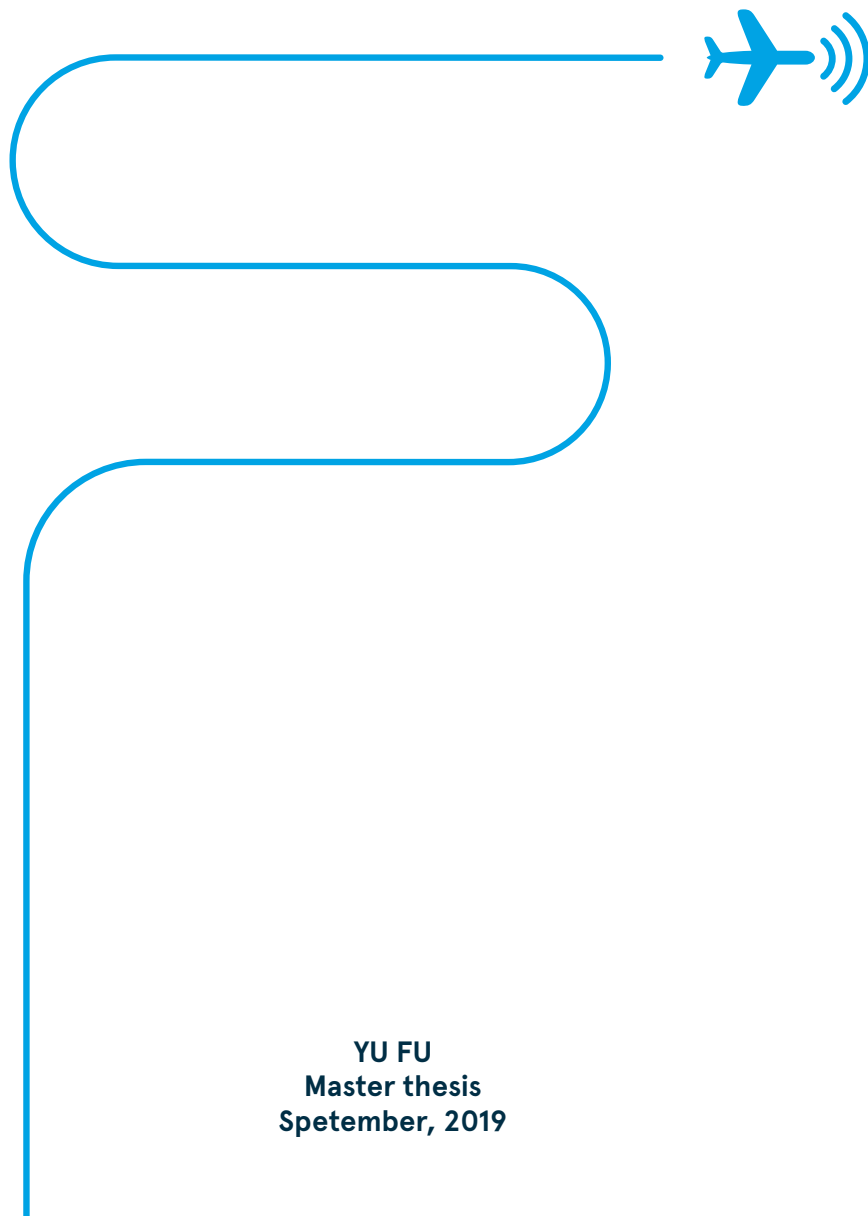# THE ONBOARD PORTAL AS A GATEWAY TO NEW CUSTOMER EXPERIENCES

YU FU
Master thesis
Spetember, 2019

The Onboard Portal as a gateway to new customer experience

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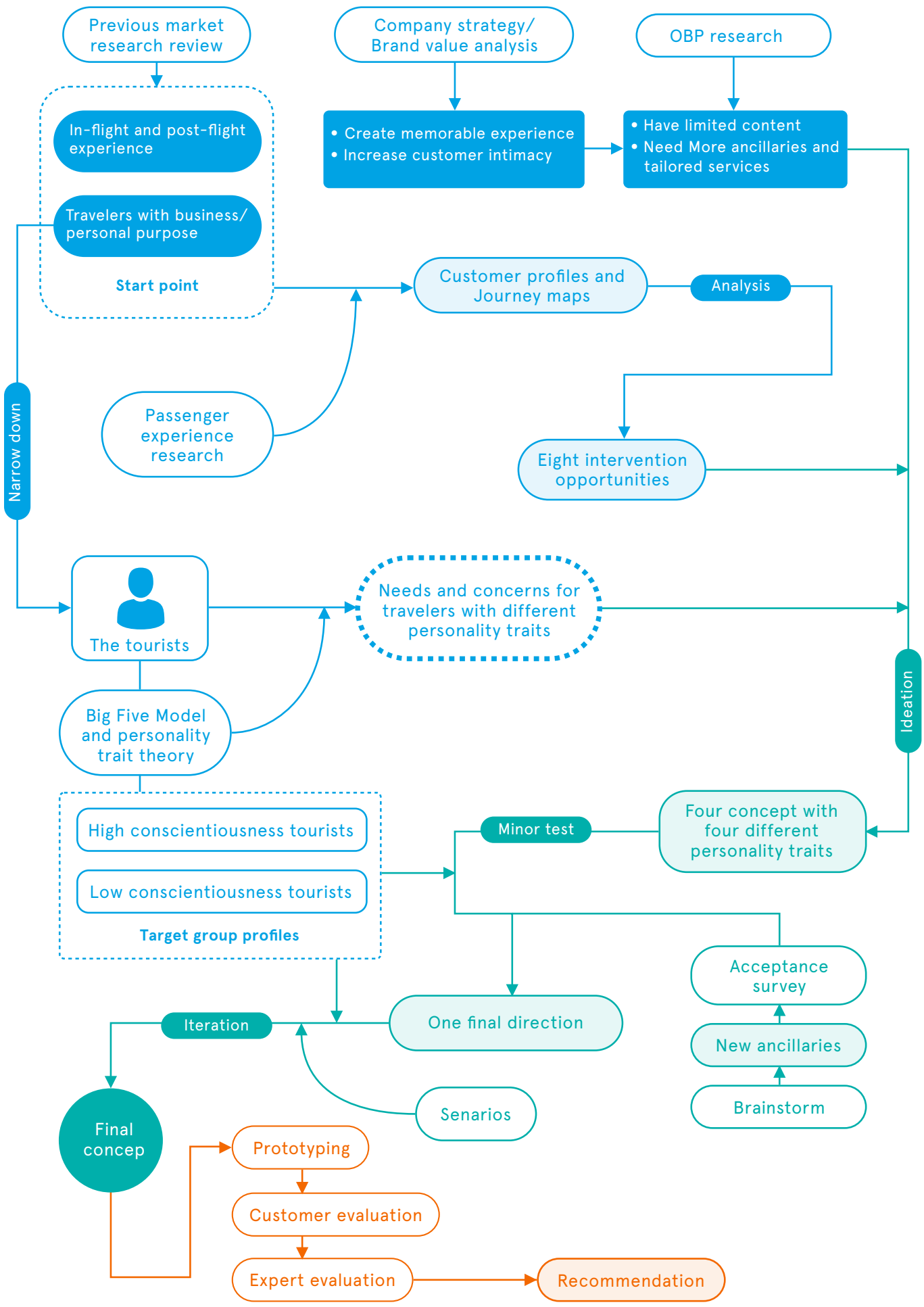Landbergstraat 15, 2628 CE Delft
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Figure 1. The overview of the whole process of this project

Executive summary

WIFI is everywhere, from cafes to bus stops, trains to airports, it's a service that people consider as necessity. Ten years ago, air space was the only WiFi-wasteland. Nowadays, it's safe to say that WiFi on planes is very common now. AirFrance-KLM also implements the WIFI service on the plane. It creates a new customer touchpoint within the customer journey — the Onboard Portal. Passengers use this website to connect the WIFI with their own devices on the plane. The goal of the project is to explore the possibilities of improving customer experience via this touchpoint by providing possible ancillaries (commission-based products /services, travel-related information, etc.).

This project proposes a new conceptual OBP including a set of ancillaries based on passengers' personalities (big five personality model, Goldberg, 1990). The concept enables the target group to arrange their trips better with immediate transportation guidance or long-term travel plan.

As Figure 1 shows, the project started with analyzing the brand value/business strategy of KLM. The result showed KLM wants to provide a memorable experience to its customers and enhance customer intimacy. Personalization and customization is the current focus, since they are good methods of enhancing customer intimacy (Greer, T. H., & Murtaza, M. B., 2003). Then, an investigation of current OBP and its competitors were conducted. It shows the current OBP only provide limited ancillaries, and do not recognize the passenger. The usage rate of KLM's OBP is low.

By analyzing the previous market research results, the in-flight and post-flight experience of travelers with business and personal purpose ware chosen as a starting point to explore how to provide personalized services and enhance user experience. Multiple research methods including contextmapping, interview and online questionnaire survey were used to create their customer profiles and passenger journeys.

Based on previous research results, eight intervention opportunities were identified as potential areas to create design interventions. Due to the constraints of time and access to the business travelers, the target group was narrowed down to the tourists.

According to the findings of Mengqi Yuan's research (2017), the theory of the big five model and personality traits was introduced for personalized services. Then, literature review and statements analysis were conducted to explore passengers' needs, concerns, and expectations with different personalities. The results were using to generate primary concepts in creative sessions. All these concepts were tested to gain more insights. Meanwhile, a brainstorm session and an online questionnaire survey were conducted to discover more ancillaries.

After comparing all results, one concept was chosen to continue as the final design direction, and the profiles of the target group based on the chosen personality trait(conscientiousness) were created. Accordingly, the final concept was developed after some iterations (concept evaluation with coaches and customers).

In the last phase, the design concept was evaluated with customers and experts from KLM to get critical feedback and suggestions, from customer's and company's perspective. The recommendations and limitations were discussed as well in the end.

About the project

This is a TU Delft Master graduation project, which was initially proposed by the digital department of AirFrance-KLM(AF/KL). In this project, the airline wants to enhance the experience of using an onboard portal to improve customers' in-flight experience. The final goal is to provide customer-relevant content, products and services via the onboard portal in a personalized and proactive way, so they can choose their preferred onboard experience and create their own ultimate journey.

Project introduction

The Onboard Portal (OBP) is one of the digital touchpoints that are used during the flight, next to the seatback in-flight entertainment systems (IFE). It is the web portal on aircraft, where passengers have access to the Internet via their personal devices, such as their mobile and laptop, and it is only present when there is WIFI available as onboard service. On this site, passengers can connect to WIFI and view trip info, destination-related info, etc.

For now, the WIFI is only offered on airplanes for long-haul flights, but middle-haul flights will follow soon. Short-haul flights are excluded from consideration.

KLM plans to offer internal and external ancillaries (commission-based products / services, travel-related information, etc.) through the OBP, because it only provides limited content currently, and there are many more ancillaries (commission-based products/services, travel-related information) that potentially can be offered to different passengers. However, they still need to make sure that they offer ancillaries that are suitable for this part of the customer journey and can create revenue.

Research direction

To create a better context of use, both functional and commercial, of the OBP, the role of the portal for the passengers during the in-flight journey needs to be better understood. This project will explore how to enhance the OBP in different aspects, Including personalization and customization (from data collecting to content tailoring), and interaction (improving the engagement of passengers).

Content

1

Understand the context

This chapter focuses on understanding the context. This chapter aims to get a comprehensive understanding of the aviation context, company strategy, the business needs, onboard portal and company analysis of passengers.

1.1 Company strategy

The airline company wants to compete on customer intimacy.

The renowned business strategists Michael Treacy and Fred Wiersema provide a business model based on three dimensions: operational excellence, product leadership and customer intimacy. They postulate that any successful business needs to maintain at least "acceptable" levels of performance in each of the three dimensions but would need to choose one of them to become a market leader in its field. (The Discipline of Market Leaders,1997).

KLM is aiming to win the hearts of target customers by excelling in customer intimacy (Figure 2. The airline company strategy). Customer intimacy strategy focuses on meeting differing customer needs by providing a wide range of customer services that involve personalization of service and customization of products.

Customization normally is done by the user, it may enable users to customize or make changes to the experience to meet their specific needs by configuring layout, content, or functionality. Personalization is done by the system being used. It tries to deliver user the content, experience, or functionality that matches their needs.

The airline company wants to create memorable experiences.

The intimacy strategy is in line with the long-term objective of KLM—moving your world by creating memorable experiences. They want customers to feel recognized, comfortable and touched during their journey.

The airline company has been working on marketing initiatives, products/services, and people to create memorable experiences. They advertise precisely and providing good service in different touchpoints by the right staff.

Figure 2. The airline company strategy

1.2 Businesses need of ancillaries

Currently, the KLM's business need of ancillaries is to enable all customers to customize their travel experience by providing an attractive & personalized ancillary offer on every moment throughout the whole customer journey (Business plan, 2019). It matches their aim to be the most customer intimate, efficient and innovative European airline carrier.

In order to reach the goal to score on the valuation as customer intimate and sell ancillaries, KLM are trying to provide **choice and control** by making offers available throughout the customer journey, fulfill customers' needs with a **personal offer** of ancillary products, further **extend** their ancillary portfolio and improve **attractivenss** and **awareness** of their ancillary offers.

Figure 3. KLM customer journey with different touchpoints (Wilbert Baan, UX Manager, 2017)

1.3 Onboard portal

Currently, the onboard portal (Figure 4.) contains wifi connection information; 3 different wifi packages, flight status information, a small flying game, a short video indicating how to use the wifi on the plane and flight status. Users can also login to their Flying Blue account, in which they can see their miles, flight reservation, and wifi vouchers.

There are three 3rd party services on the OBP for now. Passengers can buy goods through the *shop@KLM*, book tickets for enjoyable activities through *GetYourGuide* and rent cars on their destinations through *Cartraweler*.

Onboard portal usages status

According to the research, about 20% of KLM passengers and 15% of AF passengers will visit the onboard portal (Vahid, 2019), which means a lot of passengers haven't tried WIFI during their trips and there is still much room for improvement.

As for the ancillaries, passengers seem not interested in them even though passengers can use them offline. For example, there were about 12000 portal visiter from 23 May 2019 to 29 May 2019, but the total hits of ancillaries were only about 110. (AF/KL Onboard Portal data studio, 2019). See Figure5.

"A season is passengers may not realize that they can try these services without purchasing wifi packages. Another season is that passengers may believe all these services will be expensive since they are provided on the plane, but the truth is that we will provide discounts for these third party services and products. They may not notice that. "

— Vahid Babalo, Digital Experience Manager of Air France-KLM

"Our overall strategy is almost the same. We want to increase the awareness of ancillaries. Improving the engagement of OBP may be a good way to attract passengers back to the OBP."

— Matthieu Dollé, Inflight Connectivity Product Manager at Air France

Go online

Message Full flight	Free	SELECT	⌄
Surf 1 hour	EUR 8 or 2,700 Miles	SELECT	⌄
Surf Full flight	EUR 18 or 6,000 Miles	SELECT	⌄

Already have a voucher?

Flight status

↻ Refresh

○ (BKK) Bangkok   Arrived
Departure Thu 23 May
Terminal: – | Gate: –
12:05

○ (AMS) Amsterdam
Arrival Thu 23 May
Terminal: – | Gate: E20 | Baggage belt: 017
18:40

ⓘ **More information about your flight**

Make sure to refresh this page just before we land. Your flight details may change.

Have a connecting flight or special baggage? You might need to go to a different baggage belt. Please check the latest information once you're at the airport.

SHOW LESS

WiFi on board

How to use WiFi on board

Not sure how to go online? Watch this video to learn everything about how to get WiFi on board.

Shop@KLM

Spoil yourself or treat a loved one! Browse our wide range of great deals and have them delivered onboard your next flight or any location around the world.

Find incredible things to do

Turn your trip into an amazing experience by booking the best things to do and see in advance.

Enjoy your ride

Need a rental car or ground transfer to get you where you want to go? Arrange it all in just a few easy steps and have your ride available at the airport.

Become a pilot

Always wanted to fly an aircraft? Play this game and earn points by collecting as many coins as you can!
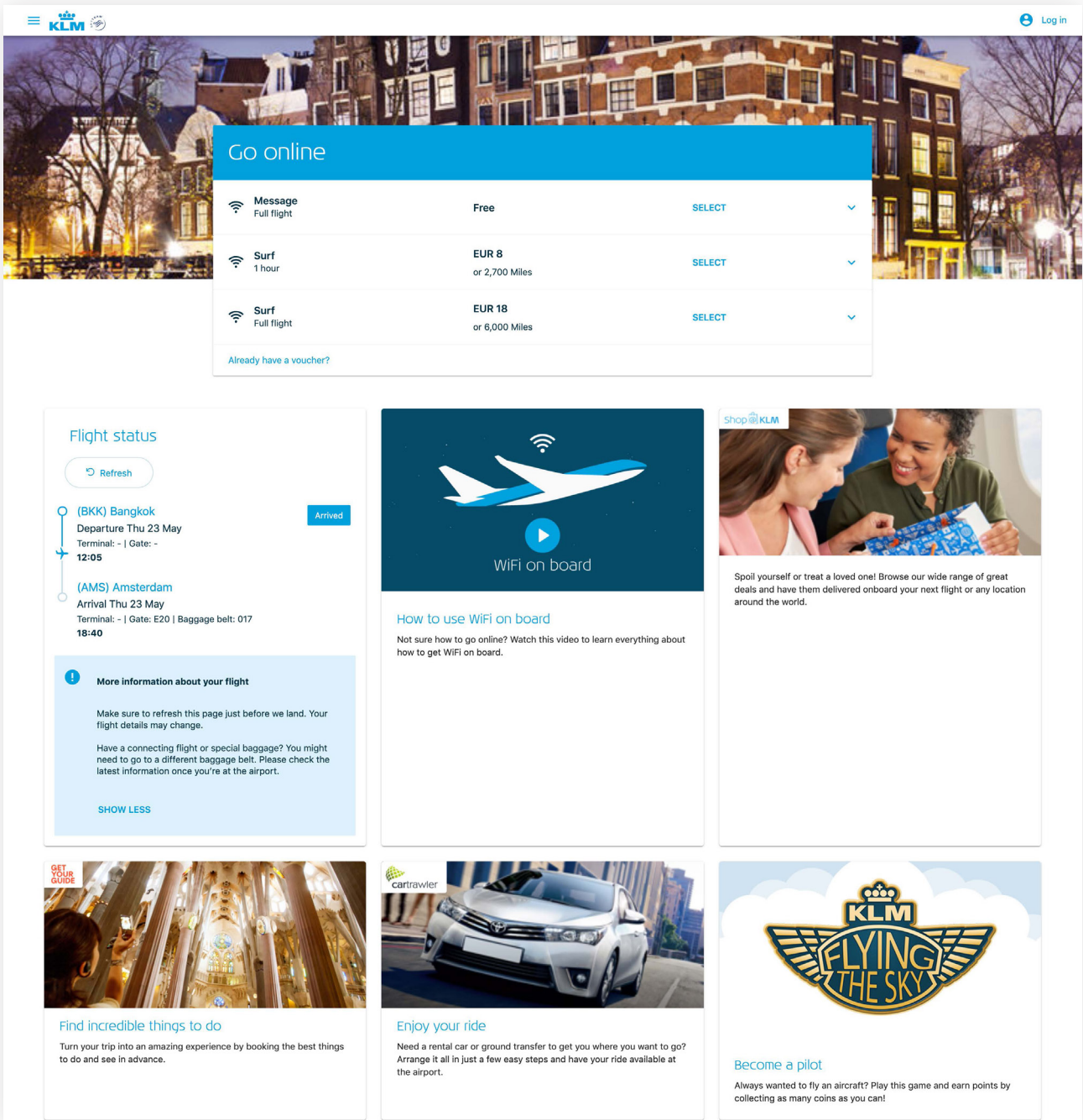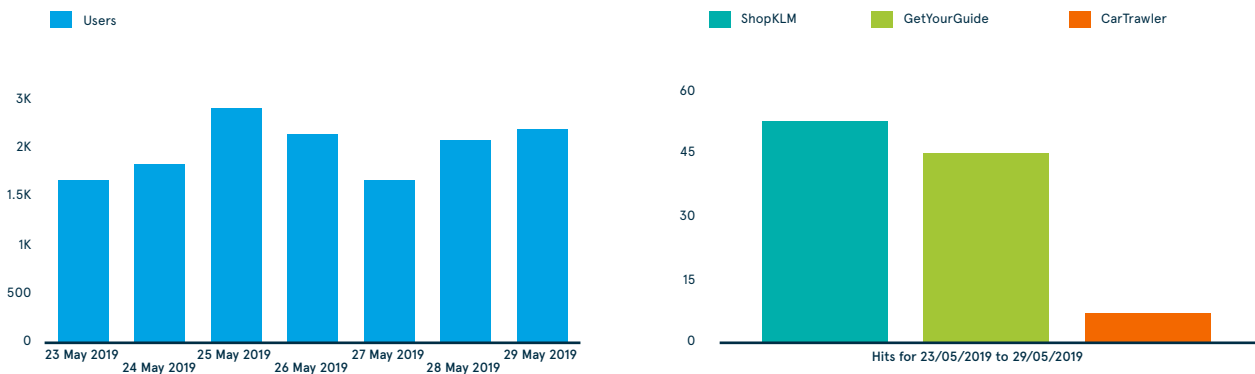
Figure 4. KLM Onboard portal

Figure 5. Portal visits – Per day

13

Flow of using OBP

The WIFI service can be accessed once the aircraft is at 10,000 feet via personal devices. Since then, passengers can connect to wifi and the onboard portal will pop out.

Passengers can browse all the contents and use all the services on this page for free because the portal is already loaded on the aircraft server. After chosen the wifi package, passengers can access to internet (See figure 6).
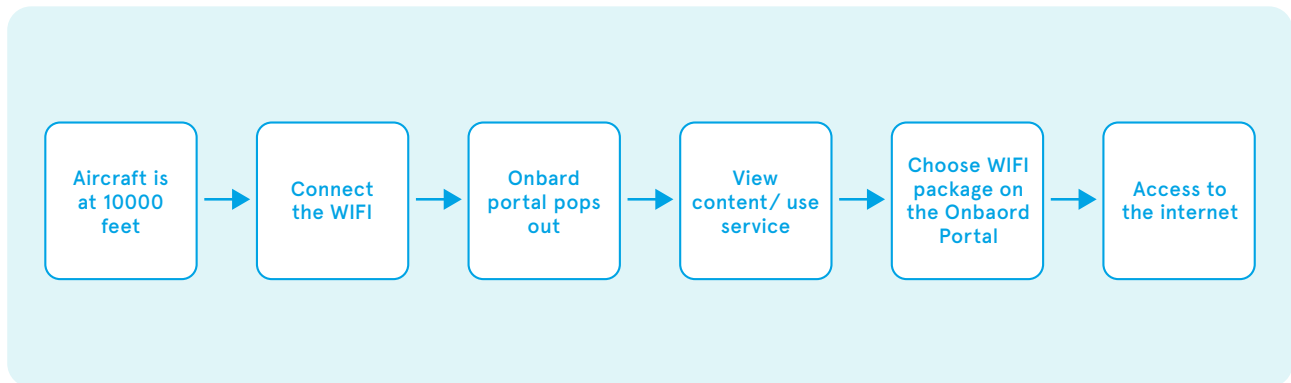

Figure 6. The flow of using OBP

1.4 Competitor analysis

A competitor analysis is performed to examine other airlines' products and services in comparison to KLM. Detailed analysis can be in the Appendix A.

We can see most of the airlines only have simple sites with wifi connection information. Most of the portals have flight status and destination information. Only a few of them have ancillaries like seat upgrade, food ordering, hotel, and car rental service. This indicates that the onboard portal's main function is for passengers to connect to the internet for now. Besides internet connection, these airlines do not invest much in their portals. But a few airlines choose to combine the onboard portal with the in-flight entertainment system, so passengers can

use their own device to watch movies, read ebooks, etc.

Besides, the portals of these airlines do not personalize the content of the passenger. The most closed function is showing the weather and travel inspiration of the destination.

Lastly, the ancillaries and services that are provided by OBP are not only for in-flight experience, which means many airlines started to consider the service during the whole passenger's journey.

In conclusion, current onboard portals do not recognize the passenger. To make a difference and enhance customer intimacy, a good way is providing tailored services by adopting personalization or customization to recognize passengers.
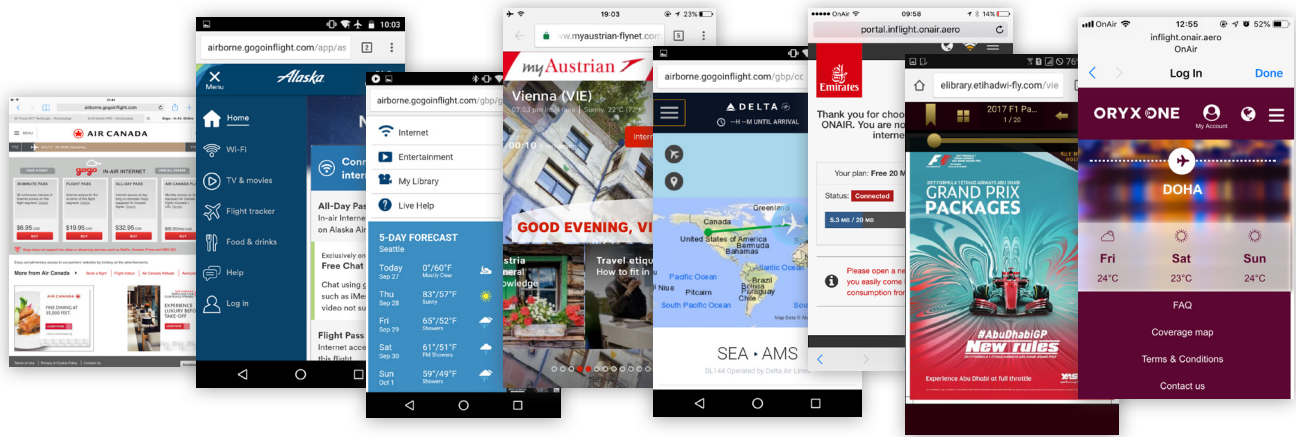
Figure 7. Some onboard portal of other airline companies.

1.5 Company analysis

Customer needs from marketing research

In 2015, AF/KL customer data insight team conducted extensive marketing research to understand the needs of different customers and they created a demand space model. See table 1. The demand spaces are a combination of these two dimensions—typologies and occasions.

As for typologies, passengers were divided into 6 groups based on their attitudes towards air travel. They are busy ambitious travelers, functional minded travelers, travel lovers, premium brand/ service seekers, online price hunters, and cautious, insecure travelers. As for occasions, based on a combination of region and haul on the first level, as well as the purpose and booking time in advance on second level, 7 distinct occasions that are actionable and differing in needs & choice criteria ware proposed.

6 Typologies combined with 7 occasions deliver 42 groups. However, among theses 42 groups some of them have similar needs. Passenger Groups with similar needs, differing from others, form a Demand Space. Each demand space has its own characteristics.

	Europeans Long Haul Personal (12% of trips)	To Europe Planned Personal (12% of trips)	Europeans Short&Medium H. Personal (12% of trips)	Europeans Short&Medium H. Business (12% of trips)	Europeans Long Haul Business (12% of trips)	To Europe Planned Business (12% of trips)	To Europe Last minute Both (12% of trips)
Busy ambitious travelers (19% of persons)	1 Entertain me (✈ 8% 🗄 11%)		2 A good start (✈ 14% 🗄 5%)		3 Give me recognition (✈ 9% 🗄 15%)		
Functional minded travelers (19% of persons)					4 Recharge in the skies (✈ 6% 🗄 8%)		
Travel lovers (15% of persons)	5 Treat myself (✈ 3% 🗄 4%)	6 Give me personalized moments (✈ 4% 🗄 6%)	7 Calm, reliance on staff (✈ 4% 🗄 2%)	8 Let me work (✈ 11% 🗄 12%)			9 Luxury now (✈ 7% 🗄 12%)
Premium brand/ service seekers (15% of persons)							
Cautious, insecure travelers (16% of persons)	10 Reassure me (✈ 12% 🗄 7%)			11 Make sure it works (✈ 5% 🗄 4%)			
Online price hunters (17% of persons)	12 Best deal for the basics (✈ 12% 🗄 9%)			13 Efficiency for a good price (✈ 5% 🗄 5%)			

Please note: ✈ *The first percentage is the share of **trips** within the typology, occasion and demand space.*

🗄 ***The second percentages are the share of declared **Value** of each Demand Space compared to the total.*

Figure 8. Demand space

The context of Onboard portal

According to the demand space, short-haul (under 3 hours, WIKI, 2019) and medium-haul (3-6 hours, WIKI, 2019) flight were categorized in the same category since they are in similar occasion. Furthermore, the wifi is currently equipped and increasingly being installed on aircraft for long-haul distances. The research focus will be on passengers travel for long-distance. However, there are still 11 demand spaces left, and they are also quite evenly distributed. It is impossible to provide personalized service for all of these detailed demand spaces in the current stage.

1.6 Following research direction

Consequently, further user research was conduct from another perspective. It only focused on a general level and concentrated on two general groups—travelers for the long-haul fight with business purpose and personal purpose. After created profiles of both of them, a theory about personality traits will be applied to create a personalized experience.

KLM has a clear vision to be competitive in customer intimacy, as it was emphasized on their branding and marketing strategy. They are also trying to provide suitable service (including hotel, pick-up, lounge, re-book tickets and seat upgrade services) for the entire customer journey(expect pre-flight phase) through the OBP.

Therefore, in this project, the in-flight and post-flight experience of business and personal travelers was chosen as a potential starting point to explore how to personalize service to enhance customer intimacy. To provide the relevant services, users' needs, expectations, concerns and behaviors need to be understood to establish their own profiles. The passenger experience research will focus on how their needs, expectations and concerns influence their experiences and behaviors.

In chapter 2, passenger experience research is conducted and the result will be explained. A personality traits model will be introduced as a personalization related theory in chapter 3. How this theory was applied will be shown in chapter 4.

Even though the business travelers contributed to airline company 54% of the revenue 2016 (airline company annual report, 2016, see figure x), the following user research won't only concentrate on the business group, because passengers with personal purpose are very important target group of KLM as well (Vahid, 2019).

Distribution of revenue

46%   54%

■ Business
■ Personal

2
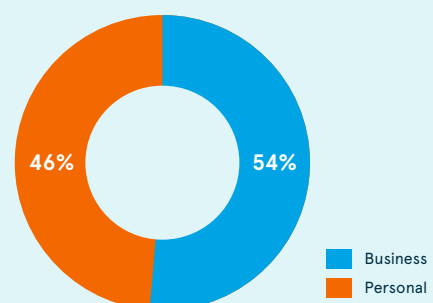
Passenger experience research

This chapter focuses on gaining in-depth understandings of business and personal travelers' latent needs, expectations, concerns and their experiences. The intervention opportunities for providing different services are defined in this chapter, too.

2.1 Research setup

The passenger experience research includes interviewing, online questionnaire survey, contextmapping (Visser, F. S., Stappers, P. J., 2005). The aim is to collect deeper understandings of business and personal travelers' behavior, their latent needs, expectations, concerns and how they experience during flight journeys.

Research goal :
Understand business and personal traveler's whole travel experience (focus on in-flight and post-fight experience), behavior and latent needs, expectations and concerns to define intervention opportunities for offering services during the flight journey.

Research question :
• How was business and personal travelers' experience during the in-flight and post-flight phase? ·What is the difference between them? What do they do on the plane and the airport?
• How do they experience their journey?
• What role does the airline company play during the in-flight and post-flight phase?

Material preparation

Contextmapping Booklet:
The travel experiences of business and personal travelers were recorded by filling in the booklet, which contained 5 steps to sensitize travelers' experiences when going on their trips. The detailed information of the booklet is shown in Appendix B. The travel journey started from booking the tickets to settle down on their destinations. Emotion capture tool was applied in step 2 and 3 to find the best and worst moments of travelers with business and personal purpose during their flight journey.
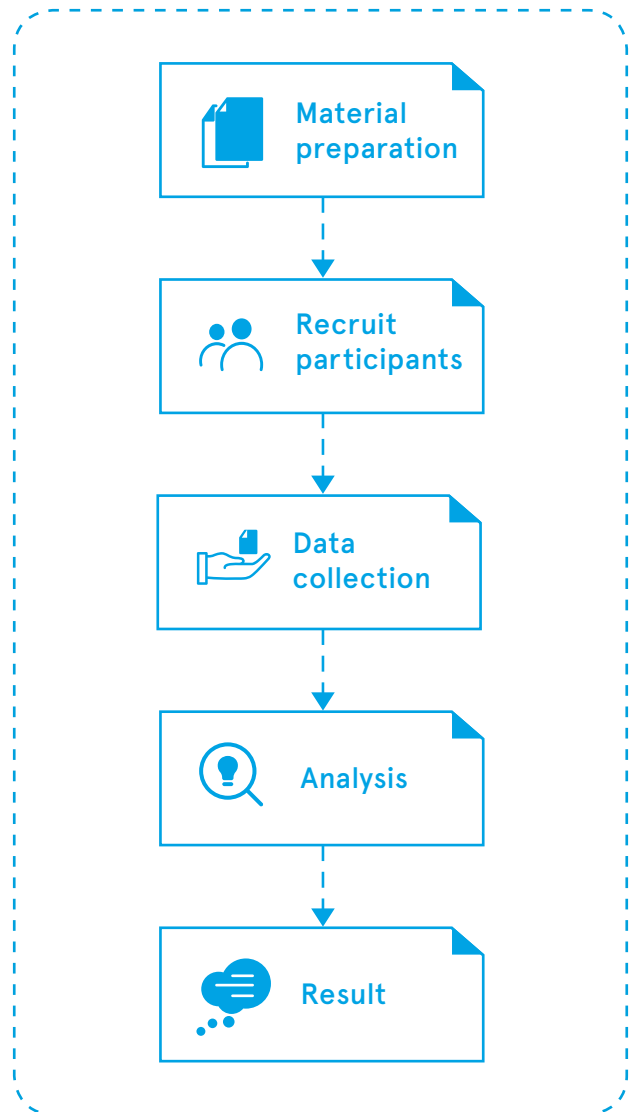

Figure 9. Research procedure

Figure 10. The booklet

Online questionnaire:
This questionnaire focus on the best and worst moment of the passengers' journey to investigate expectations and concerns. The question about the usage of wifi was also included. The aim is to investigate passengers' attitudes about WIFI and what services they have used. The detailed information of the questionnaire is shown in Appendix C.

Interview:
The questions of the interview are similar to the questionnaire. The aim is to extend the diversity of the participants and get fresh insights of passengers, so the interviews ware conducted at the airport. The detailed information of the interview questions is shown in Appendix D.

Recruit participants

In the contextmapping session, 18 travelers with personal purpose and 2 travelers with business purposes were recruited. All of them have trips by plane for at least 3 times per year. The group of participants consisted

of the professors as well as students or acquaintances in the faculty. In the online questionnaire survey session, 16 participants from different ages and nationalities background filled the questionnaire. In the interview session, 5 passengers on the airport talked about their experiences and thoughts. Therefore, insights from different types of travelers were gathered with enough diversity.

Data collection

Fill in booklets:
The participants of the contextmapping session were asked to fill in the sensitizing booklet. After a week in-depth interviews were conducted. Because of time constraints, 3 pa participants cannot join the interview session. A simple version of sensitizing material was provided during the interview to helped to recall their flight experience.

Followed interview :
An in-depth interview was done with 17 participants a week after the booklets were finished. Creative materials like stimuli cards

Travelers with personal purpose

Travelers with Business purpose

	Travelers with personal purpose	Travelers with Business purpose
Male	10	2
Female	8	0
Alone	14	1
With companion	4	1
Detailed purpose	Study abroad(3), On vocation(11), Visit friends(1), Join a Wedding(1), Go back home(2)	Join a meeting(1), Join a workshop(2)

Figure 11. Participants of contextmapping session

that showed flight-related situations were offered. The main goal of this session is to understand the behaviors and reasons behind passengers' behaviors with the help of the booklet and laddering interview techniques.

Figure 12. The followed interview

During the interview session, the participant walked through his/her experience from the start of the journey -- booking the ticket, to the end -- settling down on their destination. They were asked to reflect on the experience and explain the positive and negative moments during the journey. In this way, I got a deeper understanding of the experience that passengers went through with the airline service.

Online questionnaire and interview on the airport:
Participants were asked to elaborate on their favorite and dislike the most moments to dig out their expectations and concerns. Their experience of wifi on the plane was also studied.

Reference of other research result:
Because of the time constraint and limitations of getting access to business flyers, some previous research of Jeanie(2017) was referenced. She aslo have conducted contextmaping sessions which focus on business flyers and get many precious findings, which is really helpful to generate customer journey map and customer profile of the business group.

Data analysis

All qualitative data collected from the booklets, in-depth interviews, questionnaire and previous research were transformed into statement cards. All the insights were recorded on these cards.

The statement cards were used for immersing. The aim is immersion for inspiration only (Sanders & Stappers, 2012). In this way, I can have an overview of the passengers' experience and the problems they met in their journeys.

The statement cards were spread out and compared to find possible patterns, then they were clustered. Appendix E shows the detailed clusters of these statement cards, which covers the activities that business and personal travelers experience during the whole travel journey. All these insights helped researcher map the customer profiles of business travelers and travelers with personal purpose. The emotion capture tool helped me generate general journey maps for both groups. Based on them, the opportunities to provide service during the trip were identified. The findings will be introduced in the following sections.
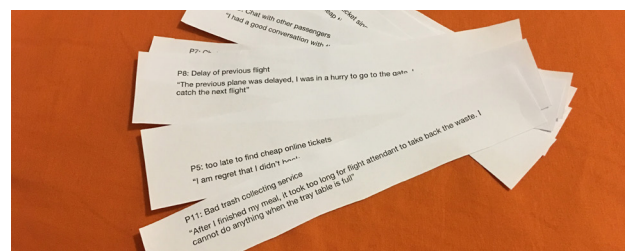
Figure 13. The Statement cards

2.2 Two customer profiles

According to all these statement, the customer profiles of business and personal travelers can be mapped to have a clear understanding of customer. (Alexander, Yves, Gregory, &Alan, 2014).

Travelers with personal purpose

The detailed profile of personal travelers can be seen on Figure 14 and 15.

Customer jobs

Jobs are the tasks customers are trying to perform, the problems they are trying to solve, or the needs they are trying to satisfy.

Customer pains

Pains are the concrete outcomes they want to avoid and eliminate.

PRE-FLIGHT

Important

Go to the destination

Enjoy the trip

Have a fun and smooth journey

Keep in a good mood

Have a good start of their travel journey

Kill time

Relex

Keep in touch with friends and family

Get more travel experiences

Look good with friends

Share travel experiences

Check travel plan

Insignificant

Extreme

Late booking, High price ticket

Afraid of missing the flight

Difficult packing tasks

Hard to carry much luggage

Boring long waiting time

Annoying and complexed security check procedure

Moderate

Figure 14. The customer jobs and customer pains of travelers with personal purpose

IN-FLIGHT

✚

Extreme

arrow space of seat

Noisy (children, baby)

Lousy food

iss food cause of leeping

Bad trash collecting ervice (not timely)

Uncom-fortable emperature

Guilty of bothering others

Find wrong seat

Not enough uggage store room

Stuck in the seat

Intermittent sleep

Not attractive entertainment on IFE

Inconstant entertaining experience

Crowed bathroom

Concerns of safety (Take off, landing, turbulence)

Limited WIFI service

Cannot clean myself

Moderate

▬

TRANSFER

✚

Extreme

Miss the connecting flight / worry about missing it

Delay of previous flight

Be exhausted

Cannot find the right way to the gate (transfer)

Worry about luggage in transfer period

Moderate

▬

POSTFLIGHT

✚

Extreme

Not easy to find local transport information

an unpleasant following trip

Wait luggage too long

Moderate

▬

Customer gains

Gains are the concrete outcomes they want to achieve.

PRE-FLIGHT

+

Essential

Early booking, low price ticket

Order food advanced

Happy activities to kill time

Nice to have

—

IN-FLIGHT

+

Essential

Cozy environment

Enough seat room

Preferred meal

Attractive entertainment

Little surprise of food

Smooth flight

Stretch body and walk around

Relief when finishing a step (onboard, landing, etc.)

Timely service of flight attendants

Nice chat with other passengers

Low prices of service

Know how much time left

Get great views

Nice to have

—

TRANSFER

+

Essential

Overview of services in transfer airport

Shopping, eating and exploring in the transfer airport
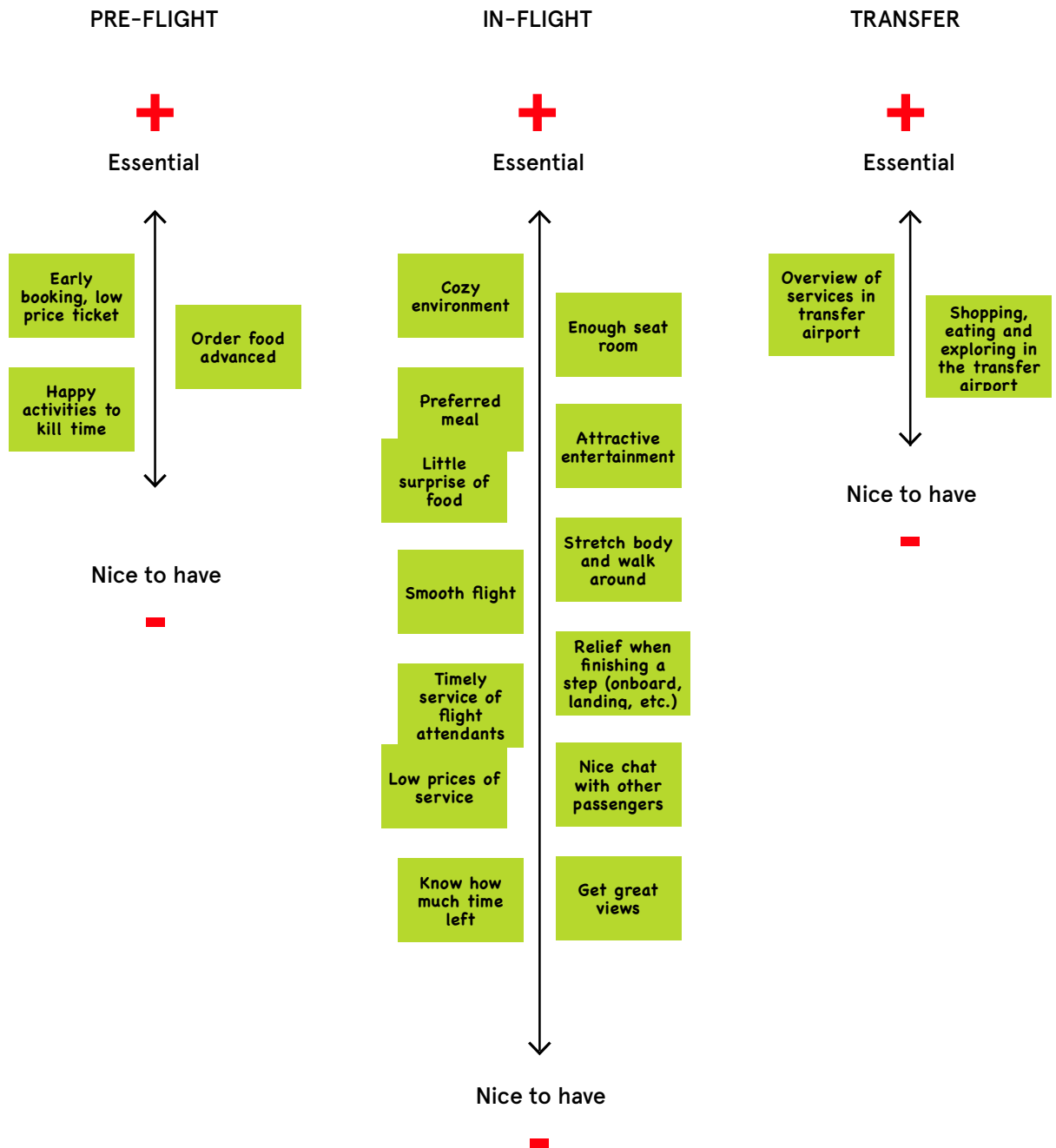
Nice to have

—

Figure 15. The customer gains of travelers with personal purpose

POSTFLIGHT

Essential

Overview of
services in
arrival
airport

Nice to have

- They are more likely to enjoy the trip.
- They want to have a good start of the journey.
- They want to keep in a good mood.
- They want to gain more travel experience.
- They are curious about things they met.
- They want to have a fun and smooth journey.
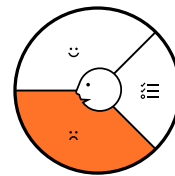- They are more open.

Travelers with business purpose

The detailed profile of business travelers can be seen on Figure 16 and 17.
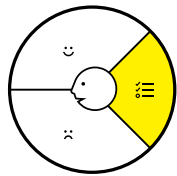
Customer jobs

Jobs are the tasks customers are trying to perform, the problems they are trying to solve, or the needs they are trying to satisfy.

Customer pains

Pains are the concrete outcomes they want to avoid and eliminate.

PRE-FLIGHT

Important

- Go to the destination
- Have a hassle-free journey
- Finsh my work efficiently
- Have a effcient flow
- Prepare for next business activities
- Have a good rest
- Relex
- Keep in touch with colleagues and clients
- Kill time

Insignificant

Extreme

- Afraid of missing the flight
- Annoying and complexed security check procedure
- Difficult packing tasks
- Cannot choose meal when check in
- Long waiting time (inefficient)

- Har on (
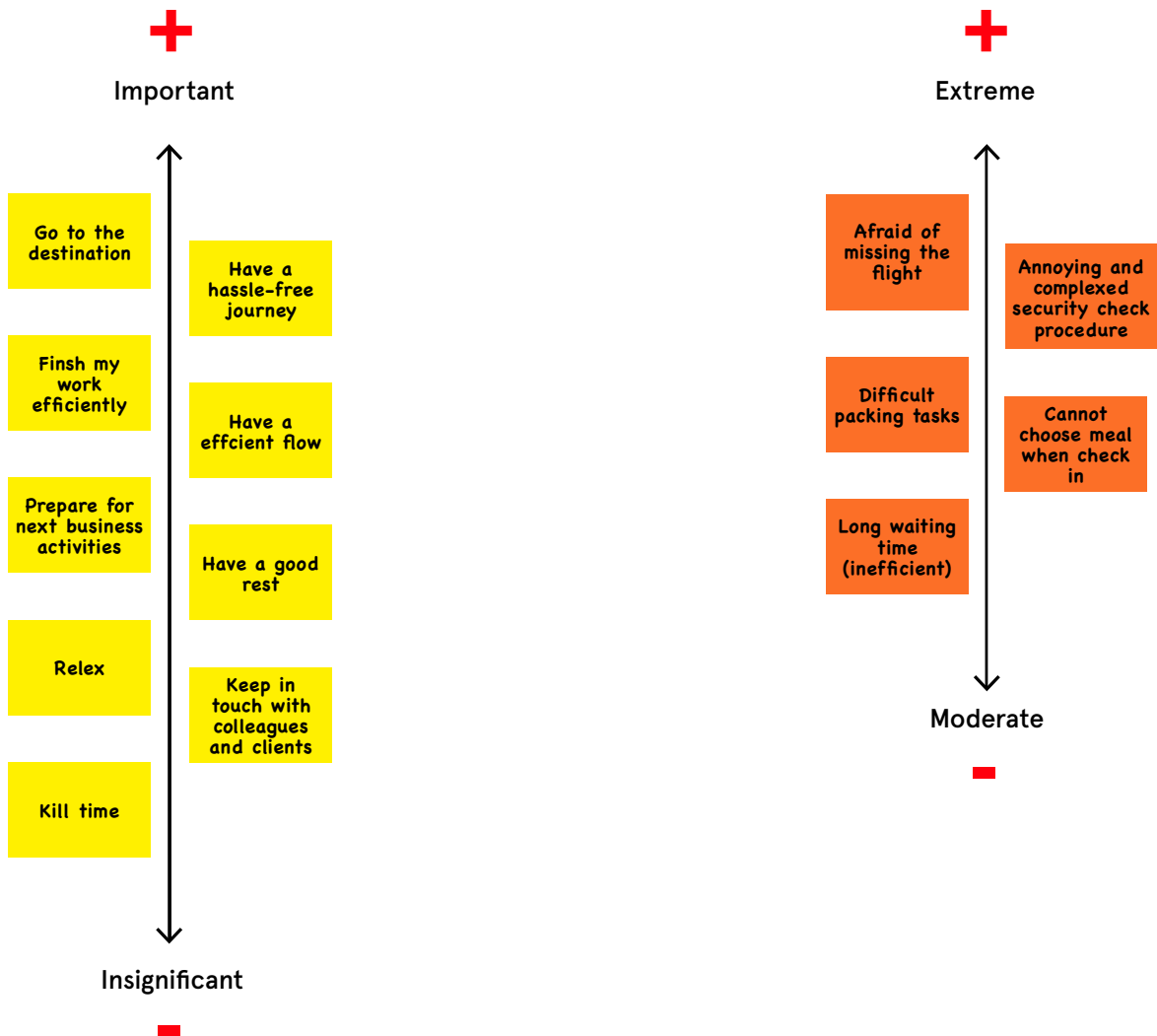- Nar
- Lo
- b
- Ur bat

Moderate

Figure 16. The customer jobs and customer pains of travelers with personal purpose

IN-FLIGHT

✚

Extreme

rd to work
the plane
privacy)

Bad sleeping
interfered
working

rrow space
of seat

Noisy
(children,
baby)

usy food

Limited WIFI
service

Crowed
athroom

Concerns of
safety (Take
off, landing,
turbulence)

nclean
throom

Moderate

▬

TRANSFER

✚

Extreme

Miss the
connecting
flight /
worry about
missing it

Waste time
(transfer)

Moderate

▬

POSTFLIGHT

✚

Extreme

Not easy to
find local
transport
information

Wait luggage
too long

Late for their
work

Moderate

▬

Customer gains

Gains are the concrete outcomes they want to achieve.

PRE-FLIGHT

+

Essential

A good coffee beark (airport)

Found good place to work (airport)

Fast pass for security check

Order food advanced

Nice to have

–

IN-FLIGHT

+

Essential

Enough seat room

Stretch body and walk around

Work on plane (without disturbance)

Preferred meal

Attractive entertainment

WIFI for work

Smooth flight

Nice chat with other passengers

Enjoyable offine moments

Nice views

Get off first

Nice to have

–

TRANSFER

+

Essential

Overview of services in transfer airport

Found good place to work (airport)

Nice to have

–
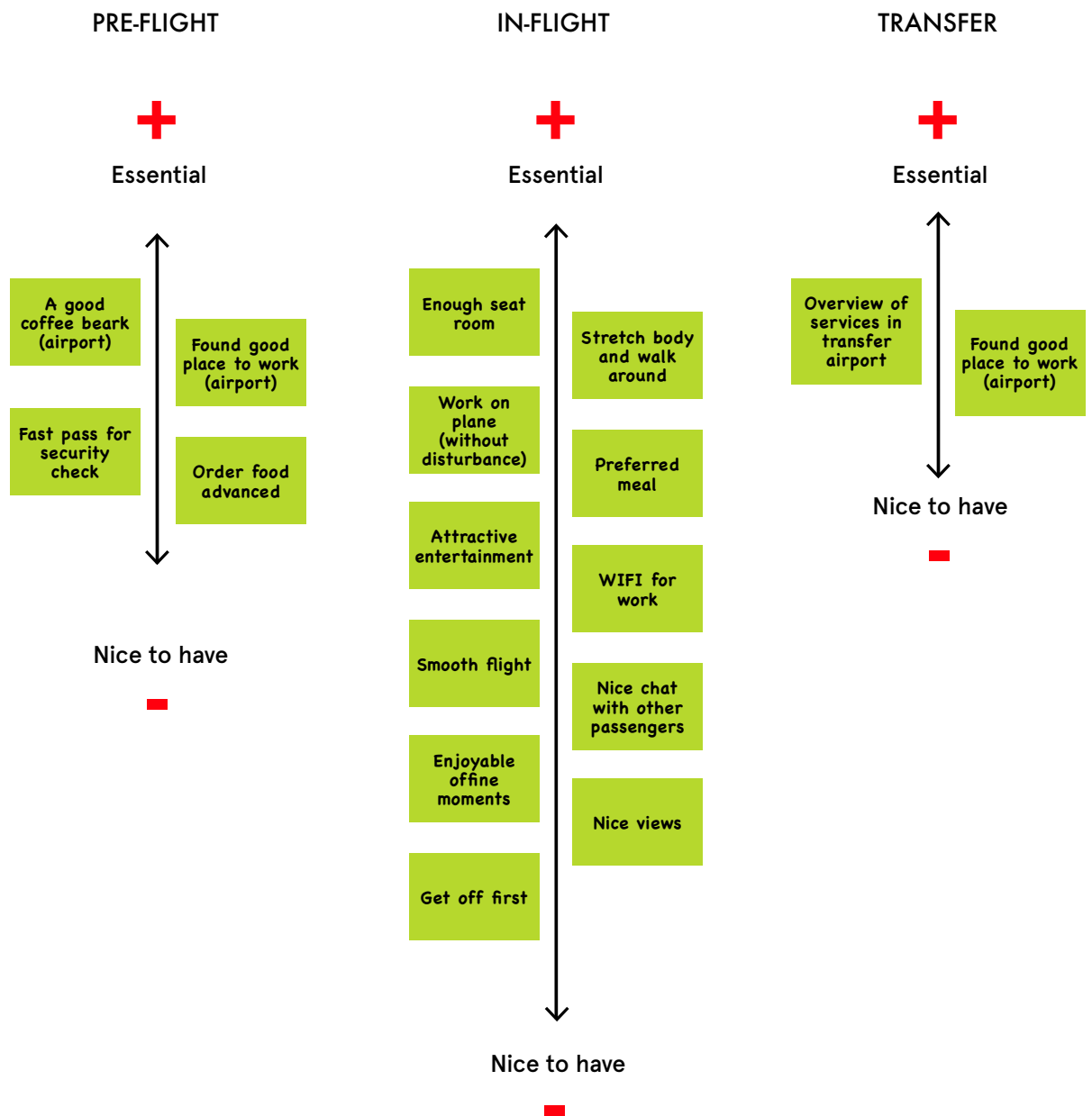
Figure 17. The customer gains of travelers with business purpose

POSTFLIGHT

+

Essential

Overview of
services in
arrival
airport

Nice to have

—

- They prefer the efficiency
- They want to achieve their mission (like have a nice performance in the meeting)
- They want to have a good rest
- They want to have a hassle-free journey

2.3 The usage of WIFI

According to the statement, most of the travelers have tried WIFI service on the plane, after realizing they can use the WIFI during the flight. They were not satisfied with the service since the internet speed was slow, and they only had very limited data.

As for travelers with personal purpose, they mostly just try the free WIFI package and send messages to socialize with their friends. Travelers with business purpose are willing to try premium to get better internet, but only when they have to use the internet to work on the plane.

2.4 The flight journey of passengers

The current journeys of business and personal trip

According to the passenger experience research, a customer journey map was created. Step by step, it provides an overview of the experience and mood change of passengers.

The timeline starts from the moment that travelers booked the ticket to they settled down as shown in Figure 18. For business travelers, the aim of the trip is to arrive at the destination at the expected time and complete the mission, and for travelers with their personal purpose, the aim of the trip was more about enjoying their trips.

The vertical axis represented the mood change of the journey. The horizontal timeline indicated different stages that travelers had been through during the trip. The common

stages for both groups are shown in blue. The stages where two groups have different behaviors were shown in red.

The overall journey can also be divided into two types— taking off during the day or taking off during the night. If the plane takes off during the night, after the first meal, travelers won't have much free time to do their own things, and they will go to sleep directly.

We can see the overall journeys from both groups are almost the same, the differences are their tendency and behaviors on **preparation**, **waiting(departure/ transfer airport)**, and **free time(in-flight)** stages.

• For business travelers, the goal of their trip was to achieve their missions, which related to their works, like doing well in the meeting or have a good rest for future works,

• For personal travelers, the goal of their trip was to enjoy themselves and keep in a good mood for their following activities such as sightseeing or visit friends.

The Ideal journey map

Nowadays, airline company becomes passengers' travel partner, and they want to enable a smooth traveling experience to achieve passengers' goal of the trip.

Therefore, the main goal is to create a hassle-free flight experience for business travelers, and fun and enjoyable experience of personal traveler. In Figure 19, the blue circles indicated activities that have the potential to be improved. They are not only in the in-flight phase but also in the transfer and post-flight phase.

Currently, most of the airline companies don't pay much attention to transfer and post-flight stages, since it is not directly related to flight. However, customers expect their whole traveling journey to be taken care of, and it is a good way to receive personalized service. Therefore, customer intimacy can be increased, if the services from airline companies expand to different parts of the journey.
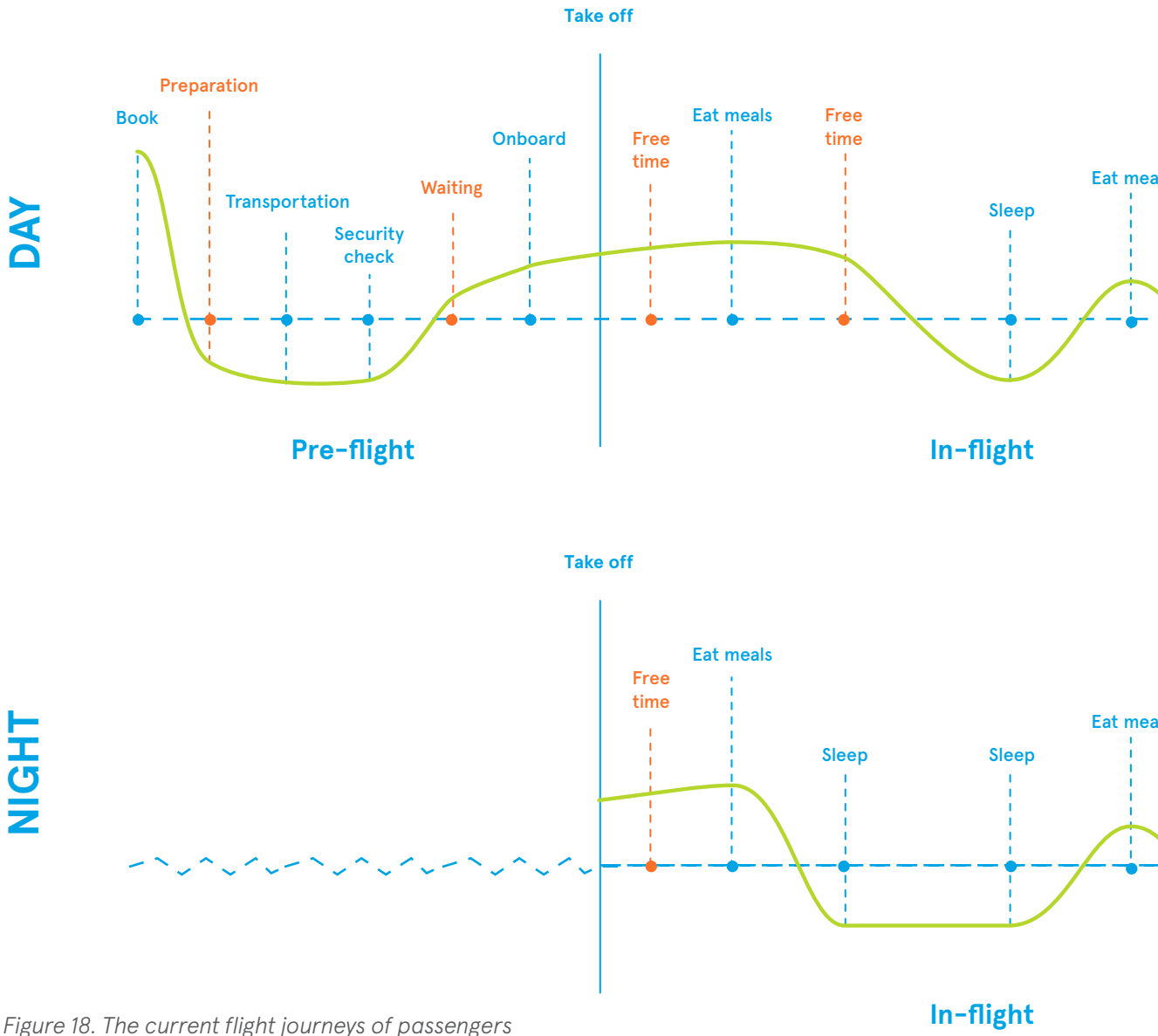
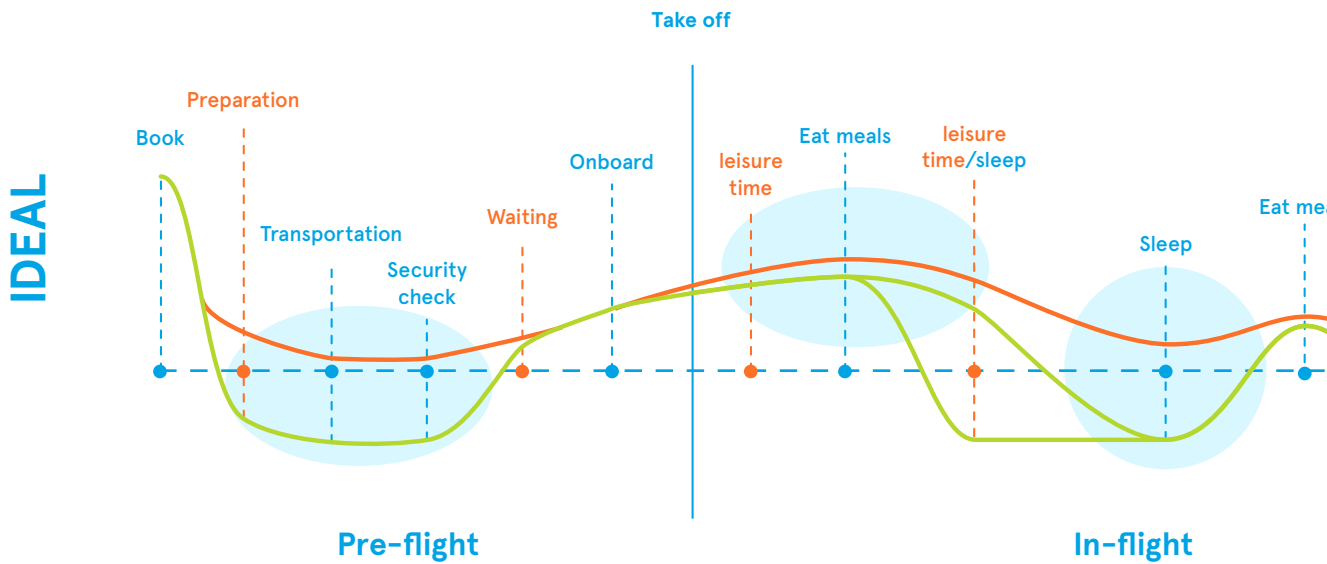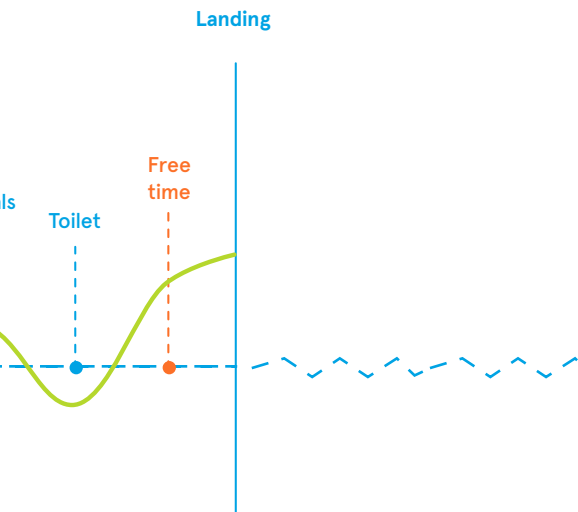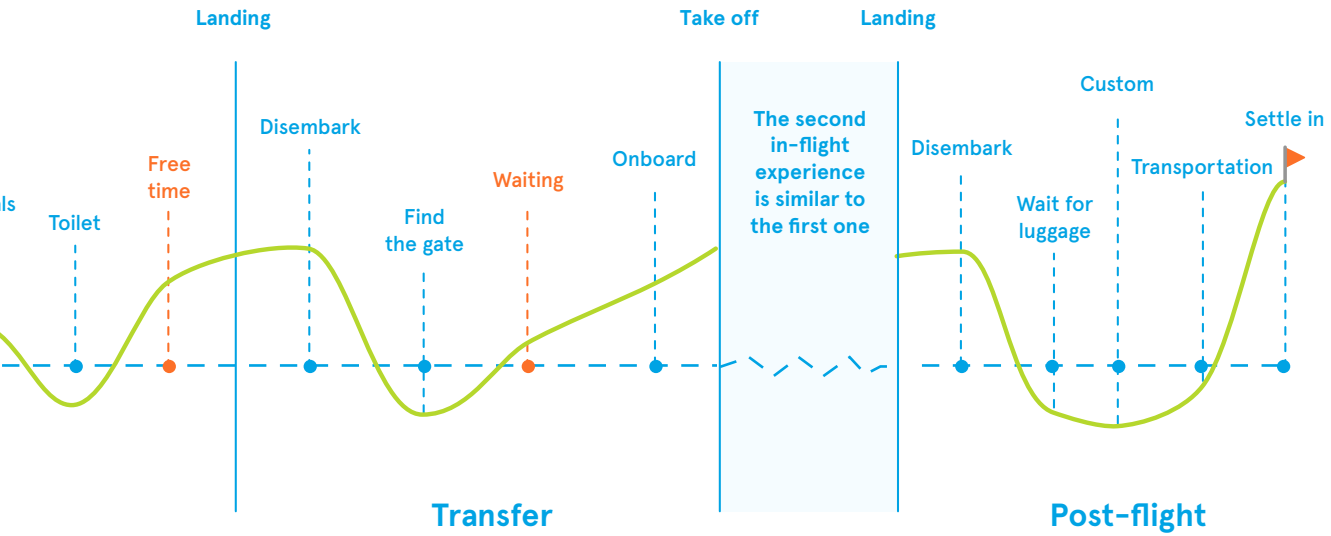Figure 18. The current flight journeys of passengers

Figure 19. The ideal flight journey of passengers

Landing

Disembark

Free
time

Toilet

ls

Find
the gate

Waiting

Onboard

Take off

Landing

The second
in-flight
experience
is similar to
the first one

Custom

Disembark

Wait for
luggage

Transportation

Settle in

Transfer

Post-flight

Landing

Free
time

Toilet

ls

Preparation	personal travelers only pack their luggage, while business travelers also need to prepare work-related materials.
Waiting (Departure/Transfer Airport)	Personal travelers tend to relax, and have fun (like look for entertainment or explore the airport), while business travelers tend to have a coffee break and work.
Free time (In-flight)	Personal travelers are more likely to entertain themselves and enjoy their time (like watch movies or chat with neighbors), while business travelers prefer to take the time to finish their work or have a good rest for the meeting

Landing

Disembark

Leisure
time

Toilet

als

Find
the gate

Waiting

Onboard

Take off

Landing

The second
in-flight
experience
is similar to
the first one

Custom

Disembark

Wait for
luggage

Transportation

Settle in

Transfer

Post-flight
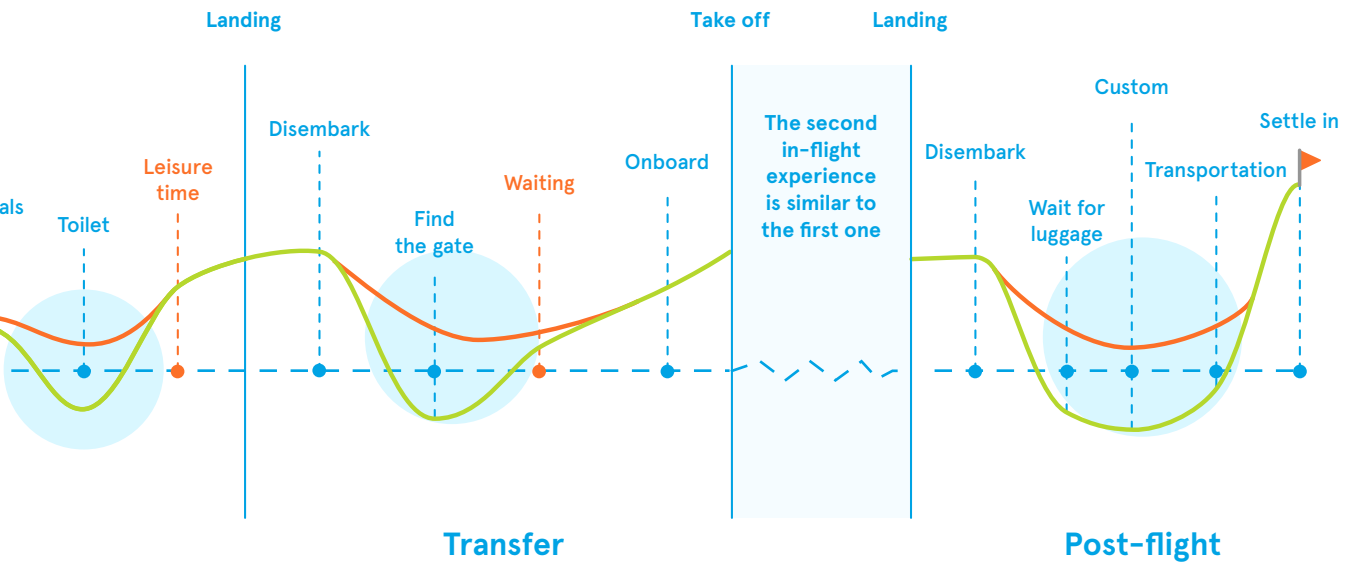
2.5 The analysis of positive and negative moments in the passenger jou

In this section, the details of the positive and negative moments of both groups are analyzed, and it is impo
the reasons behind this positive and negative moments (Polaine, Lovlie, & Reason, 2013).

Positive moments (Personal)

Travelers with personal purpose felt positive when their trip was fun, enjoyable and smooth. They were able
moments also came from feeling entertained and socially connected, such as chat with strangers on the trip
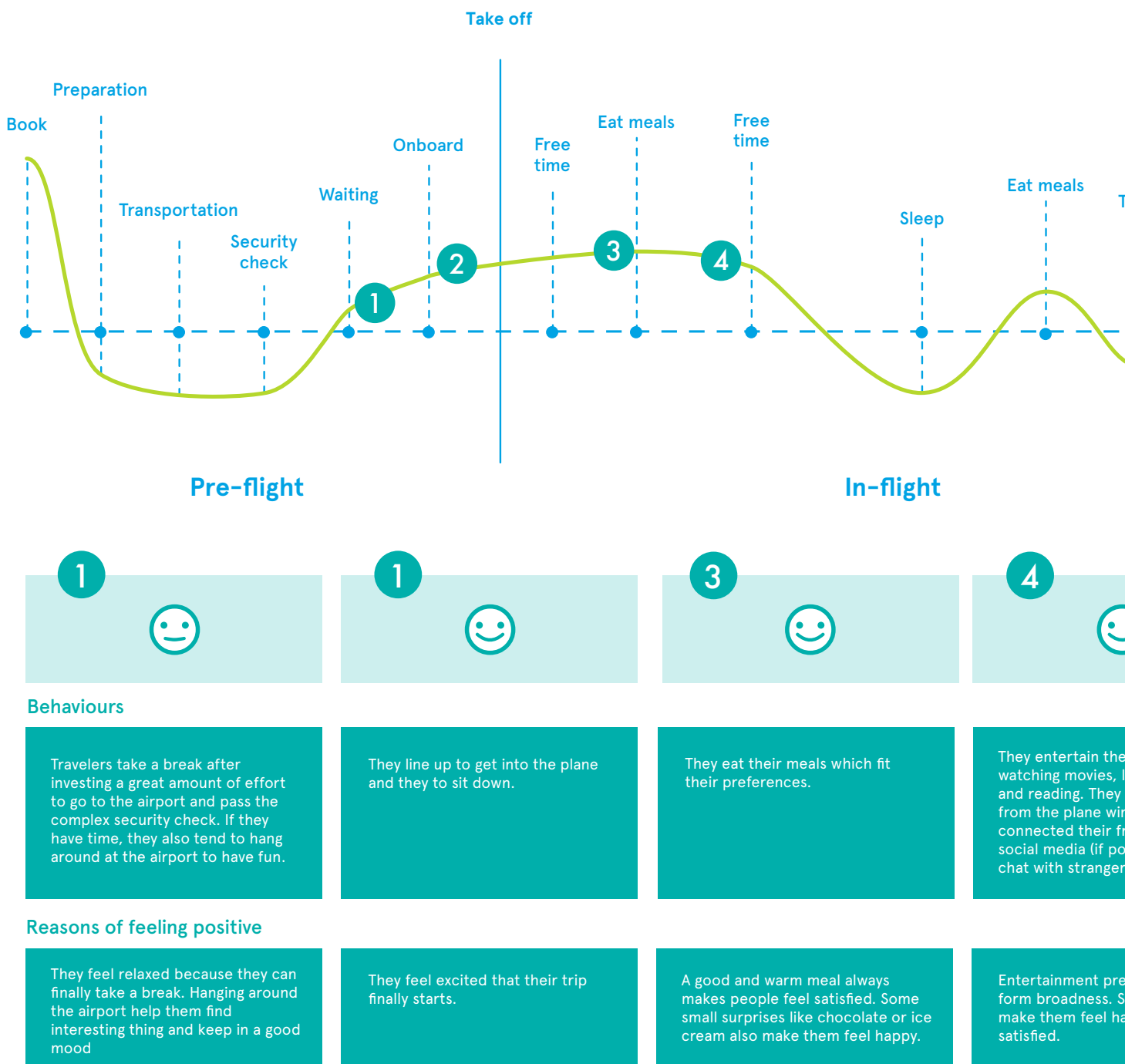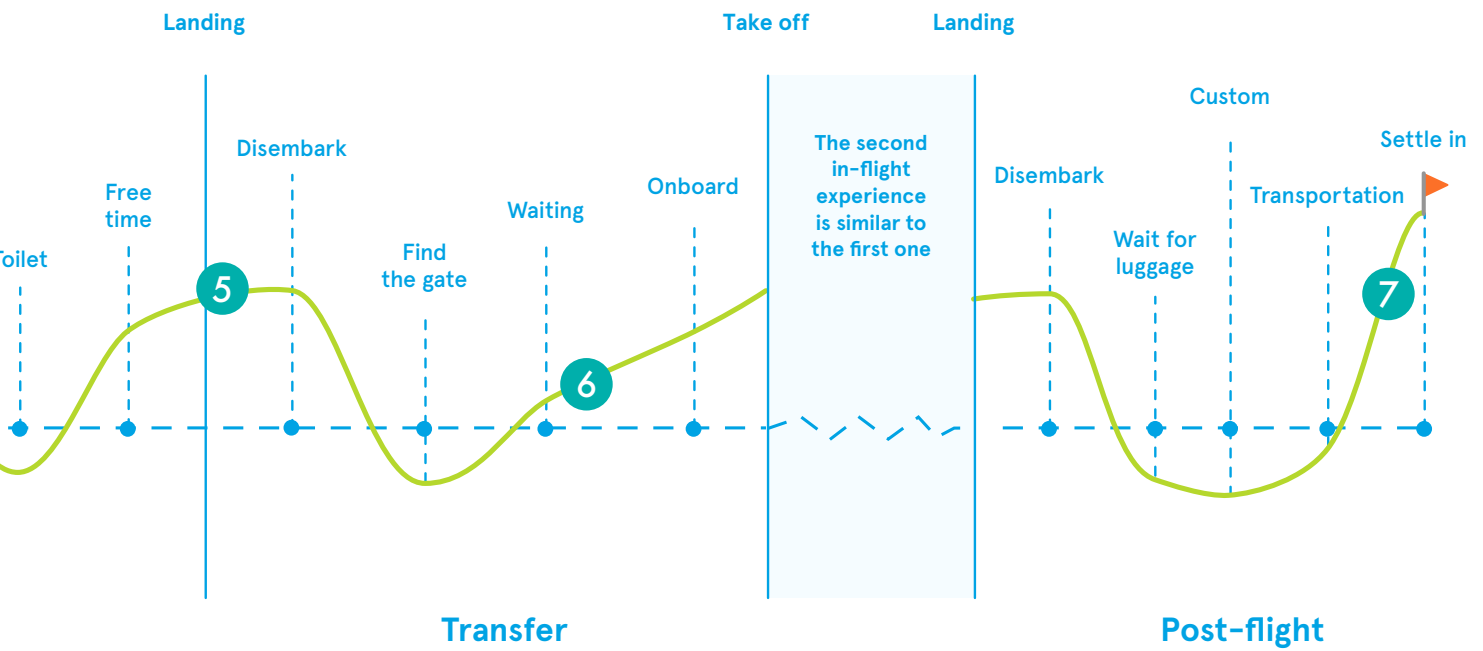Figure 20. shows the positive peak moments that travelers with personal purpose experienced during their t

Figure 20. Positive moments of personal travelers.

to enjoy their trip and find the shining points of their journey. Some positive
, explore the airport to find lovely and interesting things.
rip.

Landing

Take off

Landing

Custom

Disembark

Settle in

**Free
time**

**The second
in-flight
experience
is similar to
the first one**

Disembark

Transportation

Toilet

**Find
the gate**

Waiting

Onboard

**Wait for
luggage**

5

6

7

Transfer

Post-flight

5

6

7

They prepare to disembark and
stretch their bodies.

They connected the wifi and kill
time with their own device. The
shopping, eating and exploring in
the transfer airport if they have
plenty of time.

They check their travel schedule
on the bus/train/tram to see
where to go next.

mselves like
istening to music
enjoy the view
ndow. They
riends through
ssible), or chit-
s on the plane.

event passengers
ocial activities
ppy and

They feel relieved that the long trip
on the plane is finally finished,
stretching relieves their tiredness.

These activities are interesting and
easy to kill the waiting time.

They are looking forward next
activities, and feel happy that they
can finally settle down

Negative moments (Personal)

Travelers with personal purpose felt negative when they were disturbed, their mood was influenced, and sor
The joy of traveling and arrival on time was the biggest concern when going on a personal trip. If something
experience, they will have negative feelings. Travelers tried to enjoy every moment of their trips.
Figure 21.The graph shows the negative peak moments that travelers with personal purpose experienced dur

Behaviours			
They get out of home and go to the airport with luggage.	They open their hand luggage and take out stuff in their pockets to go through the security gate.	They start to feel bored and the noise (like baby cry) disturb them.	They try to sleep on their chairs.

Reasons of feeling negative

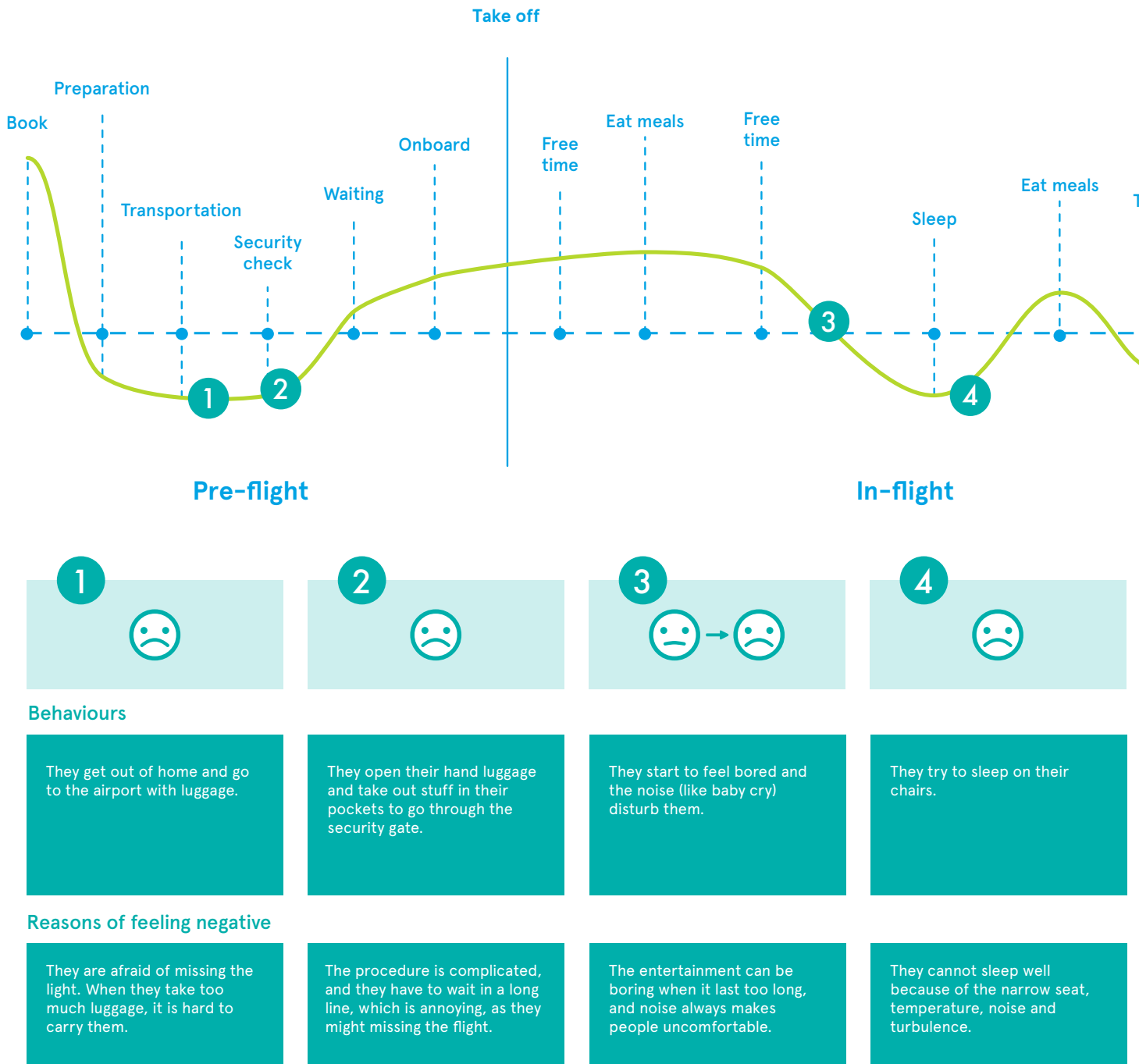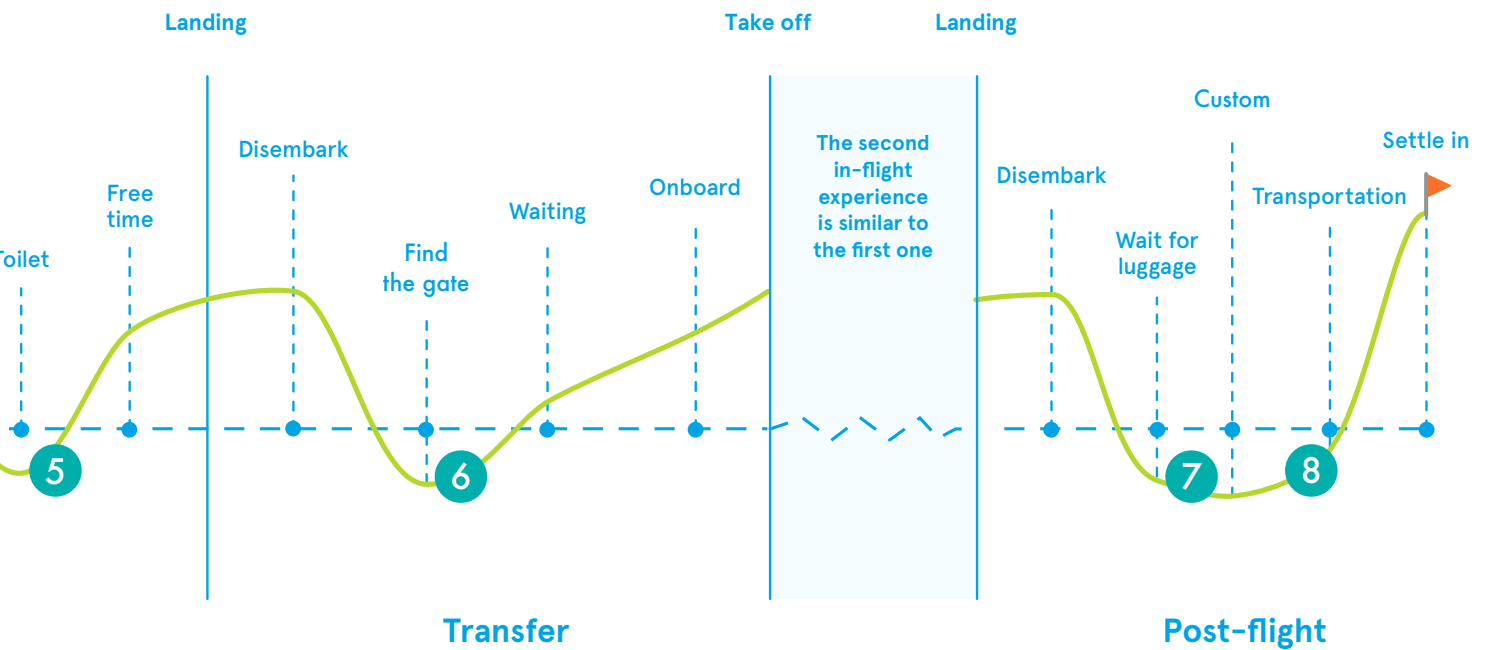|			
They are afraid of missing the light. When they take too much luggage, it is hard to carry them.	The procedure is complicated, and they have to wait in a long line, which is annoying, as they might missing the flight.	The entertainment can be boring when it last too long, and noise always makes people uncomfortable.	They cannot sleep well because of the narrow seat, temperature, noise and turbulence.

Figure 21. Negative moments of personal travelers

mething hinders their trip.
interrupts their travel plan and

ring the business trip.

Landing **Take off** **Landing**

Custom

Disembark

Settle in

Free
time

Onboard

Transportation

Disembark

The second
in–flight
experience
is similar to
the first one

Toilet

Waiting

Wait for
luggage

Find
the gate

5 **6** **7** **8**

Transfer **Post–flight**

5	**6**	**7**	**8**
They try to go over their neighbors to go to the toilet.	They worry about luggage and try to find the right way the gate of connected flight.	They wait for their luggage on the luggage claim.	They try to get out of the airport and go to the destination by taxi or public transportation.
They feel embarrassed to bother others. It is hard to get out because of the narrow seat and line for the toilet is too long.	Sometimes they don't know if they need to take their luggage and it is hard to find the right way to the gate in a strange environment.	It takes them too much time waiting.	They don't know where and how to go to their destinations since they are totally foreigners here.

Positive moments (Business)

Business travelers felt positive when their trip was smooth and efficient. They can make the best use of thei[r]
than wasting time in waiting. Some positive moments also came from feeling recharged, such as treating th[e]
of nice coffee on the trip.

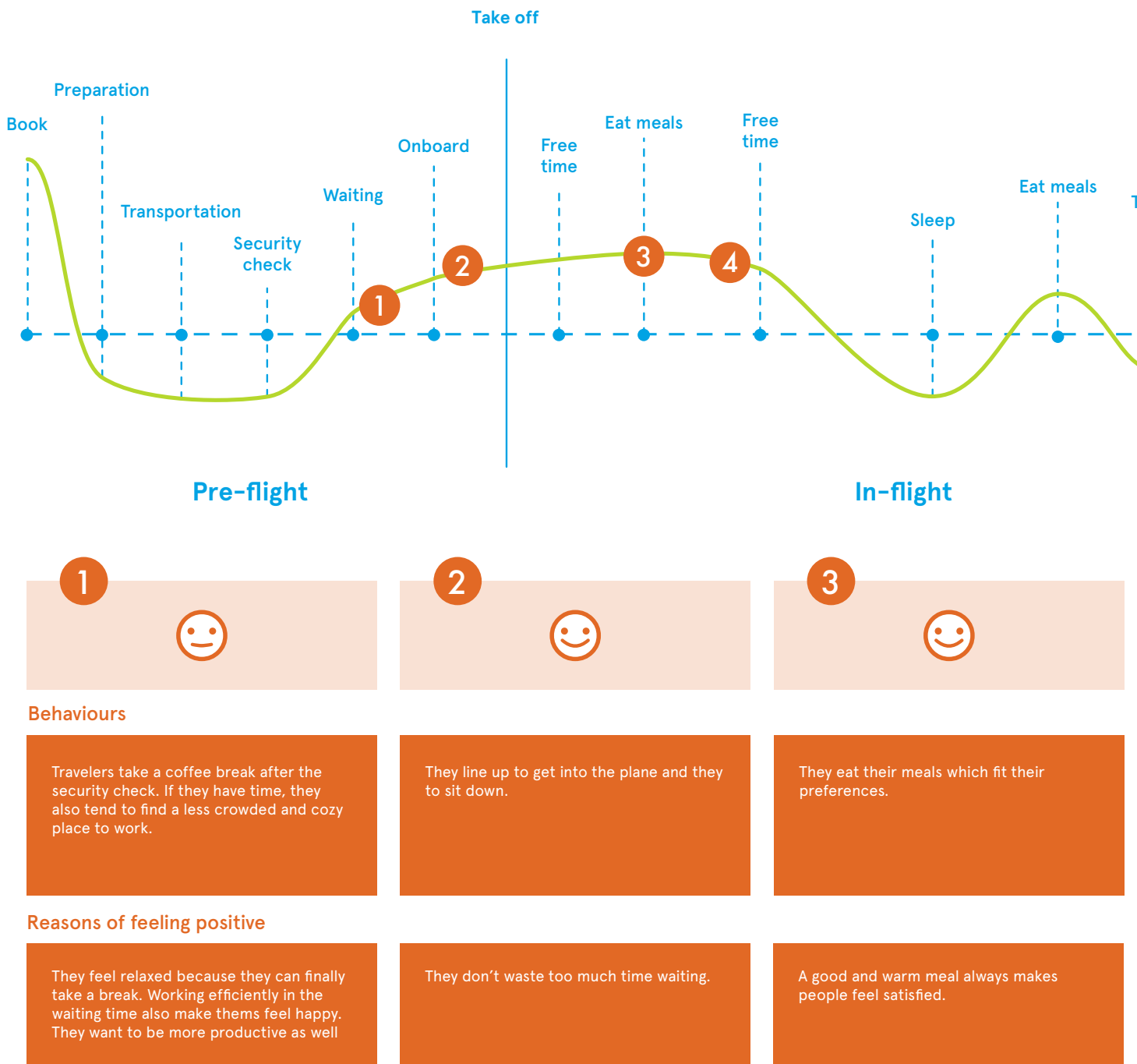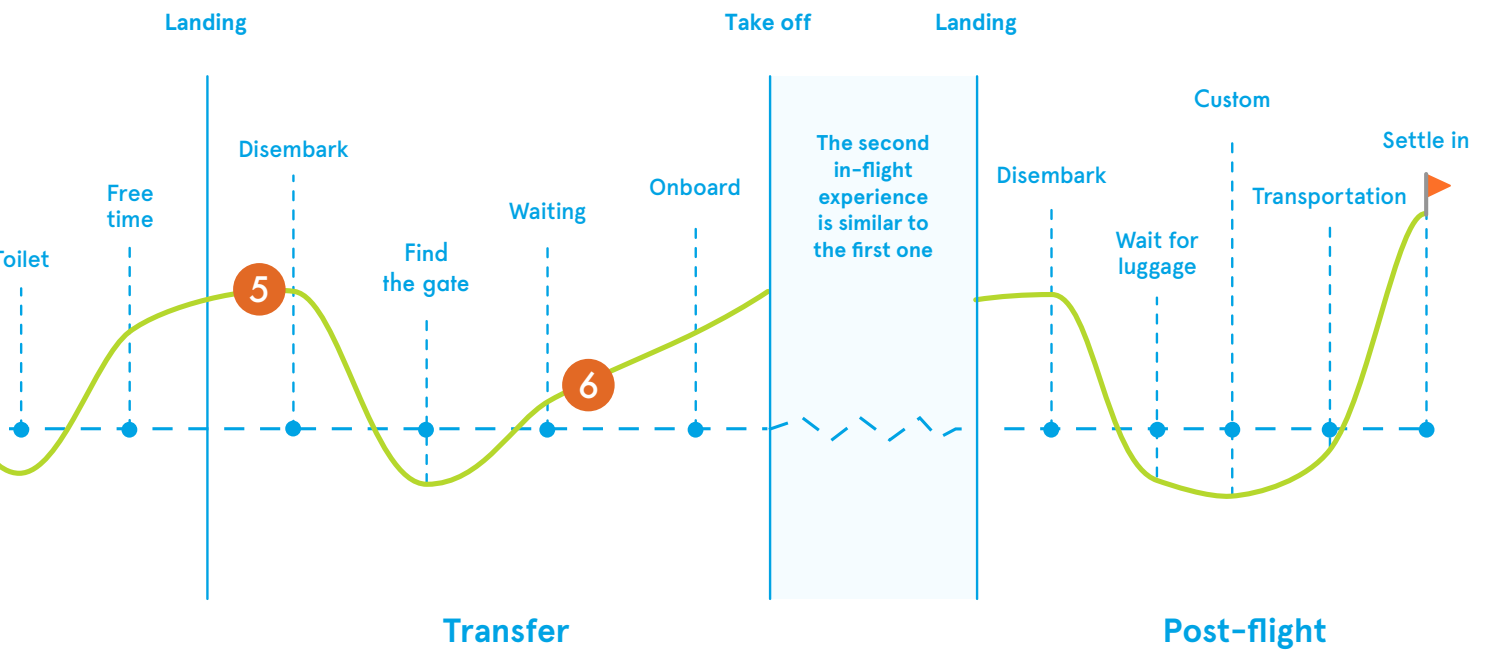Figure 22. shows the positive peak moments that travelers with business purpose experienced during their t[rip]

Take off

Preparation

Book

Onboard

Eat meals

Free time

Transportation

Waiting

Free time

Security check

Eat meals

Sleep

1 2 3 4

Pre-flight

In-flight

1 😐

2 😊

3 😊

Behaviours

Travelers take a coffee break after the security check. If they have time, they also tend to find a less crowded and cozy place to work.	They line up to get into the plane and they to sit down.	They eat their meals which fit their preferences.

Reasons of feeling positive

They feel relaxed because they can finally take a break. Working efficiently in the waiting time also make thems feel happy. They want to be more productive as well	They don't waste too much time waiting.	A good and warm meal always makes people feel satisfied.

Figure 22. Positive moments of business travelers.

r time on working rather
emselves a nice meal or a cup

rip.

Landing ... Take off ... Landing

Disembark

Free time

Toilet

5

Find the gate

Waiting

Onboard

The second in-flight experience is similar to the first one

Custom

Disembark

Settle in

Transportation

Wait for luggage

6

Transfer

Post-flight

4

☺

5

☺

6

😐

They start to work on their laptops online or offline. If they feel tired, they entertain themselves like watching movies, listening to music and reading.

They prepare to disembark and stretch their bodies. Some passenger tries to get off first.

They connect the wifi and try to find a less crowded and cozy place to work with their own device or have a good rest to recharge for the future meeting.

They make good use of time—working. Entertainment prevent passengers form broadness.

They feel relieved that the long trip on the plane is finally finished, stretching relieves their tiredness. They don't have to waste time on the plane.

They don't want to waste time. They try to keep a good mental/physical state and be more productive.

Negative moments (Business)

Business travelers felt negative when they were cramped for time. Time was the biggest concern when g
waiting time was spent over their expectations, the stress level increased and had negative feelings. Tra
processes in order to be more efficient.

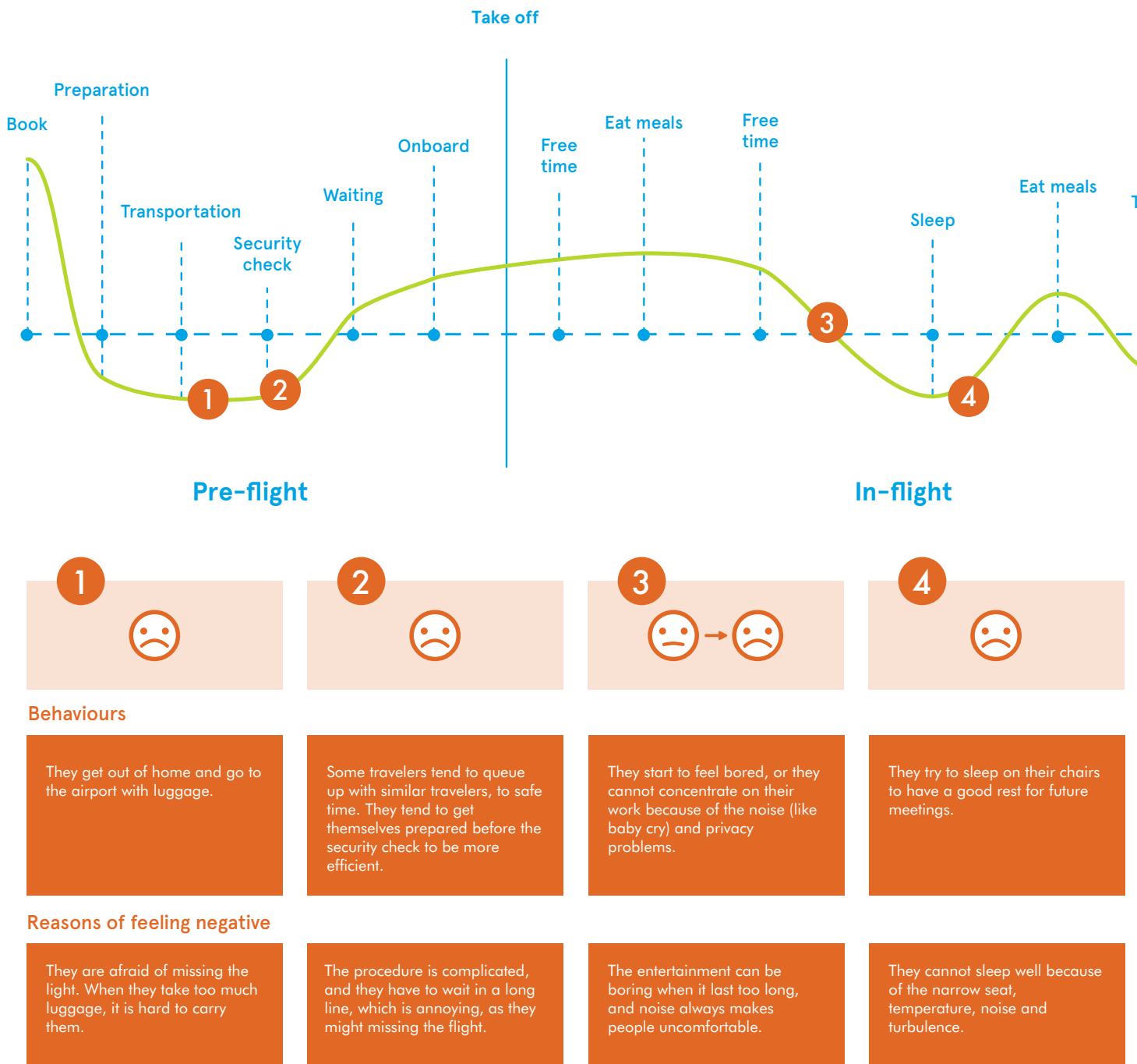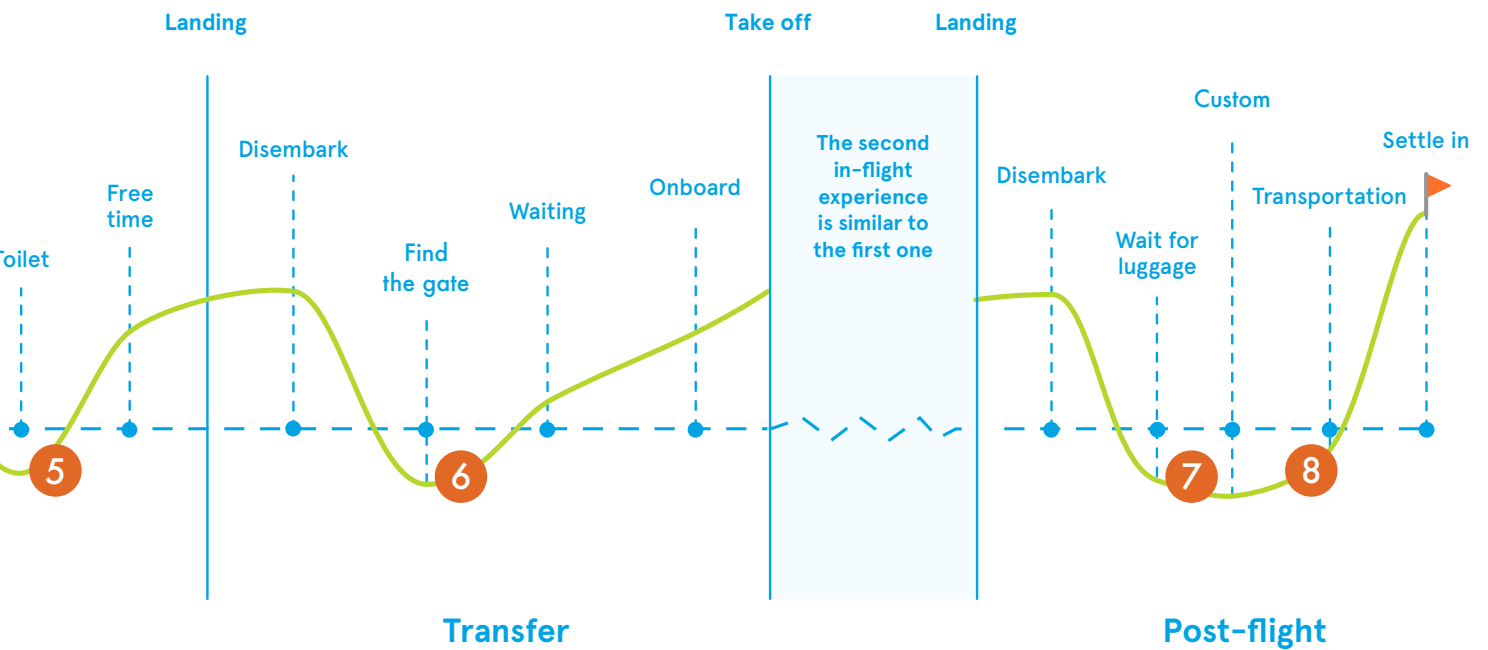Figure 23. shows the negative peak moments that travelers with business purpose experienced during the bu

Figure 23. Negative moments of business travelers

Behaviours

1. They get out of home and go to the airport with luggage.

2. Some travelers tend to queue up with similar travelers, to safe time. They tend to get themselves prepared before the security check to be more efficient.

3. They start to feel bored, or they cannot concentrate on their work because of the noise (like baby cry) and privacy problems.

4. They try to sleep on their chairs to have a good rest for future meetings.

Reasons of feeling negative

1. They are afraid of missing the light. When they take too much luggage, it is hard to carry them.

2. The procedure is complicated, and they have to wait in a long line, which is annoying, as they might missing the flight.

3. The entertainment can be boring when it last too long, and noise always makes people uncomfortable.

4. They cannot sleep well because of the narrow seat, temperature, noise and turbulence.

going on a business trip. If the
avelers tried to optimize their

usiness trip.

Landing

Take off

Landing

Disembark

Custom

Settle in

**Free
time**

The second
in-flight
experience
is similar to
the first one

Disembark

Transportation

oilet

Waiting

Onboard

**Wait for
luggage**

**Find
the gate**

5

6

7

8

Transfer

Post-flight

5

6

7

8

They try to go to the toilet.

They try to find the right way
the gate of connected flight.

They wait for their luggage on
the luggage claim.

They try to get out of the airport
and go to the destination by
taxi or public transportation.

It is hard to get out because of
the narrow seat and line for the
toilet is too long. The unclean
toilet makes them feel
uncomfortable

It is hard to find the right way in
a strange environment.

It take them too much time
waiting.

They don't know where and
how to go to their destinations
since they are totally foreigners
here.

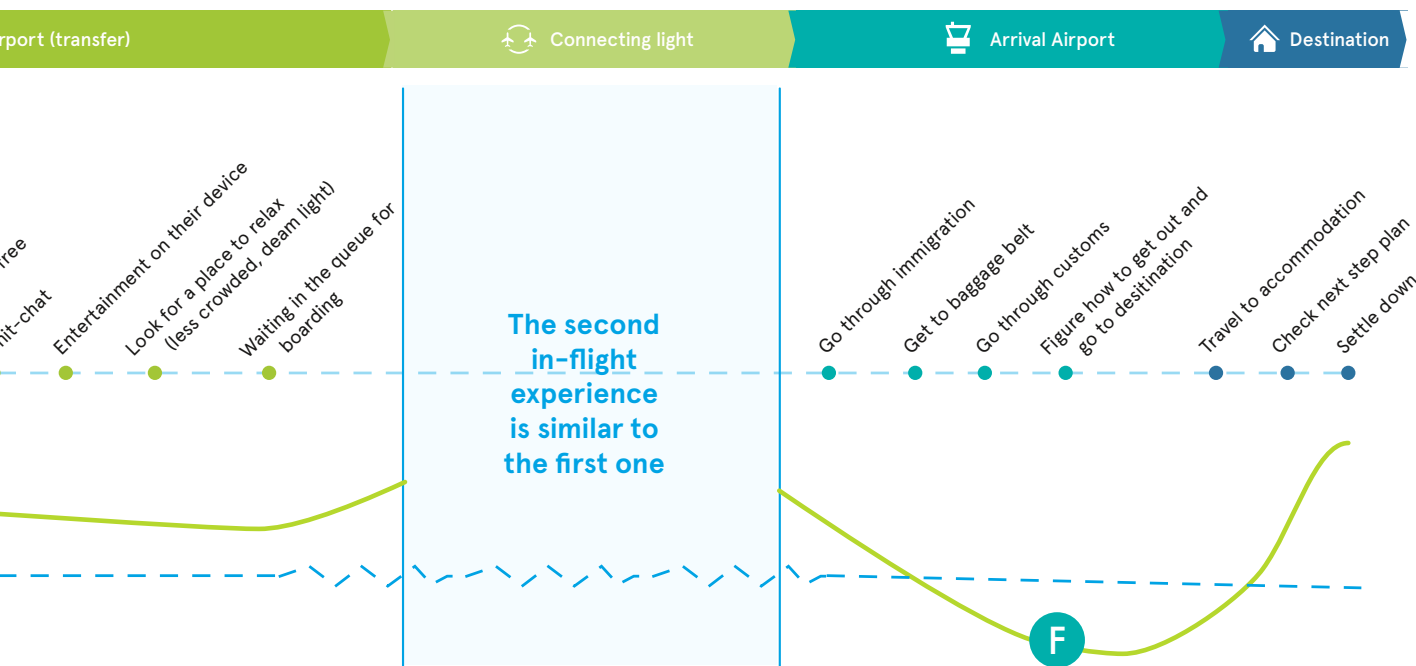## 2.6 Define the intervention opportunity in pre-flight journey

Based on customer profiles of business and personal travelers, and the result of positive/negative momen
explore and create design interventions to improve customer experience. Figure 24. and Figure 25. show the
opportunities were indicated respectively. The journey starts with boarding & find seats to settling down. In
for KLM to create design interventions.

Intervention opportunities of personal travelers

A Eating on plane

People have different preferences for food. A good meal can extremely improve the travel experience since eating is the most impressive positive moment during the in-flight journey. Not everyone knows they can order the meal beforehand. Some special local snacks can also be a small surprise for passengers.

B Leisure activities on plane

Passengers spend most of their free time on entertainment. Some passengers like to use their own devices, others prefer the IFE. Some passengers expect to see the newest movie on the plane. Social activities can also be considered since passengers use social media most frequently if they connect the wifi. They tend to share their experience and contact their friends and relatives. When they feel too bored, some passengers like to chat with others

E Spend time on the transfer airport

Some passengers are interested in the airport they will arrive, like what kind of service, food and shop it provides. Some of them may like to explore the airport if they have time (even though they were familiar with the place) while some other passengers may only want to find a good place to rest. If they are short of time, they always worry if they can catch the connected flight, some guidance might be useful. This service can be

Figure 24. Intervention opportunities of personal travelers.

ts analysis during the whole journey, eight intervention opportunities were identified as potential areas to

e travel experience (expect pre-flight experience) of business and personal travelers where the intervention

each of the phases, all the activities that they undertook were listed. These activities are the potential areas

| ‍ rport (transfer) | ⟳✈ Connecting light | 🛒 Arrival Airport | 🏠 Destination |

Entertainment on their device

Look for a place to relax (less crowded, deam light)

Waiting in the queue for boarding

The second in-flight experience is similar to the first one

Go through immigration

Get to baggage belt

Go through customs

Figure how to get out and go to desitination

Travel to accommodation

Check next step plan

Settle down

F

C Rest environment on plane

Passengers want to have a good rest on their planes, most of them cannot do this because of the noise, narrow seat, uncomfortable temperature, turbulence, etc. The noise-canceling phone, seat changing or blanket can be helpful. Some times children can be noisy, maybe some service can help them stop.

D Toliet experience on plane

It seems like the toilet is always occupied and people need to wait in line to use it. Sometimes people feel embarrassed to bother others especially when they were sleeping. Some services might be helpful at that moment.

F Guidance in another country

When passengers arrived in a new country, some of them know little about the country and the arrival airport. Some tips about traffic and travel inspiration can be useful and help them out.

Intervention opportunity of business travelers

First light — Air

Business

Boarding & find your seat
Haveing first meal
Work on their own device
Resting(sleep)
Having second meal
Entertainment (movie, music, book, tv, chit-chat, etc)
Go to the toilet
Stretch body
Wash up
Prepare for landing
Disembark
Read guidence info
Find right way to gate
Having food
Looking for work

G

G Work on the plane

Some passengers like to work offline, while some like to work online. The needs can be different. They want the private room and to work without disturbance. Privacy also needs to be considerate.

H Work a

Business
more lik
work. If
they wou
with dim

Figure 25. Intervention opportunity of business travelers.

44

or a place to
k (privacy)

Work on their device

Look for a place to relax
(less crowded, deam light)

Waiting in the queue for
boarding

**The second
in-flight
experience
is similar to
the first one**

Go through immigration

Get to baggage belt

Go through customs

Figure how to get out and
go to desitination

Travel to accommodation

Check next step plan

Settle down

H
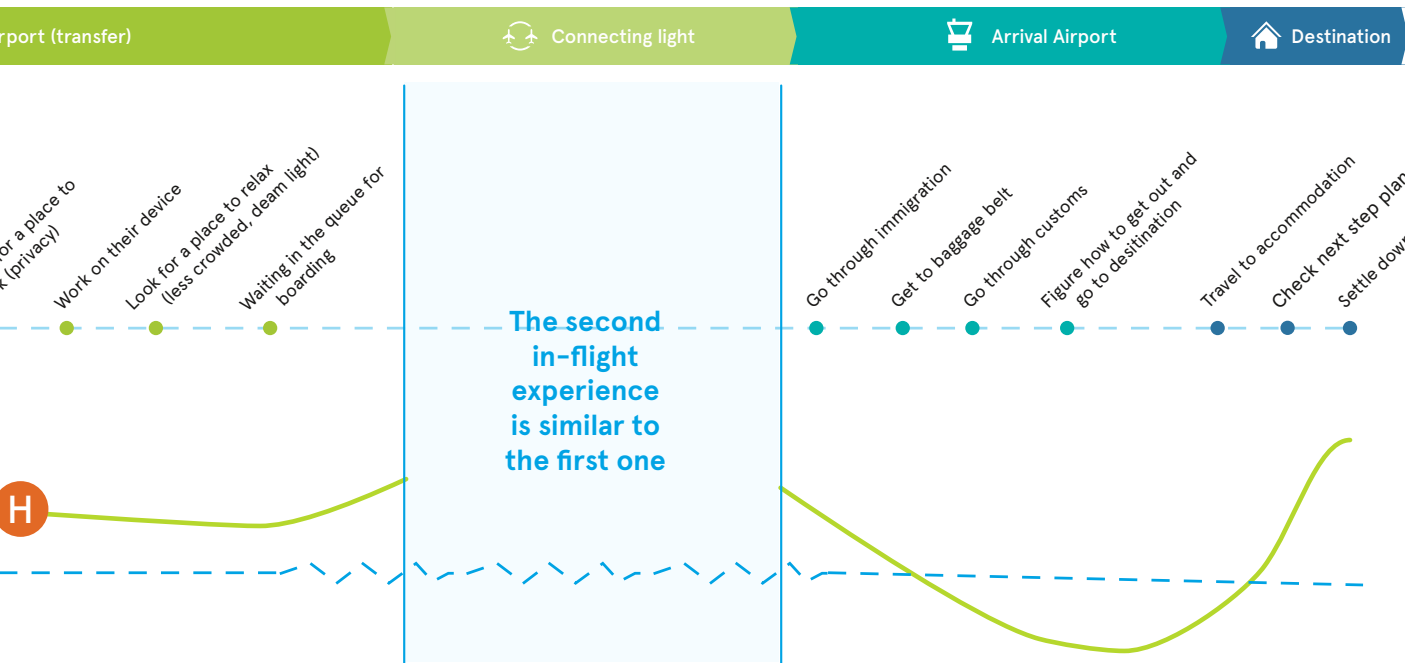
and rest on the transfer airport

s flyers want efficiency, so they are
ely to find a quiet and cozy place to
they want to recharge themselves,
uld like to find a less crowded place
light to rest. Some guidance can be

2.7 Direction for next research

Define Target group

Because of the time constraints, the target group needs to be chosen between business and personal travelers. Since there is already much research about business travelers (Jennie, 2018), and it is easier to get access to personal traveler for next step research, travelers with personal purpose will be chosen for future research and design. However, travelers with personal purpose is still a big group. Finally, the target group was narrowed down to tourists, because they are the most common and typical personal travelers. No matter what purpose personal travelers have, they more or less trend to enjoy themselves in another country after a long-haul flight.

Most valuable intervention opportunities
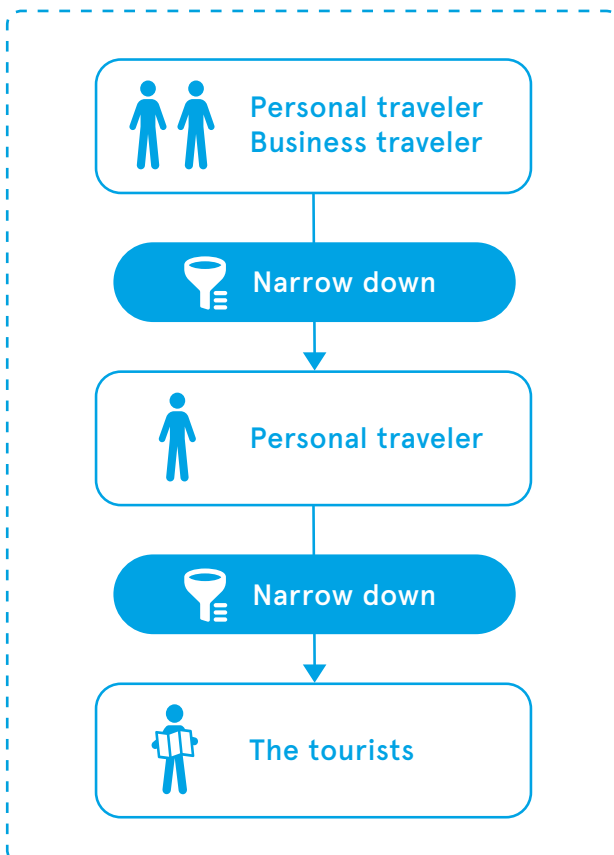
Figure 26. Define Target group

Six intervention opportunities for personal travelers were defined through this research. However, some of them are not very relevant to digital experience, like rest environment and toilet experience on the plane, which are more related to the physical experience and hardware. Among the rest 4 opportunities, leisure activities on the plane, spend time on the transfer airport and guidance in another country are most valuable because they have enough design space, and room to improve through digital services/products. In this case, these 3 opportunities will be the focus of following research and design.

Personalization
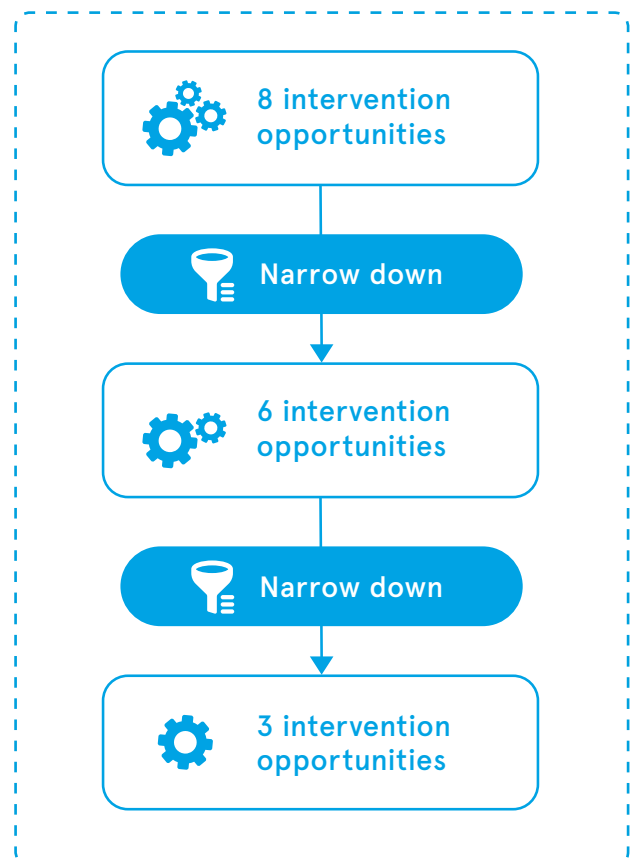
Figure 27. Choose most valuable intervention opportunities

From the previous research, behaviors and traveling experience of personal travelers were investigated. During the passenger journey, 6 intervention opportunities were defined to be the potential touchpoint to provide services. However, in order to provide more personalized service, personality traits will be considered, since people with different personalities will have different concerns and needs.

In the next chapter, the personality traits will be introduced in detail, and a more in-depth analysis based on personality traits will be done to see the connection between personality and concerns/needs.

3

Understand the Personality traits theory

The theory of the big five model and personality traits is introduced in this chapter. Mengqi Yuan has already done some research about the connection between the personalized services and personality traits in traveling with flight area (2017) and proposed a principle of personality-driven design. This chapter aims to discover how to conduct further research based on her findings and outcomes.

3.1 Personality definition & structure

Ryckman (2004) defines personality as a "dynamic and organized set of characteristics possessed by a person that uniquely influences his or her cognitions, motivations, and behaviors in various situations". Individuals do react fairly consistently in a variety of environmental situations, these generalized patterns of response or modes of coping with the world can be called personality. (Kassarjian, 1971). There are many ways to define the personality, but the common belief is that personality is patterns of responding.

According to the Equation interactionist theory formulated by Lewin(1936) (figure 20), behavior is the function of personality and environment. That means knowing someone's personality gives a clue about how that person is likely to feel and act in a certain situation.

BEHAVIOR = FUNCTION [PERSONALITY · ENVIRONMENT]

Figure 28. The Equation interactionist theory

3.2 The big five model

There are more than 15,000 words describing personality have been identified(Principle of management, 2013) in English. Researchers found many different words were pointing to the same dimension of personality. Goldberg(1990) grouped those words, and formulated five dimensions(Big Five), namely Openness, Conscientiousness, Extroversion, Agreeableness and Neuroticism. These dimensions can explain much of the variation in our personalities. He also gave a basic description of each dimension(Figure 29).

Currently, Big Five is the most validated and commonly used personality model. Much research has done to investigate the Big Five in the different areas. For example, in economics (Borghans, Duckworth, Heckman, & ter Weel, 2008; Heineck & Anger, 2010), education (Marsh, Trautwein, Lüdtke, K.ller, & Baumert, 2006; Swanberg & Martinsen, 2010), health (Smith & Williams, 1992), and social resources (Headey, Muffels, & Wagner, 2010). In the traveling with flight context, the big five model can also be applied

Trait	Description
Openness	Curious, original, intellectual, creative, and open to new ideas.
Conscientiousness	Organized, systematic, punctual, achievement oriented, and dependable.
Extraversion	Outgoing, talkative, sociable, and enjoys being in social situations.
Agreeableness	Affable, tolerant, sensitive, trusting, kind, and warm.
Neuroticism	Anxious, irritable, temperamental, and moody.

Figure 29. Goldberg, L. R. (1990). An alternative "description of personality"

3.3 How to measure personality traits

Mengqi Yuan (2017) have developed ten questions as a method tto identified travelers' personality in her previous research — "deep personalization". One of the most significant measures of the Five Factor Model(FFM) is NEO PI-R (Costa and McCrae, 1992). In

the most recent publication, there are two forms for the NEO PI-R, self-report(form S) and observer- report(form R) versions. Both forms consist of 240 items answered on a five-point Likert scale. To minimize the time consumption and keep the simpleness and fit the aviation context, the number of questions for identifying one trait reduced to two. This change may result a less accurate recognition of the original big five dimensions. However, the accuracy is not the priority in this stage.

In following research of this project, the ten questions were used to identify participants personalities. The detailed questionnaire related to travel by flight context is in Appendix F.

3.4 The principle of personality-driven design

The principle of personality-driven design is a systematic tool to approach passengers with different personalities and inspire personality-driven product and service design. It was created by Mengqi Yuan(2017). The framework (see Appendix G.) was based on the big-five personality theory. It will be used to facilitate the later idea generation session in chapter 5.

4

Apply the Personality traits theory

This chapter aims to discover the relevance between personality traits and passengers' needs and concerns through the literature review and the analysis of the previous statement.

4.1 Literature review and statements analysis

To explore needs and concerns with different personality traits, the questionnaire of personality traits was sent to these previous context mapping session participants who have experience of traveling by long-haul fight as tourists. Then their statements were recognized based on their personality traits.

Meanwhile, some relevant literature was reviewed to investigate the characters of people with different personality traits.
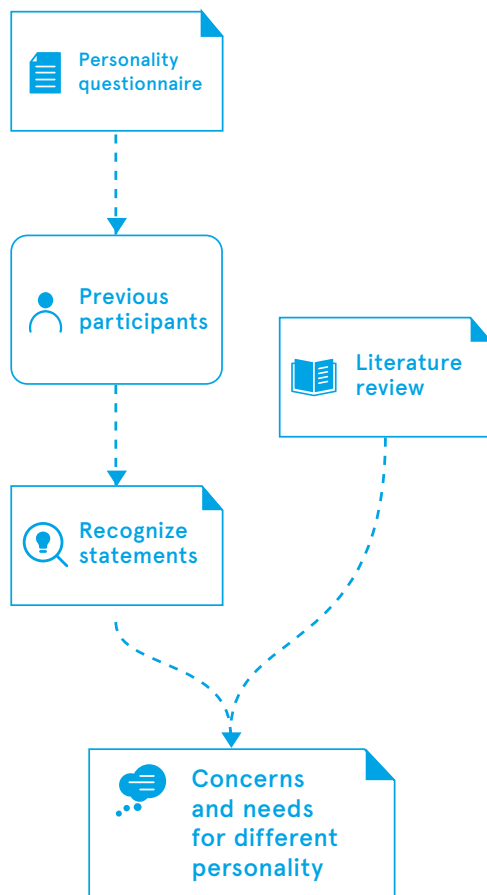
Figure 30. Process of define passengers' needs and concerns, with different personalities

Quote

"During the whole trip on the plane, I was talking with a Filipino guy. He is so funny, when we arrived, he even give me a hand chain as gift."

"When I feel boring, I'll have some chit-chat with my neighbors. It is pretty common for long-haul flight."

Literature review

Extraverts enjoy interacting with people, and are often perceived as full of energy. They tend to be enthusiastic, action-oriented individuals.(Canadian Research & Development Center of Sciences and Cultures, 2012)

People high in extraversion don't mind being the center of attention.(The IPIP-NEO, 2000)

Needs

- Meet new people
- Seek attention

Low Extraversion

Quote

"I enjoy listening to music, watching a movie or read a book by myself alone without distraction on the plane or airport."

Literature review

Introverts are reserved, highly deliberate, and enjoy spending time alone (Goldberg,1990).
People low in extraversion tend to be quiet around strangers and have less intention of talking in large group (The IPIP-NEO, 2000).

People who scored low tend to be quiet and private, and may feel too timid to engage in a problem-solving conversation with people (Kilmann & Thomas, 1975).

Needs

- Personal place

Concerns

- Be bothered

High openness

Quote

"If I have time, I like to hang around on the airport like shopping or find something new "

"After arriving at the airport, I sometimes exploring the airport to interesting place or activities. "

Literature review

People high in openness are motivated to seek new experiences and to engage in self-examination.(McRae, Tobert, 2004).

High in openness is positively related to high intellectual curiosity.(Costa, P. T., ; McCrae, R. R.,1992).

Individuals with high openness are open to exploring ideas related to the conflict situation, and their creativity and willingness to change goals. (David Antonioni, 1998)

Needs

- New experience
- New Service
- New Ideas

High neuroticism

Quote

"Sometimes I started to worry about if I can catch the connected flight when I was on my first flight and way before landing"

"If I cannot fight the right way to the transfer gate, I'll feel a little panic."

Literature review

Individuals who score low on emotional stability usually report anxiety in stressful situations.(Costa & McCrae, 1992)

Showing empathy is important while a problem or a disruption happened, and it will be even more crucial for passenger high on neuroticism. (KLM customer insight expert,2017)

Needs

- Empathy
- Double-check
- Reassure

Concerns

- Disruption
- Delay

High Conscientiousness

Quote

"I usually start to plan my trip early, like buy ticket and book hotel, it will be much cheaper."

"I'll get up early to make sure I can catch the flight, and I usually check the way to airport beforehand."

Literature review

People who score low on conscientiousness tend to be laid back, less goal-oriented, and less driven by success.(Costa, P. T., ; McCrae, R. R.,1992).

People low in consciousness like doing things their own way. (Preston Ni, M.S.B.A., 2014)

Low levels of conscientiousness are strongly associated with procrastination. (Dewitt, 2002)

Needs

- Make planes
- To be prepared
- Organized

Low Conscientiousness

Quote

"I am very happy to travel with my friends, so I don't have to make the travel plan and arrange the hotels. I'll just follow their lead"

"I don't like to pack my luggage, it is so boring and time-consuming. I always realized that I forgot to bring something after I arrived."

Literature review

People who score low on conscientiousness tend to be laid back, less goal-oriented, and less driven by success.(Costa, P. T., ; McCrae, R. R.,1992).

People low in consciousness like doing things their own way. (Preston Ni, M.S.B.A., 2014)

Low levels of conscientiousness are strongly associated with procrastination. (Dewitt, 2002)

Needs

- Less effort
- Less but crucial information

Others traits

After reorganizing the statements based on personality traits, there is no obvious concern and needs related to agreeableness, but it doesn't mean it is irrelevant in the traveling context. Literature review can still offer the pattern of this trait. It is still valuable for future research.

4.2 Conclusion

According to this research, the extraversion is most relevant to the socializing, openness is more related to the exploration and new service; conscientiousness is more about planning and preparation; neuroticism is more connected to the transfer and catching the flights, it will be more crucial when disruption or flight delay happened.

5

Explore design directions

This chapter explores the possibility of applying personality traits theory on design, and some primary concepts ware generated based on different personalities. All these primary concepts are tested to gain enough insights to create the final concept.

5.1 Potential connections between personality traits and intervention opportunities

The remained intervention opportunities were reviewed according to the needs and concerns based on personality traits, and some potential connections between them were discovered.

E   Spend time on the transfer airport

Extraversion trait can be associated with this area:
- High extraversion: Socialize with others on the plane
- Low extraversion: Avoid being bothered on the plane

B   Leisure activities on plane

Openness and neuroticism can be associated with this area:
- High openness: Explore the airport, search interesting activities and spots
- Low openness: Follow routine, stay on the place they usually do (like coffee corner)
- High neuroticism: make sure that they can catch the connected flight

F   Guidance in another country

Conscientiousness trait can be associated with this area:
- High conscientiousness: modify/ update travel plan
- Low conscientiousness: last moment to make a travel plan

5.2 Primary concepts and minor test

Assumptions

Three intervention opportunities were defined from previous passenger experience research, and the potential connections between personality traits and intervention opportunities were investigated. According to these, some assumptions were proposed.

1. Extraversion: Passengers in high extraversion trend to socialize with (like chit-chat) others on the plane, a nice conversation can help them feel better.

2. Openness: People with high openness want to explore the airport to find interesting activities and places. People in low openness want to find a quiet place to spend their own time

3. Neuroticism: Passengers in high neuroticism want to know if they can catch the connected flights in time. They want to know how much time left for transfer.

4. Conscientiousness: People with high conscientiousness want to arrange their trip well. They might want to modify or update their travel plans on the plane to have a thoughtful schedule. People in low conscientiousness don't want to put too much effort into the plan. They may only what to set a rough plan with more freedom.

Ideation

In this ideation session, some concepts were generated to explore the final design direction. It will be tested to validate previous assumptions. In addition, the needs and concerns of tourists will be more concrete in this way. The concept details can be found in

Figure 33, 34, 35 and 36.

Goal: Explore possible design directions in these three intervention opportunities, according to the concerns and needs found out in chapter 4 as well as these assumptions

Participants: Six IDE students who have the experiences of taking long-haul fight and traveling abroad as tourists

How: How-to question was used to develop the ideas. In this session, the personality-driven design principle (Mengqi, Yuan 2017) was used as a guideline and some stimuli collage was given as inspiration.

Minor test

Goal: To test design interventions with the real users as a validation of assumptions in 3 main potential opportunities and to see whether the designed concept fits the need of users with different personalities in different contexts.

Participants: 14 passengers were chosen as participants at IDE faculty and TU Delft library. All of them are frequent travelers (fly more than 3 times per year) and have experience travel abroad as tourists. They are from NL, India, China and aged between 20 and 30 years old.

Context: The minor concept testing was conducted individually at the IDE faculty and the TU Delft library. In order to evoke their flight-related experience and help them image the context where the services were used, they were invited to share their last travel experience beforehand.
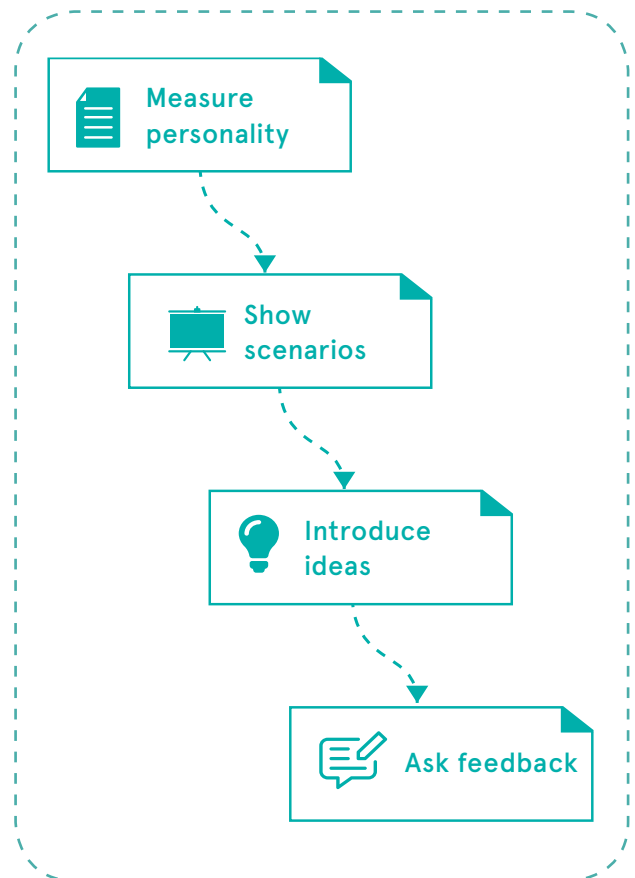
Figure 31. Test procedures
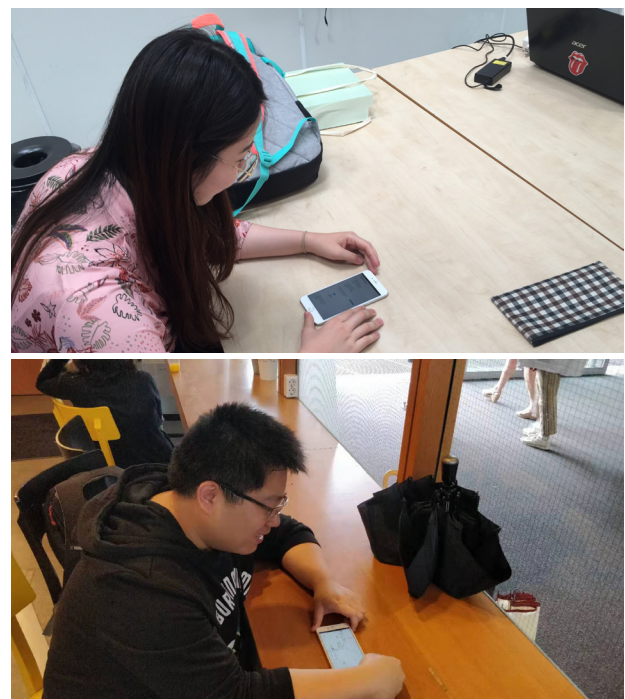
Figure 32. Participant is testing the concept

Test result and concept introduction

Concept 1: An anonymous chat room on the plane.
Passengers can chat or discuss on this anonymous online chat room on OBP. The aim is providing a platform to socialize with other passengers. Passengers won't know who is talking, so they can feel free to talk.

Tested assumption (Extraversion): Passengers in high extraversion tend to socialize with (like chit-chat) others on the plane, a nice conversation can help them feel better.
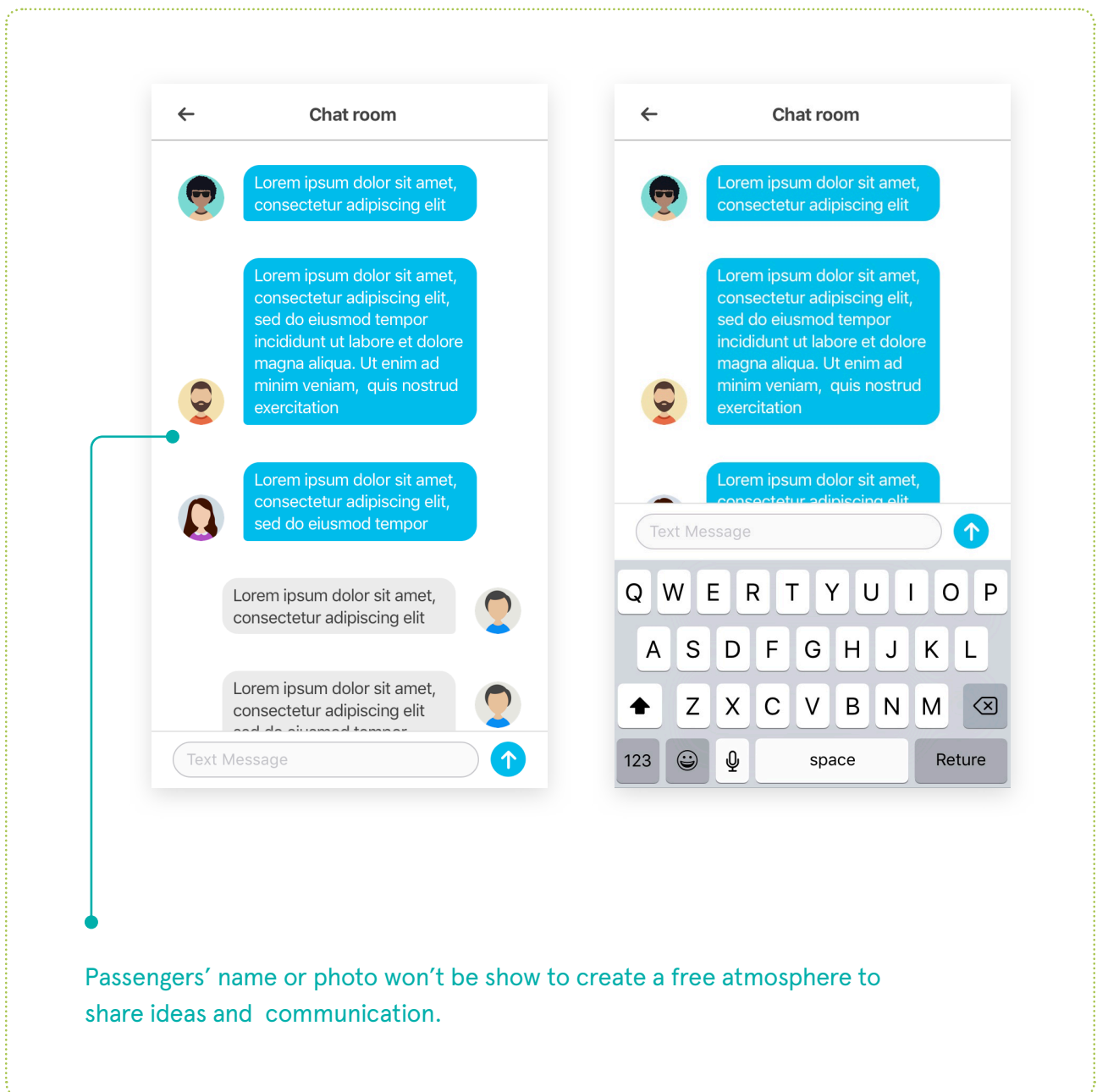

Passengers' name or photo won't be show to create a free atmosphere to share ideas and communication.

Figure 33. An anonymous chat room on the plane.

High extraversion participants:

According to the questionnaire, only 1 out of 14 participants were measured having high extraversion traits.

"I'll use it for asking questions like what is my supper. It isn't worth asking air attendants. I can also complain about the noise or the bad environment. I won't bother other passengers"

Medium extraversion participants:

7 out of 14 participants were measured having medium extraversion traits.

"I won't be the first one to talk, and I need a common topic to talk about. "

"I am not sure if I will use it. I won't join the chit-chat, but I may join the discussion about the plane to get more information about traveling. A helpful topic is needed "

"It is fun to talk to certain people on the plane, but I may need a trigger to start the conversation. If I want to talk to people next to me, I won't use my phone, just talk to them directly"

"I won't send messages initiatively, but I'll check messages to see if I can find helpful information. I won't chit chat, but if I can help somebody out by answering questions like questions about traveling, I'll do it. "

"I won't use it because there is no

motivation. And the language is a problem, I prefer to use my mother tongue. It will be better if it likes a Q&A message board. People ask and answer questions. I might use it to ask some questions about my destination if there are some locals can answer them."

Low extraversion participants:

5 out of 14 participants were measured having low extraversion traits.

"I am not very willing to use it, but I am curious about what people will say"

"I'll check it if I can understand the language. I'll join if there are some interesting content. The travel advice from locals can be great. I prefer to talk face-to-face "

Insights:

- Passengers in high conscientiousness will use the chat room more intuitively.

- Passengers in medium conscientiousness and low conscientiousness have more concerns about the chat room. They need interesting topics and conversation triggers.

- The conversation contents should be relevant to their trips.

- It is a good way to linked locals and tourists, and create social connection.

Recommendations:

It can be divided into different small

chat with different topics, (like food, attractions)

- It can be changed to a Q&A message board. Tourists can ask questions (like the places worth visiting) and locals can answer them, which can promote the communication between locals and tourists.

Concept 2: An explorative airport 3d map.

Passengers can check the place and activities at the airport, and explore the possibilities for new services.

Tested Assumption (Openness): People in high openness want to explore the airport to find interesting activities and place. People in low openness want to find a quiet place to spend their own time.

All these filters can help passengers find the places they needed.

Fun place represents interesting locations or activities at the airport. For example, Schiphol airport has a small library, park, and museum.
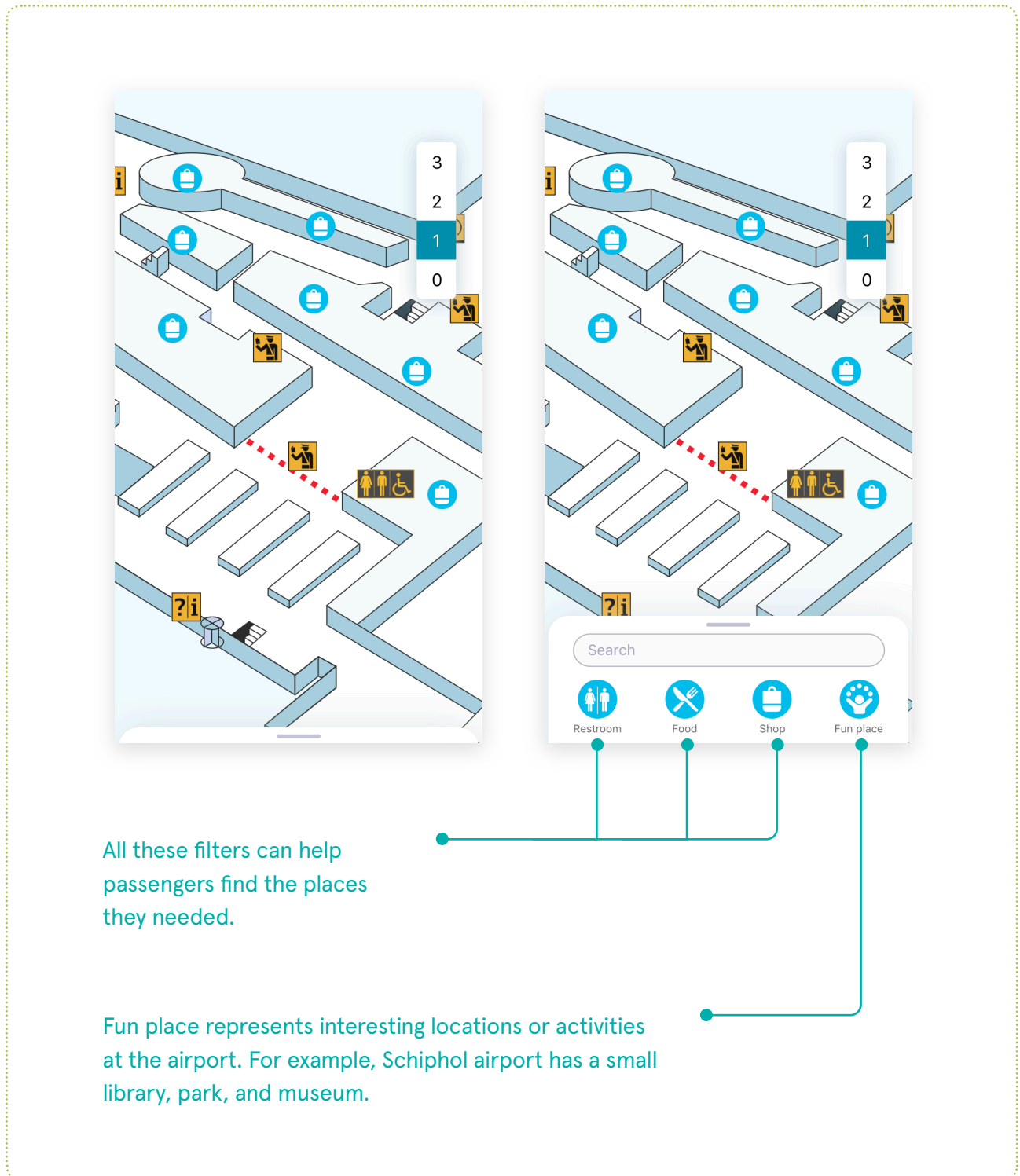
Figure 34. An explorative airport 3d map.

High openness participants:

8 out of 14 participants were measured having high openness traits.

"I might forget this function after I left this website. It is more useful at the airport"

"It is helpful and fun. Sometimes my transfer time is long, It will be better if this map also shows the information around the airport. I may want to find a place to store my luggage"

"I might use it to search for fun places and activities"

"I want a live version to see the actual situation. I might forget this place and activities when I get off the plane. If they can recommend activities and routes, it will be better. With customer reviews instead of airport's reviews"

"I'll look at it, but it is important to have a good place and activities"

"I prefer interactive panoramas like Google Street View. "

"I might look for the shops. It will be better if I can check and order beforehand, so I can go to the shop and take them directly. It is time-saving"

Medium openness participants:

3 out of 14 participants were measured having medium openness traits.
"I may use it, I need a push notification because I don't want to search for activities on purpose"

"I might use it to search for places to eat. It depends on how much time left"

Low openness participants:

3 out of 14 participants were measured having low openness traits.

"I will forget these places and activities when I get off. I prefer a live version to see the actual location. If they can recommend activities and routes, it will be better. With customer reviews instead of airport's reviews"

Insights:

• Passengers in high openness want to explore more, including outside of the airport and check the details of spots in the airport.

• Passengers in medium openness and low openness want a better notification and recommendation system to find interesting content like activities and spots.

• Some passengers want to use it at the airport instead of during the flight.

• Some passengers mention they want to check the shop at the airport.

Recommendations:

• Provide live status of the airports. For example, it can demonstrate where is clouded and where is quiet.

- A good way to notify passengers of these activities and places is needed.

- A recommendation system can recommend good routes at the airport including the places and activities that fit people's personal preferences.

- People can mark the places they are interested in and download them. So they can still check these places after landed, or combine the OBP with KLM app or airport app, thus, passengers can still use this function at the airport.

- Interactive panoramas can be provided.

- Customer reviews of all places at the airport can be helpful since passengers more trust their peers.

Concept 3: a flight status and notification system.

It tells people how much time left for transfer, estimated walking time (from gate to gate). A map with a guided route will be provided to help them find the right way to the gate. The notification system notifies people that they are delayed, and the influence of this delay.

Tested assumption (Neuroticism): Passengers in high neuroticism want to know if they can catch the connected flights in time. They want to know how much time left for transfer.

The flight status page shows the whole process of flights.

Flight status

(CDG) Paris
Departure Mon 07 Jan
Gate: E4 | Terminal: 1
14:15

(AMS) Amsterdam
Arrival Mon 07 Jan
Gate: D42 | Terminal: 1
20:00

Transfer time: 3h 20min   SUFFICIENT
About 20 min walking

Map guidence

(AMS) Amsterdam
Departure Mon 07 Jan
Gate: F03 | Terminal: 1
23:20

(CAN) Guangzhou
Arrival Mon 08 Jan
Gate: A20 | Terminal: 1
12:15

Download guide map

1 - Departures & Gates

We are sorry.
this flight will be 1 hour delayed.

Don't worry.
you still have engough time (2 hours) to transfer.

I understand

The passenger can download this map on their phone, so the can still use it offline when they are in the transfer airport.

When the passenger wants to check the detailed guidance on the airport, click the map guidance, he will be lead to the map of the airport. A clear route will be shown on this map.

If the flight is delayed, a notification will pop up to tell passengers how much transfer time is left to help them prepared.

The transfer time and estimated walking time from gate to gate will be shown on the transfer stage. If the passenger has enough time to transfer, the sufficient tag will show up to calm them down.

Figure 35. a flight status and notification system

High neuroticism participants:

2 out of 14 participants were measured having high neuroticism traits.

"It is really helpful and can comfort me. If it can recommend some activities to join or places to hang around based on my transfer time, it will be great."

"It is helpful. I'll only check it when I am pressed for time to catch my plane. I hope it can give me advice when there is a delay."

Medium neuroticism participants:

8 out of 14 participants were measured having medium neuroticism traits.

"It is helpful, I'll check it just before I am landed"

"I can double-check it, I hope it can be a live map showing where am I"

"I want to see if it is crowded on the transfer gate, show panoramas, so I can know how it looks like"

"It is practical, how can it show my routes if I need to go to other floors?"

"It can help me know if I have more time to shopping"

"I hope it can tell me want can I do at the airport, if I am delay

Low neuroticism participants:

4 out of 14 participants were measured having low extraversion traits.

"The downloaded map is helpful, I won't be nervous if I roughly know the location of the gate."

"I will check the shops I'll pass by."

"It can guide me. I hope they can recommend some activities to kill time."

Insights:

•   All passengers need this function, since catching the connected flight is very important for all of them. Some of them want to have more detailed information about their transfer gate.

•   Some passages expect to receive help through this function when they are delayed

•   People also want to enjoy their time with good activities at the transfer airport if they have enough transfer time.

•   Some passengers mention the route can include some fun activities or places.

Recommendations:

•   Combine with concept 2, provide smart recommendations of activities and places at the airport based on the transfer time.

•   Show panoramas of the transfer gate.

•   Provide advice when passages are delayed.

Concept 4: a travel plan maker which help passengers set their own travel plan.
It helps travelers explore the place and activities on their destination, arrange their travel plan (like when and how to go to the attractions that they are interested in).

Tested assumption (Conscientiousness): People in high conscientiousness want to arrange their trip well. They might want to modify or update their travel plans on the plane to have a thoughtful schedule. People in low conscientiousness don't want to put too much effort on the plan. They may only what to set a rough plan with more freedom.

The travel activities section shows all the popular activities on the destination. Passengers can click each card to check the details of this activity. They can also book tickets through the detail page.

The agenda section is for passengers arranging their travel plans. They can drag activity cards to this block to arrange the activities that they want to join every day. A day was divided in 3 part — morning, afternoon and night. They can also add or book a new hotel on this page.

Then finish their plan, they can click the navigation button to see transportation between the two places, the recommend route page will show up. They can buy public transportation tickets or book taxis on this detail page

When they finished the arrangement of transportation, the chosen mode of transportation and estimated travel time will show up.

Passengers can download this agenda as a pdf on their phone, so they can check it later.

Figure 36. a travel plan maker which help passengers set their own travel plan.

High conscientiousness participants:

4 out of 14 participants were measured having high conscientiousness traits.

"I might use it to complete my plan. There is too much information, I want to search for activities that I have planned before. How flexible it can be? "

"I'll only use it for reference. There is too much uncertainty. I hope I can see the location of these activities on a map, so I can arrange a better route. It will be great if it can modify my route of the tour based on the places I have chosen."

Medium conscientiousness participants:

5 out of 14 participants were measured having medium conscientiousness traits.

"It is helpful since I only make a rough plan before I start my trip. How the downloaded map looks?"

"It convenient, when I am too busy to make a plan beforehand, I'll use it."

"I like it, but I cannot change it after I landed. It will be better if it is an app."

"The activities are more important than the agenda, I want to mark the place or activity I am interested in. I might not actually use to make a detailed plan, I need to spend a lot of time and effort. It will be a good idea to add the agenda on my google calendar by email."

"I might use it for reference. Just use it to find some interesting activities. And I want to know the distance among these activities."

Low conscientiousness participants:

5 out of 14 participants were measured having low extraversion traits.

"It might be useful, but it will take a lot of effort to make a detailed plan. I am too tired to do that on the plan. I want to see more activities. Does it cover the activities I want?"

"I don't need a too detailed plan. A general plan is enough."

"I won't make a too specific plan. I only mark some places I really want to go"

"I am more motivated to prepare the first step after my landing--figure out how to go to my hotels."

"It is too complicated, I might not use it."

Insights:

- Passengers in high conscientiousness and medium conscientiousness would try to make a plan for reference.

- Passengers in low conscientiousness think a rough plan they made beforehand is enough, they don't care about the future trip that much. Some of them mention they only want to go to the place they really want to go, and they want more freedom.

- Passengers in low conscientiousness are more interested in solving the problems at the moment like how to go to the exit after getting off or go to their residence.

- Some passengers mention the concept is a little complicated.

- Some passengers prefer to see the spots on the map, since the location is an important factor to consider.

Recommendations:

- Simplify the use flow.

- Link passengers travel plan with their own calendar on their phone so user can keep update it afterward.

- Show the locations of these activities and attractions on a map to provide an overview.

- Allow users to mark down the place they are interested in.

- Tour routes recommendation (automatically arranged the place based on the time, money or interests)

Conclusion

The test result shows that the assumptions are only partly right. For example, almost everyone(instead of the passengers score in high neuroticism) wants to know if they can catch the connected flights in time and want guidance on the airport. Among these four concepts, concept 3 (5 out of 14 participants prefer it) and concept 4(6 out of 14 participants prefer it) are most popular.

All these concepts are about improving passenger experience. However, the business value needs to be considered as well. The final concept should have enough potential to provide ancillaries(commission-based products) to create revenue. The ancillaries will be researched in chapter 6.

6

Explore the new options of ancillaries

More ancillaries are discovered in this chapter. Acceptance of them are also tested through an online questionnaire survey.

6.1 New ancillaries

Brainstorm Session

To define more possible commission-based service/product, a brainstorm session was also conducted. It focused on creating services during their in-flight, transfer and post-flight experiences. The result can be seen in Figure 38.

Goal: come up with a possible commission-based service/product that tourists might use during travel journeys as much as possible.

Participants: 5 students of IDE faculty who have the experiences of taking long-haul fight as tourists

How: First of all, participants were introduced to OBP. Then, they were asked to share their last traveling experience, and discuss what kind of services/products that they were willing to pay for during their trip. Meanwhile, they can write down these services on post-its and stick them on the corresponding category on the whiteboard. Lastly, all these notes were reviewed to define the potential commission-based service/product for the next test.

Some collages of traveling and flying was provided to evoke the memories of traveling by plane.

6.2 Acceptance of ancillaries

Online questionnaire survey with tourists

After generating all these possible ancillaries, I still need to find out users' attitudes toward them. In this case, an online survey was conducted with 42 participants who have experience of being tourists to investigate the acceptance of these new possible products/services. In addition, the participants were also asked about their recommendations for new possible services to explore more possibilities.

Since most of the in-flight ancillaries are existed or not applicable, this research only investigated the ancillaries about the transfer and post-flight experience.

The result shows that tourists were mostly interested in public transportations (service of buying urban traffic and intercity transportation tickets for their trip). They are also pretty interested in checking the shopping area and restaurants in transfer airport; buying local phone cards with data packages; luggage storage service; booking tickets of attractions on their destination(see Figure 39). Some participants propose more service about connecting transportation, like the time table of connected bus/train and map of connecting services. The detailed information about the content of the questionnaire and results can be found in Appendix H.

Figure 37. Brainstorm Session

POSSIBLE ANCILLARIES

✈ In-flight experience

- Rent a noise cancelling headphone
- Extra free earplugs
- Get an extra special head-resting pillows
- Get extra blankets
- Extra special local food of destination

🔄 Transfer experience

- Check the restaurants on transfer airport
- Check the shopping area on transfer airport
- Pay for the lounge on the transfer airport

🏠 Post-flight experience

- Rent a car for the trip
- Check the shopping area on transfer airport
- Buy intercity transportation (bus, train) tickets for the trip
- Buy urban traffic (bus, tram, metro) tickets (like 3-day tickets) for the trip
- Book hotels on the destination
- Book hotels on the destination
- Buy a local phone card with data package for the trip
- Buy a local phone card with data package for the trip
- Check the post office/ delivery service for sending gifts or postcards
- Book tickets of attractions on the destination
- Book guided tours hosted by local guides to experience local culture (like food tour, handcraft tour or biking tours)

Figure 38. Possible ancillaries.

ACCEPTENCE

✈ **Transfer experience**   🏠 **Post-flight experience**

Most popular

Buy intercity transportation (bus, train) tickets for the trip

Buy urban traffic (bus, tram, metro) tickets (like 3-day tickets) for the trip

Check the restaurants on transfer airport

Book a Taxi for the trip

Check the shopping area on transfer airport

Book tickets of attractions on the destination

Buy a local phone card with data package for the trip

Pretty Interested

Buy a local phone card with data package for the trip

Pay for the lounge on the transfer airport

Rent a car for the trip

Book hotels on the destination

Book hotels on the destination

Check the post office/ delivery service for sending gifts or postcards

Not very Interested

Book guided tours hosted by local guides to experience local culture (like food tour, handcraft tour or biking tours)

Figure 39. Acceptance of ancillaries.

7

Define final design direction

All four primary concepts is compared in this chapter, and one of them is chosen to develop further. The profiles of tourist with correspond personality is also established for next step design.

7.1 The final design direction

Each concept represent a direction separately. However, one final design direction need to be chosen to develop to be the final concept. After consider many factors, the concept 4 is the most promising one to continue.

There are the reasons:

- Concept 4 is the most popular one in the minor test.
- Concept 4 is the most suitable platform to apply the well-accepted ancillaries (booking ticket of future transportation and attraction).
- According to the test, people experienced

most differently between high and and low conscientiousness, which shows that the needs and concerns are most relevant with personality traits in post-flight experience area.

- Concept 4 is also suitable to be applied on the OBP

The detailed explanation can be seen in Figure 40.

Therefore, the final concept design will focus on how to provide suitable service for both travelers with high/low on the post-flight period. The ancillaries about public transportation and tourist attractions were chosen to be applied for the final design.

	Concept 1	Concept 2	Concept 3	Concept 4
Preference	★	★★★★	★★★	★★★★★
Possibility to apply well-accepted ancillaries	★	★★★★	★★★	★★★★★
	Low, in current situation, it is hard to see what kind of ancillaries can be applied and how to apply them. Even though it is a good choice to improve passenger experience	High, it can be combined with the shop and restaurant at the airport. They are pretty well-accept ancillaries.	Medium, it can also be combined with the shop and restaurant at the airport, but the map is not interactive, so more information about restaurants and shops at the airport cannot be check.	Very high, it can combine with much post-flight ancillaries like public transportation and attraction relevant ancillaries, which are very popular among the tourist.
The personality influence	★★★	★★★	★	★★★★
	High, people experienced quite differently between high and low extraversion, the result may be not that accurate since the sample size of people in high extraversion is very small—only one of them have high extraversion traits.	Medium, people experienced not much differently between high and low openness, they all are willing to try it. The only difference is low openness need some recommendations for it.	Low, all passengers would like to use it. They all have concerns about the transfer.	High, people experienced very differently between high and low conscientiousness, people with high conscientiousness would like to use it, while most people with low conscientiousness think it is not that necessary.
Is it suitable for OBP?	★★★★★	★★★	★★★★	★★★★
	High, it is especially for the in-flight experience and OBP	Medium, many participants believe this function is more useful on an app when they already at the airport.	High, people like the function to check their transfer stage beforehand, since many travelers worry about that.	High, the long-haul flight is boring, and it is a good chance to allow them to do something helpful for their flowing trips, like make a travel plan

Figure 40. Detailed comparison

7.2 The profiles of target groups

In the post-flight phase, the behavior of passengers with a high and low level of conscientiousness was
insights in chapter 4 and 5, and explains passengers' characters, concerns and needs in that phase. The desi
conscientiousness traits are also defined.

High conscientiousness tourists

Characters

People with a high level of conscientiousness
indicate a preference for planned rather than
spontaneous behavior. (Costa, P. T., McCrae,
R. R.,1992). They are organized, show self-
discipline and behave dutifully. (Goldberg,
1990; Gosling, S.,2008). People high in
consciousness deal with problems and
confrontations head-on. (Preston Ni, M.S.B.A.,
2014)

They tend to be well-considered and plan
things ahead. They are more structured and
want to do every single task well. Therefore,
they try to optimize their routine and search
for more information when facing uncertainty
or unfamiliar things, such as traveling to a new
country and meet new things.

Preference

Passengers in high consciousness would
try to explore the possibility and make an
updated plan for reference.

"*It convenient, when I am too busy to make a
plan beforehand, I'll use it.*"

"*I might use it to complete my plan.*"

"*I'll use it for reference.*"

DESIGN GOAL

Help them arrange their trip
better with a long-term plan
when traveling to a new country.
Offer them a chance to be more
prepared for the further trip and
reduce unexpected.

Needs

- Organized structure
- Well-considered plan for their trip
- Sense of control
- Do everything right

Concerns

- Out of control
- Unprepared trip
- Unfamiliar stuff
- Failure

Desired Interaction Qualities

- Organized structure
- Well-considered plan for their trip
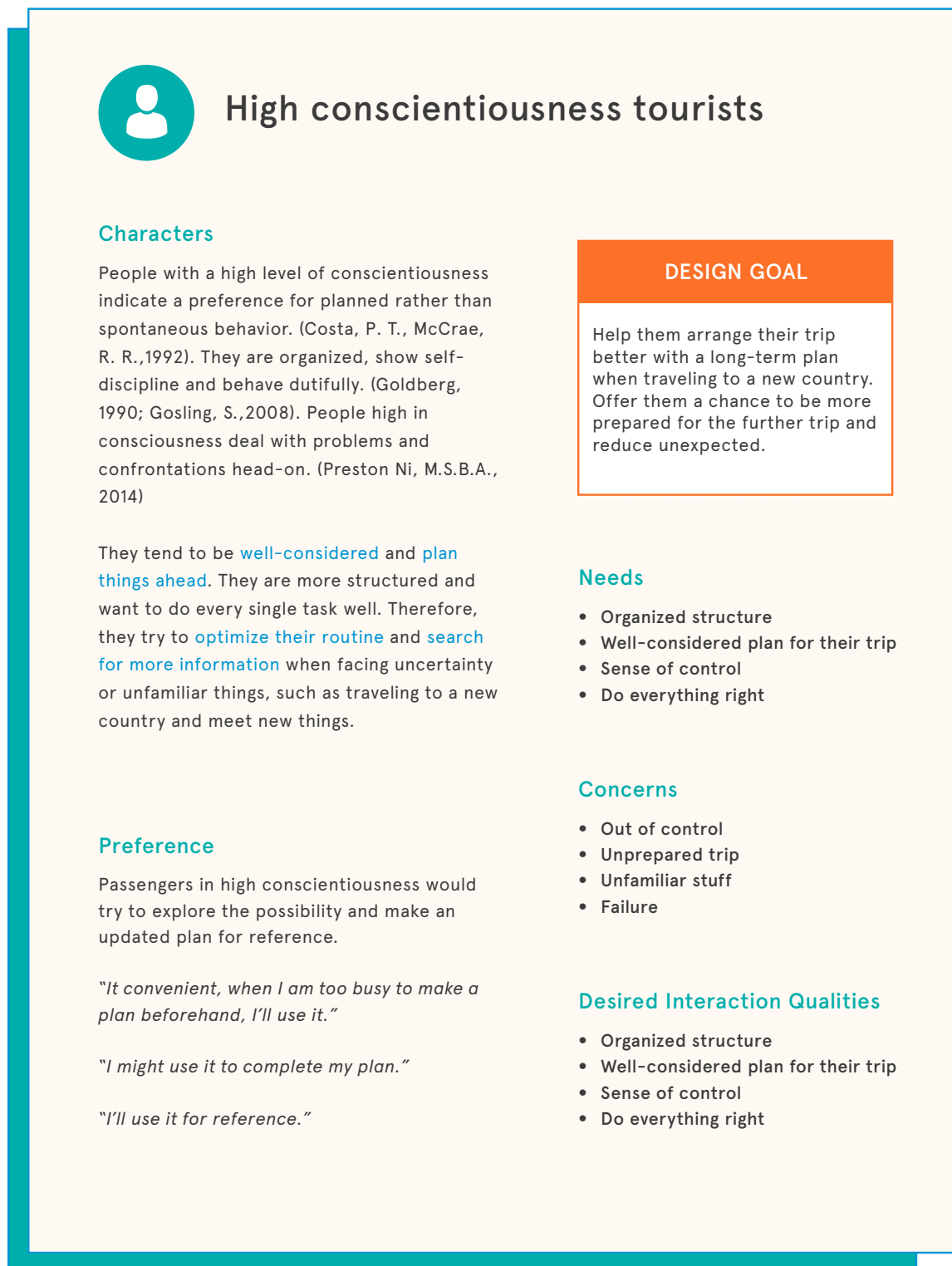- Sense of control
- Do everything right

Figure 41. High conscientiousness tourists

Figure 42.

quite different. The profiles below combine the finding and
ign goal and interaction qualities of the services for high / low

Low conscientiousness tourists

Characters

People who score low on conscientiousness tend to be laid back, less goal-oriented, and less driven by success. (Costa, & McCrae, 1992). Low levels of conscientiousness are strongly associated with procrastination. (Dewitt, 2002). Low consciousness people like doing things their own way. (Preston, 2014). Low conscientiousness is associated with flexibility and spontaneity. (Toegel & Barsoux, 2012).

They tend to prepare one step a time and do not want to take too much effort in preparation. They are less goal-oriented and prefer spontaneous way of traveling. They want more freedom and flexibility and they don't want to be forced to change.

Preference

Passengers in low conscientiousness think a rough plan they made beforehand is enough, they want to go to the place they really want to go. They want more freedom.

"I don't need a too detailed plan. A general plan is enough."

"I only want to focus on the places I really interest in. I'll consider the rest after I actually start my trip"

"I am more motivated to prepare for the things I need to do first, like figuring out how go to my hotels."

DESIGN GOAL

Help them arrange their trip better with a long-term plan when traveling to a new country. Offer them a chance to be more prepared for the further trip and reduce unexpected.

Needs

- Organized structure
- Well-considered plan for their trip
- Sense of control
- Do everything right

Concerns

- Out of control
- Unprepared trip
- Unfamiliar stuff
- Failure

Desired Interaction Qualities

- Organized structure
- Well-considered plan for their trip
- Sense of control
- Do everything right

Low conscientiousness tourists

8

Concept development

This chapter introduces the process of developing the final design concept for tourists with high/low level of conscientiousness.

8.1 Concept development

Personalized experience

The way how to provide the personalized experience can be seen in Figure 43.

The details about how and when to recognize personality is not the focus of this project. The research result of Mngqi Yuan (2017) shows passengers are willing to provide some personal data by filling in short questionnaires to get more personalized service.

As for the traveler with medium conscientiousness, the functions won't be highlighted. They can choose to use these functions or not by themselves. Since their conscientiousness trait is in medium level, it is possible they try both functions during the flight.

Functionalities

After defined the final design goals for target groups, the functions were clarified to fulfill these goals. There are two functions of this concept, one of them is for travelers with low level of conscientiousness, and the other one is for travelers with high level of conscientiousness.

Function1: First step transportation guidance (for travelers with low level of conscientiousness)

The first thing after landing is gonging to their residence. When travelers go to a different country, they normally are not familiar with local transportation, so the first step guidance should be traffic-related. Travelers always want to find the most proper transportation. This function allow them do it during the fight, which is time-saving and efficient.
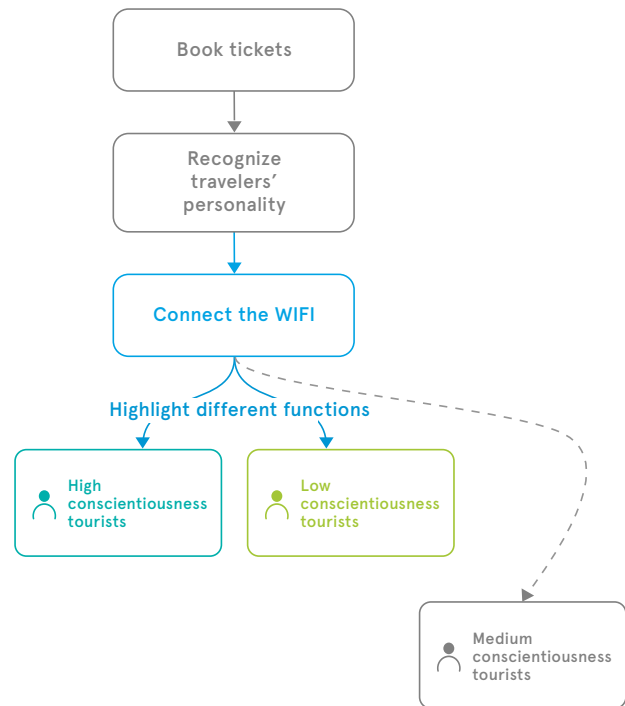
Figure 43. Personalized experience

Detailed functionalities:
- Arrange the transportation to go to hotel.
- Compare different modes of transportation.
- Figure out how to go to the spot of connected bus/taxi/train
- Buy revenant public transportation tickets
- Order TAXI

Function 2: exploration and arrange travel plan (for travelers with high level of conscientiousness)

According to the previous test results, I have made some updates of the original concept. The most important one is adding the map mode for exploration

Detailed functionalities :
- Record trip duration and interested themes
- Recommend suitable places and activities
- Explore different places and activities on the map of the destination
- Highlight reserved hotel on the map of the destination
- Save liked places

- Arrange the travel plan
- Buy pubic transportation

Scenarios

Two scenarios was created as the aspired situations of using the OBP

Scenario 1 for function 1 (tourist in low conscientiousness):

1. After connected the WIFI, the traveler knows he can use all these services on the OBP without pay for the WIFI package because of the introduction pages, and he noticed the first step transportation function is highlighted.

2. The traveler realizes the flight is about to landing soon, and he remembers this function and go back to the OBP to see how to go to the hotel.

3. He compares different modes of transportation by checking the cost of time and money.

4. He decides to buy a train ticket to the city center through OBP

5. He goes to his hotel smoothly and doesn't have to wait in line at the airport to buy the train tickets at the service desk.

Scenario 2 for function 2 (tourist in high conscientiousness)

1. After connected the WIFI, the traveler knows he can use all these services on the OBP without pay for the WIFI package because of the introduction pages, and he noticed the function of exploration and arrange travel plan is highlighted.

2. The traveler feels bored during the long-haul flight, and he remembers this function and tries to use it to spend time.

3. He notices he can buy the day ticket through the function, so he buys it immediately since it is really convenient for his trip.

4. Through this function, he finds more interesting places he didn't notice before.

The workflow

A flow chart was created to figure out the right workflow of all these functionalities. The flow chart can be divided in 3 parts—connect to the WIFI, arrange travel plan and explore destination, and first step transportation guidance.

Connect to the WIF

This part includes how penners go to the OBP, understand the website and login.
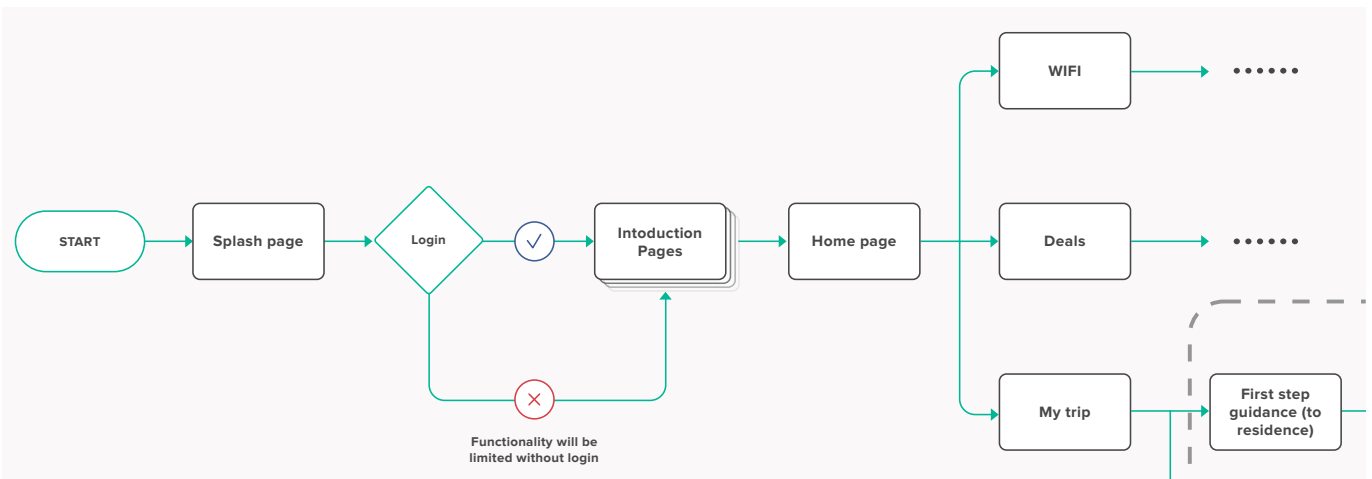
Figure 44. Flow of connect to the WIFI

Arrange travel plan and explore destination

This section includes the flow of using this function to find more interesting place and arrange agenda. The entrance of this function is in my trip page. See Figure 45.
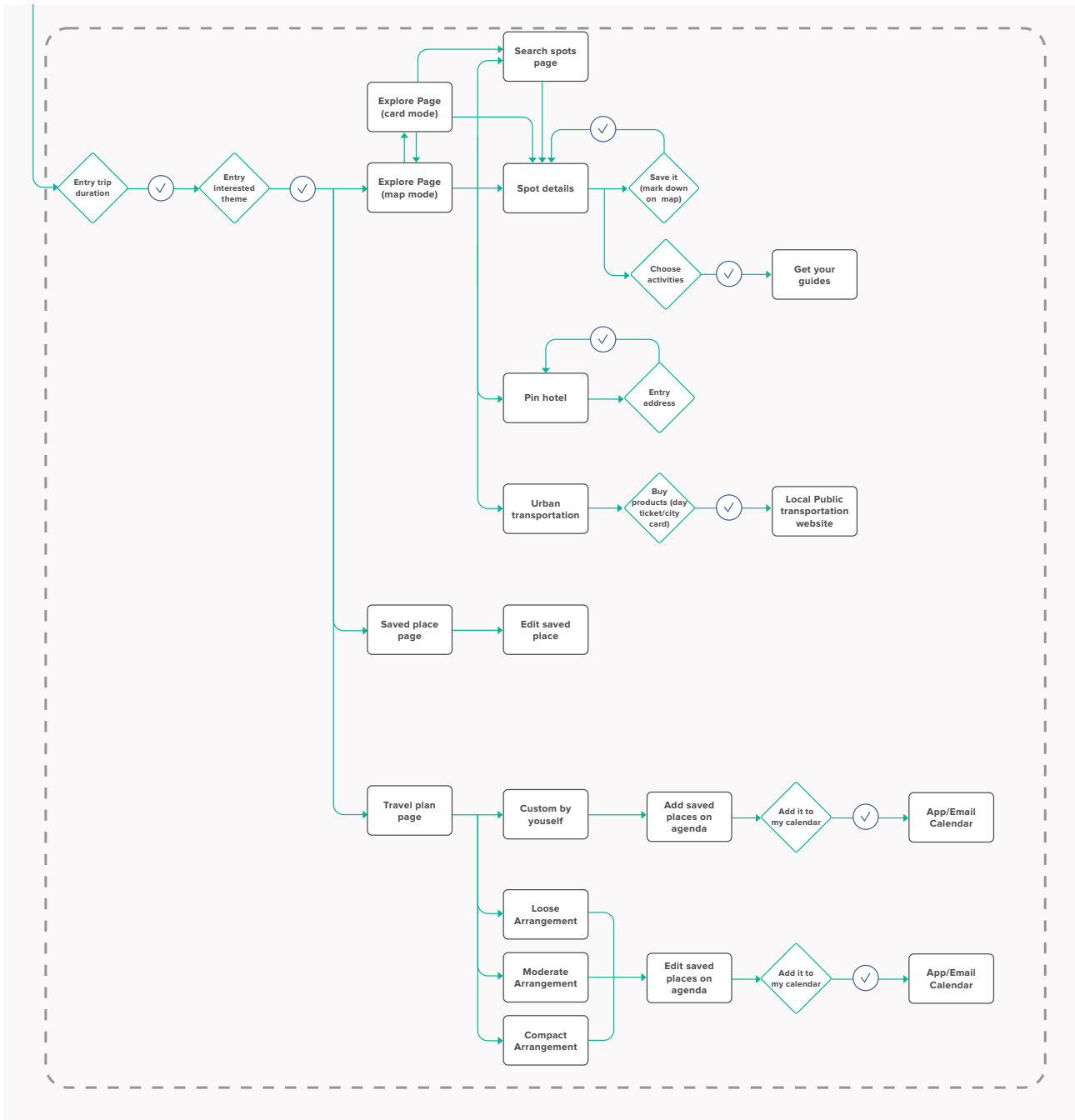
Figure 45. Flow of arranging travel plan and explore destination

First step transportation

This section includes the flow of using this function to find proper connected transportation, see Figure 46. The entrance of this function is in my trip page as well.
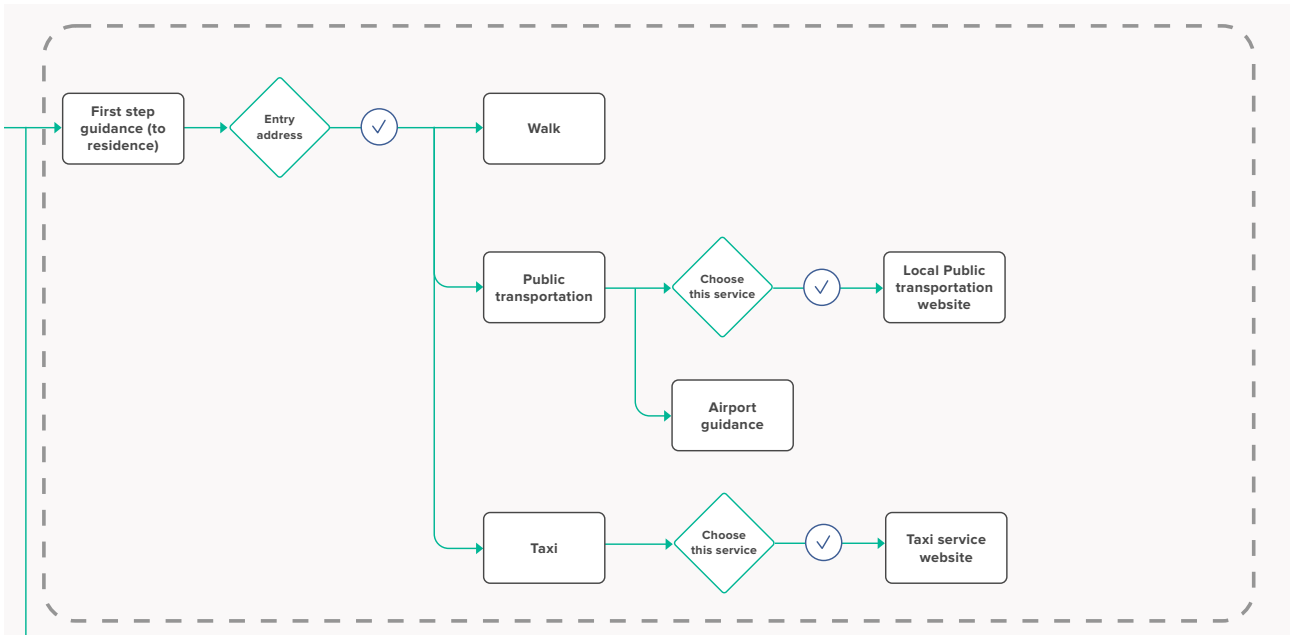
Figure 46. Flow of first step transportation

Low Fidelity Concept

Based on the flowchart, the low fidelity wireframes are sketched to show the content, screen layout as well as the interactions.

Figure 47. Low Fidelity Concept

High fidelity Concept

After the evaluation with coaches and some iterations, the high fidelity concept was created. See figure 47. More details of each pages can be seen in Appendix I.
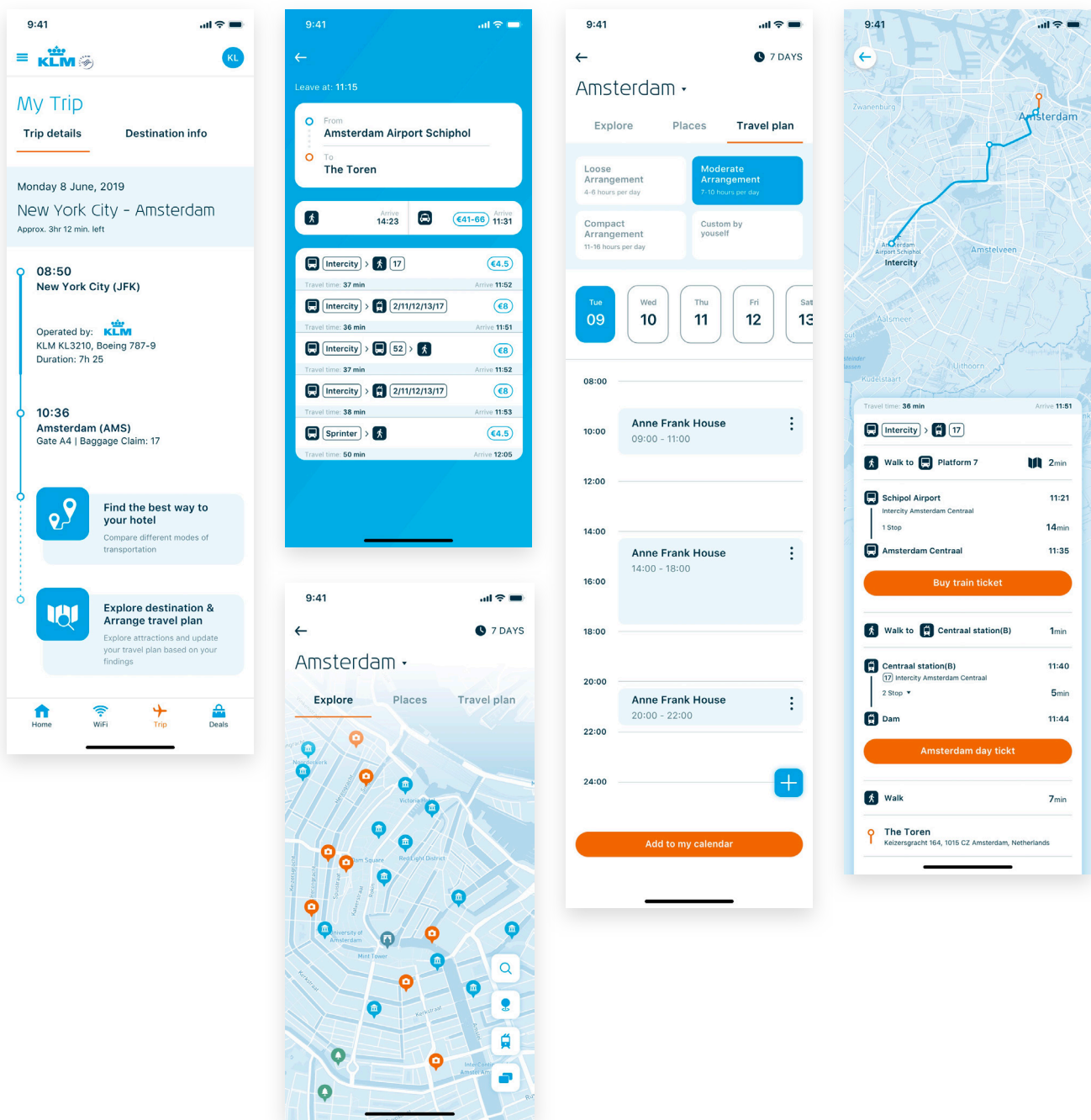
Figure 48. Low Fidelity Concept

8.2 Concept improvement

Another small concept evaluation was conducted to find out which part of the concept needs further modification. The aim is to discover the flaws of the current design and get insights and suggestions that could be used for improvements to the final design.

Participant: 6 employees of KLM Joined this session, their ages vary from 25 to 50, and they come from India and the Netherlands. Since my first minor test was done in TU Delft, it is nice to get feedback from other groups to prevent bias.

Test procedure: The test was conducted in KLM headquarter. Firstly, participants ware introduced with scenarios in chapter 8.1. Then, a digital prototype created by sketch and Protopie (Figure 49) was provided for them to display the concept. They were asked to operate the prototype twice for each function and think out loud during the test, meanwhile, I facilitated participants by correcting them when they went to the wrong directions and explaining the function afterward. In the end, an interview session was conducted to obtain more insights and suggestions for design improvement. Participant's words were recorded for further analysis.

Figure 49. he participant is testing the prototype

During the test, many valuable and constructive feedbacks were tgathered

Function of first step transportation guidance

"It is nice to see this function when I am checking the timeline of my trip"

"I would expect to see more details about the cab, so I can choose the most affordable one"

"It will be better if I can check more details of the Taxi option, the price and capacity. I usually travel with my family so I want to see how many people the cab can carry."

"I prefer to have more options. I like to use Uber if that is possible because it more cheap and trustful for me"

"It seems like you are highlighting the Taxi and Walk, but I usually don't use these modes of transportation."

"I prefer to check how is the hotel looks like, so I can recognize it when I arrived"

"I will use it to check the traffic information, but I may not actually buy it through this website. Because I will worry about if I can actually catch them"

"When I set the departure time, I don't know how much buffer time I need on the airport"

Function of first step transportation guidance

"It is also nice to use this function when I am checking the timeline of my trip"

"I am looking for the filter, so I can find a place quickly"
t
"I would like to have some help when I arrange the travel plan, for example, it will be great to know if all these places can be fit in one single day."

"I usually use Lonely Planet for reference, the explore function is really helpful for me"

"I thought loose arrangement means a longer interval between two places, so I don't have to hurry up."

"The pin my hotel button is new to me, the icon is a little confusing. I thought its function is helping me locate my location"

"I usually travel with my family and they will help me arrange the trip, but if I travel alone, I defiantly will use it."

"The loose arrangement is really helpful. Some people may like to visit 5 museums a day, but I prefer to focus on one museum and spend more time on it"

"More option of themes will be great"

"the word 'place' is a little confusing, I didn't know what is it until I tap it"

Insights:

Overall
- Adding both functions on the timeline attract travelers to use them

The buttons of both functions were added on the timeline. Travelers can easily see these functions because most of them will go to the timeline to check the fight information. Users mentioned that they were curious about these functions and would like to try it when they noticed them.

Function of first step transportation guidance

- Prefer to check more information about the taxi

Participants mentioned they want to check the details of the Taxi option including the price and capacity before going to the third party Taxi website.

- Prefer to highlight public transportation instead of Taxi and walk

The public transportation is the most commonly used mode of transportation and is supposed to be highlighted.

- More options for transportation

Car-hailing service like Uber is more popular than Taxi among some travelers, since it is cheaper and trustful, and should be added.

- The buffer time on the airport needs to be indicated

The biggest concern about booking taxi/ public transportation is the risk of miss them. Participants want to know the buffer time at the airport like the time they need to spend on the baggage claims and customs. In this way, they are more confident to book taxi or to buy train/bus tickets.

• More visual information of hotels(destination) is needed

Travelers expect to see how is their hotel looks like, so they can easily find their hotels after arrival.

Function of exploration and arrange travel plan

• Filters for the card mode of attraction display is needed

It can help users categorize the places and find their interested places more efficiently.

• Helps when arranging the plan by users themselves

Users want to know if the plan is feasible and reasonable, for example, if they have enough time to actually visit all these places arranged on the agenda.

• Icons and buttons should be clear enough to link to their functions

Otherwise, users may be confused about the functions of certain buttons. It will influence their experience of using certain functions of OBP.

• The travel plan recommendation

function helps travelers find a suitable arrangement

People have different preference about their travel plans. These three kinds of arrangement is a good referent

Concept modification

Function of first step transportation guidance

• The my trip page
Add the predicted baggage waiting time and need time on customs on the timeline

• The transportation comparing page
Re-arrange the layout to highlight the public transportation

• Add the option of Uber

• The detailed page of taxi
Shows capacity and price of each option

• The picture of hotels
Pictures of hotels were added on each detailed page of transportation

Function of exploration and arrange travel plan

• Card mode page
The filters were added

• Notifications
When the distance between 2 places is too long. A notification will pop out and say all these places cannot all be visited in a day

• The explore page
Change the icon of pin hotels
Change the "places" to "favorite"

The start point

The splash page is the start point of the while OBP, it will pop out when passengers connected to the WIFI. After clicking the orange button of the splash page, trailers will be lead to the home page where they can choose the WIFI package and check offers with deals.

The my trip page is the start point of my concept. Travelers can check the flight information on this page. The timeline is also a progress bar that shows the progress of the flight.

The predicted waiting time of customs and luggage claim is shown on the timeline to reassure travelers that they can catch they connected transportation and help them make their mind to book it during the flight.

The button of both functions is included in the trip timeline. Since the travel plan is for the future, so the timeline of this part is the dotted line. Those two buttons will be highlighted based on users' conscientiousness to draw their attention.

Almost there!

Just a few more steps to go online! Click below to continue to KLM's onboard portal.

Open browser

Not working? Just copy and paste this link in your browser:

https://connect.klm.com

| Home | WiFi | Trip | Deals |

English ▾

KL

My Trip

Trip details | Destination info

Monday 8 June, 2019

New York City - Amsterdam
Approx. 3hr 12 min. left

08:50
New York City (JFK)

Operated by: KLM
KLM KL3210, Boeing 787-9
Duration: 7h 25

10:36
Amsterdam (AMS)
Gate A4 | Baggage Claim: 17

Baggage wait time: Approx. 15 min

Time in customs : Approx. 10 min

Find the best way to your hotel
Compare different modes of transportation

Explore destination & Arrange travel plan
Explore attractions and update your travel plan based on your findings

| Home | WiFi | Trip | Deals |

Searching and comparing

After clicking the first step transportation guidance button, users will go to a search page. They can search for their residence and set the time to set off. It is pre-setted base on the landing time and needed buffer time.

By input their hotel or residence's name, users will go to the overview transportation page, where they can check the cost of time and money to choose the most suitable transportation for them.

9:41

≡ **KLM**

My Trip

Trip details

Monday 8 Ju

New York

Approx. 3hr 12 m

08:50
New York

Operated
KLM KL32
Duration: 7

10:36
Amsterd
Gate A4 |

Baggage

Time in cu

⌂
Home

Screen 1 (Destination info)

ll 🔋

KL

Destination info

ne, 2019

k City - Amsterdam

in. left

k City (JFK)

by: KLM

10, Boeing 787-9

7h 25

am (AMS)

Baggage Claim: 17

wait time: Approx. 15 min

stoms : Approx. 10 min

Find the best way to your hotel
Compare different modes of transportation

Explore destination & Arrange travel plan
Explore attractions and update your travel plan based on your findings

WiFi | Trip | Deals

Screen 2 (Search)

9:41   ll 🔋

←

Leave at: **11:15**

🔍 Where are you going?

Screen 3 (Routes)

9:41   ll 🔋

←

Leave at: **11:15**

From
Amsterdam Airport Schiphol

To
The Toren

🚌 Intercity › 🚆 17   €4.5
Travel time: **37 min**   Arrive **11:52**

🚌 Intercity › 🚆 2/11/12/13/17   €8
Travel time: **36 min**   Arrive **11:51**

🚌 Intercity › 🚌 52 › 🚶   €8
Travel time: **37 min**   Arrive **11:52**

🚌 Intercity › 🚆 2/11/12/13/17   €8
Travel time: **38 min**   Arrive **11:53**

🚌 Sprinter › 🚶   €4.5
Travel time: **50 min**   Arrive **12:05**

🚕 TAXI   €41-66   Arrive **11:31**

Uber   €26-66   Arrive **11:31**

🚶 Walk   Arrive **14:23**

Detail page for different transportations

Users can click to go to the detailed page to check more info, like the detailed public transportation, or detailed information of different Taxi classes.

An airport map is provided to help people go to the right place for their connected transportation. It is downloadable, so users can still check it after landing.

If they decided to buy some services, they can click the yellow button to the 3rd party website to buy them.

Screen 1 (left):

e: **16 min** Arrive **11:31**

AXI €41-66

alk to Pick up spot 2min

andard 4 max €41

nivan 11 max €50

siness 4 max €52

siness Minivan 8 max €58

emium 4 max €60

emium Minivan 8 max €66

More Info

e Toren
ersgracht 164, 1015 CZ Amsterdam, Netherlands

Screen 2 (middle):

9:41

Travel time: **36 min** Arrive **11:51**

Intercity > 17

Walk to Platform 7 2min

Schipol Airport 11:21
Intercity Amsterdam Centraal
1 Stop 14min

Amsterdam Centraal 11:35

Buy train ticket

Walk to Centraal station(B) 1min

Centraal station(B) 11:40
17 Intercity Amsterdam Centraal
2 Stop ▾ 5min

Dam 11:44

Amsterdam day tickt

Walk 7min

The Toren
Keizersgracht 164, 1015 CZ Amsterdam, Netherlands

Screen 3 (right):

9:41

Arrival Filter
Odd-size Baggage
ets
aggage Claim 17 Baggage Claim 15
Toilets
Banner Express Toil
Grand Café Plaza Fleurtiek Leon Gall & Gall
Esprit De Verspillingsfabriek Meetingpoint
Car Rental AKO kiosk Treinen NS T
Health Food Wall Plaza
Door D
Download map
Shuttle bus P3 / P4

Data record for recommendation

When they try to use the explore function, they could fill in some personal information for better content recommendation.

nich theme are
u interested in?

an recommend more proper activities
it your interests.

lture **Art** Shopping

tdoor **Family activities**

Skip **Confirm**

←

How long will be this trip?

We can recommend more proper activities and places if we know the duration of this trip.

06

07 Day

08

Skip **Next**

←

Amsterdam ·

Explore Favorite Travel plan

Noorderkerk

Victoria Hotel

Dam Square

Red Light District

Spuistraat

Kalverstraat

University of
Amsterdam

Mint Tower

Kerkstraat

InterContin
Amster Am

Pin hotel and buy day tickets

Pin hotel can help traveler discover nearby places. Day ticket is very useful and popular among tourist, it is good to offer them.

Screen 1 (partial):

your hotel

ur hotel on the map to find more
y interesting places or activities.

Search and add address

Toren
gracht 164, 1015 CZ Amsterdam, Netherlands

Confirm

Screen 2:

9:41

7 DAYS

Amsterdam ▾

Explore   Favorite   Travel plan

Noorderkerk
Victoria Hotel
Dam Square   Red Light District
University of Amsterdam
Mint Tower
InterContin
Amstel Am

Screen 3:

9:41

7 DAYS

Public transit

Public Transport Ticket or city card allow traveler enjoy unlimited access to all public transport lines throughout the city. Good choice for tourist.

PUBLIC TRANSPORT TICKET
Free ride of the city transport system

Check details

AMSTERDAM CITY CARD
Free ride of the city transport system. Multiple discount and free admission

Check details

Search and card mode

Users can search for the place they are already interested in. The map mode can switch to card mode. In card code, places can be ranked by interests or popularity. The filter can help find places more efficiently.

Anne Frank House

Anne Frank House

The diary of Anne Frank is undoubtedly the most famous one in the world. In what is now known as the Anne Frank House.

9:41

← 🕐 7 DAYS

Amsterdam ▾

Explore   Favorite   Travel plan

Ranked by: **Interest** ▾   ⚙️

Rijksmuseum
The Rijksmuseum tells the story of the Netherlands from the Middle Ages to the 20th century. Including works by Rembrandt and Vermeer. ♡

Anne Frank House
The diary of Anne Frank is undoubtedly the most famous one in the world. In what is now known as the Anne Frank House. ♡

Van Gogh Museum
Discover the world's largest collection of works by Dutch painter Vincent van Gogh, featuring many masterpieces. ♡

Moco Museum
The museum was founded with the mission of attracting broader and younger audiences, and of making art accessible to the public. ♡

Rembrandt House
Rembrandt lived and worked from 1639 to 1658 in this 17th-century house, which today is a museum that pays tribute to the artist's life. ♡

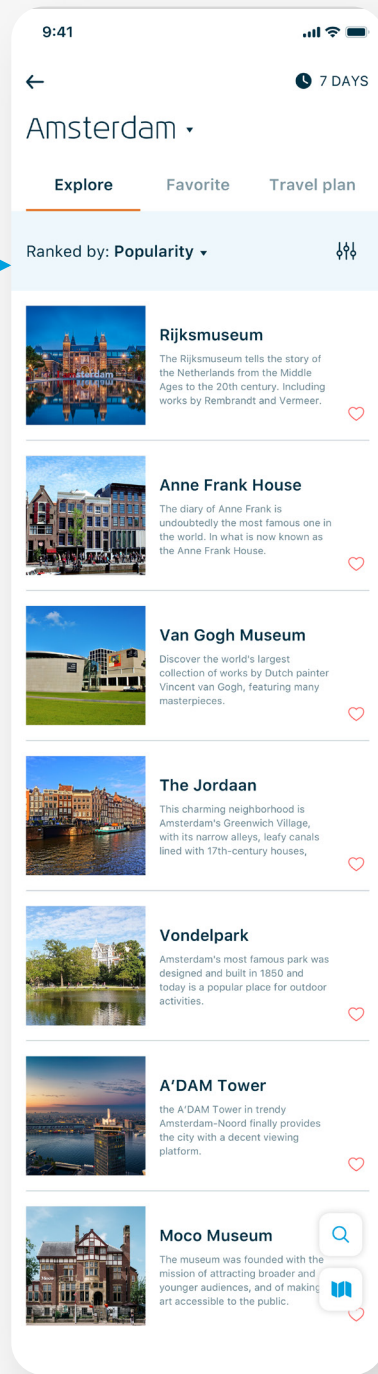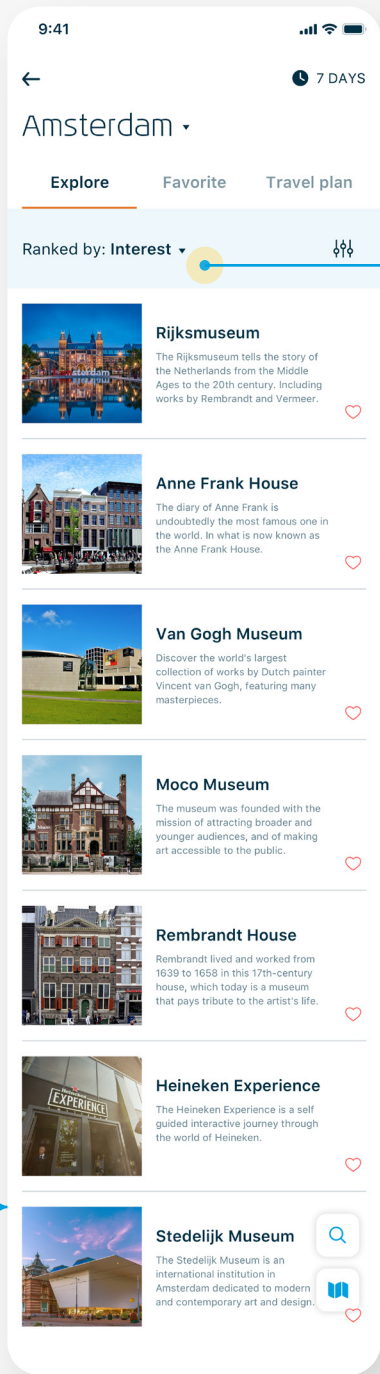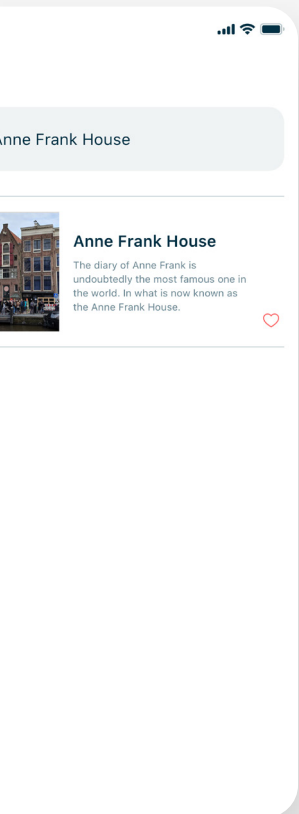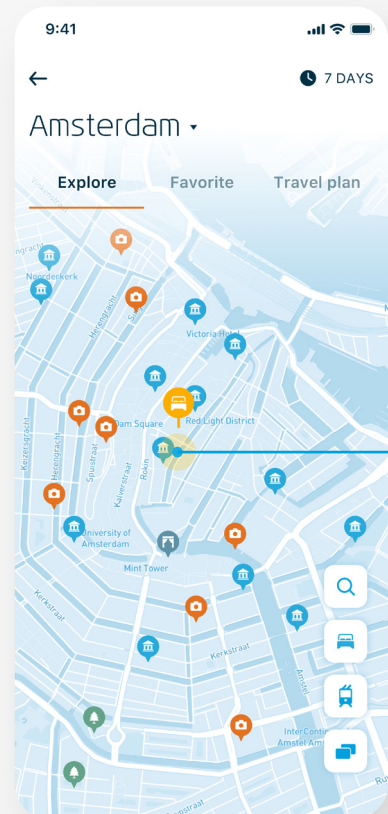**Heineken Experience**
The Heineken Experience is a self guided interactive journey through the world of Heineken. ♡

Stedelijk Museum   🔍
The Stedelijk Museum is an international institution in Amsterdam dedicated to modern   📖
and contemporary art and design. ♡

9:41

← 🕐 7 DAYS

Amsterdam ▾

Explore   Favorite   Travel plan

Ranked by: **Popularity** ▾   ⚙️

Rijksmuseum
The Rijksmuseum tells the story of the Netherlands from the Middle Ages to the 20th century. Including works by Rembrandt and Vermeer. ♡

Anne Frank House
The diary of Anne Frank is undoubtedly the most famous one in the world. In what is now known as the Anne Frank House. ♡

Van Gogh Museum
Discover the world's largest collection of works by Dutch painter Vincent van Gogh, featuring many masterpieces. ♡

The Jordaan
This charming neighborhood is Amsterdam's Greenwich Village, with its narrow alleys, leafy canals lined with 17th-century houses, ♡

Vondelpark
Amsterdam's most famous park was designed and built in 1850 and today is a popular place for outdoor activities. ♡

A'DAM Tower
the A'DAM Tower in trendy Amsterdam-Noord finally provides the city with a decent viewing platform. ♡

Moco Museum   🔍
The museum was founded with the mission of attracting broader and younger audiences, and of making   📖
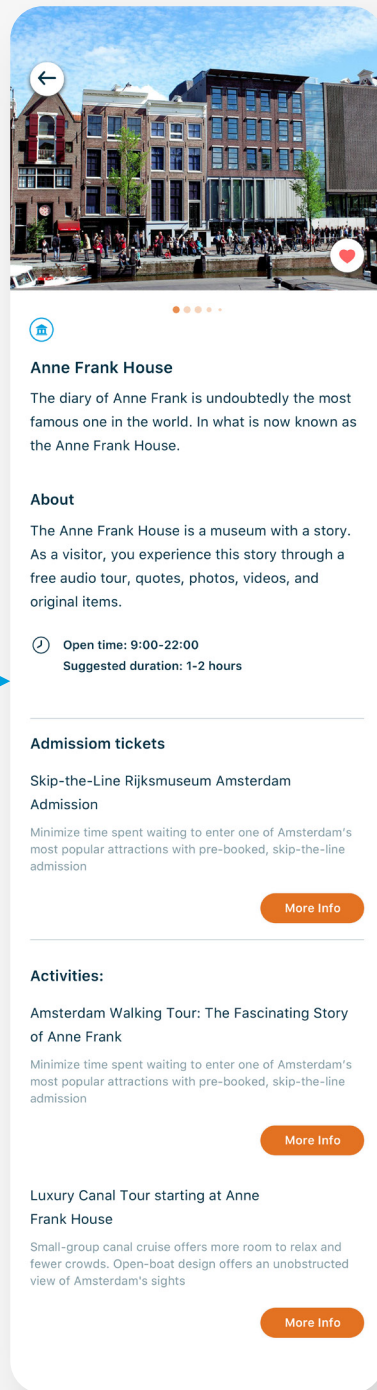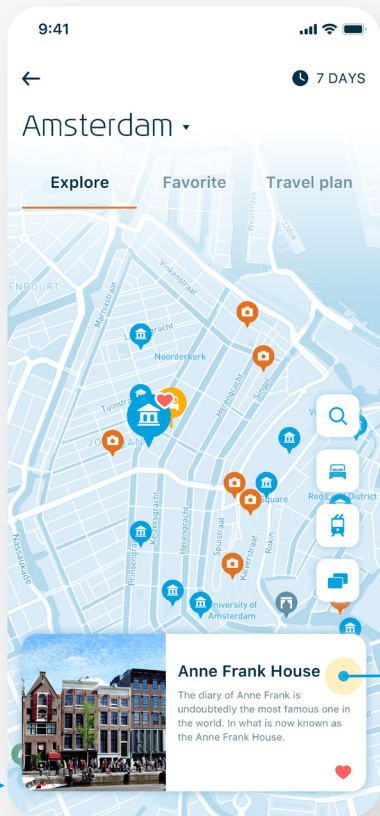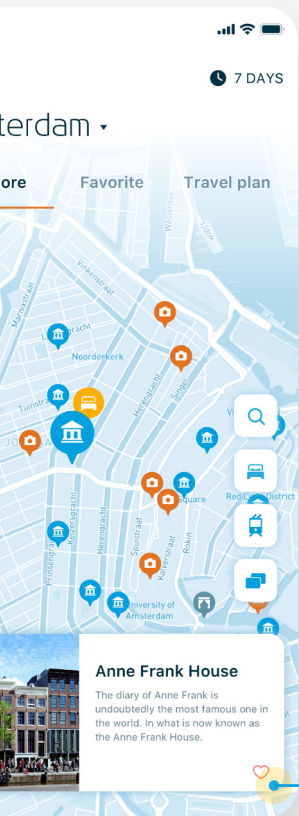art accessible to the public. ♡
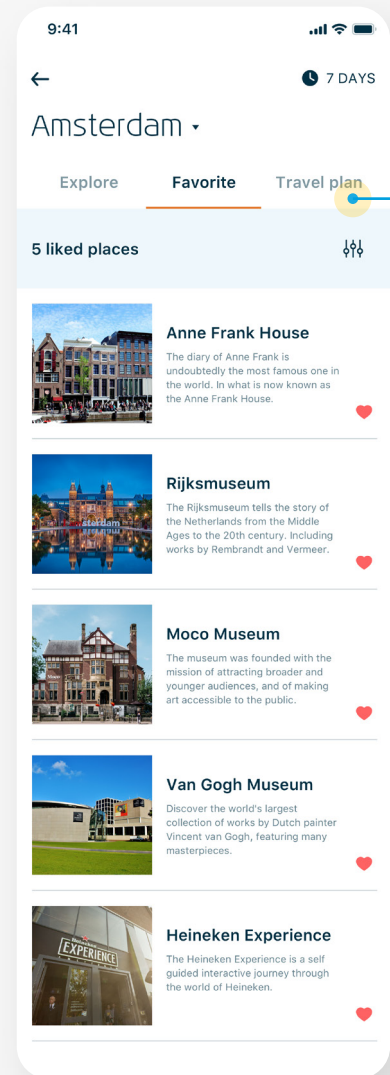
Check place and save it

When the user find places that they are interested in, they can click to check details, and "like" it. In this way, the spot is saved and highlighted on the map. Users can buy tickets on the detail page, they will be linked to 3rd party websites.

7 DAYS

terdam ▾

Favorite   Travel plan

ore

Amsterdam ▾

Explore   Favorite   Travel plan

Anne Frank House

The diary of Anne Frank is undoubtedly the most famous one in the world. In what is now known as the Anne Frank House.

Anne Frank House

The diary of Anne Frank is undoubtedly the most famous one in the world. In what is now known as the Anne Frank House.

Anne Frank House

The diary of Anne Frank is undoubtedly the most famous one in the world. In what is now known as the Anne Frank House.

About

The Anne Frank House is a museum with a story. As a visitor, you experience this story through a free audio tour, quotes, photos, videos, and original items.

🕐 Open time: 9:00-22:00
Suggested duration: 1-2 hours

Admissiom tickets

Skip-the-Line Rijksmuseum Amsterdam Admission

Minimize time spent waiting to enter one of Amsterdam's most popular attractions with pre-booked, skip-the-line admission

More Info

Activities:

Amsterdam Walking Tour: The Fascinating Story of Anne Frank

Minimize time spent waiting to enter one of Amsterdam's most popular attractions with pre-booked, skip-the-line admission

More Info

Luxury Canal Tour starting at Anne Frank House

Small-group canal cruise offers more room to relax and fewer crowds. Open-boat design offers an unobstructed view of Amsterdam's sights
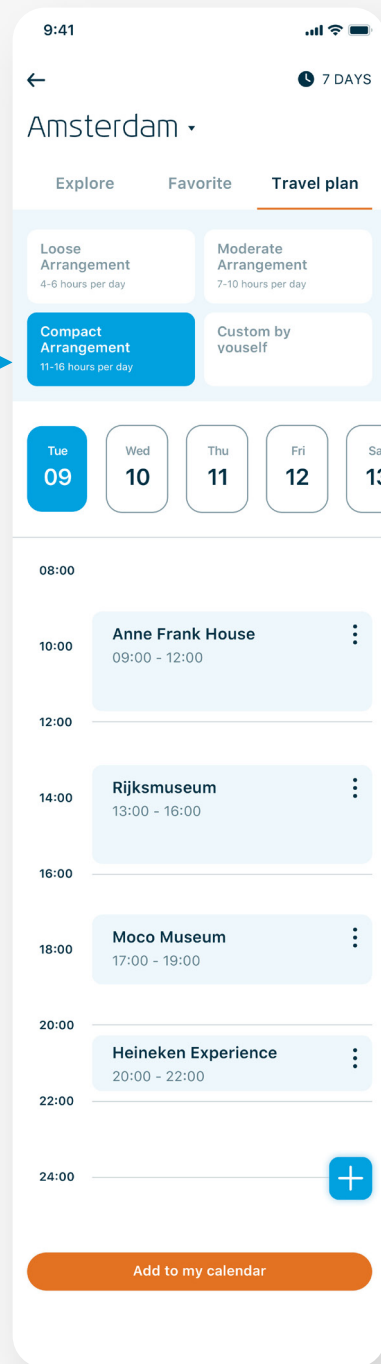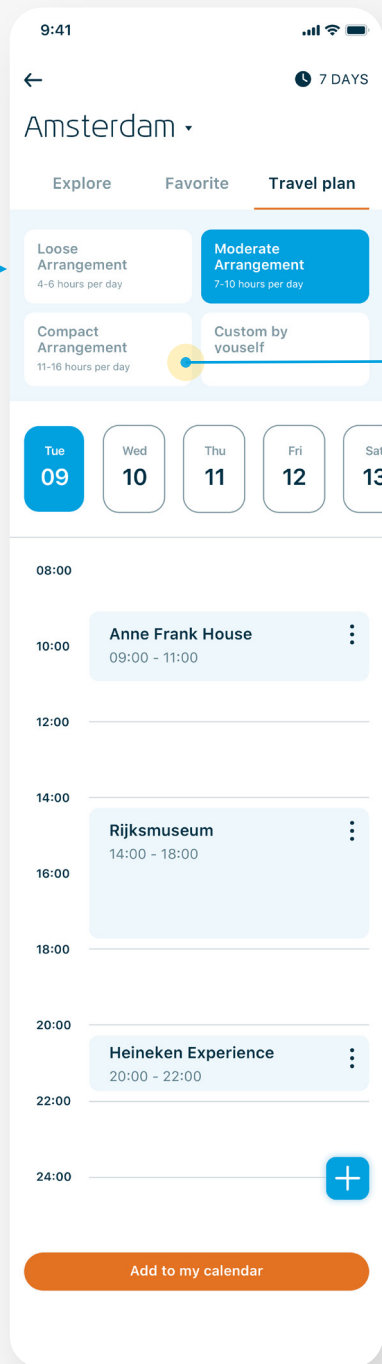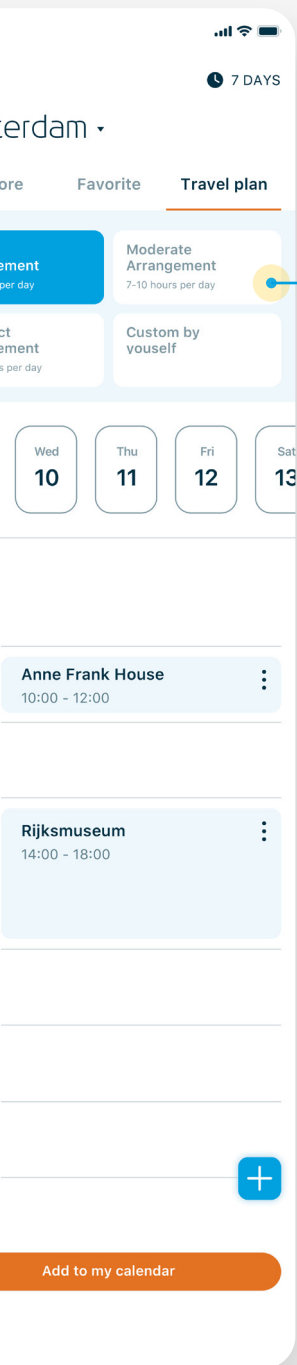
More Info
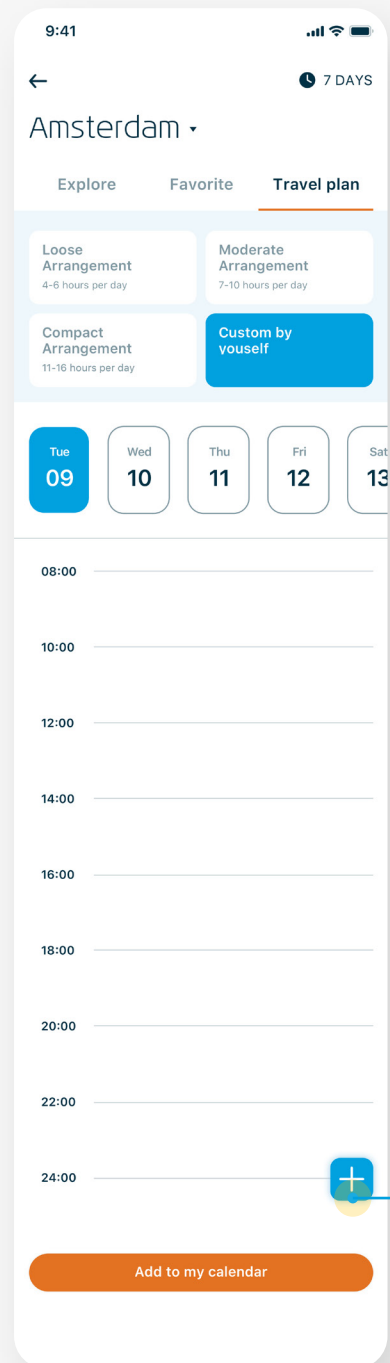
Edit saved place and arrange travel plan

The saved place can be edited in the "favorite" category. When the user goes to the travel plan category, he can choose from 3 pre-setted travel plans(based his interests and trip duration) or custom from an empty agenda. Of course, he can directly modify the pre-setted travel plan.

9:41

← 🕐 7 DAYS

Amsterdam ▾

Explore   **Favorite**   Travel plan

5 liked places

Anne Frank House
The diary of Anne Frank is undoubtedly the most famous one in the world. In what is now known as the Anne Frank House.

Rijksmuseum
The Rijksmuseum tells the story of the Netherlands from the Middle Ages to the 20th century. Including works by Rembrandt and Vermeer.

Moco Museum
The museum was founded with the mission of attracting broader and younger audiences, and of making art accessible to the public.

Van Gogh Museum
Discover the world's largest collection of works by Dutch painter Vincent van Gogh, featuring many masterpieces.

Heineken Experience
The Heineken Experience is a self guided interactive journey through the world of Heineken.

9:41

←

Amst

Explo

Loose Arrange
4-6 hours

Compac
Arrange
11-16 hours

Tue
09

08:00

10:00

12:00

14:00

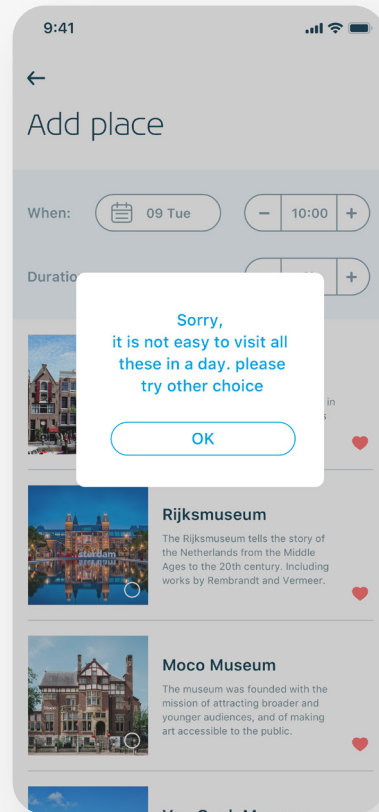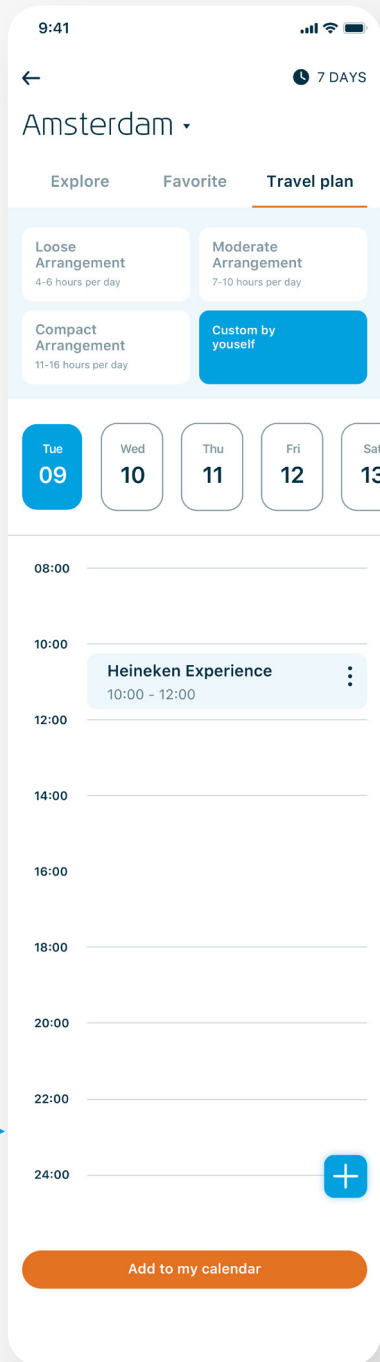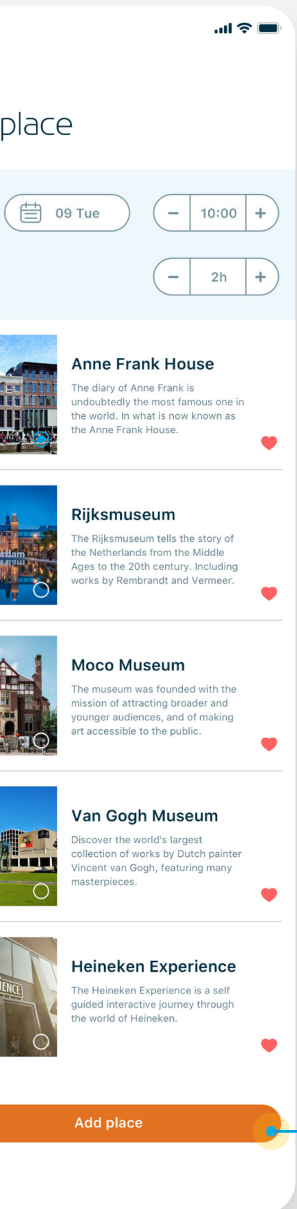16:00

18:00

20:00

22:00

24:00

Add saved place on agenda and send agenda to own devices

The user constant with an empty agenda, they add the saved places on it. When finished, he can also send it his own calendar app or his mailbox calendar. When the user is arranging the plan, and the distance between those places is too long, a notification will pop out and suggest he try other options.

place

09 Tue   — 10:00 +
          — 2h   +

Anne Frank House
The diary of Anne Frank is
undoubtedly the most famous one in
the world. In what is now known as
the Anne Frank House.

Rijksmuseum
The Rijksmuseum tells the story of
the Netherlands from the Middle
Ages to the 20th century. Including
works by Rembrandt and Vermeer.

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younger audiences, and of making
art accessible to the public.

Van Gogh Museum
Discover the world's largest
collection of works by Dutch painter
Vincent van Gogh, featuring many
masterpieces.

Heineken Experience
The Heineken Experience is a self
guided interactive journey through
the world of Heineken.

Add place

9:41   🕐 7 DAYS

←

Amsterdam ▾

Explore   Favorite   **Travel plan**

| Loose Arrangement 4-6 hours per day | Moderate Arrangement 7-10 hours per day |
| Compact Arrangement 11-16 hours per day | **Custom by youself** |

| Tue **09** | Wed **10** | Thu **11** | Fri **12** | Sat **13** |

08:00

10:00

Heineken Experience   ⋮
10:00 - 12:00

12:00

14:00

16:00

18:00

20:00

22:00   ⊕

24:00

Add to my calendar

9:41   ⣿⣿⣿

←

Add place

When: 📅 09 Tue   — 10:00 +

Duratio   —   +

Rijksmuseum
The Rijksmuseum tells the story of
the Netherlands from the Middle
Ages to the 20th century. Including
works by Rembrandt and Vermeer.

Sorry,
it is not easy to visit all
these in a day. please
try other choice

OK

Moco Museum
The museum was founded with the
mission of attracting broader and
younger audiences, and of making
art accessible to the public.

Van Gogh Museum

8.4 Interactive prototype

Please check https://share.protopie.io/VTh9iEkKw4S for the interactive prototype(Or scan the QR code in Figure 50). It is not a fully functional prototype. I only worked own my features due to the time constraint.

Figure 50. QR code of the interactive prototype

9

Final Evaluation

The final evaluation includes customer evaluation and expert evaluations, from customer's and company's perspective. According to the result, some recommendations are proposed.

9.1 Evaluation set-up

In this chapter, the new concept of OBP is qualitatively evaluated. The final evaluation includes customer evaluations and expert evaluations. The feedbacks from both sides are crucial for deriving the final conclusion and recommendation.

Customer evaluation

The research questions of customer evaluation are:

From the customer perspective

1. How personality (conscientiousness) influence travelers' feeling about the concept.
• If travelers in the same level of conscientiousness have the same preferences toward the functions and services of the concept.
• If travelers in different levels of conscientiousness(high/medium/low) have different preferences toward the functions and services of the concept.

2. To what extent do travelers feel the concept meet the design goal of helping them arrange their trip better with long-term plan and immediate guidance.

3. If the concept achieved the goal of improving user experiences and engagement of OBP

From the company perspective

4. If the concept stimulate travelers' their purchase intention of certain ancillaries (create revenue)
5. If the concept improves customer intimacy.

Expert evaluations

The research questions of expert evaluation are:

From the company perspective
1. If the concept is feasible to apply (Technical aspect)
2. If the concept has enough potential to create business value (Commercial aspect).

9.2 Customer evaluations

According to these research questions, some assumptions were proposed:

Assumptions

Function of first step transportation guidance

Research question 1: how personality (conscientiousness) influence travelers' feeling about the concept.

• This service helps traveler prepare my trip better and they are willing to try it again for a future trip (By comparing travelers' willingness to use the function again, their preference can be investigated)

Research question 2: To what extent do travelers feel the concept meet the design goal of helping them arrange their trip better with immediate transportation guidance.

• This service is convenient for my trip
• The comparing function can help me find a better mode of transportation to go to my residence
• The booking bus/train tickets function is helpful for my travel preparation.
• The function of guiding me to the right platform is to help fun and reduce the hassle.

Research question 3: if the concept achieved the goal of improving user experiences and

engagement of OBP

• This function makes Onboard portal more interesting

Research question 4: if the concept increase travelers' their purchase intention of certain ancillaries (create revenue)

• Travelers are willing to buy the public transportation tickets/day ticket through this service
• Travelers are willing to book TAXI/Uber through this service

Research question 5: if the concept improves customer intimacy.

• This service is helpful and relevant to travelers thems

Function of exploration and arrange travel plan

Research question 1: how personality (conscientiousness) influence travelers' feeling about the concept.

• This service helps traveler prepare their trip better and they are willing to try it again for the future trip
(By comparing travelers' willingness to use the function again, their preference can be investigated)

Research question 2: To what extent do travelers feel the concept meet the design goal of helping them arrange their trip better with long-term plan

• The function of searching for fun places and activities is interesting and helpful for my trip .
• "Pin hotel" function is relevant to the trip

and useful for me to explore my destination
• "Recommendations based on interests" is helpful for me to explore my destination
• The function of booking activity/entrance ticket is convenient and helpful for my travel preparation.
• The function of buying day tickets/city cards is convenient and helpful for my travel preparation.

Research question 3: if the concept achieved the goal of improving user experiences and engagement of OBP

• Arrange travel plan is fun and give travelers a sense of achievement
• This function makes Onboard Portal more interesting

Research question 4: if the concept increase travelers' their purchase intention of certain ancillaries (create revenue)

• Travelers are willing to buy the day tickets/city cards through this service
• Travelers are willing to book ticket of activities/entrance through this service

Research question 5: If the concept improves the customer intimacy.

• This service is helpful and relevant to travelers themselves

The aim of the customer evaluation is to answer research questions by validating these assumptions with travelers in different level of conscientiousness.

In order to validate these assumptions, a seven-point Likert Scale questionnaire was generated to measure their intention and feelings. The detailed questionnaire can be found in appendix J.

Participants

19 travelers with experience of traveling abroad as tourists were recruited for the evaluation of this concept. Most of them(16) are the staff of the KLM, and the rest of them(3) are students from different majors at TU Delft. Their gender was balanced. Participants aged from 20 to 60. They came from different countries including The Netherlands, India, Romania, Syria and China. The diversity is ensured.

Evaluation procedure

Participants took the same procedure in chapter 8.2, with two extra steps:

1.In the beginning, the level of participants' personality (conscientiousness) was measured by a questionnaire (see appendix K). Participants can be divided into 3 groups: travelers score high in conscientiousness, travelers score low in conscientiousness and travelers score medium in conscientiousness.

The questions on the questionnaire come from previous research of Mengqi Yuan (2017) and Ten-Item Personality Inventory (Gosling, S. D., Rentfrow, P. J., & Swann Jr, W. B. , 2003). In this way, the accuracy can be more guaranteed.

2. In the end, a scale questionnaire (see Appendix J.) was provided to evaluate the concept, and the following interview was based on the result of this questionnaire.

The whole process took 15- 25 min per participant.

Figure 51. Participants are testing the prototype and giving feedbacks

Test result

The detailed result of the questionnaire can be found in Appendix L.

👤 7 out of 19 participants scored high in conscientiousness.

👤 7 out of 19 participants scored medium in conscientiousness.

👤 5 out of 19 participants scored low in conscientiousness.

Result of first step transportation guidance function

👤 5/7   👤 6/7   👤 5/5
pretty agree that this service helps them prepare their trip better and they are willing to try it again for the future trip.

👤 6/7   👤 6/7   👤 4/5
pretty agree that this service is convenient for their trip.

👤 7/7   👤 7/7   👤 5/5
pretty agree that the comparing function can help them find better mode of transportation to go to their residence.

👤 6/7   👤 7/7   👤 5/5
pretty agree that the booking bus/train tickets function is helpful for their travel preparation.

👤 7/7   👤 7/7   👤 5/5
pretty agree that the function of guiding them to the right platform is help fun and reduce the hassle.

👤 7/7   👤 7/7   👤 5/5
pretty agree that this function make Onboard portal more interesting.

👤 5/7   👤 6/7   👤 5/5
pretty agree that I will buy the bus/train tickets through this service.

👤 4/7   👤 5/7   👤 4/5
pretty agree that they will book TAXI through this service.

👤 5/7   👤 5/7   👤 5/5
pretty agree that this service is helpful and relevant to them.

Result of exploration and arrange travel plan

👤 5/7   👤 6/7   👤 2/5
pretty agree that this service helps them prepare their trip better and they are willing to try it again for future trip.

👤 5/7   👤 7/7   👤 3/5
pretty agree that the function of searching for fun place and activities is interesting and helpful for their trip.

👤 5/7   👤 6/7   👤 4/5
pretty agree that "Pin hotel" function is relevant to the trip and useful for them to explore their destination.

👤 7/7   👤 6/7   👤 3/5
pretty agree that "Recommendations based on interests" is helpful for them to explore their destination.

👤 4/7   👤 5/7   👤 5/5
pretty agree that the function of booking activity/entrance ticket is convenient and helpful for their travel preparation.

👤 6/7   👤 7/7   👤 5/5
pretty agree that the function of buying day tickets/city cards is convenient and helpful for their travel preparation.

👤 6/7 👤 6/7 👤 2/5

pretty agree that arrange my travel plan is fun and give them a sense of achievement.

👤 6/7 👤 7/7 👤 4/5

pretty agree that this function make Onboard portal more interesting.

👤 6/7 👤 6/7 👤 5/5

pretty agree that they will buy the day tickets/ city cards through this service.

👤 4/7 👤 5/7 👤 4/5

pretty agree that they will book tickets of activities/entrance through this service.

👤 6/7 👤 7/7 👤 4/5

pretty agree that this service is helpful and relevant to them.

Findings:

Function of first step transportation guidance

Some participants mentioned they prefer to go to the attractions after landed, they would like to check if there are luggage storage spots nearby.

"I usually choose the flight landed during the day, so I can directly go to attractions instead of the hotel, so I wan to check the nearby luggage storage points. Show them on the map can be helpful."

The delay may cause them cannot catch the connected transportations

"I am worried about the delay in the flight or customs"

Travelers want to use these detailed traffic information for reference.

"I want to download all information like hotel address and traffic information for reference, so I can still use it after landed"

One participant mentioned he wants the guidance of the last few minutes walking

"I would like to download the map of last few minutes walking, it can help me find the destination"

When making the purchase through the OBP portal, travelers want to be reassured that they won't pay extra fees. One participant said he more trust in official websites to buy tickets.

"I need to be reassured that I won't pay more, otherwise I'll do it afterword"
"I will buy these if there is no extra cost or at least be transparent about it"
"I prefer to book tickets through the official website to avoid extra cost"

Travelers want to check more detailed information about public transportation.

"I would expect it shows the early and later option of the train, just in case I cannot catch the right one "

Some travelers want to have a more clear view of their hotels.

"It will be great to see the hotel with google street view"

Some travelers mentioned they want to have more information of transportations

"It will be great to show if this place can be reached by public transportations because, in India, many places can only be reached by Taxi or your own car."
"I would like to see the tram or bus stations on the map"
"I might be interested in how to travel between 2 places"

Travelers want to show the travel plan on the map to have an overview

"It will be great to also show the recommended plan on the map, so I can check it based on the location."
"Show the planned route of travel plan on the map can be very helpful"

Travelers want to have a clearer view of the distance.

"It will be great if it can show the walking zone on the map, well, based on my hotel location, so I can find interesting places that can be reached by walking"

Travelers expect the share and cooperation feature about travel plan

"I want to share the plan with my friends."
"I am expected to work on it with my friends cooperatively."

For those travelers who score very high on conscientiousness, they like to make a very detailed plan and arrange everything beforehand. In this way, exploring is more useful than making a travel plan during the flight

"I would like to download all these liked places, and I don't want to make a travel plan on the airplane since I already have one, I'll rearrange it later"

Some mentioned they want to use this function after landed.

"Well, I still want to use this function when I am out of the plane"

The content recommendation is important since there are many websites with similar features, travelers prefer unique and personalized content.

"The last time I went to New York, I used an app called Eric's New York, it gave me recommendations from locals, which is very useful, and it is an offline guide app"
"The recommendation systems of other websites never worked well for me. They just recommend me the content I am not interested in"

The answers of research questions

1. how personality (conscientiousness) influence travelers' feeling about the concept.

• According to the questionnaire result, in most cases, travelers in the same level of conscientiousness tend to have the same preferences toward the functions and services of the concept.

high conscientiousness
Generally, most of the travelers score high in conscientiousness tend to like both functions, because those functions can help them arrange their trip better. However, there are two exceptions:

A. Those who score particularly high on conscientiousness. They prefer to make a very detailed plan and arrange everything beforehand, so they don't need to use these functions.

"I usually make a very detail plan beforehand, I'll arrange the agenda of every day's activities and all transportations including the trip between the airport and my hotel. I may only use it to find more places"

B. Those who only prepare transportation. They prefer to arrange the transportation beforehand because it is easy and cost less time, so they don't need the function of arranging transportation and prefer the function of exploration and arrange travel plan.

"I only need to spend 30 minutes arranging transportation, so I usually do it beforehand. As for a detailed plan, it will take a lot of time, so it is great to arrange it on the plane since I have a lot of time"

Medium conscientiousness
According to the result of the questionnaire, almost all participants with a medium level of conscientiousness like both function and would like to try them again for future trips. A possible reason is that they have an interest in making plans and arrange their trips, but their interest is not strong enough to let them arrange everything advanced.

Low conscientiousness
The test result shows that most travelers

sore low on conscientiousness have the same preference—like the first step transportation guidance function and are not passionate about the exploration and arrange travel plan function. Only parts of them (2/5) were willing to try the later function again in the future.

• In terms of travelers with different levels of conscientiousness(high/medium/low), two of them (travelers score high/medium conscientiousness) have the same preference, but the rest one (travelers score low conscientiousness) have different preference than others.
—travelers score high and medium in conscientiousness are all very interested in both functions
—travelers score low in conscientiousness prefer first step transportation guidance function instead of exploration and arrange travel plan function.

Although 19 participants are not a big group, I have gained enough qualitative feedbacks to confirm part of my speculation about how conscientiousness the travelers' preferences. Personality (conscientiousness) can be applied as a start point to highlight different services accordingly to provide a personalized experience.

2.To what extant do travelers feel the concept meet the design goal of helping them arrange their trip better with long-term plan and immediate guidance.

Immediate guidance
According to the feedback from participants, most of the participants agree that the service is helpful, and all these functionalities(comparing different transportation, book public transportation tickets, and the guidance to connected transportation spots) are helpful, which imply the goal was reached, and there is no clear

clues show the personality has influence on this research question

Long-term plan
According to the feedback from participants, most of the participants agree that all these functionalities(searching for fun places, pin hotel, recommendations based on interests, booking activity/entrance ticket and buying day tickets/city cards) are helpful, which imply the goal was reached, and here is no clear clues show the personality has influence on this research question

3.if the concept achieved the goal of improving user experiences and engagement of OBP

It is considered to be achieved since most of the participants agree function 1 and 2 make OBP more interesting and function 2 can bring them the senses of achievement.

4.if the concept increase travelers' their purchase intention of certain ancillaries (create revenue)

Function of first step transportation guidance
1. Most of the travelers show high intention of buying bus/train tickets and booking taxi/uber through OBP. Only a few travelers with high level of conscientiousness were not interested in these since they usually arrange transportations advanced.

Extra findings: The extra fee and the risk of missing the connected bus/taxi are the biggest concerns

Function of exploration and arrange travel plan

Most of the travelers show high intention of buying day tickets and city cards since is really useful for the tourist.

The overall intention of booking tickets of activities/entrance through this service is pretty high since 13/19 are willing to actually spend money on it.

However, this intention is a little lower among the tourists with high conscientiousness, since some of them already arrange these beforehand.

Extra findings: the unique and interesting contents are very important features influence their purchase intention. They prefer advice from locals.

5.If the concept improve the customer intimacy.

Most of the travelers agreed that both services are helpful and relevant to them, which shows customer intimacy was increased. There is no clear clues show the personality has an influence on this research question

Conclusion

The test result shows that personality has an effect on the traveler's preference. Therefore, the theory of personalities can be used for other services that are relevant to travel. The unexpected finding is that all participants enjoyed the function of first-step guidance, hence It is a universal need for most of the tourists.

With proper ways to apply them, all the ancillaries (pubic transportation, Uber, tickets of activities and attractions) works well among the tourists

Both functions meet the goal of helping travelers arrange their trips. It improves the engagement of OBP and makes it more

interesting, which creates a better user experience of OBP. With these functions, tourists are willing to spend money through the OBP for their trips. Customer intimacy is also increased since all these functions are revenant to their trip experience as tourists and provide an opportunity to customize their trips,

Function of first step transportation guidance

In conclusion, this service is helpful for tourists to arrange their next step transportations. The comparing function allows them to find and book suitable transportations. The timeline of my trip helped travelers be aware of the needed buffer time, which help them arrange their transportations efficiently and confidently. However, the accuracy of the information about the buffer time is important, which affect customers' trust in the service. Besides that, the airline company needs to reassure travelers that they won't pay too many extra fees, otherwise, they may just check the traffic information during the flight and book transportations after arriving at the airport. KLM could cooperate with more partners of public transportation and call-hailing service to provide more comprehensive services to help travelers go to their next destination.

Function of exploration and arrange travel plan

To conclude, this service provides a good experience of exploring and arranging trip plans during the flight. It helps travelers prepare their trip comprehensively and offer them a chance to enjoy their time during the flight, which prevents their long-haul fight trip to be boring. However, tourists expected more unique and interesting content recommendations

9.3 Expert evaluations

To answer the research questions from the company perspective, evaluative sessions with experts were conducted.

The evaluation sessions were carried out with an expert of flight-plane system, a front-end developer of OBP, 2 members of KLM mobile app team and a manager of the ancillary team.

Procedure: A one-on-one session was conducted with all of the five experts. Firstly, I introduced the project background, then showed them how the prototype works and elaborate my concept. Participants were allowed to give feedback during the session. Finally, there was an interview session to get feedback and suggestions.

The result

If the concept has enough potential to create business value (Commercial aspect).

According to the feedbacks of the ancillary team, the transfer and tourist activities do have the potential of business value, and it already on the future strategy plan.

Trip schedule arrangement function is on the plan and considered on the business level, even though we haven't actually implemented it yet.

"Nice ideas, I am curious about your test result of users, It is nice to see how it will work in the end"

"Yes, transfer and tourist activities are good products to focus on, but not in this year's plan, it will be in the future plan"

"We can start to work with NS first."

"We can see if Cartraweler has the intention to provide service of public transportation, at least it can be the start point, we can always looking for new partners of public transportation."

"On the business level, there is an option of arranging your own schedule like when to eat, sleep, it will be great to allow them to arrange transportations as well"

If the concept is feasible to apply (Technical aspect)

The technical background of ancillaries on the OBP

After the discussion with an expert, how ancillaries work on OBP was figured out. The reason passengers can still use those 3rd party ancillaries without paying to activate the internet is that these websites are unblocked (Figure xx.). However, if there are too many websites on the whitelist, it will cause many issues and conflicts. It has become the constraint of many services.

"The whitelist mechanism has become the pain in our ass for years "

OBP

The whitelist

www.klm.com

www.airfrance.com

www.getyourguide.com

www.cartrawler.com

API ....

....
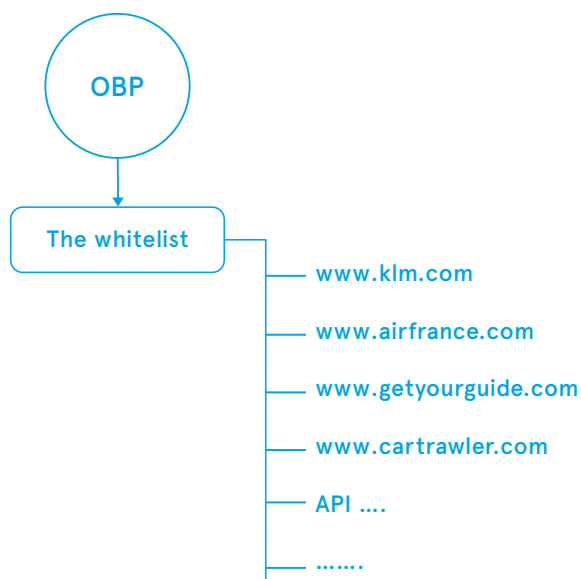
Figure 51. The whitelist mechanism

Showing buffer time
In the current phase, the time of waiting in the baggage claims and customs is not able to be lively predicted through the API of Schipol airports when travelers are in the air. Since there are so many unexpected like weather and airport conditions, the baggage claim can be changed at the last minute. However, Schipol airport is working on the prediction mechanism. It can be achieved in the future.

"They can estimate when the first baggage will arrive, but they will never tell you when your suitcase will be there, it may take more time."

"The baggage waiting time is roughly predictable only when the plane is landed, but they are working on the production mechanism for predicting it during the flight"

For now, the most feasible way is showing the estimated time based on assumptions. The average waiting time in different situations can be used as a reference.

Function of first step transportation guidance

Airport guidance
There is a route plan API from Schipol airport that can calculate the time from one gate to another gate. With this API, the KLM app already achieved the function of guidance from gate to gate or from security to gate.

"After connecting to the Schipol API, We already have the function of showing the time of transfer from gate to gate or from security to gate."

The KLM application offers guidance by highlighting the starting point and destination on the airport map and showing instructions as well as the time table of walking. The route function is too complicated to achieve in the current situation.

"In the app, we highlight the start point and endpoint like the gate or security, but we don't show the route. We show the time table of walking and instructions"

"It is difficult to visualize the route. The oration needs to be considered."

"The time table of walking and instructions are more informative than the line. And it hard to visualize the route since there are many floors."

The function of guidance to the taxi pick-up point and the train platform is the point to point navigation, which is hard to be achieved for now, but KLM and Schipol airport is working on it.

"Because of the limitation of Schipol API, we cannot show the point to point walking time. But it is under works. Our final goal is to show the needed time from any location to any other location."

However, as for the onboard portal, the airport guidance is a simple map with a route that doesn't need to show the current location of travelers. It is much easier to be achieved.

Searching and comparing
It is also hard to achieve the search and compare function for now, since it will call to too many APIs and bring too much data cost, developers have to whitelist a lot of websites which will cause more troubles.

The ideal way is to create KLM's own API to build their own pages(see figure), the API can be used to communicate with all URL. However, it will cost more money and energy.

The most practical way is to whitelist a website that has similar functions of searching and comparing the transportations.

Public transportation
As for applying the public transportations, it is easy to only put NS on whitelist, since it is only one URL, but if KLM wants to try it in many different countries, they need to manage a lot of URLs like the SNCF in France, DB in Germany, Amtrak in America, etc. The logic flow also needs to be managed, for example, show NS when the traveler's destination is The Netherland. So, it is better to just apply this function to serval major airports like Schipol airport or Charles de Gaulle Airport in this early stage.

Car-hailing function
One biggest issue of Uber is the permission of the park. Normally the taxi has a license that allows them to park around the airport. In the Netherland, Uber doesn't have this permission, so it can only be used in other countries that allow them to park near the airport.

Function of exploration and arrange travel plan

Exploring function
As for the functionality of exploring on the city map, the google map API need to be used. However, android phones always call to google site automatically. If it is unblocked, the Android device will communicate with google unnoticeably, it will bring a lot of data cost. Another problem is that if KLM unblocks one google API like Google Maps, other google APIs will be also unblocked along with it,

because they may share the same IP address.

Travel plan agenda function
The calendar functionality is feasible, but it is time-consuming and difficult to be achieved. There is an issue of the time zone(different websites may be in different time zones), and KLM has to avoid sending out confidential information.

Recommendations for travel plan functionality
Techniques of AI and machine learning need to be used to provide the proper recommendation.

Conclusion

From the commercial aspect, the ancillaries I currently focus is promising, the next step is to find out a suitable way to apply them.

From the technical aspect, it is hard to achieve all these functions on the OBP in the current state. There are many technical constraints. However it is not totally unfeasible, all these constraints can be overcome, we just need to balance the possible cost and revenue. The concept can be used as an inspiration for the development of future OBP. Most of the functions can be achieved by co-operating with the proper partner. The details can be found in the next session.

9.4 Limitations

Limitations of the project scope

Only one personality(conscientiousness) was considered and tested. However, travelers' preference for service may be influenced by multiple personalities. This research didn't investigate the possible influence of multiple different personalities.

In addition, in the research of conscientiousness, I didn't eliminate the interferences of other personalities. This to some degree it influenced the reliability of the result.

Limitation of primary concept minor test

Because of the constraint of time and resources, all the participants of the minor test of primary test ware recruited from TU Delft. They were limited to college students and staff. It's unable to grantee enough diversity, which may cause deviation in the result.

Limitation of personality measurement

In order to get the result quickly, I choose to use a simple questionnaire with only a few questions to measure participants' personality. It may not be very accurate.

Limitations of quantitative research

As for the quantitative research of ancillaries, due to the limited time of this project, the sample size was limited. The airline company could conduct another round of tests with a bigger sample size. This research was carried out in forms of an online questionnaire, the result may be different in an offline and face to face context.

As for the final evaluation to investigate the influence of personality. It was only a qualitative test with 19 participants. The result does show some tendency, but it can not be considered as a 100% validated result. More in-depth quantitative research with larger participants group is needed in the future.

9.5 Recommendations

According to the evaluation result, recommendations for further development are given as follows.

Recommendations for further concept development

Function of first step transportation guidance

More relevant ancillaries
More ancillaries can be applied to this function. For example, show the luggage storage spots near their next destination, since some travelers prefer to go to the attractions after landing, they would like to check if there are luggage storage spots nearby.

More detailed public transportation information
The information of early and later options of transportation is useful, which can provide travelers more choices in case they cannot catch the one they want to take.

Check the information after landing
Many participants mentioned they want to use the relevant information (like the information of the pubic transportation they have decided to take and the route of transfer, and the last few minutes walking) after landing, so a piece of advice is allowing them to download the information of the transportation and routes that they have chosen during the flight. Another suggestion is to combine the OBP with the KLM app, in this way all the information can be checked through the KLM app.

Clear statements of charge fee(be transparent)
When purchasing through the OBP portal, some travelers said that they want to be reassured that they won't pay the extra fee, so it is important to be transparent of the fee we gonna charge, and the discount information can be highlighted. In this way, passengers will trust more on the airline company and pay.

Function of exploration and arrange travel plan

More information can be added on the map
Information like the bus/tram station and the restaurant can be added since tourists want to know how to go to the places they liked and if they can eat something nearby.

Show the travel plan on the map
Show the planned route and places of travel plan on the map can give travelers a better overview of the location and distance, so they can arrange it better.

Indicate the map scale
Show the map scale can help travelers have a clearer view of the distance between two places, so they can choose if they walk to go to the destination.

Share and cooperation
When tourists travel with their friends or family, the cooperating function can help them arrange the travel plans together and all of their ideas can be considered. As for the travelers who don't want to make the plan, they also can get it from their friends.

Separate the exploring and travel plan function
For those travelers who score very high on conscientiousness, they like to make a very detailed plan and arrange everything beforehand. In this way, exploring is more useful, the liked places can be downloadable.

Cooperate with partner who provides recommendations
The interesting and attractive content is very important for users. The airline company can cooperate with different local partners in different countries to provide in-depth recommendations.

Form customization to personalization
For now, travelers custom their plans and content by themselves, if KLM gets enough data about their personal choices, the personalized plan can be provided in the future.

Recommendation for implement

In the current stage
For now, it is hard to actually apply all these functions because of the technical limitations. KLM can try to add some core functions by co-operating with partners have similar functions in countries that tourists prefer to visit.

First step transportation guidance: the core is helping travelers comparing different transportation modes and arrange their next transportation. The customer evaluation has already validated that it is really helpful and travelers want to use it.

The airline company can cooperate with public transportations and car-hailing partners by whitelist their URLs. In this way, passengers can choose their favorite traffic modes, however, without a page integrate all transportation, passengers need to open all different websites of transportation to search for how to go to their next destinations. It will influence passengers' user experience and sacrifice some usability.

The airline company can cooperate with transit navigation partners like *9292*

or *Citymapper*, but they all have their limitations, for example, *9292* can not search for hotels by their names and *Citymapper* are only available in the urban area of limited cities.

Exploration and arrange travel plan: the core is helping travelers find more places that they may be interested in and arrange their agenda based on it. The customer evaluation has also validated that most travelers are very interested in it and want to it.
The airline company can cooperate with some travel websites, like *TripAdvisor* or *VisitACity*, they also have their own limitations, like the *VisitACity* can only recommend travel plans without considering travelers' interests and travelers can not customize their own travel plans.

As for the buffer time at the airport, the assumptions of the waiting time can be shown. Passenger can roughly know the waiting time, it is also helpful.

In the future

Both functions
When the technique constraints like the whitelist mechanism and google API application is solved. The airline company can try to build their own pages by using the data and API from its partners of public transportation and traveling.

Buffer time
When Schiphol airport becomes smart enough to estimate the actual waiting time of baggage claims and customs, the OBP can use it to reassure passengers.

Recommendations for service for other personality traits

This project finally concentrates on

conscientiousness and the service for post-flight experience. However, there are many other personality traits and intervention opportunities during the journey that can be focused on. The other 3 primary concepts (see chapter 5) which are relevant with openness, neuroticism and extraversion still have enough room to develop further, since many participants think they are useful during the minor test session. Further research about personality influence is needed.

The only missed personality trait is agreeableness. People with high agreeableness are more willing to help others, while people who are low in agreeableness more focused on themselves. This feature is relevant in the context of waiting at the airport and in the flight. This personality trait can be combined with the primary concept 1 "An anonymous chat room on the plane" to promote the interaction and communication of travelers.

9.6 Personal Reflections

The project lasted for 5 months in total. When I look back on the project, I am surprised by how much I have learned. It is a memorable experience.

This project is a great opportunity for me to explore and understand how digital experience. It started with a specific topic—the ancillaries of OBP. After done some research I realized that I don't have to only consider the in-flight experience, since the Onboard Portal can also be the platform to provide services for their rest trip experience. I have to make many choices during this project. The first one was decided target group. It is not easy since everyone takes the planes and everyone would like to use the WIFI on the plane if possible. I think I have made a wise choice, tourist is a very common

group, which can easily get access to, it helped a lot for my following research.

Another choice is personality traits. During the midterm phase, I was struggling with how to continue, since I needed to think about personalization. After going through the demand space, I was kind of overwhelmed, there are so many different needs to consider. It was lucky that I found the previous research about applying this theory on flight travel experience, it offered a brand new perspective for me to provide better personalized experience.

I was pretty enjoying the design phase, but I am a little struggled with the final evaluation. I had to think about how to validate my assumptions and test my design concepts. It took me quite some time to figure out what should I test and analyze the evolution results. As a little introvert person, it is challenging for me to search that many participants for my evaluation session. I am glad that I managed it.

I have also learned a lot about time management, the truth told me it is very important, and I'll never forget it, since we may need to finish the work with the time constraints.

The project taught me a lot, and I glad that I have used all my knowledge and skills that I have learned from school.

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