and benefits to values: a higher level of abstraction.

## Differences and preferences

### R4: Which key concept differences do end-users identify?

#### Concept differences

The major differences found by the participants (Term trial versus Windy days trial):

1. Period of 2 weeks versus a direct response to windy days
2. Trying one board each time versus trying multiple boards more rapidly
3. Paying for trial and lease together versus using a credit system with single reservations
4. Board shipment or going to the head office versus always having to pick it up at a venue
5. No forced personal contact versus personal contact at venue
6. Trial and lease as a package versus individual services

### R5: Which concept attributes do end-users prefer and why?

#### Preferred attributes

The attributes that were preferred considering these differences will be presented next, and why so. Per difference these were the following attributes:

1. A more direct response to windy conditions. You are more certain there will be wind on the day(s) you will be testing. More control in planning when to test.
2. Trying multiple boards rapidly. Compare a broader range of boards in less time or at once. An experience and feeling of boards more directly after each other. Being flexible to make a confident decision in a shorter amount of time.

3. A credit system with single reservations. More in control of how much you want to test and therefore how much you will spend on the trial.
4. Picking up boards at a local venue. Being able to do this, the threshold is lower for end-users. Going to a venue is more accessible, as more people would theoretically have a choice to drive to service nearby (instead of HQ), for it would be closer to home.
5. Personal contact at a venue. Real life contact is important and more human knowledge can be gathered. Sharing experiences can help with this.
6. Individual services should always be the case. You don't want to be forced to lease: it should be accessible and easy to get rid of.

Participant quotes stating the difference and preference per point:

*"Concept 2 is more convenient because with a trial period of 2 weeks the question is whether there will be wind. If you can go to the venue to pick up a board when the wind blows, it is much more convenient. Then I decide for myself whether there is enough wind to test a board." - P0 on 1*

*"I see the one where you can try more boards as more flexible than the other one where you first have the board you are going to lease for 2 weeks." - P9 on 2*

*"This gives me a better feeling, more in control: I decide when I will test a board. I have control over the number of credits." - P0 on 3*

*"With the Term trial you have to be close to HQ. The Windy days trial is easier to access because it is your own chosen place where you can pick up those boards." - P3 on 4*

*"You can still consult a little, personal contact. There are often people in those venues who also know what they are talking about." - P3 on 5*

*"Apart from each other, must always be the option. Because it may also be that I test two boards but I don't like it. You should not be forced to lease." - P5 on 6*

## Benefits and values

R6: What kind of values do end-user link to trial service attributes?

### Benefits

From the attributes above, the following benefits were derived:

1. A more direct response to kitesurf conditions is convenient, and gives control over when to test (functional).
2. Trying multiple boards realises a certain flexibility in comparing boards (functional), this would lead to more confident decision making (psycho-social).
3. A credit system with single reservations gives control over test opportunities and expenses (functional).
4. Going to a venue is a low threshold way to acquire a board and more accessible, as it is closer to home theoretically (functional).
5. Having personal contact at a venue enables to share knowledge and experiences, in a social direct way (functional).
6. Individual services are more accessible (functional) and easier to get rid of, which would bring relief (psycho-social).

### Values

From the benefits above, the following end-user values were derived:

- A comfortable life: convenience and control (terminal).
- Independent: try whatever I want, make my own choices (instrumental).
- Being confident: consult with others and make a confident decision (instrumental).
- In control: to be in control of the situation, to avoid big efforts and ties, to not be forced (instrumental).

These end-user values will be taken into account while adjusting the trial design into one final concept.

**G4: Understand why end-users prefer certain trial service attributes, to test the validity of assumptions that were made.**

In this part, the assumptions A2, A3 and A4 will be checked if they are true. This will be done to answer R7:

**R7: Are end-user thoughts and opinions in line with prior assumptions?**

Each assumption will be touched upon. Hereafter, further insight that were gained during the open discussion will follow.

## Testing assumptions

### Assumption 2

*The end-users prefer trial and lease as separate services, rather than combined.*

The impression that the participants left behind was that they would rather see the services offered separately. The combination of trial and lease felt like an obligation that is only interesting for the company.

*"If you can split them up, it seems better to me. If I test someone's board here at my club, I don't need the trial. Always nice if you can build a package yourself." - P1*

*"Rather loose services: this gives you freedom. Then, you are not really committed to anything. I think that is also fundamental. Otherwise it is just like marrying someone and getting handcuffed. Wait a minute: we are together but there must also be respect for each other. I find that much more tempting." - P2*

In addition, they indicated that it should not be a rental service. To prevent this, someone who only chooses to do a trial should pay more for this. The overall trial costs must therefore depend on whether someone leases or not.

*"You have to let it depend on whether the user is actually going to lease. If he ends up leasing something, then he may have the trial as a bonus. If he only tests, returns and says 'no, I will buy another brand', that is fine but than he has to pay. Then you pay it as a kind of rent." - P8*

### Assumption 3

*The end-users perceive more leeway and flexibility in the structure of the Term trial than in the Windy days trial.*

Both concepts are seen as equally flexible. However, the tools that have both concepts to plan, compare and evaluate must be put together well.

*"For both the same: one is local, within the other it will be shipped. The one could be two days, the other two weeks. The difference therefore lies more in the time span. For the rest, you can try all the boards within both concepts." - P1*

*"I think I am flexible with both. You have to see it this way: right now this is not there yet. Like i said before, I had never surfed on the Appelflap (board model): I bought a board that I did not know. This trial gives me the opportunity to make a difference." - P5*

### Assumption 4

*The end-users prefer the Term trial for trying one specific board and the Windy days trial for trying multiple boards.*

If the participants would have doubts about 1 board, they would probably opt for the Term trial sooner. This concept is seen as a confirmation when a specific board is already the obvious one to go for. The Windy days trial is seen as a much more practical and realistic solution when there are doubts between multiple boards. Especially since this concept offers the opportunity to test them side by side in a short amount of time.

*"One board: than you have already made your choice. Then I would go for concept 1. I would have it delivered then and would just enjoy testing that thing. I would already know." - P0*

*"You really feel the difference between a small or a large board when you start surfing them one after another. If there are two weeks in between, it is very difficult to find out what those conditions were, and how the board felt then. By being able to change in one day, I think you can make a decision faster." - P3*

Many participants imagined reserving several boards (2 or 3), to test them extensively on one day in the same conditions. For example: half an hour on one, half an hour on the other, et cetera. Most of the participants preferred

the Windy days trial concept for this reason.

*"You could even take two boards. Then you actually have exactly what you want: to have boards on the beach and grab them. It will cost some credits, but you will be able to make a choice quickly." - P3*

## Further insights

### Trial and lease in general

The mere idea of a board trial and a lease construction was well received. When the concepts were presented to participant P0 for example, he confirmed precisely the underlying idea and functioning of a trial being a support in decision making:

*"If the Windy days trial was here, I would start tomorrow because I want to test them. I notice that the guys who already have an Appletree board also have this tendency: I would like to try another, did I make the right choice? The cognitive dissonance after you have bought something: you think you made a good purchase and afterwards you think 'well maybe I should have chosen something else'." - P0*

Another feature of the lease construction that a few participants responded to positively, is the fact that kitesurfing is an really expensive sport and in this way you do not have to pay a large amount for a board in one go. A major financial benefit that comes from the trial is the prevention of a bad purchase. Participant P5 tells this in a short anecdote:

*"I bought a board, but I think I surfed on it for half a season. I don't think it's the board I want, but I have paid 800 euros for it. I won't have that situation with concept 2. Maybe I have to pay some money in the beginning, but I can form an opinion for that money." - P5*

This participant also said that it had never been successful for him to visit a test-event. This gave away that he actually always makes a blind choice. The alternative way to borrow boards from buddies was mentioned, but was considered as a limited option.

Ultimately, participants embraced the opportunity to try out boards. Especially when they are not sure what they want or what suits them.

## Options

Many participants would like it if, in addition to leasing, there is still an option to buy. This goes hand in hand with the insights gathered from the MUD Jeans company case (paragraph 3.1): that company also offers this option.

*"What I find interesting is that you get the choice to lease or buy. I can imagine that if you only offer leasing that some people say: 'Leasing? I want to own a board!'. Buying is still there: something for everyone." - P0*

One of the participants (P3) indicated that leasing would give him the impression that he still has his own board. According to him, this would result in more careful use. You know for sure that when something happens this is your fault, since you won't share the product.

### Buy a lease option

Something that was mentioned often with regard to the lease construction is having the ability to buy a lease board after a while. The scenario that comes with this is that a board works very well for a user and that buying it would be cheaper in the long run. This could be applied with the condition that the user will eventually return it to Appletree, so it doesn't leave the system. This could be done with the gentleman's agreement mentioned earlier in this report, or a kind of deposit which was a participant suggestion. Another thing that was mentioned that somewhat corresponds to this subject is a small additional payment to exchange a board during a lease.

### Beginning and uncertain wave kites

As an experienced wave kiter you know roughly what you are looking for and you can substantiate things by trying out. However, when you start with wave kiting (first board) or don't know what you want, a trial should offer great support in choosing a board. Participants with several years of experience also said that these people actually have no clue what differences there are. They should try out several shapes and sizes first.

*"I think this is a very logical step, because while I was looking for a board I thought: what suits me?" - P6*

*"The people making the transition to wave kiting, have to test 4 boards: they have no idea. People who have more experience with boards know what their preference is". - P8*

## Credits

Although participants were quite skeptical about using a credit system, they generally changed their opinion when they saw the bigger picture. Where they previously thought it was a waste of money, they later realized that these expenses would be paid back if they opted for lease. That said, they didn't think it is reasonable that purchased credits don't give a discount on subsequent buying.

*"I want to be able to pick up a board easily, I want to compare boards, I want to be able to form my opinion. I want to pay for that, sure. And if I have made a choice then it is not wasted money, because those credits are still a discount on a possible lease." - P5*

A participant suggestion was that you can hand out credits to those who share their experiences with Appletree. According to him, it is not at all self-evident that people just share their experiences for free.

## Other tips

In addition to many insights, participants also gave some tips. Most have already been processed above, but two have been left out. The first is the recommendation to continue to think about what happens when there is suddenly no wind. This can put users in unpleasant situations. The second tip is that boards at their end-of-life can be upcycled as decorations, side tables and wall hangers.

# 5.5 Study evaluation

## Usefulness

The interesting findings from the PrEmo analysis and discussion, are identifications of desired experience attributes. This will be the input of a new storytelling narrative. Findings from the Interaction quality scales and discussion, are considered as the most useful results. It will be the structural foundation of a modified trial and PaaS system with improved interactions. End-user values that were identified by laddering, will be taken into account while adjusting the overall design. The assumptions that were tested and other insights that came about, are mainly structural additions to the design.

## Limitations

### Participants

The wave kilters that had the time to participate in this test, were a bit older on average than intended. This was due to the limited time available to search for participants, and the fact that it was during summer holidays. On the other hand, they were all true potential customers for Appletree.

### Experience videos

Participants often responded to things that were not intended as stimuli. For instance, they reacted on the quality of the 'teasers' and worshipped the Appletree products. In addition, they responded strongly that it was not made clear exactly what the services entailed. Focussing on individual concept differences would have been better. This would probably have resulted in a more clear comparison: putting things next to each other and giving an opinion based on that. Preferably for both concepts at the same time.

In addition, the videos were narrated in English. All participants mastered this language, but it could still have caused misinterpretations.

### PrEmo and Interaction quality sheets

Sometimes a participant needed extra explanation about the emotions of the PrEmo sheet and the qualities of the Interaction quality scales. The words were a bit vague for them. This made it difficult for all participants to get to the same level of interpretation.

### Interviewing

Similar to the user research that was done earlier in this project, the quality of the user test depended on the author's modest skills in interviewing. The results are mainly qualitative. Some quantitative information was gathered during this research as well, but it does not reflect the reality because of the limited sample size.



# 6. FINAL DESIGN PROPOSAL

The aim of the project is not to design a perfect system: it is intended to serve as an exploration to show Appletree what this direction could mean for them. The user test gave insights about what concept attributes worked and what attributes didn't. This chapter will present the iteration of the overall design, resulting in a final concept that fits better with the end-user and context. At the end, recommendations will be given for further development.

# 6.1 Adjustments

**The purpose of the user test was to enrich the idea and make improvements. The overall aim in a nutshell was to: form a great experience, evoke desired interactions, identify end-user values and understand end-user preferences (the research goals). The design efforts that were put into the two concepts will be evaluated and adjusted where needed.**

## 6.1.1 Experience to convey

The experience that the concept has to convey is a balanced combination of sustainability and convenience, as both subjects appealed to the end-users. A new storytelling narrative is created to convey this experience to the end-user. The strengths that evoked positive emotions effectively and fundamental storytelling ingredients that were set earlier, will be used for this. The narrative below came about. This narrative will be used to convey a positive experience to wave kitesurfers they can identify with, while using the design.

### New experience narrative

*Appletree Surfboards is always innovating and exploring new ways to push boundaries. That has brought the founding brothers of the company, Wieger and Jorrit Buurma, from a shed in an apple orchard, to developing the high-performance boards Appletree is known for today. As a Dutch company, we always focussed on making these durable products for our beloved North Sea. Now, the company wants to take sustainability to a higher level, with a unique lease service that will reduce the environmental impact: yours and ours. To achieve this as supplier and customer, we both will be making more efficient use of boards. This means: reusing boards, keeping them in shape and extending their lives. With this service we want to start a trend in the surfboard industry, and inspire people and society positively. Before you join in, we insist you try our boards at a venue nearby, so you will find the perfect board to lease. After that, you will never experience downtime, so you can boost your kitesurfing to its best. Find the perfect board, decrease the impact on our planet and never stop kitesurfing while riding the best, with Appletree.*

## 6.1.2 Trial attributes

To improve interactions from a user's perspective, the results from the Interaction quality scales and the subsequent discussion will be leading. The 8 end-user activities that were identified earlier in paragraph 4.5.2 are now used to gather favored attributes (and touchpoints) for a new, modified structural PaaS model concept. These activities are merged into 4 activities and modified to the new situation. The steps are visualised in a revised wireframe, which can be seen on the next page. This visual can be followed while reading this section.

### **1. Investigate boards and get recommendations by the company**

As Appletree has the desire to let potential customers make more autonomous decisions, the use of a digital means to compare boards and to get board recommendations will be implemented. Users will be able to make easy online comparisons at the Appletree website. In addition, they will be able to make real life comparisons at venues, for many like to assess and talk over the tangible boards. Personal contact at the head office is hereby avoided.

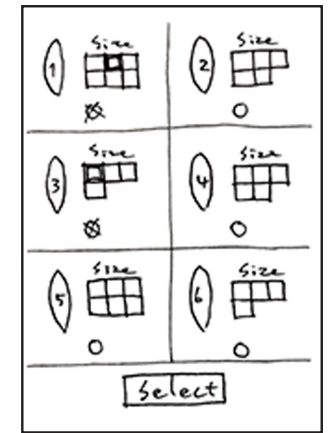
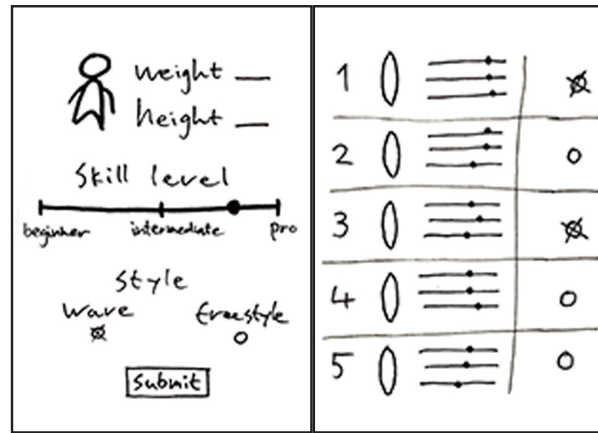
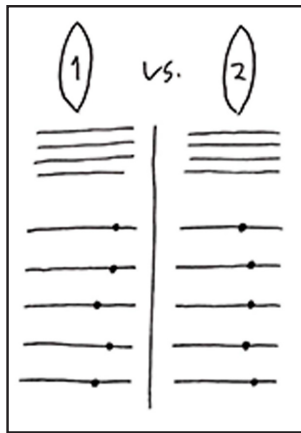
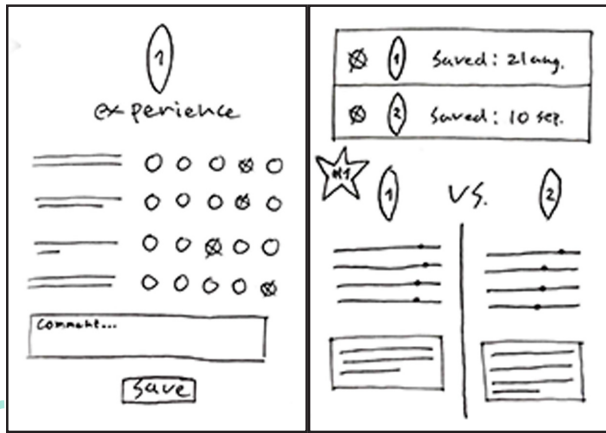
To get personal recommendations after registration, the users will be able to fill in their physical properties and preferences, resulting in a board-match. This feature will be the biggest help to starting and doubting wave kitesurfers who don't know exactly what they want yet.

### **2. Arrange a moment for testing and select boards**

The reservation process was considered a convenient way to make testing possible for everyone. Users will be able to decide for themselves when, where and what to test: something that was first determined by the company. This shift in control was noticeable for the participants in the study and was well received. A smart agenda will have to ensure that all of this can actually be determined by the user.

### When

Wind certainty is a very important factor, which when taken into account brings a much greater certainty. Being able to make a trial reservation on a short-term basis is therefore favored. Besides, the trial process is intended to be last a day or a few days, not weeks. The users will be able to test a few boards on the same day(s), in the same conditions, as this is highly preferred.



Website  
Comparison tool  
Board display at venue

Registration

Matching tool

Select board(s)

Reserve moment(s) with credits

Recieve at venue

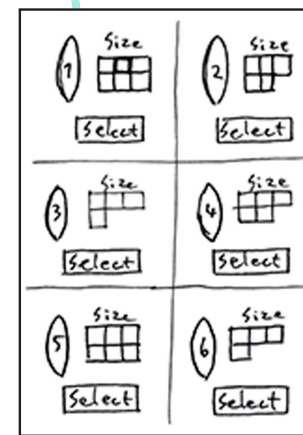
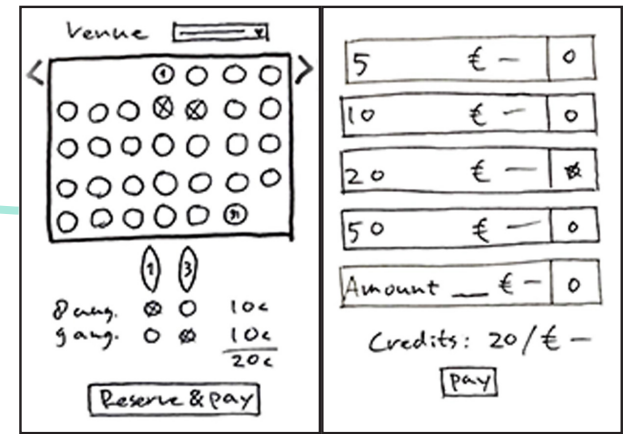
Try board(s)

Return at venue

Evaluation tool

Choose board

Evaluation report



### Where

Local venues make the trial a more low threshold activity, for user won't have to drive for hours. A few venues at Dutch coastal towns will be the points to get to for the trial service. The venues will hold a stock of test-boards that can be reserved for trial.

### What

One or multiple boards can be reserved for one or multiple days. A reservation will cost the user credits, of which the amount depends on how many boards and how many days. While picking out a suitable moment for the trial, the user will be able to pay for these credits. After this, these credits can be used to finalise the reservation.

### **3. Test board model(s) and evaluate experience(s)**

For the board receipt, the user will have to go to the selected venue to pick up the reserved board(s). The venue will have access to an agenda with reservations at that specific location. The user will take the board(s) for testing, and is free to go where is desired during the reservation. After the reserved time is over, the board(s) will have to be returned to the same venue, to keep the stock complete. Extra credits can be bought and new reservations can be made. When the user is done testing, he is able to evaluate his experiences to identify which board meets the expectations the most. A number of criteria will be rated, using the evaluation tool.

### **4. Get advice and make the right decision**

The overall aim is that every trial user is able to make a confident decision on what to lease (or buy). As discussed before, the user that still doubts about what choice to make, is able to send an evaluation report to the company. Appletree will give feedback on this structural evaluation, to form a last personal advice. This evaluation report could be interesting input for Appletree's knowledge, as it tells something about how people experience their boards. The company could consider to compensate users that send this report with an extra reduction. When a winner is identified, the user will be given the option to lease or buy. The invested credits will give a discount on both options, as a trial stimulates a better choice.

## 6.1.3 PaaS attributes

### **Overall model construction**

#### **Separate services**

Trial and lease are offered as separate services. This is done to make users feel more independent: something which they value. After all, they might not even want to lease after trial, or do a trial before lease. The option to buy a board still exists parallel to this, as an immediate transition to a model without selling boards would be a radical implementation for the company.

#### **Venues and logistics**

Just like the PSS case of Awayco in paragraph 3.1, Appletree will need to build partnerships with local venues that keep their boards for trial. These local venues were preferred by the intended end-users. Venues make the trial experience more personal and accessible.

The local venues serve as depots for the trial service, but are also great pick-up points for customer orders. For example: when (damaged) trial boards need to be exchanged, orders can be delivered there in the same drive. In this way, logistic movements only have to be made from the logistic center to venues and back. That logistic center is the place where damaged board will be repaired and new boards will be received from the factory in Portugal.

Currently, the only pick-up point is the Appletree head office. Using these local venues as pick-up points would theoretically reduce or at least shorten logistic movements of Appletree and customers.

### **Options and take-back**

Offering several options for the user to acquire a board, serves a variety of customer demands. The PSS case of MUD Jeans in paragraph 3.1 inspired to implement this. When testing the trial concepts, participants reacted positively on the fact that in addition to leasing, a board could also be purchased. However, these different options require take-back facilitated in different ways as well. Next, all the different options to acquire a board will be touched upon, as well as their take-back solutions. This is visualised as well.

### Standard board (lease)

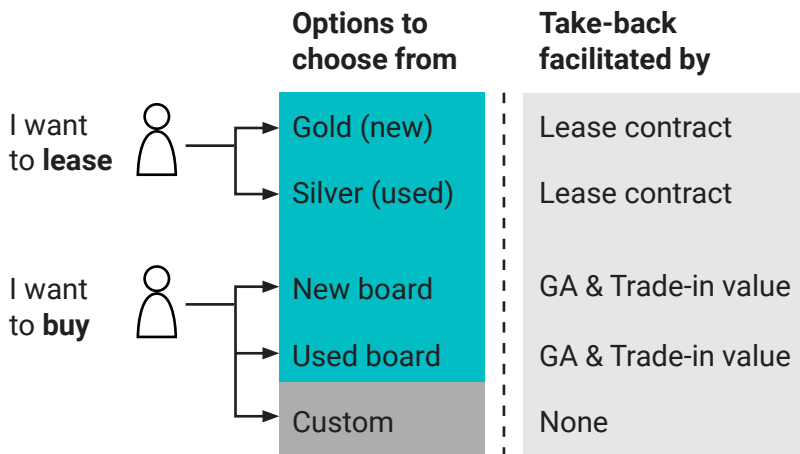
Either a new (gold-level) or used (silver-level) board subscription. A lease contract for 1 or 2 years will apply to this. Users will have to return the board when the lease term is over. These boards will be used as input for the 'used board stock'. Only lease users will have the service that arranges a substitute when reparation is needed. New users that have invested in a trial will receive a discount for the credits they invested.

### Standard board (buy)

These boards can be reused in the circularity of the PaaS system, just like the lease boards do. A gentleman's agreement (GA) will serve as a stimulance for customers to return these boards. They will be given the opportunity to sign this agreement, which states they will return the board after use. All standard boards that are purchased can be returned for a trade-in value. The state (value) of the board at the moment of returnal will decide the amount.

### Custom board (buy)

Custom boards can't enter the PaaS model, for this would mean users could get something that isn't standard and doesn't meet their expectations. These will be sold separately from the PaaS activities.



## Revised model construction

A revised version of the model construction (figure 19) was created to visualise the adjusted design. The current ways of selling boards still exist parallel to the PaaS activities. Besides, the revised model still has three entry moments:

- Trial, followed by either buying or leasing
- Buy a board
- Lease a board

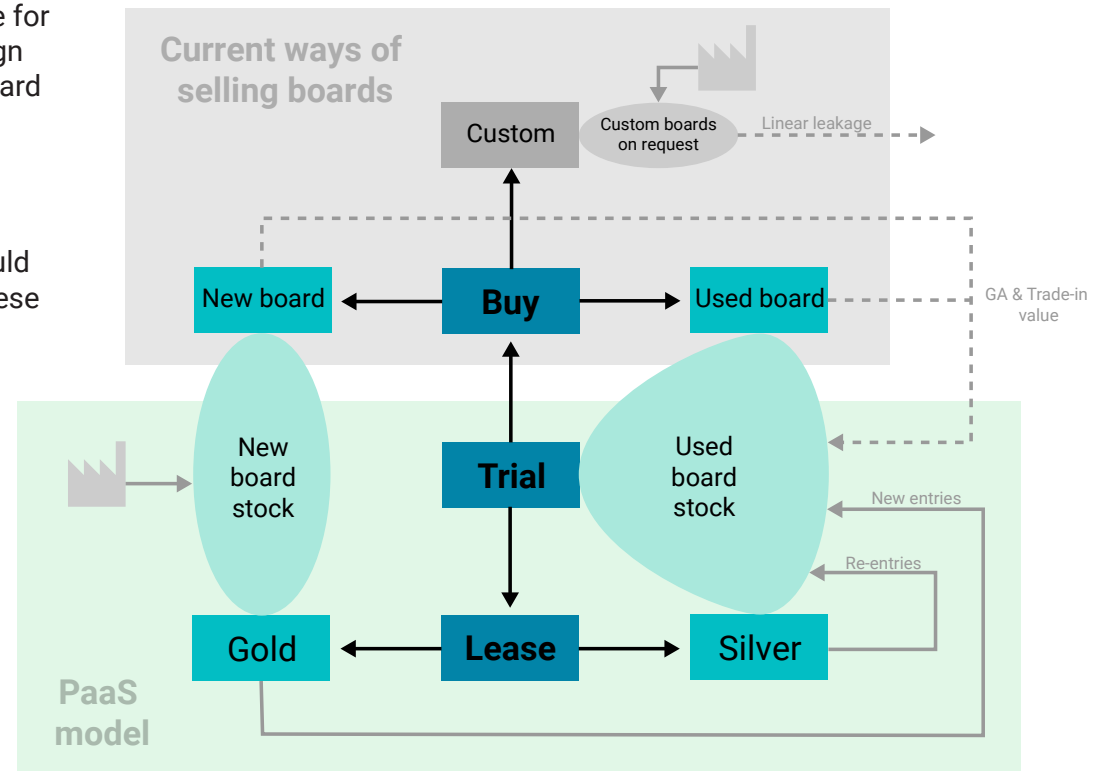


Figure 19: Revised model construction

## 6.2 Additional elaborations

**This paragraph came into existence because there were two ideas on the shelf that deserved an elaboration. This concerns the much-discussed gentleman's agreement and the development of a second behavior goal.**

### Gentleman's agreement

A lease contract will carry out the return of leased boards: this was considered as logic and understandable. For buyers something else would be more applicable. The gentleman's agreement will serve as a stimulance for board buyers to return their purchased board after they are done with it. Besides, they can get a trade-in value for this. The latter will (just as the rest) depend on the sustainable intentions of the user. The return agreement of the PSS case of MUD Jeans (paragraph 3.1) was used as inspiration.

### Agreement breakdown

MUD Jeans gives a small folder with their jeans. In this folder they tell about their sustainable values and story. Attached to this folder is a small return agreement (image 12). On the back of this agreement are the details to send it back to MUD Jeans directly, without any costs by standard mail. Handing out a folder with a simple return agreement like this, is a low threshold means to let buyers sign and send it back. The agreement you sign for is:

*"Right now, another never-ending denim journey has started. These jeans are yours, at least for now. Your adventures shape the character of our jeans. We'd like to have them back in the future, so we can give them a second and possibly even third life. Do you promise to never throw away these jeans as rubbish?"*

MUD Jeans collects the agreements and will process them. After a year they will remind you about this agreement. Although the company uses this agreement for their lease customers, it is proven to be a stimulance for people to actively participate in the return process. Therefore, it is a inspiration for this project to stimulate returns of buyers.

### Main takeaways

The most important aspects of this agreement are: a coherent story customers can relate to and an activating agreement stating the sustainable benefits of returning the product. Both aspects are being used to get in the mind of the users for them to take action after use. The storytelling narrative will be used as a source to give form to these aspects for the gentleman's agreement.

Another aspect is that the agreement is sent to the company, so that the company knows that it can hold the user to this agreement. The buyer will keep this agreement mentally, something which could be activated simply by sending a (yearly) reminder per email.

### Proposal

At the end phase of the purchase on the Appletree website it is made clear that a trade-in value applies. The gentleman's agreement will be presented here as a reason why, and as an activating means to provoke the eventual return. The agreement proposal is as follows:

*We at Appletree Surfboards understand you choose to have a board of your own. Although, we would really like to have the board back in the future, if it ends up being unused or damaged. Only then we are able to make sure it will be reused efficiently or disposed responsibly. Hopefully the board is still in a good shape when you return it, then we will find it a new friend; maybe even multiple times. By signing this agreement you promise to return your board. Then we promise this action will lead to sustainable gains.*

The buyer should be able to sign this gentleman's agreement with only a name and email address. By giving an email address, the buyer will subscribe to receive (a newsletter with) reminders of: the agreement and the trade-in value. The possibilities to share this sustainable agreement via social media could be a great way for the buyer to vent his excitement and spread the word.

## THIS IS YOUR RETURN AGREEMENT

SIGN AND SEND BACK

Right now, another never-ending denim journey has started.

These jeans are yours, at least for now. Your adventures shape the character of our jeans. We'd like to have them back in the future, so we can give them a second and possibly even third life.

Do you promise to never throw away these jeans as rubbish?

FIRST NAME: Mathijs  
LAST NAME: Terranea  
EMAIL: mathijs.terranea@gmail.com

SIGNATURE:  NEWSLETTER: YES/~~NO~~ subscribed!

After 1 year we will check on you and the jeans. Perhaps the Repair Service can help them out with a stitch, or maybe they are in need of a friend. In case the jeans are just chilling in your wardrobe, not being of any use, we'd like to give them a new destination.

Image 12: MUD Jeans return agreement

## Reward system

While looking into ways to provoke a desired behaviour, a second behaviour goal was created that could potentially enhance sustainability. This goal is focussed on ensuring users will care for the assets during use, and was stated as follows:

**B2:** To prevent reckless use of wave kites, while they are using trial and lease boards.

As the designed outcome was not applicable at the time in trial-development, it was put aside to serve as a proposal for the whole PaaS design later on. In this section, this proposal (a reward system) will be elaborated. First, dystopian use scenarios are imagined to identify where reckless use might occur. Then, the current efforts to tackle reckless behaviour are reviewed, followed by the idea to reward desired behaviour.

### Dystopian use

To indicate where reckless use might occur theoretically, dystopian use scenarios are imagined. Reckless use is unsustainable behaviour, as it provokes damages and quicker wear and tear of the assets. Product value is lost, due to this behaviour.

### Breaking a board

The worst case scenario within a sustainable perspective is that the user breaks (snaps) the board. Reparation of this won't bring the board back to its previous state for a full hundred percent. Luckily it doesn't happen very often, for Appletree boards are really strong.

### Surfing with a damaged board

When a user keeps kitesurfing with a board that is damaged, the damage can get much worse. A user might think it is nothing, or hesitate to bring it in when there are good conditions.

### Losing a board

Another worst case scenario is that the user loses the board, or the board gets stolen. The PaaS system then loses the value of the asset completely, and a new board has to be manufactured to replace it.

### Current efforts

Some earlier implemented efforts to punish reckless behavior are the proposed deductible and damage fees. When or board is damaged or lost, the user has to pay for the consequences. A naturally reckless user might want to pay for an insurance to prevent paying a lot in the end. Another effort that has to be taken into consideration, is to provide clear information about undesired behavior and the unsustainable consequences. Why handing in the damaged board as soon as possible is 'the right thing to do' for example.

### Rewarding desired behaviour

To stimulate ideas to provoke sustainable behaviour, the nine dimensions of behaviour change by Daae and Boks (2014) were used as inspiration. These dimensions feature variations of how to affect sustainable behaviour with design. The dimension 'encouragement' proved to be an great inspiration, with its underlying question: should the desired behaviour be promoted or the undesired discouraged?

Promoting a desired behaviour was chosen for, with 'rewarding the user' as a deeper focus. This means that users who use the board properly and do not cause damages will get rewarded for that behaviour. The direction lead to the ideation of a point system that keeps track of the cumulative days of use without damaging the board. Doing well in this reward system as well behaved user, will result in receiving goodies and reductions.

For example: after half a year without damages the user receives a Appletree shirt and after a whole year a reduction on the next year of lease (e.g. one month off). Something like a reduction could promote further leasing as well. How this might look like is visualised in figure 20. When damage or loss occurs, points (days) will be distracted as a penalty according to the weight of the problem. To prevent cheating, the user must provide proof that the board is still in good condition, for example by sending in some photos.

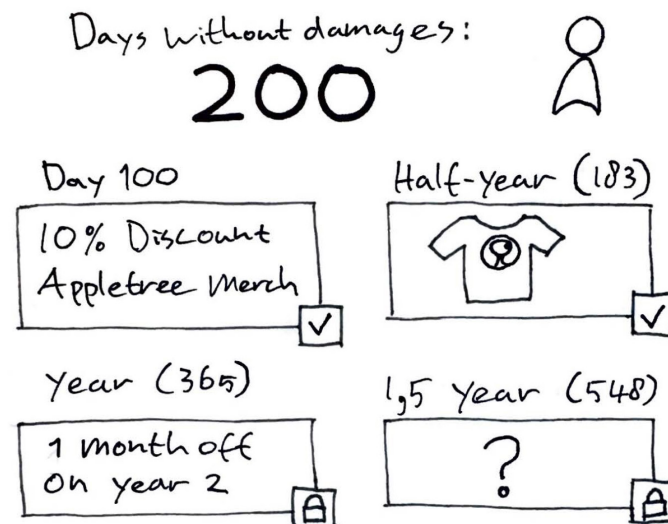


Figure 20: Point system with rewards

## 6.3 Recommendations

**This section will discuss subjects that have not been worked out or touched upon. Recommendations and suggestions will be given for further development and implementation.**

### 6.3.1 Disregarded matters

This project has a certain scope, which means that some facets couldn't be treated due to time and relevance. While doing research and developing ideas and concepts, a number of matters were encountered that are not touched upon fully yet. This section covers these matters, mainly because they are worth mentioning. Besides, future points of attention (FPA) are given for further development.

#### **Pricing**

The pricing of the trial and lease service is not covered in this report. This is something that has to be calculated when the design is developed further. Besides, from a user's perspective questions arose about how much customers are willing to pay. That is the trade-off that must be made: cover the costs, but remain attractive.

*FPA: What do the trial and lease service cost?*

*FPA: What price are end-users willing to pay?*

#### **Deductible, fees and insurance**

A deductible will be used to discourage reckless use of a wave kiteboard during lease. For example, when a board is beyond repair this deductible should be paid. Besides, standard fines for major damages and damages due to improper use during trial and lease should be implemented, as well as a standard reimbursement (of the current value) when the board is lost.

Of course, the assets will suffer the wear of aging and become more vulnerable to damages through time. Board age and previous reparations will have to be taken into account, to help to determine if damages are due to wear or improper use.

A paid lease insurance could be an extra option to cover the user for material damages, or even other areas such as accidents, liability and travel. Different levels of insurance is something to consider.

*FPA: Determine how high the deductible and the damage fees will be.*

*FPA: A log should be kept about the history of the board (damages and reparations).*

*FPA: A possible insurance deal with the NKV (Nederlandse Kitesurf Vereniging).*

#### **Damage, maintenance and control**

The company has to keep their assets in a good shape as service provider. All incoming boards will have to be checked after each use, to meet the standards of the quality control. Product value can be sustained with this controlled maintenance. Incoming board damages and discovered damages have to be dealt with. When a board has reached its end-of-life, it has to be processed responsibly by the company.

To achieve a fast but controlled reparation, the company should appoint repair experts with the skills to repair and maintain the assets with an Appletree standard. This reparation process should be provided with all the original materials.

*FPA: How to recycle or responsibly process boards at their end-of-life.*

*FPA: Controlled repair in one repair facility (logistic center) versus local repair hubs with shorter logistic movements.*

#### **Product packaging**

Something can be said about the current package that Appletree ships their boards in. That package is currently valued for reusing the spare foam: the negative where the board's core is cut out. Though, the customer has to throw it away somehow in the end. Reusable packages or cases would be a great way to ship boards in.

*FPA: Design reusable packages for logistics.*

## Tracking

A database with all the information about the assets and corresponding users is inevitable. With a database Appletree will be able to keep track of all their assets, PaaS users, subscriptions and actions. By doing this, they will create knowledge like: favored board models, favored subscriptions, exchange frequency and stock levels. Besides, they will know where damages occur frequently, which will be valuable for future board designs.

Scanning a board could have major benefits in the logistic processes. To quickly identify a board and its accompanying user, RFID technology (a chip) could be added to the boards. This technology is cheap and can easily be read by an NFC reader in a smartphone. Information like serial number, manufacturing year, material, dimensions, et cetera can be retrieved this way. Something, which could be of importance for future recycling. In addition, this information could be secured by blockchain technology.

Some information on the board is required as well, so that when board is lost and washed ashore, it can be retrieved and identified by anyone. With the help of instructions or a QR code for instance.

*FPA: Board identification possibilities.*

*FPA: Gathering and processing of user feedback and material feedback.*

## Customer service

A customer service has to be developed to meet customer demands. For instance, when a board is damaged, Appletree should deliver another board as substitute or replacement. Then, the user is guaranteed to continue kitesurfing and able to get back in the water as soon as possible. Acting fast on these demands is favored, for kitesurfers tend to have a 'fear of missing out' on windy conditions. A fee or deductible has to be paid of course.

Changing and failing kitesurf conditions during a trial should be taken into account as well. This can put users in unpleasant situations. It could be the user's responsibility to plan the trial in a period with good conditions. In that situation, Appletree could provide the user with info and tips for proper planning.

*FPA: How soon will the user be provided with a substitute board?*

*FPA: Failing kitesurf conditions during a trial should be taken into account.*

## Buy or exchange a lease board

The option to buy a lease board from the company during lease, became a recurring conversation. This possibility will have to be considered for implementation. A penalty for canceling the lease contract could be imposed. The gentleman's agreement will come in play in this situation as well.

Then there is also the scenario that a lease user wants to exchange a board for another size or model. This is also something to consider, with the user paying an exchange fee as a suggestion.

*FPA: Is the lease user able to buy or exchange boards?*

## What's in it for venues?

Appletree probably will have to come up with some arrangement to make a deal with venues. For example: a percentage of the trial earnings and a fixed amount per month for storage.

*FPA: Arrangements with venues.*

## 6.3.2 Product design

### Product properties

To make sure boards always meet the expectations of users, the boards need to be exact copies of each other. The only logical differences are the ranges of board models and sizes. To make them more standard, but still customisable to some extent (to meet customer demands), some other product properties will have to be taken into account.

#### Standard board properties

As discussed earlier in paragraph 4.1.3, the boards used in the PaaS model only consist of fiberglass laminated wave kiteboards in standard sizes. Glass boards are more allround and have a higher overall demand than carbon laminated boards. Besides, these boards are cheaper and easier to fix without seeing the reparation.

#### Customisable board properties

There are three identified options users might want to customise once a board chosen: the fin setup, the addition of straps and traction pads.

##### Fin setup

All boards will come standard with 5 fin-boxes, so that a user is able to choose between a 3 (thruster) or 4 (quad) fin setup. Currently, an Appletree board doesn't come standard with a set of fins. The company could consider providing lease boards with a set of fins. A deal has to be made with a fin supplier, so that they can offer a range of fins to choose from for their lease users.

##### Straps

Some wave kitesurf with 1 or 2 straps, some surf without. Appletree focuses on the 'strapless' wave kiter segment, but offers to add strap-inserts to a board as well. All boards should ideally have these inserts built-in by default, so an individual is able to choose straps as an add-on if this is preferred.

##### Traction pads

Grip comes in two different ways. One might want to wax the board or add traction pads to the board's top surface. It should be considered whether the latter is a standard property or a add-on.

### End-of-life

When the time comes a board has reached its end-of-life, the company has to make sure it won't end up as waste. This section discusses some possible solutions, as full recyclability remains an issue.

#### Upcycling

An easy, accessible way to give these boards a second life is by upcycling them into new products. For example: wall hangers, furniture (coffee table, chair), decorations and art objects. By doing this, a new value is given to something that previously was regarded as waste.

#### Future disposing

It seems that proper separation is the best way to throw away a board responsibly. For example, theoretically, fin boxes could be taken out with some violence. However, the rest of the board itself is a foam core to which a fiberglass skin is stuck. This ends up as residual waste at a landfill. This option is anything but desirable.

However, Appletree is participating in a project which could solve this problem in the future. The project is aimed at recycling fiberglass and carbon fiber from wind turbine blades. There is a new technology being developed that heats the resin, allowing it to flow out of the fiberglass without damaging the fibers. Other applications for this technology are being looked into, including surfboards. Ultimately, it could be possible to retrieve the fiberglass skin from surfboards in this way, which would make disposing and recycling a surfboard much easier. In addition, it could be possible to make surfboards from the fiberglass that will be retrieved from the wind turbines.

## 6.3.3 Implementation

### **Serving end-user groups**

In paragraph 3.3, three end-user groups were identified that were great candidates for the design direction of this project. A wish from the company was to serve as many of these end-user groups as possible. Personas were created and in the course of the project a focus was placed on 'The Seeker'. This resulted in the ideation of a trial service. Parallel to this, the lease service construction kept core properties that served 'The Flexible': it offers them ways to ride a new board every year, for instance.

Currently, the lease service could serve 'The Budgeteer' as well, because this potential user doesn't have to pay a high amount of money anymore to acquire an Appletree board. However, during ideation another means to serve this end-user group came about: an extra 'bronze' level lease subscription. This subscription is discussed within idea 4 in appendix C. This idea offers multiple used boards for a lower monthly fee. The implementation of this subscription level could be implemented at a later stage, when boards will be reused beyond second hand use.

Overall, it has been taken into account that these services can be set up separately next to the company's current activities. Theoretically, it would be best to first start with a lease service with only gold-level subscriptions, as this naturally creates a 'used board stock' for a trial service and silver-level subscriptions. These parts can then be implemented later when the used board stock is big enough.

### **Logistic steps and plans**

Right now, the only Dutch location the company has is their head office in Hillegom. Before taking the step to the first local venue for trial service, they could start experimenting from here. Hillegom is a strategic place, as it lies almost in the middle of the Dutch coastline and is easy reachable from some kitesurf spots and bigger cities. Especially the coastal towns Zandvoort and Noordwijk, from which it is less than a 20 minute drive. From Hillegom they can work to more local solutions, first serving the spots along the coast with higher demands.

A logistic center has to be created as well, preferably at the head office. There, incoming boards from the factory in Portugal will be received, and damaged boards will be repaired. Also, transportation (preferably electric) will be needed to drive boards back and forth between this center and all venues.





# 7. PROJECT EVALUATION

**In the final chapter of this report, the project goals are reviewed to indicate whether they have been achieved. Besides, there will be discussed how the design may contribute to wave kites, Appletree and sustainability. Finally, the author will reflect on this project as a whole.**



# 7.1 Discussion

**Project goals have been set at the beginning of this project. This paragraph discusses whether they have been achieved. Also, some overarching project limitations will be set out.**

## Project goals

As an answer to the project's problem definition, a solution space was created. This was divided in three parts and considered as goals for the project. Per goal, there will be a short discussion to what extent it has been achieved.

*1. Reduce environmental impact, by using the sustainable properties of a PaaS model.*

Literature, theories and knowledge are used to achieve this goal. The system is designed in such a way that it stimulates resource efficiency and product value is retained. However, this is theoretically substantiated and will have to be proven in practice. Other (new) factors have to be taken into account as well when it comes to sustainability. The footprint of logistics and reparations for example.

*2. Make this model beneficial for Appletree Surfboards and its products.*

The eventual PaaS model has been design to be easy implementable for the company as much as possible. It offers a variety of options, serving new potential end-user groups. There has been given a look into a more sustainable life for their polluting products (which surfboards are in the end). To find out if this design actually fits in the company's future, parts of it must be tested.

*3. Give the end-user an increased experience.*

In depth research has been done to find potential users and to offer them a great experience. Convenience and sustainability are of paramount importance in conveying this. A focus was placed on the interactions of one end-user group, which resulted in a trial service as an addition to the overall

PaaS-lease model. Whether the final design (or parts of it) actually increase the experience will have to be tested in practise.

## Project limitations

- As the author is a surfer and novice kitesurfer himself, some biases have to be taken in account. There has been tried to let this go as much as possible. On the other hand, it also offered some empathy and mutual understanding.
- Only qualitative research was done during this project, as this said more about needs and preferences of potential end-users. These sample sizes were too small for statistical analysis. Future research could focus on collecting more quantitative data out of user research.
- This project is merely an exploration of what is possible, and the final design is a theoretical model. To further develop this design, some parts have to be created and tested in practice.

## 7.2 Contribution

**The project is evaluated to a further extent, with the following question in mind: what does it contribute to the community of wave kitesurfing, Appletree and sustainability?**

### **What does it contribute to wave kitesurfers?**

The final design is a new way to try and use Appletree wave kiteboards, taking into account the desires of wave kitesurfers. The project showed that a variety of end-user groups could potentially benefit from these services. It has been taken into account that there are different customer needs, which is why there are many options to acquire a board. Before this is decided, customers will have the opportunity to find the perfect board before they lease or buy it. For them these services are probably very convenient and at the same time good for their conscience, since they opt for a sustainable alternative.

### **What does it contribute to Appletree?**

Direct implementation of the final design is probably one bridge too far. However, Appletree has already indicated that they definitely benefit from certain parts of research and design. The project should offer the company insights on how to provide customers with an opportunity to try and discover boards: a direction they already wanted to explore. It also shows that three different target groups can potentially benefit from a PaaS lease model. This offers opportunities for addressing a target group that they are not currently serving. Ultimately, the PaaS model is a new way to pursue sustainable ambitions and company values even further. Moreover, it is a totally new way to offer boards, which brings a novel experience to the world of kitesurfing.

### **What does it contribute to sustainability?**

The project lead to a design that should reduce the environmental impact, by using sustainable and circular properties of the PaaS model. In this model, boards will be used more efficiently, as they are (almost) certain of multiple, sequential users. They won't end up in a shed anymore, because the company owns them. Besides, the company will take care of these assets, for they will be maintained after each use. This should improve the life-span of boards as well. Finally, by making use of the trial service, customers are able to make a better decision. This might lead to a longer active ownership of the board.

## 7.3 Personal reflection

I am happy that I took the time for the creation of this project. This resulted in a project that I really supported and a challenge I was excited about. How cool is it that I have been given the opportunity to do what I find interesting while learning from it? The combination of personal interests and those in design, combined into a graduation project. It's funny how varying IDE is and how many paths you are able to choose. Six years ago I wouldn't have thought I was doing something like this for my graduation.

The project itself isn't something I did before, but it was a direction that I really wanted to explore for my self development. Designing a service was a direction that was quite new to me as I had no great experience with it. As a result, I lost the grip on things sometimes. In the beginning, for example, it was difficult to decide what research I wanted to do. Maybe that was because I already had a certain direction in my head of what I wanted to design. I have learned in previous projects that I have to give this up, but it remains difficult sometimes.

In addition to this tunnel vision, I swam too much (figuratively) while doing explorations. I went very wide in exploration at times where I should have gone into the depths of elaboration. As a result, I stagnated and the project eventually took longer than planned. Looking back, I definitely needed this time, because it gave me some extra weeks to sort things out. I was then able to take the final steps and complete the project in the way I intended.

My communication to my supervisors and the company has not always been strong. I think and hope that this has improved in the course of the project. I really liked the meetings with my supervisory team, because these were moments I was supported in thinking about the next steps. Also, there were times I needed a boost to keep the project Dfl-worthy, as I tended to think on a strategic level too much.

I should have inspired myself more to ignite idea generation and to go into depth. When I stagnated, it was often because I had no inspiration. I should have talked more with the supervisory team, especially in the first half of the project. Besides I could have contacted fellow students who were graduating at the same time, to meet up and discuss about things.

The biggest learning about myself is that I tend to elaborate everything that I come across: that has delayed myself and the process. That burden goes hand in hand with the dilemma of design in general:

Designing is never finished, but there must be 'a design' at some point.



# REFERENCES

# References

- 7DTV. (2018). *Swapfiets: In één jaar van 150 naar 50.000 klanten! Oprichter Dirk de Bruijn aan het woord* [Video file]. Retrieved from: <https://www.youtube.com/watch?v=sTtWcK50uUE>
- Achterberg, E., Hinfelaar, J., Bocken, N.M.P. (2016). Master circular business models with the Value Hill (White paper). Retrieved from: <https://www.circle-economy.com/financing-circular-business>
- Bakker, C., den Hollander, M., Van Hinte, E., & Zijlstra, Y. (2014). *Products that last: Product design for circular business models*. Delft: TU Delft Library.
- Cialdini, R. B. (1987). *Influence* (Vol. 3). Port Harcourt: A. Michel.
- Daae, J.Z. and Boks, C. (2014). Dimensions of behaviour change, *J. Design Research*, Vol. 12, No. 3, pp.145–172.
- Desmet, P.M.A. (2003). Measuring emotion; development and application of an instrument to measure emotional responses to products. In: M.A. Blythe, A.F. Monk, K. Overbeeke, & P.C. Wright (Eds.), *Funology: from usability to enjoyment* (pp. 111-123). Dordrecht: Kluwer Academic Publishers.
- Fischer, A., & Achterberg, E. (2017). The Circular Phone: Legal, operational and financial solutions to unlock the potential of the 'Fairphone-as-a-Service' model. Retrieved from <https://www.circle-economy.com/the-circular-phone>
- Ford, G. T., Smith, D. B., & Swasy, J. L. (1988). An Empirical Test of the Search, Experience and Credence Attributes Framework. Michael J. Houston (Ed.), *Advances in Consumer Research* vol. 15, Association for Consumer Research, Provo, UT (1988), pp. 239-243
- Ellen MacArthur Foundation. (2015). Towards a circular economy: business rationale for an accelerated transition. Retrieved from: [https://www.ellenmacarthurfoundation.org/assets/downloads/TCE\\_Ellen-MacArthur-Foundation\\_9-Dec-2015.pdf](https://www.ellenmacarthurfoundation.org/assets/downloads/TCE_Ellen-MacArthur-Foundation_9-Dec-2015.pdf)
- Ellen MacArthur Foundation. (n.d.). Concept. Retrieved February 22, 2019, from: <https://www.ellenmacarthurfoundation.org/circular-economy/concept>
- te Grotenhuis, H. (2018). *Naast Hendrik met Bert van Son van MUD Jeans* [Video file]. Retrieved from: <https://www.youtube.com/watch?v=QxMfIXiutw0>
- Herskovitz, S., & Crystal, M. (2010). The essential brand persona: storytelling and branding. *Journal of business strategy*, 31(3), 21-28.
- International Sailing Federation. (2012). *ISAF Kiteboarding Format Trials*. Retrieved from: <http://www.sailing.org/tools/documents/EC8bKiteboardingTechnicalReport-%5B12451%5D.pdf>
- Laurans, G. and Desmet, P.M.A. (2017). Developing 14 animated characters for non-verbal self-report of categorical emotions, *Journal of Design Research*, 15(3/4), pp. 214–233.
- Lockton, D. (2010). *Design with intent: 101 patterns for influencing behaviour through design*. Equifine.
- Mark, M., & Pearson, C. S. (2001). *The hero and the outlaw: Building extraordinary brands through the power of archetypes*. New York: McGraw-Hill.
- MUD Jeans. (n.d.). MUD Method. Retrieved March 5, 2019, from: <https://mudjeans.eu/mud-method/?lang=nl>
- Osterwalder, A., Pigneur, Y., Bernarda, G., & Smith, A. (2014). *Value proposition design: How to create products and services customers want*. John Wiley & Sons.
- Taylor, B. (2007). Surfing into spirituality and a new, aquatic nature religion. *Journal of the American Academy of Religion*, 75(4), 923-951.
- Rachel Carson Center. (2014). *Prof. Dr. Bron Taylor on "Surfing, Nature, and, Spirituality"* [Video file]. Retrieved from: <https://www.youtube.com/watch?v=48-rkcQsREg>

Rodgers, E. (2017). Surfing As A Sport Subculture: An Investigation Of Social Resistance, Does It Occur, What Values Are Challenged And Why?

Schwartz, B. (2004). The paradox of choice: Why more is less. New York: Ecco.

Tukker, A. (2004). Eight types of product service systems: eight ways to sustainability? Experiences from SusProNet. *Business Strategy and the Environment* 13(4), 246-260.

Tukker, A. (2015). Product services for a resource-efficient and circular economy—a review. *Journal of cleaner production*, 97, 76-91.

The Ecoboard Project. (n.d.). What's an Ecoboard? Retrieved January 22, 2019, from: <http://www.sustainablesurf.org/ecoboard/what-is-an-ecoboard/>

Van Kleef, E., Van Trijp, H. C., & Luning, P. (2005). Consumer research in the early stages of new product development: a critical review of methods and techniques. *Food quality and preference*, 16(3), 181-201.

## Dictionary descriptions

Confident [Def. 2]. (n.d.). In *Lexico.com*. Retrieved July 17, 2019, from <https://www.lexico.com/en/definition/confident>

Control [Def. 1]. (n.d.). In *Lexico.com*. Retrieved July 21, 2019, from <https://www.lexico.com/en/definition/controlled>

Easy [Def. 1]. (n.d.). In *Lexico.com*. Retrieved July 17, 2019, from <https://www.lexico.com/en/definition/easy>

Personal [Def. 1]. (n.d.). In *Lexico.com*. Retrieved July 17, 2019, from <https://www.lexico.com/en/definition/personal>

## Inspiration

Van Boeijen, A., Daalhuizen, J., van der Schoor, R., & Zijlstra, J. (2013). Delft design guide. Amsterdam: BIS Publishers.

Stoevelaar, J. (2017). *A roadmap for development of a smart malaria diagnostic device: use and acceptance of the Excelscope by healthcare professionals in Nigeria*. (Unpublished master's thesis). Delft University of Technology, Delft, The Netherlands.

# Image references

*The Appletree logo, the frontpage image, chapter images and layout images are courtesy of Appletree Surfboards.*

## Image 1

Dominique (pictured) and Bruno Legaignoux: the founders of kiteboarding and kitesurfing [Online image]. (n.d.). Retrieved from: <https://www.surfertoday.com/kiteboarding/the-history-of-kiteboarding-began-25-years-ago-with-the-legaignoux-brothers>

## Image 2

Kelsick, J. (2019). No title [Online image]. Retrieved from: <https://www.youtube.com/watch?v=dZRdzl3rKkw>

## Image 4

[Untitled photo of a foil kiter]. Retrieved from: <https://www.kitesurfholidays.com/blog/kitesurf-foil-technique>

## Image 6

Swapfiets [Online image]. (n.d.). Retrieved from: <https://www.bndestem.nl/breda/swapfiets-opent-winkel-in-het-centrum-van-breda~a49fbf67/>

## Image 7

[Untitled photo of Mud Jeans]. Retrieved from: <https://www.amsterdammade.org/makers/mud-jeans/>

## Image 8

[Untitled photo Awayco surfboards]. Retrieved from: <https://awayco.com/how-it-works>

## Image 9

[Untitled photo of Signal snowboards]. Retrieved from: <https://signalsnowboards.com/pages/experiences>

## Persona images: paragraph 3.3

### Persona 1

Lozan, C. (2017). No title [Online image]. Retrieved from: <https://unsplash.com/photos/EdA845C1yXc>

### Persona 2

Ivanov, D. (n.d.). Break [Online image]. Retrieved from: [https://www.resshot.com/photos/break\\_rs\\_JaYOE9](https://www.resshot.com/photos/break_rs_JaYOE9)

### Persona 3

Taheri, A. (n.d.). No title [Online image]. Retrieved from: [https://unsplash.com/photos/t\\_UL3iGikCM](https://unsplash.com/photos/t_UL3iGikCM)

## Images in appendix A

### Surfboard blanks

[Untitled photo of surfboard blanks]. Retrieved from: <https://surfblanksaustralia.com/>

### Laminating

[Untitled photo of surfboard glassing]. Retrieved from: <https://www.boardcave.com.au/the-surfers-corner/surfboard-glassing-tools-of-the-trade/>



# APPENDIX



APPLETREE

# A. Surfboard creation

## Regular surfboard creation process

The process of creating a great surfboard demands pure craftsmanship. Big surfboard manufacturers (creating mass produced boards) are able to cut costs by exchanging some steps with machines, but the surf community is unanimous: nothing beats a board crafted by hand. This paragraph is dedicated to the most common way of surfboard creation, which thereafter will be put side to side with the creation process of Appletree.

### Shaping the blank

A surfboard blank is like a sculptor's marble: the surfboard's form is shaped out of it. The most common used blanks are made of PU (Polyurethane) or EPS (Expanded Polystyrene) foam. They typically come in a variety of molded surfboard-like shapes, with a stringer. This wooden strip in the middle of the board, provides strength and stiffness.

The shape of the blank is a rough idea of the board's dimensions and is chosen with the final size and shape in mind. Only the thoroughbred surfboard shaper, producing small amounts of boards, will shape the whole blank by hand to its final form. Manufacturers use milling machines to shape the blank instead, which delivers a symmetrical form and a more consistent product. They finish the milled blank by sanding the machined grooves and by adding some extra details to the shape.

### Adding a skin

When the foam core of the surfboard is shaped, it will then be laminated using layers of fiberglass cloth and resin on the top and bottom of the board. This sandwich construction of multiple layers gives the board its desired strength and flex. PU boards demand polyester resin, EPS boards demand epoxy resin. Due to these differences in materials and their properties, the surfing characteristics, pricing and durability between these types of boards differ slightly. Considering sustainability, an EPS core is favorable because of its recyclability (in contrast to PU). On top of that, the accompanying epoxy resin has a smaller carbon footprint (than polyester resin) and is substitutable with bio-based alternatives.

### Fin box and finishing

When the board has its skin, fin boxes can be inserted. Gutters have to be created in the bottom of the board in order to hold them. Once these gutters are crafted neatly, the fin boxes are glued into them with resin. This step is taken before or after adding the final layer of skin: this is called hot-coating. This extra layer of resin removes any unevenness in the lamination. Any imperfections will be sanded off from this layer at the end, giving the board its finish.



Surfboard blanks



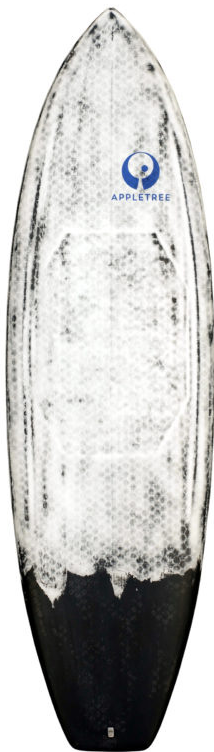
Laminating

## Appletree process differences

The purpose of this paragraph is to explain the durable and sustainable characteristics of Appletree's process and materials. To keep an overview of the surfboard creation process and Appletree's differences compared to this, the image on this spread and the images on the next spread can be followed.

### Closed foam

The first major difference is the type of blank Appletree uses: XPS (Extruded Polystyrene) instead of the common used EPS (Expanded Polystyrene). The game changing difference between these polystyrene foams, is that XPS doesn't contain the beads that EPS has. This makes the material waterproof. When the skin of the board is punctured or damaged, water can't penetrate. This is the case with EPS boards: water seeps through, worsening the damage. For boards with a XPS core this means they are easier to fix when any damage occurs. Appletree chooses not to use bio-based foam. It is already out there, but it has still some disadvantages: it is not waterproof, less durable and breaks easier. Therefore, it will not outlast the life of the XPS board they currently create, making it less sustainable. The company receives their blanks in rectangular pieces of foam, without a pre-inserted stringer.



Applino full carbon

### U-Flex stringer

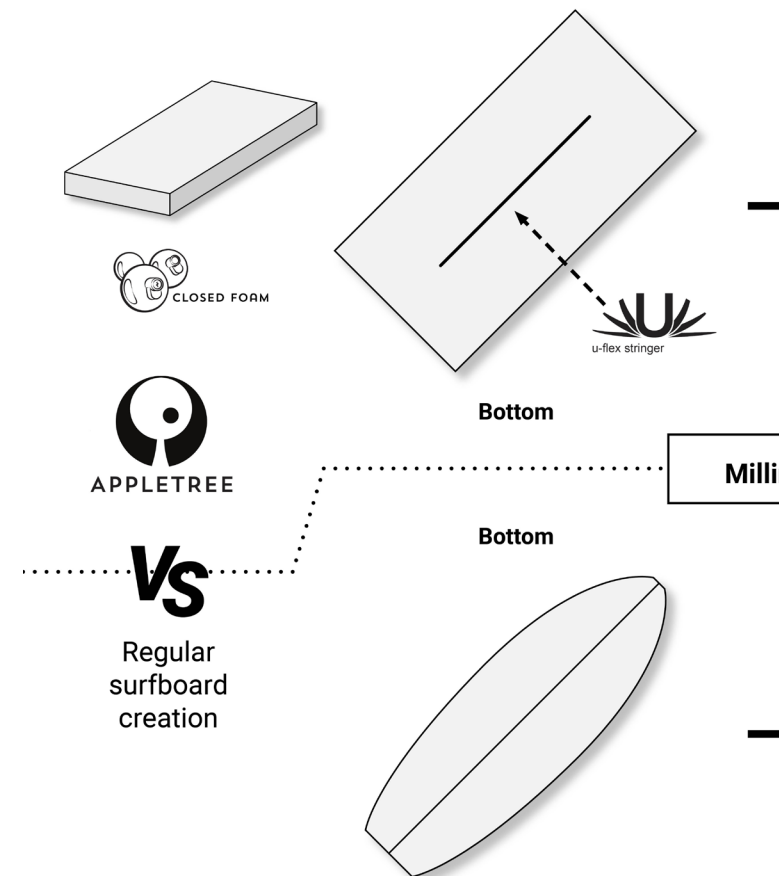
Appletree designed their own stringer to counter the strength of the skin and to control the flexibility. The U-Flex stringer is fixed within a gutter in the middle before the blank is milled. The stringer doesn't extend the whole length of the board, leaving some flexibility in the nose and tail of the board. It is made of high density foam wrapped in fiberglass, covered with a thin layer of unidirectional carbon fibre.

### Fin boxes

After the blank is milled, it is shaped by hand to its final form. Fin boxes are inserted at this point, to be covered by the whole skin (lamination as well as hot-coat). This is beneficial for the fixation in the board.

### Appletree magic

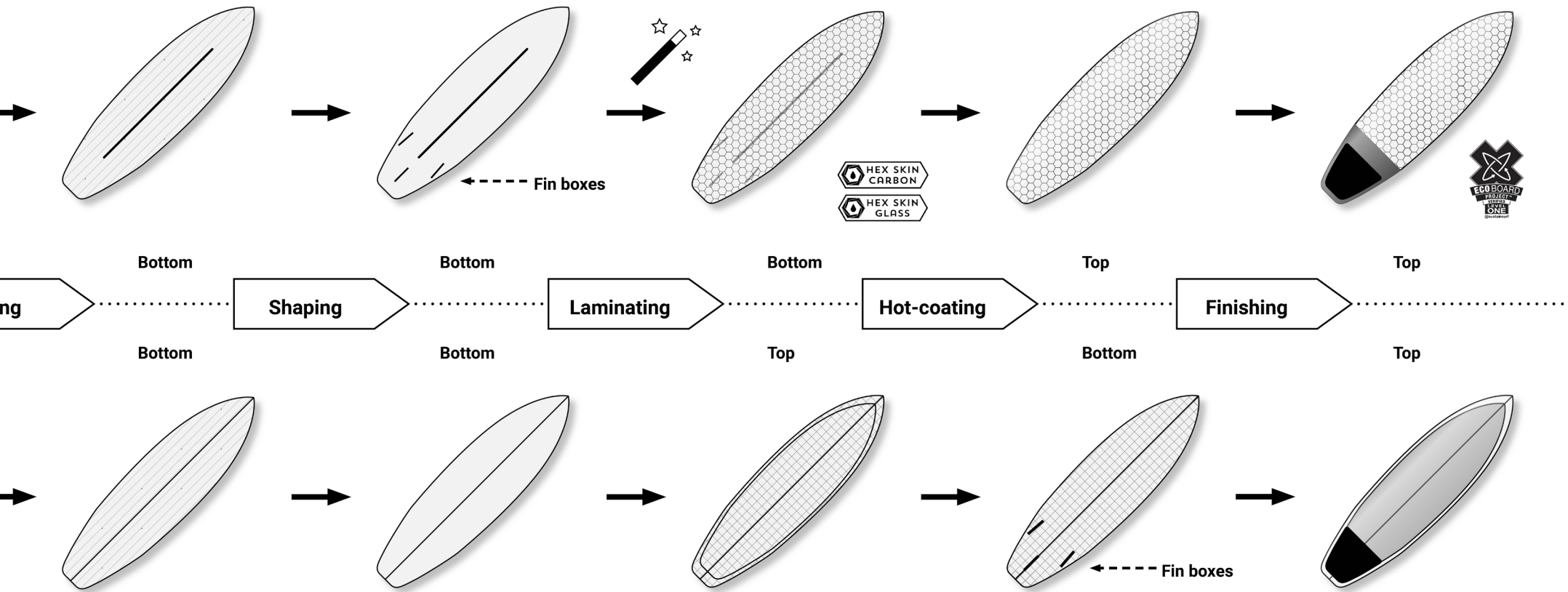
XPS is notoriously hard to laminate, but the technology that Appletree mastered makes this possible. This is what they call the 'fusion tech', which they are really proud of. They are able to inject



the epoxy resin while the board is drawn vacuum. The result is a board with less epoxy resin, but a stronger construction than a regular board. The lamination process in detail is a big company secret. For others this is the part where they use their Appletree magic.

### Hex Skin Glass & Carbon

Appletree produces both fiberglass and carbon fiber laminated boards, of which the latter is the strongest and lightest construction they produce. The wave kiteboards feature a thin, lightweight



PET honeycomb layer on the top of the board. This gives the deck good resistance against impact and its signature look, hence the name 'Hex Skin'.

The wave kiteboards also have an additional XPS honeycomb layer under the front foot to minimise heel denting. Overall, the kiteboards have a stronger construction, simply because these boards have to endure heavier forces (e.g. high jumps). To sum up the differences between Appletree kiteboards and surfboards:

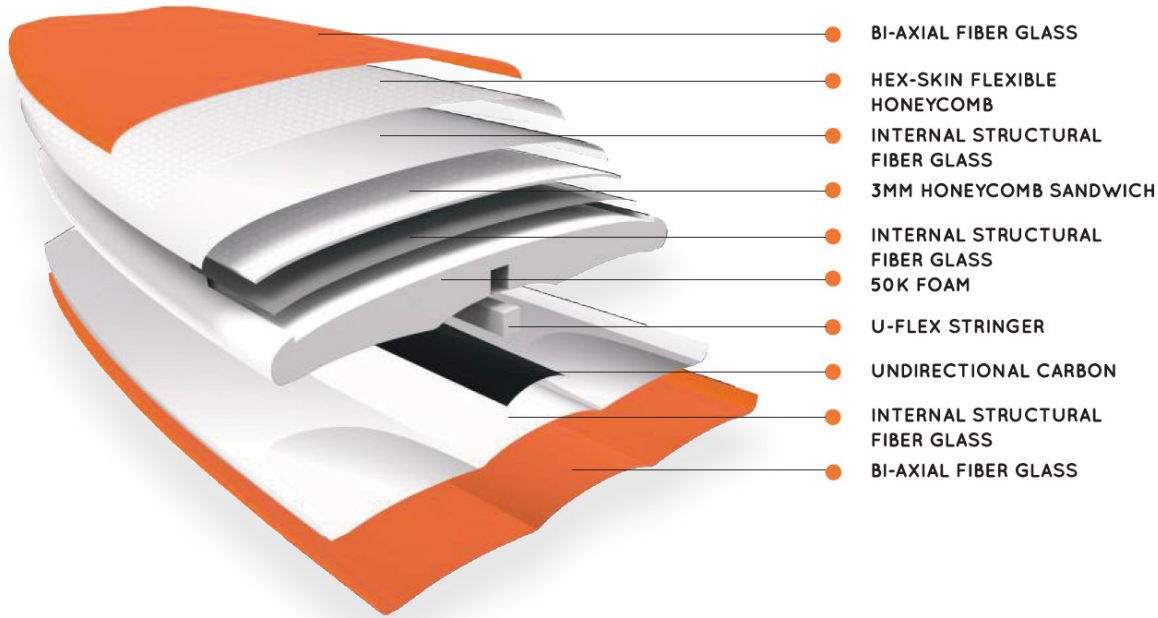
- Kiteboards: carbon or glass lamination, honeycomb layer on top, XPS honeycomb layer under front foot.
- Surfboards: glass lamination, no honeycomb, no special front foot layer.

After lamination, the boards will dry before they are hot-coated. In the hot-coat resin, some other colours can be added to give the board a colourful finish.

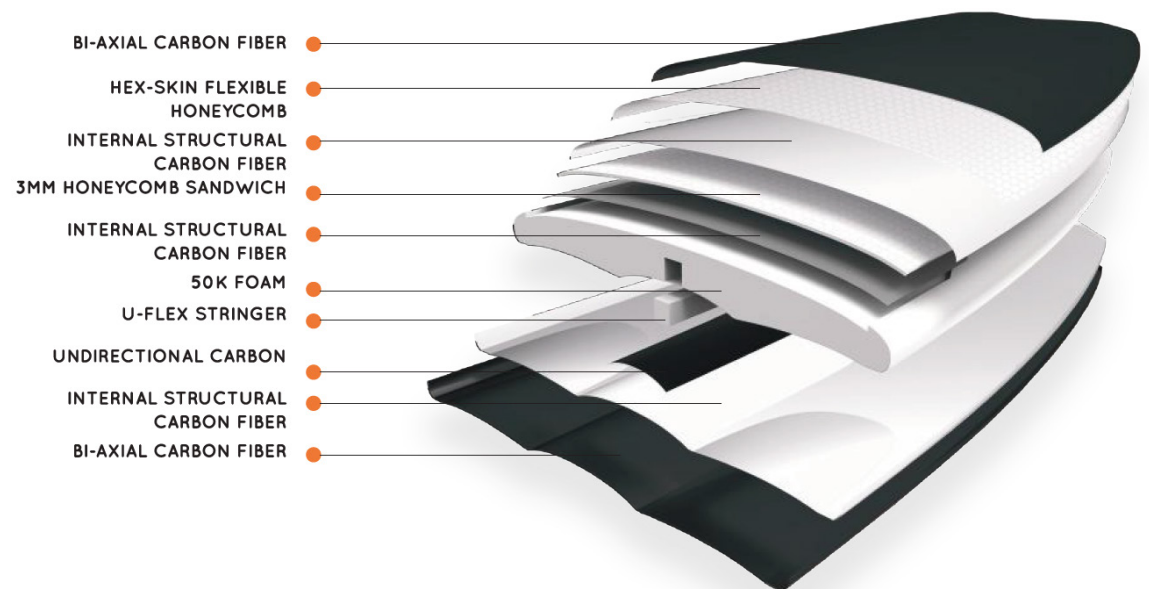
### The Ecoboard Project

Appletree boards hold an 'Ecoboard Level One verification', which means they produce with reduced environmental and toxic impacts through the use of more sustainable materials and manufacturing processes ("What's an Ecoboard?", n.d.). For instance, the epoxy resin that is used has a 40 to 50 percent organic content.

## Hex-Skin Glass



## Hex-Skin Carbon





## B. Research questions interview

To find some PaaS model directions to work with, wave kitesurfers will be interviewed. The following research questions are going to be used (derived from the holistic overview):

1. What is the current general behaviour of wave kitesurfers?
2. What product experience do end-users have with their wave kiteboard?
3. What relationship and expectations exist between end-users and company (services)?
4. What intentions and concerns do end-users have for the environment?
5. What opinions do end-users have on different PaaS constructions?
6. Appletree users only: How do existing Appletree users value the company and its product?

### 1. General behaviour

*What is the current general behaviour of wave kitesurfers?*

- How did they get to own their first wave kiteboard?
- How did they get to own their current wave kiteboard?
- Where do they use and where do they take this board?
- Where do they store the board?
- How many times do they kitesurf with this board?
- How many boards do they own?
- Do they lend or share boards?

### 2. Product experience

*What product experience do end-users have with their wave kiteboard?*

- What is their relation with the kiteboard?
- What is the value they attach to the kiteboard?
- How long are they already using the kiteboard?
- How long do they expect to use the kiteboard?
- What actions are taken ones the kiteboard is damaged?
- What kiteboard features are important to them?

### 3. Company relationship and expectations

*What relationship and expectations exist between end-users and company (services)?*

- Where do they purchase a wave kiteboard?
- What do they find important when buying a board?
- What extra service do they expect from the manufacturer or retailer?
- Are they aware of any warranty they have on the board?

### 4. Sustainable intentions and environmental concerns

*What intentions and concerns do end-users have for the environment?*

- What sustainable kiteboard properties are important for wave kitesurfers?
- How do they think about board recyclability?
- Do they know what the Ecoboard logo stands for?
- How would they discard the board after it's broken or beyond reparation?
- How sustainable is the wave kitesurfer?

### 5. PaaS questions

Transition question: What does the end-user think about the future of kiteboard usage?

*"In PaaS-modellen behoudt de serviceprovider het eigendom van en de verantwoordelijkheid voor het product. Dit stimuleert het ontwerp van hoogwaardige, onderhoudsarme en duurzame producten. Bovendien zorgt het behoud van het eigendom voor terugname en hergebruik of recycling van materialen en componenten. Dit leidt tot een verbeterde grondstof-efficiëntie. "*

*What opinions do end-users have on different PaaS constructions?*

- What thoughts do they have for using and testing?
- What do they think of a lease subscription model?
- What do they think of a rent subscription model?
- What do they think of a pay-per-use model?
- What do they think of seasonal use?
- What do they think of worldwide use?

**Lease subscription:** a monthly fee to use and even change boards. Single user.

**Rent subscription:** a monthly fee to use boards. Sequential users of one board.

**Pay-per-use:** a fee per usage. Boards are available at a venue.

**Seasonal use:** (extra) board during high-season or a surf trip.

**Worldwide use:** boards available at local surf spots during travel (no plane fees).

## 6. Appletree board user

*How do existing Appletree users value the company and its product?*

- How do wave kitesurfers get to know Appletree?
- What triggers them to purchase an Appletree board?
- Why do they choose Appletree over other brands?
- What do they like the most of their Appletree board?
- Would they recommend Appletree and why?

# C. Ideas

## Idea 1.1 - Short-term trial

This PaaS-idea is made for the potential customers that want to try out a board or several boards before they buy one (end-user group 1). The accompanying persona of 'The Seeker' was used as inspiration.

### Model construction

The idea of this construction is a board-trial, with a duration of 6 months (for the idea example). During this period, the user is able to try out boards without any rush in favored conditions. At the end of each month the user may choose to exchange the board for another model within an exchange window. In the figure this is shown at the end of month 2 and 3, where the current board model is exchanged for another. The user is able to try up to 6 models within this trial period. Appletree will receive the used boards and will check and prepare them for new users.

After the 6th month, the last board of the trial is retrieved by Appletree. Hopefully, the user is able to make a confident decision to purchase a brand new board. The payment for the trial will result in a discount on the purchase. It should discourage users to 'just do the trial'. Ideally, the trial should always lead to board purchase.

### What is in it for the end-user?

The freedom to test boards over a longer time. Try out several models when and where you want to, in favored conditions and make a better decision. Receive a discount on the subsequent board purchase.

### What is in it for Appletree?

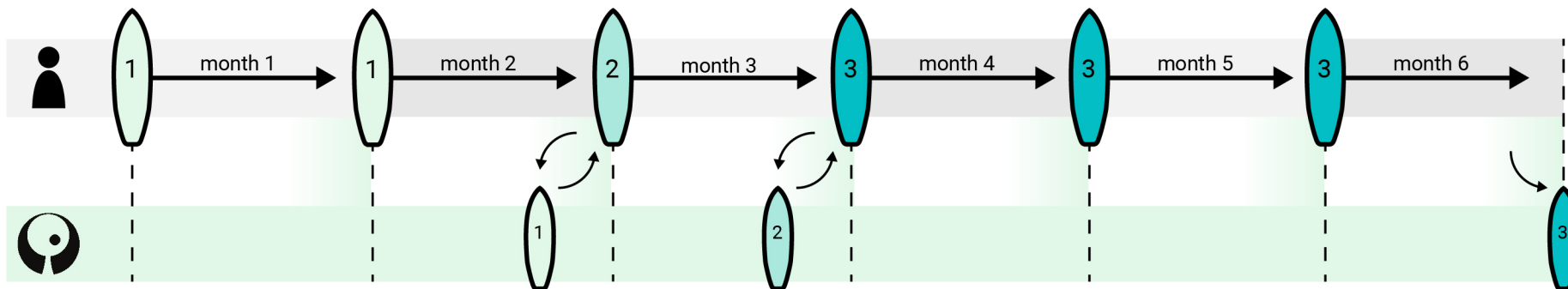
With this model, the company offers a low threshold for potential customers get familiar with their boards. It could take away any doubts that they might have, which could lead to more people buying their boards. Besides, the trial costs will generate profit whether the user buys a board at the end or not. Above all, this profit is generated by using a stock of used boards.

### What is in it for the environment?

The model uses a stock of used boards. When it is operative, the boards are checked and maintained after each use. This would lead to efficient, longtime use of the assets. Though, this stock has to be manufactured first when setting up this model. Besides, the user might want to buy a brand new board, which has to be manufactured as well. Within the model, boards are reused frequently, but the purpose of the model is to sell new boards. In that sense it is not resource-efficient.

A counter argument for all this is that the user is able to make a better decision, using this model. A good decision might lead to a longer active ownership of the board.

Because of possible monthly board exchanges, the sustainability of many logistic movements have to be taken into account.



## **Pros and cons**

### End-user

- + Try multiple boards without any rush
- + Make a more confident choice
- + Discount on subsequent board purchase
- Stuck with the (payment of) the trial when a desired board is found quickly

### Appletree

- + Profit on used boards in trial and on board purchase
- + Offer customers a great way to get familiar with boards
- Possible abuse of the model by users that do the trial, just to have a board
- A stock of boards has to be manufactured first

### Environment

- + A good decision might lead to a longer active ownership of the board
- + The model uses used boards only
- Manufacturing of the board stock
- New boards are manufactured constantly for users that purchase one after trial
- Many logistic movements

## **Future points of attention**

- This model could be more adaptable to the needs of users, by letting them choose how many months they want to try. Though, they might abuse the model by using it to take a board on a trip for a month for instance. Maybe this can be solved using higher pricing for shorter trials.
- The discount on eventual purchase is a great deal for the user, but also a deduction on the margin that is earned on board sale. Pricing of these variables will need attention.
- Payment for the trial could be done in front, or using monthly payments. The company might favor the first option.
- As kitesurfers generally want to try before they buy, this trial could be implemented in other ideas that will be discussed next.

## Idea 1.2 - Windy days trial

This is a second PaaS-idea made for the potential customers that want to try out a board or several boards before they buy one (end-user group 1).

### Model construction

This idea is a board trial construction with rental (or pay-per-use) properties, using local venues. When the kitesurf conditions are good, the user reserves a board at one of these locations. With this flexibility, the user is able to try a board model, or several models in favorable conditions. The user is able to rent the board for a day, a few sequential days, or separate days. Doing this trial would result into some kind of reduction on sequential purchase.

Venues that are located at surf spots in the Netherlands, will have a small stock of all Appletree wave kiteboard models. Users will pick up their reservation here, and the board is retrieved here after use as well. Then, the venue will check and prepare the board for the next user.

### What is in it for the end-user?

The freedom to test boards when the conditions are good. Try out boards at a local spot, in favored conditions. Make a better decision for board purchase.

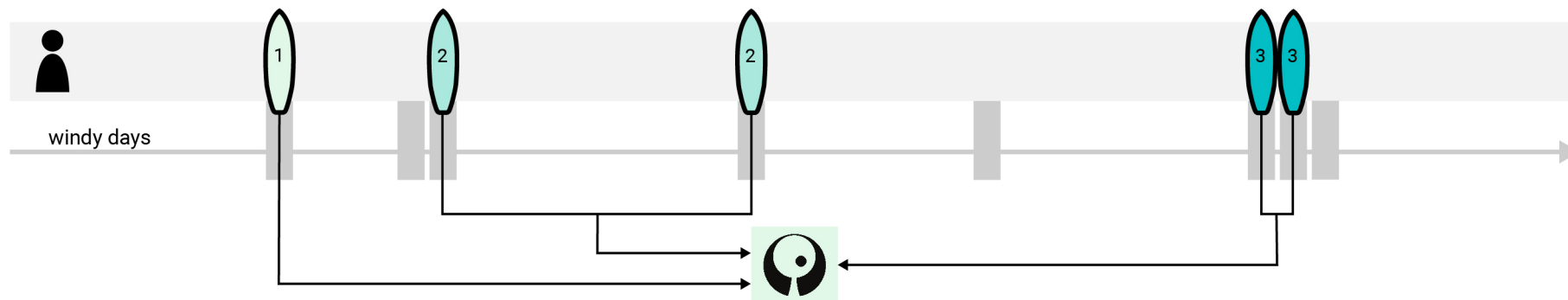
### What is in it for Appletree?

Just like idea 1.1 the company offers a low threshold for potential customers get familiar with their boards. It could take away any doubts that they might have, which could lead to more people buying their boards. Above all, this profit is generated by using a stock of used boards.

Although this idea would be very convenient for the user, the model revenue is highly dependent on kitesurf conditions and seasonal activity. When the conditions are good, many reservations will lead to boards that are not available for others. When there aren't good conditions, no one will use this service.

### What is in it for the environment?

Just like idea 1.1 the model uses a stock of used boards and therefore has the same pros and cons concerning the environment. The only difference lies within logistics. Having more local organised operations, less logistic movements have to be taken into account. Only periodical movements between venues and the Appletree headquarter.



## **Pros and cons**

### End-user

- + Try when there are good conditions
- + Make a more confident choice
- This service is only available at location specific venues
- Demand will be high when the conditions are good

### Appletree

- + Profit on used boards
- + Offer customers a great way to get familiar with boards
- Boards will have to be checked after each use
- The model revenue is highly dependent on kitesurf conditions and seasons
- A stock of boards has to be manufactured first

### Environment

- + A good decision might lead to a longer active ownership of the board
- + The model uses used boards only
- + Working with partners will lead to local logistics
- Manufacturing of the board stock
- New boards are manufactured constantly for users that purchase one after trial

## **Future points of attention**

- When board damage occurs, the reparation is preferable done at the venue, or local to prevent logistics.
- Different trial packages can be set and paid in front. For example: 1 model for 1 day, 1 model for 3 days, 2 models for 4 days and all models for 10 days. This can be achieved with credits. Each package could have a different reduction on sequential purchase.
- Someone might want to use several boards on 1 day. A package for this can be created as well, leading to a higher expense.
- Participating venues can do the sales pitch for Appletree.

## Idea 2 - Long-term lease

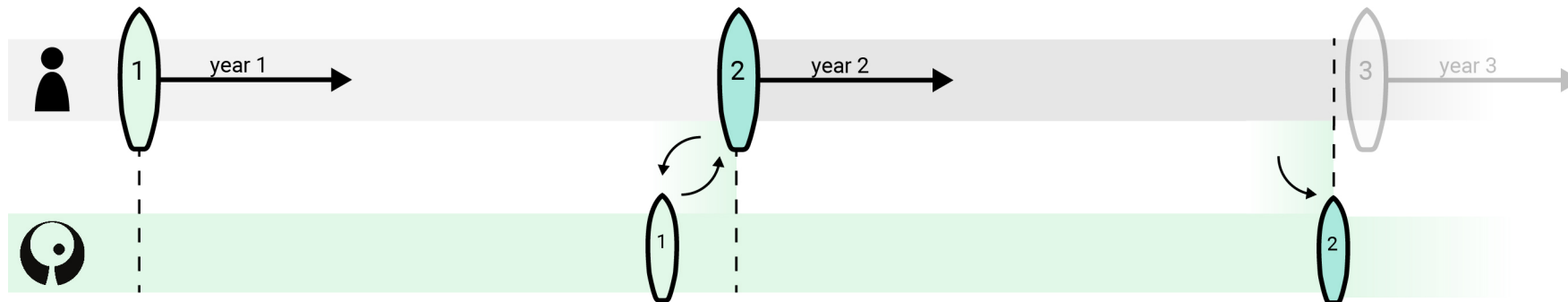
This PaaS-idea is made for Wealthy wave kites that want another board every now and then, on a long-term or seasonal basis. (end-user group 2). The accompanying persona of 'The Flexible' was used as inspiration.

### Model construction

This long-term lease construction is for the ones that want a new board at the start of the season (year). The ultimate, 'gold-level' subscription would deliver a brand new board to the user every year (optionally the newest model). The subscription would be paid for using monthly payments, with the possibility to stop or lease further at the end of the year. At that moment, Appletree receives the used board and the user has the option to lease another brand new board. After the second year, they might enter a third year and so on.

A distinction in construction and subscription hierarchy can be made by using used boards instead of brand new boards. This 'silver-level' subscription has a stock of used boards, including the ones that would be retrieved from gold-level users. This would create a more affordable, accessible and sustainable option, with the same construction properties.

Another way to meet user needs and change pricing for both gold and silver-level subscriptions is the length of the lease that is agreed on. Entering a 2-year subscription for a board (without a board exchange window within this term) should, in essence, lead to cheaper monthly payments for the user, when comparing to a 1-year subscription. In this situation, the payments are spread out over a longer period.



### What is in it for the end-user?

Ride a new board every year, whether it is brand new or used. Choose a subscription with new or used boards and a preferred subscription length. Pay for use instead of possession. No struggle of buying and selling boards every year, just a simple exchange with Appletree.

### What is in it for the Appletree?

The company receives monthly payments from the use of their assets. They stay owner of the boards, which means they are able to perform controlled maintenance and reparation when boards are returned.

### What is in it for the environment?

First of all, boards won't end up in someone's shed when they're not used anymore, because they are returned to the company. Within the silver-level subscription, all boards will be used until they do not meet quality standards anymore (or end-of-life). Stock is created with ending gold-level subscriptions. Just like idea 1.1, the boards are checked and maintained after each use. This would lead to efficient, longtime use of the assets.

## **Pros and cons**

### End-user

- + Ride a new board every year, or 2 years
- + Option to choose between two subscription levels
- The lease length might exceed the time (season) one actually want to use a board

### Appletree

- + The company retains ownership at all times
- + Profit on new and used boards
- + Stock for the silver-level is created by the gold-level demand
- Regulate stocks of new and used boards at the same time

### Environment

- + New boards are certain of being reused by sequential users
- New boards are manufactured constantly for gold-level subscription demand

## **Future points of attention**

- The subscription length could be changed the other way around as well with subscriptions that last only 9, 6 or even 3 months, depending on kitesurf seasons and user preference.
- A smart system has to regulate the stock of new boards and used boards. The silver-level receives constant input from the gold-level, but has end-of-life output as well.
- An option to buy the board with reduction when the subscription ends could be implemented, if the user really likes the board and wants to keep the board for own use. During the lease, this could be possible as well, letting the user pay the residual value of the board. Although these options seem very nice, they provoke leakage in the PaaS system, by letting boards escape the company's ownership.
- The silver-level boards could function as substitute for when a gold-level board is damaged and in repair, waiting to get back to its user. Within silver-level subscription, damaged boards will just be substituted or not at all.

### Idea 3 - Pay off or keep leasing

This PaaS-idea is made for wave kites with a low budget, like youngsters. (end-user group 3). The accompanying persona of 'The Budgeteer' was used as inspiration.

#### Model construction

This lease construction offers a great solution for wave kites with a low budget to own a used, high performance Appletree board. The user chooses a used board model and pays it off in a year, with 12 monthly payments. When the year is over, the user may choose to either keep the board or lease further, exchanging the board for another model. Entering this second lease should be made interesting for the user using a financial discount. After the second year, they might enter a third year and so on.

When the user chooses to keep the board after a year, some kind of agreement has to take care that the user will return the board to Appletree eventually. This moment might occur when the user doesn't like the board anymore or the board has reached its end-of-life. When the board is returned, Appletree should take care of recycling and responsible waste processing.

#### What is in it for the end-user?

You don't have to pay a big amount for board ownership. Pay off an used Appletree board in a year or keep leasing and pay for use. Owning the board after a year would mean no more ties to the company and accompanying obligations, only an agreement to return the board when you're done with it.

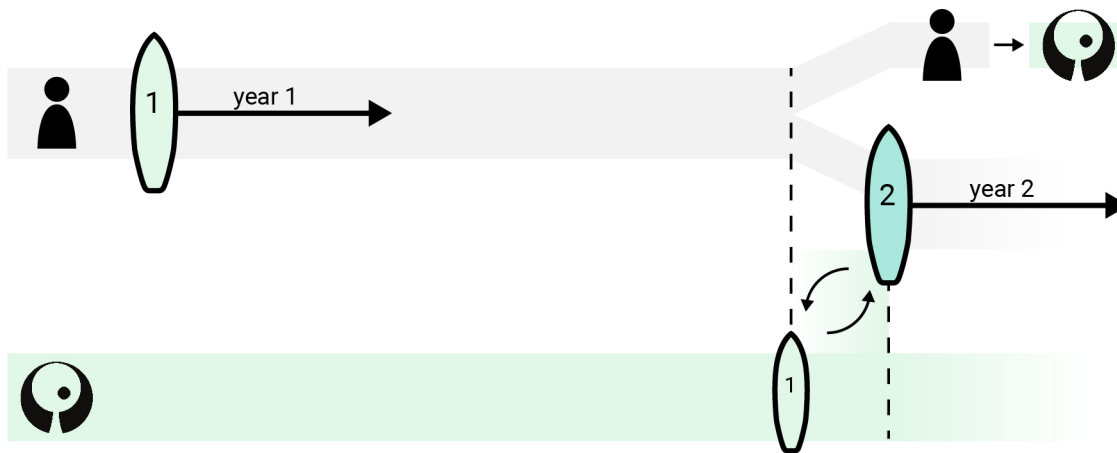
#### What is in it for the Appletree?

Ultimately, the company is able to sell (get rid of) used boards. On the other hand, profit can be made with subscriptions on these used boards, just like idea 2. When the assets stay within the ownership of Appletree, they are able to perform controlled maintenance and reparation when boards are returned.

#### What is in it for the environment?

Just like idea the previous two ideas, this model works with a stock of boards that has to be manufactured first. Although, when the model is operative, the boards will be checked and maintained after each use. This would lead to efficient, longtime use of the assets.

When the user chooses to keep the board after a year, the company loses the ownership. This goes against the sustainable properties that a PaaS model is about. Although, this model construction concerns used boards only. But then again: how is this a constant stock of used boards created?



## **Pros and cons**

### End-user

- + Financially attractive way to own a high-performance board
- + Option to keep the board or lease further

### Appletree

- + Profit on used boards only
- A stock of boards has to be manufactured first

### Environment

- + The model uses used boards only
- Manufacturing of the board stock
- The company could easily lose ownership over some boards that are kept

## **Future points of attention**

- The agreement to eventually return the board to the company (when the user chose to keep it) could be done with a strict agreement or a gentleman's agreement, based on good faith.
- There is a vague input of used boards within this model. It is not ideal to compensate leakage through buying, by adding newly manufactured constantly boards. Roulation of boards is something that is favored.

## Idea 4 - Levels

This PaaS-idea originates from a combination of idea 2 and 3. This blend of two model constructions could serve wave kites that want another board every now and wave kites with a low budget (end-user group 2 and 3).

### Model construction

This construction is built on the hierarchy of the 'silver and gold levels' that were proposed with idea 2, only now the structure of idea 3 is added to the hierarchy: a third, bronze-level. The silver-level concerns only second hand boards and the bronze-level multiple used boards. The image shows the course of a board through the different levels. For the example only 1-year subscriptions are used, while 2-year subscriptions are possible as well.

### What is in it for the end-user?

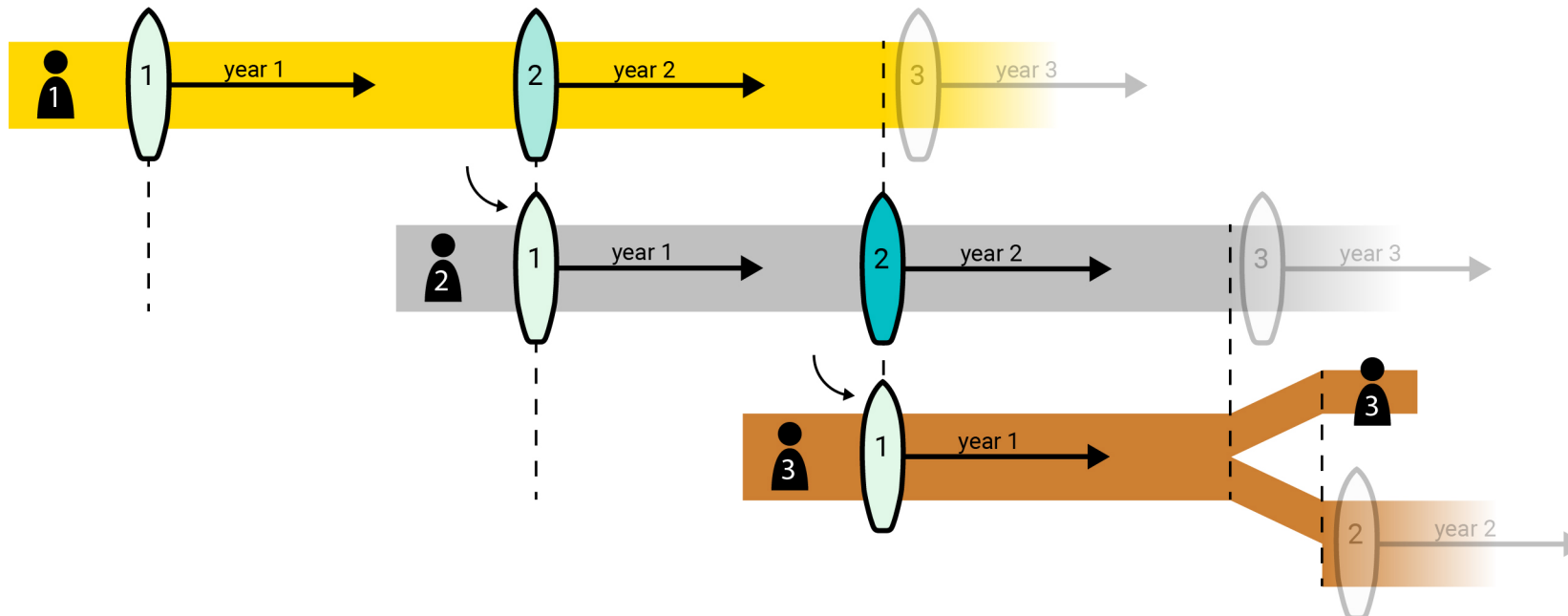
The added value of this model compared to those of idea 2 and 3 is that the blend of these two ideas benefits two end-user groups, instead of just one. The silver-level could serve end-users between the demands of the pilot that wants a new board every year and the student that does not have the money for a new board and doesn't mind a used one.

### What is in it for the Appletree?

By introducing a third level, the company has to regulate 3 board stocks at the same time. Though, they could serve two end-user groups and a bigger variety of customer demands by offering more options with these levels.

### What is in it for the environment?

The silver-level with only second hand boards is a more premium level than just a pool of used boards. Rotation within this model is like a digestive system that takes everything from what's going through it. The input of new boards from gold is turned into silver, where it is used again. Finally they arrived at bronze, where the boards will be used multiple times, until they are either paid off, or discarded from the PaaS as 'waste'.



## **Pros and cons**

### End-user

- + Ride a new board every year, or 2 years
- + Option to keep the board or lease further
- + Option to choose between two subscription levels
- + Financially attractive option for wave kites with a low budget
- The lease length might exceed the time (season) one actually want to use a board

### Appletree

- + Profit on new and (multiple) used boards
- + Stock is created, beginning by the gold-level
- Regulate stocks of 3 levels at the same time

### Environment

- + New boards are certain of being reused by sequential users
- The company could lose ownership over some boards that are kept
- New boards are manufactured constantly for gold-level subscription demand

## **Future points of attention**

- Only the bronze-level has the option to pay off the board. The value of these boards is the lowest, and should ideally be paid off with a student budget within a year. For gold and silver this isn't an ideal option, because you have to keep supplying the stock of the levels below them with used boards.
- Maybe the bronze-level is not needed and the silver-level can function in its place. This means that the silver-level would be the level with the pay off option. Price plays a factor in this. If a second hand board (not a multiple used board) can be paid off by a student within a year, then it is possible to discard a 3-level hierarchy.

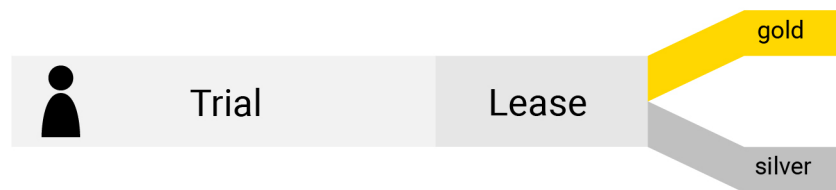
## Idea 5 - Trial & lease or buy

This PaaS-idea originates from a combination of idea 1.1 and 2. This blend of two model constructions could serve potential customers that want to try out boards and wave kites that want another board every now and then (end-user group 1 and 2).

### Model construction

This combination puts a trial period in front of a earlier presented gold-level or silver-level lease subscription. Idea 1.1 was initially made to still sell boards, which tended to just postpone linear use by a better decision. Preferably, assets shouldn't leave the PaaS or stay in it as long as possible.

This model start with a trial. Per month a different board model can be tried. When the right board is chosen, the user starts the lease subscription. Choosing the silver-level means the user can keep the board from the trial and the gold-level delivers a brand new board. The amount of trial-months will be added to the payment of the lease.



### What is in it for the end-user?

The freedom to test boards over a longer time, without any rush. Try out several models when and where you want to, in favored conditions. The user now has the option to try some board models before choosing one for a long-term lease. Choosing not to try a board is an option as well. Just like idea 2 the user is able to ride a new board every year, whether it is brand new or used.

### What is in it for the Appletree?

Same as in idea 1.1 the company offers a low threshold for potential customers get familiar with their boards. The company receives monthly payments and stays owner of the assets, which means they are able to perform controlled maintenance and reparation.

### What is in it for the environment?

Just like idea 2 boards won't end up in someone's shed when they're not used anymore, because they are returned to the company. Within the silver-level subscription, all boards will be used until they do not meet quality standards anymore (or end-of-life). Stock is created with ending gold-level subscriptions.

The trial and silver-level stock consist of (multiple) used boards boards. Just like idea 1.1, the boards are checked and maintained after each use. This would lead to efficient, longtime use of the assets.

## **Pros and cons**

### End-user

- + Try multiple boards without any rush
- + Make a more confident choice for lease
- + Ride a new board every year, or 2 years after trial
- + Option to choose between two subscription levels
- The lease length might exceed the time (season) one actually want to use a board

### Appletree

- + Profit on (multiple) used boards in trial and silver-level. Profit on new boards in gold-level.
- + Offer customers a great way to get familiar with boards
- + The company retains ownership at all times
- + Stock for the silver-level is created by the gold-level demand
- + Silver-level stock can be used for the trial
- Regulate stocks of new and used boards at the same time

### Environment

- + New boards are certain of being reused by sequential users
- New boards are manufactured constantly for gold-level subscription demand

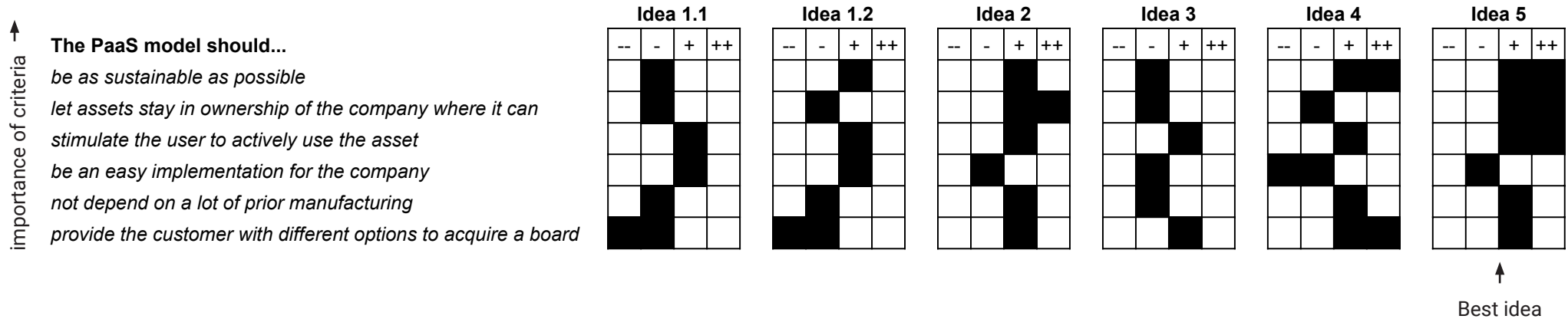
## **Future points of attention**

- See idea 2
- A third bronze-level for students could be implemented within this model as well. This would result in to the same subscription subdivisions as idea 4. End-user group 3 would be served then as well.
- The trial should have some kind of limit on the amount of boards to try. This would reduce logistics which is favorable for the company, the environment and maybe even the end-user.
- Possibility of using the flexible and effective trial of idea 1.2.

# D. Harris Profile

A Harris Profile was used to visualise the strengths and weakness of the ideas, with respect to design criteria that were set at that moment during the project. As all ideas had to meet the set 'requirements', the criteria that were 'wishes' at that moment were used to evaluate. The relative performances of the ideas were tested regarding these wishes.

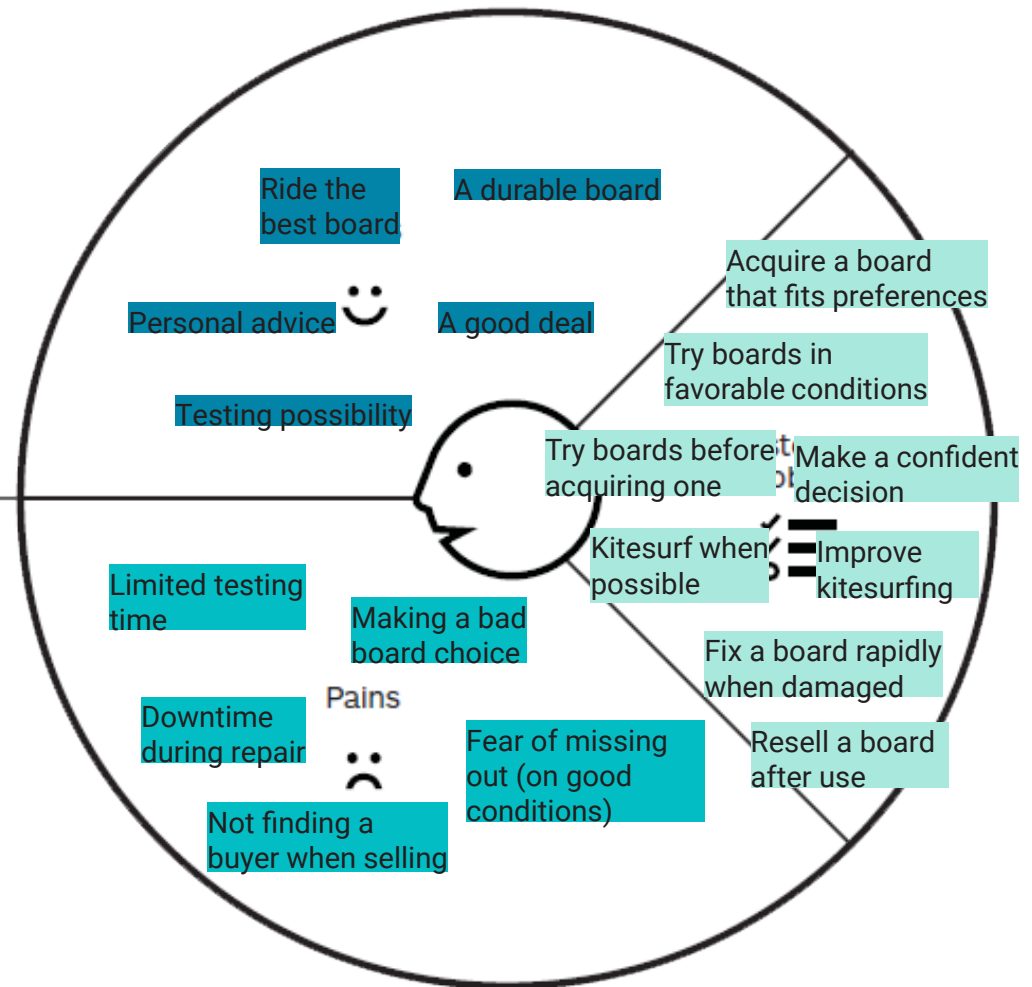
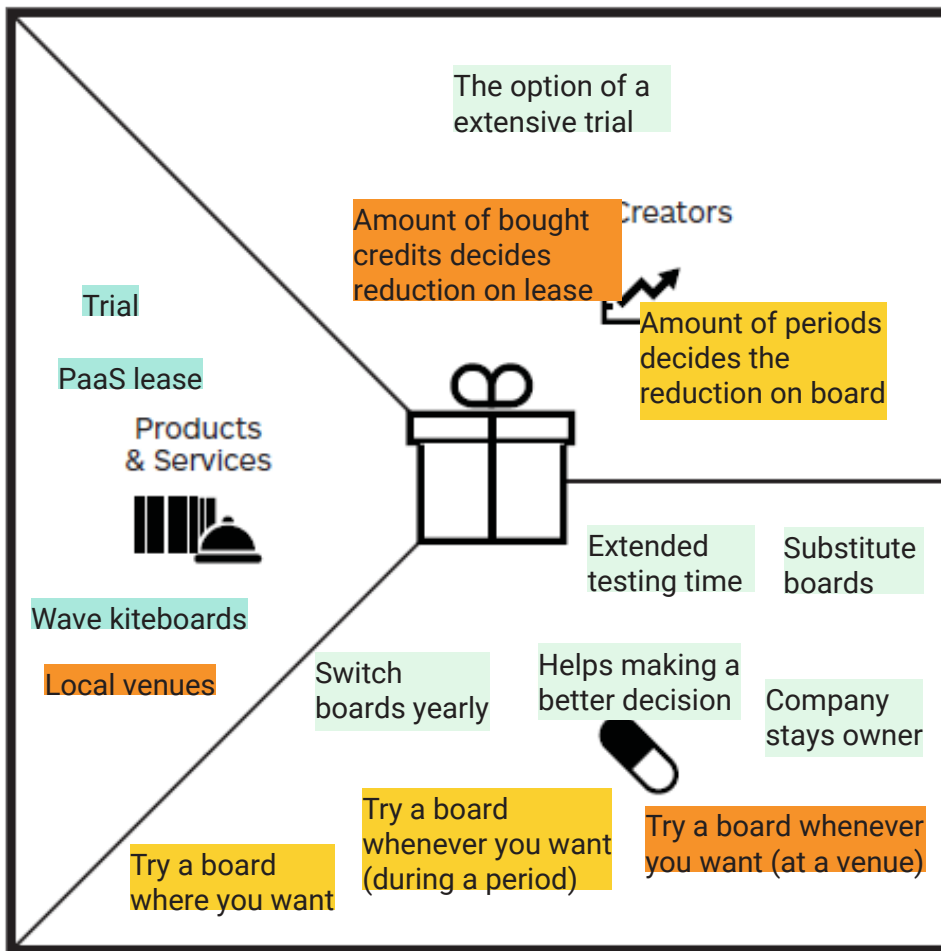
The criteria are ranked in order of importance. Each idea is evaluated by giving them a rating for each criterium, ranging from: --, -, +, ++. The best idea is chosen by taking into account the rating and the importance of the criteria. Idea 5 is chosen for this reason.



# E. Value Proposition Canvas

Concept specific:  
Term trial

Concept specific:  
Windy days trial



## The Value Map

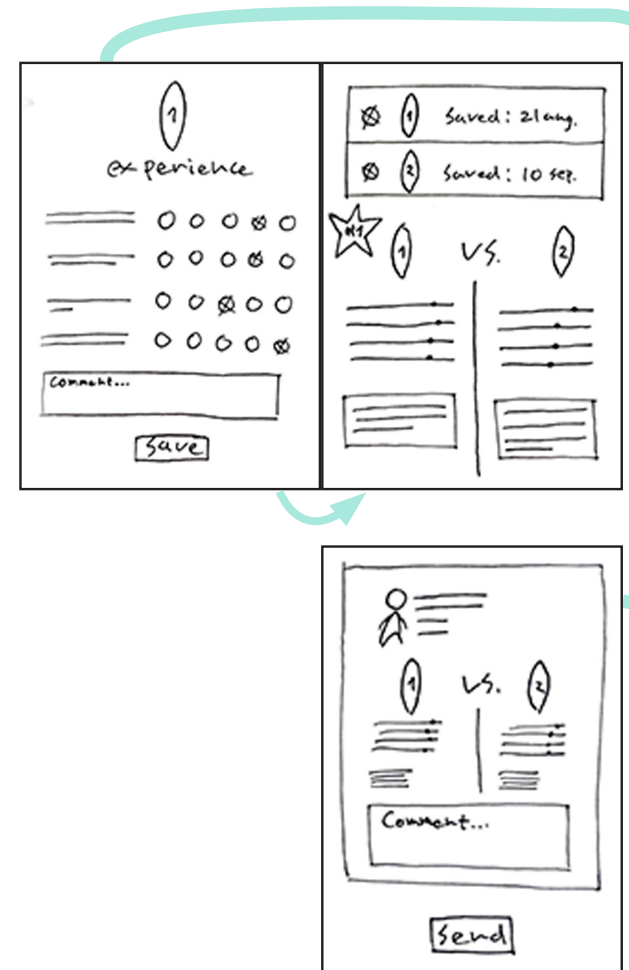
- **Products & Services:** This is a list of all the Products and Services a value proposition is built around.
- **Pain Relievers:** describe how your products and services alleviate customer pains.
- **Gain Creators:** describe how your products and services create customer gains.

## Customer Profile

- **Customer Jobs:** describe what customers are trying to get done in their work and in their lives, as expressed in their own words.
- **Pains:** describe bad outcomes, risks, and obstacles related to customer jobs.
- **Gains:** describe the outcomes customers want to achieve or the concrete benefits they are seeking.

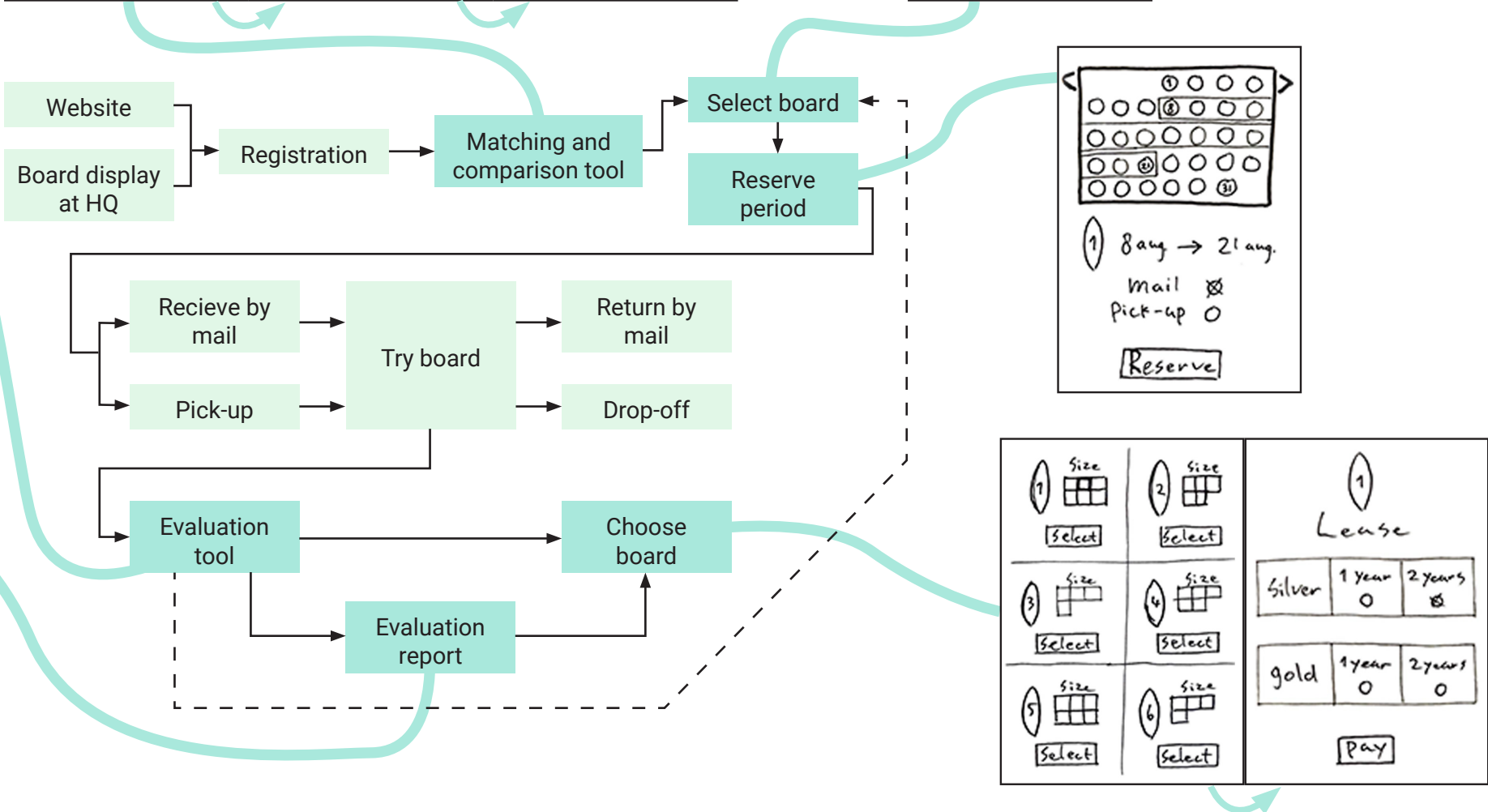
# F. Concept wireframes

## 1. Term trial



weight — height — Skill level beginner intermediate pro style wave <input checked="" type="checkbox"/> freestyle <input type="checkbox"/> <input type="button" value="Submit"/>	1		<input checked="" type="checkbox"/>	(1) vs. (2) 
	2		<input type="checkbox"/>	
	3		<input checked="" type="checkbox"/>	
	4		<input type="checkbox"/>	
	5		<input type="checkbox"/>	
			<input type="button" value="Compare"/>	

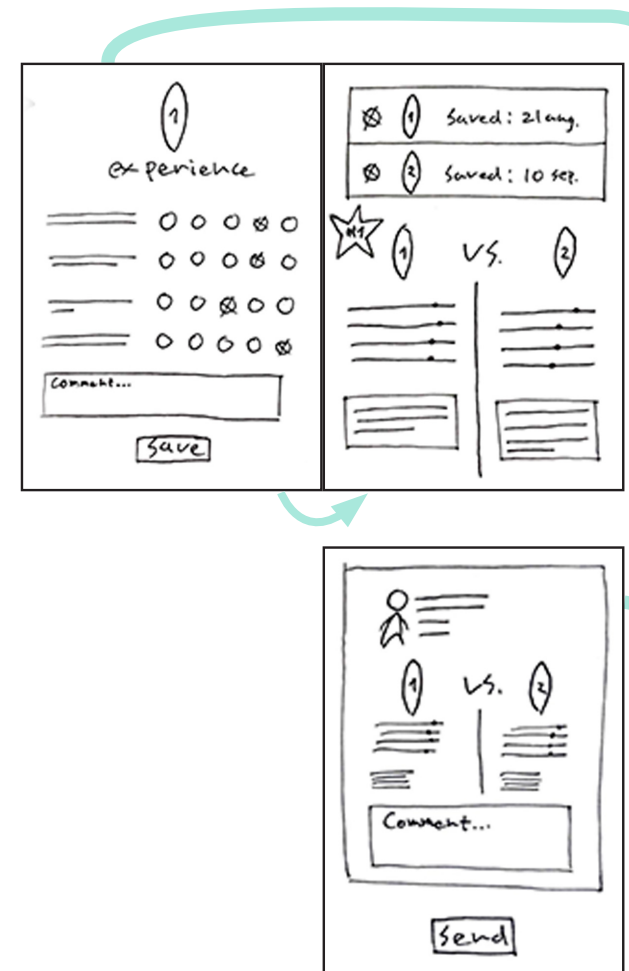
(1) Size <input type="checkbox"/>	(2) Size <input type="checkbox"/>
<input type="button" value="Select"/>	<input type="button" value="Select"/>
(3) Size <input type="checkbox"/>	(4) Size <input type="checkbox"/>
<input type="button" value="Select"/>	<input type="button" value="Select"/>
(5) Size <input type="checkbox"/>	(6) Size <input type="checkbox"/>
<input type="button" value="Select"/>	<input type="button" value="Select"/>



(1)	(2)	(3)	(4)	(5)	(6)
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(1) 8 aug → 21 aug. mail <input checked="" type="checkbox"/> pick-up <input type="checkbox"/> <input type="button" value="Reserve"/>					

(1) Size <input type="checkbox"/>	(2) Size <input type="checkbox"/>	(1) Lease <table border="1"> <tr> <td>Silver</td> <td>1 year</td> <td>2 years</td> </tr> <tr> <td></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>gold</td> <td>1 year</td> <td>2 years</td> </tr> <tr> <td></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table> <input type="button" value="Pay"/>	Silver	1 year	2 years		<input type="checkbox"/>	<input checked="" type="checkbox"/>	gold	1 year	2 years		<input type="checkbox"/>	<input type="checkbox"/>
Silver	1 year		2 years											
	<input type="checkbox"/>		<input checked="" type="checkbox"/>											
gold	1 year		2 years											
	<input type="checkbox"/>		<input type="checkbox"/>											
<input type="button" value="Select"/>	<input type="button" value="Select"/>													
(3) Size <input type="checkbox"/>	(4) Size <input type="checkbox"/>													
<input type="button" value="Select"/>	<input type="button" value="Select"/>													
(5) Size <input type="checkbox"/>	(6) Size <input type="checkbox"/>													
<input type="button" value="Select"/>	<input type="button" value="Select"/>													

## 2. Windy days trial



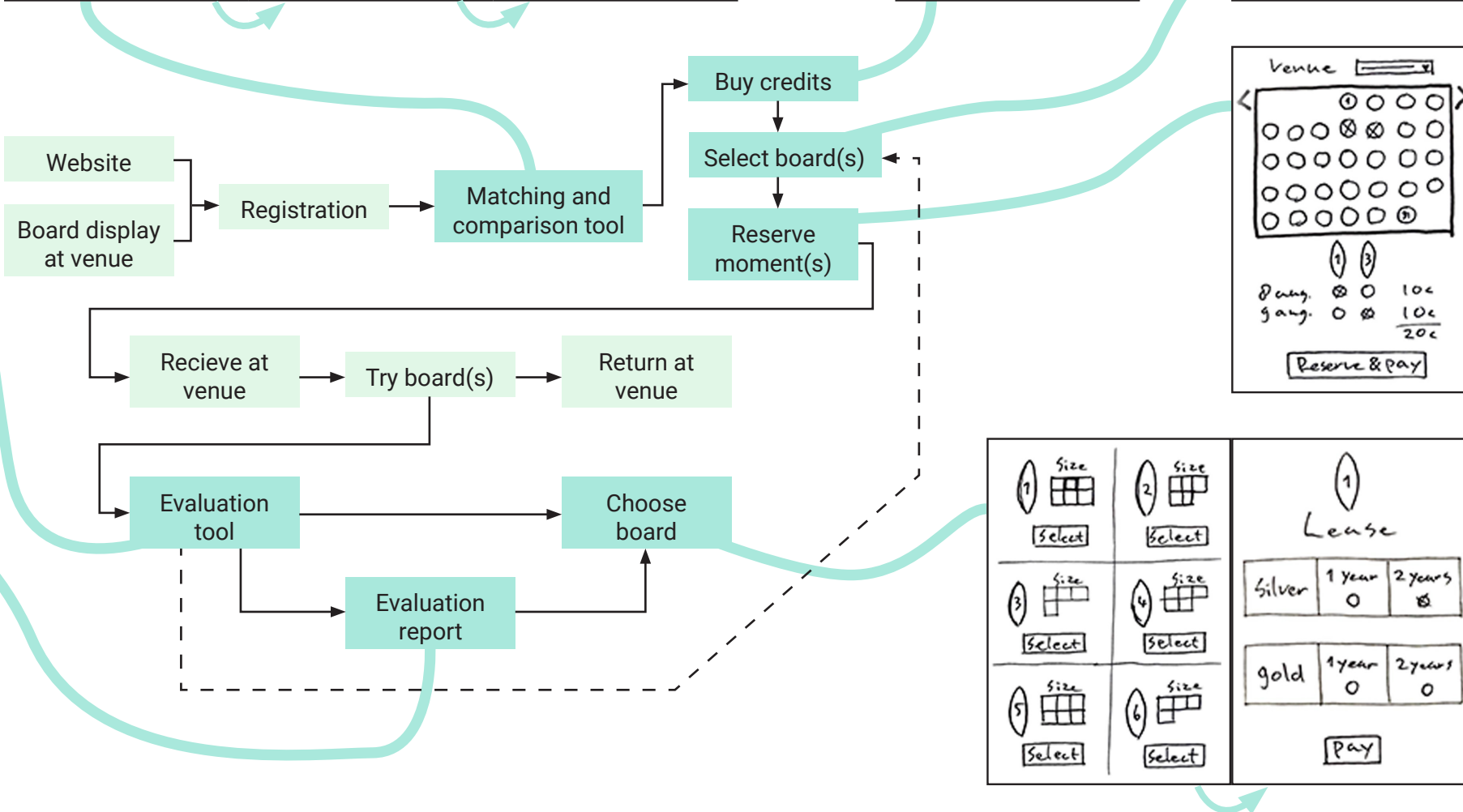
weight —  
height —  
Skill level  
beginner intermediate pro  
style  
wave  freestyle

1		<input checked="" type="checkbox"/>	vs.	
2		<input type="checkbox"/>		
3		<input checked="" type="checkbox"/>		
4		<input type="checkbox"/>		
5		<input type="checkbox"/>		

5	€ - 0
10	€ - 0
20	€ - <input checked="" type="checkbox"/>
50	€ - 0
Amount	€ - 0

Credits: 20/€ -

1	Size	2	Size
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Size	4	Size
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Size	6	Size
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



1	Size	2	Size
<input type="button" value="Select"/>	<input type="button" value="Select"/>	<input type="button" value="Select"/>	<input type="button" value="Select"/>
3	Size	4	Size
<input type="button" value="Select"/>	<input type="button" value="Select"/>	<input type="button" value="Select"/>	<input type="button" value="Select"/>
5	Size	6	Size
<input type="button" value="Select"/>	<input type="button" value="Select"/>	<input type="button" value="Select"/>	<input type="button" value="Select"/>

Lease

Silver	1 year <input type="checkbox"/>	2 years <input checked="" type="checkbox"/>
gold	1 year <input type="checkbox"/>	2 years <input type="checkbox"/>

# G. User test related

## Interaction quality scales

### Concept 1 - Term trial

Beoordeel het concept op de volgende punten:

	+++	++	+	+/-	-	--	---	
controle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	geen controle
makkelijk	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	moeilijk
zelfverzekerd	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	onzeker
persoonlijk	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	onpersoonlijk

### Concept 2 - Windy days trial

Beoordeel het concept op de volgende punten:

	+++	++	+	+/-	-	--	---	
controle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	geen controle
makkelijk	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	moeilijk
zelfverzekerd	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	onzeker
persoonlijk	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	onpersoonlijk

# PrEmo

### Concept 1 - Term trial

Welk gevoel gaf deze concept experience video?

1 = ik voelde het licht  
2 = ik voelde het  
3 = ik voelde het intens

<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Vreugde	Hoop	Trots	Bewondering	Tevredenheid	Fascinatie	Aantrekkingskracht
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Verdriet	Angst	Schaamte	Minachting	Ontevredenheid	Verveling	Walging

### Concept 2 - Windy days trial

Welk gevoel gaf deze concept experience video?

1 = ik voelde het licht  
2 = ik voelde het  
3 = ik voelde het intens

<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Vreugde	Hoop	Trots	Bewondering	Tevredenheid	Fascinatie	Aantrekkingskracht
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Verdriet	Angst	Schaamte	Minachting	Ontevredenheid	Verveling	Walging

# User test procedure

## Introductie

Voor mijn afstudeerproject ben ik een duurzame service aan het ontwerpen voor de Appletree Surfboards. In deze service worden hun kiteboards aangeboden als een dienst. Je krijgt eerst de mogelijkheid boards uit te proberen. Daarna is het mogelijk een board te leasen voor een vast bedrag per maand. Wij gaan vooral kijken naar het eerste gedeelte: de 'trial' (proefperiode).

Eerst een paar vragen:

- Hoe oud ben je?
- Hoeveel jaren ervaring heb je met wave kitesurfen?
- Ben je een Appletree bezitter?
- Is het goed als ik onze gesprekken opneem? Dit is voor mij handig om terug te luisteren. Je blijft anoniem

Start audio recording

## Experience videos

Ik heb twee concepten ontwikkeld voor deze 'trial'. Ik laat je van elk concept een korte video zien, waarin het concept wordt gepresenteerd. Na elke video vraag ik je om gelijk het gevoel dat er bij je opkomt te uiten op dit blad (PrEmo). Je mag een of enkele emoties kiezen en invullen hoe sterk je dit voelt. Zo eerlijk mogelijk natuurlijk. Daarna vraag ik je naar onderbouwing.

- Waarom koos je voor deze emotie(s)?

## Storyboards

Nu zullen we wat dieper gaan duiken in de structuur van elk concept. Hiervoor doorlopen we storyboards: dit zijn weergaven van de stappen die je zou doorlopen in beide concepten. Na het doorlopen van een storyboard vraag ik je om dit blad in te vullen (Interaction quality scales). Daarna zal ik weer vragen naar je onderbouwing.

- Wat triggerde je om deze beoordeling te geven?

## Laddering

Nu je meer weet over hoe de concepten in elkaar zitten, welke belangrijke verschillen kan je opnoemen?

Noteren verschillen

- Welke producteigenschappen zijn belangrijk voor jou?
- Waarom is dit belangrijk voor jou?

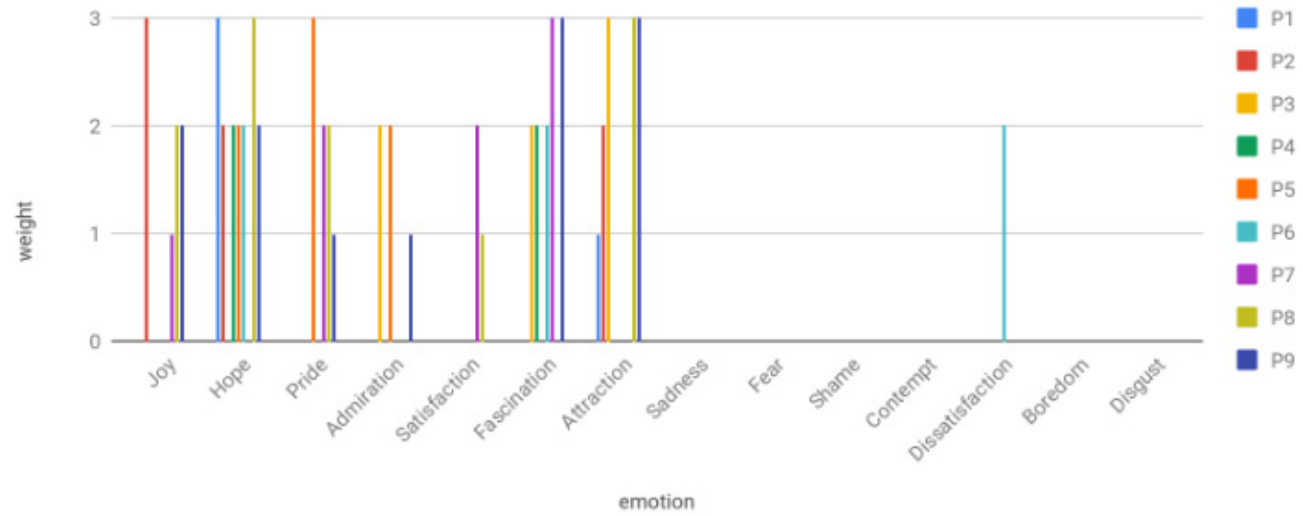
## Open discussie

- In welk scenario zou je het liefst een trial willen doen?
- Verschilt jouw concept voorkeur als je twijfelt tussen meer of minder boards (eentje bijvoorbeeld)?
- Zou je een trial service liever zien als een losse service?
- Wat vind je van de flexibiliteit en speelruimte van de concepten en hoe zou je dit verbeteren?
- Welke verbeteringen zou je willen toepassen?
- Heb je nog andere opmerkingen?

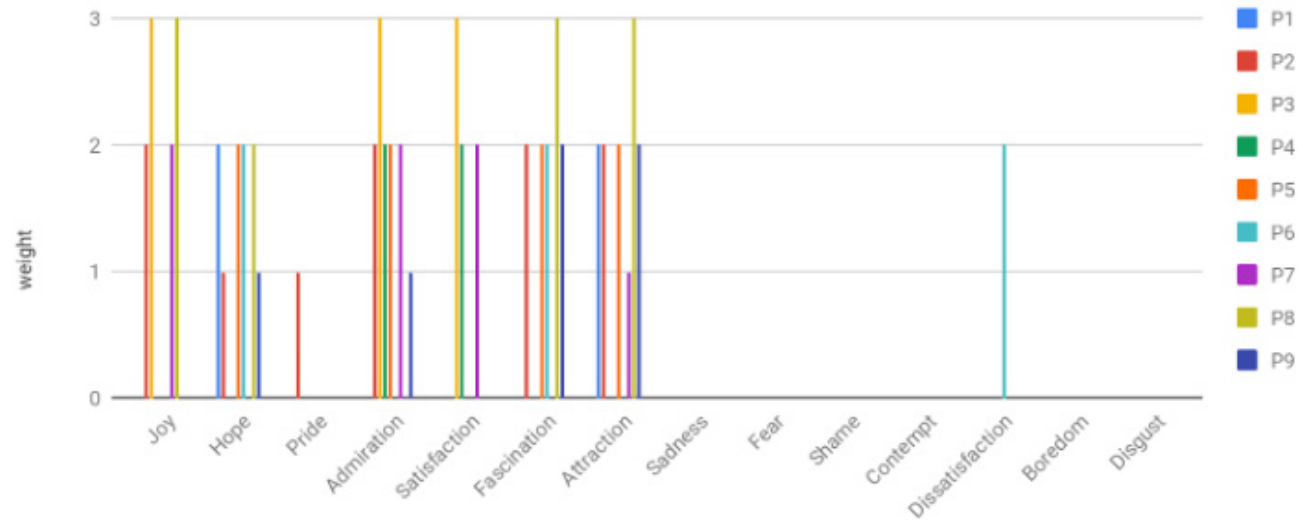
# H. User test data

## PrEmo data

PrEmo data - Term trial

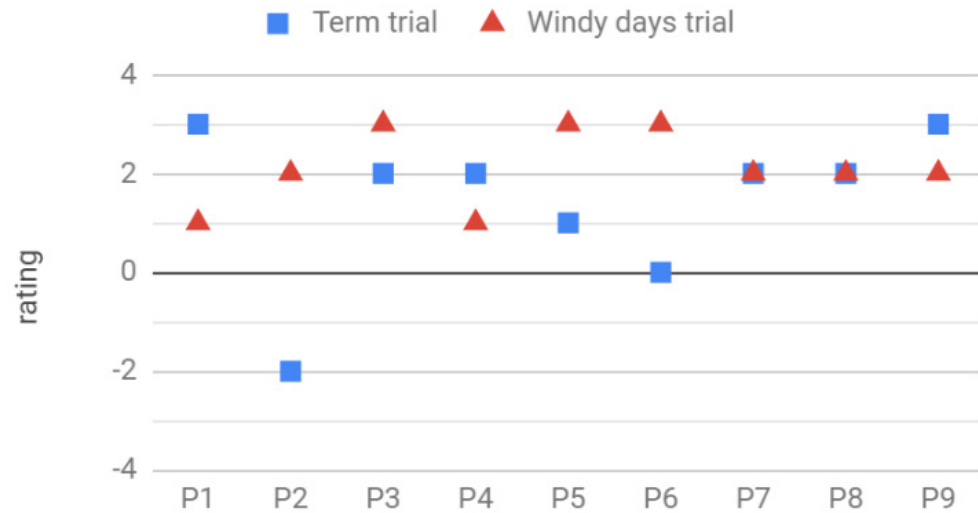


PrEmo data - Windy days trial

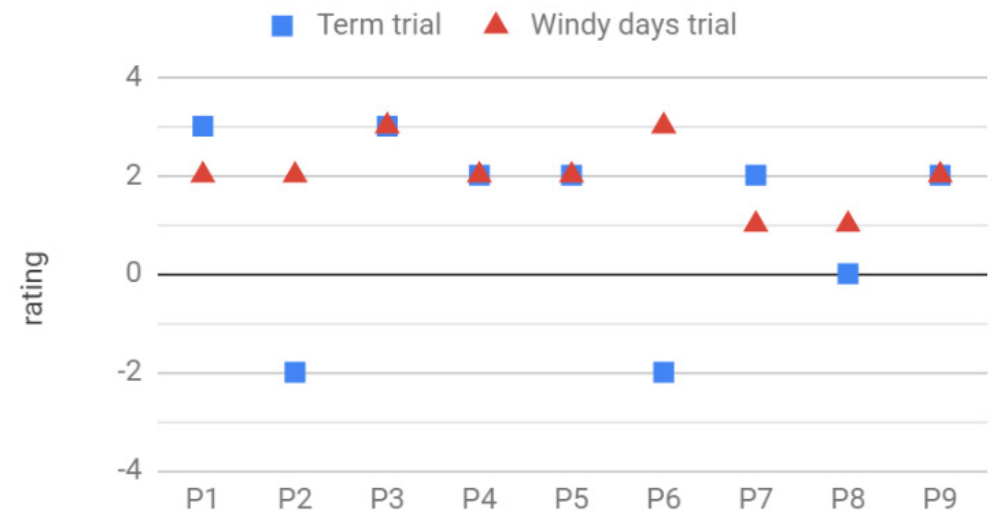


# Interaction quality scale data

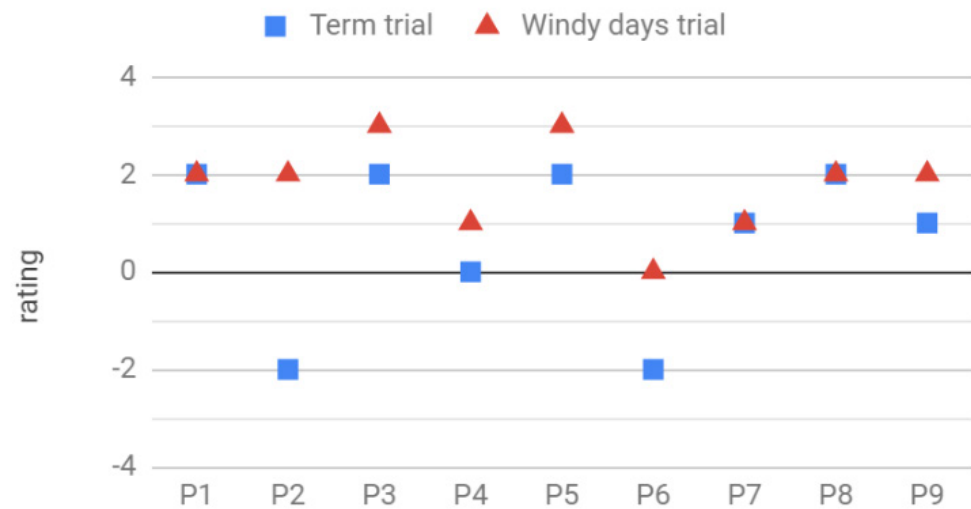
## Controlled



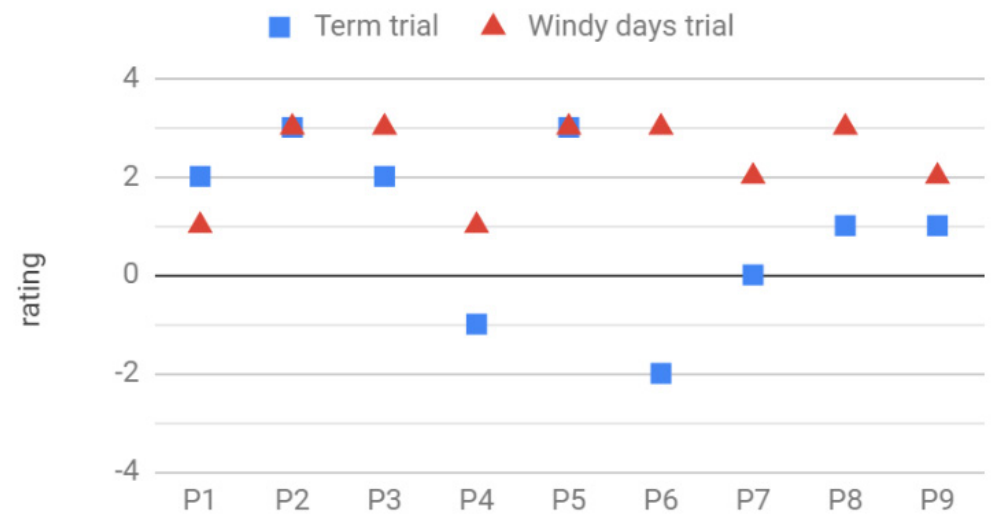
## Easy



## Confident



## Personal



# I: List of requirements

These criteria were set up with input from the company, learnings from PSS company cases and interviews.

The PaaS model should...

## **Demands**

### *end-user*

- assign a product to an individual.
- enable sequential use by multiple users.
- let the user try a board first, before entering a long-term use agreement.
- prevent an individual to use a board longer than 3 years.
- give users the freedom to take a board anywhere they would like to take it.

### *company*

- be implemented next to the current company activities.
- be cost neutral by all means.
- first serve the Dutch market.

### *environment*

- be sustainably beneficial compared to current linear use of wave kiteboards.
- permit a board to be used actively and efficiently until its end-of-life.

### *assets*

- only consist of fiberglass laminated wave kiteboards.
- use standard wave kiteboard models, without any custom alterations.
- impose the user to pay a fee when damage occurs.
- retain the standard 1 year product warranty on new boards for construction errors.
- ensure assets to return to the company after use.
- facilitate quality checks on all returned assets.
- repair damaged assets to company standards.

## **Wishes**

- be as sustainable as possible
- be an easy implementation for the company
- let assets stay in ownership of the company where it can
- stimulate the user to actively use the asset
- not depend on a lot of prior manufacturing
- provide the customer with different options to acquire a board
- ensure that assets can't escape the PSS completely.
- let the company recycle and responsibly process assets at their end-of-life.
- have its logistics facilitated as local as possible
- let the user make autonomous decisions

