The Long Now:
Strategic Design Workshops
for Non-Designers

By Celine Tesselaar
In collaboration with
Vanderlande Industries B.V.

" Creativity is thinking up new things,
Innovation is doing new things"
- Theodore Levitt

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Acknowledgments

Here in front lays the final step of my study MSc Strategic Product Design. For the past months, I have been working for Vanderlande Industries to create workshops and finalize outcomes of these workshop to help them innovate in a new and exciting way, namely through design. In this journey, there were several hoops and hurdles, but luckily there was sufficient support to overcome these. For this, I would like to express my gratitude to some people for guiding me, throughout this thesis but also throughout my life.

Firstly, I would like to thank Vanderlande Industries and Odeke Lenior in particular. Although the start was difficult because of all the circumstances, the team and participants of the workshop felt welcoming. I am happy to deliver this thesis that brings new potential to the company and I am curious to see the outcome of the next innovation steps Vanderlande is going to take. Odeke, thank you for your creativity, new insights, and for being my guide in the complex world of smart logistics.

Secondly, I would like to thank my supervisory team, Lianne Simonse and Bart Bluemink. Lianne, for encouraging me to be critical and for all your advice on the topic and on strategic design. Bart, for your endless energy and support and for helping me think in new directions through our numerous meetings.

Furthermore, I would like to thank all the people working at Vanderlande who participated in the workshops and for spending time giving me their feedback on all the different elements I designed. Also, I would also like to thank all the professionals I could interview throughout this project, your insight were truely valuable.

Lastly, I would like to thank my family and friends. My family, who has supported me throughout my entire studies, even though they have no clue of what I am doing. My friends, for helping me with testing the workshops, giving their feedback and their energy, or for the small coffee breaks that we had. Boaz, thank you for always being there for me when I need you. You have truly made me a better person.

Enjoy,

Celine Tesselaar

Executive Summary

Vanderlande Industries B.V. is the global market leader for future-proof logistics process automation at airports and in the parcel market and the leading supplier of process automation solutions for warehouses. Vanderlande gained its number one market position from constant innovation and making great quality products, meeting the question of the customer and coming from a technology-driven perspective. However, to stimulate their innovation, bridge existing knowledge silos, and be ready for VUCA Worlds, Vanderlande wants to have the right creative response. Through a series of collaborative workshops, a group of Vanderlande employees from different departments is guided through the process of Design Roadmapping called The Long Now. The scope of this project is Traveling in Europe process will focus on centralizing the passenger, instead of the airport as a driver for innovation and value. Furthermore, there is a plan to use the workshops also for other domains, e.g. parcels and warehousing. This led to the initial research question: "How to create a digital process of Design Roadmapping in which the passenger is central for Vanderlande and that could be transmitted to different domains?"

Through a theoretical background, the design of The Long Now can be separated into three different levels: Firstly, The Long Now Process design, on this level all design choices regarding the process and outline of the workshops are defined, including the involvement of senior management. Secondly, the strategic workshop design, on this level is the design of the strategic workshops necessary to build the design roadmap. And lastly, the knowledge design. The workshops are for non-designers, so the needed design research was done beforehand and served as input for the different strategic workshops. On all three levels, guidelines were created as a foundation to design for these layers.
Secondly, because of the existing knowledge silos within Vanderlande and the externally created design knowledge that needs to be adopted by the participants, knowledge barriers within the group can occur. Knowledge boundaries happen when ideas are so novel that a new language, interpretation, or interest is needed. Therefore, the right design frames and tools for knowledge crossing are necessary. All these different insights are transformed in a design goal:
"Design the process, strategic workshops, and content for "The Long Now" that is transmittable to different domains following the created guidelines and that helps in crossing any existing knowledge boundaries by designing the tools/ frames/ methods for this."

Through continuous iteration loops, the workshops and the necessary design frames were first tested and redesigned, to make sure that the flow of the workshop and the knowledge crossing elements were optimal. The final design of the Long Now is a set of Design Roadmapping workshops that is ready to be transmitted to the next domain of airports. Based on this first version of the workshop, a set of recommendations is written for the next Long Now, which will take place in other domains.

In addition to this research, the strategic workshops also produced outcomes regarding the scope of Traveling in Europe, which resulted in a future vision statement for Vanderlande: In 2050, Vanderlande orchestrates seamless, sustainable connections for every journey.

Reading Guide

The reading guide is created to help the reader in the understanding of the thesis.

This project consists of multiple chapters. At the end of every chapter, the key takeaways of that chapter are written in the dark blue cirkels.

Text given in the light blue text box indicate extra information

Text in the light blue box and orange text shows outcomes of The Long Now. The focus of the thesis is more on the design of the process than on the specific outcomes, however small elements will added to show as a case study

Text between lines either display interesting quotes said in the project or in the interviews

To indicate where each chapter fits in the project, there is a small visualisation present of the process on the corner of each left page where the orange filled shows the step.

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Chapter 1 | 01
Project Introduction |

This chapter gives an introduction to the topic of the thesis. It gives the initial problem statement and explains the objectives of this thesis.

Vanderlande Revenue split (FY2019)

- Warehousing
- Airports
- Parcel

4 million pieces of baggage

Active in 600 airports

48 million pieces of parcels

Figure 1.1: Vanderlande's facts and figures

1.1. Vanderlande Industries

Vanderlande Industries is a company established in 1949 in Veghel, The Netherlands. Vanderlande has grown over the years from developing machines for the textile industry to transport systems, and eventually to their current business in creating future-proof logistic process automation. Vanderlande delivers fully integrated solutions, including the systems, software, and life-cycle services to three different markets: Airports, Parcel and Warehousing.

They are the global market leader for future-proof logistics process automation at airports and in the parcel market and the leading supplier of process automation solutions for warehouses. They are active in over 600 airports worldwide, where they are capable of moving over 4 billion pieces of baggage annually. Also, more than 48 million pieces of parcels are being sorted by systems created by Vanderlande by some of the world's most leading Parcel companies (Fig. 1.1.) (Vanderlande Industries B.V. 2021).

1.2. Challenges at Vanderlande Industries

Vanderlande gained its number one market position from constant innovation and making great quality products, meeting the question of the customer and coming from a technology-driven perspective. However, the world is changing every day, new technologies arise, customer demands change and external factors come into play. All of this could affect the number one position of Vanderlande in the future. To understand how to secure this global number one position and optimize growth, we need to identify opportunities and solve the current challenges.

Vanderlande experiences different challenges which could effect their current business from innovation and withhold them from having a strong competive advantage.

Bridging the knowledge silo's

Firstly, there is great potential inside Vanderlande. They develop innovative technology and keep strong relationships with their direct customers. However, the knowledge that each department generates does not transfer to the other departments. Relevant knowledge remains in its silo, which is a risk of innovation. Knowledge silos can misalign roles, misallocate resources and diminish responsibilities (Serrat, 2017). Knowledge is one of the largest strengths of Vanderlande, so the optimal use of this knowledge is important. The right business opportunities should be matched with the right technology to unlock all potential. By sharing internal knowledge you can maximize the strengths of a company and make sure it adjusts to this changing world and creates a competitive advantage (Reid, 2003).

Human-Centered Design

Vanderlande's current innovation is driven by technology, by scouting technology and finding effective use for them. But, besides technology feasibility and business viability, there is also a need to understand the user in the form of desirability (van Boeijen et al., 2013). This understanding happens by understanding the value, needs, and wishes of users. This user can be your direct customer (airports in the case of Vanderlandes current strategy). But this user can also be one step further away, the end-user, which is the traveler. If we understand the needs they have, we can create an optimal user experience which is an important driver for competitive advantage and business success, and hit the "Sweet spot of innovation" (Lemon and Verhoef, 2016).

Nowadays focussing on problem-solving and making flawless working systems is not enough. Customers want better experiences (Hilden et al., 2016). To understand what these experiences should be like, Vanderlande should not only understand this end user now but more importantly discover what they care about and need in the future.

External Threads

Lastly, Vanderlande is dealing with large (future) threads in the airport markets. One of the largest threats they have to deal with now is the effects of the COVID-19 pandemic on air transportation. The revenue for services for air traffic, including airports, has decreased over 71% compared to 2019 and it is not expected to be restored to pre-Covid 19 levels until 2024 (CBS, 2021; IATA, 2020). This could lead to large issues, as airports represent 37% of their revenue as of 2019 (Vanderlande Industries B.V. 2021).

But also external factors can occur, what if there is a new entrant in the market? What if flying inside the EU is no longer the logical option, maybe due to the hyperloop or political decisions? All these uncontrollable elements are the dimensions of the so-called VUCA Worlds (Volatile, Uncertain, Complex and Ambiguous). All future scenarios could occur and require an innovative answer. (Buccolo & Matthews, 2010).
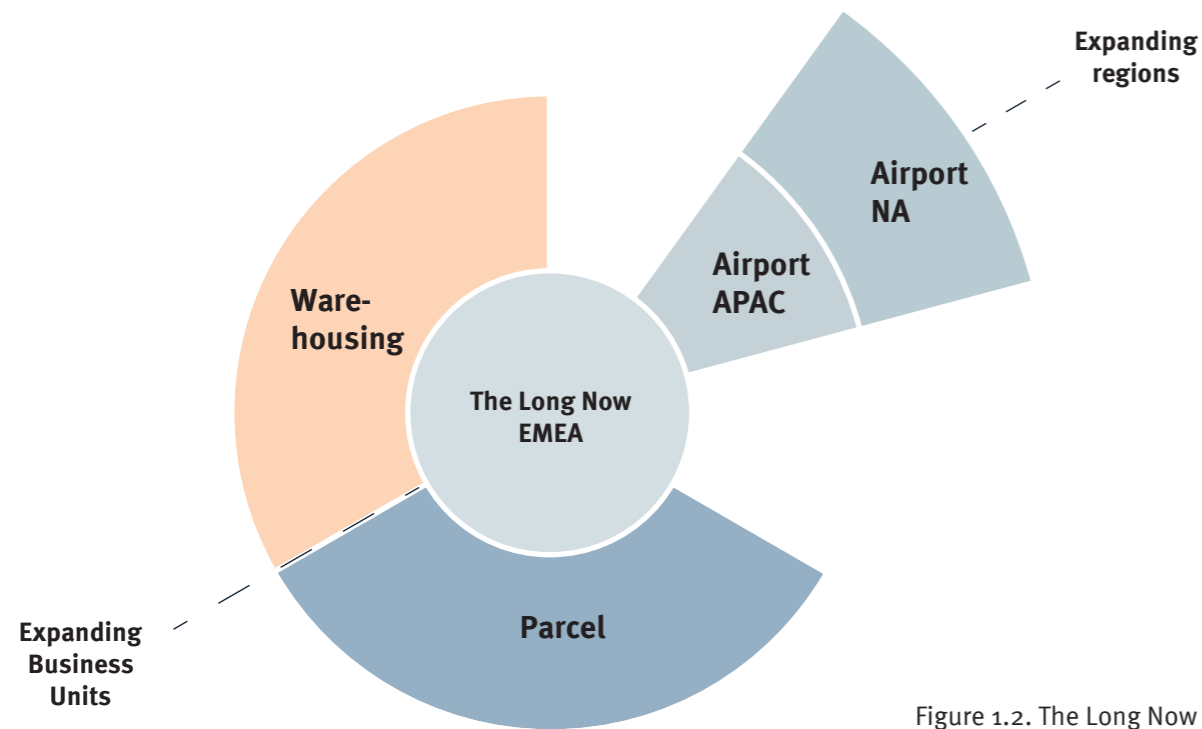
Figure 1.2. The Long Now in Expanding regions and domains

1.3. Solution

Vanderlande aims to be ahead of these future strategic challenges by having the right creative responses and securing its position in the market. They want to get a better understanding of the future and generate ideas on how to turn them into new value propositions. To do so they need to eliminate or transform external threats and build on their internal strengths of technology and business knowledge. Also, collaboration, coordination, capability, and connection are necessary to bridge the organizational silos (Serrat, 2017). And lastly, VUCA worlds require a deeper understanding of customer needs (Kim et al. 2018).

All of these solutions come together in the method of Design Roadmapping. Design Roadmapping is the process of creating a roadmap with design innovations that has a future vision as its end (Simonse, 2018). Through a series of collaborative workshops, a group of Vanderlande employees from different departments will be guided through the process of Design Roadmapping, with the final product of having a design roadmap. Because Roadmapping already has an established definition inside Vanderlande, the process will be called "The Long Now".

1.4. Scope

Set-Up
The Long now is a set of strategic design workshops in which employees of Vanderlande will build towards the creation of a strategic and tactical roadmap. In every workshop, they will either learn skills embedded in design thinking or work on aspects of the Design Roadmap (Simonse, 2018). All of this to conclude the final result.

Domain
As previously said, Vanderlande operates in three domains: Airport, Parcel, and Warehousing. The scope of this assignment will be focussed on the Airport domain. However, the scope for the roadmap will not be Airports, but Traveling in Europe. This scope was chosen as it embeds the end-user in the outcome and looks for fully integrated and holistic solutions. In the journey of traveling, airports are only a small segment for the passenger. Furthermore, the scope of traveling through Europe was chosen because Vanderlande is active worldwide, but the workshops will only be carried with employees residing in Europe.

"No passengers has as final distination the airport they are travelling to"
- Lianne Simonse

Process
It is expected that if the workshops turn out to be successful, they will be carried out to the other domains of Warehousing and Parcel as well as to the Asian- Pacific and American region. The workshops must be shaped in a way that they can be transmitted to different directions, as this project will form the base for the next workshops (Fig 1.2.).

1.5. Initial Research Question

In summary, Vanderlande wants to create a set of workshops that builds towards a design roadmap. That should be possible to transmit into different domains. This leads to the following research question:

"How to create a digital process of Design Roadmapping for Vanderlande in which the passenger is central and that could be transmitted the different domains?"

In making these workshops, a few things are necessary to research before they can be made successful. Those sub-questions are highlighted below.

Digital Design Roadmapping workshop
Design Roadmapping is a new design process for Vanderlande. Therefore a good understanding is needed of how Vanderlande could benefit from this strategic process but also how the workshops can be optimized for Vanderlande's context.This leads to the following subquestion:

"How to structure Design Roadmapping in a way that benefits vanderlande and its employees?"

In addition to this, the workshops should also take place in a digital environment. The project has been started and is expected to finish during the

global pandemic. Vanderlande has followed the given advice from the Dutch government to work from home if possible. One of the obstacles in this is that the participants have never done any design roadmapping workshops. This means that the workshop should guide the participants in the process, but also match with the current innovation strategies created by Vanderlande and be suitable for an online environment. This leads to two questions:

"What elements are essential in a Design roadmapping workshop, and how can we digitize those?"

"How to create digital workshops that are successfull for all participants?"

Bridging Knowledge Silos
Secondly, Vanderlande has different knowledge silos in which they operate. An important aspect of the Design Roadmapping workshops is that participants with a multidisciplinary background work together to succeed. Therefore we should understand how we can dig up this knowledge but also use this knowledge efficiently in the workshop and cross the existing knowledge silos. This leads to the following question:

"How to cross any existing knowledge silo between participants through the use of Design Roadmapping and digital strategic Workshops"

"Which boundary objects or design tools/

artifacts are necessary for successful knowledge crossing in the workshops."

Focus on End- Users
Vanderlande operates in a Business-to-Business environment, where they sell their products and services to airports. An interesting perspective is, if we look further down the value chain, to the end-user, in this case, the passenger. The passenger is the one paying for the services and experiences delivered by the airport and therefore by Vanderlande. It is important to understand this customer in order to create better value.

"How to incorporate the (future) end-users perspective in the process of Design Roadmapping and in Vanderlande's given context"

Strategic Workshop Design

Knowledge Design

| | Theoretical Background | Insights | | Workshop Design | | | | |

Project Brief

Design Goal

Final Design

Theoretical Background

Company Analysis

Insights

Guidelines

Strategic Approach

TLN

Process Design

Knowledge Collect

Trend, User, Tech Research

Testing

Observations

Interviews

Redesign

Discover　　　　**Define**　　　　**Ideate**　　　　**Deliver**
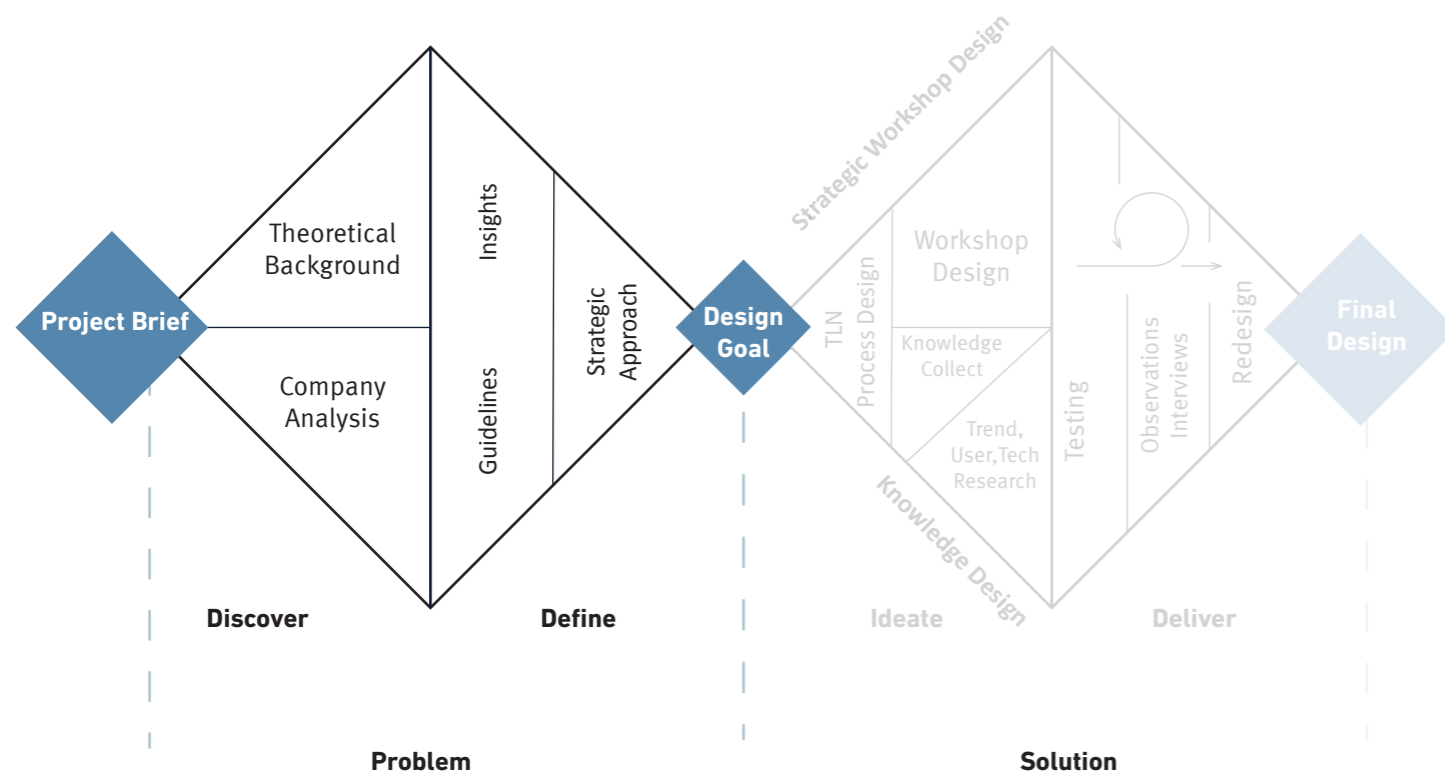
Problem　　　　　　　　Solution

1.6. Approach

The design of this project can best be described with a double diamond. In a double diamond process, two diverging and converging activities take place, one aimed to design for the right problem, and one to design the right solution (. There are four main stages distinguished. The first part of this double diamond is explained in this chapter.

Discover
The project starts with a deep dive into the topic to make sure the right thing gets designed. This phase starts with researching Vanderlande, to understand their current context and processes. Secondly, it also dives into the topic of online workshops, design roadmapping and the communication objects necessary in the long to answer the research questions

Define
This deep dive gets converted into guidelines and insights how the workshops and process should be structured. These insights and guidelines form the strategic design approach for the next phase of this project by explaining the second diamond.

Design Goal
Based on the insights a design goal is formulated and the boundaries of this thesis are given.

1.7. Objectives

This thesis holds four objectives

A set of strategic design workshops that build towards a Design Roadmap

The main goal of the workshops is to create a workshop for Vanderlande that enables the Design Roadmapping Process. The end product of these roadmapping workshops is a tactical and strategic roadmap that represents all decisions and outcomes made in the workshop in a way that they form a logical pathway towards a future vision. The roadmaps are the final document and will be distributed to board members and other employees of Vanderlande.

The workshops which can be transmittable in different domains

In case of a successful outcome, the workshops will be transferred to the different domains and regions. This means that workshops should be transmittable for these domains of Vanderlande, as the final outcome of the workshops.

It benefits the servitization strategy Vanderlande by incorporating the end-users and design thinking.

The workshops and the technique of design thinking are aimed to be something living inside Vanderlande. The workshops should help to build a foundation among the employees in design thinking, and therefore thinking with a user perspective.

It investigates the necessary boundary objects needed in both the communication of the end-user as the communication within Vanderlande

Multiple employees from different departments and with different backgrounds will be working on this project. Therefore it is good to research how we can incorporate the end-user to all of them and how we can facilitate communication between them.

Key Takeaways

Vanderlande Industries is the global market leader for future-proof logistics process automation at airports. Vanderlande gained its number one market position from constant innovation and making great quality products, meeting the question of the customer and coming from a technology-driven perspective. However, to stimulate their innovation, bridge existing knowledge silos, and be ready for VUCA Worlds, Vanderlande wants to have the right creative response. Through a series of collaborative workshops, a group of Vanderlande employees from different departments will be guided through the process of Design Roadmapping, with the final product of a design roadmap. This process will focus on centralizing the passenger, instead of the airport as a driver for innovation and value. Also, the workshop should be able to be transmitted to different domains. This leads to the final question:

"How to create a digital process of Design Roadmapping in which the passenger is central for Vanderlande and that could be transmitted to different domains?"

Figure 2.1. Company Overview

02

Chapter 2
Vanderlande Context

An important aspect of the strategic workshops is that it fits Vanderlande current business and builds on the strengths they have now. This chapter focuses on collecting and understanding Vanderlande's current and future landscape. Also, it helps in understanding who and what is important to take into account in the design of the strategic workshop. This chapter will first describe a general overview of the company and then details the airport context of Vanderlande.
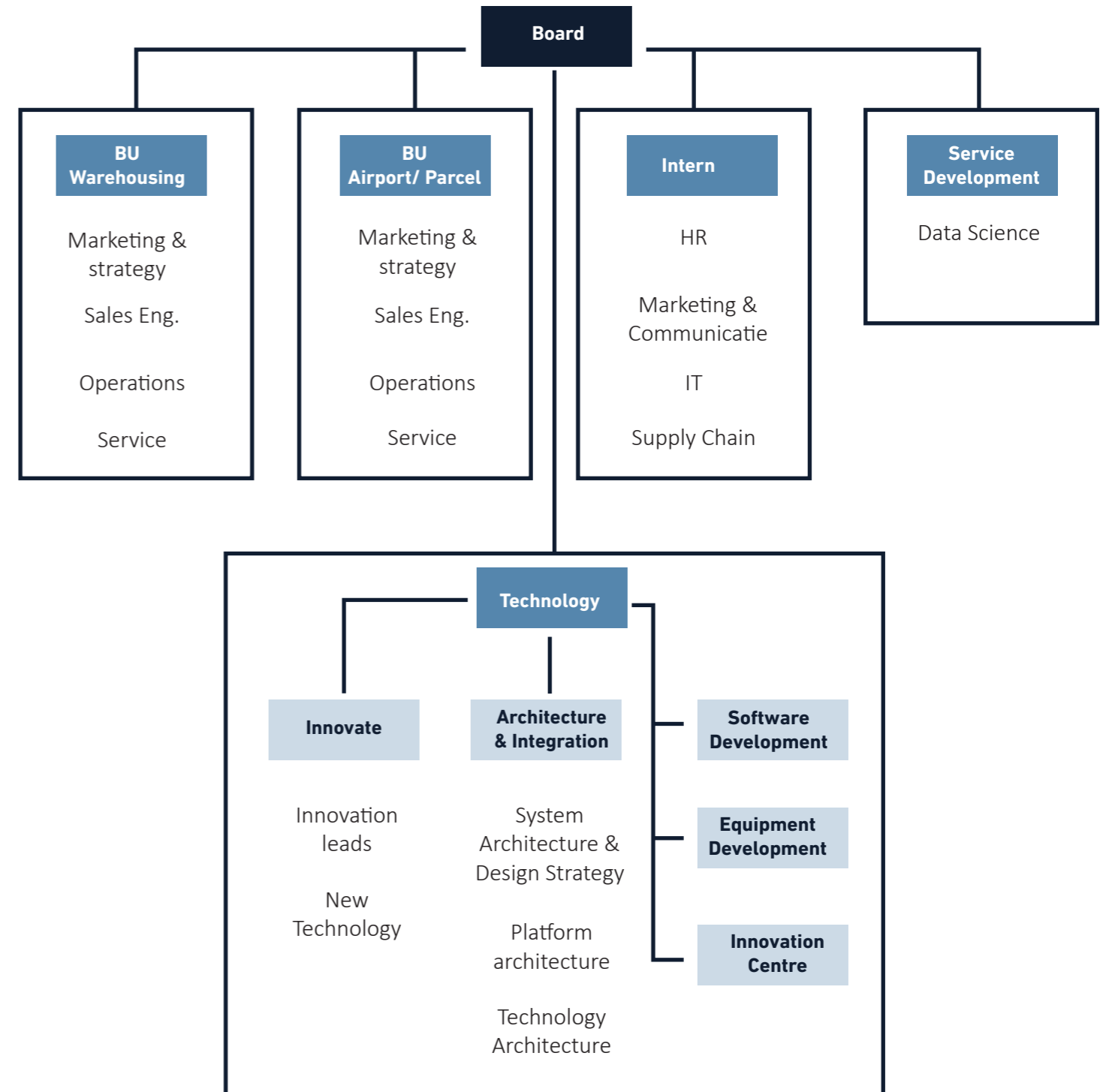
2.1. Company structure

Vanderlande operates in three different markets, warehousing, parcel, and airports. Their company however is structured in a different way (Fig 2.1.). There are two main business units; Airports Parcel (AP) and Warehousing (W). These business units are maintaining contact with customers, perform acquisition and sales, as well as researching the market of their specific entity. Next to the business units is the technology unit. In this unit, the development of existing solutions takes place as well as innovation of new technologies and solutions. Through sprints, the innovation team discovers what new technologies could be interesting for their business. Lastly, there is also the service unit; they are responsible for a number of services provided by Vanderlande, more detail about the service given by Vanderlande can be found in paragraph 2.3.

Confidential

Figure 2.2. Mission Statement

2.3. Life cycle services

Over the years Vanderlande has shifted from design products to developing end-to-end solutions. In this development, they developed services in combination with their products to create more value for the customer. They used servitization to create more value for the customer with the products and software that they already had. In total, they have created three types of services which an overview has been given in the figure 2.3. They provide services on 3 levels. The first level is additional services to support the existing products by maintaining the system and supporting the maintenance team of the customers. The second level is to support their customer by executing their on-site based operations. This also includes education for existing control room operations or taking over the control room operations so the customer can focus on their core business. On the third level is the services at the business level, by consulting on optimal material handling solutions. This includes both field operations outside the control room and management of operational activities. With these services, Vanderlande becomes a true partner with their customer by sharing also financial challenges of new investment. It aims at creating value for both. More detail about the type of servitization used by Vanderlande can be found in paragraph 3.3.

Confidential

Driving Digital business:
Driving Digital Business is creating an outstanding customer experience through digital service excellence. At Vanderlande they can receive (real-time) data of their customers. They want to use this data effectively to put the customer in the center and create fitting and predictive solutions. This program consists of two parts. The first part is creating new digital services for end-users to actively support them. This brings value to the customers by providing a service where the pains and gains of the customer are central and also self-service is enabled. The second part is to create an infrastructure to unlock the value of data end-to-end. This means that data will be used to optimize the whole value chain and create a seamless experience by better collaboration. (Vanderlande Industries B.V. 2020).

Winning with smart platforms:
In this program Vanderlande wants to move from being an engineering-to-order company into a highly profitable market-driven platform-based solution provider by 2022. Vanderlande has created a strategy to make platforms that could be reused in different projects, instead of creating new solutions for every project from the start. This adds value to customers as smart platforms are faster in delivery, implementation time, more reliable solutions, and also less expensive. In smart platforms, all software and hardware solutions are part of the building blocks as well as the enablers. The platform and its solutions should meet at least 80% of the requirements of Vanderlande's targeted market segment. (Vanderlande Industries B.V. (2020).
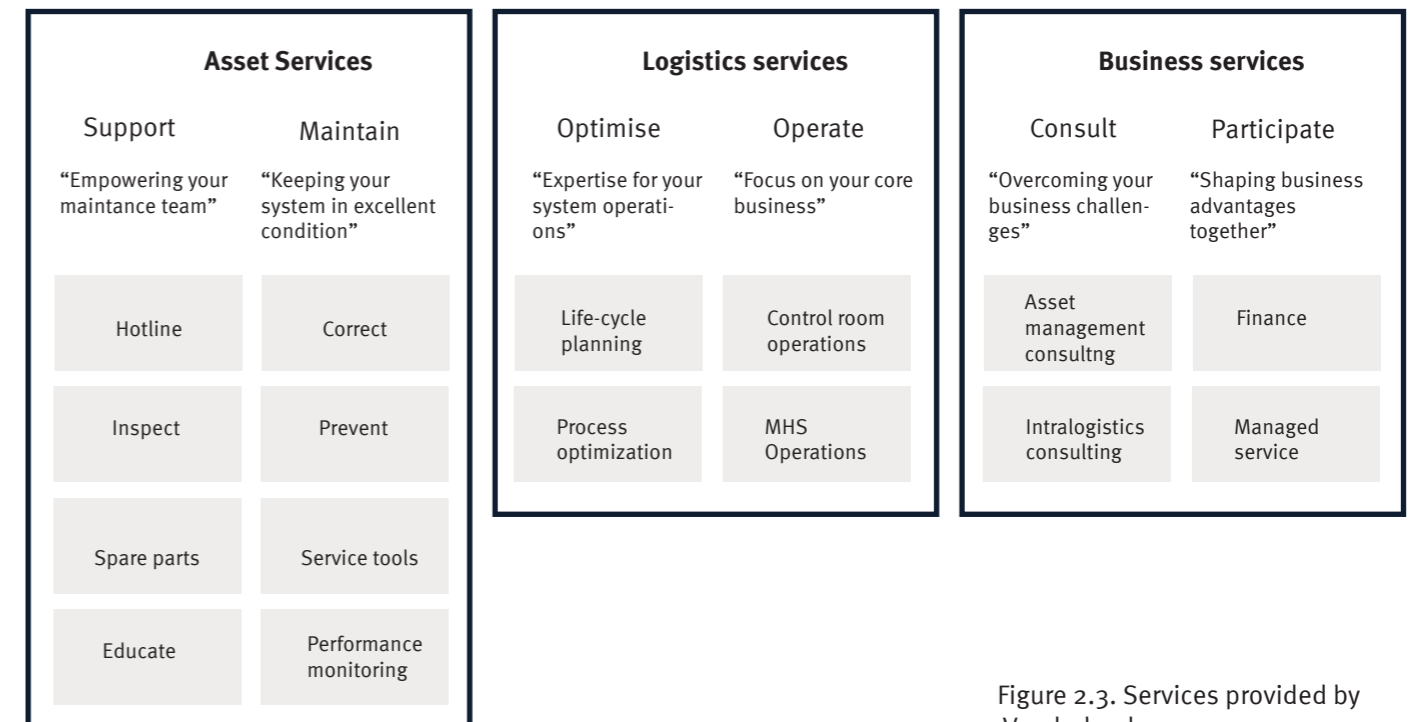
Asset Services		Logistics services		Business services	
Support	**Maintain**	**Optimise**	**Operate**	**Consult**	**Participate**
"Empowering your maintance team"	"Keeping your system in excellent condition"	"Expertise for your system operations"	"Focus on your core business"	"Overcoming your business challenges"	"Shaping business advantages together"
Hotline	Correct	Life-cycle planning	Control room operations	Asset management consultng	Finance
Inspect	Prevent	Process optimization	MHS Operations	Intralogistics consulting	Managed service
Spare parts	Service tools				
Educate	Performance monitoring				

Figure 2.3. Services provided by Vanderlande

18   19

2.4. Vanderlande Airport Context

This section describes the Airport segment of vanderlande. All information is retreived from Vikipedia (2021), Vanderlandes internal database.

2.4.1 Stakeholders

Vanderlande has 6 stakeholders in the process of baggage handling at the airports they operate in. The role and activities of these six are presented in figure 2.4. The stakeholdermap is divided into two levels, a direct level of stakeholders. Their direct customers and people who interact with their products are visualized closely to the core of Vanderlande. Other stakeholders that influence either the airport context or the baggage handling context are visualized on the outside.

Airport

Owner of the airport infrastructure and responsible for properly functioning baggage handling systems (BHS). Airports are the direct customers of Vanderlande's logistics system. They are responsible for internal and organization and overall operations including the connections and overview of the other stakeholders, and real- time monitoring and control of the in-bound and out-bound processes.

Airports are either regional, international or Hubs. Regional airports are smaller airports that are mostly serving point-to-point flights, meaning there are little to none transfers taking place. Also smaller airlines or low cost airlines are serving these airports.

International airports are larger sized airports to which mostly point-to-point flights take place, but there are also connecting flights. These airports are serving a large amount of international flights. Larger airlines are flying to these destinations as well as smaller airlines.

Hub airports are connected in a large air-to air transfer network. Hub airports have a large amount of transfer passengers. Hubs are usually the home of a large airline e.g. KLM uses Schiphol. Hub airports are designed to improve the entertainment at the airport to serve the transfer passengers.

Handler

Handlers can be seen as the literal hands in the baggage handling process. The handlers are responsible for loading and unloading of the airplane. They take out baggage into containers and cards, coordinate ULD's and recover processes of delayed or problemed bags. Handlers are either presented by the airport, airline or a third party.

Airline

An airline is a company that provides air transport services for travelling passengers, baggage and freight. Airlines are responsible for their passengers and the flight plan and for being in contact with the airports and baggage handlers. Airlines hire either their own ground handling personnel, other airlines to do this or a third party.

Airlines have a large influence on Vanderlande, as they determine the price and quantity of carry-on and hold baggage. There are three types of airlines:

Legacy airlines: Legacy airlines provide multiple services at the terminal and on the airplane. They own a large fleet with airplanes that vary in size, operate at multiple routes and have different classes. Legacy airlines serve connecting flights, KLM is an example of a legacy Airlines

Low Cost Carrier: A low cost carriere reduces cost by offering services which passengers have to pay for, for example changing seats, in-flight entertainment and additional hold luggage. LCC mostly has a fleet consisting of similar airplanes. They often fly to small airports in a direct flight. Ryan Air is an example of a LCC

Holiday Carriers: An holiday carrier mainly transports tourists. They usually have a small fleet, with similar sized airplanes. Holiday carriers concentrate their flights from a few airports

Regional Carriers: They are often small airlines that either service direct flights between smaller airports or fly to and from larger airports to connect to other (partner) carriers.

O&M Team

The Operations and Maintenance (O&M) team consists of multiple different parties that are together responsible for the operations and maintenance of the baggage handling system.

BHS Operations: Responsible for the operational control of the baggage handling system at an airport. They are responsible for the real-time monitoring and fixing issues as label identification at manual stations

BHS Service and Maintenance: Responsible for a well maintained operating BHS. They are in charge of maintanance operations, both reactive and preventive. They fix any jams in the system and transfer bags when necessary.

IT Service:Responsible for a well maintained and functioning baggage handling IT-System.

Security Team

The security teams is responsible for checking the bags for safety reasons. This includes the hand luggage, hold luggage and the passenger.

Security: Responsible for detection of explosives and weapons.

Customs: Responsible for detection of illegal goods. They perform custom controls. They look at the images made by the CT-scan. They can select flights they want to further investigate upon arrival.

Passenger

Passengers want to fly from one destination to another for various reasons. They could be flying with hand luggage and/or hold baggage. Vanderlande recognize three types of travels:
Business travelers who are frequent flyers whom only bring handluggage. Frequent flyers who bring hand and hold luggage. Lastly, holiday travels who bring both hold and hand luggage.

The type of passengers and the amount depends on the type of airport.

Additional stakeholders

Besides these 6 stakeholders there are also secondary stakeholders. Those are present in figure 2.4.

Figure 2.4. Stakeholders Vanderlande in the airport context

2.4.2. Airport Solutions

Vanderlande provides fully integrated solutions for baggage handling systems at airports. This concludes hardware, software, and necessary services described in 2.3. In this solution, they divide the airport journey into 8 steps: Check-in, Security Screening, Transportation, Bagstorage, Bagsorting, Make-up, Load and unload and reclaim. The different sections are explained here. For all these sections Vanderlande created unique solutions (Vanderlande Industries B.V. 2021).

Check-in
At the check-in, the bag gets weighed, scanned and it receives a label which includes all information and is scanned at various moments throughout the process to locate the suitcase and determine its direction. After the label is added, the bag is sent off to a restricted area.

Security Screening
Security screening happens at two places. The first one is the security screening of hand luggage as well as the passenger (fig.2.5.) and secondly, also the hold luggage is going through security to make sure that the bag meets the requirements of customs and security.

Transportation
Transportation happens all throughout the process. In transportation, the hold baggage is traveling from and to different areas making sure it arrives on time at the right destination. The baggage can be transported either through individual carriers or on large conveyors.

Bag Storage
Whenever a piece of luggage arrives too early or needs to be transferred from one flight to the other, it can be stored temporarily in automatic bag storage. Whenever it's time for the baggage to move again, it can be restored from here. This system can also help in times of peak moments.

Bagsortation
To make sure the bag travels in the right direction it gets sorted. Because the system is constantly aware of where a piece of luggage is through scanning the label, the sorter can determine which bag should go in which direction.

Make-up
This is the moment where a piece of luggage leaves the system larger system. The baggage gets placed into a ULD or cart to be transported to their airplane. This transportation of conveyor to cart/ ULD can either happen manually with supportive tools or fully automated. Also, the transportation of the baggage to the airport can be done fully automated or by handlers of the airline or airport. From here the baggage gets loaded into the airplane.

Unload
After the airplane has landed, the bag gets transported out of the cart/ ULD again. From here the piece of luggage either goes to the right reclaim area, is

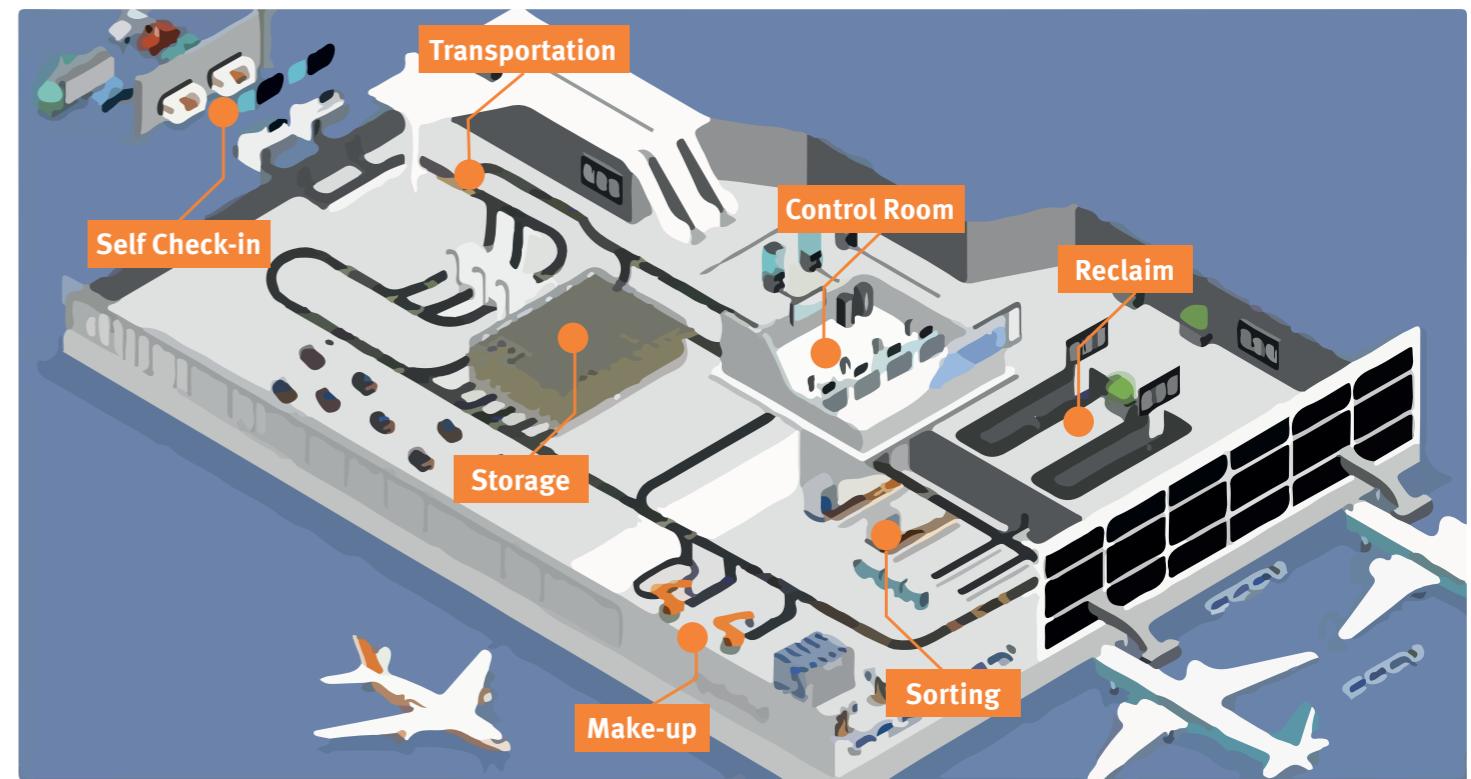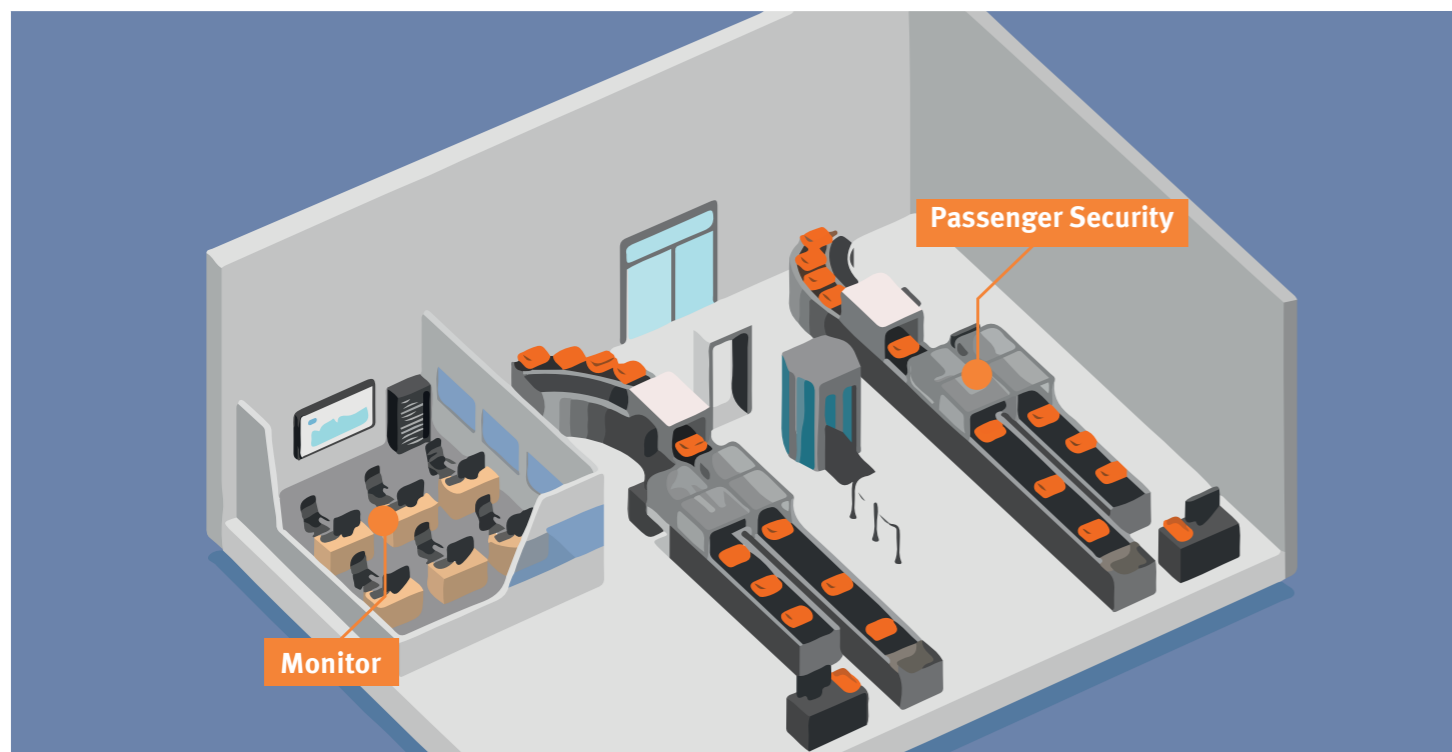Figure. 2.5. Overview of passenger security screening (Vanderlande Industries B.V. 2021).

transferred to the new destination and unload area, or gets stored for later retrieval. All through unique identification of the label placed on the luggage.

Reclaim
The reclaim belt is where the passenger picks up his or her bag again from the reclaim carousel. After this bag has fully left the system of Vanderlande.

Software
Because of the scanning and unique identification, the location of the bag can be identified throughout the entire baggage handling system. Through software created by Vanderlande, not only this can be regulated, but the entire system can be overviewed. The software used by Vanderlande can monitor all aspects of the BHS, but also help in the planning of incoming or outgoing flights.

2.4.3. Creating Baggage handling Solutions

The creation of Vanderlande has smart platforms in which they look together with the customer at which platforms or modules are necessary to make the baggage journey optimal. This differs largely for the type of airport. Hub airports for example require larger systems and baggage storage for incoming flights whereas regional airports require simpler solutions. In case an airport has specific requirements or needs it is possible to make these modules fit. These specific needs are being discussed through meetings with both the BU Airport/ Parcel and Technology which are so-called Flight Plans.

Additional to the products Vanderlande offers its Life Cycle Services. Depending on the type of need, the services are offered in various stages of buying, implementing, or operating the services of Vanderlande.

2.4.4 Stakeholder involvement in the baggage handling solutions

The baggage handling solutions that Vanderlande provides are almost fully automated. To indicate what and where the interactions of the stakeholders are with the systems of Vanderlande, the bagage handling journey is created (Fig. 2.7). This journey follows a bag through the different stages indicated in section 2.4.2 and explains the interaction between the stakeholders from section 2.4.1. in this different stages.

In the bottom section of this visual, the product solutions of Vanderlande are mentioned for the specific stages of the baggage handling journey.

This journey has been reconstructed based on information retrieved by Vanderlandes internal database (Vikipedia, 2021) and the website of Vanderlande (Vanderlande Industries B.V., 2021).
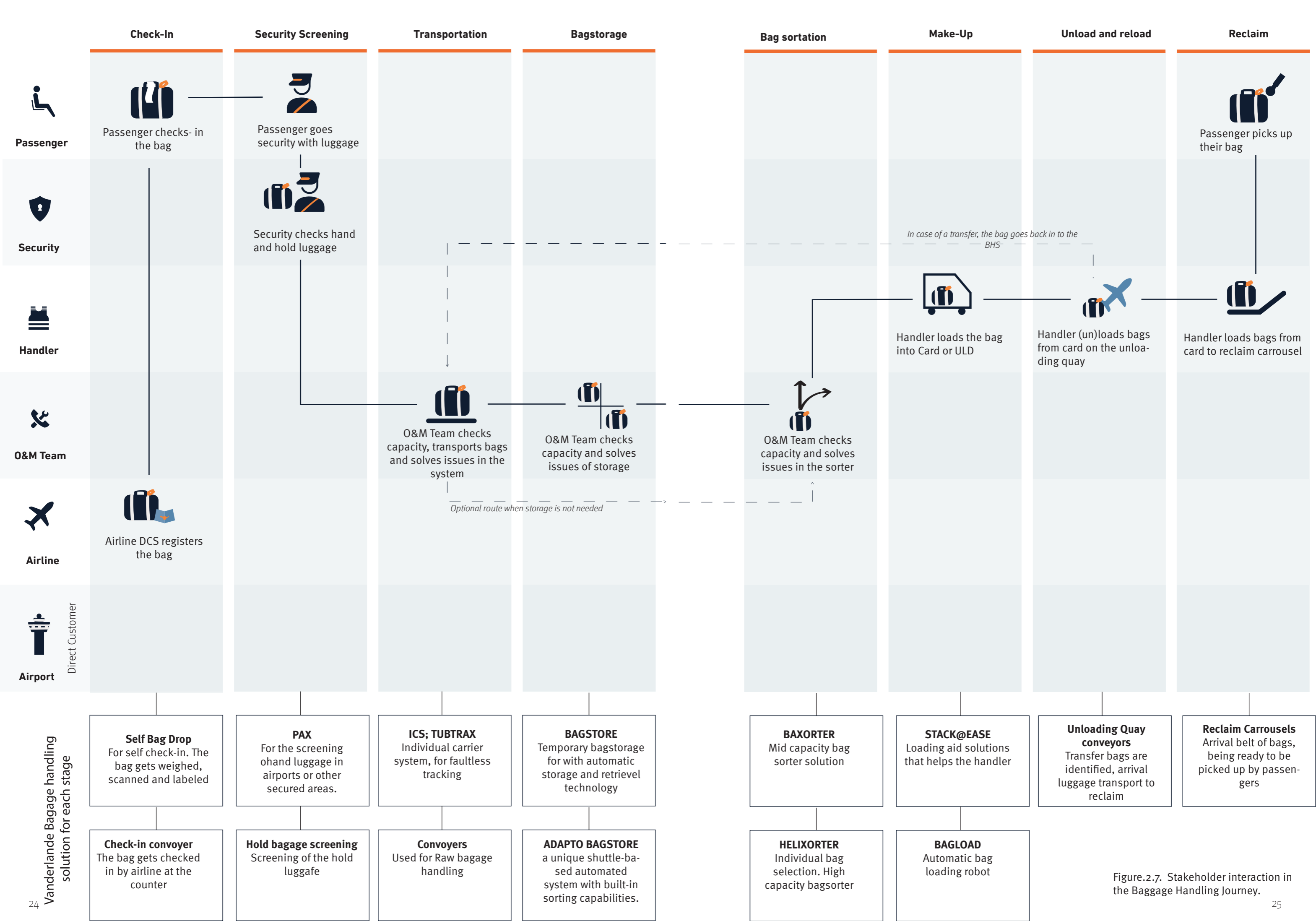

Figure.2.6. Overview of bagage handling system (Vanderlande Industries B.V. 2021).

| Check-In | Security Screening | Transportation | Bagstorage | Bag sortation | Make-Up | Unload and reload | Reclaim |

Passenger

Passenger checks- in the bag

Passenger goes security with luggage

Passenger picks up their bag

Security

Security checks hand and hold luggage

In case of a transfer, the bag goes back in to the BHS

Handler

Handler loads the bag into Card or ULD

Handler (un)loads bags from card on the unloading quay

Handler loads bags from card to reclaim carrousel

O&M Team

O&M Team checks capacity, transports bags and solves issues in the system

O&M Team checks capacity and solves issues of storage

O&M Team checks capacity and solves issues in the sorter

Optional route when storage is not needed

Airline

Airline DCS registers the bag

Direct Customer

Airport

Vanderlande Bagage handling solution for each stage

Self Bag Drop
For self check-in. The bag gets weighed, scanned and labeled

PAX
For the screening ohand luggage in airports or other secured areas.

ICS; TUBTRAX
Individual carrier system, for faultless tracking

BAGSTORE
Temporary bagstorage for with automatic storage and retrievel technology

BAXORTER
Mid capacity bag sorter solution

STACK@EASE
Loading aid solutions that helps the handler

Unloading Quay conveyors
Transfer bags are identified, arrival luggage transport to reclaim

Reclaim Carrousels
Arrival belt of bags, being ready to be picked up by passengers

Check-in convoyer
The bag gets checked in by airline at the counter

Hold bagage screening
Screening of the hold luggafe

Convoyers
Used for Raw bagage handling

ADAPTO BAGSTORE
a unique shuttle-based automated system with built-in sorting capabilities.

HELIXORTER
Individual bag selection. High capacity bagsorter

BAGLOAD
Automatic bag loading robot

Figure.2.7. Stakeholder interaction in the Baggage Handling Journey.

Key takeaways

Vanderlande already develops new ways of creating value and optimizing their current business. Examples of this are Winning with smart platforms and life cycle services. From the analysis three things become apparent

Servitization has an increasing role at Vanderlande

Over the years vanderlande has changed their position from providing products to providing product service and system and outcome based projects. They centralized the needs of airports through making smart use of the data and building long term relationships. Also in their plans they emphasize providing end-to-end solutions.

The role of the end-user is not accounted for in the design process, yet.

In the current product-service systems of Vanderlande, the focus on how to create added value for the end-user, the passenger, is not being accounted for. Passengers are only divided in the type of travelers and in the amount of luggage they bring. However, in their mission and airport vision, they aim to include this more by focusing on either delivering satisfactory experiences to end-user and making travel memories become great. To be able to reach this they need a deeper understanding of who this passenger is now.

Potential to grow to different markets

Vanderlande has created platforms to use in their existing market of Airports, Parcel and Warehousing. With this strategy, they could grow their platform strategy into different markets and extending their core business. If we look at the airport platforms a logical step would be staying in de the mobility sector, however other sectors should not be excluded.

Chapter 3

Theoretical Background

03

The project brief entails various elements that should be researched to understand how to design for them, and how they can benefit Vanderlande. In this theoretical background dived into three different essential parts of the workshops namely: Design Roadmapping, Online workshops, and User-perspective through servitization and communication.

3.1. Design Roadmapping for Vanderlande

This section aims to focus on the initial subquestion: How to structure Design Road-mapping in a way that benefits Vanderlande and its employees.To understand how to design the roadmapping process for Vanderlande, a basic understanding of what (design) roadmapping is. In addtion to the understanding of how the process is structured, and what could the strategic workshops look like. In this section I aim to answer the following subquestions:
- What is (Design) Roadmapping?
- What elements should be taken into account when Design Roadmapping?
- What design roadmapping workshops and activities could benefit Vanderlande.

What is a roadmap?
The definition of a roadmap is described by the Cambridge dictionary (2021) as: "a plan for how to achieve something". Roadmaps could be used on different occasions and serve the purposes to create a strategy of innovations towards a future vision (Simonse, 2017). Phaal et Al. (2007) state that a roadmap should answer three questions: " 1. Where are we going? 2. Where are we now? and 3. How can we get there?" A roadmap is generally a visual portrayal of the design innovation plans. However, roadmaps could consist of different elements depending on the outcome and purpose the roadmap serves. The roadmapping of innovations is established by three main elements; the strategy of timepacing, synchronizing dialogue, and map-ping innovation elements to a timeline (Simonse et al., 2014). These three concepts are interrelated.

Besides the definition of a roadmap, there is also the definition of the word "road-mapping". Phaal & Muller (2009) describes the roadmapping as the visual strategic planning process whereas the roadmap the outcome is of such a process. Depending on the use of the roadmap, the activity of Roadmapping also changes.

What is design roadmapping?
Over the years there have been many different types of roadmapping e.g.Technology Roadmapping, Innovation Roadmapping, Product Roadmapping. All these forms are driven by innovation and support strategic long-run planning (Phaal et al., 2004; Oliveira et al. 2020). In these types of roadmapping, the focus is on combining commercial and technological knowledge and represents a technology push and market pull (Phaal et al., 2004).

Kim et al. (2018) address the gap in this technology of embedding the customer experience in strategic planning. The main focus is on discovering user values and matching the right business opportunity and technology developments with these values (Simonse, 2017). This requires a more holistic understanding of the users, as their deeper needs and values need to be extracted. It also requieres a shift from the feature-driven to experience-driven (Kim et al., 2015). A second difference between roadmapping and design roadmapping, is increased ownership and involvement of designers in the process. Simonse (2018) describes that the design roadmapping team should be a mixed group of innovation professionals with diverse backgrounds and roles. The designer has a central place in this. Lastly, there is a shift from future prediction to preparation (Kim et al. 2015). Therefore design roadmapping is the right creative response to complex challenges. It is more flexible in its reaction to market changes (Kim et al, 2015; Kim et al., 2018). Because markets can change fast, it is important to update the roadmap regularly.

The activities in design roadmapping however also show similarities with traditional roadmapping of innovations, as it also includes a (1) strategy of time pacing, (2) synchronizing dialogues, and (3) mapping innovation elements to a timeline (Si-monse, et al., 2013). Especially synchronizing dialogues in design roadmapping is important. The design roadmap is a summary of internal communication and design

Value mapping   Idea Mapping   Pathway Mapping

Figure3.1. Design Roadmapping Process (Simonse, 2018)
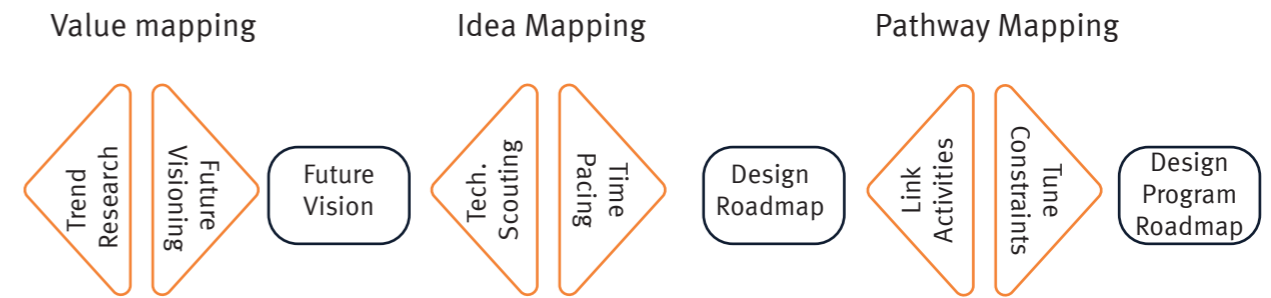
decisions made during these dialogues.. The process of creative dialogues can be stimulated through the right tools of communication but also to make use of visual outputs (Kim et al. 2020, Simonse 2017).

Lastly, there is also the importance of persuading senior management. Design Roadmapping and Design thinking are new terms for Vanderlande (see chapter 1.2). Because senior management is unfamiliar with this strategic process and design thinking in general, they need to see the beneficial side to it. Involvement of senior management helps in making the right resources available, but also is an important aspect of bottom-up innovation and later implementation of the roadmap created. To make design roadmapping successful, it needs to be supported on all levels of the company, therefore the inclusion of senior management is crucial (Simonse, 2018).

Different Roadmapping workshops
Although some of the activities are considered to be essential, the process of design roadmapping is not rigid. Because the process is highly dependent on the organiza-tion it is for and the intended outcome, there is no rigid set of given activities to use in a workshop to collectively create a design roadmap. There are however multiple approaches generated and proposed by various researchers. In appendix A, three approaches (Phaal, 2007; Kim et al., 2016; Simonse, 2018) are explained more in-depth.

Overall the process of Simonse (2017) seems to be most fitting for this project. This technique ocuses on three key activities: Value Mapping, Idea Mapping, and Path-way Mapping. This process is more suitable for longer-term innovations and radical innovation, as it looks on a more abstract level at future value drivers that could arise and what future worlds could occur. By creating a future vision done through performing creative trend research and determining value drivers, a highly custo-mer-centric mindset can be created. This is all done in the first key activity of Value mapping. In the second key activity, idea mapping, technology gets scouted and combined with the previously found user values to generate ideas. Lastly, the third activity, pathway mapping, focuses on linking all core activities to make a detailed innovation plan and tune any final constraints.

If all different strategic processes are compared, a clear resemblance can be seen in a strong fuzzy front that drives further steps. Furthermore, we see how all three are sharing a systems understanding to formulate a future vision. The approach of Kim et al. (2017) seems to be more suited for bringing ideas to concrete levels of pro-totyping and incorporating new user values. There is the direct involvement of the user through e.g. user interviews and observations. Kim et al. (2018) describe this as "Seek the original source of customer and user needs often". He uses this tech-nique for often more short-termed design roadmaps, in which the horizons display more incremental innovations over the timeline (+- 5 years). The direct approach of introducing user research is interesting for the question of Vanderlande, as they are not yet familiar with the passengers.

Key takeaways

Design roadmapping is a process that can be used to create stable innovations in VUCA worlds. Vanderlande's business unit Airport can be seen as a problem with VUCA conditions, as there are plenty of strategic challenges arising in this field. In the process of design roadmapping, there should be sufficient emphasis on generating a deeper understanding of the context including the user.

The process explained by Simonse (2017) should form the basic outline of the road-mapping process, as it focuses on more radical and far future innovations. This process includes three large mapping phases to build the Design roadmap: Value mapping, Idea mapping, and Pathway mapping (Design takeaway 1). However, Vanderlande does not even know who the current passenger is and what their needs are, therefore the workshops should also act as medium to explore this end-user of today through existing research. By understanding who the customer is now, it could be easier to understand what their drivers are in the future.

The activities in roadmapping should focus on creating dialogue, therefore the right tools should be provided (Design Takeaway 2). This creative dialogue is aimed at achieving consensus on all design decisions, with the design roadmap as a final artifact to discuss these decisions.

Lastly, to match the company it is important to have both influences from higher hierarchical levels of Vanderlande. This means the involvement of senior management is necessary (Design Takeaway 3).

Include the three mapping session of Design Roadmapping

Design takeaway 1
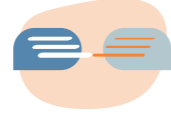
Tools or activities to support creative dialogue between participants (e.g. with visual output)

Design takeaway 2
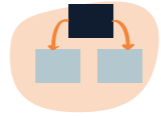
Create involvement from all levels of the hierarchy by active involvement

Design takeaway 3

3.2. Designing Digital Workshops

Since March 2020 the biggest part of the Dutch population is working from home, due to the Covid-19 pandemic. This also includes most employees from Vanderlande. With this in mind, we need to make sure that all strategic design sessions have to take place in a digital environment and from their home setting. To understand how this affects the participants of the online workshops, a literature study has been conducted. To research the main question: :

"How to create digital workshops that are successful for all?"

"What elements are important in digitizing strategic workshops?"

Online Working
Since March, almost 88% of the global organizations have encouraged or required their employees to work from home (Gartner, 2020). This increase has led to a growing population of people working remotely or partly from home. Although to some people the global pandemic has led to a drastic and radical change in their daily working life, it is expected to stick for a large part of people that work from home, as almost 33% percent does not want to go back to the office after the pandemic (Wolters, 2020). Reasons for this can be that employees feel more productive when working from home. They feel less interrupted by colleagues.

Remote meetings and workshops
An important part of online working is online meetings and remote workshops. In general, there are some strong benefits of holding workshops online, first of all, are they more inclusive (Swarchz et al. 2020). People from all over the world can work together without having to travel to be present. Also, most of our physical work interactions can be substituted by available technologies (Ip-

sen et al., 2020; Berrero et al., 2020, Schwarz et al., 2020).

However, there are certain risks in working from home, an important one is the increase of loneliness due to the lack of social interaction (Barrero et al. 2020, Schwarz et al. 2020). There are fewer spontaneous conversations as everyone has their agenda and planned purpose, also the informal coffee breaks or lunch are harder to reproduce digitally Also, the overwhelming amount of digital meetings can negatively influence the collaboration within meetings. People tend to feel exhausted from these meetings and therefore not engage in the conversation, which can affect the project and outcomes of the virtual meeting (Swarch et al., 2020)

Although we miss physical interactions, different researches have shown that online collaboration can be just as effective as physical ones. Participants, in both large and small groups, can provide just as many unique and high-quality ideas in groups through electronic brainstorming or brainstorming on digital platforms as through traditional verbal brainstorming. In larger groups, they were even more satisfied when using electronic brainstorming. The reason for this could be that by electronic brainstorming the group can access the ideas of others and build on to those (Gallupe et al., 1992; Russel, 2019).

How to make online meetings successful
Knowing the negative, positive and neutral effects of online meetings on the outcome and on participants, we can look at the elements making a meeting successful. There are numerous researches dedicated to determining antecedents of an effective meeting. Some suggest increasing the entitativity of a group to make meetings more effective, others suggest that engagement to evoke motivation is the rule of thumb

(Blanchard & McBride, 2020; Ribeiro et al. 2020). Looking at the literature, there are a few variables making meetings successful.

Purpose
Every workshop should have a purpose that is clearly communicated to the participants. This purpose can be in the form of an agenda or sharing the common goal at the beginning of the workshops (Blanchard & McBride, 2020). Sharing a written agenda beforehand even increases the perception of the effectiveness of a meeting (Leach et al. 2014).

Structure
The structure explains the outline of the meeting. Things that help with motivation are dynamic interactions. The structure is part of the engagement. Noordermeer (2020) has created a structure that supports diverging activities in the beginning and then moves into converging activities (Fig. 3.2). By using this structure, every participant walks out with a clear objective, which can be followed- up on in the next workshop (de-Bara, 2021). This way the participants have the feeling they make continuous progress. Other things to take into account in the structure are making sure that there are sufficient breaks and synchronous activities (Ribeiro et al. 2020)

Tools
Described as an important factor for the effectiveness of online meetings are the right tools. Video and chat should be comprehensible to use and give a frictionless pathway across different devices. Also brainstorming tools, like online whiteboards, as they provide collaborative and visual options to communicate ideas or process to one another (Ribeiro et al. 2020, Noordermeer, 2020). Existing digital whiteboards are e.g. Miro.

Warming-Up　Task Appraisal　Diverge　Reverge　Converge　Reflect　Closing
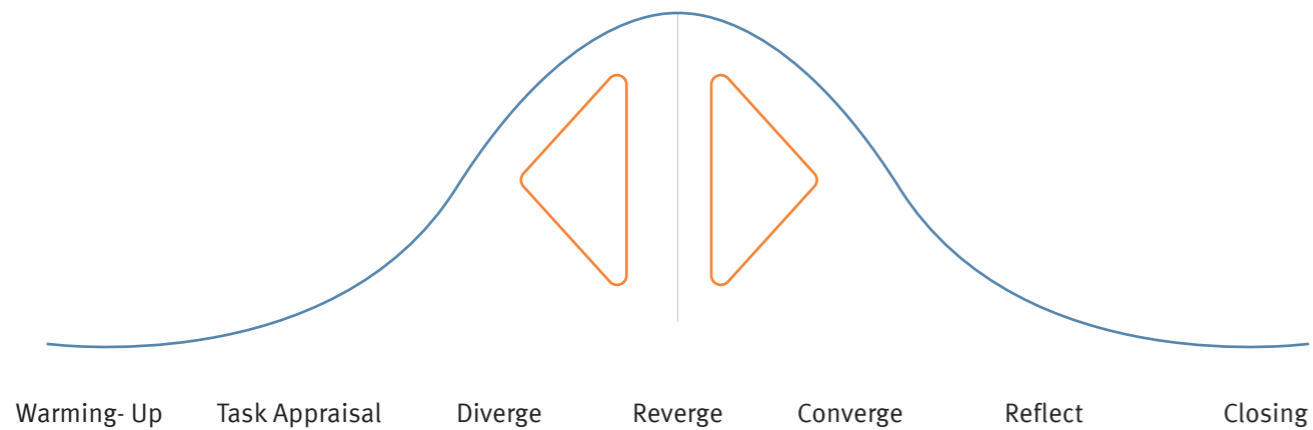
Figure 3.2. Ideal structure of Digital workshops (Noordermeer, 2020)

Tools are already previously mentioned in the design roadmapping take-aways. In that section, tools should be helpfull to stimulate creative dialogue. This means both in verbal communication of digital meetings, as well as for visualizations. In this case, online whiteboards are again a way to facilitate design roadmapping in this process, as it supports both.

Social interaction
One of the negative side effects of remote workshops is the lack of physical interaction and therefore social small talk. The social connection participants feel with another can affect the outcomes of an effective (Blanchard & McBride, 2020). For example, groups of co-workers who share embarrassing stories with one another before brainstorming generate up to 26% more ideas by one another (Harvard Business

Review, 2018). This is because it lowers the boundaries of actively participating.

Ways to digitally stimulate social connectivity are for example by giving participants time to get to know each other and connect outside of the structured meetings, or to work in smaller groups (deBara, 2021).

Engagement
Besides the right structure and purpose of the meeting, there are also other elements to stay engaged during an online meeting. Strategies to provoke engagement are active learning, interactive content, educative assessment, the use of small groups, and keeping it simple (Ribeiro et al. 2020). Also by giving room to prepare for the meeting beforehand, participants are more likely to actively engage in the meeting (Leach et al., 2014).
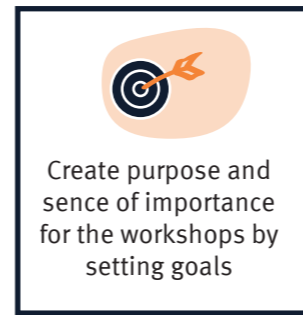
Create purpose and sence of importance for the workshops by setting goals

Design takeaway 4

Create engagement through active learnign and interactive content

Design takeaway 5
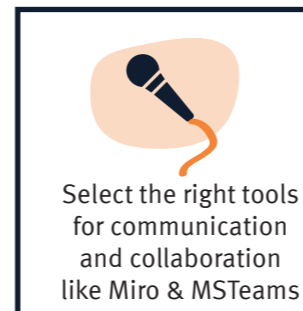
Select the right tools for communication and collaboration like Miro & MSTeams

Design takeaway 6
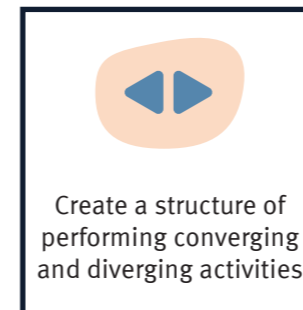
Create a structure of performing converging and diverging activities

Design takeaway 7

Key take-aways

There is large importance on creating structured and clear meetings, especially for an online environment. In the research, several variables could be taken into account when designing a successful meeting. Before the meeting, an agenda should be shared explaining the purpose and goal of the meeting (Design Takeaway 4). There should be sufficient room for interaction, both work-related discussions and in between small talk. Participants should feel engaged by keeping it simple and creating active learning. This means a sufficient interplay between plenary parts as well as synchronous and asynchronous activities in subgroups (Design takeaway 5). Also, the structure of converging and diverging activities can be helpful in creating engagement and purpose, as it builds continuously towards a reached goal and consensus (Design takeaway 6). Lastly, Tools like miro and MS Teams can help to make the meeting interactive and switch from plenary sessions to subgroups. These tools are also helpful in facilitating a creative dialogue, essential in design roadmapping, as they provide options for both visual and verbal communication (Design takeaway 7).

Interesting is that all factors described for an effective meeting can also influence each other, e.g. the right tools can help to set interaction and engagement.

3.3. Bridging Knowledge Silos

In the introductionis mentioned that Vanderlande has a challenge in overcrossing the different knowledge silos, which could be a risk for innovation. This chapter also focuses on this:

"How to cross any existing knowledge silo between participants through the use of Design Roadmapping and digital strategic Workshops"

Knowledge Boundaries between Actors
Innovation requires strong collaboration between different disciplines of one organization (Serrat, 2012). Therefore a large part of innovation is the sharing of knowledge. Knowledge crossing boundaries between different disciplines inside an organization is seen as one of the largest obstacles to innovation (Carlile, 2002). These so-called "Knowledge boundaries" could occur as actors from different disciplines or backgrounds have different ways of communicating, language, interpretations, cultural or political perspectives, or mental frameworks (Carlile, 2002). The more diverse the background and novelity of the knowledge shared, the larger the boundary is between understanding and adopting this knowledge can be. This is especially the case in projects with high levels of innovation (Carlile, 2004).

Different Knowledge Boundaries
Carlile (2004) states that knowledge boundaries could occur on three levels: syntactic, semantic, and pragmatic (Fig 3.3). On the first syntactic layer are boundaries that have to do with transferring the knowledge, by using a common lexicon and shared structure of information sharing. This means that the actors speak understand language or jargon used. On the second layer, semantic boundaries occur when actors have different interpretations of the

knowledge. Semantic boundaries focus on translating the knowledge. In this the understanding of your own interpretation is necessary, but also seeing the differences between others. On the third layer are pragmatic boundaries. These boundaries occur when there are different interests between the actors. The different interests could occur when the information is so novel, that it could generate negative consequences for the receiver of the information and their existing knowledge is at stake. It requires them not only to learn about what is new but also to transform current knowledge to fit with this new knowledge.

Crossing Knowledge Barriers between actors.
A way to overcome design communication problems is with the use of boundary objects. Griesmer and Star (1989) define boundary objects as " Boundary objects are objects which are both plastic enough to adapt to local needs and constraints of the several parties employing them, yet robust enough to maintain a common identity across sites". Boundary objects are physical or virtual artifacts that create a common language between different actors but remain open for interpretation. Boundary objects help the process of transferring, translating, and transforming knowledge within heterogeneous groups (Carlile, 2002). An example of a boundary object is a design roadmap, for one it communicates the needed technology aspects, whereas for the other it explains the value drivers and interesting trends.

Carlile (2004) mentions strategies for the creation of boundary crossing semantic and pragmatic boundaries. Semantic knowledge boundaries can be crossed using standardized forms and methods to create a common meaning. These forms should support the representation of the domain-specific know-

ledge by indicating the difference between actors. To transform knowledge across pragmatic boundaries, methods, and forms that help the participants learn and negotiate the knowledge, to create common interest.

If we translate this to design roadmapping, the knowledge crossing is part of the creative dialogue. In this creative dialogue, a heterogeneous group of participants is collectively discussing to reach a consensus on innovation topics. The methods or forms created here should help the participants in this creative dialogue by displaying any differences due to their different interests but also help to reach consensus despite these differences. This can be done by negotiating on the knowledge shared and learning from eachother to create common interests.
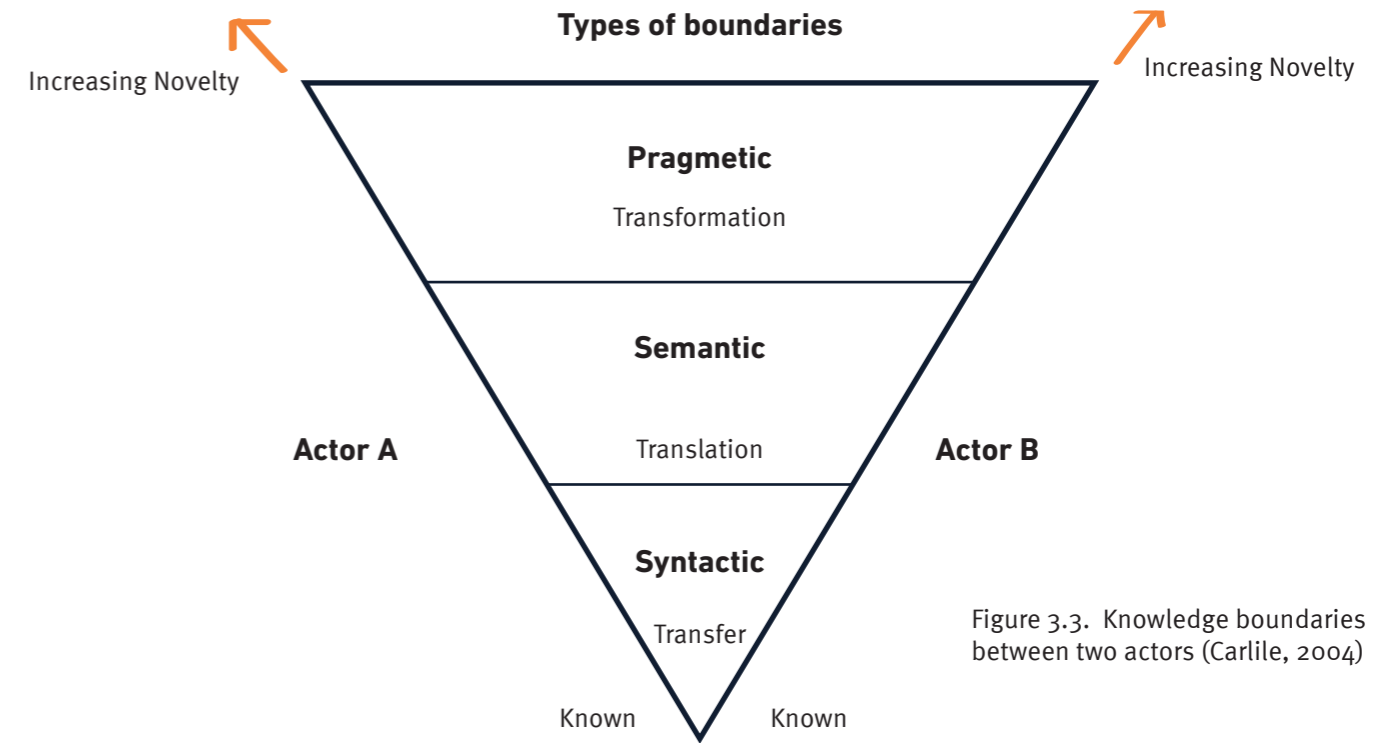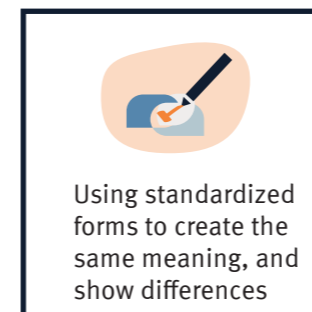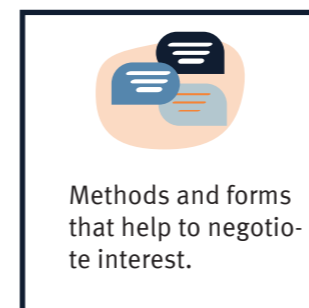
Figure 3.3. Knowledge boundaries between two actors (Carlile, 2004)

Take-away 8

Take-away 9

Key take-aways

Knowledge crossing boundaries between different disciplines inside an organization is seen as one of the largest obstacles to innovation. There are several levels on which knowledge boundaries could occur, syntactic, semantic and pragmatic. Thefefore, we need to understand how we can span them.

Two solutions are given for crossing knowledge boundaries: 1. Using standardized forms to create the same meaning, but also represent differences between domain-specific knowledge. (Take-away 8)
2. Methods and forms that help to negotiote interest. (Take-away 9)

Both are part of the creative dialogue used in Design Roadmapping

3.4. End-User Involvement in Strategic Workshops

Over the years the focus of new product development has simultaneously shifted from designing for the user to designing with the user, as well as designing product solutions to designing integrated product-service systems. Both interesting developments that centralize the needs and the wants of the user, to create value. Vanderlande also has created a shift in offering life-cycle services. However, their focus on generating new solutions is still on the airport as customers.

This leads to the two following subquestions:

"How to incorporate the (future) end-users perspective in the process of Design Roadmapping and in Vanderlande's given context"

"Which Design tools/ artifacts are necessary for successful knowledge crossing the user in the workshops."

Focus on the User in B2B

In traditional B2B markets, manufacturing firms have focused on creating products for their direct customers, in this case, other businesses. However, due to the high competition and growing customer demands, manufacturing companies have started to shift away from traditional products by generating value through services (Visjnic et al., 2017). This shift is called servitization (Vandermerwe and Rada, 1988). Through servitization, the value brought from one company to another is not on the product itself, but in the knowledge and activity associated with the product. With this focus shift of servitization, also the shift of creating products to creating fully integrated solutions for users has become important. Solutions generated by manufacturing firms for business customers are beco-

ming more customized to the specific needs of their customer and their specific context, to the highest level of being an outcome-based model (OBM) (Visjnic et al.,2017)

Servitization can be done through various approaches and on different levels of customer-focus. Tan et al. 2010) provide a visual overview of the different servitization approaches (fig 14). The figure shows the range of servitization, moving from products with services as add-ons to services with products as an add-on (Tan et al., 2010; Hakanen, 2017).

If we compare Vanderlande's servitization approach described in chapter 2 and show in figure 3.4, we see that Vanderlande's assets services are part of both product use and product life services, the logistic services are part of customer activity services and lastly, their business service is part business supporting services. Concluding that through the addition of life-cycle service Vanderlande already aims to be at maximal customer-centricity in their servitization strategy. However, there is still room to grow.

End-User focus in B2B

Although B2B companies already focus on generating better products and services for the business customers, the supply chain is longer. This means that the business customers of manufacturing companies often have customers as well. There is a great benefit in understanding what these so-called "overarched" customers want, as they also add value to the supply chain. Bluemink et al.(2020) describe the act of creating value for these customers as overarching servitization. In this constellation, solutions are services with a product that supports it, instead of the traditional Product Service Systems (Visjnic et al., 2017). However, this process requires a change in cultural paradigm as well as capabilities and therefore a new way of

thinking. In the case of Vanderlande, this strategy of overarching servitization calls for a deeper understanding of the passenger.

How to focus on End-Users?

End-User focus is the deeper understanding of users' life, which can be created by generating an empathetic mindset for these users (Dalton& Kahute, 2016). It is a way to get more insights into the user's values and needs, which can be translated into products or services. Creating empathy and understanding user values is also an important step in many design processes (e.g. IDEO's design thinking). To understand the user we need to research them, this can be done in multiple ways and through multiple approaches e.g.by studying the user or direct involvement of the user in the project.

In larger organizations like Vanderlande, different elements of the design cycle are performed by different groups. Meaning that the user research is often not done by the same group as the one that has to gain insights from them. This means that the information or ideas need to cross borders of different disciplines before they can be adopted or put into use. This is also the case in the innovation process of Vanderlande, where there has already been a large amount of previously performed amount of user research through various (student) projects or performed by external stakeholders. This information needs to be communicated to the participants but this could have several issues.

Bridging Knowledge of the End-User

Roschuni et al. (2013) specify several issues in communicating user research. they identify three communication issues (Fig 15). First, there are mechanistic problems, which are problems within the channel of communication
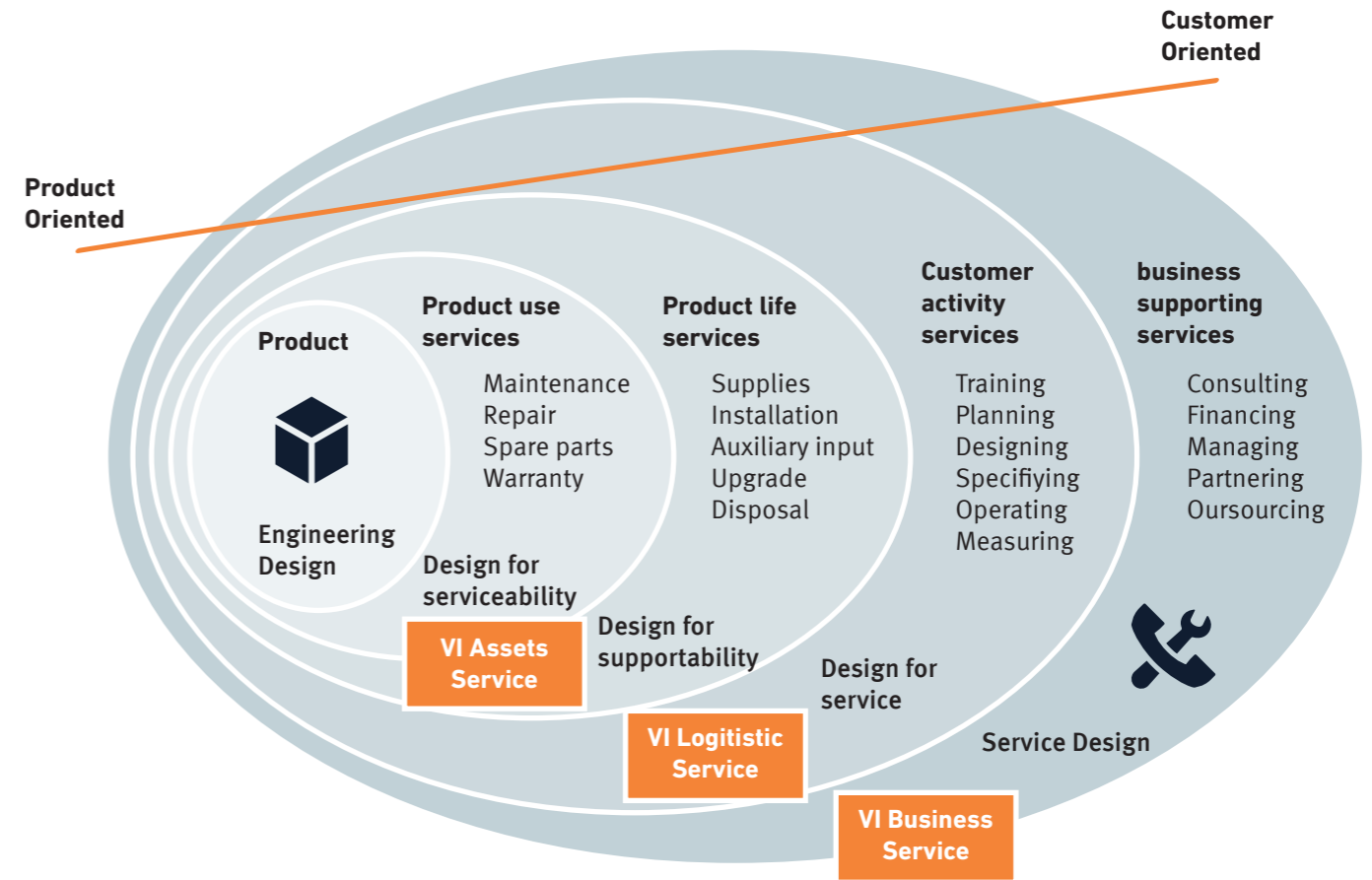

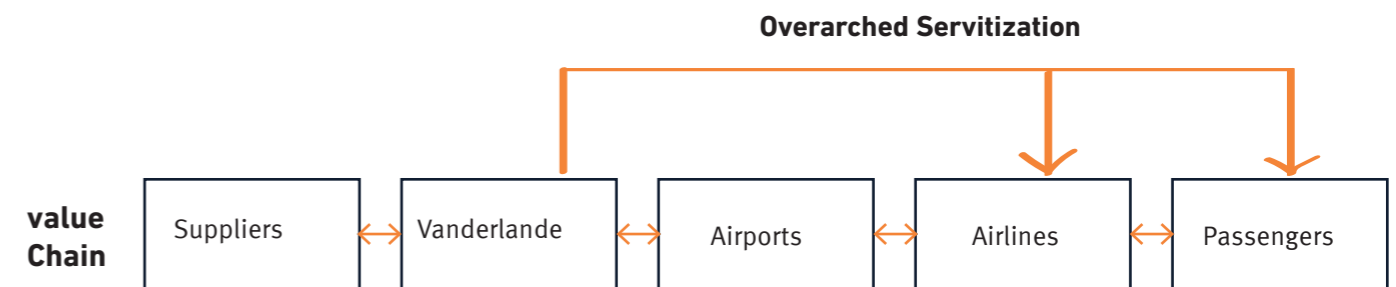Figure 3.4. Servitization strategy Vanderlande (Tan et al., 2010)

Figure 3.5. Overarched Servitization

like noise and incompatible systems. Secondly, there are also systemic problems in communication, where on one hand there are problems in translation, meaning interpretation, and understanding of the data sent. Lastly, Roschuni et al. (2013) add inertia, which is a cognitive bias and resistance to the received information. The reason for this is that the information communicated would lead to a shift in the knowledge that is seen as too costly.

These levels show high similarities with the framework proposed by Carlile (2004) (Fig 3.3). The syntactic level show similarity with mechanistic problems, in the basic design layer of communicating the knowledge in an understandable and logical way. The semantic level shows similarities with systemic translation, both explain that the correctly interpreting and translating the knowledge. And laslty, the pragmatic boundaries show similarities with systemic Interia. The data sent is so novel that it could affect any existing knowledge, beliefs or way of working.

Strategies to cross communcational Issues
To make effective communication of user research there are multiple things to take into account. For mechanistic layer of knowledge sharing, it is important to create a shared lexicon besides creating a clear structure for communication and the right tools to communicate the user research (Roschuni et. al., 2013).

Problems with systemcis translational problems can be solved by helping the receiver of the knowledge create the right understanding and awareness of the given information but also by letting them translate it to their own domain.

For the third layer, Günay(2020) provides an overview. She states that the most important thing is that any delive-

rable presenting user research, which could be any tool, framework, or artifact, should give empathy, inspiration and engagement. Roschuni et al (2013) mention three different strategies: actionability, socializing, and ownership (Fig. 16). Actionability refers to tools for do-ability, suggesting opportunity and make use of the of research in their design process. Techniques include participatory activities or experiential/ active learning. Socializing user research is used to create empathy by establishing relationships through shared stories and experiences. Socializing the research makes sure the data represented is humanized by generating stories or experiences around them. This can be done by facilitating a meeting between primary clients and users or through the use of e.g. visualizations used in service design to keep empathy in the communication. (Roschuni., 2013; Segelström, 2009). Ownership is about creating engagement through emotional investment in the project. This could be including clients/ stakeholders, in the research activities, and letting them carry out the activities. Also about the data represented Günay (2020) mentions it should be novel and rich for the stakeholders but on the other side should have increased interpretability by having a sufficient level of abstractness and open-endess. All these techniques mentioned decreasing the risk of inertia.

Double Ethnographic
Another important aspect of crossing knowledge boundaries, mentioned by multiple studies (e.g. Gunay, 2020; Roschuni et al., 2013;), is the understanding of the client's company. Roschuni et al. (2013) calls this double ethnography, where on one side you research the user and on the other side try to understand the company you research for.

To overcome inertia and systemic translation problems, there is an importance in understanding the culture of the company. It is important to understand what information they need, already have and their cultural (normshuni., 2013). By understanding the language and using existing tools of communication, both mechanistic (Semantic) and (systemic) problems in communication can be solved. Researching the company and the stakeholders can help understand when, where and how user research should be communicated, as well as increasing the credibility of the data represented (Roschuni, 2013).

Double ethnographic Research to boost innovation
Design Roadmapping and its outcomes is an impactful way of creating new strategies which affect all levels of the company including the decision-making levels. In such strong innovation projects, strategic engagement is a necessary element. However, there are elements that could have a potential impact on the company that it could scare them. Terms like "but we have always done it that way"summarize the existing barrier that might exist (Evans, 2013). To start the Design Roadmapping process is an existing barrier or driver for future thinking, to make to boost the innovation process and make the intended outcomes fit. This can help to overcome inertia throughout all stages of the process.
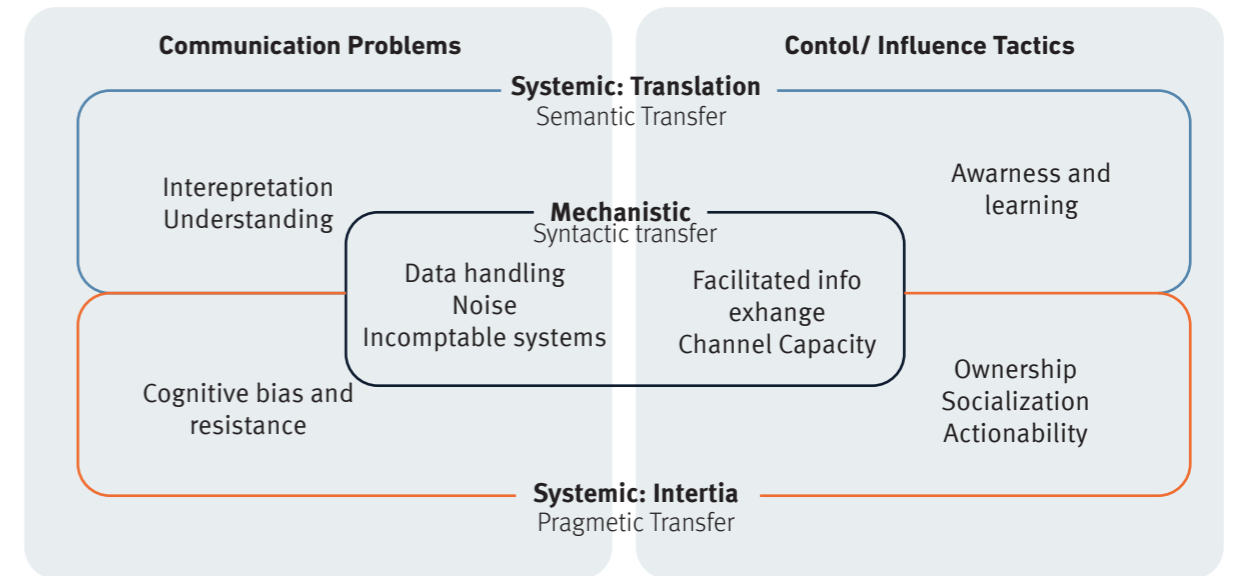

Figure 3.6.. Communication issues through knowledge boundaries in user research (Roschuni et al. 2013)
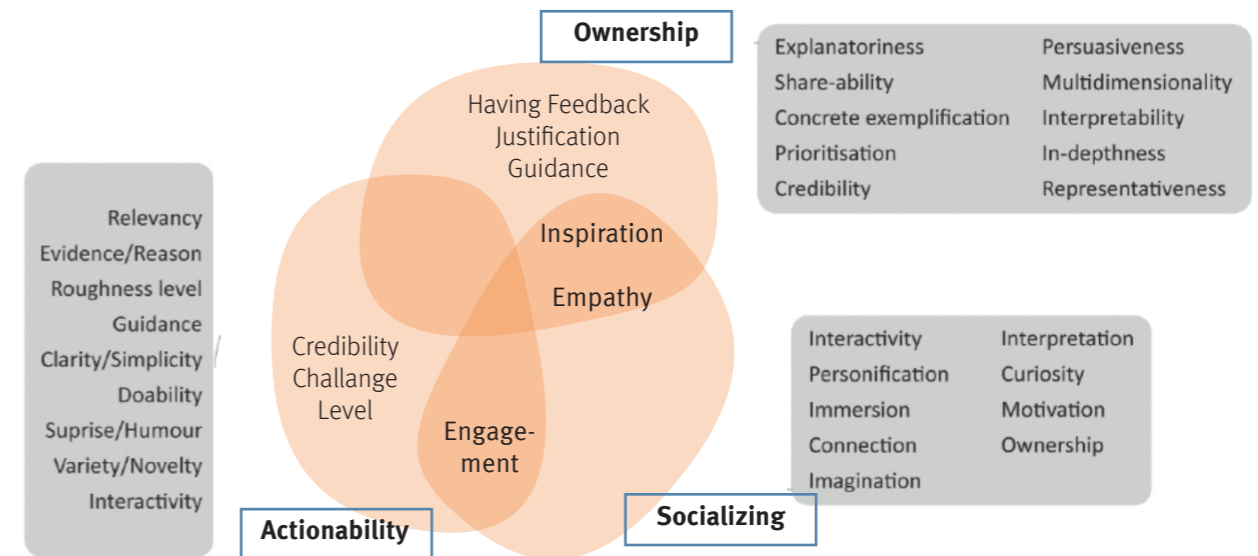

Figure 3.7. Dimensions of communication of user research given (Gunay, 2020)

3.4. Expert review

To see how design roadmapping can be optimal for Vanderlande, an interview with roadmapping expert Euiyoung Kim was held.

He emphasized three things:
- Use the roadmap as a mean to facilitate discussion, not as a goal on its own. The creation and agreement on the details present on the roadmap are more interesting than finding quick solutions.

Choose people who are willing to dare and have an innovative mindset

Bring ownership in the project by bringing in work that they have done before.

This led to one new design takeaway (14). The inclusion of familiar materials of the company to increase engagement, ownership and support for this project.

"We use the roadmap as a mean to facilitate discussion"

"Don't invite save people"

"To bring ownership bring in the research from the work they do"

Make user research actionable by providing inspiration and active learning

Design takeaway 10

Make the user research social by creating empathy for end-users (e.g. through visuals and humanizing data)

Design takeaway 11

Bring ownership in the research by engagement and familiar materials

Design takeaway 12

Make user research actionable by providing inspiration and active learning

Design takeaway 13

Make use of the exisitng materials and lexicon to cross semantic knowledge boundaries

Design takeaway 14

Key take-aways

Servitization is something that has been embedded for the years in the company of vanderlande. In their new structure they provide besides their product and system an sufficient amount of services, ranging from product services to business services. The next step in this servitization strategy is overarching servitization, where there is an increased emphasis on design solutions that fulfil also the needs and wishes of user further in the supply chain. In the case of vanderlande this is the passenger.

However, there are some issues in understanding these passengers, in the case of vanderlande, as they have not yet been incorporated. To make sure this happens, design research performed by external groups or internal groups needs to be translated, transferred and transformed into the project of the Long Now and into this collaborative design project. This could lead to several communication issues as the knowledge that needs to pass the boundaries to the participants is relatively new. This could be mechanistic problems, but also systemic problems like translation or inertia. To overcome this several recommendations are made regarding the communication of design research.

First, it is important to design objects that are actionable, this helps in the engagement of the users (Design Takeaway 10). Secondly, the objects presented need to be social, so participants can empathize with the design research (Design Takeaway 11). And lastly, the objects need to bring ownership, by engaging the participants in the research and making parts of it their own (Design Takeaway 12).

Another important aspect in the communication of user research, is the understanding of any pre-existing barriers for future innovation. By learning about the company's culture, structure and even lexicon, knowledge can be presented in a way that is more suited for the company. This also includes making use of materials familiar fo the participants or that they worked on themselves (Design Takeaway 13& 14).

Chapter Summary

This chapters aimed to create theoretical background to answer the intial research question. In this background 14 guidelines were founded on how to design the roadmapping workshops for Vanderlande.

The insights are found on 4 topics, namely the deeper understanding of design roadmapping. On the facilitiation and design of online workshops. And on the knowledge crossing between the participants and between the design researcher and the participants to explain user research.

Furthermore this chapter gave insight on what knowledge crossing means and how it could be done. In this three things are important that communication of the insights is actionable, socialize and brings ownership.

The guidelines of this theoretical background fill form parts of the design for the strategic design workshop that will be discussed in later chapters.

Chapter 4
Strategic Design
Approach

04

This chapter summarizes the insights gained from the theoretical background and the company context by creating the design approach that forms the basis of the following chapters. Furthermore, it explains the guidelines expressed in chapter 3 relate to this approach.
Lastly, the next steps of this thesis are given by introducing and explaining the second diamond of the double diamond framework.

4.1. Strategic Design Approach

Combining all insights from literature, the strategic workshop design can be made on three levels in which every level zooms in more on the creation of the strategic workshop set (Fig. 4.1)

The first level is the overall design roadmapping process level. The design roadmapping process in a new form of innovation inside Vanderlande. This new innovation method requires a new language and tools so it can be interpreted and used correctly by all participants. For this reason, it has been decided to no longer call the workshops Design Roadmapping, but "The Long Now". Roadmapping was already a term used inside Vanderlande but had a different meaning than the one proposed by Simonse (2018).

Secondly, besides the shaping of the overall Long Now Process, the individual strategic workshops in which the different design roadmapping activities are performed have to be created for a digital environment.
And lastly, the design and creation of the (user) knowledge and the way this is communicated to the participants need to be designed.

In this framework, all design levels influence each other. The Long Now process design decides what the outcomes are that need to be worked on in the workshops, and the content supports the strategic workshops.

The design layers are explained more in-depth in the next section.

4.2. Design Layers
The Long Now process Design

The Long Now Process Design
First, there is a design of the general process that will be carried out in The Long Now. Design roadmapping will form the base for this, however, the exact structure and quantity of workshops is a variable that needs to be designed. This layers determines the outcomes needed in the strategic workshops and the knowledge that needs to be designed as input. Other design guidelines can be found in figure 2.2. The Long Now design gets explained in chapter 5.

Strategic Workshop Design
On a second level, the strategic workshops on an individual level need to be designed for. This means the design of the workshops and all

activities included in this workshop. The structure of the workshop and the activities should not only build towards the creation of a roadmap and necessary in-between results but also focus on the explaining the relevancy of each step and reaching consensus in the workshops. The length of the workshop and the entry-level of the participants are important dimensions in the design of the individual workshops. The design of the different strategic workshops are explained in chapter 7

Knowledge Design
And lastly, there is the design of the knowledge, which serves as input for the different workshops. An important value that designers bring to the workshop is their knowledge about design research techniques and methods and being able to communicate this through visual representation (Roschuni, 2013). This level requires multiple steps; the research itself, the creation of useful insight and, the visualization and communication of these insights.

Design guidelines
To support the design on all three levels, the design takeaways are grouped according to level (Fig. 2.2).
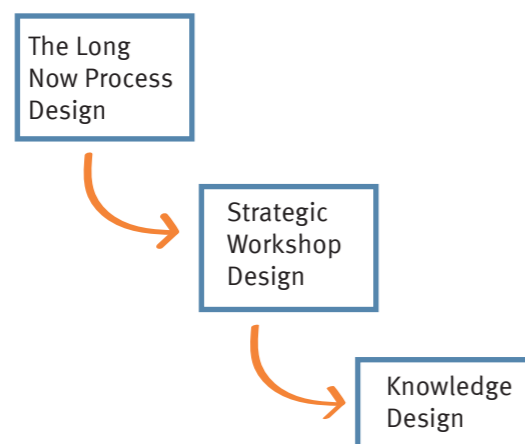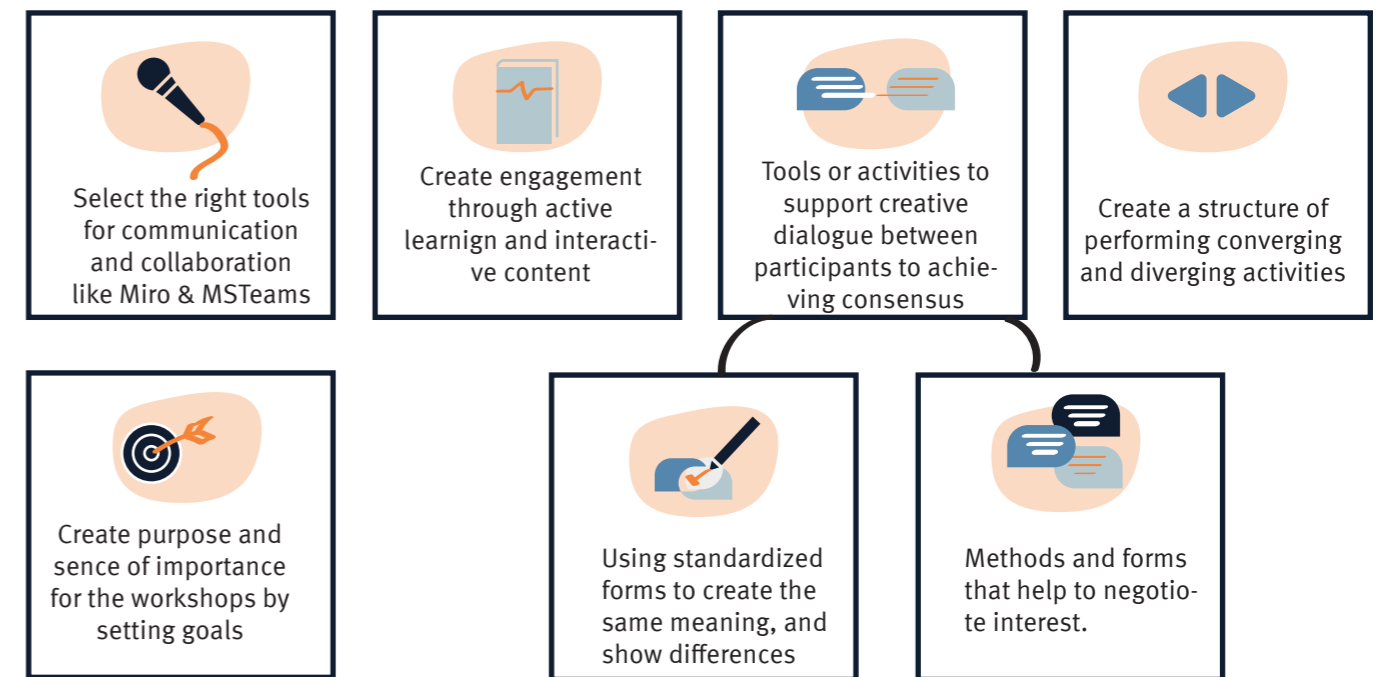
Figure 4.1. Design Layers in The Long Now

The Long Now Process Design

- Discover barriers and drivers for future thinking by understanding the company
- Include the three mapping session of Design Roadmapping
- Create involvement from all levels of the hierarchy by active involvement

Strategic Workshop Design

- Select the right tools for communication and collaboration like Miro & MSTeams
- Create engagement through active learnign and interacti-ve content
- Tools or activities to support creative dialogue between participants to achie-ving consensus
- Create a structure of performing converging and diverging activities
- Create purpose and sence of importance for the workshops by setting goals
- Using standardized forms to create the same meaning, and show differences
- Methods and forms that help to negotio-te interest.

Knowledge Design

- Make the user research social by creating empathy for end-users (e.g. through visuals and humanizing data)
- Bring ownership in the research by engage-ment and familiar materials
- Make user research actionable by providing inspiration and active learning
- Make use of the exisitng materials and lexicon to cross semantic knowled-ge boundaries

Figure 4.2. Design Principles for design layers
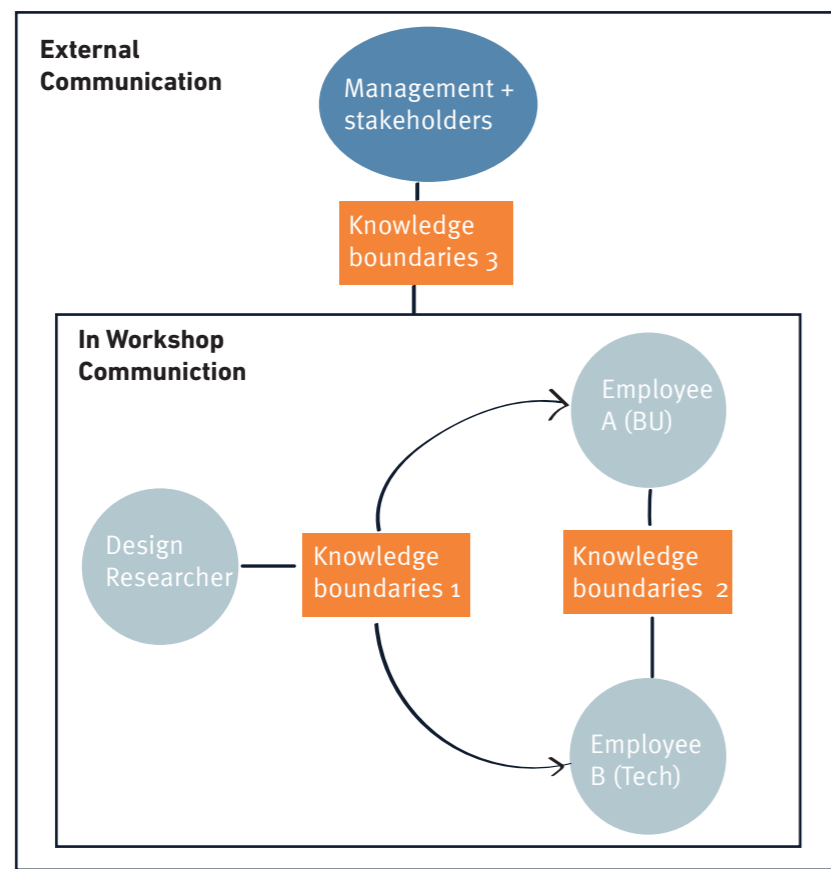
Figure 4.3. Knowledge boundaries in The Long Now.

Figure 4.4. Second Diamond for desiging the Right solution

4.3. Bridging Knowledge in The Long Now

Besides the different layers of design, a second insight is that the tools that are designed need to support knowledge crossing between all stakeholders in The Long Now.

In the design of The Long Now, knowledge boundaries have to be crossed on three levels to create the bottom-up innovation of the Design Roadmap (Fig. 4.3.) And can therefore be designed for using the given insights from the literature.

On the first level is communication within cross-disciplinary innovation. This communication includes the communication necessary to express the design roadmapping process and to express any type of externally performed user research. For this, the artifacts presented should be actionable, socialized, and provide ownership to the actors. This way they

will adopt the new knowledge about design roadmapping and user research (Roschuni et al. 2013). Also the use of existing materials to increase ownership in the project.

Secondly, there are knowledge boundaries between participants of the workshop. All participants work in different departments of Vanderlande. To make sure that communication between different participants runs smoothly and helps them to understand each other, different tools and frameworks should be designed in order to facilitate teamwork and to support creative dialogue. The tools provided to them should represent any existing differences in interpretation and translation of the knowledge to their own domain, and help to negotiate to achieve consensus.

The design of tools and methods that bridge these knowledge boundaries should be transferring knowledge by creating a common lexicon between the participants. This can help them to

translate the knowledge to their own domain and transform knowledge by discussion. The tools should support the participants in this creative dialogue, preferably by making use of visual outputs that fuel the discussion.

Lastly, the communication of the process to higher hierarchical levels of the company. As this project requires multiple participants, higher levels of management of innovation should be included. To convince senior management of the importance of this project, several boundary-crossing activities have to be held. This requires three phases, beforehand to receive approval, during to communicate the process and in between results, and afterward to express the design roadmap.

For this case the design of the tools should support the higher management levels in transferring all relevant insights of the project, translating how this affects vanderlande, and active involvement in design outcomes that have a high impact on the current strategy.

4.4. Design Goal

To frame all insights a design goal has been made:

"Design the process, strategic workshops, and content for "The Long Now" that is transmittable to different domains following the created guidelines and that helps in crossing any existing knowledge boundaries by designing the tools/ frames/ methods for this."

This design goal is based upon the initial research question, but answers part of the how question, by explaining the three design layers and the guidelines. Furthermore, is the research goal more focused on designing tools that could help span knowledge boundaries explained in section 3.3. These tools help in creating the customer-focus earlier discussed in the initial research question. Furthermore, the goals express focus on designing the workshops in a way that they are transmittable for new domains is. These domains are the other fields that Vanderlande operates in, for example, the Asian Pacific region and Latin American Region of airports, and the BU Parcel/ Warehousing.

The scope of this first workshop will be Airports in the European region. This workshop will serve as the starting point of the following workshops. To see how the effect of the different strategic workshops, the outcomes of the different strategic workshops will be highlighted in blue sections.

4.5. Design Approach for the Next Phase

To indicate the next steps of the workshop the second diamond of the double diamond figure is used (fig 4.4). This part focuses on designing the right solution.

Ideate
The ideation phase is divided into three activities. First, the design of the Long Now process, means thinking about creating the right process and steps for the long now. Secondly, the ideation of the strategic design workshops and the preparing workshops. Thirdly, the creation of the right knowledge should be made. This includes trend research and user research. Trend research is performed through interviews and desk research. User research is performed by the combination of various design

projects performed by external parties.

Deliver
The last step is the delivery of the end process. Both the process and the content are iteratively tested and redesigned before the execution of the workshops. During the testing of the workshops, observations are made to see how the participants are reacting to the design of all layers. To reflect on the effectiveness of the strategic workshops and knowledge crossing artifacts that are created, interviews with the participants will be held. Lastly, the outcomes of the workshops are displayed. All these observations lead to the final design.

Final Design
In this graduation project, the final deliverable is a set of tested workshops for the first series of The Long Now, that could transfer to other domains. The process includes the finalized set of workshops and the individually tested frames to support communication and interaction of The Long Now. The entire process, including activities with senior management and preparing the content, is presented in a Miro board.

4.5. Limitations

Due to the quantity of the workshops, the extra difficulties in communication and planning due to Covid-19, it has been decided that this thesis focuses on only creating a Shared Vision of The Long with all stakeholders.

Key Take-aways
In the creation of the Long Now there are three design layers. The design of the process, including the workshop types. Secondly, the design of the individual workshops and lastly the design of the content. All layers have their own design guidelines found in literature.

Furthermore, there are also important moments of communication, in which knowledge boundaries could occur, namely between the facilitator/ design researcher and the participants, between the participants and lastly in de communication to senior management. To frame the insights a new problem statement:

"Design the process, strategic workshops, and content for "The Long Now" that is transmittable to different domains, following the created guidelines and that helps in crossing any existing knowledge boundaries by designing the tools/ frames/ methods for this."

In this thesis the focus is on the design of the process and including workshops and content, and uses the outcomes of this process as a case study.

Chapter 5
The Long Now
Process Design

05

This chapter marks the start of the second diamond and the ideation phase, by giving an overview of the Long Now Process. In this chapter, the design decisions are explained. The chapter gives an idea about the individual workshops that need to be designed and the content that needs to be included in the process which will be discussed in other chapters.

Figure 5.1. The Long Now Process Design
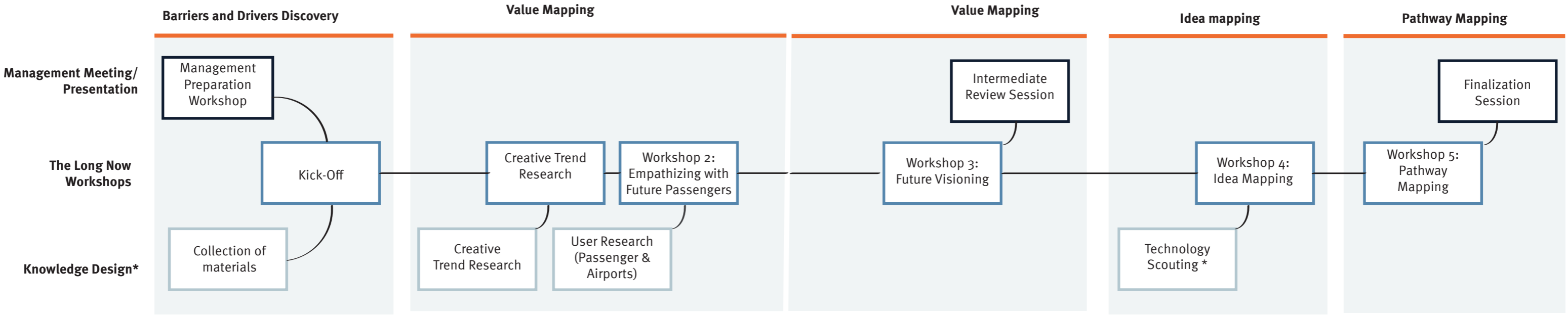
Legend:
- Strategic Workshop Design (chapter 7)
- Knowledge Design (Chapter 6)

* Some of the content elements were made by me, some were already made by Vanderlande.

Process diagram columns: Barriers and Drivers Discovery | Value Mapping | Value Mapping | Idea mapping | Pathway Mapping

Rows: Management Meeting/Presentation | The Long Now Workshops | Knowledge Design*

- Management Preparation Workshop
- Kick-Off
- Collection of materials
- Creative Trend Research
- Creative Trend Research
- Workshop 2: Empathizing with Future Passengers
- User Research (Passenger & Airports)
- Intermediate Review Session
- Workshop 3: Future Visioning
- Workshop 4: Idea Mapping
- Technology Scouting *
- Finalization Session
- Workshop 5: Pathway Mapping

- Include the three mapping session of Design Roadmapping
- Discover barriers and drivers for future thinking by understanding the company
- Create involvement from all levels of the hierarchy by active involvement

5.1. The Long Now Design

The Process of the Long Now can be seen in figure 5.1. This design was built up out of the design principles explained in the previous chapter. The design guidelines and how they are integrated into the process design are discussed in this section. The design of this process was done by through continious iteration between the internal designer of Vanderlande and me as an external designer to fit within the pace and process of Vanderlande.

The workshops are built up out of the three critical mapping sessions described by Simonse (2017). These mapping sessions are value mapping, idea mapping, and pathway mapping.

The value mapping sessions are decided to be translated into multiple smaller workshops, this is done because the topic of design roadmapping and focussing on the passenger is relatively new for the participants therefore the decision was made to take a deep dive into the future passenger in an extra workshop, to empathize better with them. Also, the workshops could only last 1-2 hours each because of the difficulty in getting all participants present.

Discovering boundaries and drivers of future thinking is seen as an essential element in the communication of user research as well as in the success of the workshop in itself. To discover any pre-existing barriers or information a kick-off meeting is designed. This meeting does not only give the participants an idea about the strategic workshops and design roadmapping, but was also aimed at identifying any expectations or challenges that they thought they would experience through the workshops.

Lastly, the involvement of senior management is included in the process. This involvement is carried out in three steps. First, in the start of the project to receive engagement and interest in the Long Now. Secondly, there is a middle review session to discuss the outcomes and receive feedback on the created design vision. Lastly, to discuss the roadmap, explain and discuss the final outcomes of the roadmap.

5.2. Strategic Workshops in the long Now

In total a series of 6 workshops will be designed to create a design roadmap for vanderlande. Those 6 workshops and their goals are explained in figure 5.2. The exact design of the four first workshops can be found in chapter 7.

Beside these 6 workshops, 3 sessions will be held to inform management in the process of The Long Now. The design for those workshops can also be found in chapter 7.

5.3. Knowledge Design in the Long Now

As the workshops can only last a limited amount of time, it has been decided to create content for the workshop that serves as input. This is done to save time and only focus on converging materials to useful insights. Throughout the project various design research activities were performed in order to generate input for the workshops and to communicate end-users desires and needs.

The content and how to create this content is explained in chapter 6. During the strategic workshops new content was added based on the next steps. These things are mentioned as the design outcome in the blue areas of chapter 7.

Workshop	The Kick-Off	Workshop 1 Creative Trend rearch	Workshop 2 Empathizing with Future Users	Workshop 3 Future Visioning	Intermediate Review Session	Workshop 4 Brainstorming	Workshop 5 Linking Activities	The Long Now Review Session
Timing	1 hour	2 hours	2 hours	2 hours	1 hour	3 hours	3 hours	1 hour
Goal	The goals of this workshop is to get everybody on the same page about the Long Now. This includes understanding the process and expressing expectate barriers or drivers	Determine the most the most interesting trends for the future of vanderlande	Empathizing with end-users Who are they and what do they care about now and in the future and what experiences do they aim to seek?	Create a future vision for 30 years from now build up of the trends and artifact	Receive feedback over the process and the future vision statement	Develop intersting ideas and concepts for next generations using the future vision and values as starting point for these ideas	Creation of the mutual design roadmap in which all idea are linked and existing activities are matched	Receiving final feedback on the first version of the roadmap from all stakeholders
Expectated Activities	Introduce and explain design roadmapping through examples Discover barriers and drivers expected for the Long Now	Presentation on found trends and the process of finding them. Determine Strategic Innovation fit.	Determine most important user value driver and determine which trends are most intersting for them or how trends relate to future personas	Creating far future scenarios Creation of a vision statement Creation of a vision artifact	Explaining the design outcomes of the previous workshop Gather feedback on the future vision	Brainstorming on third horizon ideas Technology presentation Creating Value propositions for the third horizons	Map idea's on timeline and match linking acitivities of existing roadmaps. Create a Draft roadmap	Explaining the design outcomes of previous workshops Gather feedback on the future vision
Expected outcomes	List of barriers and drivers for The Long Now	Trend patterns and the strategic fit	Value Drivers/ Future Personas	Future Vision statement and future vision artifact	A shared future vision	Ideas for all the far future (h3)	Draft Strategic/ tactical Roadmap	The Long Now Strategic/ tactical Roadmap

Figure 5.2. The Long Now Process design

Key Take-aways

The Long Now Process consist of 4 phases. The first phases is to determine any existing barriers and drivers for innovation and making sure that all stakeholders are on the same page. The next stage are value mapping in which an extra workshop is added to empathize with the future end-user. The last two stages as are Idea and Pathway Mapping. For each of these workshops of idea mapping, knewledge needs to be designed to use in the workshop.

Throughout process there are three moments where the involvement of senior management is asked. At the start to get approval for the project, midway to update and receive feedback on the future vision, and at the final design.

Chapter 6
Knowledge Design

06

An important value that designers bring to the workshop is their knowledge about design research techniques and being able to communicate this through visual representation. This design research can, when done right, bring a more customer-centric focus to the participants without having to perform the research themselves (Ruschini, 2013).

The workshops in The Long Now are limited in time, therefore the decision has been made to perform some of the activities necessary for the workshop by the designers working on this project.

In the project, three types of knowledge design have been done, namely the collection of the content of existing materials and transforming this to The Long Now, trend research, and user research. In this the chapter the design of these materials is discussed, to make the process transmittable, as well as the outcomes.

The outcomes of the different activities are given in the blue boxes
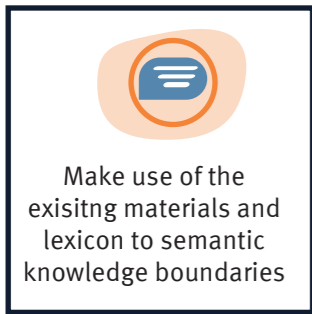
6.1. Collection of knowledge from participants

At the start of the project, small interviews were held using miro to collect the first materials and input for the workshops and to create engagement. The workshops aimed at digging up knowledge that exist in the different silos of Vanderlande and integrating this as recognizable input for the workshops. By making use of the existing materials, ownership in the project can grow and existing knowledge becomes visible.

The "Coffee Meetings" were used to explain the topic of the Long Now through a presentation, collect interesting materials and insights from the participants, and lastly, to collect the first initial ideas on innovation directions they see for Vanderlande.
  These meetings were done through

Miro. This also helped them to get already comfortable with the used software (fig.6.1).

The "Coffee interviews" included besides the question of adding additional interesting materials four other questions based on the design roadmapping principles:
- New emerging technologies and their functionalities
- Stakeholder involvement
- Interesting trends in a DEPEST
- Ways they perform market research.

The coffee interviews asked to define the strongest qualities of Vanderlande but also their biggest challenge, the conversation concluded in describing what kind of future directions they see for Vanderlande.

Outcomes
The coffee interviews were done with 4 people. However, from the coffee interviews, the first materials of Vanderlande were obtained. The outcomes of these interviews were mainly trend and technology reports in multiple domains. Those things were taken into account in creative trend research and user research which are described later in this chapter.

Make use of the exisitng materials and lexicon to semantic knowledge boundaries

Figutre 6.1. Design Map for Collecting Input from participants

Trend Research Outcomes

6.2. Creative Trend Research

Trend research is therefore an effective method in order to explore the future and think in new ways but also embedding the customer perspectives.

The technique used in the Long Now is the creation of trend patterns through immersion. The process starts with defining the right scope. This is the scope in which research will be performed. One of the largest challenges in trend scanning is to explore the borders of your scope. This means looking beyond the expected and existing markets but stay with the complexity of the given context (Evans; 2003; Simonse, 2017).

The second activity is the immersion in the context through various sources and lastly the creation patterns through clustering (Simonse, 2018)

This extensive trend research has been performed to serve as input for the workshops, by presenting the outcomes of trends. The outcomes are mostly related to passenger trends for the scope Traveling in Europe. The outcome of this trend research is used to make participants think in new directions and generate ideas about what the future could be like and what value they can bring to this future.

Areas of Trend Research

Vanderlande now mainly focus on creating solutions for the existing airport market and smart logistics. Therefore, an interesting approach is to look beyond those borders to find new markets or opportunities they could explore.
The areas for the creative trends research are given in figure 6.2. The areas of the trend research answer the Who, What, How and Where/ from question of the domain: Traveling in Europe. Looking beyond the borders of their usual scope can help to see the world in new directions (Evans, 2003)

"Who" signifies the passengers and their experiences. In overarching servitization, it is the traveler that we want to create value for, so understanding what drives them is important. What are the reasons for traveling? Travelling can have different purposes and different types of tourism. How we travel is covered by mobility and logistics. Travelling does not necessarily mean the current context of airports, as trains and cars can also be used to move around travel in Europe. And lastly where/from, Cities are the starting or ending point of most of the European travels and therefore influence the final stages of Traveling in Europe.

Traveling in Europe search area's

Passenger experience — Mobility and transportation — Traveling in europe — Tourisme — Cities and living
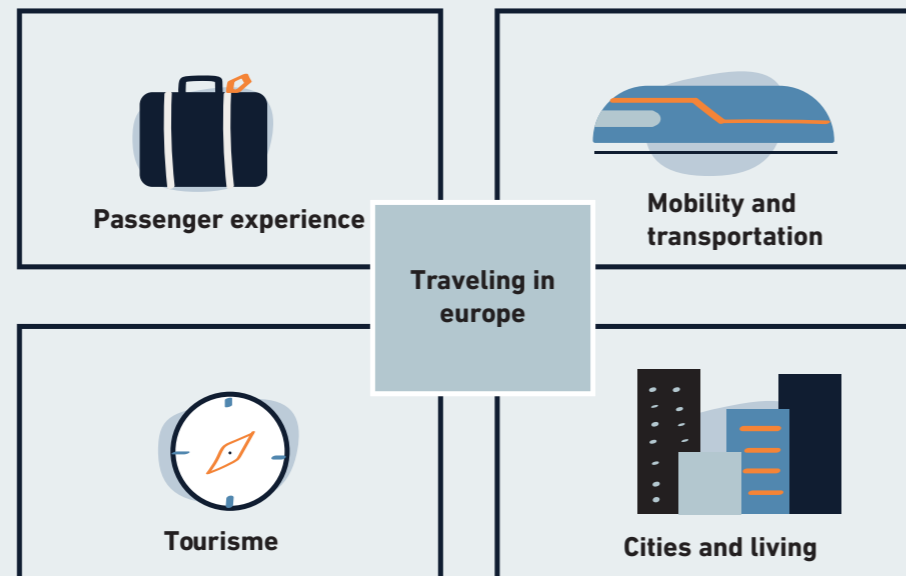
Type of media	Example
Websites	Full list can be found in References
Podcasts	Innovative Leaders by INFO #15 NS: Joost van der Made The McKinsey Podcast: The future of airtravel Check-in the Vanderlande airports podcast: episode 4- end-to-end Thinking
Repors	TU Delft Inhouse Design Report White paper: Bagagge as a service ETC - European Tourism Trends and prospects INFO Vision on Mobility: Enrout to 2050
Blogs	Vanderlande Internal Airports Blog
Era Analysis	Appendix B

Table 6.1. Immersion for the Trend Research

Name	Function
Cher van Slobbe	Innovation & Strategy Consultant, Capgemini Invent
Pepijn van Dalen	Management Consultant, Capgemini Invent
Claire den Boer	Design Strategist, LeasePlan
Sicco Santema	Professor Network Design & Innovation, TU Delft
Bert van Wee	Professor of Transport Policy, TU Delft
Barend Klitsie	PhD Design Innovation Management, TU Delft
Mathijs Voorend	Marketing Manager, Thales
Albert Postma	Professor of strategic foresight and scenario planning, EFTI (NHL Stenden university)
EuiYoung Kim	Assistant Professor of Design for Dynamic Stability, TU Delft
Deborah Nas	Professor Strategic Design for Technology - Bassed innovatio, TU Delft Member of the Supervisory Board, Hardt Hyperloop

Table. 6.2. Expert Interviews

Immersion

Immersion is a deep dive into an area of interest to submerge yourself in the context. Immersion can be done to collect pieces of information to later use in the discovering of new trends (Simonse, 2017).

For the immersion data was collected from various sources and activities: (internal) blogs, websites, podcasts, articles, reports, and analysis of the era of aviation history and lastly through interviews with 10 experts in total. All sources can be found in table 6.1.

Interviews with experts

Interviews with experts are a proposed method when submerging yourself into the context. The involvement of experts in future-oriented projects is seen as a key research resource, as they fill the gap of knowledge of certain topics, as well as providing interesting viewpoints, opinions, and arguments (Evans, 2015). Besides adding new viewpoints, experts' involvement can also positively influence roadmapping workshops. de Oliviera et al. (2020) states that " involving large groups of experts through individual interviews leads to richer and more focused workshops in terms of information, involvement of the participants and decision making."

Interviews were held with experts in the given areas and with various backgrounds, a list of interviewees can be found in Fig 22. The interview guide used can be found in Appendix C. All interviews lasted between 45 minutes to 1 hour and were done through video calls to which the audio is recorded. From these interviews, the most interesting quotes were written down and pre-clustered to structure the interview and find an overview and preliminary trends. Also, the most important quotes from the interviews were selected from the recordings made, to later use as inspirational input into the workshops.

During the interviews, some experts proposed interesting documents to scan or referred to previous work they had done. Those documents were also included in the Immersion through desk research.

Trend Research Outcomes

Creating patterns

After the immersion into the different areas to collect interesting information, the second step is to discover trends through clustering the pieces of information. This first clustering led to 44 interesting trend cards, explaining evolving trends (Appendix D). After this step, different initial trends were clustered again to even find a deeper meaning, this left us 14 clusters. A final round of clustering was done to define the deepest layer of value derived from the trends, which left us with 6 large trends .(Fig 6.3.)

> "The ideal journey is for me the one were the passenger has its maximal experience"
> – Prof. Mr. Dr. Ir. Santema

From information to Insights
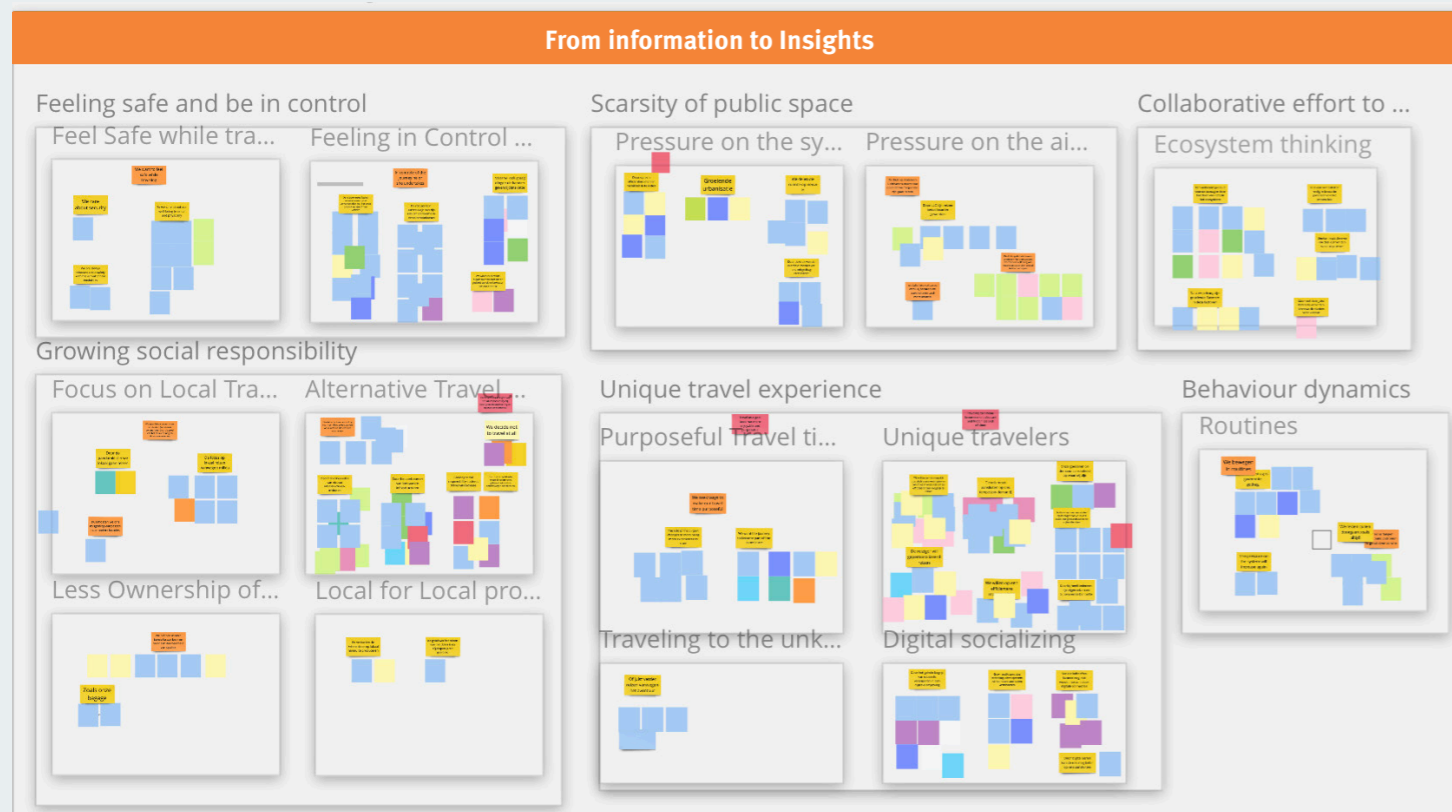
Figure 6.3. Creation of Patterns

Trend Patterns

Feeling safe and in control.
During our travel time, we want to feel in control to make sure the travel runs as smoothly and safely as possible. We focus on our mental and physical health in this process. By being in control we know every step of our travel and all necessary information to make sure that nothing can go wrong anymore. On the other hand, we know things are safe and reliable, we are okay to give things out of hand.

This pattern is built out of two trends:
- Being in control over the journey
- Feeling safe and healthy while traveling

A shifting focus to local traveling

The development of (new) sustainable modalities

Being in control over the journey

Feeling safe and healthy while traveling
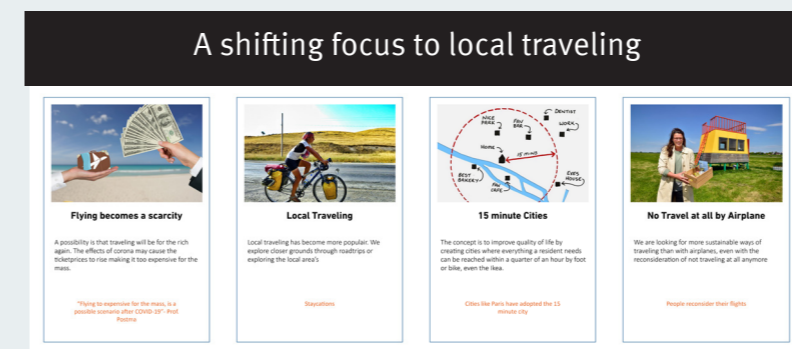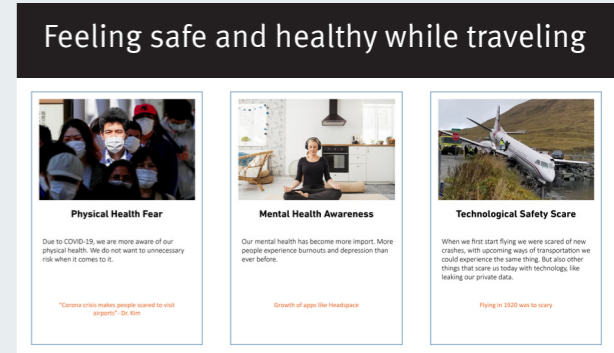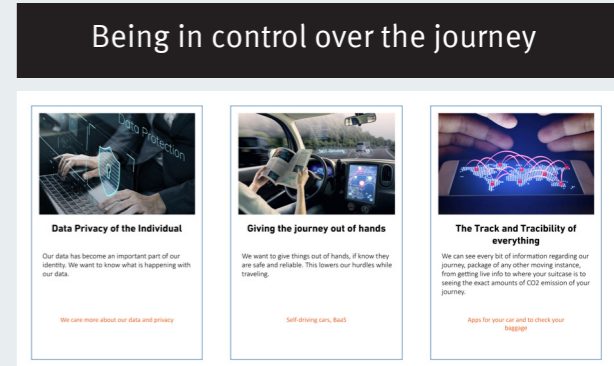
Sustainability
We want to make more sustainable choices in the modes of traveling and our consuming behavior. An increasing group of consumers as well as companies are growing interest in sustainable alternatives or changing their lifestyle. This affects the way we travel, the modes of transportation and the destinations we are going to, and the reasons why we travel. Because of this growing environmental responsibility, new more sustainable modalities are arising. We also rethink our current travel to make only necessary trips or we change the destination to staying closer at home.

This pattern is built out of two trends:
- A shifting focus to local traveling
- The development of new sustainable modalities

Trend Research Outcomes

Comfortable Urban Living
Besides the growing population and urbanization also the mass-tourism due to cheap plane tickets causes the cities to overflow in people. This brings challenges in mobility but also calls for creative solutions to reclaim the urban space. Making better use of the existing system or rethinking the public space by banning cars from city areas. All factors to make the cities a more enjoyable place to live and to visit.

This pattern is built out of 2 trends:
- Overpopulation in urban areas due to mass tourism
- Reclaim of the urban space

Overpopulation in Cities

Low Cost Carriers make Cities Overflow in Mass Tourism

Flying has only become cheaper, due to low cost carriers. They travel mainly from city to city and therefore facilitate mass tourism of citytrips.

Ryanair 20 euro flights to London

No more place for you in the City

In 2030 we will be with 8.6 billion people, and with the trend of urbanisation our cities.

Urbanisation and Population growth

Reclaim of the urban space

Mobility Hubs

Hubs at the border of the cities where all types of modalities come together. You can easily switch from modality to another. Small electronic vehicles can than be used for the last mile of your journey.

Mobility hubs, similar like Q-park

Carless Cities

More municipalities are focussing on creating carless cities.

Sharing of a parkingspot in different area's around the Netherlands

Pay per Use

By Pay per Use of our transportation we can make better use of the current system. If we pay more per use in peak hours of traffic we can manage overcrowded trains and trafficjams better and make them become obsolete.

Rush hour charges
Pay per KM

Personalized experiences

A Personalized Travel

Personalization will be the key, providing passengers with what they want. Unique travelers call for unique experiences.

Travel assistance
Personalized choices

On-demand Delivery

Packages are getting no longer delivered to your house, but to you. No matter were you are or what time, you will get your package right where you want it.

Sidewalk robots and Drone delivery

Traveling On-Demand

Start the journey whenever you want to. This means no more waiting at airports or busstops as you can travel whenever you want.

Virtual Busstops
Personal Rapid Transit, PODS

Meaningful travel time

Traveling adds to Life Values

More companies see that traveling should not only bring you from A to B, but should also provide with a service that enriches your life and values.

"Passenger, for example say they want to travel on time, but when they really care about is being acknowledge and have freedom" - Head Innovation NS

The Experience Journey

The journey itself becomes an experience adding to the destinations. This makes the journey no longer a waste of time, but adds purpose and enjoyment.

"During the journey I already experience the destination, so it brings me into a certain state of mind" - Prof. Mr. Dr. V. Santema

The Entertainment Airport

Airports become centra of entertainment. They serve more than your flight, for example restaurants and cinema's. Also shops at airportsbecome experience stores, where you buy the product and it gets delivered at home

Singapore Airport

seamless traveling

Baggage as a Service

Get your luggage picked-up from your home and delivered at your final destination. No more check-in, carrying your heavy bag or waiting at the reclaim carrousel

Baggage as a Service at Connexxion
Inhouse Design Team

Mobility as a Service

Utilising a variety of modes of transportation organised to travel from door-to-door through a single booking process or ticket will become the new norm. You will always been shown the mode of transportation that gets you to the final adress in the way you want.

Mobility as a Service (MaaS)

Touch Free Travelling

No more frictions in the journey. No more queues and crowded terminals, all existing issues will be eliminated due to new technologies

Digital queuing
Biometrical face recognition

Unique Experiences in Traveling
Unique travelers call for unique experiences, whether this means a unique destination or a journey does not matter. In this traveling, we see that we seek to make our travel time more purposeful by adding an experience to it, as well as making it more fitting to our own needs and wants. Seamless experiences are a central part of making the experiences more enjoyable. Personalization in this case plays a large role, as every travel has its own journey.

This pattern is built out of 3 trends:
- Meaningful travel time
- seamless traveling
- Personalized experiences

Collaborative effort to solve societal issues
Large organizations are discovering more and more the power of synergy. By working together, more can be achieved and the customer can even be served better. In this collaboration, there is an important issue of sharing data, as this is crucial for optimizing user experience. At the same, we also look at how businesses can make better experiences for the earth by producing more local.

This pattern is built out of 2 trends:
- Ecosystem thinking
- Local for local production

Traveling for escaping routines

Exploring the Unknowns

Traveling to unknown places or even further, to space. Nothing seems impossible.

Space X

The Recovery of (Air)travel

Airtravel will recover, how ever this can take up to five years. We are eager to travel again, people have already started booking their tickets. Also looking at past pandemic or crisises we can see that airtravel is most likely to recover

Looking at past pandemics

Traveling is a Natural Habit

Over the last decania we have seen that traveling in itself is a natural habit. We will always travel a consistent amount of time.

"Over the years we see that our traveltime has remain consistent of 80-70 minutes" Prof. Dr. Jan Wee

Digital traveling to connect

Socializing Digitally

Social interaction cannot (yet) be replaced by digital interaction, but new alternatives are rising. Multiplayer gaming has for example become more popular over the last years.

Gaming (Animal Crossing)

Business Travel Dissapears

business travel will be absolete as result of COVID-19, we have discovered new methods in which we can work remotely.

Zoom, Miro

VR Travelling

Traveling from your home to anywhere in the world through 1 click. Due to immersive technology, we can be anywhere in the world with the blink of an eye.

VR trip tours musea and VR holiday

Less ownerships of goods

Shared Mobility

The sharing of vehicles has become more normal. People care less about the possesion of the vehicle and more about the use.

Felyx, Green wheels, LouseCars

Clothes as a Service

We already wear second hand clothes and sleep under hotel sheets. We can borrow clothes on the destination of our holiday, making our luggage obsolete.

"Hotels will become like B&B's, clothes already hang in the closet and a laptop will be provided" - Prof. Mr. Dr. V. Santema

Less Luggage per Person

The amount of Luggage we bring has decreased over the years. We are about to bring less by policy, but also we go more on short trips.

Flexibel Travellers

We become more flexibe in choosing different modes and choose the one that fits our journey of that day the best. Also the amount of modalities to choose from increases.

Modalities like Car to go, felyx or Public transport

Local for Local Production

Expansion of Import of Goods

We are buying more than ever of the internet, all these products need to come from somewhere. Passenger planes have recently been filled with goods instead of passengers due to COVID-19.

Virgin Atlantic has increased its cargo only flights by one third

Multilocal Production

We are going to produce products more local. Leading companies are reassessing their sourcing and manufacturing networks and rebalancing their supply network strategies in favor of multilocal design, supply and support.

Multilocal companies like relate alter their products to the domestic market

Growing Corporate Social Responsibility

More companies are aware of climat change, making sustainable choices and caring about the environment

KLM Fly Less Campaign

Ecosystem Collaboration

Blockchain to Decentralize the Travel Industry

The travel landscape is dominated a few companies who act as third party player in the booking industry. By decentralization, the third-party is taken out, resulting in more secure and safe booking and more transparency for every party.

Blockchain based startup Winding Tree

Collaborative Effort Through Ecosystems

More companies are starting to focus on creating ecosystems in order to create better products for their final customers. Question remains on who the orchestrator is?

OV Chipkart

Data Sharing as Collaboration in Ecosystems

Data sharing between different parties has become the norm in order to perform the most optimal way. Also to create personalization and deliver the full service.

OV ChipkaArt

Travel Freedom
Freedom is a large driver for passengers. The excitement of going to new places and discovering, is something that is likely to restore again after the global pandemic. A reason for this is the routine behavior of humankind. In this same movement of freedom, we also the freedom in making our own choice and filling in our own time. We started to connect more digitally, we do this for social purposes as well as work-related ways. This makes physical travel obsolete in some instances. Lastly, a movement of not being attached to any form or instance is also a trend. We feel less the need to have stuff but more need in sharing things. We do not see expensive items as status items anymore. Not owning brings us the freedom to be flexible in all choices.

This pattern is built up out of 3 trends:
- Travel for escaping routines
- Less ownerships of goods
- Digital travel to connect

Trend Scenario's
Based on the smaller trends, 4 small scenarios were created this can found in appendix E. However, later in the process multiple iterations based on the insights generated in the strategic workshop altered these trend scenario's
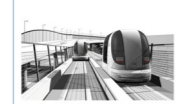
Communicating the Trend Research

Communicating the research properly is one of the most important things for crossing the knowledge boundary and overcoming systemic inertia (Roschuni et al., 2013). To explain the outcomes participants should understand how the research was build up and what the outcomes could mean for them. To do so a presentation and a video has been made on the process and outcomes of the Trend Research

6.3. User Research

Persona Creation
User research helps in understanding the needs and wishes of end-users. In design roadmapping, some designers use creative trend research to discover value drivers for future users, while others research the existing user through design techniques to understand their current needs and wishes (Simonse, 2017; Kim et al., 2016). However, inside Vanderlande there is no common understanding of who the current traveler/ passenger is now, therefore could it be difficult to translate the trends into value drivers of the future end-users. To let the participants of The Long Now get a general understanding of the current passenger, extra focus to this was added. The existing insights and data on the passenger were collected out of previous internal and external projects. This has to be transformed into one general idea of the passenger.

To make sure the user research is still adopted by participants, it has been decided to socialize the outcomes of user research through (future) personas. Personas are in this case a visual output that summarizes all collected documents about the existing passenger. Furtmore, can personas help later in the process to support any design decision. Lastly, the use of personas was chosen to represent the value drivers by seeing how they would react to emerging trends. More can be read about this in chapter 7.4.

The process of designing the personas consisted of three stages. First the collection of existing materials and determining the relevance. Secondly, discovering overlapping values or ideas and lastly making a visual representation of the output.

Make the user research social by creating empathy for end-users (e.g. through visuals and humanizing data)

User Research Outcomes

Collection of existing materials
In the collection of existing materials, there were two kinds of materials. There were existing personas/ traveler types created internally by Vanderlande or externally by partners of Vanderlande. In total 9 different personas/ types were collected: 3 traveler types used internally by Vanderlande, 3 traveler types discovered by the TU- Delft in-house design team (Foppen et al., n.d), and lastly, 3 personas used at Rotterdam the Hague airport (confidential) (Fig.6.4). Secondly, also information about the emotional journey of the passengers has been collected from the Inhouse Design Project (Foppen et al., n.d), the PASSME Project (2018), and the passenger journeys in the explained in the personas of Rotterdam The Hague Airport.

Personas Vanderlande	Personas Inhouse Design team	Personas RTH Airport
Business Traveler	**Relaxed Traveler**	**VFR Traveler**
Holiday Traveler	**Focused Traveler**	**Luxurious Traveler**
Frequent Traveler	**Adventure Traveler**	**Experience Traveler**
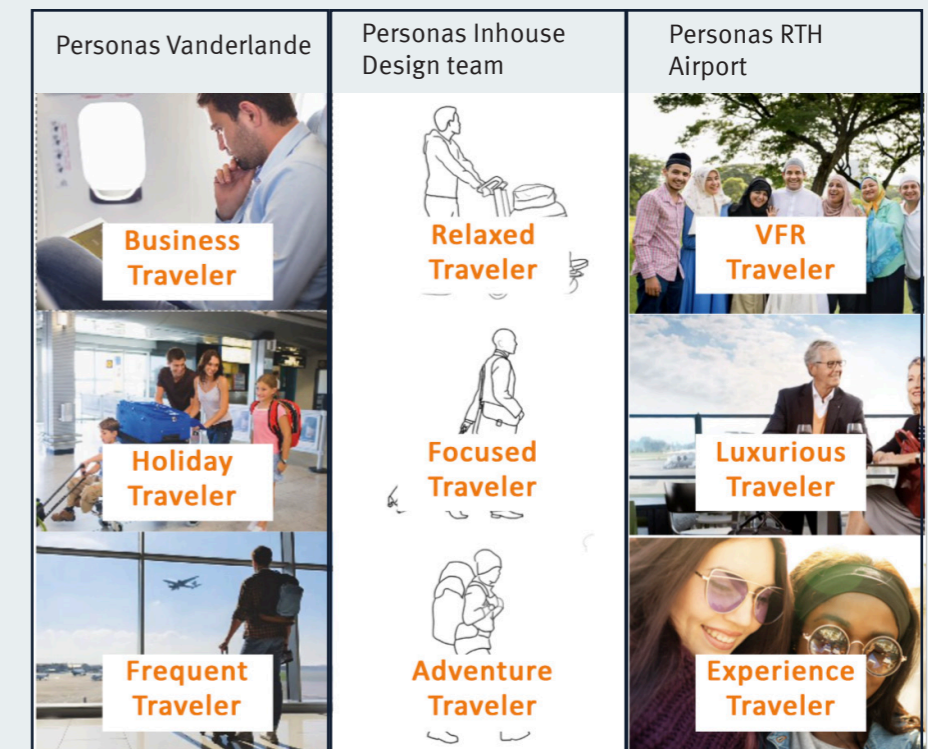
Figure 6.4. Overview of Collected Personas

User Research Outcomes
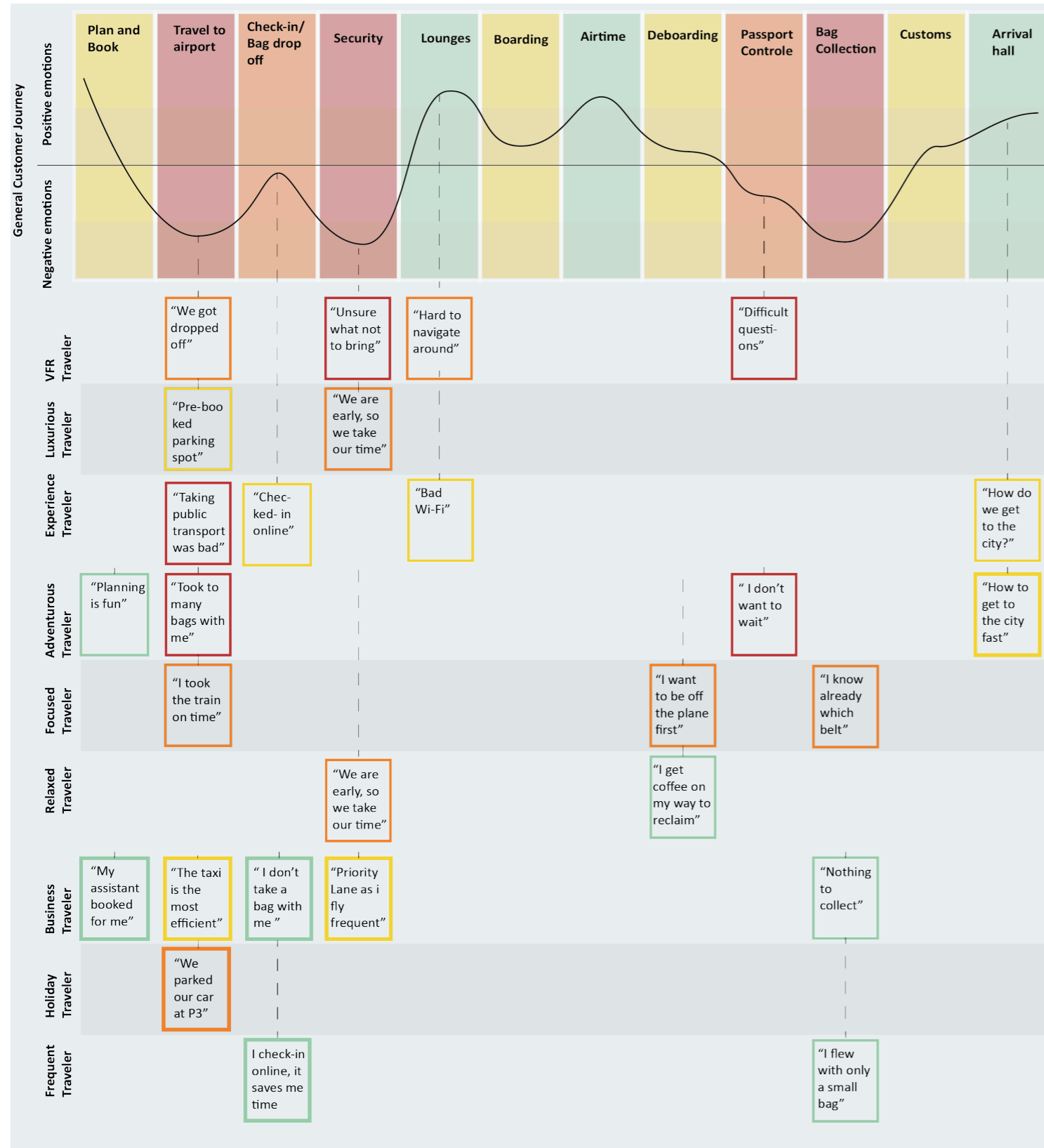
Figure 6.5. Overview of the Customer Journeys in comparision with eachother

Discovering Overlapping Values and making visual output
Because all found personas were based on different things (e.g. personas based on travel behavior and on purpose of the travel), they were transformed into customer journeys using the data available of all resources, highlighting what the individual emotions of these personas are and how they compare to others (Fig.6.5.). From these 9 personas, a new combination of 6 traveler types was created with additional travel characteristics to show the differences between them (Fig. 6.6.). Those traveler types served as input initially the kick-off and workshop 2.
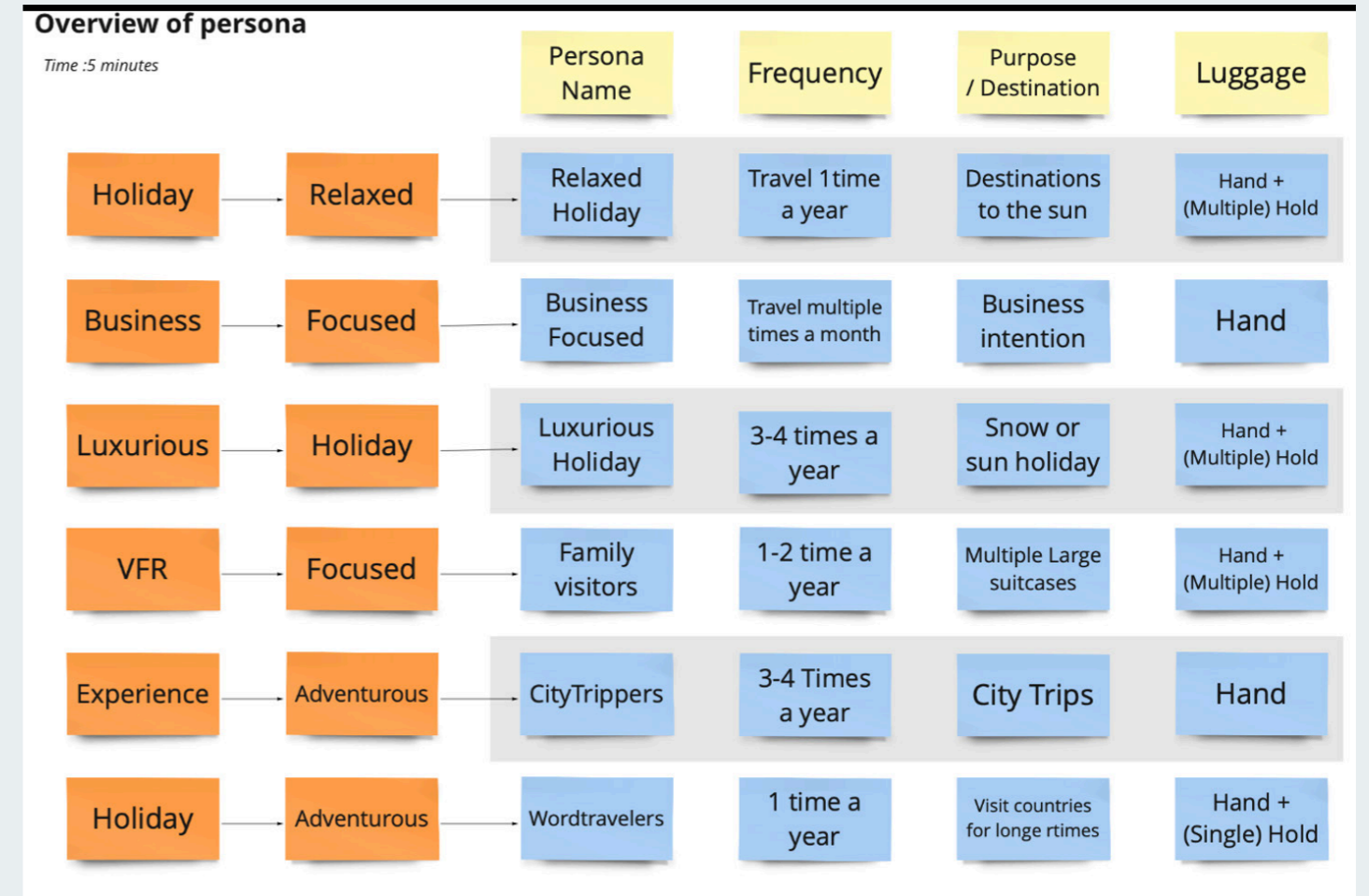
Figure 6.6. Overview of Combined Personas with travel characteristics

6.4. Airport Values

Airports are now the main customer for Vanderlande. Although the focus in this project is on the overarched customer, the direct customer (airports) remains a key stakeholder, therefore their value drivers should also be included. This visual is retrieved from Vanderlandes Strategy Document (2020) (Fig 6.7). This serves as input for workshop 3

The airport values focus mostly on process optimization by reducing operating and capital expenditures and growing their business by scaling up.

Some of the values of the airports are reflected in the trends and wishes of the personas. E.g. Sustainability is something that we see growing in passengers. Also, the focus on creating better and more seamless travel experiences is something that we see in the trends.

Airport Values

Confidential

Figure. 6.7. Overview of Airport Value Drivers
(Vanderlande Industries B.V., 2020)

Tech Scouting
A central part of Design Roadmapping is the mapping of technology (Simonse, 2011). The technology will be used to support the user value drivers, and play a role in the time pacing strategy of your roadmap. The scouting of new technology is one of the key activities to discover new emerging technologies that could potentially be matched with user values.

Vanderlande has an in-house design technology research team that scouts technologies and maps them. In figure 6.8. technology radar of Vanderlande's airport market has been displayed. This serves as input for workshop 4.

Technology Outcomes

Confidential

Confidential

Technology Radar Vander-

(Vanderlande Industries B.V. 2021)

Key Take-aways

In The Long Now, part of the research is already performed by the designers, to make sure existing materials are being used but also bring new elements to the workshop.
In this chapter, a Design Map is given on how the existing materials can be rertieved. Furthermore, it explains how new knowledge is created from existing insights and performed research in the creation of creative trend research and personas. Also, the visualizations of the Airport Valued drivers and the technology radar are introduced.

The knowledge design focusses on mainly the traveler through the research. By bringing this to the strategic workshops, the end-user focus is also more likely to grow.

Important in this is that the presentation of these materials is actionable, recognizable, and social to increase the adaptation by the participants and to increase the end-user perspetive

07

Chapter 7
Strategic Workshop Design

This chapter focuses on the iterative process of designing the strategic workshops. It includes both the sessions designed for management and the strategic sessions designed for the participants. The design of the workshops focuses on creating optimal engagement for the users, but also on crossing the knowledge boundaries that are present. In this chapter the workshops are described, tested (expect workshop 2), redesigned, performed, observed, and reflected upon through interviews with the participants. All these steps are described for each workshop. Furthermore, are the outcomes of each workshop and the design steps taken after that described in the light blue boxes. All design decisions that conclude to the final design are mentioned in this chapter. The Final Design can be found in Chapter 8.

7.1. Management Preparation Presentation

At the start of this project, the senior management level was not involved in the project. To start The Long Now their approval was needed for the available time resources and involvement of the participants. To convince senior management, a meeting was initiated to explain the relevancy of design thinking, the process and relevancy of design roadmapping, an overview of the proposed "The Long Now" and lastly the first overview of participants. This meeting was aimed to receive approval for the further workshops and to gather the opinion about the necessary participants who would be an addition to the team. The meeting was done by an In-house strategic Designer of Vanderlande (Odeke Lenior), who is also the one closely involved in the creation and preparation of the workshops. The meeting was held with the CTO and the Executive Vice President of Airports of Vanderlande.

7.1.1. Presentation Design
The Meeting consisted of three key elements: The presentation, a teaser workshop, and a frame to propose the participants in the workshop.

Presentation
The presentation included the explanation of Design Thinking, Strategic Design and Design Roadmapping, and multiple examples of design roadmapping outcomes. An important element in convincing senior management to invest in the Long Now was the addition of KPI's of design thinking in other companies.

Teaser excercise
In the meeting was a small teaser of what The Long Now process is going to look like (fig 7.1.). This teaser was not intended to produce any relevant insights, but to inform the management level about the outline of the workshop by experiencing it first hand. In the teaser workshop, the participants are guided in 15 minutes through all the workshops of The Long Now. They were guided through a quick brainstorm on trends, determining the values, crafting a future vision statement, and brainstorming ideas for this statement.

The teaser exercise uses active learning to create engagement and gather a better understanding of the process. This excercise was used to cross the boundaries by explaining the content of every workshop, but also learn the management level how this process can transform Vanderlande's Innovation or strategy for the airports domain.

Participant Selection for the Long now
Lastly, in the workshop, the first selection of participants was presented. In the workshop, senior management was asked to adjust this list according to their knowledge.

Selecting the right participants is an essential part of design roadmapping. In the theoretical background has been described that a design roadmapping team consists of experts in technology and in the business department and a designer (Simonse, 2017). In design roadmapping, a heterogeneous group of participants with different backgrounds and experiences can positively influence the creative dialogue and the outcome of the roadmap (Hodgkinson and Healey, 2008). However, besides having diverse knowledge there is also an importance in having an innovative mindset. This was highlighted in the conversation with Euiyoung Kim. This criteria is harder to select as it is subjective, therefore the selection was done through snowball sampling in iterative steps to select "Innovative " participants, first by creating a group in combination with Odeke and Bart, who also asked colleagues whom to invite.

An overview of the participant selection can be found in figure 7.2. Most of those participants have also worked in different roles and departments throughout their career at Vanderlande, meeting the criteria of Hodgkinson and Healey (2008). In total a group of 16 people has been selected, but with the expectations that some of the 16 would not be present throughout all of the workshops.
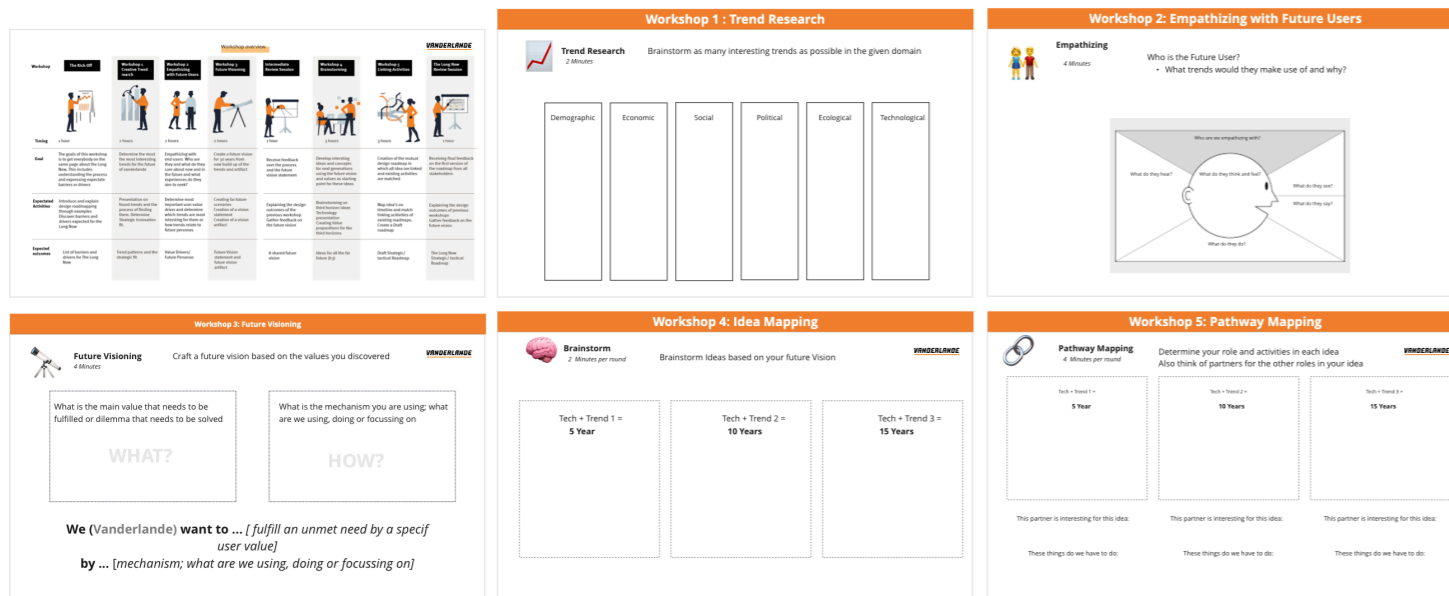
Create engagement through active learnign and interactive content
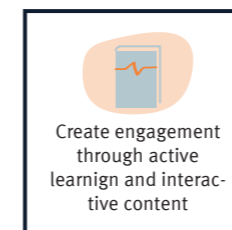
Workshop Design

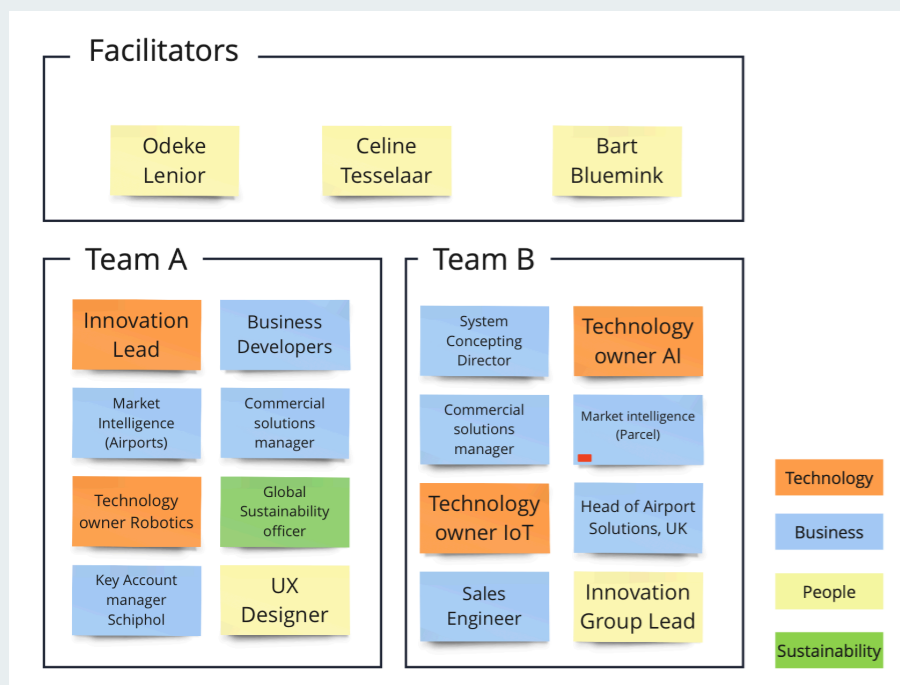Figure 7.1. Teaser Workshop to explain TLN

Workshop Outcome

Figure 7.2. Participant Selection

7.1.2. Insights

The teaser exercise could be an effective and engaging way to introduce the participants to Design Roadmapping. It gives an idea of what the process could be like. It could serve as a (syntactic and semantic) knowledge crossing mechanism between the designer and the participants/ senior management in the explanation and learning of the process. It learns part of the language and forms used in the process as well as gives an insight into the outcomes. Through this workshops the interpretation of what the Long Now is can be can alter . However, because I was not present in this workshop I could not observe this. The workshop, in general, made a positive impression on senior management, as they were excited about the project.

7.2. Kick-Off

The purpose of a kick-off meeting is to lay a foundation for the rest of the project, by getting everyone on the samen page (Lucidchart, 2019). This meeting serves as a purpose to explain design roadmappingagain to the participants and share the outline of the next workshops. Furthermore, does it introduce the online brainstorm tool Miro. As well as it introduces ithe workshop domain, manages expectations and outcomes and lastly aims to look towards any existing barriers and drivers that could occur.

7.2.1 Pilot Test

The first workshop was pilot tested with 2 employees also attending the real workshops. During this pilot, the workshop was given in less than 50 minutes to collect initial feedback on the design and activities of the workshop by participants, and by the other facilitators. After the kick-off, the participants were able to leave feedback for improvement.
The initial workshop design is based on the literature to discover any initial boundaries in future thinking, to see objectives but also discover any challenges beforehand. The workshop design tested in the pilot is given in figure 25.

Frame 1: Welcome
To welcome everyone to the workshop

Frame 2: Agenda
The agenda of today.

Frame 3: Post-it Colors
Giving every participant his or her own post-it color, this way the person who wrote the post-it can be traced back

Frame 4: Ice-breaker
To stimulate the social connections of the group, a small exercise was held to get to know each other and discover

what kind of person they are. In this exercise, they make a short persona of themself, in which they share one small fun fact about themselves.

Frame 5: Rules of Online and Brainstorming
As most participants are new to design thinking, a small ruleset is being explained in order to stimulate brainstorming and the overall process.

Frame 6: An extensive presentation on The Long Now as a project.
It explains where it comes from and how it fits in the company. What the basics of design thinking and design roadmapping are. The scope of the project gets introduced and lastly, the process gets discussed

Frame 7: The process
The next step explains more in-depth what the process is, what each step undertakes and what the outcomes of each strategic workshop is.
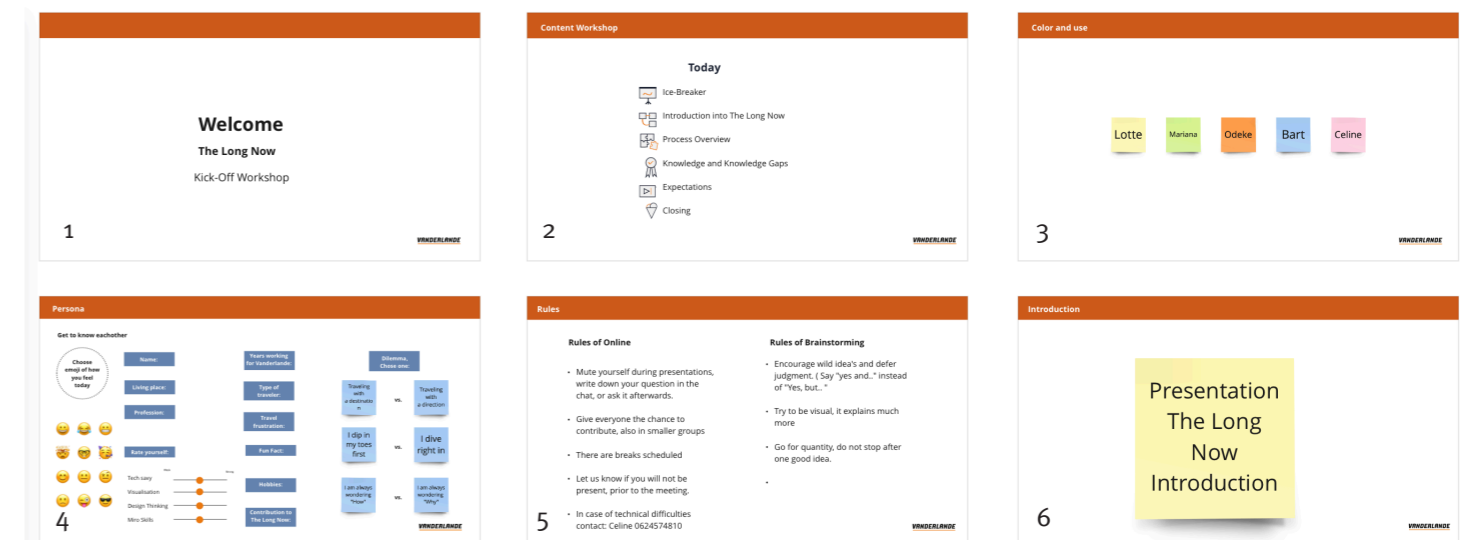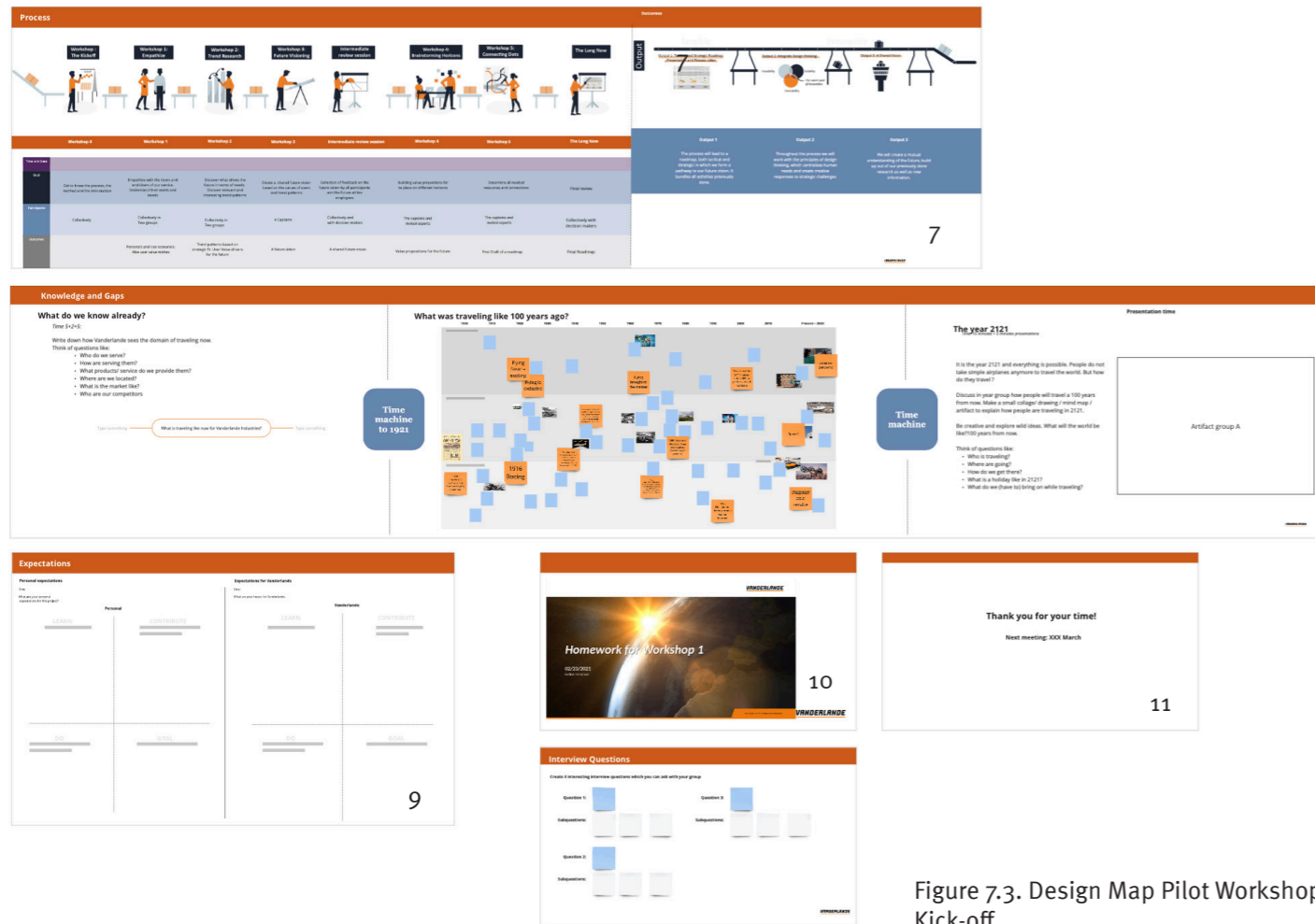
Figure 7.3. Design Map Pilot Workshop Kick-off

Frame 8: Time machine
To start the process of thinking in new directions, the time machine exercise is held. In this time machine, we first brainstorm what traveling means now for Vanderlande. To identify any gaps in knowledge. Then we take a time machine to see what traveling was like 100 years ago and then we shift to a brainstorming exercise of what traveling looks like in the futur, a 100 years from. Brainstorming will be done in small groups, who make an artifact or collage of traveling in the future which they will present.

Frame 9 Expectations
Defining success and objectives beforehand can help shape the rest of the workshops. We ask what participants expect from the workshops, what they hope to learn and to contribute. This is done both from a personal perspective as well as from a company perspective.

Frame 10. Homework
The next workshop is about understanding the user value and the strategic field. To overcome inertia, the participants are asked to prepare an interview in groups and conduct them as homework. The interview should be with somebody who has traveled before. The output of these interviews will be used in the next workshop. To prepare them for the interview, a small introduction on how to conduct qualitative research is held

Frame 11: Closing

Insights + Improvements
The workshop had several insights, most about the design of the workshop.

The timing of the workshop
During the workshop, the main remark was that the workshop was too long. The workshop initially would last 2 hours but this was later shifted to 1 hour. The reason for this was that 2 hours was impossible to plan in a way that most of the participants would be presented. Because the workshop was drastically shortened, two main changes were made:

1. Converging activities (Collection information or ideas) will be carried out by the facilitators and the outcomes serve as input for the workshops
The workshops are on the structure of converging and diverging activities. This takes a long time, as diverging ideas or insights is a process that can be time-consuming. Therefore, the diverging activities, like the collection of data, will be done outside the workshop by the facilitators. The outcome of this data collection will serve as input for the workshops and serve as a starting point for the converging activities to take place. Important in this workshop format is that user research presented follows the guidelines of being social, actionable, and provides ownership. This design change can be seen mostly in workshops 1 and 2, where content from chapter 6 is presented.

2. Focus on a maximum of 3 activities in the workshop.
Secondly, to shorten this workshop, the focus has shifted on only 3 activities that were seen as most important: The explanation of the process, discovering barriers and drivers for the process, and lastly a first introduction to the passenger. This means that the time machine assignment and the homework assignment are removed. The homework assignment of empathizing with end-users through interviews has been changed to a first introduction of the passenger according to the above principle of changing data collection activities to only diverging activities.

Support creative dialogue between the participants by the right tools and smaller groups.
During the workshop, there was little conversation between the two participants. This could be solved in two ways:
1.Create smaller break out rooms
Making use of the right tools and intimate setting, can positively influence the conversation. Also, the switch from plenary rooms to breakout rooms can give a strong distinction between what is expected from the participants.
2. Create tools to support synergy by giving everyone clear instructions and a collaborative framework.
The tools (frames in Miro) should give sufficient guidelines and options to work together, by giving everyone a task or by designing activities that indicate that synergy is necessary to achieve an outcome.

The Barriers and Drivers are not clear in this workshop
In the design frame of the expectations, participants are only asked to determine their goals and successes. However, there should be a bigger focus on the barriers or challenges. Also there were too many questions asked now using this frame, so a redesign of the frame is necessary (fig. 7.5.)

7.2.2. Design of the kick-off and Execution
Based on the recommendations a second iteration has been made on the kick-off. In this section, the outline of the workshop and the outcomes will be discussed. The design map for the workshop can be found in figure 7.4.

Overview of participants and agenda
The overview of the participants and the agenda of the workshop were previously sent to the participants.

Quick Introduction to Miro
To make sure all the participants would feel comfortable with using Miro as a tool for the workshop, a small exercise was created in which the participants had to place their name and

Presentation on the Long Now
This presentation included an introduction to the topic, an explanation of design thinking and design roadmapping and lastly some previous examples. The presentation had as the main goal to inform the participants about the upcoming activities and to give a first idea of what design roadmapping is and why it is necessary for Vanderlande. The examples seemed to give an immediate idea of what the workshop is about and why they are necessary.

Overview of the Process
To add to the presentation, an overview was given including all workshops and goals of each workshop. One of the reasons to do this included was to create a purpose for the workshop by setting goals and communicating those goals.

Expectations and Objectives
To discover any initial or existing barriers towards future thinking, participants were asked to write down what their expectations were regarding the workshop. The format consists of four questions (fig. 7.5).
The first question included what they wanted to learn. This question helped to discover any motivations for future thinking. The second question was what they expected to contribute, this was to discover what any of the individual qualities of the participants were. The third question was to acknowledge or describe any challenges that could happen in this project. This question was focused on discovering any barriers for future thinking. The final question asked to describe when this project is a success.

The output of these objectives and challenges was taken into account in the design of the next workshops.

Traveler types
After the goals and objectives were written down. The research into personas from chapter 6.3 was introduced to the participants. The reason to include this in the project here was to show that the focus is on the end-user in the project.

During the presentation, multiple questions arose about the topic of understanding the traveler and the scope of the assignment in comparison with Vanderlande's current scope of only focussing on airports.

Missing Traveler types

Figure 7.4. Design Map Workshop
Kick-off

To bring ownership to the user research presented and to make it actionable, the participants were asked to review the traveler types to see if they recognized them if they could think of any niche types.

Because there was limited time in the workshop this was the final slide presented in the workshop. The participants mentioned a few more personas, however, most of them were more scaled under niche.

Ranking
This frame was meant to diverge the number of types by determining which is most important for the different types of airports given by Vanderlande. (Fig. 7.6)

In the workshop, there was unfortunately not sufficient time to proceed with this exercise.

7.2.3. Reflection on Design Frames
One of the objectives in The Long Now is that the frames and tools used are effectively helping in crossing the knowledge boundaries that could occur.

In this workshop 2 types of mechanisms were used:

Discovering Objectives, Goals, and Challenges
This framework was used to cross knowledge boundaries between the facilitators and participants in understanding biases towards design roadmapping. This framework showed to be effective, as all participants could easily communicate their thoughts. However, it is not able to determine wether this frameworks made (all) barriers and drivers for future thinking visible. These things could also be latent knowledge, making it harder to describe.

Traveler Types
To communicate user research traveler types were used to express the outcomes. Traveler types were chosen as they humanize data of the previous research, however the types could have been more detailed and making them actual personas. In the assignments afterward, there has also been tried to create actionability and ownership by giving the option for input and prioritization.

Although the traveler types part was not fully finalized in the workshop, it could be a successful boundary-crossing object as it has been referred to on several occasions in the workshop. Also later in the workshop actual personas are made representing these traveler types more indepth.

7.2.4. Final Design Recommendations for the Kick-Off
For the final desig, it is better to leave the personas part out of the kick-off as it requires too much time to explain and does not fit effectively in the flow of the workshop. Instead of this, adding an activity that helps the participants get familiar with future thinking, brainstorming and the domain of the workshop is more suited. In the final design, the time machine exercise described in the pilot version of the workshop could be more interesting. The personascould be better introduced in workshop 2 where the focus is on empathizing with future users, and the fit is more clear.

Figure 7.5. Design fram Objectives and expectations

Figure 7.6. Design Map persona Ranking

Workshop Outcomes

Figure 7.7. Outcomes of the Kick-Off workshop

Barriers and Drivers for Future thinking
In the workshop, the barriers and drivers for The Long Now were identified via goals, challenges.
Also the things they want to contribute and learn are defined (Figure 7.7)

Goals
- Get broad stakeholder involvement
- Create actionable roadmaps
- Link it to the other roadmaps
- Create shared understanding of the users, the traveler of the future

- Find new solutions

Challenges
- Create a shared vision on the future
- Link it with current initiatives
- Make it tangible
- Different mindsets
- Create new solutions

All thos things are either encountered for or will be taken into account.

Key Take-aways

In the kick-off the main goal is to get everyone on the same page for the next series of workshops. A learning was to keep the workshops to maximum of three activities and perform the diverging activities before the workshop so more time in the workshop can be spend on converging and creating consensus

The Design Frame for the expectation and challenges, showed to help in understanding what the challenges and successes are in The Long Now, however it is unclear wether all barriers and drivers can be indentified using this frame, as this is latent knowledge.

Lastly, the persona excercise in this workshop could not fully be tested, making it difficult to draw any conclusions on the effects on growing user knowledg on this frame.

7.3. Workshop 1: Creative Trend Research

Creative Trend Research is design activity intended to create a future outlook of the company and its scope. In this is it searches for new potential directions where value can be created (Simonse, 2017) In the design of the strategic workshop, the main goal is to discover which previously establsihed trends are relevant for Vanderlande and could be important drivers for the future. In this workshop, we aim to find trends that are a strategic fit for Vanderlande (Simonse, 2017). Furthermore, it should build a basic foundation for what the future of travel can look like through the exploration of trends. To make sure the workshop has the effect that we want to achieve, a pilot test has been held. The creative trend research from chapter 6.2. serves as input in this workshop.

7.3.1. Pilot test
To see if the workshop had the intended outcome a first pilot of the workshop was held. The pilot workshop was executed with 3 participants with different non-design backgrounds. The initial workshop design is given in figure 7.8.

Frame 0: Agenda
This first frame helps to bring structure to the workshop and also gives a sense of purpose throughout the workshop.

Frame 1: Excercise Miro
As these participants were unfamiliar with working in Miro, so a small exercise had been added.

Frame 2: Presentation on found trends
The trends were presented through a PowerPoint presentation. First, the larger trend themes were explained, followed by an explanation of the smaller trends, similar to how it is explained in chapter 6.2.

Frame 3: Review of the trend Patterns.
The participants were asked to see if they agreed with the trend clusters, whether they all understood them, and whether they saw a connection between the identified trends.

Frame 4: Connections between trends
To see how participants would see connections between trends, a frame was added were they were asked to identify patterns.

Frame 5: Ranking trends on strategic fit
Simonse (2018) proposes a framework of ranking the trends on two aspects: impact on the user and strategic fit for the company. In this frame, the participants were asked to rank the individual trends by placing them on the axis.

Frame 6: Level of uncertainty
Another way of identifying scenario drivers is by ranking the trends on the level of uncertaintiy. By choosing the two extremes on an axis, drivers for scenarios and the building of scenarios can take place. Later a small test was done to see how creating scenarios build up out of the most extreme trends did not work, are. The trend scenarios became too specific to work with and to create an holistic view of the travel of the future.

Both design frames 5&6 were considered to be to difficult too use.

Frame 7: Building scenarios out of patterns
Based on the patterns created in frame 4, the trends were reviewed again to see how trends could add up to make relevant scenarios. Connections and synergy were closely looked. A total of 4
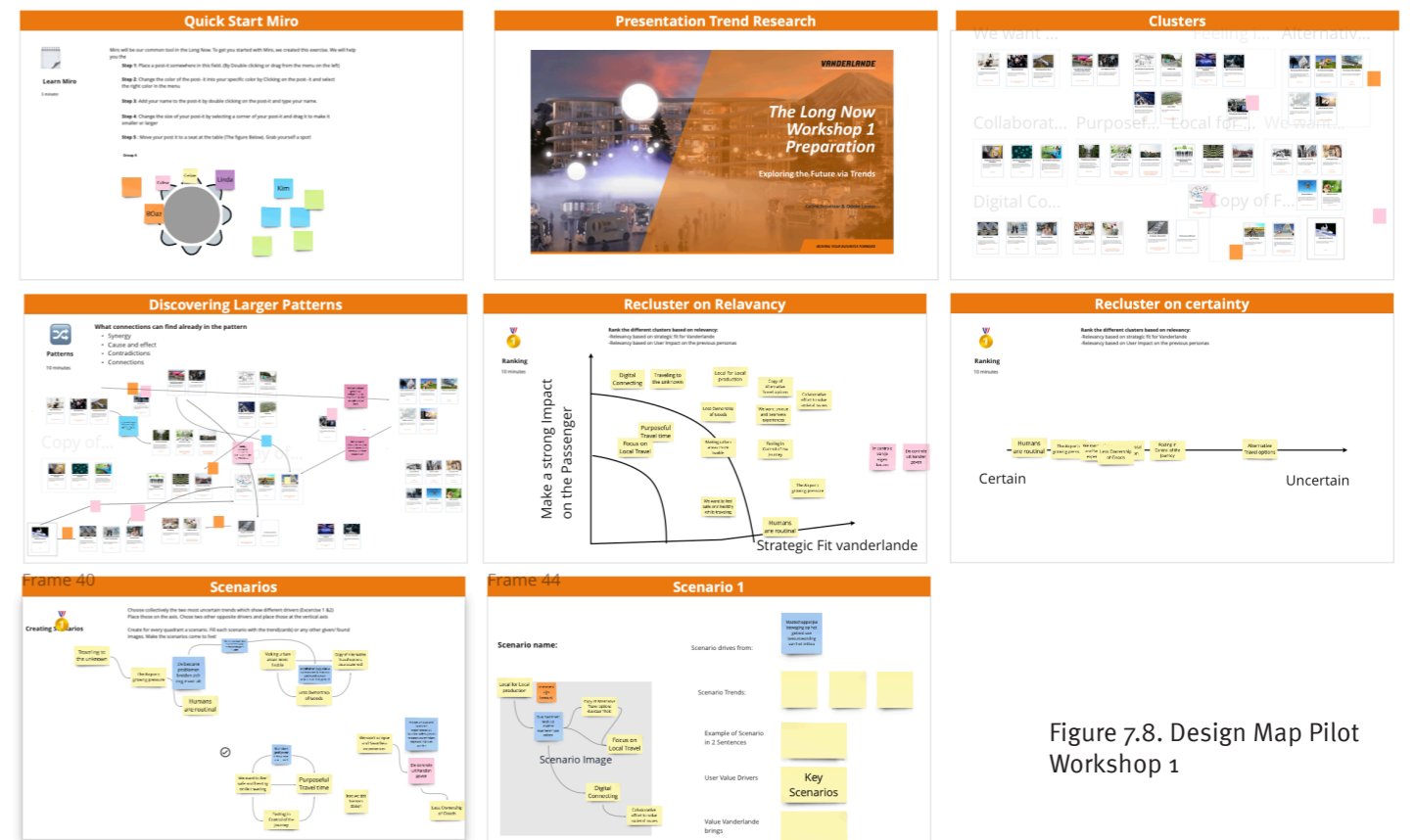

Figure 7.8. Design Map Pilot Workshop 1

distinctive scenarios were created.

Frame 8: Describing scenarios
After a voting session, the most interesting scenario was selected to be further developed in frame 8.

Insights from testing
The workshop provided a few important insights that influenced the final design of the workshop.

- *The communication from the design researcher to the participants was insufficient, this resulted in poor communication between the participants.*
At the start of the workshops, the preparing activities and the trends were explained through a presentation and through the set of trend cards. As the first exercise was to review the trend cards, the participants noticed that assessing the cards and the clusters was too difficult as they had insufficient knowledge of the cluster. The understanding of the information had to deal with the high level of novelty of the trends, as all pilot participants had not yet previously worked with design or design thinking and were unfamiliar with the domain and Vanderlande. Because they could not understand the trends, it also lowered the actionability, sociability, and ownership over the trends. Looking at the framework given by Roschuni (Chapter 3), the communication problems of user research mostly existed through mechanistic problems that transferred to problems of systemic translation. The trends should be giving more in-depth in order to be understood, as well as more socialized and actionable and bring more ownership to the users.

The information given to the participants needs processing time before the participants are able to perform any action with the given information.
After the workshop, the participants addressed that it felt that there was too little time spent on processing the trends and trend clusters and that they preferred to see the trend cards before the workshop so they would be able to work with the trends. This is an additional guideline in the creation of the workshops, as processing time or creating moments of reflection are not yet addressed in this research. The workshop should provide time and tools to make an individual assessment of the given information before continuing to express this to within groups.

- *The design and structure and the design frames should give better instructions to work with and to combine knowledge of the different participants.*
During the workshop, the participants experienced a hard time expressing their thoughts with one another by using the given Miro Boards only. This had multiple reasons, the participants were not extremely experienced in working with more boards and the framework that they were given did not provide sufficient guidelines and starting points to work with. A way to overcome this problem is by designing the task into smaller pieces that give sufficient freedom to work with, but do provide enough input to start. This remark is especially addressed to board 5, 6, and 7 seen in figure 7.8.

Timing of the workshop
The last insight is that the timing of the workshop was again too long. This problem could be solved by lowering the number of tasks that have to be performed by the participants and increasing the preparations by me and by reviewing the process. There should be a limited amount of 3 activities in the Long Now.

- *The scenarios in these workshops that were created were not shaped collectively, as voting for the most interesting scenario showed different interest.*
In the final part of the session, participants were asked to identify multiple relevant scenarios and later choose one of the scenarios to work with. This approach showed the tension between the different participants as they all chose the scenario they found most clear, creating not one mutual understanding of the importance of the future. In the workshop there should be more room and steps striving towards the creation of shared consensus, this was also one of the design principles. This means that the tool given in the process did not function strongly enough to support creative dialogue to achieve consensus.

Improvements
A total of 4 recommendations for the final workshop are made:
- The workshop should be shortened to only 2 main activities, as the workshops shows to be too long.
Therefore the amount of input given by the facilitators should increase to collect only the most important insights in the workshop, and not focus on creating new content during the workshop.
- The formats used in the workshops should be smaller, making the activities easier to proceed. These strategies of keeping it simple can provoke stronger engagement(Ribeiro et al. 2020)
- There should be time for processing the given knowledge by design tools that help in this and in the formulation of an opinion about the given trends or giving the information prior to the workshop. This can be done by adding individual frames where reflective questions are asked.
- The research presented in the workshop should be more in-depth, made more social, this way the participant can easier understand this.

7.3.2.Design of the workshop and Execution
The final design of the workshop is given in figure 7.9 .A &B. In the following

section, there is an explanation of the structure of the workshop.

Preparing materials
To prepare the participants for the workshop and give them time to process the large quantity of the trends and trend cards, the presentation given in the workshop, is sent beforehand. This way the users can view the objects before the start of the workshop, which helps them in solving communication problems regarding communicating research on a systemic level. The presentation sent beforehand, also asked the participants to deliver any missing trends as input for the next workshop.

Recap of the previous workshop and Explenation of today.
The workshop gives an overview of the goal of that day, and to express the purpose of this workshop in the overall process of The Long Now. The second frame also gives a recap of the found barriers and drivers in the workshop. Those will be taken into account in the

design of the next workshops.

Presentation
The presentation in the workshop included the trends explained in the preparation segment. However, during the pilot the trends seemed too distant and not bring any ownership of the research that was done, to be understood and adapted. To address this problem, 6 small videos were made to enrich the trends. The videos showed parts of the interviews in which the interviewees gave examples or explained more in-depth the effect of the trend. The workshop also gave a insights of the influence of this trend on Vanderlande. This was done to show the relevancy of the non obvious trends, which may lay outside the scope for Vanderlande but should still be included, as they influence other aspects.

Individual Ranking of the trends
After the presentation, the participants all received their own framework shown in figure 7.10. This framework focussed on the tree levels of trends (Trend themes, trends and trendcards).

This framework holds two initial goals: Helping the participants to form an opinion to later express to one another, and secondly to collect input on the trends based on their domain-specific knowledge to further use in the next workshop. The first question was to write down their first thoughts on the trend themes, this is done to help the participants to recall the trends and form an opinion about them individually. The second exercise included the ranking of the trends on a scale of considerability. This helped to form an opinion about the trends, but this time on a more detailed level. Simone (2017) describes this level of considerability as the amount of strategic fit for the company. To overcome syntactic boundaries (boundaries through the lexicon used) there was chosen to go for a more
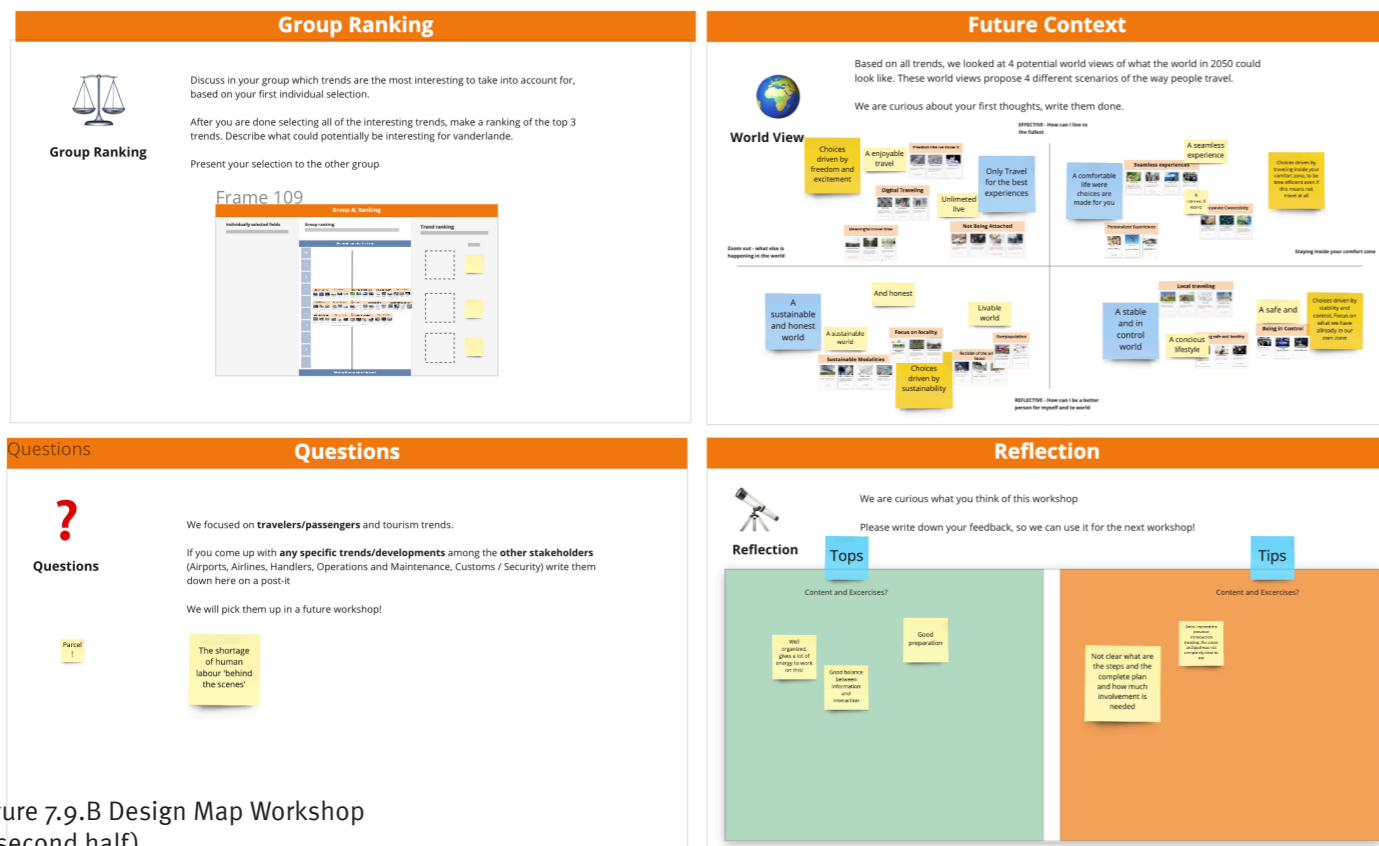
Figure 7.9.B Design Map Workshop 1 (second half)

neutral language. The fear was when calling it strategic fit, the participants will only chose trends that lay already inside their scope, instead of focussing on new opportunities. The last exercise is too also reflect on which trend cards are most important, using dotvotes to indicate the most interesting and least interesting trendcard. This exercise was included to generate insights on smaller trends, which have potential for Vanderlande,or stand out more than others.

Group Ranking of the Trends
The second exercise included a group ranking of the trends (fig. 7.11). This design frame holds multiple goals:
To start a discussion within a group, expose individual barriers against the trends by discussion, create a shared understanding of the trends by discussion, and create consensus on the most important trends.

The group was divided into two smaller subgroups both consisting of 3-4 people. The group was asked to create a mutual ranking and to making a top 3 of the trends. This frame helped the participants to start the discussion

and gave an overview of the different interest. Its model aimed to show pragmetic barriers, as different levels of interests in specific were made visual through this step.

Frame Future Context
To express what we aimed to with the retrieved, an example was shown of four different scenarios for future traveling build-out of all trends. The scenarios were build up out of 2 axes. More about this framework can be found in Appendix E, as multiple iterations will follow on this.

Because the workshop was too long, no feedback was collected on this.

Closing frames, collection next week, and feedback
The workshop closed with retrieving information from the participants about trends among other stakeholders. These stakeholders are more known to the participants of the workshop, and therefore they are asked to give input about this topic. Also, general feedback on the workshop was collected.

7.3.3. **Reflection on Design Frames**
During the workshop several tools and frameworks were used to transfer knowledge between the researcher and the participants, to translate knowledge to new insights. To understand the quality of these design frames and the effectiveness, the workshop was observed 2 participants were interviewed (Lead innovation and Global sustainability officer) . During the interviews, the questions focused on the adoption of knew knowledge, with a specific focus on knowledge focus on the passenger of the future. For this the three tools of presentations and videos, trend cards + Trends and miro board structure were addressed.

Secondly, the interviews also focussed on the adaptation of this knowledge by the effect of actionability, socializing and ownership, the three criteria described in chapter 3.4. to see if user research is adopted by the other participant. Lastly, also the workshop itself was discussed to see if there were any improvements necessary. The interviews were semi-structured interviews performed by online video call, the interview guide can be found in

appendix F and serves as guide for all interviews.

Trend presentation and videos
The presentation explaining the different trends with the additional videos were seen as an informative tool to express the given ideas. They both described the richness of the content given as a good foundation for the start of the workshop.They enjoyed the alternation between presentation and video, to learn but also to process the information given by hearing it from multiple sources.

"The way it was presented was really nice. I enjoyed the variety of content given and the alternation between presentation and video"

The process of telling and showing the data was seen as an enriched way of giving information. The communication of the user research was seen as actionable and social through the visualizations. The presentation and videos showed sufficient input to work with, sometimes even too much, as the participants both mentioned that information given was repeated too many times.

"Sometimes I lost my attention, there were too many recaps of the trends and then it became too lengthy"

To address whether the information changed their perspectives on future traveling and future travelers, both mentioned the holistic and broad scope of the trends. They were pleased that the trends expressed would normally be outside their focus, and now they could see the relevancy of the given trends. Their view on traveling in the future did not primarily change but got more expanded.
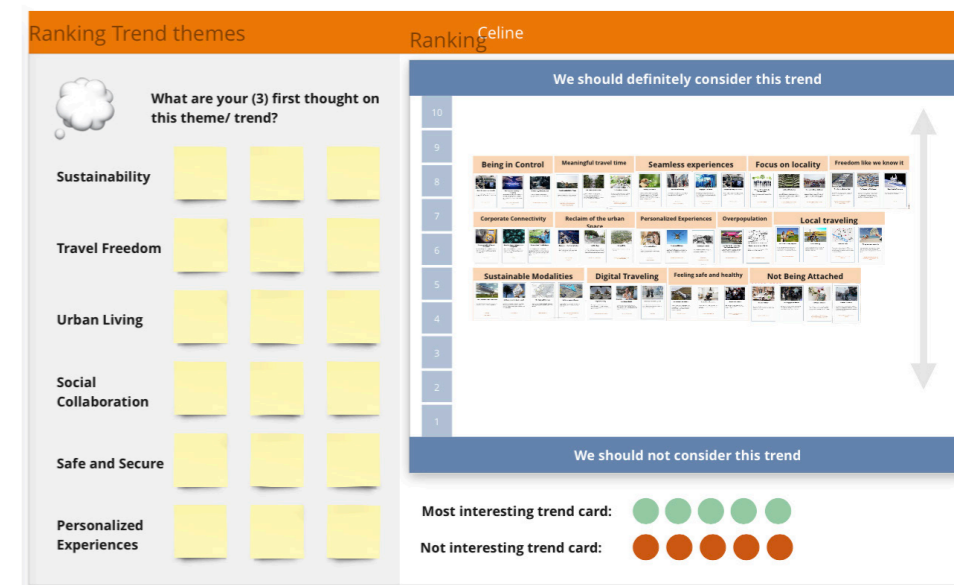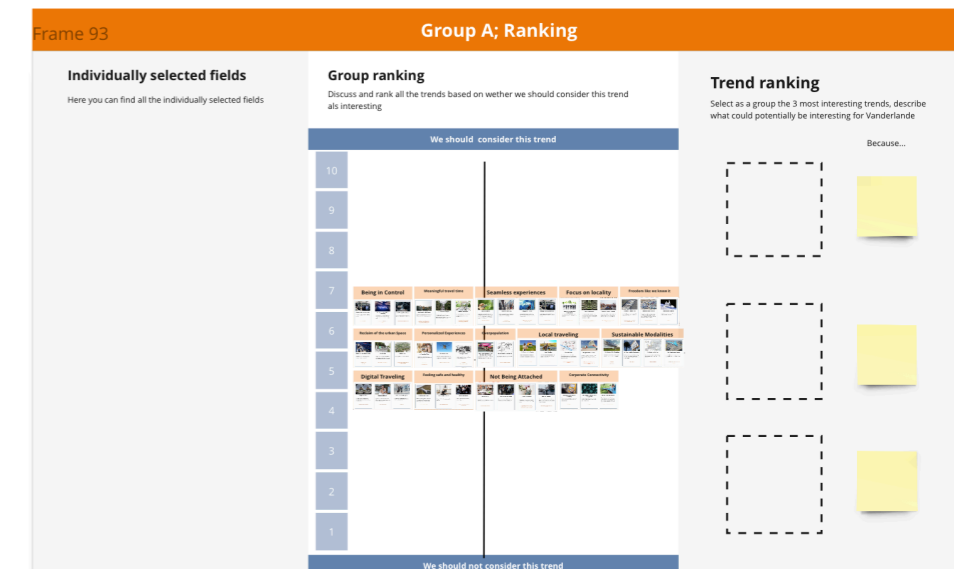

Figure 7.10. Design Frame Individual Ranking

Figure 7.11. Design Frame Group Ranking

Interesting was that there was also a moment of reflection on a systemic translational problem explained in figure 15.

"How should I interpret this trend? What perspective should I have and what role should I take?"

Both recommended that they would have preferred if the trend presentation and videos could have been rewatched in their own individual time in the workshop, because of the large quantity. By enabling them to review the trends in their own tempo later in the workshop, participants can recall them better and understand them better.

Trend Cards and Trends
The trend cards seemed to have two functionalities. First, they gave a more in-depth view of the higher-level trends by providing examples. This enriched the content of the trends. Secondly, the trend cards helped in expanding the domain of future traveling by giving new examples of future trends that might have previously been outside the search scope of Vanderlande.

An interesting insight was that during group ranking, participants showed different interpretations on how the trends could be used. An example is given in this quote:

"On one side I see the trend of more sustainable modalities, and I think we could play a role in enabling the future way of traveling. And what role we could play in it. An on the other side also inside your own scope make sustainable decisions."

This quote indicates that the given trends and trend cards still provided room for interpretation to their own domain, in this case not only sustainability as a driver for the user but also a driver for their business.

Another observation in this discussion, was the likelihood of a trend by discussing the negative effects a trend could have. This indicates that the participant had not only understood the trends but was also able to translate this to their own domain. The discussion asked for an additional communication object in the form of a metaphor for the participants to understand each other's opinions and interests:

V:" No no, I did not say it is not possible, but it is limited at some point. I think some things will never be possible with data like."

P: "Can you give an example of things that are not possible."

V: "Yeah, for example, I can see that the airplane on the screen. You have an international flight and you can see everything very futuristic and I can see my Netflix account on the screen. This is super personalized, but this shows who I am and what I like."

The different interpretations could indicate that they transferred the trend to their own knowledge domain to see how it would impact it would make. This would indicate that any knowledge boundary of expressing the trend has been crossed as it has been transformed.

The trend cards were seen however as too much. A good way to solve them is by sending them beforehand or having a physically printed version of them.

"The one negative remark I can have on them is that there were too many of them."

Process Individual and Group Ranking
The design of the first individual ranking and secondly a group ranking was seen as a positive aspect of the workshop. By letting participants rank the workshop first individually, they could form their own opinion about the trend but also their own interpretation and prioritization.

"What I thought was good is that you had time to individually work on the trends and then later bring everything together in the subgroups, [...] then you could really see the differences."

Because the participants already formed an opinion by themselves, the group session created a rich discussion about the trends and the interpretation of the trends. Mentioned in the interviews was that having all individual ranking displayed besides the group ranking really helped as a starting point for the discussion and to show the different perspectives of others. This helped to make individual opinions of others visible.
Therefore they can be seen as an effective design frame in crossing knowledge boundaries between participants. The format of the group ranking on itself was not mentioned specifically as helpful, however, it was useful in the conversation between the two different groups, as it visually showed differences.

"You need a form of dialogue to understand what others did in their individual part of the assignment"

Workshop Outcome

Outcome of the workshop
From both the individual ranking and the group ranking a total 7 trends were ranked as most interesting for Vanderlande (Fig. 40). These 7 trends are:
- Seamless Experiences
- Being in Control
- New Sustainable Modalities
- Eco-system Collaboration
- Meaningful Travel Time
- Personalized Experiences
- Local for Local production

Throughout the group discussions it appeared that some of the smaller trend cards that were not part of the larger trends were also important. Those were also taken into account (e.g. mobility hubs).

Translation to Values
To transform the trends to underlying travel trends, I mapped the "winning" trendcards on a Value Map (Appendix G). This map served as input for the next workshop.

Figure 7.12. Most interesting trends ranked

Content made from this workshop
Based on the workshops, the values retrieved from the map were divided into two different future contexts, expressing different ways the world could move to.

This was used to generate two trend scenarios for the future. One more based on the group discussion of Team A in workshop 1 and one on team B. (Fig.7.13.)
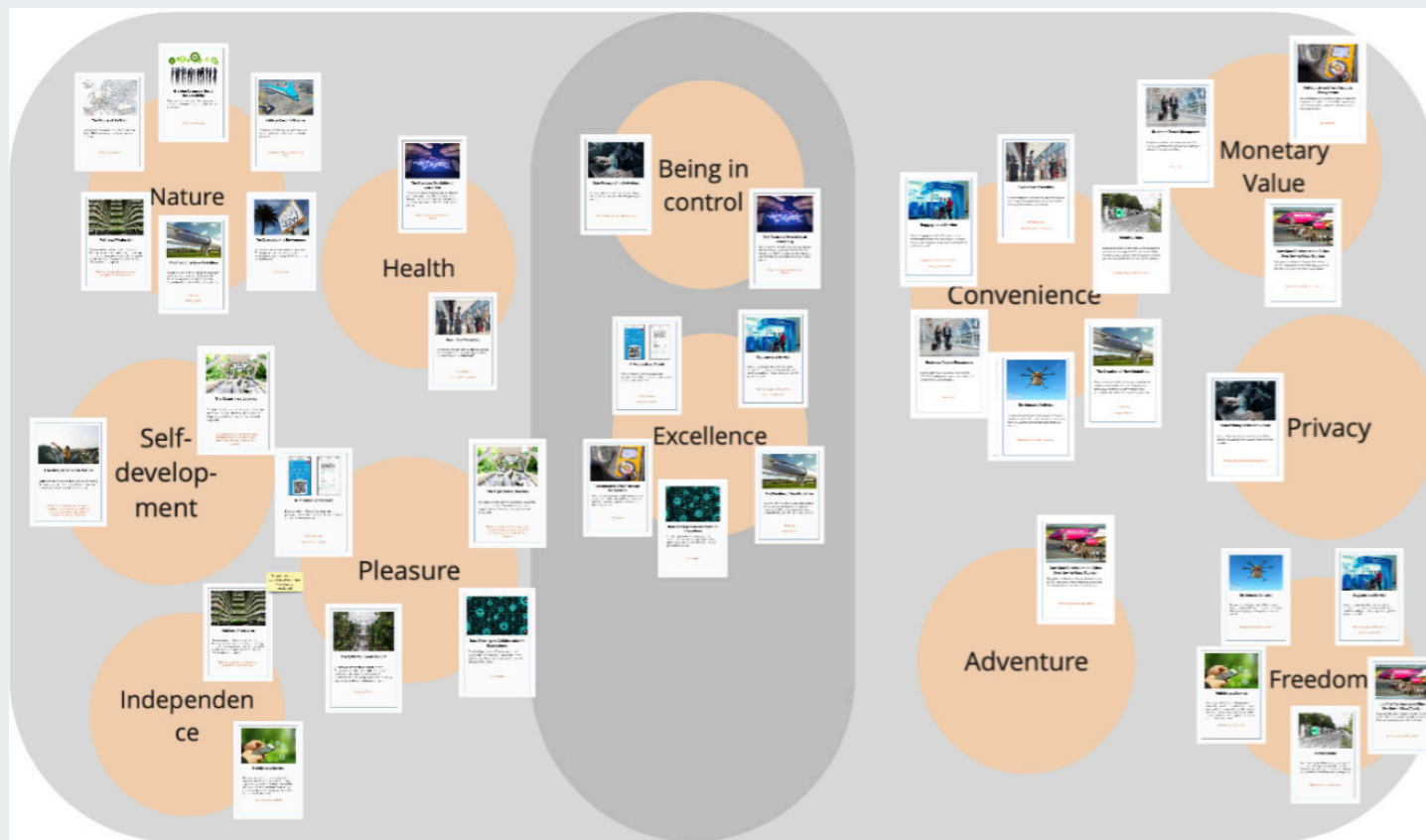

Figure 7.13. Future World Context

Team A Future Context

High Level of cooperation to solve complex issues.
 Making the earth a better place

Consumption levels decrease
 More quality over quantity

 Traveling is more a luxury
 Increased focus on quality/enjoyment of the experience

Focus on experience of traveling and new ways of travelling.
More control and self development for the journey
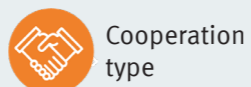
Cooperation type

Quality Levels

User Experience

Focus

Team B Future Context

High level of cooperation to serve customers exellence
Ecosystems are more profit driven

Consumption increases, quality is equal to quantity

Traveling becomes easier.
Making it faster and accessible for a large group. Personalization makes every journey unique

Personalization leads to a stronger focus on privacy of our data

7.3.4. Final Design Recommendations
Based on the interviews and the workshops there are several final design recommendations for the workshop. The first is to shorten the workshop by leaving the Future Scenarios as an example out of the workshop. This will give more time for the most interesting part of the group discussion and also shared between the groups a discussion.

Second, the trendscards should be sent earlier to participants. This will give them more time to read them and it will be easier to work with them. The fact that participants had room for own interpretation was seen as a good thing. This means that they were able to adopt the trend to their own domain of knowledge and see the impact there, as happend in this case.

Key Take-aways

In this strategic workshop participants focussed on selecting the trends that have the most

Overall the workshop was conceived as positive and relevant in seeing a broader perspective of the future.

The design tools used to cross the previous workshop design were enriched through videos and examples, in addition to the existing trends and trends. The combination of everything made the tools effective and actionable to use throughout the workshop.

The individual design frame was an extra help in this, as it gave the participants time to reflect, and interpret the cards and translate to their own set of expertise.
By having time to reflect on the trends and develop an individual opinion. The group design frame became more effective and fueled the dialogue.
Any difference and overlapping ideas became visible, making the reach for consensus

7.4. Workshop 2: Empathizing with Future Users

A design roadmap focusses on creating a future vision based on discovered valuer drivers of future end-users (Simonse, 2017). Therefore, it requires a deep understanding of the customer and user needs to develop a clear and shared vision of the desired customer-experience (Kim et al., 2018). Often in large organizations, the understanding of who the end-users is, is not taken into account. The same is for Vanderlande as they only focus on creating value for their current customer: Airports. To make sure that the end-user is embedded in the process we need to empathize with them and understand what drives them. Where the previous workshop focused on discovering trends that match with Vanderlande's innovation strategy this workshop focuses on finding value drivers for future users.

7.4.1. Design workshop 2 and execution

The workshop was designed to better understand future user by creating an idea about who they are, and what them drives. This workshop had no pilot test. An overview of the workshop can be found in figure 7.14. In the workshop a total of 6 participants was present.

Frame 1. Presentation
The workshop started with a recap of the previous workshop explaining shortly the most interesting trends according to Vanderlande. Secondly, it also introduced the two future contexts derived from the previous workshop.

Frame 2. Views on the Future Context
One of the outcomes of the previous workshop was the most interesting trend cards mapped on what kind of value impact they would have on users (Fig. 7.13.) This frame makes a distinction between the two worlds that were derived from the previous workshop. The two worlds are build up out of values on what the world could look like in extremes when these

values drive the future. There were a few overlapping values between the two groups.

Frame 3. Ranking Values
Based on these two worlds and their driving values, the participants are asked to rank which values are value drivers for future travelers. This is done in two smaller subgroups of 3 participants each. In these groups the participants created a ranking from all the different values it could be seen as unique and a driver for future generations or if they are a basic or commodity value (Fig. 1.15)

Participants expressed their difficulties in ranking the values, as they felt that the user value drivers would be highly dependent on the type of traveler and would vary between them.

Frame 4. Presentation Group
After the group ranking, plenary activity was held to make sure that the most interesting insights were also shared between the two different groups. The

groups were asked to shortly present their top three and explain why they selected these values as drivers. After this, a selection of 5 was left. Those 5 were chosen as most interesting to select future personas on.

The discussion between groups was short as there was limited time. This made that there were still some values or opinions not discussed between groups and it did not become one consensus on all trends. There were no large differences between the two groups, looking at their design frames made.

Frame 5. Break

Frame 6. Persona presentation
This presentation was a recap of the given presentation in the kick-off. More about this presentation can be found in chapter 7.2. The presentation was however shortened.

Frame 7. Traveler of the future
In the kick-off, 6 different personas were identified in the present. Participants

were asked to rethink the personas of today into personas of the future based on the previously discovered value .
In the exercise, the participants were first asked to vote through dot voting on the personas that would most likely disappear in the future and which personas are most likely to stay. Secondly, they were asked how the personas would develop themselves, based on the previously found value drivers. Lastly, the participants were asked to identify any missing types of personas that they would see in the future.

Participants found it easy to express why they would see or would not see persona change, disappear or stay. The frame helped in creating the conversation. All participants who wrote things done were asked to explain, to which a discussion unfolded. By voting, individual opinions became visible.

Interesting was that a participant in the first exercises scored nature a low-value driver, which would propose a persona

that is much focussed on slow and sustainable travel. This seems to be a conflicting opinion.

Frame 8. Persona Selection
The frame was used to create consensus on selecting the three types of passengers that would best incorporate the values that would thrive future passengers.

Due to time constraints, this frame was not used in the workshop, however, in the previous frame, there had already been discussed which of the personas was seen as the most interesting for the future, making this one become redundant.

Frame 9 ; Relfection
Lastly, the participants were asked to reflect on this workshop by giving their feedback.

In the reflection several points of improvement became apparent for this workshop:
- Reading work for the workshop that prepares for the workshop. This was

Ranking of User Values
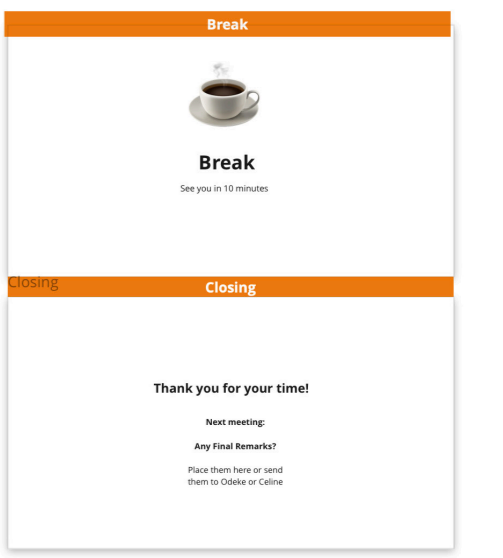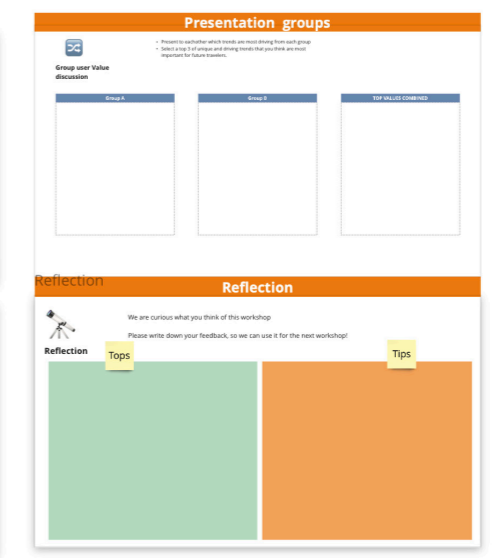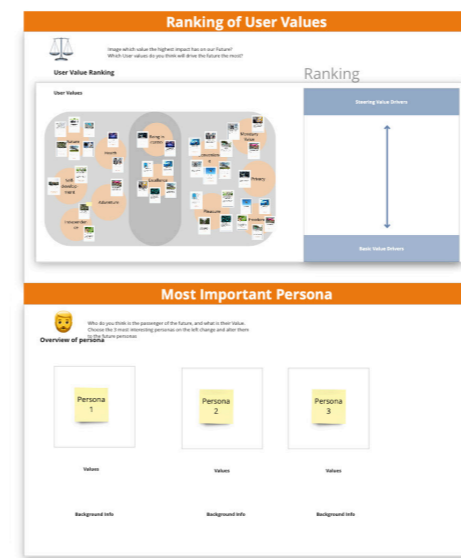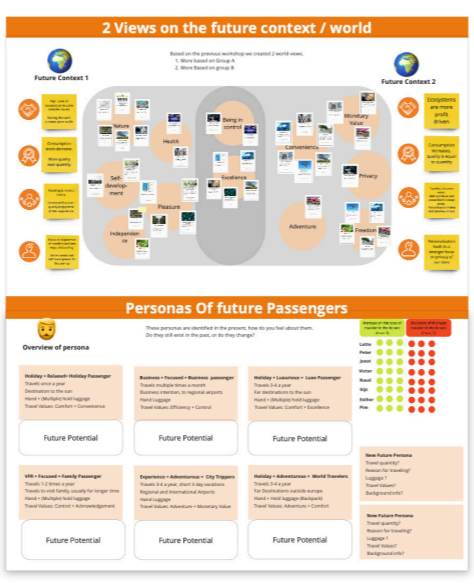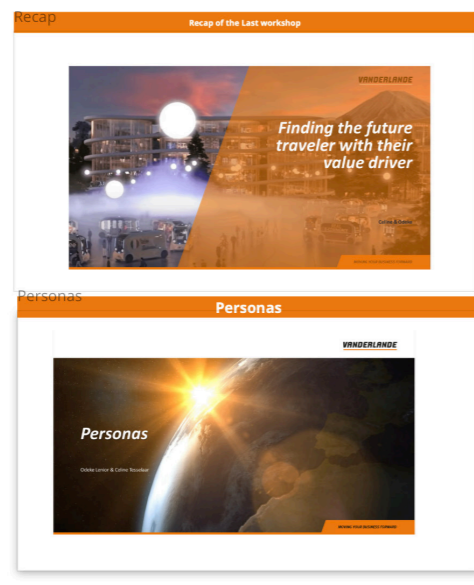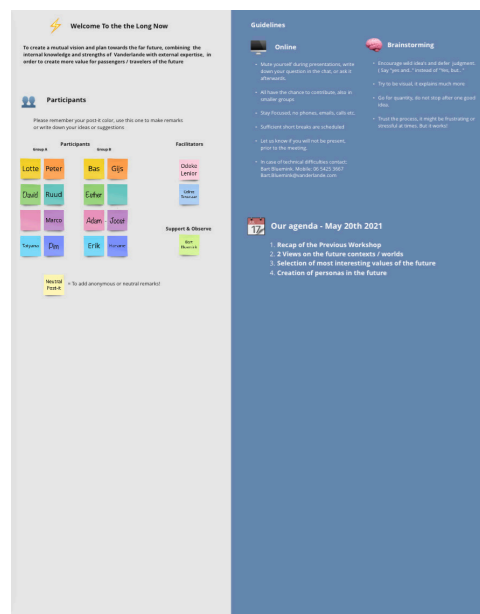
- Discuss and position the values you believe are unique values for the future that will actually drive the future.
- And note which are more basic values for passengers of the future

User Value Ranking
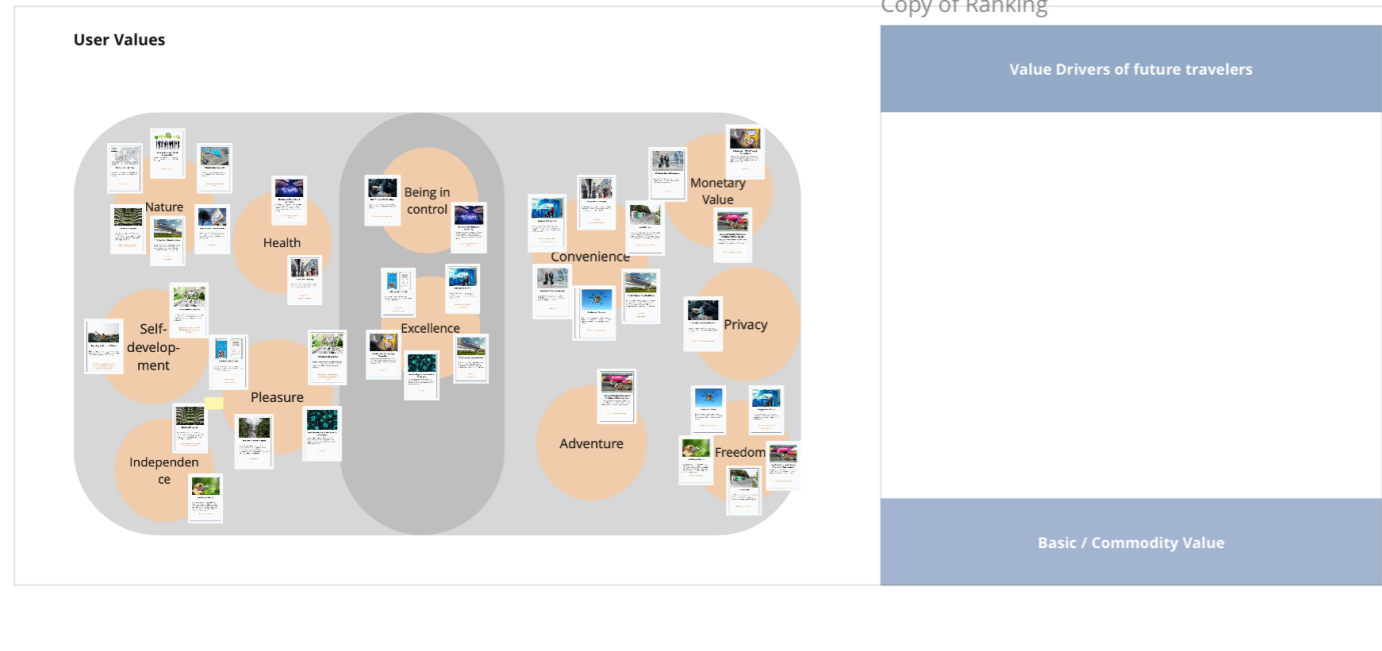
Figure 7.15. Design Frame Ranking user Value drivers on impact

Personas Of future Passengers
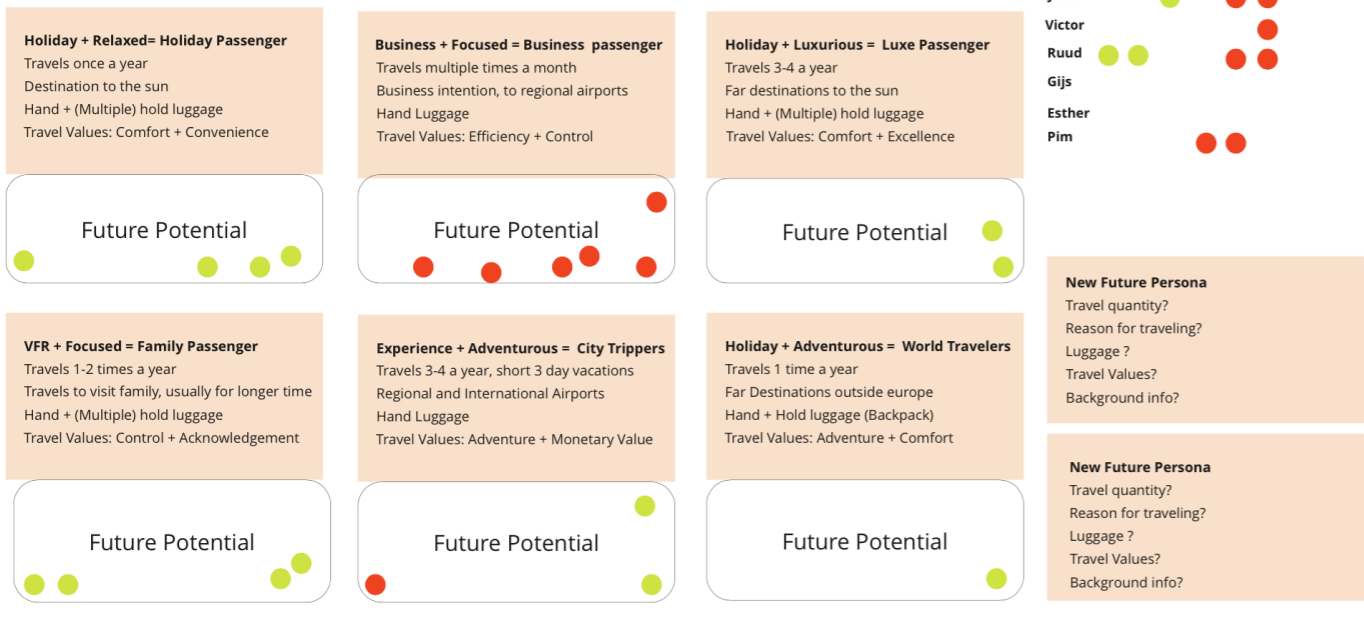
Figure 7.16. Design Map Persona Future Potential

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asked by multiple participants. As there were 3 weeks between every workshop, the participants wanted to receive more updates and in-between information/ inspiration to keep them engaged.
- Quantitative data on how the population is going to change.
To help the participants in understanding the most interesting target group, participants want an idea of who is the most interesting target group right now.
- More time on making consensus between and within groups. The tools to achieve consensus should focus on creating a collective story. Therefore the focus should lay more on creating a discussion, but the format should also help in diverging all opinions into one narrative.

7.4.2 Reflection on Design Frames

During the workshop, several tools and frameworks were used to transfer knowledge between the researcher and the participants and to translate knowledge into new insights. To understand the quality of these tools and frameworks and their effectiveness, 2 participants were interviewed (UX Designer and Innovation Group Lead). One of the participants joined all workshops so far and the other joined only the kick-off. Besides the overall process also a deep dive was done into the boundary-crossing mechanisms created for this workshop namely, the ranking of the values and the redesign of the persona of the future.

Ranking the Values:
The assignment of the ranking of the values seemed to be difficult for multiple reasons.
First of the participants had a difficult time distinguishing what value is most important because of the diversity of the passengers. Multiple times the discussion evolved on values that could be ranked high for one type of persona but low for the other and vice versa.

"In all this discussion it remains a bit difficult that you have to choose for a very broad group of travelers. "

Multiple discussions unfolded on values that could be a commodity of type of traveler but a driver for others. Participants were highly encouraged throughout this process to think for the next generation of users. Throughout the subgroups, also different discussions unfolded about the drivers for travelers on why they would choose a modality.

"It depends a bit on the person, not only on the money you want to spend. But also how much I control you want to be. "

"It was a difficult assignment, as you would have estimate what is important and what not"

Secondly, the values all seemed connected, making it hard to rank one over the other as there were all sorts of connections between the two different groups.

Thirdly, discussion arose on what every type of value exactly meant and what kind of trend cards fall under them, and why. The titles used to explain the values too vague. This discussion happened partly because some members were not present in the previous workshop and were confronted for the first time with these cards. Also mentioned in this is that these values mean something different for every group member, therefore first a sort of common ground had to be established on what all trend cards meant.

"I believe that the problem here was that two people were not there during the previous workshop, so we had to jump back and forth between the different cards to understand what the values were exactly expressing. Maybe here we were talking at cross purposes because we all had our own interpretation of the subject"

Lastly, the introduction of the new language and terms to describe the values was to abstract for both of the participants. One of the interviewees had difficulty distinguishing two similar values. The other participant had more difficulty with the switching lexicon, as he was used to the terminology used for the trends and now had to move to values.

This shows that the lexicon of this workshop should be differed to cross syntactic knowledge transfer from the design researcher to the participants. A different design frame/ tool has to be used that focuses more on either, using the existing lexicon of the trends, or on establishing a new lexicon with the participants. Because the trends were not understood on syntactic level, knowledge did not effectively cross the boundaries.
Secondly, also more room for ownership on matching the trends to the values that should be present. This will participants in better understanding the value drivers and create a common ground.
Both stated that ranking might not be the best option, as this loses the connection between the values that could be present. By redesigning this frame to a way that there is more room to discover connections and see the direct influence on the passengers, the discussion becomes more vivid. Also in this case the knowledge boundary between participants could be easier crossed, as there is more room for own

interpretation and adding their own knowledge in the process of linking.

Personas
The second assignment of discussing the future personas was easier for the participants. Both participants mentioned that they gained new knowledge on the Future Passenger from the discussion. The questions that were asked, triggered to think in new directions and think of the far future scenarios. The voting helped to make any existing differences visible and start the discussion
Through socializing the future through personas, the future became more tangable and it was easier to discuss between participants what they tought the future is going to look like.

"This was a fun exercise to really see what is going to change, we also added new personas. I think that is good"

What was mentioned in this discussion is that the basic outline given for the personas could have been more in-depth. The frame provided not enough details to fully empathize and understand the current persona but was sufficient enough to start the discussion. The personas could be sent

beforehand.

The overall workshop
The overall flow of the workshop was not optimal. Participants had difficulty at first connecting from the first exercises to the second. They did not initially see the overlap between the two, however in the end the connection could be made more clearly. Both gave positive feedback on the use of tools and break-out rooms in the workshop, as those pushed the creative dialogue. However, more time should be spent on this dialogue as consensus was not reached .
Overall the strategic workshop did help the participants to gain knowledge about the future user, especially through the group discussion and the persona excercise

Highest Ranked Values
In the workshop 6 drivers were ranked as highest as future value drivers. These values were:

- Nature --› Sustainability
We see that sustainability is becoming more and more a reason on which modality we take. Examples of this are Vliegschaamte, in which we are ashamed for our pollution.

- Being in control
Being in control refers to how much controle you have over journey. How much can you influence the journey.

- Freedom --› Flexibility
Flexibility refers to how easy you can make use of this type of modality and how much freedom it gives you.

- Concvenience --›
The time we spend on traveling influences partly how we want to travel. For some, getting there as fast as possible from a-to-b is important other care more about the journey.

- Excellence --› Comfort
The comfort of modality can be a reason why you would choose for a certain modality.

- Monetary Value --› Finance
The price is for some instance a reason on why to choose a certain modality over another.

Those drivers are mainly on why we choose certain types of modalities

Beside these modalities there were also 4 main travel motivations

discovered, these are the reasons why people would travel:
- Escaping routines
Travelers escaping their daily lifes to relax in a other
- Discover new/ experiences
People whom actively go to different destinations and might stay for a longer period of times
- Social Connecting / visting family or friends
Traveling to visit any relatives or friend and visit them.
- Professional Motivations
Work related travel

Also the participants were asked to identify new personas which they could see develop in the future.

Future Personas
All insights on the most important drivers for the choose of modality, the reason why people travel, the old personas and the group personas, were combined into 6 new Personas.

Those personas reflect on what has been said in the discussion, and summerize and humanize the different user value drivers selected as most important.

For each persona a spiderweb was created, explaining how the six main value drivers relate to them. This helps to inditicate similarities between personas on what they value.

An overview of the 6 personas can be found in figure 7.17.

The full personas can be found in Appendix H.

Workshop 2 Outcomes

Figure 7.17. Personas of the Future

7.4.3. Final Design Recommendations

For the final iteration of this workshop, a few recommendations can be made.

First of all, the traveler should be clearly introduced in the beginning. This should be the passenger of today. Through understanding who this traveler of today is, we could also look more in-depth at which trend(card) will make the most impact on this traveler and determine the most important drivers behind the trend cards and the passenger. Also, if not all trend cards are represented, new personas could be created, similar to in the workshop.

After this is done, future personas could be made expressing these value drivers to socialize the outcomes of the user value drivers. In these personas, their gains could for example be expressed through the trend cards that influence them the most.

In this redesign, there should be more room to discuss these personas and their drivers, as participants felt hurried in this workshop.

Key Take-aways

The workshops focused on discovering future value drivers, that were then used to discover the personas of the future. Overall the workshops did provide the aimed outcome of future personas. These personas embody the future value drivers. However, the design frames also had some flaws.

First of all, the values described in the first exercise (Ranking value drivers) did not make use of the existing lexicon, but a new one. This caused hurdles in understanding and adopting the insights. This could be improved by establishing the language together or give better insights on what steps were taken beforehand. Because the knowledge was not crossed effectively, the group conversation also became less insightful.

The use of personas on the other hand is an effective tool in crossing knowledge boundaries, as it created empathy for the end-user and also new insights on who the end-user is and how the future evolves.
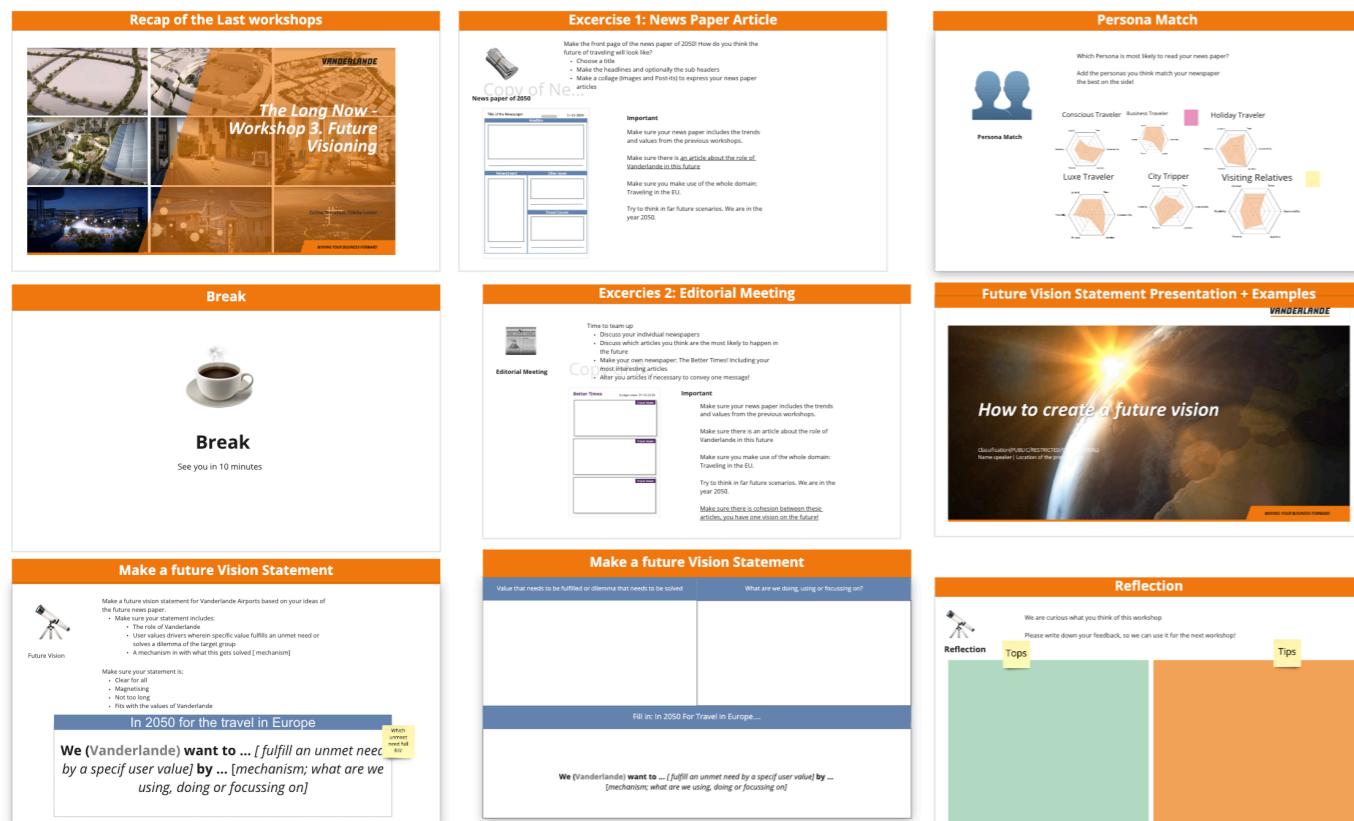
Figure 7.19. Design Map Pilot test Future Visioning

7.5. Workshop 3: Future Visioning

A future vision establishes the destination of your design roadmap. A future vision captures the value wishes that people have now and translates this into the desired future (Simonse , 2017). This workshop aims to explore what this desired future is and what value Vanderlande can bring in this future.

7.5.1. Pilot Test
The workshop was pilot tested with two non-designer participants from outside Vanderlande.
The Initial workshop is given in figure 7.18.

Frame 1. Recap of the previous workshop
The process started with a recap of the outcomes of all previous workshops. This includes mentioning the trends and values and personas to update the participants on the newly crafted future personas

Frame 2. Make a newspaper article
To combine all insights about the future and value drivers, participants

are asked to make the front page of a newspaper of the year 2050 (Fig 7.19). The goal of the newspaper was to create a within-group discussion on what the future could look like and later help to build a shared future vision. In this newspaper, they were asked to create a title and subtitle and make a visual for the articles that they thought should be on the front of their newspaper. The newspaper had a few rules: At least one article should explain the role of Vanderlande in the future, the newspaper should include the trends and values from the previous workshop. The newspaper should cover far-future scenarios and it should make use of the whole domain, traveling in Europe.

The pilot participants worked together on making the newspaper. For the final workshop, the first idea was that the participants would create an individual newspaper. During the making, they were engaged in the activities and reached a consensus on the articles fast. The facilitator needed to interact on some cases in the creation of the articles, to make sure the impact for future users is also mentioned in the

different articles. The outcome of their newspaper was mostly written text instead of visuals, while the goal was to have a visual newspaper.

Frame 3. Persona Match.
After the creation of the newspaper, the participants were asked to define a maximum of 2 future personas that would read the newspaper.

In the pilot, an discussion unfolded because they wanted to include almost all of them. Also, the reason why certain personas would read those newspaper got lost in the discussion

Frame 4. Break

Frame 5. Editorial Meeting
In the editorial meeting, multiple individual newspapers would have to be combined into one Newspaper. They could reuse articles from their newspaper. An additional guideline of this newspaper is that all combined articles should be coherent.

This activity was not tested, as the two participants already created one article.

Frame 6. Future Visioning Presentation
The outcome of this workshop is a future vision statement, which is based on the newspaper they made. This presentation explained what a future vision is and gives several examples of the iterative process of crafting a future vision.

Frame 7. Creating a Future Vision
The goal of the workshop is to craft a future vision statement that is built out of previously found value drivers and is shared between all participants. To help them in the process of crafting they were given a statement that they should fill in, namely: We (Vanderlande) want to … [*fulfill an unmet need by a specific user value*] by … [*mechanism; what are we using, doing, or focussing on*]. With this future statement, a brainstorm format is included (Fig. 7.20). This format lets the participants first brainstorm all the user value drivers or unsolved dilemmas in the newspaper and then on the mechanisms. The mechanism is in the case the solution space of this unsolved need

Afterward, the participants are asked to formulate and iterate on a future vision statement including these two elements.

The final vision statement created in the pilot was not magnetizing, so they performed several iterations. Especially the examples of the presentation helped them in creating a statement.

Frame 8. Reflection

Improvements
In the pilot, the participants were engaged in the process and enjoyed the creativity they could express. Several improvements could have been made:

Visualizations level in the Newspaper
The newspaper layout did not indicate enough that there should be more images and less text. The design of this tool should support adding visuals or
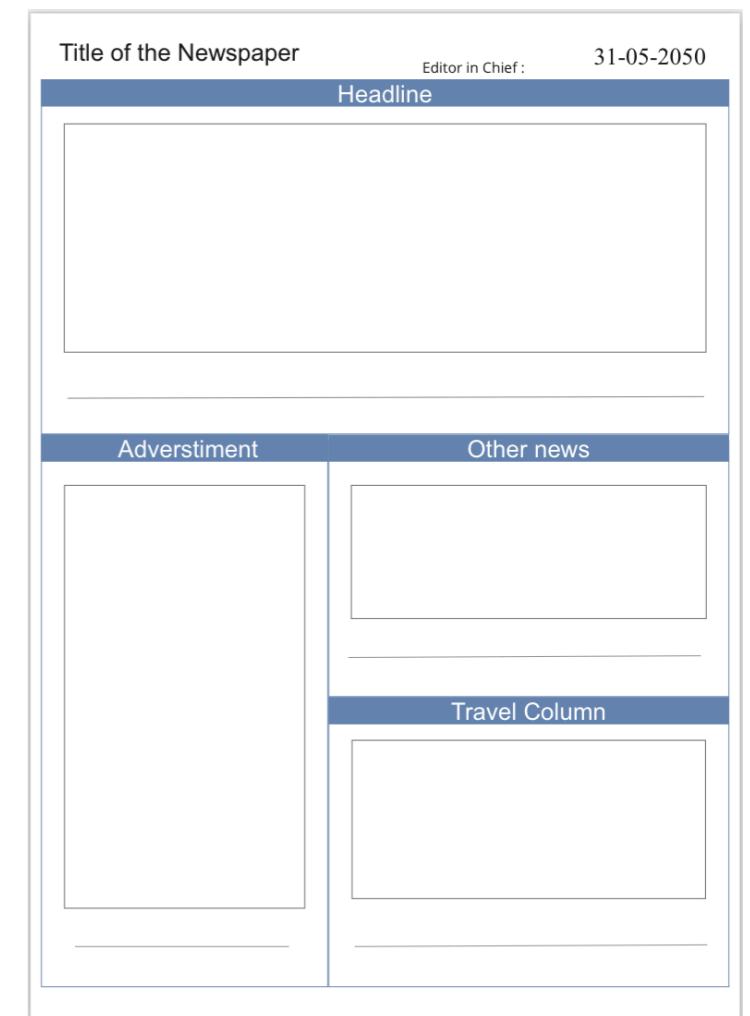

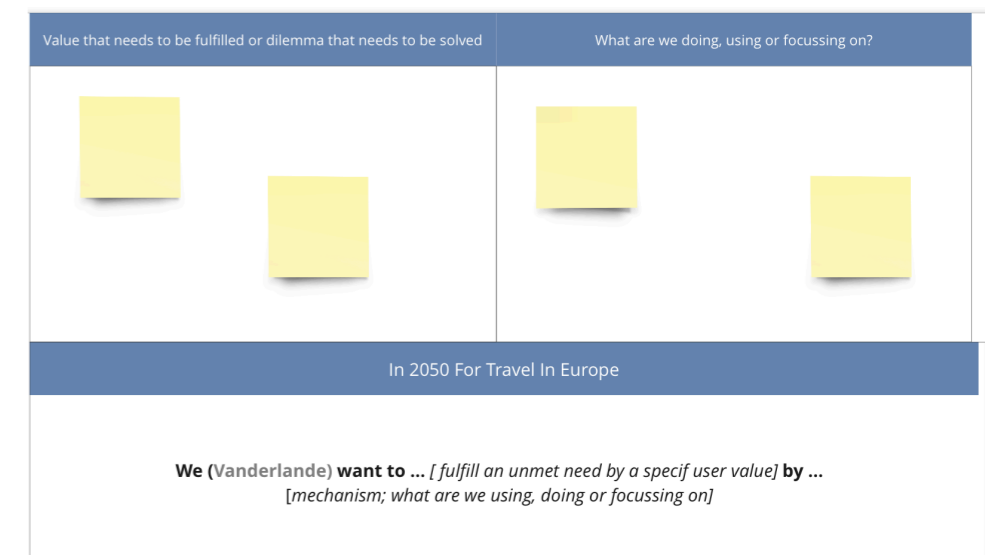Figure 7.20. Design Frame creating a Future Newspaper

Figure 7.21. Design Frame Crafting a Future Vision Statment

Figure 7.22. Design Map Workshop 3: Future Visioning

images for expressing ideas.

Match the persona
The participants were unable to identify why the personas would match to their newspaper, resulting in that all of them match. The activity should be changed slightly, by asking also to match a maximum of two personas and ask for an explanation.

Room to review older workshops
Participants should build their newspaper out of the previous work that they did. To make sure they remember their trend ranking and other previous activities, this data should be presented somewhere.

7.5.2. Design workshop 3 and Execution:
In this workshop, 7 participants were present. Because some boards did not requiere any changes based on the pilot, those are mentioned briefly in section.

Frame 1: Recap of the previous workshop

Frame 2: Recap of workshop 1: creative

Trend research

Frame 3: Recap of Workshop 2: Empathizing with Future Users

Frame 4: Airport Value (Chapter 6.4)

The outcomes of the previous workshops were added to encourage the participants to craft their newspaper on the insights generated in those workshops. This was done to make sure that all newspaper represents a possible idea about the future, based on things that are supported by all participants.

Frame 5: News Paper
The goal of this activity remains the same as in the pilot. The design frame has been slightly altered to encourage the use of imagery more and to limit the text used (7.23). Also in facilitation, the participants are encouraged to add visualizations.

In the workshop, the participants worked in 3 duos to create the newspaper. Most duos started with making a list of

newspaper ideas and headlines, which they quickly discussed and agreed upon. Then they worked individually on creating the articles. They had some small discussions in between.

Frame 6: Persona Selection
To clarify their newspapers, they identified a target group for their news paper using the 6 existing personas. The duos did select multiple Personas.

Frame 7: Break

Frame 8: Editorial Meeting
In the editorial meeting, the goal is to craft one newspaper based on the strongest and most interesting newspaper articles of the others. First, the duo's presented their articles, then they decided on common themes. For these common themes, they looked for the best matching article, which they placed in the newspaper.

Because of time constraints, the participants did have time to change or alter the editorial newspaper. Also, there was little time to discuss missing articles or missing ideas about the future.

Frame 9: Presentation on Future Vision
The presentation explained the goal of a future vision and gave distinguishing properties to take into account when crafting a future vision statement. Also, examples were provided.

Frame 10: Future Vision Statement
In the workshops, this activity and design frame remained the same as in the pilot.

The groups split up in the same duos as in the previous activity. The duos brainstormed using the final crafted newspaper and created a future vision based on this. This led to three similar statements, however, all slightly focused on something else.

The three groups briefly shared the outcomes. No final statement of all groups was created because of the limited time

Frame 11 & 12: Reflection and Closing
The participants were asked to give their feedback on the workshop.

7.5.3. Reflection on Design Frames
During the workshop, several tools and design frames were used to start a creative dialogue and cross any relevant knowledge. To understand the quality of these tools and frameworks and their effectiveness, 2 participants were interviewed (System Concepting Director and Innovation Lead). Both participants joined all the previous workshops. The interviews took 30 minutes each. In this workshop no new information was added, therefore the participants were only asked about the knowledge crossing between partcipants.

The boundary-crossing mechanism created for this workshop were the future newspaper and the future vision crafting format.

Future Newspaper
The crafting of the future newspaper was by both participants seen as an engaging activity. They enjoyed the outside-of-the-box brainstorming by thinking in far-future scenarios. However, also some improvement were suggested:

Both participants stated that they started off by brainstorming on articles that could be on the newspaper. From there they would select the most interesting one and work on them individually. however, they did not have time to go in-depth on brainstorming multiple articles and choosing from them. They preferred more time and grip on the brainstorming.

"We did not really have time to select articles, but that is what you should have wanted. You could give more instruction next time like spend the first five minutes on brainstorming articles."

Secondly, the groups were not mixed enough. Team members that work closely together in other projects were also matched in some of the duos in this workshop. He expressed that had not gained new knowledge from his group member.
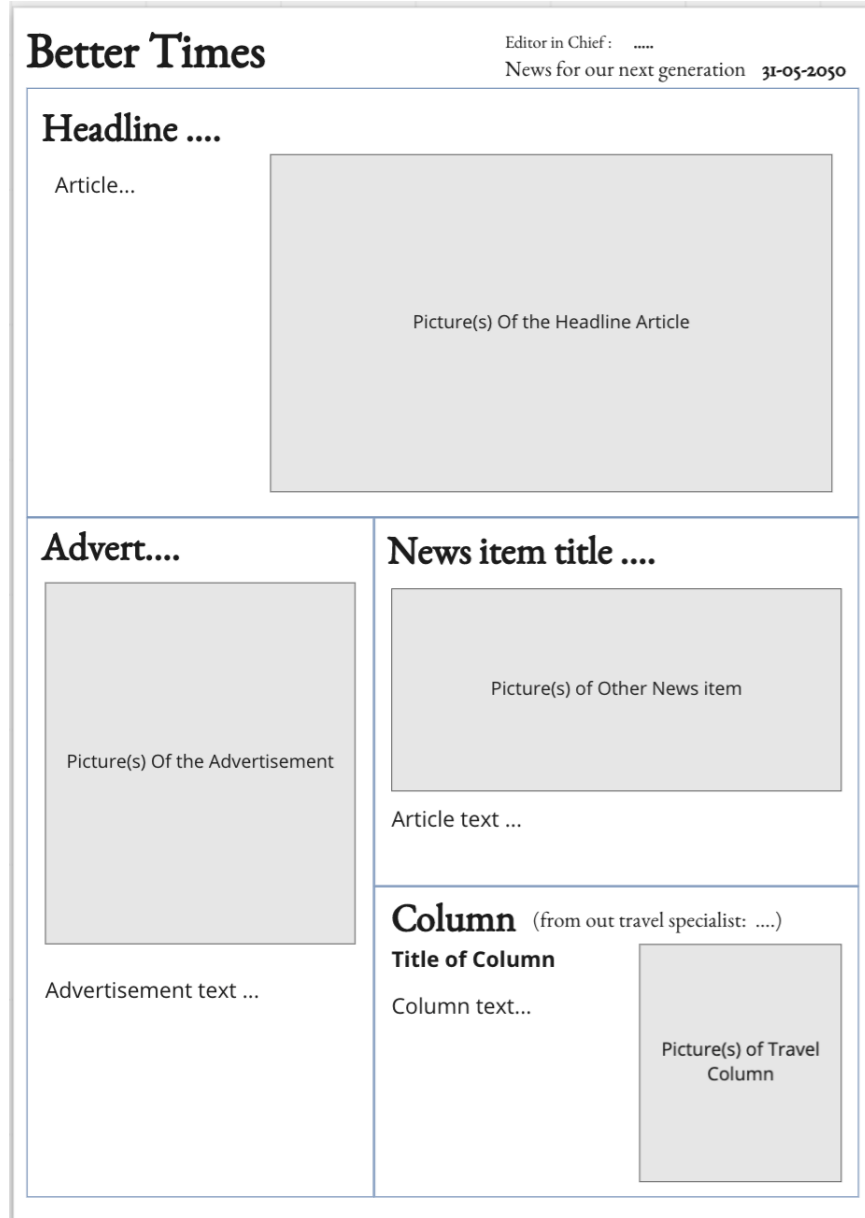
Better Times

Headline ....

Article...

Picture(s) Of the Headline Article

Advert....

Picture(s) Of the Advertisement

Advertisement text ...

News item title ....

Picture(s) of Other News item

Article text ...

Column (from out travel specialist: ....)

Title of Column

Column text...

Picture(s) of Travel Column

Figure 7.23. Improved Design frame
Creating a Futur News Paper

"I feel like if you mixed the duos more you would have had more innovative ideas"

Lastly, one interviewee mentioned that they enjoyed having the scope of the newspaper still open, as it helped to think in a broader solutions. She mentioned that she not only focused on modality types but also on city and infrastructure. However, the other thought the scope was too large, making it difficult to see how this helps in the creation of a statement.

In conclusion, the tool was effective enough to help participants create a dialogue and brainstorm with a broad lens. However, the tool was not every effective in crossing knowledge boundaries because of the insufficient tim. There was no chance of brainstorming and discussing thoroughly what should be on the newspaper. Secondly, also the group members had to similar backgrounds, making the there were no knowledge boundaries.

The future vision statement
The same team members worked together on the creation of their future vision statement. For this, they used a design that helped them brainstorm on the different elements present in the statement.

Both mentioned that they enjoyed the compactness of the exercise and the design frame. By splitting the sides up into two smaller brainstorm sessions, it became easier to formulate the statement.

One of them mentioned that the two smaller brainstorms helped in clarifying where the future vision statement comes from, and what details it entails. The brainstorms give all the pieces that you summarize in your statement by finding the overarching value

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"You do not have to put in all the details, but everybody does need to understand where it comes from."

Secondly, the "why" is missing on this board, stated on interviewee. To make it more clear what the role is of Vanderlande in this future

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"But the why, our inner believe in what drives us as Vanderlande, that one is missing in the format"

However, also in this design participants did not learn any new knowledge from their peers. There was inffucient time to discuss the different statements between groups.

Although they expressed that they both did not learn new things in this workshop, the Future vision statement and the newspaper could be serve as boundary objects between the participants and to

external stakeholders. The future vision statement expresses an idea about future values, that all participants should understand and interpret correctly, made through agreement. The shared understanding, in this case, is actually transformed into an object. This object should be solid enough so all members have the same understanding of what it entails but could mean different things for their specific domain.

Overall Workshop
Overall the strategic workshop was experienced as engaging by brainstorming with new tools. However, both explained that they would have preferred more time for all activities. In addition to this, they want a stronger connection between the two exercises

However, both mentioned that they still missed the newness in their statement and in the workshop. This will be taken into account for workshop 4

The workshop ended in three different newspapers made by the different subgroups (Appendix I) and one agreed-upon newspaper (Fig 7.24) and three future vision statements crafted by the group (Fig 7.25). Based on this newspaper we can see that some groups went in different directions than others, however, in the final newspaper, one article of every group is represented. The individual newspapers give an idea about how every group sees the future.

All input from this workshop was converted into two things which will be discussed more thoroughly in the following section.
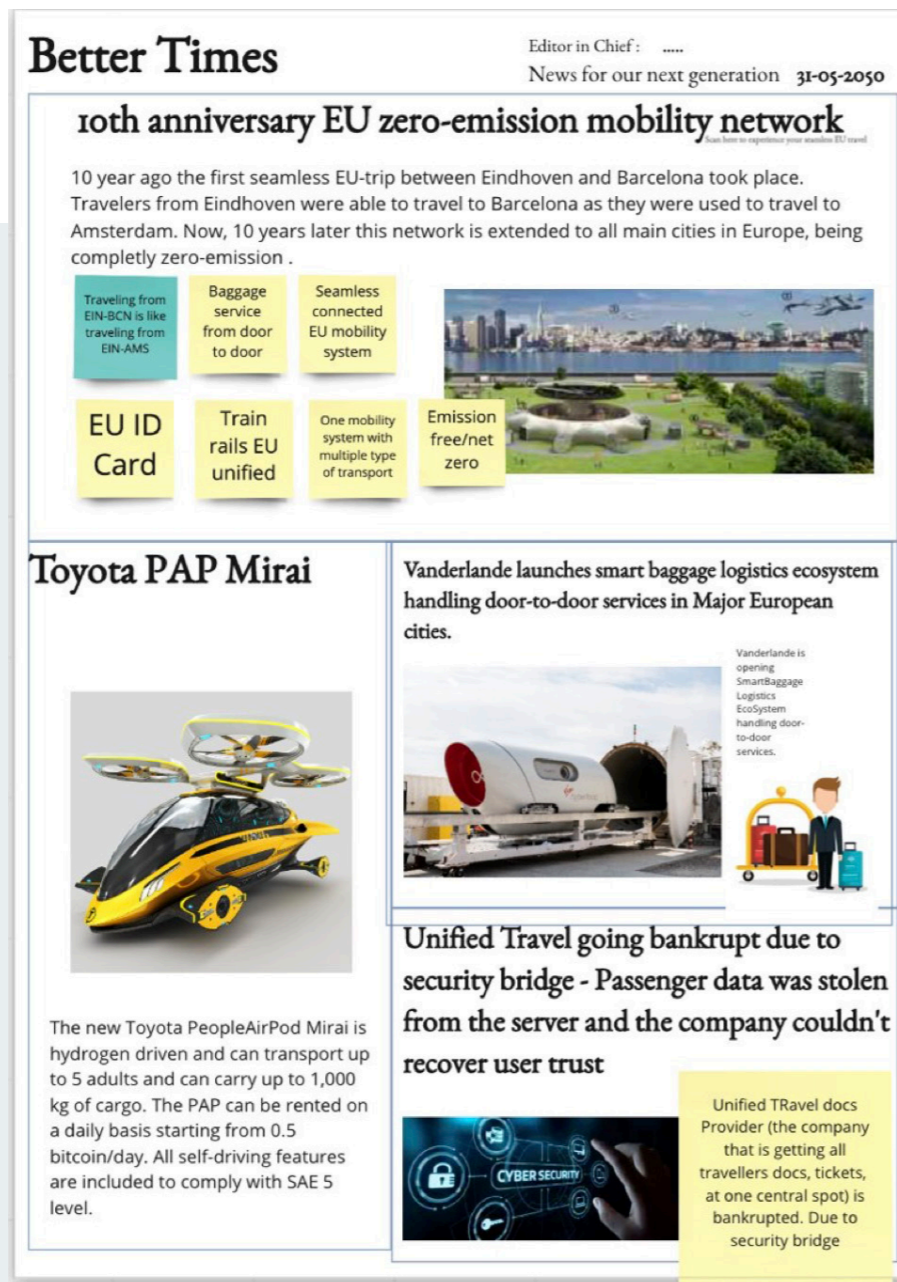

Figure 7.24. Newspaper Outcome
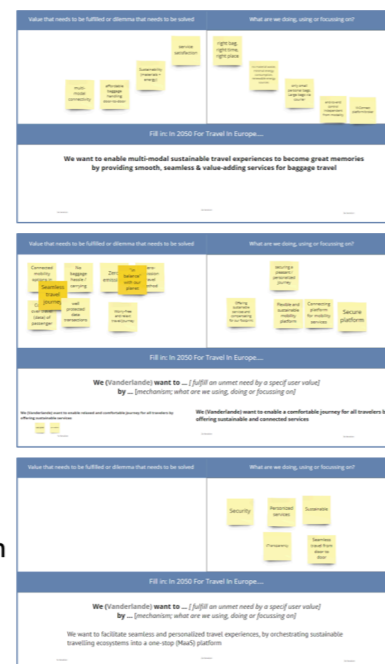
Figure 7.25. Future Vision Outcomes

Figure 7.26. Future Visions Combined

Future vision statement

Based on the three group statements, the facilitator team crafted one new future vision statement. This statement is build-out of the overlap between the different statements and the overlapping articles in the newspaper. This initial future vision statement is built out of four properties which is elaborated on in the smaller boxes (Fig. 7.26). This statement is a first draft for the mid-review session. The final future visions will be discussed more in detail in paragraph 7.6 .

Future Worlds

Vanderlande wants to explore multiple future contexts that fit the future vision statement. A future context is in this case a way that the scope of Traveling in Europe could be heading to based on the previously found trends and value drivers. The reason to add four different worlds is because of the complexity of the scope. There is not one dominant type of passenger, not one dominant type of modality that we focus on, and not one dominant type step in the customer journey that is being improved. To explore all possible scenarios of what is believed the future could develop, an iterative process of clustering took place.

In this iterative process, the focus was first on discovering any contradictions within the selected trends, value drivers, personas, airport values, and newspaper articles. Multiple contradictions were found (e.g. personalized vs standardized) however, no two contradictions could be placed on a matrix to form four different worlds because insights would not fit in. Therefore we decided to cluster on similar value with the personas as the advocates and match all other materials to these personas, some personas were

combined as their spider wheel provided similar values. This method eventually resulted in four different future contexts.

The four different contexts are explained in Figures 7.27 - 7.30. The idea is that these future context could live together, but also be an individual outcome. The worlds are explained by what user value they represent, what the experiences would be like, how business and governments are reacting or encouraging this world, and lastly what there would be at stake. To indicate what the future are based on the Airport values, trends and newspaper articles we have found. The future world contexts are:
- Our concious Future
- Our Connected Future
- Personalized Future
- Our Data Driven Future

To compare the four different futures an comparison visual has been made in figure7.31. This visual indicates what the world and travel looks like in 2050 and what the main modalities are in this context.

Figure 7.28. Our Conscious future

Figure 7.29. Our Personalized Future

Figure 7.28. Our Connected Future

Figure 7.30. Our data driven future

Concious Future

Conscious Travelers

5.2bn

Booked Travels

High Cooperation

1.2°C

Increase

Data to protect

Train
Network

Connected Future

Holiday Travelers

7.5bn

Booked Travels

High Cooperation

2.2°C

Increase

Data to collaborate

Hyperloop
Network

Personalized Future

Luxury Travelers

4.6bn

Booked Travels

Low Cooperation

2.2°C

Increase

Data to personalize

Individual
Pods

Data Driven Future

Budget Travelers

8.9bn

Booked Travels

Mid Cooperation

2.5°C

Increase

Data to optimize

Electric
Planes

Figure 7.31. Comparrison of the future world context

7.5.4. Final design Recommendations

A few improvements can be made to the workshop based on these insights. First, the addition of the "why" in the future vision statement creation, as a starting point for the "what" and the "how". Secondly, the scope of the article should be more narrow, and there should be more structure given by holding a brainstorm at the beginning for new articles. Lastly, the workshop requires more time.

Key Take-aways

The goal of this workshop was to explore what the desired future is and what value Vanderlande can bring in this future.

This was done through two design frames. First the crafting of the future newspaper, and secondly the creation of a future vision statement.

Both design tools were mentioned by the participants as engaging and clear. They engaged the participants to think outside their usual scope into a broader one. However, because of time constraints, the creative dialogue became too small, making it difficult for knowledge boundaries to become visible and to take advantage out of them.

7.6. Intermediate review session

In design roadmapping, the persuasion of senior management on design roadmapping and innovation is a necessary step (Simonse, 2017). The Long Now is a bottom-up innovation project, meaning the lower hierarchical levels are starting the innovation. To make sure that the outcomes of this project will be seen and used by senior management, the involvement of higher hierarchical levels is needed. Through involvement in the process on various stages and giving them an active role, they can grow ownership in the project and also actively participate to make the Long Now more succesfull. For this reason, an intermediate review session was held.

7.6.1. The review session

The session's main goal was to inform senior management and receive feedback on the previously crafted future vision statement. The presentation existed of three stages: Explanation of Design Roadmapping, a summary of all previous workshops and outcomes, and lastly, the collection of feedback on the four future worlds and the initial future vision statement. In total 9 senior managers were present in the workshop

For the collection of feedback Menti. com was used, this is online interactive presentation software that lets viewers give real-time feedback on any proposed question. The first question asked to divide 100 points over the four future contexts on what they think the future is most likely to look like. Secondly, they were asked to divide the 100 points over the four future contexts on what they thought is most valuable for Vanderlande. Furthermore, they could give feedback on the future vision statement. All outcomes can be found in the next section. Lastly, they were asked to give feedback on the whole process.

7.6.2. Reflection on Design Tools
No interviews could be held with the management levels to see what they thought of the workshop and future vision as tools to communicate knowledge produced in the Long Now. However, feedback was collected through Menti.com.

One interesting comment made was that it took some time to understand the process and the language. This is a clear example of a syntactic knowledge boundary. In the workshop, a common language is created through continuous collaboration and crafting the outcomes together. This language and the terms are not familiar with this

senior management level. The crossing of the syntactic boundary is necessary to also cross semantic and pragmatic knowledge boundaries.

Figure 7.32. Photo taken during the presenation.

7.6.3. Recommendations

In communication with senior management, it is important to use a language and words that they are familiar with. This is the basis for all knowledge crossing. If this is achieved, a future vision can help to translate the knowledge to have a similar understanding and interpretation among all stakeholders and create a common interest in the final roadmap.

What do you believe the world will look like in 2050?

Conscious Future
44%

Data Driven Future
24%

Connected Future
19%

Personalized Future
12%

Which future do you believe is relevant for Vanderlande?

Data Driven Future
37%

Conscious Future
29%

Connected Future
26%

Personalized Future
8%
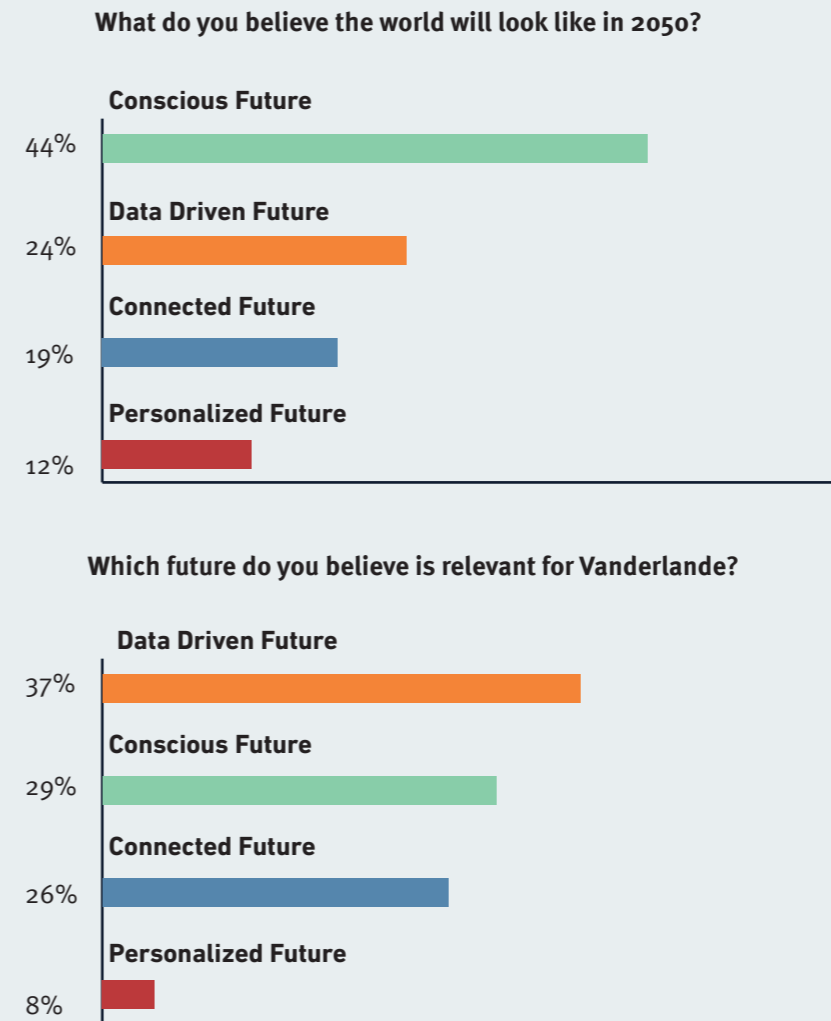
Figure 7.33. Outcomes of the Mentimeter. Votes of senior management

In this workshop, there were 2 future worlds considered most valuable and likely, the conscious world and the data-driven world (Fig. 7.33). The comments on this were that those 2 future worlds should be the basics conditions for the others as well and should be combined to make full value.

Secondly, the feedback on the future vision statement was that it was too long and too complex. They were unsure what product-service ecosystems are. The statement should be made more compact.

Based on these insights another iteration was done on the future vision statement (Fig. XX). In this statements a combination of all four worlds is created.

Those four different worlds, in combination with the future vision statement, will be part of the brainstorm for the next phase of this project; idea mapping.

Future Vision Statement

In 2050, Vanderlande orchestrates **seamless sustainable connections** for **every journey**

Seamless	Sustainable	Connections	Every	Journey
- End- to-End - Intermodular - Hassle Free - Convenient	- CO2 Neutral - Local Sourcing - Circular	- In a Network - Connections between people - Connected journeys - Data Driven	- Unique - Personalized - Excellence	- Passenger Journey - Baggage Journey

Chapter 8
Final Design and Recommendations

08

The design goal of this project was to create a set of digital design roadmapping workshops for Vanderlande, that could be transferred to different domains. In this process, a series of strategic workshops has been created and tested . Furthermore , insights have been collected on the effects of the different design frames on crossing knowledge boundaries between the design researcher and between the participants. This chapter discusses the final design, which is the set of strategic workshops on Miro that is made transferable to the different domains. It provides insights on the process and points of recommendations for THe Long Now. Laslty, it discusses the final insights on the design knowledge crossing mechanism and the tools used for this.

8.1. Final Design

The design goal of this project was to create a set of digital design roadmapping workshops for Vanderlande, that could be transferred to different domains. The final design of Vanderlande is a Miro Board which includes all design maps and frames used to create the steps in the Long Now. Through the previous steps, all design elements and frames are discussed and the basic outline is given for the workshops as well as any recommendations for the final design. Because the design maps and the recommendations to those maps have been discussed extensively in the previous chapter, this final design will not elaborate on this. The final design can be viewed through the QR-code gi- ven in figure 8.1. with a password upon request. In this chapter are only the overview and general ideas behind the final design explained.

The final design of the workshops is a set of Miro workshops given in figure 8.2. The final design elaborates on 5 things. The goal of this final design is that any new designer in the project can facilitate the next set of The Long Now.

Learning about Design Roadmapping

To teach any designer new to design roadmapping. A presentation is made explaining what design thinking and design roadmapping with explanations about the process, examples of the outcomes of this process.

I want to convince my managers of Design Roadmapping

A second area is designed to convince senior management. In this area, all tools used to start the design roadmapping workshop are mentioned. This includes the presentation and the teaser workshop
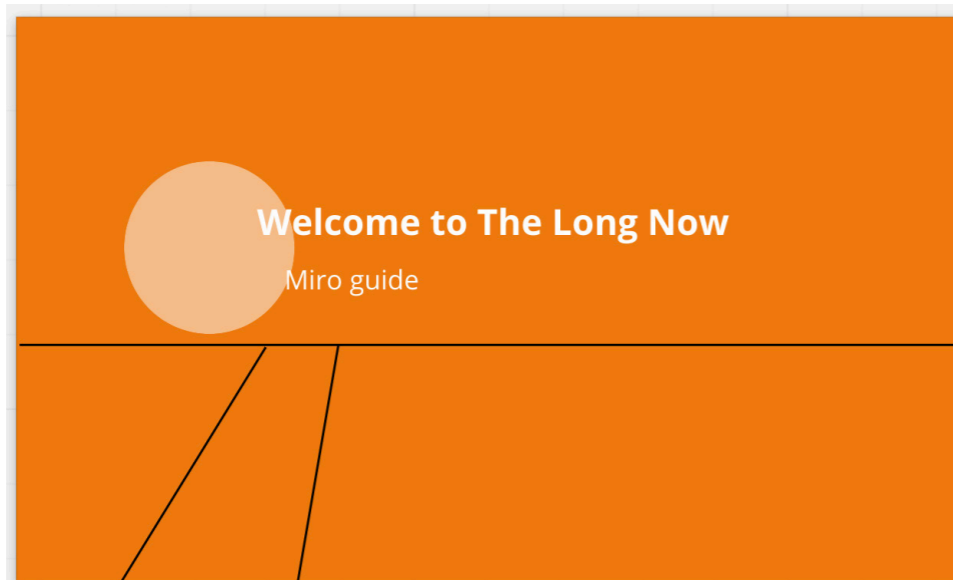
I want to Prepare for the Long Now

In the Long Now, most of the Knowledge design is not transferable to the different domains. For example, the trends are different in other regions of the world, making it not possible to use all of the existing trends cards.

To make sure that the Long Now is still transferable over the different domains, attention is spent on explaining how to perform these steps. For all these steps the Blanco final canvas is given. Through these design frames, the designer is guided in creating the right knowledge for their domain. An example of what this process looks like is given in figure 8.3. Here the designer is guided to the creation of new Trend Cards.

I want to do a full design cycle of the Long Now

The final design frames are crafted in a way that even with new knowledge of different domains the process can be executed. (8.4.) All the design maps are improved based on the recommendati- ons made at the end of every section in chapter 7. Because these recommendations have already been discussed, no further detail about the redesign will be given here.

To make sure that the design maps and the different design frames are understood correctly, a facilitation guide is added to every workshop. This guide explains the goal of the workshop, the goal of every design frame and gives a time indication. (Fig. 8.4)

I want to see previous results

Lastly, to give any further insights on how this first cycle of the Long Now was, the results are placed on this Miro Board as well. These results can help to better understand what the intended outcomes are of each workshop.

Figure 8.1. QR- Code to view Final Design

Welcome to The Long Now

Miro guide

Welcome to The Long Now

The Long Now is a set of strategic workshops building towards the final design of a Design Roadmap.

This Miro serves as toolkit for facilitators of the Process of the Long Now. In this toolkit both in depth will be explained how to facilitate the different workshops. Furthermore there is also an in-depth explanation of the design of the content for the workshops and also the loose excercises are explained.

However, the facilitation and preparation of the Long Now is not for everybody. It requires a strong understanding of design thinking and visualization skills

So feel free to choose a topic on the right and discover the process of the Long Now.

I want to learn more about design roadmapping

I want to convince my managers of Design Roadmapping

Prepare for the Long Now

I want to do a full design cycle of the Long Now

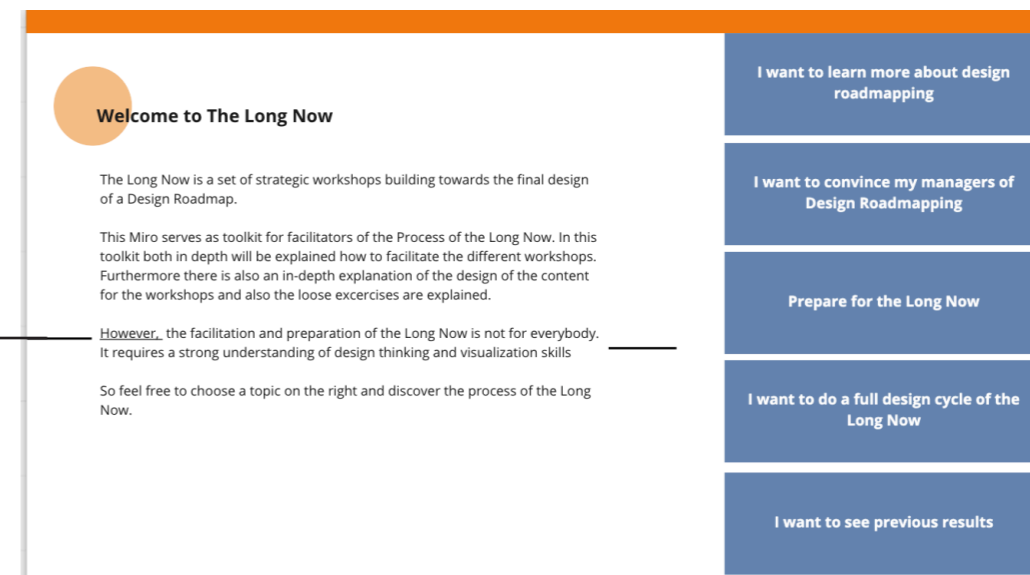I want to see previous results

Figure 8.2. Overview of Final design.

Prepare Knowledge for the Long Now

An important value that designers bring to the workshop is their knowledge about design research techniques and being able to communicate this through visual representation. This design research can, when done right, bring a more customer-centric focus to the participants without having to perform the research themselves (Roschuni, 2013).

Important in this is that the outcomes are actionable, are made social (feel empathy for the outcomes) and bring a sense of ownership in the workshop.

I want collect materials from participants

I want to summarize User Research in Personas

I want to perform Creative Trend Research

I want to perform creative trend research

In design roadmapping, creative trend research is an essential step in generating the future value drivers and therefore defining the needs of your future users (Simonse, 2017). Creative trends research is the activity of synthesizing smaller bits of information collected through various ways into new trend unities (Simonse, 2017). The outcomes of this trend research can help the viewer to see the world in new directions and to think differently, and make future proposals more grounded and believable (Evans,2003).

Step 1	Step 2	Step 3	Step 4	Step 5
Define the scope of your search .	Check if there are already existing trendcards in the deck available, that fit your scope	Collect bits and pieces of information through research	Cluster the bits and pieces. When you find many similar overlapping trends, create a trend card	Cluster all trendcards on deeper layers of value.
• Make use of scope larger than your existing domain (e.g. Traveling in Europe) • Let you scope focus partly on the end- user		• Interview experts • Websites • Articles • Newspapers • Blogs • Etc.		What do they mean to the user of for vanderlande?
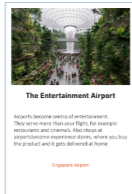
The Entertainment Airport

>>Titel of your trend<<

>>Background info<<

>>Example<<

Figure 8.3. Final design: I want to to perform creative trendresearch example

Workshop 1: Group ranking

Goal:
Let the groups summarize the individual ranking and create a top 3 trends, which is agreed upon by all members. These trends should be the closest fit for Vanderlande, and should be taken into account

Time: 20 - 30 Minutes

Activity: Place all the individual ranked frames on the left. Let them compare the individual frames. Make an agreement on the final ranking for all trends. Try to reach consensus on the top trends, and understand the reason why these trends should be considered.

In the middle frame the trends can be ranked again. On the right the selection of the top 3 is made

Workshop 1: Group ranking

Group Ranking

Discuss in your group which trends are the most interesting to take into account for, based on your first individual selection.

After you are done selecting all of the interesting trends, make a ranking of the top 3 trends. Describe what could potentially be interesting for vanderlande.

Present your selection to the other group

Group Ranking

Frame 93

Figure 8.4. Final Design Faclilitation guide

8.2. Insight and Recommendations for The Long Now

8.2.1. Principal Findings

The initial research question was "How to create a digital process of Design Roadmapping for Vanderlande in which the passenger is central and that could be transmitted the different domains?" The design of this Design Roadmapping workshops took place on three layers. 1. The design of the (user) knowledge as input for the workshops. 2. The design of the strategic workshops to converge this input to make steps towards a future vision, fitting for Vanderlande. 3. And lastly, the Long Now Process Design. All these three layers were shaped using design guidelines that were previously established through a literature study. Besides the different layers of design, a second insight was done that knowledge crossing between the different stakeholders is necessary to create innovation, but there can be issues in this crossing, so-called knowledge boundaries. Knowledge of the user is created by a designer, but the participants are the ones that have to gain insights from it. The same is for the knowledge boundaries between groups, as all participants have different backgrounds and different interests that have to come together in one final future vision and roadmap. To make sure the knowledge crossing happens effectively, the effect of the design frames and tools was researched. The outcomes of the specific tools can be found in chapter 7.

The knowledge design was created through interviews, desk research, and the collection of materials existing in knowledge silos. With these elements, a set of trend cards have been produced and multiple personas have been created. Furthermore, were the outcomes of the different workshops in between transformed in a way that served as new materials in the next workshop.

The design of the strategic workshops has been an iterative process of testing

and redesigning, to make sure that the knowledge design would be adopted and existing knowledge boundaries would be crossed. This lead to a final set of design workshops (chapter 8.1.)

Lastly, the design of the workshops is a build-out of a theoretical framework, in which a strong focus is on introducing to a new type of innovation and to the end-users, by making sure that any existing barrier for this is known.

The next section describes the insights on the final design gathered throughout the interviews, observations of the strategic workshops, and feedback received after the final design. It is explained on the three design layers to which recommendations are added for the next cycle of the Long Now. Secondly, the insights on the knowledge crossing tools and frames are discussed.

8.2.2. The Knowledge Design

The Knowledge design positively influences the attitude towards the *workshops of the participants.*
All workshops included a form of design research as input. This input was either the trend research, user research, or elements of the previous workshops transformed into new insights. The reason to do this was initially because of the limited time inside the workshop to perform both diverging and converging activities. Therefore, the team decided to focus only on collecting feedback and converge materials in the workshops. There were also a few other advantages of doing this:

Firstly, by preparing the workshops and bringing in new and existing materials, participants saw the workshops as more professional and more purposeful. They mentioned that liked the quality and preparations on several occasions. By strongly preparing the workshops the support and enthusiasm for the workshop also grew.

Secondly, the diverging activities (e.g. trend research, user research) require skills that non-designers do not possess and take time to learn. Most participants

had no experience with design or design thinking activities. By letting designers perform these activities the quality and diversity of these outcomes are likely to be higher.

Lastly, by preparing the workshops by doing performing activities more focus and time can be put in reaching consensus through the specific tools and creative dialogue. One of the main outlines of creating purpose in the workshop has been decided that every workshop needs to have a collaborative agreed on the outcome. By introducing all participants with the same knowledge, this consensus is easier to establish as they all have the same starting point, and more time can be spend translating this knowledge to their domain to see how it can impact this.

However, in contradiction to this is also the risk that not all perspectives and information is taken into account. By performing for example trend research with a larger group of participants it is more likely that the input collected is more varied and thorough. Also, the detail level of the trends can be higher if the participants do for example trends research in their specific work field. This could have increased the level of detail in the outcomes and helped in seeing other interesting trends.

Also, diverging activities are seen by some participants as more fun as, they can focus more creation of new knowledge. By including the participants in these activities more ownership in the knowledge crossed might be created by including them. One of the strategies explained by Roschuni in chapter 3. (Recommendations 1)

The role of the (Internal) designer
Throughout The Long Now, an internal designer of Vanderlande was constantly involved in the design of all layers and communication. The inclusion of an internal designer that is familiar with the status quo of the company has positively influenced the process of the workshop for multiple reasons.

Recommendations 1

- Execute the design research by designers to guarantee the quality of the outcomes

- Introduce the design research materials in the workshops to increase engagement of the participants, be more time-efficient and focus longer on converging activities.

- Invite experts to theknowledge design sessions to increase even higher and more holistic results, this could also increase ownership if the experts are also participants.

Recommendation 2

- Closely involve an internal designer of the company as a knowledge crossing mechanism to overcome any boundaries, and to match activities and participants to improve innovative outcomes.

First of all, is the internal designer more familiar with the existing knowledge boundaries that could occur and how to cross them. An example of this is the creation of a design tool made in Visual 7.XXX. On this design frame, participants were asked to rank on a level of consideration, instead of strategic innovation fit for Vanderlande. The use of the language was an intervention of the internal designer explaining that strategic innovation fit is not a used term inside Vanderlande and could therefore cause resistance from the participants. The internal designer acts in this instance a boundary-crossing

mechanism and helps to create mutual understanding between the external designer and the participants. Rau et al. (2013) acknowledge the importance of engaging a translator to cross semantic boundaries.

Secondly, roadmapping requires a diverse team of professionals that have an innovative mindset, the internal designer is better able to select participants that have the right mindset and complementary skills for the team. In addition to this, the internal designer is also able to better sense the barriers or drivers for futures thinking that are present within the participants and the organization. Lastly, the

internal designer is more aware of other ongoing innovations inside the company and other existing knowledge. (Recommendation 2)

Communication across boundaries of User research
From the theoretical background (chapter 3), several guidelines were founded on how to successfully communicate user research across boundaries. In the design of the communication, these guidelines were included to overcome the risk of inertia. Also during the testing and interviews, some insights were collected on effectively communicating user research.

Firstly, the importance of showing where the user research comes from, how it is collected was important in understanding what the outcomes are. An example of this is that in the pilot test of the trend research workshop only the trends were explained, however, the test participants showed difficulty in understanding these trends and how they could perform actions with them. In the final design of the workshop, a video and a more thorough presentation were added explaining where the information was collected, who was involved, and how it was transformed to actionable outcomes. Participants addressed that all these elements helped them in understanding the trends more and made them usable objects. The design research should also give room to add on or or to make it possible to adapt or transform so it becomes more relevant for the different stakeholders. Also, the guidelines of visualizations were a good strategy, as visuals helped to better understand the data, make it easier to remember and to refer to. An example of this is that the personas were referred to several times inside the workshop. This is in line with guidelines found in chapter 3. (Recommendations 3)

8.2.3. Strategic Workshop Design

Processing Time and Discussion Time
The workshops all lasted between 1-2 hours, this was too short for most of the workshops. Throughout the workshops and interviews, multiple times were mentioned, and noticed that the workshops felt rushed and that there was little time to process any new information. The time to process was especially needed in the case when new knowledge or new tools were introduced to the participants. This new knowledge needs to be understood, translated to

their field, and transformed in most cases to form an opinion about which can be a starting point of the creative dialogue. Also, the time spent on the creative dialogue between participants should be sufficient to learn from others' perspectives and change interests, if necessary, to reach a consensus.

To make sure that the workshops can be longer, commitment from the participants is necessary. They need to be aware of how much time is asked of them, so they can make sure that they can be involved.

A successful design frame in processing the information was for example the individual ranking of the trends (Fig 7. 10) This frame helped to process new information by expressing first thoughts

and pushed the participants to form an opinion by ranking the trends. (Recommendations 4)

Balance of plenary and individual/subgroup activities
In line with the previous insight is the balance between plenary activities and dividing into groups or individual work gives the workshops a dynamic flow that is engaging. The creation of subgroups helps in the generation of conversations as groups are forced to communicate. Tools or frames to facilitate the discussion in these break-out rooms are highly encouraged so results between subgroups are homogenously presented. This is in line with guidelines found in chapter 3. (Recommendations 5)

Recommendations 3

- Making steps of the user research visible by displaying the actions undertaken

- Create visual output that socializes the user research to create more awareness

Recommendations 4

- Spend sufficient time on letting the participants process any new information. Provide tools to process and form individual opinions if necessary

- Spend sufficient time on a creative dialogue between participants. This is the core of your design roadmapping workshops.

8.2.4. The Long Now Design

A kick-off workshop to discover barriers and drivers
One of the design additions to the existing technique of design roadmapping was the discovery of barriers and drivers in a kick-off workshop The Long Now. These barriers and drivers are not fully discovered as this workshop only focused on the expected challenges and goals of the participants towards The Long Now. The difficulty in uncovering barriers and drivers for future thinking can be tacit knowledge which is hard to uncover by a framework. The initial questions do give an idea of what could be challenging and those should be taken into account when creating the next set of workshops, however, a more thorough understanding of the barriers and drivers needs to be created by deeply understanding the company and ethnographically researching previous innovation projects. In this, the internal designer is more sufficient to communicate the previously found barriers.

Secondly, the kick-off workshop also supported the introduction to design roadmapping. Using an existing example of previous workshop design roadmapping worked to let participants understand the meaning outcome of the workshops. However, this could be encouraged by letting the participants quickly experience future thinking and brainstorming. The far future brainstorm was done in the pilot test of the kick-off and worked to introduce brainstorming in a design context.
(Recommendation 6)

Recommendation 5

- Plan a flow of plenary and individual/sub-group activities to create engagement in the workshop

Recommendations 6

- Use a kick-off workshop to discover barriers and drivers, and to make sure that everyone is on the same page.

The workshop to focus on the end-user.
In the process of The Long Now, a special workshop has been introduced to research the values of travelers and to see how trends indicate new types of future travelers. The outcome of this workshop was a set of future personas which represent earlier identified values. From the interviews and observations, the workshop and the persona helped in developing a deeper understanding and making the future passenger more visible.

Secondly, the workshop started with determining which values are most

Recommendation 7

● **Make value drivers more tangible through future personas to create empathy for the future end-user and to make the future contexts more vivid.**

Recommendation 8

● **Focus on creating a shared lexicon inside Vanderlande with all stakeholders, especially in communicational presentations. This is the fundament for creating a shared or agreed-on outcome.**

Recommendation 9

● **Make sure participants are engaged in between the workshops by giving regular updates and providing inspirational materials.**

driving, this was considered too difficult not knowing who the traveler of the future is. However, by translating the value drivers to future personas these values became more tangible. The use of personas helps to step out of your existing business-to-business and explore new user groups and making the user values integrated into the trends and trend cards visible. This is in line with guidelines found in chapter 3. (Recommendations 7)

The importance of support from all hierarchical levels.
The involvement of higher management levels is important to include as they are the ones that have to approve of the project and make resources available. During the meeting with management, the strategic workshops and the outcomes of these workshops were explained, ithis comncluding the vision statement and the future world context. The involvement of the management level in this phase helps in collaboratively shaping a future vision statement, as they can actively deliver input. By actively involving the management level in the workshops and the creation of the future vision,

their ownership in the project is more likely to grow.
Secondly, the vision statement becomes this involvement a collectively constructed shared object that serves as a reference point of innovation.

However, in those meeting it is important to be aware of any semantic boundaries, through the use of the lexicon. In the review workshop, a final remark was made that the language used in the presentation was sometimes too complex, referring to the specific design terms. In the creation of a shared future vision statement or any other design object or tool, the fundamental basis of speaking the same lexicon should be taken more into account. (Recommendations 8)

Time between workshops
Lastly, in The Long Now there was a time gap of three weeks between every workshop. The reason to do so was that the design, testing, and preparing of the materials for workshops is a time-intensive process. Also, making the workshops fit in the schedule of the participants was a reason to have time between the workshops.

However, the timing between the workshops negatively affected the participants. On multiple occasions was mentioned that would like to timing between the workshop smaller or to be more in the time between workshops. One participant mentioned that he would like to receive any inspirational or preparing activities before the workshop, so he could become more engaged. Recommendations 9)

8.3. Discussion Knowledge Crossing Elements

This thesis also focuses on which design tools and methods are efficient to cross knowledge boundaries. This chapter's paragraph discusses the overall knowledge crossing elements. Detailed explanations about each knowledge crossing element can be found in Chapter 7 and Figure 8.5.

From the workshops, we can see that any new knowledge explained by the design researcher to the participants takes beside the right outline also time to adapt and transfer to what that information means to them. This became apparent mostly in the trend research workshop, where the participants received a large quantity of new knowledge through trends and trend cards. To make sure that this information gets transferred to their domain and form an opinion about it, there needs to be time to reflect on the information first. Therefore, individual reflection moments (like voting, ranking, or first ideas) were added after giving new information. What helps in understanding is making use of information that is alrweady present in the Silos but by uncovering it and make it accessible for all. Another helpful insight was the role of a translator in this process. The internal designer can help in formulating the right language of the given knowledge, so it becomes understandable for all, and everyone has the same interpretation.

After this opinion is formed, there is the knowledge boundary between the different participants. All participants have valued the information they received differently based on their background and interest. The individual frameworks can help to indicate these differences by making them visual and fuel an interesting conversation. To make sure that all knowledge is crossed, a visual design output of the consensus between participants is helpfull. This output shows the interests that are common or transformed between the two participants. The second knowledge boundary is easier to be crossed than the first one because the participants all work with standardized tools and language making the expression of their own beliefs easier for the rest of the group.
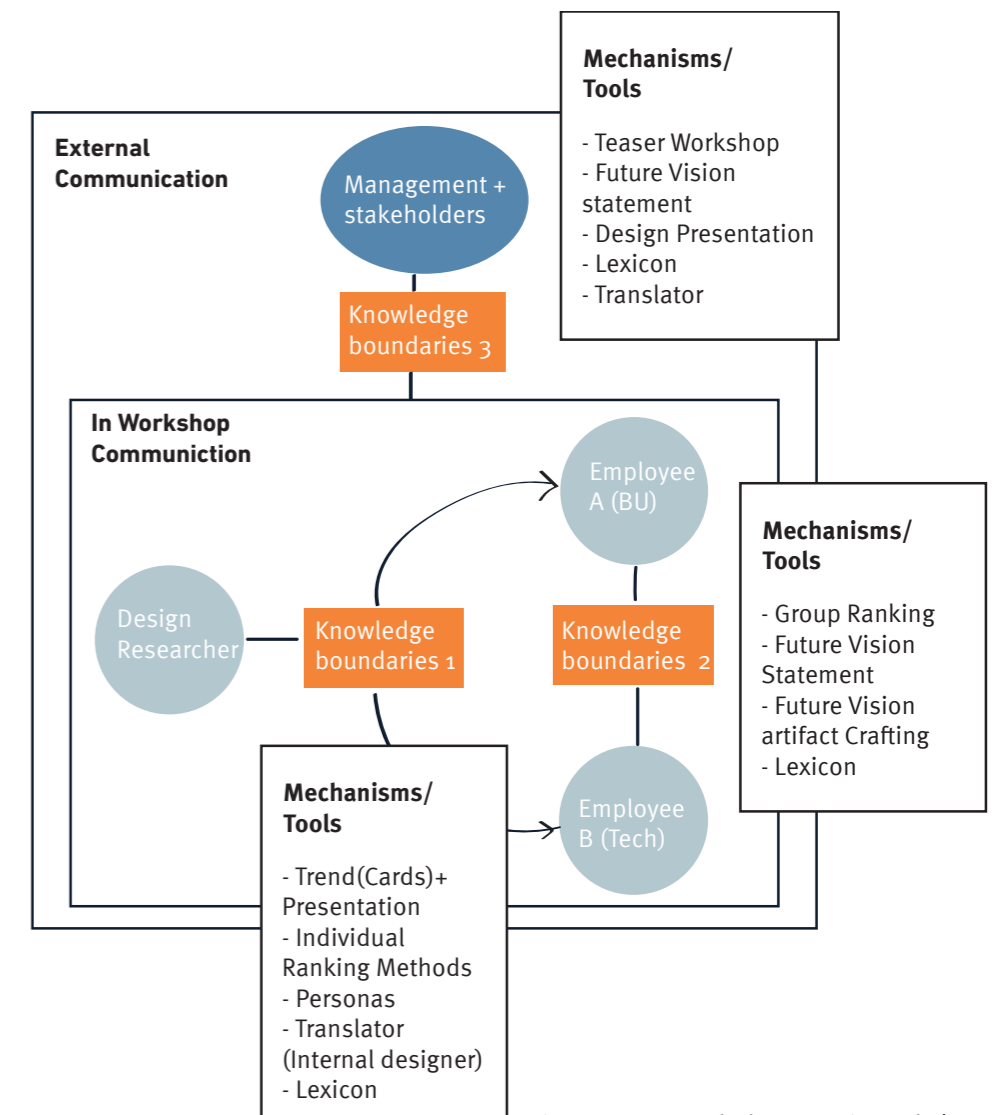
Also during the workshops, little knowledge was added from these participants in the form of new trends, models, or frames throughout. Only in some instances, examples were used to clarify between one and another. A reason for that is that some of the knowledge was already dug up from the different silos and formed the basis of Design Research. Also, the participants had previously worked together in other projects, so they were aware of each other's knowledge. For the next phase, more involvement is needed from also the existing knowledge within the silos, the workshops will then become even more strategic as all knowledge is included.

Lastly, the third knowledge boundaries are between the Long Now team and the management and stakeholders. In the intermediate review session, knowledge boundaries became visible when their comments made about the unfamiliar language. They were unaware of the language created for the Long Now, because of their low involvement. So either the involvement should be higher so the language could be shaped together, or the language needs to be altered with the help of a translator. Secondly, the future vision statement and the newspaper could serve as boundary objects between the participants and external stakeholders. They express a summary of all previous activities and connect the insights of all the actors and their domain-specific knowledge.

Figure 8.5. Knowledge crossin tools/ frames and mechanisms

09

Chapter 9
Conclusion and Limitations

In this chapter the conclusion and limitations to answer my research question can be found. The chapter ends in personal reflection based upon the personal objectives I wrote in the Design Brief.

9.1. Conclusion

The initial research question was "How to create a digital process of Design Roadmapping for Vanderlande in which the passenger is central and that could be transmitted the different domains?". in this research question, the focus was also on solving initial problems at Vanderlande, namely overcoming knowledge silos.

Based on the theoretical background, the design roadmapping process for Vanderlande can be divided into three layers, namely design of the knowledge, design of the strategic workshops, and design of the Long Now process. For each of these different layers, several design guidelines are given. In addition to this, there is also an importance in understanding how knowledge crosses between different actors of this innovation project. Because design roadmapping requires different actors with various backgrounds, there could be issues with crossing knowledge boundaries. There are three moments in which this could happen, firstly, in the communication of the knowledge design from design researchers to the participants. Secondly, between participants, when they have different interpretations of this knowledge. And lastly, from the roadmapping team to senior stakeholders. These so-called knowledge boundaries also have their own tactics on how to cross them.

All these insights lead to a design goal: "Design the process, strategic workshops, and content for "The Long Now" that is transmittable to different domains, following the created guidelines and that helps in crossing any existing knowledge boundaries by designing the tools/ frames for this." In this question, the domain of airports is used.

The process design of "he Long Now consist of 6 strategic workshops. 5 Design roadmapping workshops and one kick-off in which the goal is to get everyone on the same page. The first 3 design roadmapping workshops build towards a future vision and are the focus of this thesis. One of these workshops is devoted to empathizing with the future user, this is done to learn more about travelers. In this design also regular meetings with senior management are planned, to make sure the process is supported from the top-down.

To answer the question of how to focus on the end-user, the layer of knowledge design is introduced. In this knowledge design, the focus is on stepping into the world of the (future) user through trend research and empathizing through personas. The knowledge design is built partly out of insights and materials collected from within Vanderlande so that they are already familiar with it. The knowledge design is used in the strategic workshops, where participants use these materials to build towards a future vision. To make sure that the knowledge design is interpreted correctly and is adapted by the users, the outcomes should bring empathy and ownership, and be actionable, through providing inspiration and active learning, From testing the workshops, also other aspects turned out to be help in communication the knowledge design. Namely, a translator to make sure the lexicon is understood and giving the participants time and tools to reflect on the information shared.

The final design, that answers this main research question is a set of strategic workshops made digital through Miro Software. These workshops let participants build towards a future vision and eventually a roadmap through a digital way. The workshops have a focus on converging the knowledge design

brought into the workshops, making the workshops highly effective as they only work on reaching consensus. To reach a consensus the knowledge boundaries between the different stakeholders should be crossed. Tools to help facilitate this are standardized tools and forms, which help to show any differences of interpretation of the knowledge. The final set of design roadmapping workshops is transmittable, by making use of empty frames which can be filled with the domain-specific knowledge design.

This first set of The Long Now focuses on the scope of Traveling in Europe. For this scope, a future vision statement is created based on the insights of the previous workshops. The final statement is: in 2050, Vanderlande orchestrates seamless, sustainable, connections for every journey

**9.2. Limitations
To the Final Design:**

Transferability of the Final Design
The goal of this thesis was to create a set of strategic workshops that could be transmitted to different domains. In this thesis, the focus was only on the domain of BU Airports. In the final design and design recommendations, a blanco set of workshops and tips are given on how to exceed the second round of workshops. However, the transmissibility of this is not yet tested. The next round of The Long Now will determine whether this set of workshops is also suitable for the other domain

Test and Reflection was not done for all strategic Workshops
Secondly, not all design frames were discussed or tested a second time. The kick-off workshop did not have a closing interview to discuss the effects of the designer frames and the outline of the workshops, however, observations were made. Secondly, workshop 2 empathizing with future users, was not pilot-tested before the actual workshop. This could have helped to determine any design flaws before the workshops and might have affected the outcomes and design of this workshop.

The conclusion on the design frames and their knowledge crossing capabilities.
After every workshop, only two participants were asked to reflect upon the workshop and on the design maps and frames. This is a very limited amount of people, making it difficult to draw any conclusion based on this limited amount of data. Also, it is difficult to fully see whether knowledge is understood and adapted because this can be latent knowledge. A Larger sample size is needed. Also, the use of quantitative data techniques could be interesting for this.

Limitations towards the outcome of The Long Now: Traveling in Europe

Participants presence and group collaboration
Throughout the workshops, some participants were not present in all workshops. This caused that some participants had a disadvantage in the workshops, as they were not always aware of what happened in the previous workshop. To close this gap, the results of the previous workshops were always shared with the group at the start of every workshop, however, this could have influenced the outcome of the workshop

Secondly, also the subgroups were made during the plenary workshops. This made it difficult to always match group members with different backgrounds with each other. An example of this is that in the crafting of the newspaper two group members worked together who had similar mindsets.

The size of the Scope
The scope of the workshop was: Traveling in Europe, however, the scope of this project was too large and complex. In the trend research, I only focused on four aspects of traveling in Europe; however, I noticed that by focusing only on those four areas, other existing areas or stakeholders remained under the radar. For example, the values of stakeholders or security were not taken into account, partly because the discussion was whether these stakeholders are still existing in 2050, and because of this data was not available. To overcome this issue either research should include the perspectives of all stakeholders, or the scope should have been made more precise.

Time restrictions
The workshops were all time restricted to two hours, to make sure that as many participants could join as possible. However, due to the limited time, some discussions had to be cut off and the consensus was not fully reached. This could have influenced the outcomes of the workshops.

Testing the vision with external stakeholders.

Lastly, the vision was only tested with employees of Vanderlande, and higher hierarchical levels. However, the final statement should also be confirmed with the other stakeholders outside of Vanderlande, e.g. airports.

9.3. Personal Reflection

One of my initial learning goals in this thesis was to discover what working for a large corporate, that is partly unfamiliar with design, would be like. During the last half-year, I focused on creating highly strategic design workshops and I learned all the barriers that could come with this but also all the good sides. What I enjoyed especially was seeing your work being appreciated by people that new to innovation through design. A good example of this was the Midterm review with senior management, where they complimented us on the work we had done and saw how this project could also be successful if done by other groups. However, partly due to the online circumstances I also learned how difficult it is to arrange this in a large company. The project took quite some time to kick off. Another problem was the actual physical distance between Vanderlande and me. This made it hard for me to connect with the company.

The other learning goal was to see how I could involve non-designers in the role of designers. I enjoyed the facilitation of the members and seeing how they were actively involved in crafting newspapers, learning about trends that could impact the
I do think that my role as a designer was in the end bigger than I initially expected. I wanted to let participants also research new things, but this is something more for the future of The Long Now, when it spreads to new domains and when the support for the project has grown.

Lastly, I wrote about my insecurities in my project brief regarding my decision-making and seeking external confirmation. I noticed this also during the first few months of this project. However, I feel I gained more confidence during the project, making decisions by myself and not being afraid to show my opinion and trust in my expertise.

10

Chapter 10
References

In this chapter the conclusion and limitations to answer my research question can be found. The chapter ends in personal reflection based upon the personal objectives I wrote in the Design Brief.

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