

Enhancing Mobility around Schiphol Airport for International Passengers

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**Enhancing Mobility around Schiphol Airport for
International Passengers**

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Executive Summary

This study presents the process and results of the graduation project: Enhancing Mobility Experience around Schiphol Airport for International passengers.

This project is part of this project Optimaliseren Mobiliteit rondom Schiphol (in English Optimise Mobility around Schiphol). Within its broad scope, this graduation focuses on Chinese passengers, who arrive at Schiphol Airport for the first time. It is aiming to create a care-free and seamless transport journey from/to Schiphol from their perspective.

The project took place in five phases, Research&Analysis phase, Ideation phase, Conceptualisation phase, Embodiment phase and Verification phase.

The Research&Analysis phase consisted of desk research, field research and analysis. The Research&Analysis phase revealed the existing ecosystem: a well-developed transport system in the Netherlands, and the potential of the Chinese outbound tourism market. This phase also showed the real experience of first-time passengers: difficulty on getting information, making a choice and feeling the sense of safety. Last but not least, it defined the design goals for the design phases: enable passengers to plan their trips based on the needs easily, and make them feel confident, supportive all the time.

The Ideation phase and Conceptualisation phase developed the final concept according to the design brief established at the end of Research&Analysis phase. During this phase, several iteration

cycles were conducted to develop and refine the concept. The final design is a digital platform, in the form of a WeChat Mini Program, a light application embedded in WeChat (one of the most frequently used digital product in China). It supports the users from planning their transport before leaving to conducting their transport plan after arrival by fulfilling people's needs on choosing route, tickets, getting information and finding the right spot for boarding.

In the last two phases Embodiment phase and Verification phase, a high-fidelity interactive prototype was built and tested. The user test shows the final design almost meet the design goals. Passengers feel supported during the process of choosing routes and tickets, and feel easier on completing the tasks of finding the spot and getting on the vehicle in an unfamiliar environment. However, the role of the Mini Program in a visitor's journey of visiting the Netherlands is not clearly defined. For the final design, it is recommended to accomplish the service beyond the phone screen. For Schiphol Airport and other transport operators, it is recommended to use WeChat Mini Program as the carrier of service. The final design could be a starting point of the future development of the digital platform as a Mini Program. Those conclusions from Research&Analysis stage might also be a reference for them.

Figure 1 shows an overview of the process of this graduation project.

Phase	Research & Analysis ▶	Ideation ▶	Conceptualisation ▶	Embodiment ▶	Verification
Activity	Desk research Field research Analysis	Brainstorming Idea evaluation	Storyboarding Task analysis Wireframing	Visualisation Prototyping	User test
Process	Investigate the background, users, interactions and contexts	Generate ideas and design directions as the base of final concept	Develop the final concept	Embody the final concept	Evaluate the final concept and the whole project
Deliverables	<i>Design Brief: Defined Problems, Design Goals, Design Requirements</i>	<i>Design Direction</i>	<i>Low fidelity prototype</i>	<i>High fidelity prototype</i>	<i>Conclusion of user test</i> <i>Limitations</i> <i>Recommendations</i>

Figure 1 Process overview of the graduation project



01

Introduction

1.1 About this project

This graduation project *Enhancing Mobility around Schiphol Airport for international passengers* is part of this project *Optimaliseren Mobiliteit rondom Schiphol* (in English *Optimise Mobility around Schiphol*), which is initiated by Schiphol Airport, public transport operator NS, GVB, Connexxion, local government authorities Gemeente Amsterdam, Vervoerregio Amsterdam, ProRail, and TU Delft, with the goal to create a seamless connection between Schiphol and the Netherlands.

The focus of this graduation project is lied on the passenger experience on transporting from/to the Schiphol Airport to/from other parts of the Netherlands or Europe, from the perspective of first time Asian passengers.

The stakeholders of project *Optimaliseren Mobiliteit rondom Schiphol*, public transport operator GVB(Amsterdam municipal transport), NS(the principal Dutch passenger railway operator), Connexxion(bus transport company to and from Schiphol) and local government authorities Gemeente Amsterdam (municipality of Amsterdam), Vervoerregio Amsterdam (a joint venture of municipalities on traffic and public transport), ProRail (Dutch rail network infrastructure supplier and maintainer) will also be involved in this project. Figure 1.1 shows the overview of the stakeholders.

Please see Appendix P for the Project Brief.

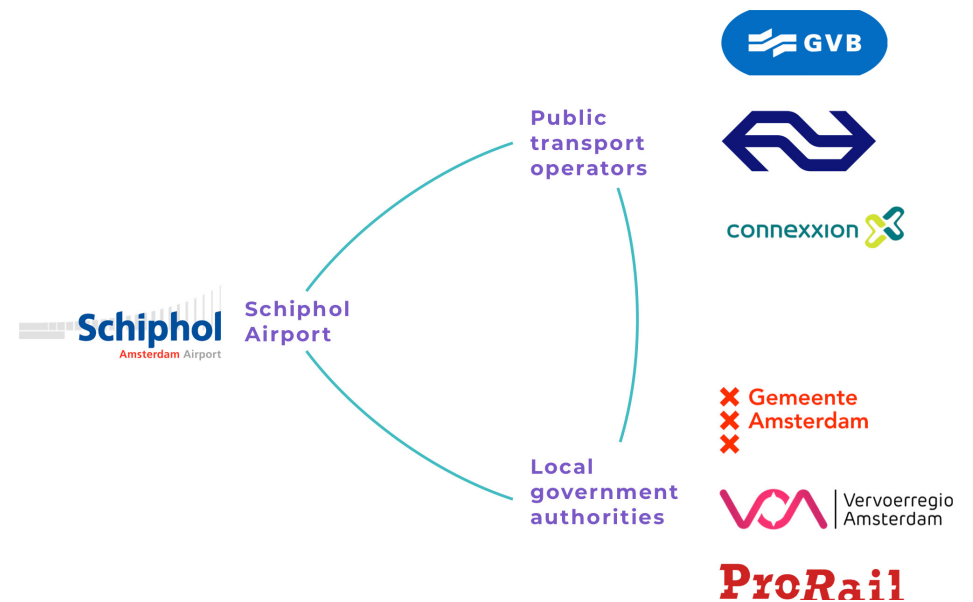


Figure 1.1 Stakeholders involved in this graduation project

1.2 Relevance & Impact

The number of international passengers who arrive in the Netherlands per year is continuously increasing. It is predicted that the number of incoming visitors will grow by at least 50% from 18 million in 2017 to 29 million in 2030 (NBTC, 2019). Correspondingly, the demand for services for international travellers grows strongly. One essential aspect of service for international travellers, transport, was experienced as 'non-user-friendly' by international travellers (NBTC, 2015).

For first-time passengers, they are confronted with the unfamiliarity and complexity of the transport system when they arrive at Schiphol Airport. While the Dutch transport system is mature, as well as a large variety of choices of transport tools are offered, in other aspects, from information searching, way-finding, transport plan choosing to ticket purchasing, international passengers face with multiple problems (Lehr, 2016). Therefore, the opportunity of this graduation project is to create a user-friendly and care-free mobility experience with digital and physical support for Asian passengers.

1.3 Aim

The aim of the project is to create a care-free and seamless transport journey from/to Schiphol Airport from the perspective of first-time Asian passenger. Therefore, the scope of this project is as Figure 1.2 shows.

The research on the current transport system as well as multiple types of passenger's journey in various contexts will be done. The aimed deliverable of this project will be a digital platform with functions such as information provision, way-finding, travel plan choosing and tickets purchasing, together with the recommendations on the physical environment in Schiphol Airport as well as the whole transport network.

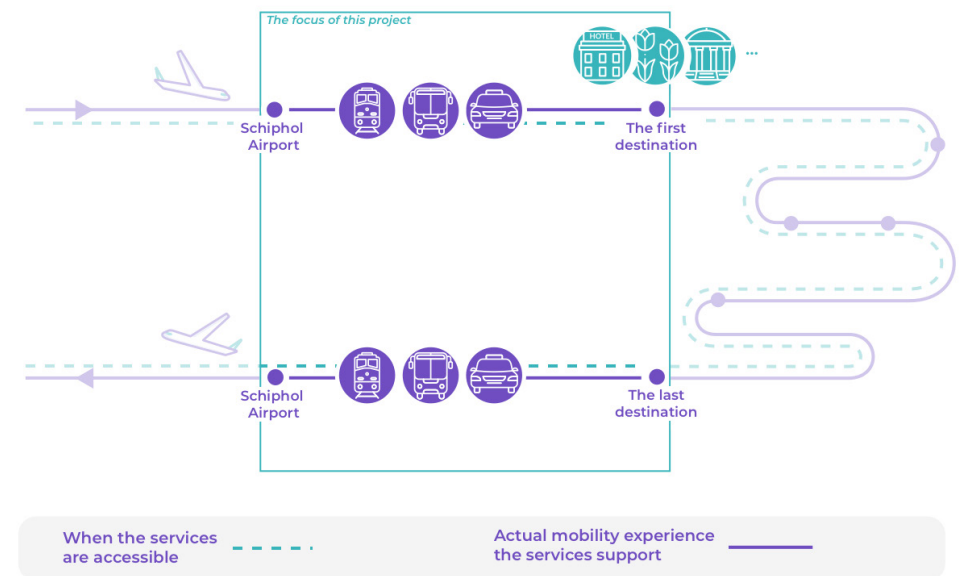


Figure 1.2 The scope of this project

1.4 Approach and Process

The project is divided into five phases, Research&Analysis, Ideation, Conceptualisation, Embodiment and Verification phase.

In Research&Analysis phase, the background, target users and the context are investigated in the forms of desk research and field research. At the end of this phase, the Design Brief consisting of Defined Problems, Design Goals and Design Requirements is established as the base of the following design phases. In the Ideation phase, many ideas are generated and evaluated. The final design direction is defined after several cycles of idea evaluation. In the Conceptualisation phase and the Embodiment phase, the final concept is iteratively developed and prototyped. In the final phase, the Verification phase, the final concept is assessed by real users, first-time Chinese passengers.

This report is structured based on the project phases, presented in six chapters, Introduction, Research&Analysis, Conceptualisation, Final Concept and Evaluation.

Figure 1.3 shows the process of this project and where the reader could find the key results in this report.

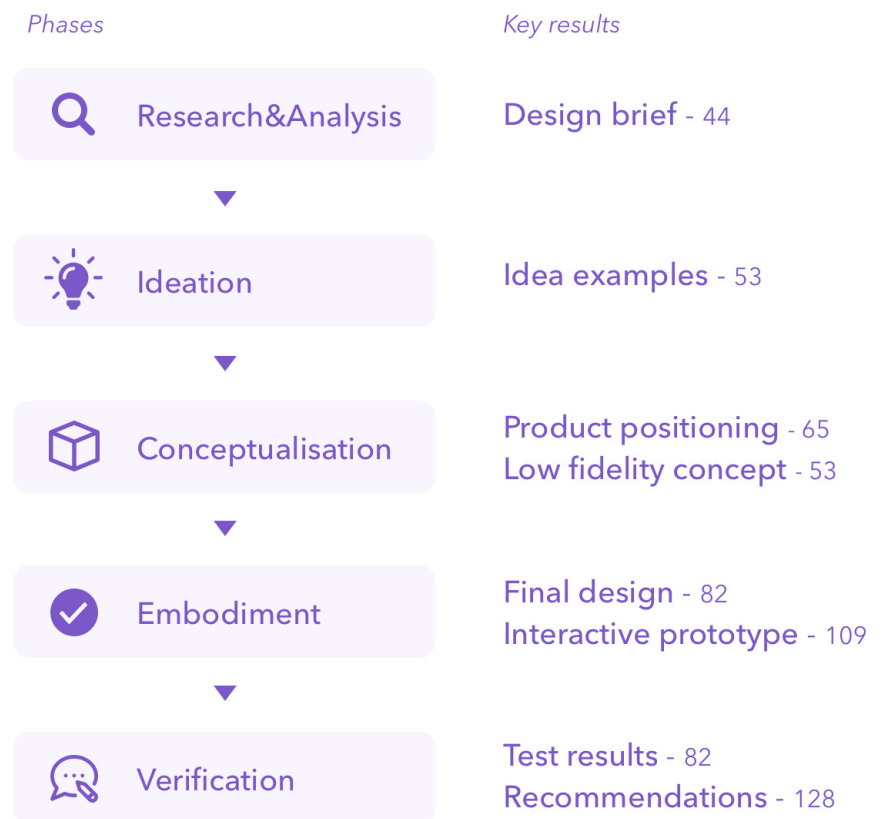


Figure 1.3 Project process and key contents index



02

Research & Analysis

2.1 Introduction

This chapter presents the process, the findings and the conclusions from the research phase of this project. To understand the background, the current situation and the possible future vision of this project, multiple research activities were conducted:

- 1 As a starting point, some desk researches on background information like the Dutch transport system and Chinese traveller in the Netherlands or Europe are done;
- 2 To further understand the context, users and interactions between them, qualitative researches like interviews, observations, self-experience were conducted;
- 3 When the data collected, the analysis approach 'analysis on the wall' are used to standardise and sort out data from different sources.

As a result of the Research&Analysis phase, main findings and design guidelines are presented in the form of Insights Map, Design Goals, Personas with Travel Pattern and Customer Journey Maps to support the ideation and conceptualisation process of later phases of this project.

Figure 2.1 shows the process, activities and the deliverables of Research&Analysis stage.

Stages	Desk research	Field research	Data analysis
Activities	• Research on current transport system (modalities&tickets) • Research on Chinese travel market/outbound travellers	• Service safari • Interviews • Observations • Internet retrieving	• Analysis on the wall
Deliverables	<i>Research Questions</i> <i>Transport/Tickets mapping</i> <i>Brief of Chinese travel market/ travellers</i>	<i>Service safari with insights</i> <i>Touch-points in Schiphol mapping</i> <i>Raw data of each research</i>	<i>Insight mapping</i> <i>Current solutions&reasons mapping</i> <i>Key insights</i> <i>Personas</i> <i>Customer journeys</i> <i>Design goals</i> <i>Design guidelines</i>

Figure 2.1 Process, activities and deliverables of Research&Analysis stage

2.1.1 Aim&research questions

Aim

Based on the design scope and the focus of this graduation project, four main aims of the Research&Analysis phase are developed:

- 1 Understand the existing ecosystem and scope;**
- 2 Have an overview of passenger experience;**
- 3 Understand the needs of both customers and stakeholders;**
- 4 Define the opportunities for Ideation&Conceptualisation phases;**

Research Questions

Based on the aims, several research questions are developed, which guides the research and analysis activities, and decides the deliverables at the end of this stage.

1 Understand the existing ecosystem and scope

- What is the current transport system set-up in the Netherlands?
- What are all possibilities of transporting from/to Schiphol?
- What are all options getting information, finding ways, making decisions on transport and tickets?

2 Have an overview of current passenger experience

- Who are the users?
- What are the different passengers' journeys?
- How do they interact with the current service?

3 Understand the needs of both customers and stakeholders

- For the stakeholders: What effort did they put in the system? What

trouble are they encountering?

- What kinds of information are crucial for passengers?
- What types of products do the partners want to connect to the future service system?

4 Define the opportunities for the next stage

- What are the possible solutions for the found problems?
- What are the guidelines on design based on the context, users and stakeholders?

The complete version of Research Questions and the methods chosen to answer them could be seen in Appendix A.

2.2 Desk research: the background

2.2.1 Dutch Transport System

Dutch Public Transport Operational Set-up

In the Netherlands, public transport combined with cycling is the primary choice of transport for millions of people every day (Organisation of Public Transport, 2019). There is a forecast of 30% to 40% autonomous growth of public transport in the future 10 to 20 years. For international passengers, public transport is the most important means of transport for travel in the Netherlands, especially for non-neighbour country passengers.

Dutch Public Transport system is composed of transport services of Bus, Tram and light rail, Metro, Regional taxi, and Train. Those public transport services are provided by several public transport operators like Dutch Railways(NS), GVB, Connexxion, and regulated and maintained by several national or regional government authorities like Prorail, Gemeente Amsterdam and Vervoerregio Amsterdam.

	Arriva	Connexxion	EBS	GVB	HTM	NS	Qbuzz	RET	Syntus	Veolia
Bus	√	√	√	√	√		√	√	√	√
Tram				√	√		√	√		
Metro				√				√		
Train	√	√				√			√	√
Other				√		√				

Figure 2.2 Overview of Dutch public transport operators and their transport modalities (taxi not included) (Lehr, 2016)

Figure 2.2 shows an overview of Dutch public transport operators and their transport modes, regional taxi not included (Lehr, 2016). Besides those Dutch operators, some foreign companies also provide public transport service in the Netherlands like Thalys, FlixBus. The regional taxi service is provided by multiple local taxi companies.

Transport from Schiphol Airport

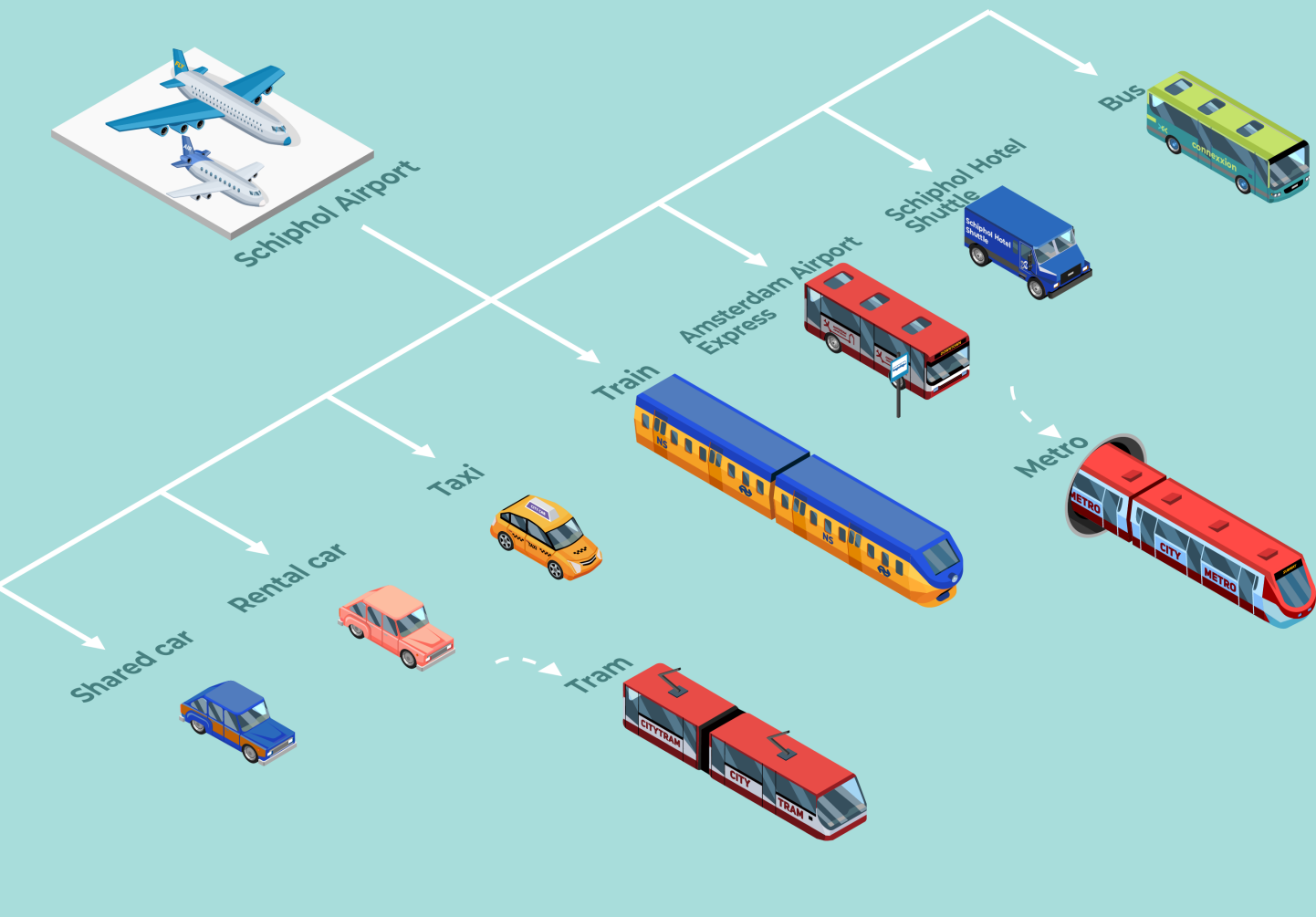
For international visitors who just arrived at Schiphol Airport, there are multiple choices of transporting to their first destination. As Amsterdam is the most popular destination for both leisure and overnight stay, a large number of Chinese visitors firstly go to Amsterdam after their arrival; besides Amsterdam, other large cities like Rotterdam, the Hague, Utrecht in the Netherlands could also be visitors' first destination; there are also some visitors transferring to train or bus to another country after they arrive at Schiphol Airport. For each destination, there are different modalities of transport to choose from.

Figure 2.3 shows the overview of modalities and frequently-used tickets from the perspective of an international passenger. The detailed introduction of all modalities, the way to take the modalities and the tickets for them could be found in Appendix B.

Key insights of 2.2.1

- There are numerous ways of transporting from Schiphol to somewhere else;
- A variety of tickets are available for international tourists, with different functions as well as usage.

TRANSPORT FROM SCHIPHOL



Train

Passenger could take the train to anywhere across the country. It's also possible to take a train abroad.

Bus

From Schiphol, there are buses to Amsterdam, other cities in the Netherlands and other countries.

The Amsterdam Airport Express (bus 397) is a fast and direct way to Amsterdam. Other city or regional bus lines could take passenger to destinations across the country. Foreign transport operators provide routes to other countries in Europe.

There are shuttle buses of some hotels providing transport service to their guests. Besides, the Schiphol Hotel Shuttle can drop the passenger at almost every hotel in Amsterdam.

Taxi

Passenger could take a standard taxi at Schiphol's official stand. With reservation in advance, the larger taxis Schiphol Travel Taxis are also available for small group passengers. For a luxury travel, the Schiphol Business Taxi is available.

Rental car

There are multiple rental car companies providing care rental services in Schiphol. Passenger could book the vehicle online or at one of the car rental desks.

Shared car

There are also shared electric cars named car2go could be collected from Schiphol Airport. They are small white and blue cars for two person and some luggage.

The passenger could also request a UBER trip at Schiphol.

Private cars

For passengers who have a native friend drive a car and will pick them up, they need to meet their friends at Arrival gates or Meeting points, or go to the parking areas upstairs.

Tram&Metro (not started from Schiphol)

Tram and Metro are not available in Schiphol Airport, but they are possible options for later transfer to their destination after their first trip from Schiphol.

Frequently used tickets for tourists



Amsterdam Travel Ticket

It provides unlimited travel on transport between Schiphol and Amsterdam and unlimited travel for trams, buses and metros in Amsterdam.



Holland Travel Ticket

It provides unlimited travel on all the trains, busses, trams and metros in the Netherlands.



Anonymous OV Chip Card

With credits, OV Chip Card could be used in almost all public transport modalities across the Netherlands.



Amsterdam&Region Travel Ticket

It provides unlimited travel for NS trains, trams, buses and metros in Amsterdam and it surroundings.



GVB day/multi-day tickets

It provides unlimited travel on busses, trams and metros operated by GVB in Amsterdam.

Figure 2.3 Transporting from Schiphol

2.2.2 Chinese travellers in the Netherlands

Chinese outbound travel market

China is the largest outbound travel market in the world. In 2018, the number of outbound trips of Chinese people was almost 150 millions. The number of outbound tourists is continuously growing over past few years(China Tourism Academy&Ctrip, 2019). It is expected by COTRI(China Outbound Tourism Research Institute) that the number of Chinese tourists will jump to 390 million in 2030.

China is also the world's biggest tourism spender. In 2017, Chinese travellers spend around 258 billion dollar on outbound travel, while the USA spend 135 billion dollar in the second place(UNWTO,2018).

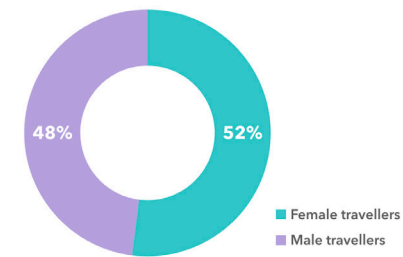
The image of Chinese travellers and their travelling behaviours

Gender

There are more female tourists than male tourists in the Chinese outbound travel market. It is reported that female tourists accounts for 52% of outbound travellers in 2018. In 2018, the Post-80s people(age 28-38) is the largest group for outbound travel, accounting for 29%. The Post-90s people(age 18-28) and Post-70s people(age 38-48) take in the second and third position with the proportion of 18% and 17%. (China Tourism Academy&Ctrip, 2019)

Figure 2.4 shows the age&gender distribution of Chinese outbound travellers.

Gender distribution of Chinese outbound travellers



Age distribution of Chinese outbound travellers

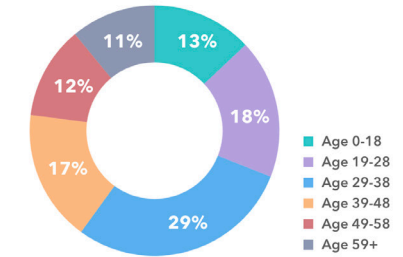


Figure 2.4 Age&gender distribution of Chinese outbound travellers in 2018

Purpose of visit

For Chinese visitors, more than half of them visit the Netherlands for a business purpose (55). 44% of Chinese people who visited the Netherlands in 2014 are with the purpose of leisure. (NBTC, 2014)

Figure 2.5 shows the Purpose of visit of Chinese outbound travellers in 2018.

Purpose of visit to the Netherlands

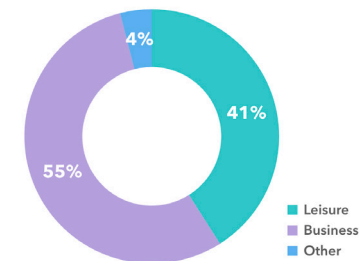


Figure 2.5 Purpose of visit of Chinese outbound travellers in 2018

Types of trips

44% of outbound tourist from China prefer to travel in a group, especially for the tourists from second, third and fourth-tier cities and areas. 42% of Chinese tourists prefer individual travel, which is an increasing number. (Ctrip, 2018)

For tourist aged above 65, only 17% choose individual travel abroad. For family-trip travellers, 50% of them prefer travel in a group, 47% prefer to travel individually. (Chinabaogao, 2018)

In the future, people would have an increasing interest on Fully Independent Tours(FIT) or Semi-Independent Tour (SIT, which means flight ticket and accommodation are booked through travel agencies while the destination is explored on their own). (NBTC, 2018)

Figure 2.6 shows the Types of outbound travel of Chinese outbound travellers in 2018.

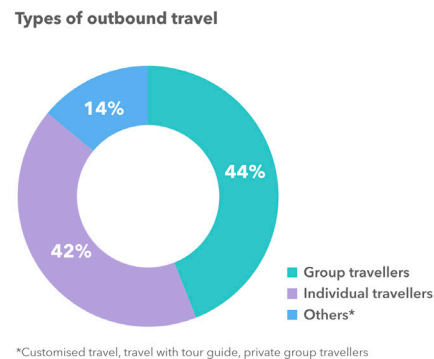


Figure 2.6 Types of outbound travel of Chinese outbound travellers in 2018

Other behaviors

- Chinese visitors are increasingly prefer convenient, safe and friendly destinations. (China Tourism Academy&Ctrip, 2019)

- Travellers from China have an increasingly intention on enjoying high-quality services, instead of merely travel for sightseeing purposes. (China Tourism Academy&Ctrip, 2019)

- The Majority of Chinese tourists visit more than three European countries in their travel routes. (China Tourism Academy&Ctrip, 2018)

- Travellers from China concern about terrorism, crime, and political tensions most. Chinese people are also worrying about language issue in an outbound travel.(NBTC, 2018)

- Almost half of the total Chinese visitors stayed in Amsterdam for their tour in the Netherlands. (NBTC, 2018)

Key insights of 2.2.2

- China is the largest outbound travel market in the world, and China is also the world's biggest tourism spender;
- There are more female outbound tourists than male outbound tourists;
- People aged 28-38 are the largest group for outbound travel, while people aged 18-28, and people age 38-48 take in the second and third position;
- More people visiting the Netherlands for business purpose than leisure purpose;
- Currently, there are more group travellers than individual travellers. However, people would have an increasing interest in individual travel;
- People are increasingly caring about the service during a trip.

Moving on

Conclusions for this section

- The Dutch Transport System are well-developed and well-designed, enabling international travellers to travel across the whole country;
- Chinese outbound travel market is large and still growing; there are opportunities in this market for Dutch tourism.

Questions for the next section

- How do the users experience the transport system in real situations?
- What are the problems and opportunities?

2.3 Field Research: the context, the users and the interactions

In the previous section of this chapter, the general knowledge of the Dutch transport ecosystem and target user, travellers from China, are established. In this part, the methods used to explore the passenger experience further are introduced. It also provided analysed results of all research activities in a variety of forms.

2.3.1 Research methods

Service Safari

As the start point of field research, a service safari is conducted to understand the current service system. From planning to boarding, the whole service was experienced, recorded and reflected from the perspective of the writer. The experience is recorded as photos with comments. The prepared materials and collected artefact related to the service are shown in Figure 2.7.

Seven options of transporting from Schiphol are experienced, recorded and reflected in the service safari process, like taking a train, catching a taxi or renting a car. The photos are taken for each touch-points and interaction.



Figure 2.7 Prepared materials(map of Schiphol Plaza, transport modalities and tickets map) and collected artefact(booklet of Schiphol Travel Taxi)

Result examples

- **NS train ticket machine:** the machine is easy to find with its distinct title, vivid colour, and central location; the payment method is indicated on the machine, as shown in Figure 2.8.



Figure 2.8 The train ticket machine in Schiphol Plaza

- **Official taxi stand:** the waiting line is well-arranged, and the long, yellow banner is eye-catching. As shown in Figure 2.9.



Figure 2.9 Official taxi stand in Schiphol

- **Schiphol Hotel Shuttle:** the visual image of the Schiphol Hotel Shuttle is hard to distinguish. As shown in Figure 2.10



Figure 2.10 Schiphol Hotel Shuttle

The complete version of service safari please see Appendix C.

Interviews

While the secondary data and the self-experienced data has been collected, the real experience of international passenger needs to be explored and understood. Eight formal interviews, with people who have experience on transporting from Schiphol, and some informal ones, with people who have general experience on travelling, are conducted to know users' goals, expectations, problems and needs.

The process of the interview is shown in Figure 2.11. The Interview Questions (see Appendix D) are developed based on the research questions and organised in a logical and user-friendly way. After that, a pilot test is conducted to evaluate whether the research questions are clear and easy-to-answer. After changes to the Research Questions, formal interviews are conducted both with random passengers in Schiphol Airport as well as people who have been to Schiphol Airport before. The interviewees varied in age, gender and profession. However, due to the difficulties of recruiting passengers in the Airport, the representativeness of the interviewees' group is a bit low. There are overmuch interviewees in the age group of 19-28 compared to the age distribution of all outbound tourists.

In the interview, data about: who they are, how they plan and conduct the trip, difficulties they have met, are collected.

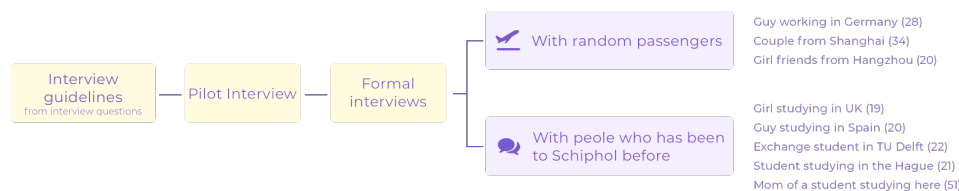


Figure 2.11 Process of the interviews

Result examples

An exchange student in TU Delft:

"I feel a sense of uncertainty all the time. I need confirmation that I bought the right ticket, I arrived at the right platform, and I got on the right train. I'm afraid of making mistakes because I think it's hard for only myself to solve the problem once it happened."

Girl friends from Hangzhou:

"When we booked the hotel, the review said we could take the train to the hotel, so we did like that."

Student studying in the Hague:

"The way-finding system is clear. However, when I'm in a super nervous state, it doesn't work for me anymore."

Observation

Some observation session is conducted in Schiphol Airport. The research goal for observation is to know how different types of passengers behaviour in various stages of passenger experience, the problems they encountered, and how they solve the problem.

There are two ways of observing. One is focusing on a specific type of users, follow and record their experience; the other is focusing on a particular touchpoint, staying in somewhere to see how people interact with the touchpoint. Figure 2.12 shows people in the ticket machine area.



Figure 2.12 People in the ticket machine area

Result examples

[Train ticket machine] Two girls tried to use the train ticket machine, but they had no coins. So finally one of the friends went to the service desk to buy tickets.

[Ticket scanner] Some people look at the ticket scanning pole(only Dutch) for a while as they're not sure if they should scan their ticket there.

[Passengers] Most of Asian passengers take the train.

Internet Retriving

To know more about what passengers are confused about, I did some Internet Retrieving in Chinese travel fora like Qyer and Mafengwo.

For instance, I search the keywords "travel in Holland", "OV chip-card", "Schiphol Airport" in those forums to have a look at those frequently-asked questions. Figure 2.13 shows the section of the Netherlands, Belgium and Luxembourg in Qyer travel forum.



Figure 2.13 The section of the Netherlands, Belgium and Luxembourg in Qyer travel forum

Result examples

- When people mention 'day ticket' for travelling in the Netherlands, there is some misunderstanding. Some people think it means the train day ticket; some people think it means the GVB day ticket.
- Some people ask if it's possible to buy a ticket on the bus; some question if the ticket sold by the driver could be purchased with cash and change.
- Many people complain that there are too many types of transport ticket in the Netherlands.

2.3.2 Analysis method

Analysis on the wall

The analysis method Analysis on the wall (Sanders, 2012) is used to analyse all data from different sources. Firstly, all data are marked with different colours, which represent the sources, like an interviewee, observation of service safari. Also, every piece of data is mapped to different stages of the passenger experience (from at home to boarding). Next, those data are categorised to sub-subject within each

passenger experience stage. Finally, the data are 'translated' to general insights. The insights are marked as positive, negative or neutral. The process and some examples are shown in Figure 2.14

The direct result of Analysis on the wall is an insight mapping which will be shown in 2.3.2. The map of data could be found in Appendix E.

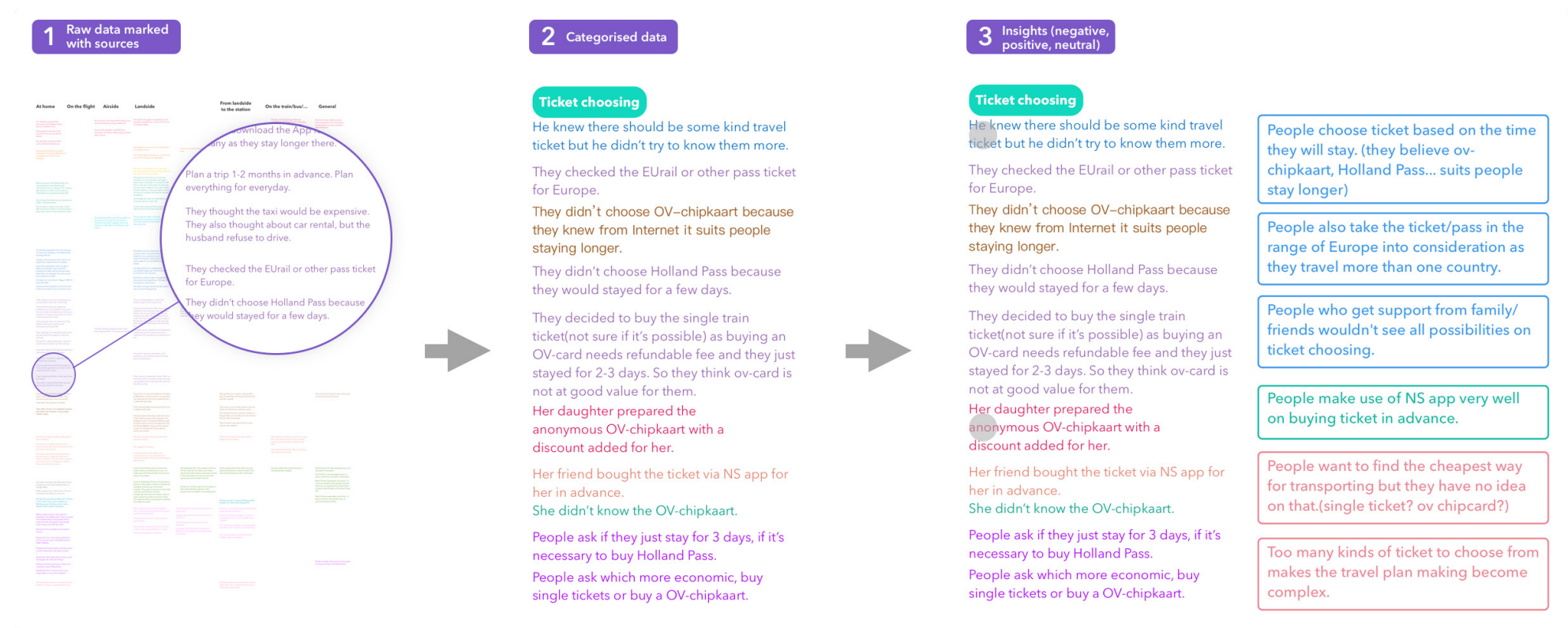


Figure 2.14 The process and example of Analysis on the wall

2.3.3 Results

After conducting all research activities and data analysis, multiple deliverables are made as the answers to Research questions (see 2.2.1).

Insights Mapping shows all insights obtained from various types of research activities; Key insights are insights summarized from the Insights Mapping, which might be able to lead the future design from a higher place; Ways to Complete Main Tasks maps users' current options on each touchpoint from the travel planning to boarding; Personas show three typical users and their travel patter, which derive from the users I interviewed and the big data of Chinese outbound tourists; Customer journeys present the complete experience from the beginning to the ends of these three typical users, and their goals, expectations and pain points. Figure 2.15 shows the process from research activities to research deliverables.

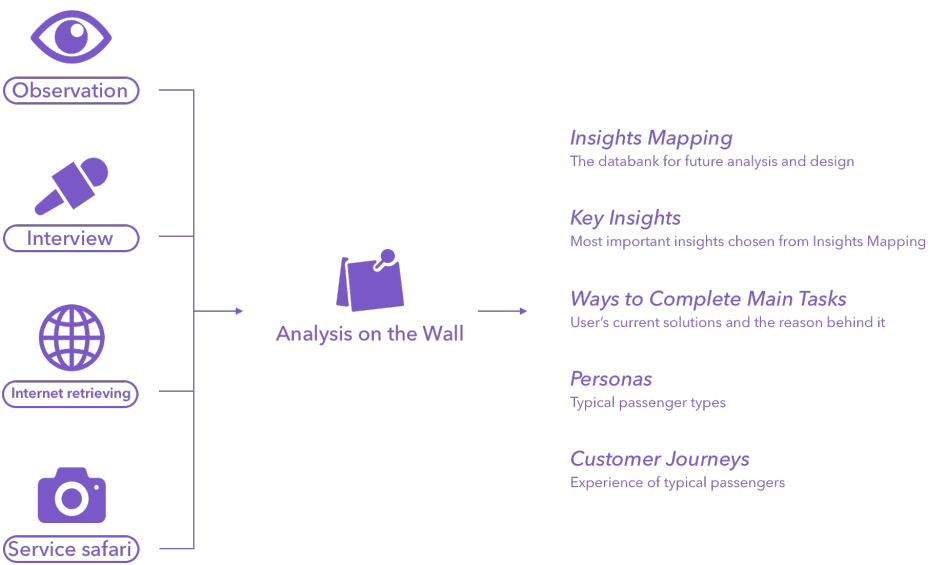


Figure 2.15 From research activities to research deliverables

Ways to Complete Tasks

To answer the research question **what are the current options of passengers to get information, find ways, make decisions on transport and tickets**, relevant data are collected from service safari, interview and internet retrieving.

As shown in Figure 2.16, for each task throughout the experience, the channels/touchpoints, what, how and why mentioned by people are shown. Besides, possible pitfalls and design guidelines are developed to support future conceptualisation. This figure only shows a piece of example, please see the full version in Appendix F.

The Design Guidelines derived from this work are shown in 2.4.3.

Stages	Tasks	Channels/ Touchpoints	What	How	Why	Possible pitfalls	Design Guidelines
Before leaving	Getting transport/ticket Information	Searching engines	Google, Baidu	"from A to B"	Get answer quickly	Outdated info	Succinct and accurate info
	Buying/booking products						
	Choose and prepare the way of payment				...		
After arrival	Transport/ticket information						
	Getting transport/ticket information						
	Way finding				...		
	Getting on the transport						

Figure 2.16 Example of Ways to Complete Tasks

Insights Mapping

Insights Mapping is the first result of Analysis on the Wall (2.3.1). It maps insights in following stages: Preparation before leaving, On the flight, Arrival, Knowing what to do next and buying the ticket, Getting on the transport, On the vehicles. Besides the stage, some general insights are placed in the General column. In each column, insights are sorted in multiple subjects, like transport choosing, ticket information, etc.

The insights in red are negative, in blue are neutral, in green are positive.

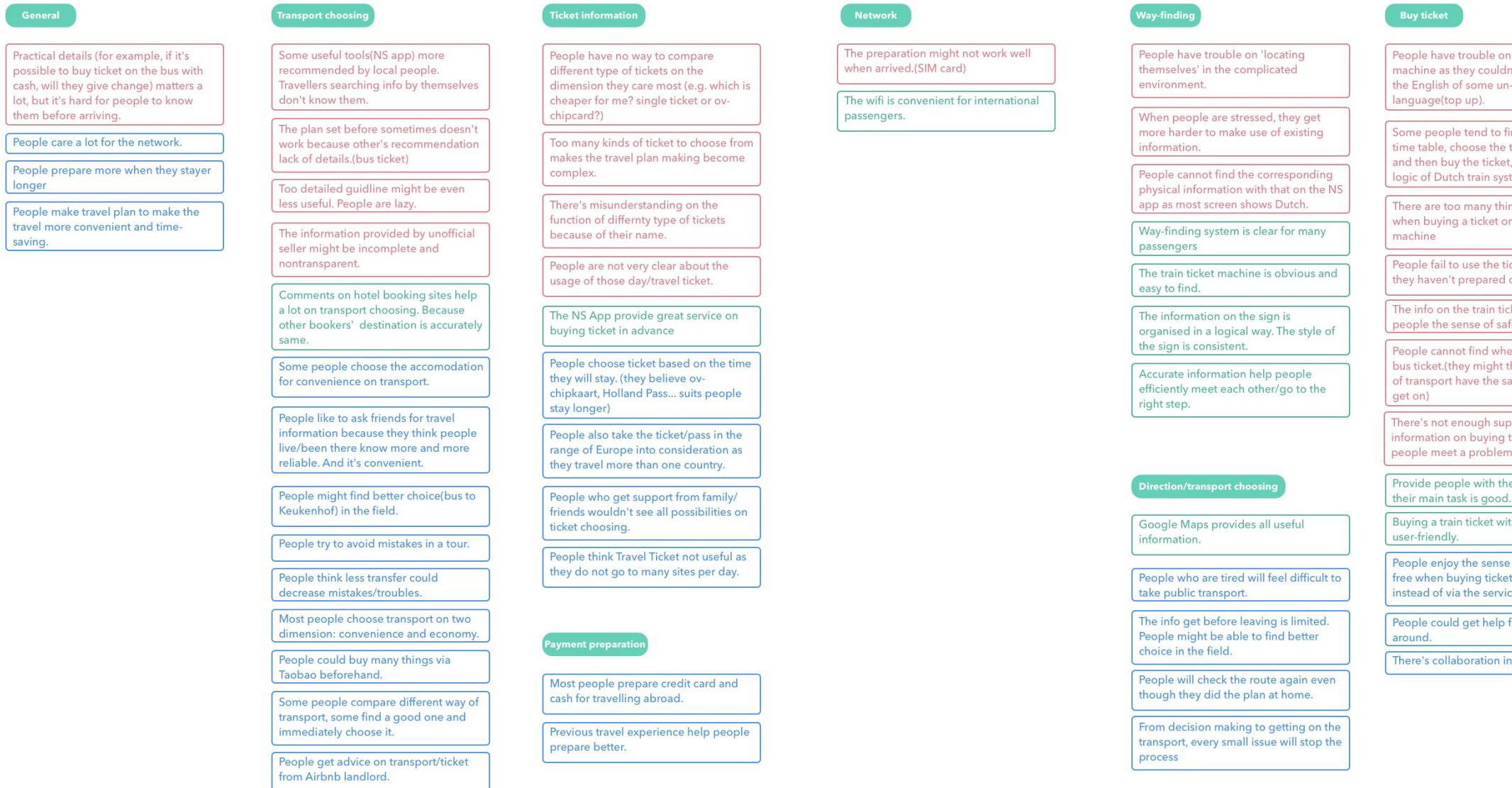
Figure 2.17 show the Insights Mapping.

Preparation before leaving

On the flight

Arrival

Knowing what to do next and b



- Negative
- Neutral
- Positive

Figure 2.17 Insights Mapping

Buying the ticket

Getting info/help

Using ticket
can't understand
dail

People have problems on asking
detailed question or describe problems
in English

Some people don't notice the
information desk in Schiphol.

People failed to get info as the WiFi is
not good in the plaza.

Information/booking details in Chinese
prepared before leaving make it's
harder to check in English in the field.

The outdoor information is hard to
recognise when the sunlight is strong.
(or it's rainy)

People who prepared a lot and have
clear goal and destination need less
information or support.

The personnel could recommend
tickets/transport on travellers' own
need.

Some people believe official
information more.

Info lacking

It's hard for people to know detailed/
special usage of ticket/transport. (a
train ticket use for two tour, buy ticket
on the bus)

There's almost no way for people to
know how to buy bus ticket until they
get on the bus.

People cannot know the detailed info of
car rental before consulting in the desk.

People believe the means of transport
they knew before better.

Getting on the transport On the train/bus/...

Way-finding

The transportation should be easy to
recognised.

People have trouble on finding the right
platform.

Large, obvious sign is helpful.

Well-arranged function area is helpful.

Ticket scanning

Forgetting to scan the ticket is a
frequently-made mistake by first-time
passenger.

The environment doesn't clearly shows
people need to scan their ticket.

The environment doesn't clearly shows
where to scan the ticket.

It's annoying the scanner is upstairs.

The scanner with Dutch on it doesn't
clearly guide people.

People think the OV-chipkaart is
convenient and easy-to-use.

First-time passenger make less mistakes
when they got some 'reminds'

Getting on the train

People find it's hard to confirm the train
is the right one with limited information
to match.

People couldn't find the corresponding
information with that on Google Maps,
which they rely on. ('Intercity 2451')

The information of cancellation or late
are not the same on the App and on
the screen, which is confusing.

Limited info(time, destination, platform)
might results in mistake.

Luggage

Large luggage creates trouble on the
train.

Information on the train

Only Dutch on some trains is
unsupportive.

There are different information shown
on the screen and on the App.

The screen shows information out of
people assumption based on their
previous experience.

Ask for info/help

Asking people in the same situation
could be useful.

The NS app also works on solving
problems.

Some people want to know where he/
she is all the time.

People need support when something
unexpected happen

General

General comments

Most people experience the transport
from Schiphol as not bad.

Travellers think Dutch people are
friendly.

Feelings/emotions

Alone passengers are more stressed
and helpless.

Prior experience affect people's feeling
on next stage experience.

People are tired and nervous after long-
term flight.

For first-time passenger, even the
transport system is clear, they find it's
complex.

People are afraid of making mistakes.

Problems

Sometime people cannot find info in
English even though it's there.

The weak Wi-fi in the plaza while that in
the airside is pretty good results in
some trouble.

The wifi is not well-covered in the
Schiphol Plaza

Most people don't know other
transport options(STA, Hotel Shuttle)
besides the common ones.

Most people lack knowledge in various
types of tickets.

Behavior pattern

The way of taking a train in the
Netherlands is completely different
from that in China, which results in
confusions.

A 'guide' could facilitate everything for
you and make you feel the sense of
safety.

Girl friends, or young people group, or
family are the top 3 traveller
combination.

The payment mode of people when
travelling could differ a lot from before.

Some people want to confirm all the
time he/she is not doing something
wrong.

A large amount of travellers will be to
more than one country in Europe.

Most of Chinese passenger choose
train and don't go out of the plaza. As
they think it's most convenient and
know little about others.

People believe more on the App than
the physical information(screens).

Key Insights

Key Insights is a summarized version of the Insight Mapping, which shows the most obvious and important insights about users problems, needs and expectaions.

Before leaving

- Criteria for transport choosing of most people: **convenient and costeffective**.
- People prefer 'true experience' (from friends or people online) because they are **easy to understand, detailed and reliable**.
- There are some **great resources** international passengers **seldom get access to**: Domestic Apps: NS, 9292; Special transport service: Schiphol Travel Taxis, Schiphol Hotel Shuttle; all kinds of travel pass/tickets.
- Sometimes it's hard for travellers to '**calculate**': which hotel is closer to the city centre? which is more cost-effective, single ticket or OV-chipkaart? as they are completely not familiar with the destination and transport system, only get some general information.
- The information collected before might **lack in details**(bus ticket, train ticket usage, coins), which might be crucial in the real situation. As a results, **well-made plan might not be carried out**.
- Making travel plan is not a linear process, but more lik 

After arrival

- There are **many difference between Chinese public transport and Dutch public transport**, especially about how to use it, which

make people make mistakes of feel confused. Taking a train in the Netherlands is completely different from that in China, and is more close to take a metro in China. Also, in China, when people taking bus they only need to scan for one time.

- A large amount of Chinese passenger will **visit more than one country** at one time when travelling to Europe, which means they have complicated plan to make and the Dutch transport system need to coordinate and support it.
- The transport system should make people do right, and make people **feel they are doing right**.(train tickets, platform, train)
- For most Chinese passenger, they could easily finish basic tasks and solve simple problems in English. However, when the situation become **detailed and complicated, they feel hard to express themselves and get proper help**. Besides, understanding non-daily terms is difficult for them.
- The environment itself should guide people **intuitively finish their tasks**.
- If there's only Dutch, try to add English. When the English exists, **make the user know it**.

Personas

Three personas are developed to reveal types of users and various, typical travel pattern. The development of the personas are based on those factors:

- People I researched with: I interviewed more than ten people. I choose some of them, who have different profession, all encountered many problems and have different travel pattern (to what extent they plan their trip) as the base of the persona;
- The image of Chinese outbound travellers(2.2.2): I take the age and gender distribution into consideration. However, even though people aged 49-58 is the third largest group in all Chinese outbound tourists, due to the only interviewee aged 49-58 didn't have an independent trip, and there is not much information on the internet about independent traveller aged 49-58, the persona in this age is missing;

Besides, the personas do not cover business travellers because:

- No one I interviewed randomly in the Airport is business travellers;
- From my observation, there is always someone holding a paper or an iPad to pick up someone travelling for business purpose;
- Business travellers do not need to plan too much for their business trip, compared to leisure travellers.

After consideration of the factors above, three personas are developed. The first is a couple, Chens, who always plan the travel pretty well; the second is a student travelling for study, Li, who suffers a lot from the lonely trip with large luggage; the third is two girls who have a spur-of-the-moment trip.



Chens, detailed-planning couple

Personal information

- Age 33
- No kids
- Living in Shanghai
- Poor language skills

Travel pattern

- The goal for this trip: enjoy the time and explore the world with my loved one
- Travel for 3-4 times per year
- Plan a trip 1-2 months in advance
- Make a detailed travel plan before leaving: where to go in which day
- Plan reference: Qyer (travel platform)

Transport/ticket

- Compare various means of transport/types of tickets and choose the best one
- When choosing transport: care 'convenient' and 'time-saving' most
- When choosing tickets: the most economical tickets based on how long they would stay

Emotion and feelings

- Relaxed, open-minded
- The plan could be flexible

Main problems

- Unable to conduct their plan(taking a bus to Kuekenhof) because they don't know where to buy a ticket.

Main needs

- The information they got beforehand could perfectly match with the real



Li, student alone with large luggage

Personal information

- Age 18
- Moderate language skills
- Living in Changsha

Travel pattern

- The goal for this trip: get to his school quickly and fluently, without any mistakes
- Travel for 1-2 times per year
- Make a moderate-detailed plan before leaving: plan the route from Airport to his school one week before leaving
- Plan reference: his friends living in the Netherlands

Transport/ticket

- No comparison, get the recommendation from his friend and follow it because he believes experience from people lived there most;

Emotion and feelings

- Afraid of making a mistake or getting lost
- Nervous and tired

Main problems

- Not able to feel "I'm doing right" during the travel
- Not able to find the information she need immediately
- Not able to get support/help when the problem happens

Main needs

- Every piece of information is accurate and reliable
- The sense of safety and certainty: everything is going right
- Intuitive and proactive information
- Get support/help anywhere and anytime he needs



Jia and Wenjun, friends with little preparation

Personal information

- Age 25
- Good language skills
- Studying in Italy

Travel pattern

- The goal for this trip: escape from their daily routines
- Travel for 2-3 times per year
- No preparation on transport

Transport/ticket

- Check the route with Google Maps after arriving
- Buy tickets first with the machine, finally in a personnel window

Emotion and feelings

- Hesitated
- Confusing

Main problems

- Not able to quickly have an overview of an unfamiliar transport system
- Have trouble choosing tickets in a short time with limited information (which type of ticket most convenient and economical)
- Do not prepare coins for the ticket machine

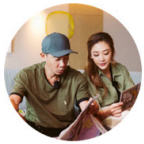
Main needs

- Have an orientation on multiple aspects
- Get enough information/reliable recommendations on the best option of tickets
- Not get into a trap
- Always find a solution/alternative way when something doesn't work

Customer journeys

Based on three personas, three customer journeys are developed to show their complete experience. The phases and stages of the customer journey are based on the Travel Phases defined by Lehr (2016). In the customer journeys, their different behaviours, goals, expectations, pain points, emotions and possible values are shown, which inspire and support future conceptualisation.

Please check the three journeys (Figure 2.18, Figure 2.19, Figure 2.20) and the summary of them in the next few pages.



The journey of Chens from travel planning to their first destination

Phases

Preparation before leaving

Steps

General orientation

Transport selection

Goals

Have an overview of the travel destination

Determine the cities to go, the time and duration of the trip

Choose the flights

Determine the places and activities for each day

Determine the transport modality (non-public or public transport)

Choose the accommodation

Choose the transport from airport to hotel

Actions

Search The Netherlands in travel platform

Read travel guide or others' post on travel experience

Check the price and time of various flights, choose and buy the ticket

Read travel guide or others' post on travel experience;
Search for detailed information for the cities or activities

Evaluate the cons and pros of each modality;
Get information from travel guides, others' experience or car rental agencies.

Check the facilitation, environment and transport accessibility of the hotel

Read the transport guide and reviews about transport on the hotel page(train);
Double check with a map App

Touchpoints

Qyer, a travel platform/BBS

Qyer, a travel platform;

Flight booking website

Qyer, Baidu(searching engine)

Qyer, Baidu

Booking.com, Apple Maps

Booking.com, Apple Maps

Expectation

Quickly get familiar about the destination on multiple aspects(transport included);
Clear, well-organised information

Quickly find the interesting destinations and suitable duration for them; get valuable advice on schedule

Tickets in good time and price still available

Quickly know every options and match personal interests with them;
Get a fluent and convenient route/schedule among the attractions

Reliable information clearly showing the accessibilities and usabilities of each transport modality;
Recommendations on transport based on chosen places/activities

Quickly find the options of convenient transport;
Easily know if the accommodation is convenient in transport even when I'm not familiar with the city.

Get reliable and detailed information from others' real experience

Painpoints

Information overload

Hard to define 'convenient transport' in a unfamiliar city

'Unpurposed travel guide' lack in details

Emotions

Excited

Anxious

Impatient

Cautious

Curious

Values

Feel welcomed
Self-direction

Being informed
Feel in control

Freedom to choose

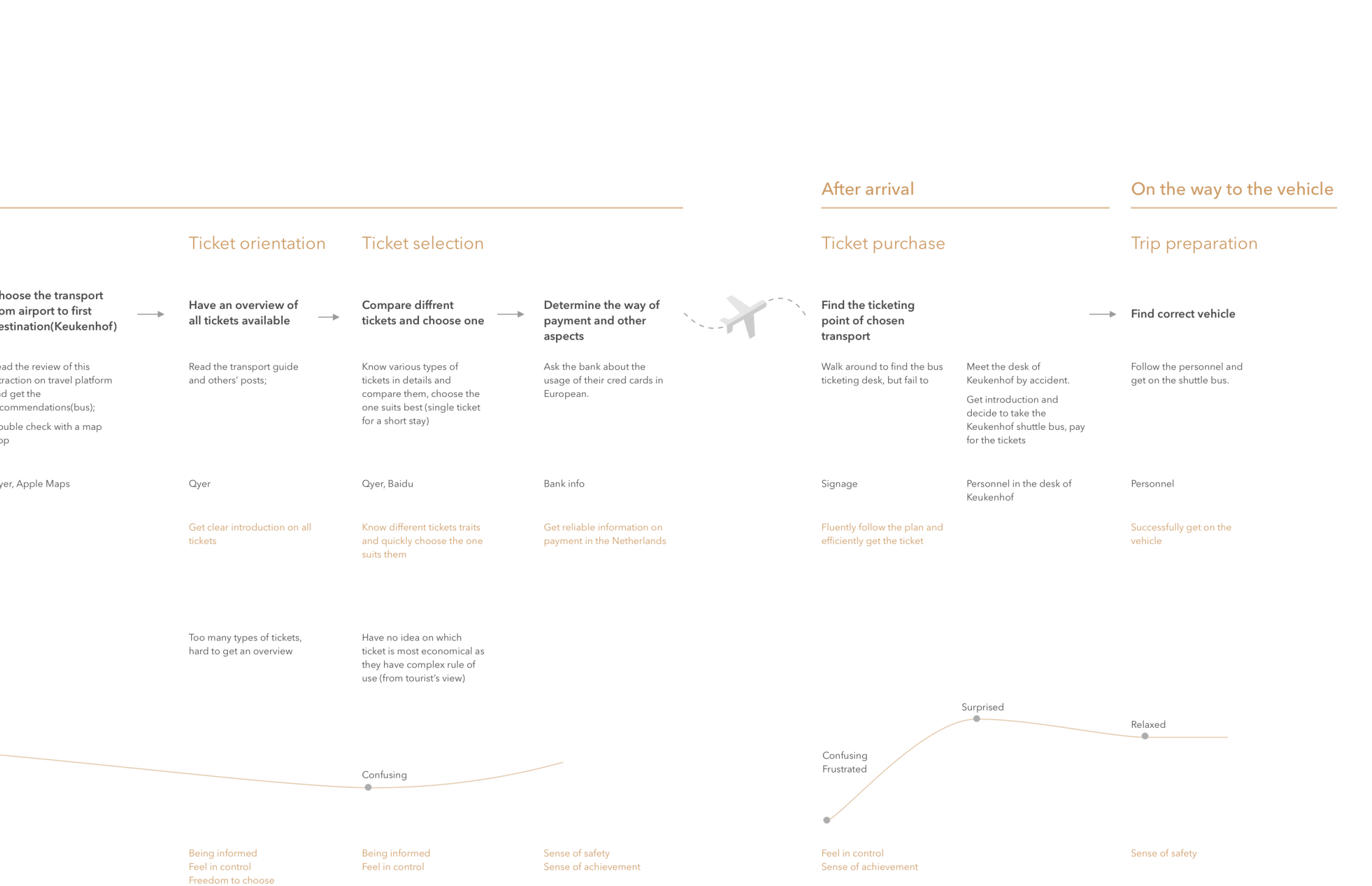
Being informed
Feel in control

Being informed
Feel in control

Freedom to choose
Being informed

Sense of safety

Figure 2.18 Customer journey 1





The journey of Li from travel planning to their first destination

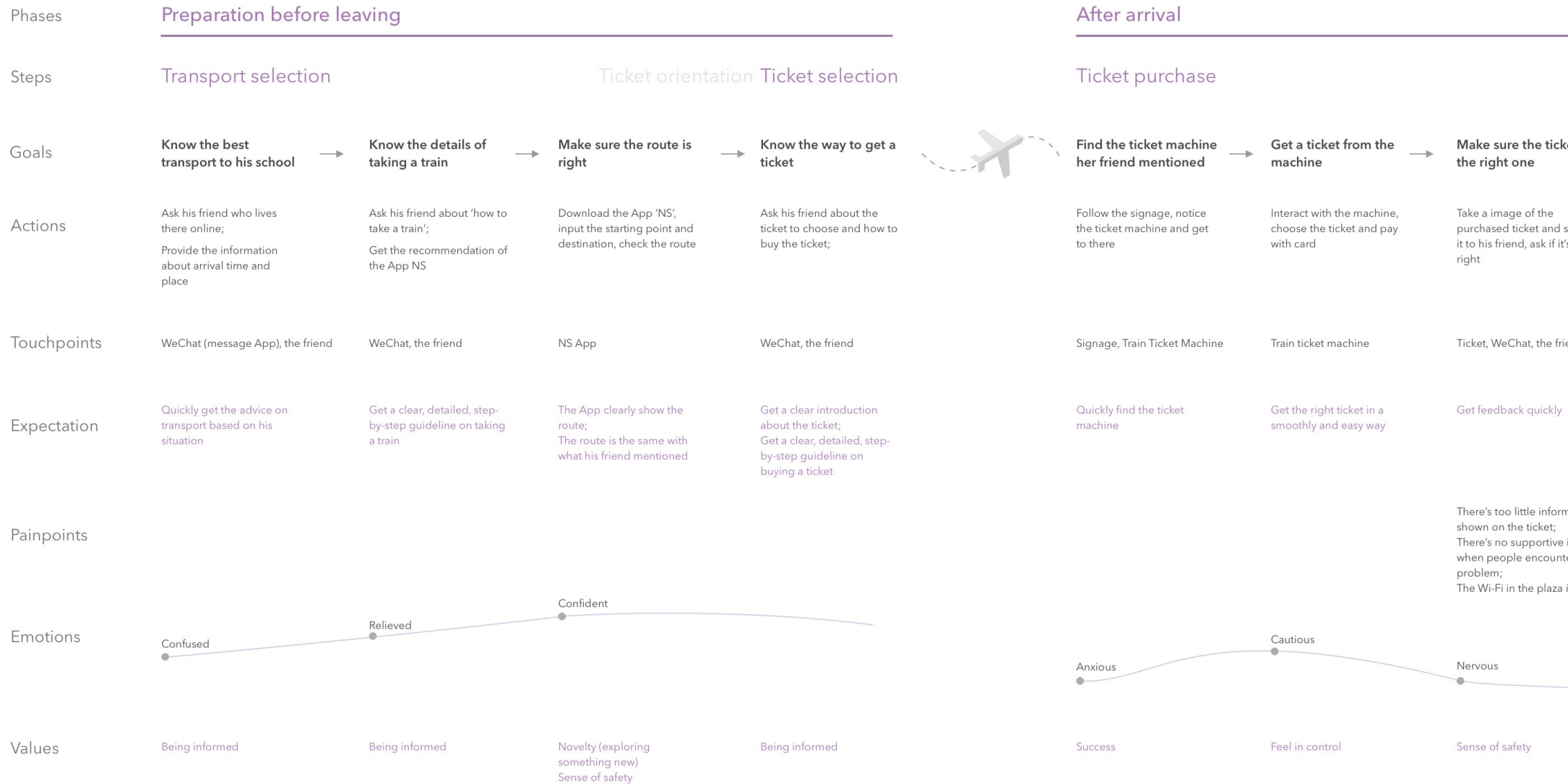
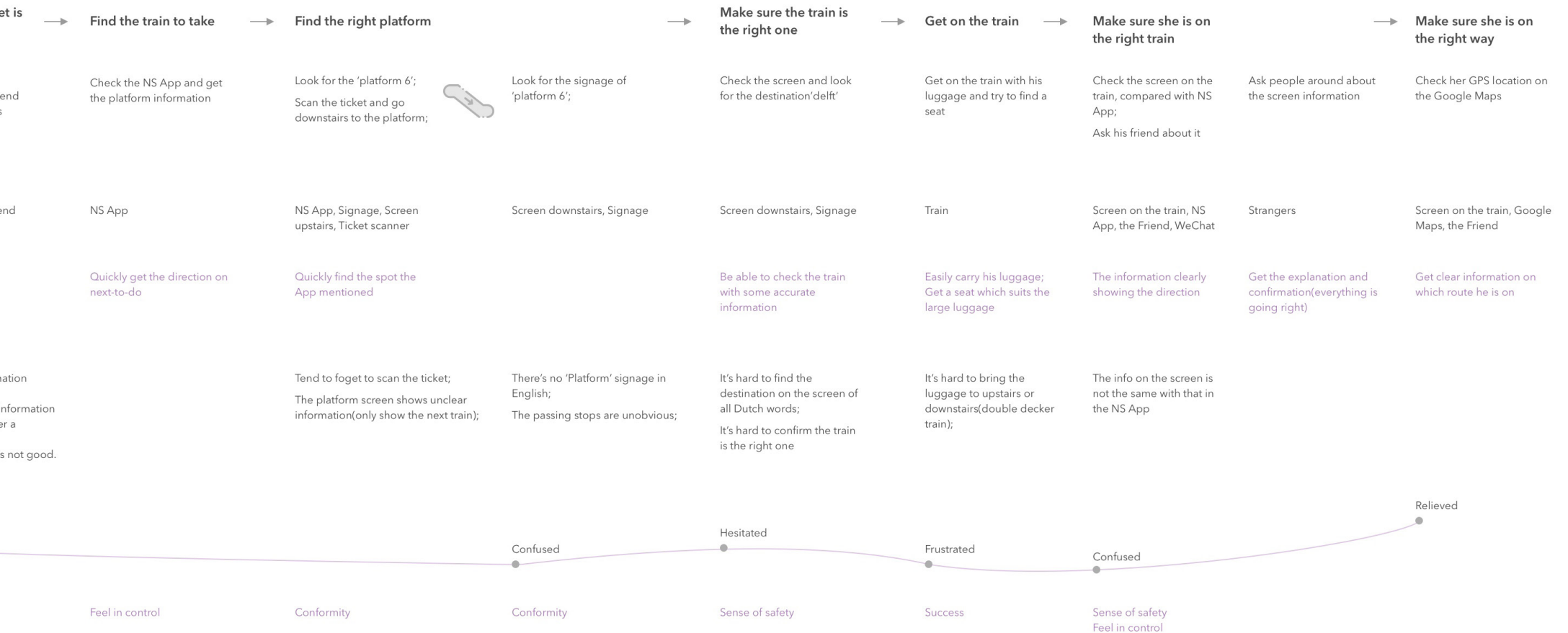


Figure 2.19 Customer journey 2

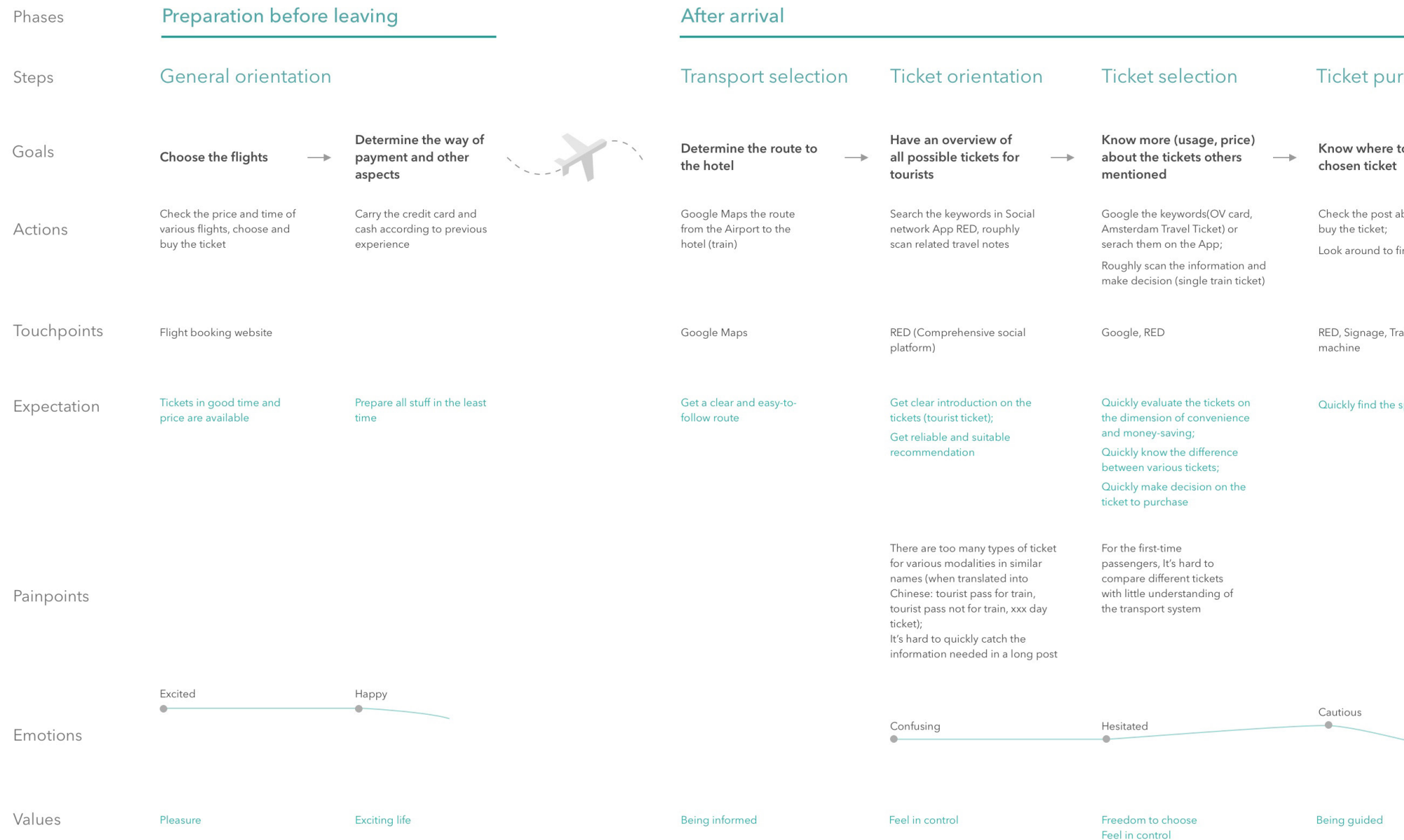
On the way to the vehicle

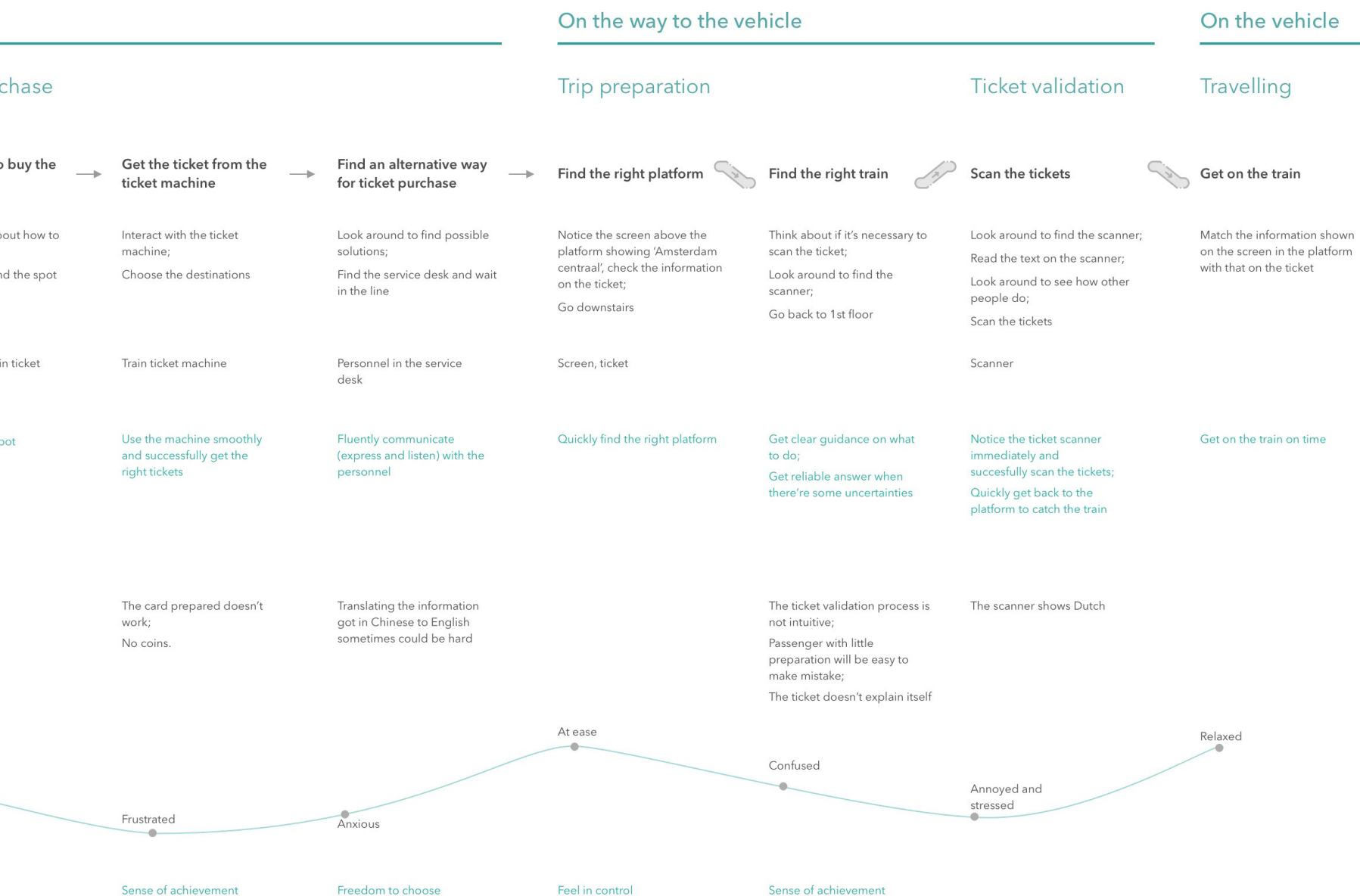
Trip preparation





The journey of Jia and Wenjun from travel planning to their first destination





Some key points from the three customer journeys are summarised:

Customer journey 1: The journey of Chens

- They have a detailed and long preparation stage, which is not a linear process but an iterative or even messy one;
- They are the deep user of travel websites; they like to get information from other's real experience;
- The main pain point of them is the information they obtain before lack in practical detail, which hinder the carrying out of the plan.

Customer journey 2: The journey of Li

- Li checks 'if this step is right' all the time;
- He is lacking in the sense of safety and not able to feel in control from arrival to getting on the vehicle;
- The main point of he is he cannot feel assured and supported in the Airport.

Customer journey 3: The journey of Jia and Wenjun

- They have the shortest preparation stage;
- They expect it could be a fluent journey, even without much preparation. However, they encounter some annoying issues like the payment for the ticket machine;
- The main points of them are the ticket system is not friendly enough to all situations and cannot quickly understand the transportation system.

Moving on

After getting closer to the users and listen to the stories of their real experience, a detailed and more in-depth image of their experience, needs and expectation is built.

Conclusions for this section

- People preference on travel planning, choosing routes are varied
- People get information and support on travelling from multiple channels, from travel advising sites, online forum to their friends
- The physical facilitations are good, however, communicating the information and idea is not easy

Questions for the next section

- How to step from research to design?

2.4 Conclusion: Design Brief

The conclusions of the Research&Analysis stage are presented as a Design Brief, which leads to future Ideation and Conceptualisation. The Design Brief consist of three parts:

Main Problems: the focus of the future design

Design Goals: the general aspired qualities of the future design

Design Guidelines: the detailed requirements of the future design

2.4.1 Main Problems

Calculating problem Sometimes it is hard for travellers to 'calculate': which hotel is closer to the city centre? Which is more cost-effective, single ticket or OV-chipkaart? As they are entirely not familiar with the destination and transport system, only get some general information.

Hard-to-reach resources There are some great resources international passengers seldom get access to: Domestic Apps: NS, 9292; Special transport service: Schiphol Travel Taxis, Schiphol Hotel Shuttle; all kinds of travel pass/tickets.

Information lacking details The information collected before might lack in details(bus ticket, train ticket usage, coins), which might be crucial in the real situation. As a result, a well-made plan might not be carried out.

Transport culture shock There is much difference between Chinese public transport and Dutch public transport, especially about how to use it, which make people make mistakes of feeling confused. Taking a train in the Netherlands is entirely different from that in China, and is more close to taking the metro in China. Also, in China, when people are taking the bus, they only need to scan for one time.

No sense of safety First-time passenger is nervous, lacking in the sense of safety. In this situation, getting information becomes even harder. Double-check is common(before leaving and after arrival). During a trip, they might consistently check 'Is everything going right?'

Language barrier For most Chinese passenger, they could efficiently finish basic tasks and solve simple problems in English. However, when the situation become detailed and complicated, they feel hard to express themselves and get proper help. Besides, understanding non-daily terms are difficult for them.

2.4.2 Design Goals

Based on the insights generated in the analysis stage, two main design goals with several sub-design goals are developed.

- **Make passenger even in extreme state feel confident (they are doing right) and supported (even though they are doing wrong, it's still fine) through the whole journey**

- Enable users to quickly adapt to a new, different transport system
- Enable users to make decision in an unfamiliar field easily
- Guide people to finish their tasks intuitively
- Decrease the language barrier in complex situation
- Make all necessary information exists and be easy to find
- Decrease the cost of making mistake

- **Enable passenger to plan their transport journey based on their needs easily and freely**

- Make what people care about matters
- Provide reliable information in the 'user language' at the right moment, right place
- Create the information democracy: people could know everything if they want, and they know they could
- Improve the accessibility of all great resources
- Support passenger with the situation the Netherlands is one destination of their travel in Europe

2.4.3 Design Guidelines

Besides the Design Goals, which would guide the Ideation phase, some design guidelines which would guide the design detail in the Conceptualisation phase are also generated. They are developed from the reasons behind people's current choices on getting information, making transport plan, buying a ticket and finding the way.

Information

- Give people succinct and accurate info
- The information should be reliable and frequent-updated
- The information should be obvious, accurate and show at the right place, right moment
- Make the information everywhere consistent. If they are different, all of them seem unreliable
- Provide the information in the 'user language'
- Provide information which even works for stressed person

Behaviours

- For some people, make the choosing process as quick as possible, make use of their previous data(preference, things matter most)
- Give enough freedom or flexibility to users
- Help people to get accustomed to a new platform for getting information Personalised recommendations

Usability

- The tool/product should explain itself
- The support should be easy to get access to
- Relate the products/info in a logic way and give recommendations in the right time
- Create the sense of control

Language

- Develop tools in user's own language(but could match with the info in the field)
- Make two-language everywhere and make people know 'there's English'



03

Ideation

3.1 Introduction

The previous chapter investigates the background, the users and the interaction relevant to the topic of this project. The Main Problems, Design Goals and Design Guidelines were also defined to support and guide the ideation stage. In this chapter, the methods and process of ideation based on the results of Research&Analysis stage is introduced, the generated ideas are presented and evaluated to develop the final concept of this project.

Figure 3.1 illustrates the process of the Ideation stage. There are two types of the brainstorming session, and two rounds of evaluation on the ideas, finally, taking the comments from stakeholder into consideration, the final direction to develop in the future stage is defined.

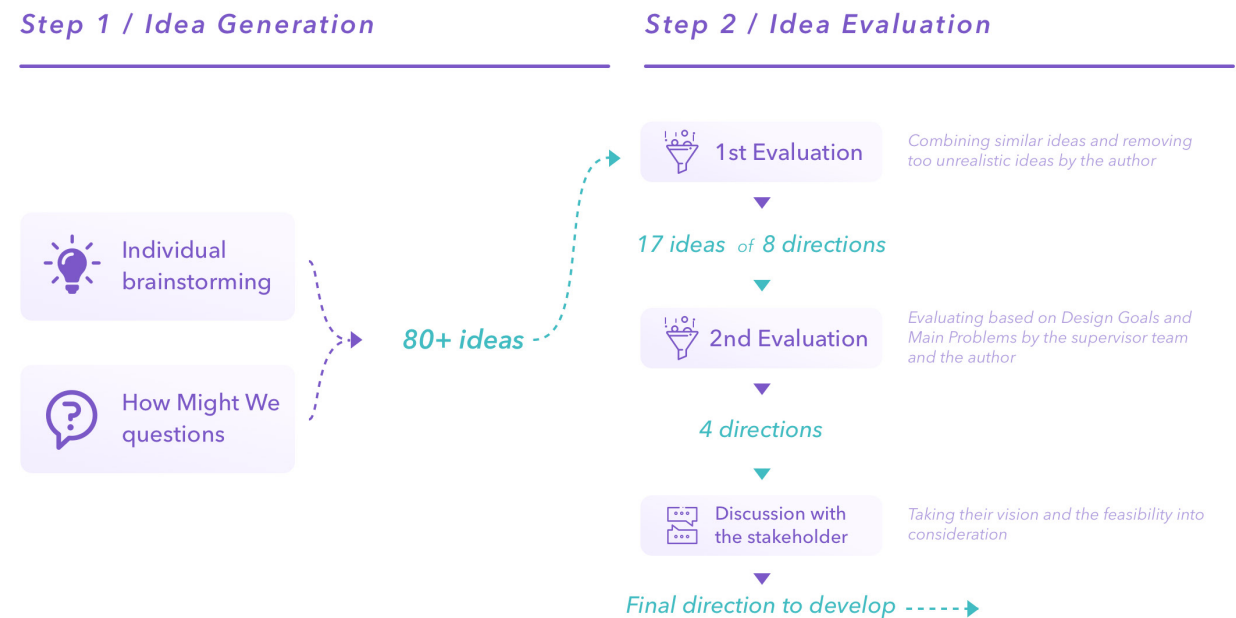


Figure 3.1 Process of Ideation stage

"How Might We" Sessions

The How Might We questions are generated and used as inspiration for the group brainstorming sessions.

Firstly, the Point of View of each persona, which highlights 'who are they', 'what they need', and 'why their needs are not satisfied' are defined. As the second step, the How Might We questions are developed based on the topics of the questions. One example of the Point of View and How Might We questions are shown in Figure 3.3 and Point of View of each persona.

The full version of the Point of View and How Might We of the three personas could be found in Appendix G.

After the preparation work is done, a group of designers start to generate ideas to answer those questions(See Figure 3.4).

<u>Design Challenge</u>		
Design the experience of transporting from Airport		
Who	Need	Why
A couple with detailed travel plan	Their plan could be carried out successfully and fluently	The information collected before is usually not including details There are other choices in the field which is not known by the user before hand
Topics		Questions
Amp up the good		How to provide even better choice for them?
Remove the bad		How to make every choice the best choice?
Explore the opposite		How to make the 'preparation' not necessary?
Question an assumption		How to make the transport flexible enough?
Go after adjectives		How to change 'unknown' to 'known'?
Create an analogy from insight or context		How to make the journey like fighting monsters game?
Use unexpected resources		How to make use of the accident?
Play POV against the challenge		How to make non-planning trip the best?

Figure 3.3 One example of the Point of View and How Might We questions

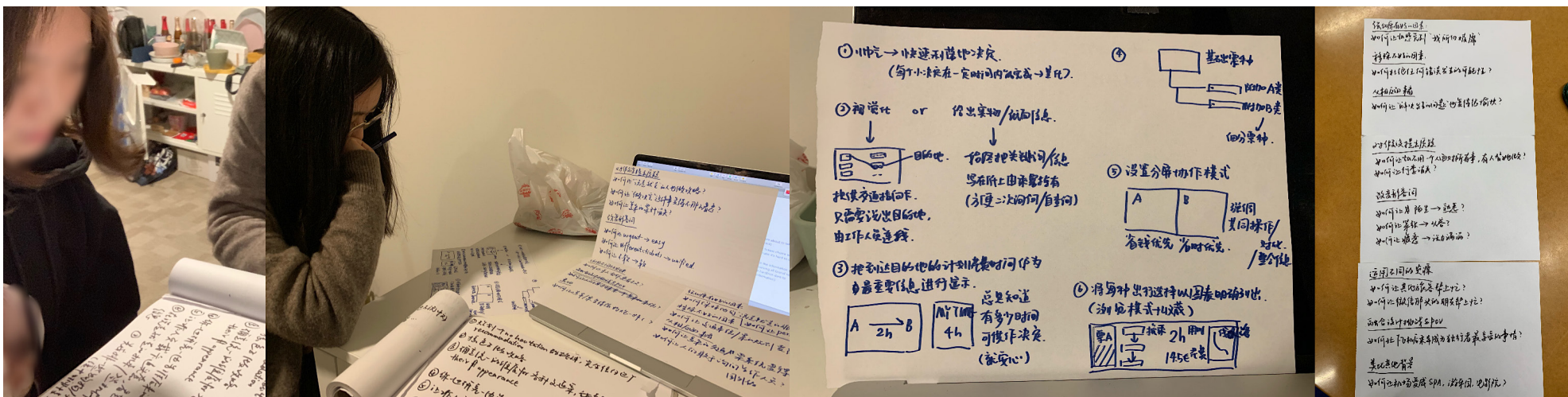


Figure 3.4 How Might We sessions

3.2.3 Ideas Mapping

There are in total 80 ideas collected in several rounds of brainstorming. To have an overview of each idea, and to compare each other and explore the possibility of combining different ideas, they are mapped to topics in the horizontal axis. Also, in consideration of the feasibility of ideas, the ideas are mapped in the vertical axis in 'could be implemented in three months', 'could be implemented in three years' and 'might could not be implemented'.

The Map of all ideas see Appendix H.

3.3 Idea Evaluation

For the final concept, some ideas should be chosen, combined and evolved. Several rounds of ideas evaluation are conducted with different people involved.

3.3.1 First-round evaluation

Goal and process

Those crazy or unrealistic ideas coming out in the brainstorming might inspire other better ideas and bring positive emotion to the brainstorming group. However, those ideas might not be possible to develop in the conceptualisation stage. The goal for first-round evaluation is to remove the ideas which are too unrealistic to develop, combine similar ideas and sort the ideas into several Design Directions.

The evaluation is conducted by the author in Excel. The ideas chosen are highlighted in the table. Please see the table in Appendix H.

Metrics

- Realistic or not
- Whether there are similar ideas to combine with

Results

Seventeen ideas are left after first-round evaluation, and eight design directions are summarised. Besides, there are some recommendation to current system.

The design directions are:

General:

A Multi-functional platform (idea 1, 2)

B Change their mood (idea 3, 4)

On getting information:

C Intuitive transport info collecting (idea 5, 6)

D Quick orientation (idea 7, 8)

On ticket choosing:

E New (tourist) tickets (idea 9, 10, 11)

On getting support:

F Q&A for specific spots/touch-points (idea 12, 13)

G Involve local people (idea 14)

H Change the meaning of 'making mistake' (idea 15, 16 17)

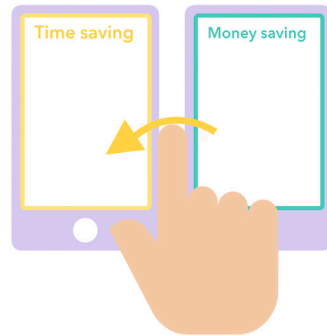
The eighteen ideas in the seven directions are introduced below. The icons in the upper right coner indicated in which stage the idea focuses on.

A Multi-functional platform

1 Unified transport planing /ticket booking system



- Different travel plan making mode: save-money/save-time/save-effort;
- Divide the process into several steps, set the goal for each step separately, which avoid users get lost in making a travel plan;
- Parallel information(various types of transport modalities) are organised in the same way;
- Ticket comparison on different categories (like the Apple website).



2 Super Schiphol Map



- Locate users in the Schiphol;
- Show route like other Map Apps, providing an estimated fee;
- Enable users to buy various types of tickets with the App;
- If permission got, get information about the user's flight and hotel automatically.



B Change their mind

3 Slow down their pace



- Encourage people to have a rest/shopping/video call in Schiphol to have a buffer between exhausting travel: then, they would have a more relaxing mood and more time for preparation.
- Or create an area for people to plan to deliver the message: It is okay to sit down and spend some time on planning the travel.

4 Transfer the first trip to an adventure



- Make the first trip not the last pain before people's holiday, but the first exciting moment in their travel.

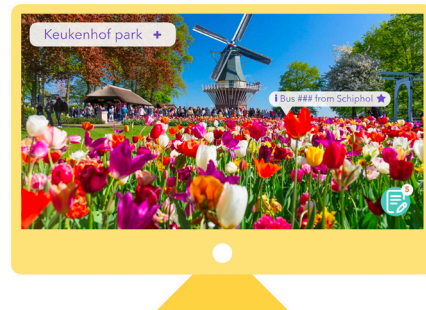


C Intuitive transport info collecting

5 Introductory video with pop-up



- By watching an introductory video, catch the pop-ups and finish your plan making.



D Quick orientation

7 Game on the flight (digital/paper)



- Make the passenger who prepared little have a basic understanding of the transport system he/she will deal with in a playful way.



"Now, you are the Minister of Dutch mobility government! You have the right to plan the railway in this country! ..."

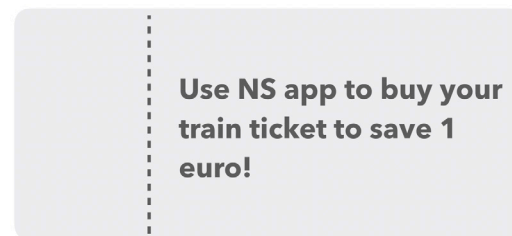
6 Sweep and collect



- When reading other's travel story or guidelines, select the content you think important and sweep to the right. Then just continue to read. The system would recognise and tag the content (attractions, transport tips, etc.), and then automatically organise a travel guide for you.



8 Brief information on the boarding pass



Backside of a boarding pass

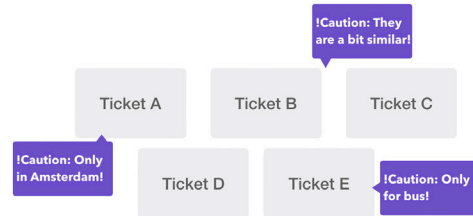
- Show an important message on the boarding pass or somewhere notable.

E New (tourist) tickets

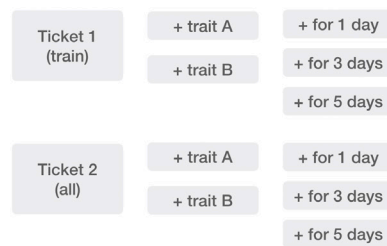
9 Simplify the ticket logic



Current situation

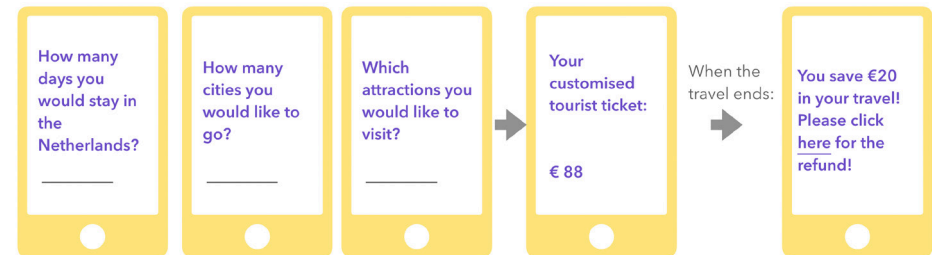


In the future



- Make the ticket explain themselves during the process of choosing a ticket.

11 Only one type of tourist ticket: customised one



- The passenger pays a fixed amount of money, and always get a refund in the end.

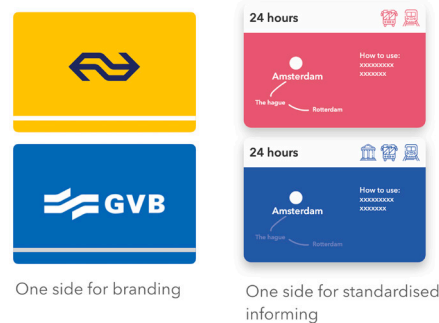
10 Standardised the visualisations of the tickets



- Create a visual standard for all (tourist) tickets:

- Different colours, size, logo and shape, represent specific meanings: modality, days, regions, etc.

- The goal is to lower down the effort to know various tickets and compare different them.



One side for branding

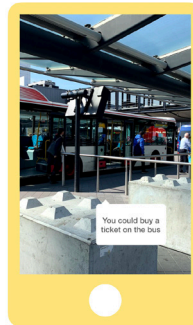
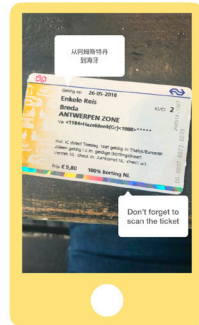
One side for standardised informing

F Q&A for specific spots/touch-point

12 AR Scanner



- The user could scan everything and get the translation and tips.



G Involve local people

14 Proactive help from the passer-by



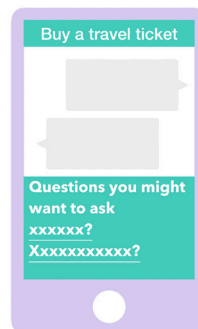
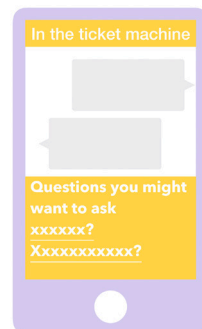
- If some people do not dare to ask others for help, let us encourage others to help them.

If you have time now, please try to help some people who are first be there in the plaza :)

13 Chat with AI personnel



- The user could choose the spot or step he or she has a question. Several frequently answered questions are also provided.



H Change the meaning of 'making a mistake'

15 Insurance on 'not fluent process'



- If the passenger gets some troubles because of the outside reasons, they could get some discount on their tickets or other rewards;
- Make users know: if you make a mistake, it's not your fault, it's our fault
- Make users know: do not worry about you will probably make a mistake! (and then they might not)



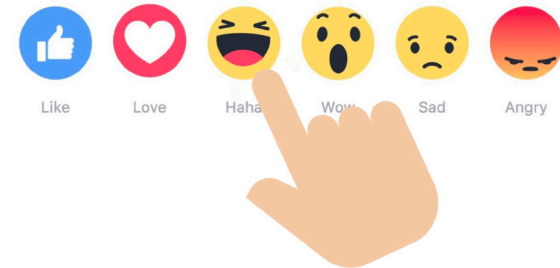
16 Complain machine



- Put a machine(or a page in an App) for complaints. Make the process like "haha, I find your drawbacks again!"



17 Encourage people to share their failures



- People might like to make fun of their embarrassing moments, which decrease the negative emotion.

Recommendations on current service

[Service desk]

- Make it more obvious
- Provide keywords for question (with translation reminds) on the window

[Waiting line]

- Redesign the waiting line(machines or service desk) to release the pressure for the customer who spends more extended time on their task

[Language]

- Use different colours/fonts for different languages and make it consistent everywhere

[Where trouble happens(ticket machine)]

- Add signage of alternative way
- Promise to the users their problems will be solved and let them know(even before the difficulty arising)
- 'Please press the button/call this number. We would solve anything for you.'

3.3.2 Second-round evaluation

Goal and process

After showing eighteen ideas/seven directions as the results of the first-round evaluation to the supervisor team, the 2nd evaluation session involving the supervisor team and the author is conducted, with the goal to develop the final concept.

Two metrics are brought to evaluate the seventeen ideas/eight directions: the number of problems(defined in 2.4.1) the idea might solve, and the Design Goals (2.4.2) the idea might be able to achieve. Please see the evaluation details in Appendix I.

Metrics

- How many Defined Problem the design might be able to solve
- To which extend the Design Goal might be achieved with the design

Results

Based on the results of idea evaluation with the metrics 'solved problem' and 'achieved design goals', four design directions 'Multi-functional platform' 'New (tourist) tickets', 'Q&A for specific spots/ touch-points' and 'Change their mood' are chosen.

3.3.3 Comments from the stakeholder

Goal and process

The opinion from the stakeholders matters a lot. To take the feasibility and stakeholders' vision into consideration when developing the final concept, the author discusses the concept with Marco Gerrese from Schiphol.

Results

- The stakeholder shows a significant interest in the WeChat environment
- The stakeholder wish to build an online mobile platform which enables visitors to book their trip and get automatically directed to the point of entry for the transportation
- For the feasibility and visions, the design directions 'Multi-functional platform', 'New (tourist) tickets', 'Change their mood' are chosen for further development.

3.4 Conclusion

Based on the two rounds of ideas evaluation and comments from Stakeholders, the conclusion is to develop the directions 'Multi-functional platform' and 'New 'tourist' tickets' into an online mobile platform, as well as create a service together with the direction 'Change their mood'.

Other ideas will also be considered, evolved and combined into the mobile platform or physical service.



04

Conceptualisation

4.1 Introduction

The previous chapter presents the generation of a couple of ideas and the evaluation of the ideas. As a result, the final design direction is determined as the base of the final concept. This chapter presents the process of how the final design as a mobile platform supporting transportation from Schiphol Airport for Chinese passengers is developed.

Figure 4.1 shows the process of conceptualisation.

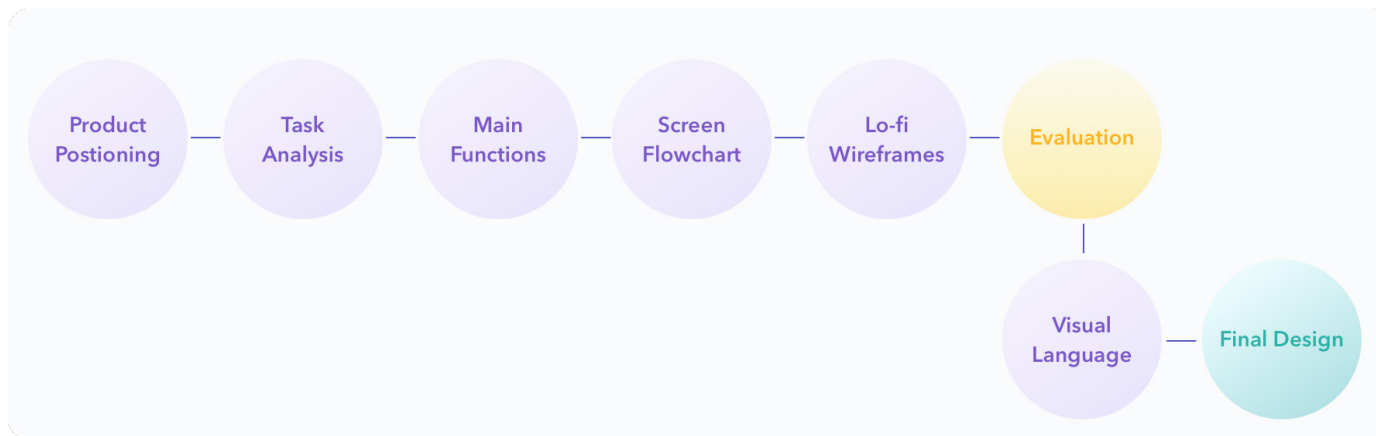


Figure 4.1 Process of Conceptualisation stage

4.2 Product Positioning

At the beginning of the Conceptualisation stage, various aspects of the product are clarified.

Product Definition

After ideation and idea evaluation, the final design direction is defined:
A digital platform enabling passengers to plan and book their 'trip'
(transport modality+ticket+tips for plan implementation).

Target Group

Individual visitors from China, who plan the transport by themselves.

Main Functions

- Ticket selection, ticket recommendation
- Route selection, route recommendation
- Getting instructions

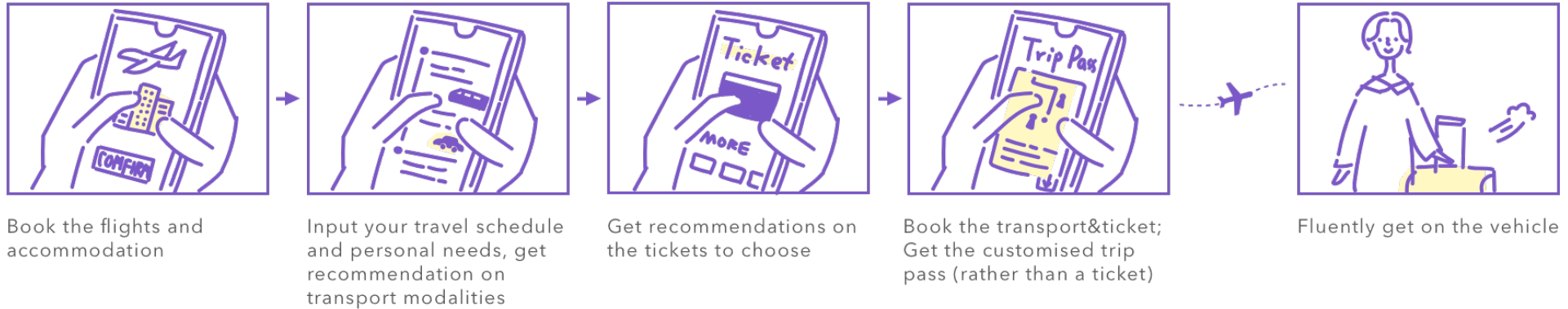
User's goals

- Plan their transport journey based on their needs efficiently and freely
- Feel confident and supported through the whole journey

Scenario

The storyboards (Figure 4.2) shows two aspired situations of the mobile platform using. One for people who make travel plan before leaving, the other for people who have no preparation before arrival.

1 Planning before leaving



2 Planning after arrival

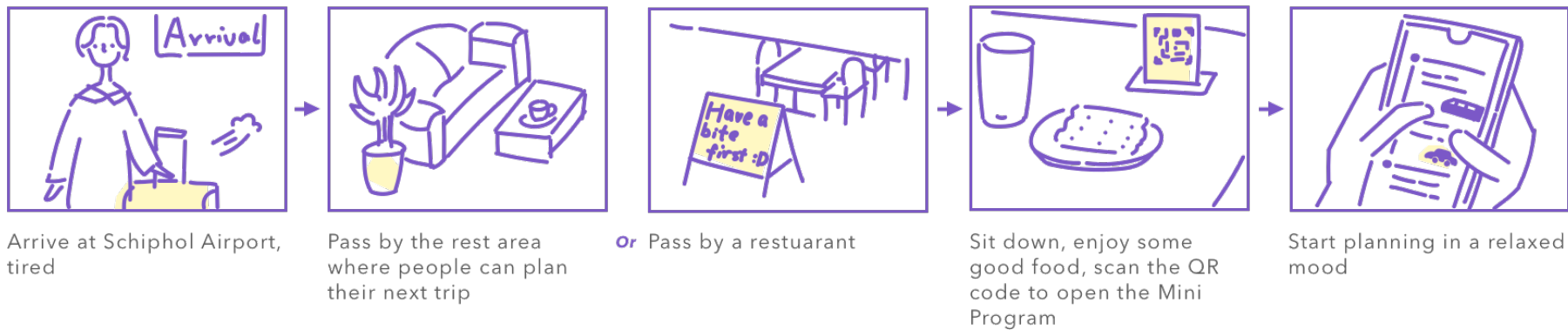


Figure 4.2 Aspired situations of using the mobile platform

4.3 Form of the product

This digital platform is assumed to be developed as a WeChat Mini Program.

Mini Programs are small applications that function within WeChat (most-frequently-used mobile Application in China, with over 1 billion monthly active users). Compared to regular Application, for users, WeChat Mini Program is easy to get access and share; for the developer, it is easy to develop.

The Mini Program is easy to get access. For most Chinese people who have WeChat Application in their phone, instead of downloading an App, they could access a Mini Program by searching, scanning a QR code or opening a sharing link. Figure 4.3 shows different ways of accessing a Mini Program.

After the user opens the Mini Program once, it would be even easier to get access. The user could simply drag the main screen of WeChat to find used Mini Program, or make the Mini Program keep floating in WeChat, as Figure 4.4 shows.

Those traits enable the users to use it anytime, anywhere; therefore, the Mini Program is well suited for the travelling industry.

Besides, the Mini Program is sharing-friendly. Users could easily share a page in a Mini Program to their friends in WeChat, which allows the users to discuss the plan with their friends or share the platform to others.

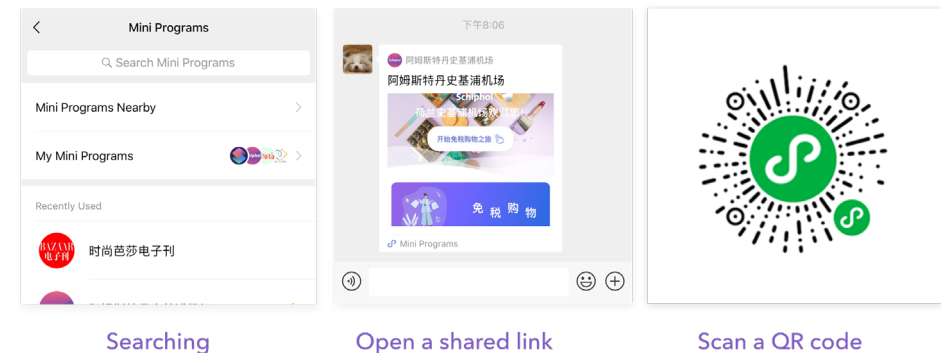


Figure 4.3 Three ways of opening a WeChat Mini Program

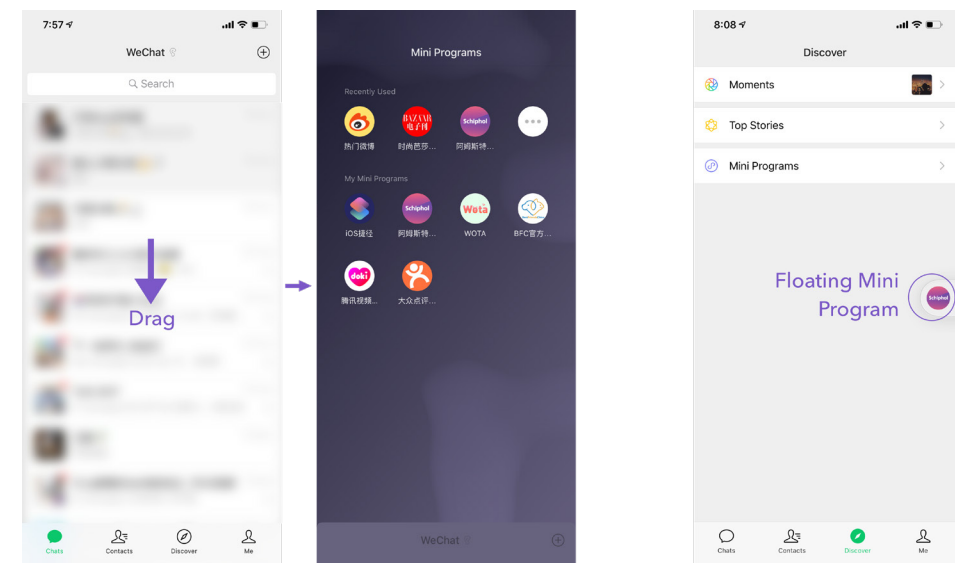


Figure 4.4 Opening a used Mini Program

4.4 Task Analysis

The task analysis is conducted to define the specific functions and the structure of the product. It helps to understand the user's need in various touchpoints and the path they might take to complete their task. The author lists four frequently-happened situations of using the product and do a Task Analysis for each.

Situation A

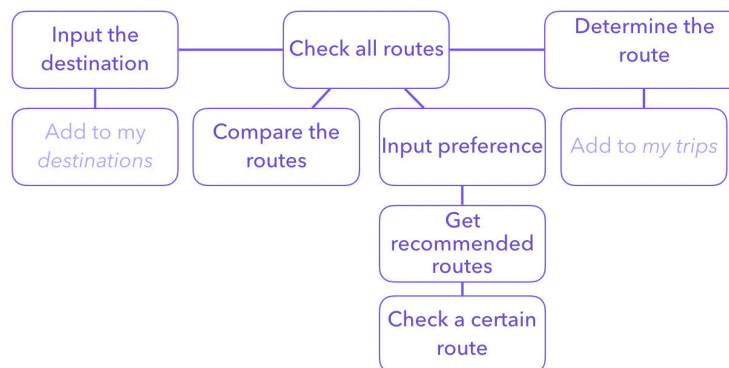


Mr and Mrs Chen (Detailed-planning couple) get the information from an online travel forum that they could take a bus to Keukenhof park from Schiphol. So want to use the Mini Program to [check the route](#) and [book their trip at home](#).

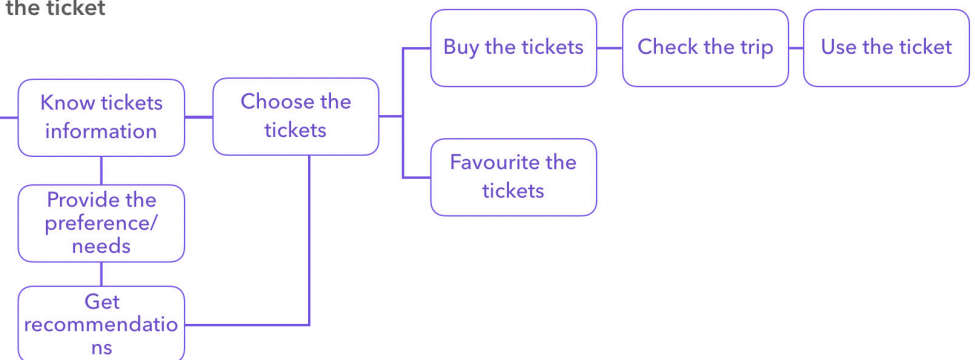
>> **Moving on**

- Add the function: show 'my trip'.
- Add the function: show 'my travel (a series of trips)'

Goal: Determining the route from Schiphol to Keukenhof



Goal: Determining the ticket



Situation B

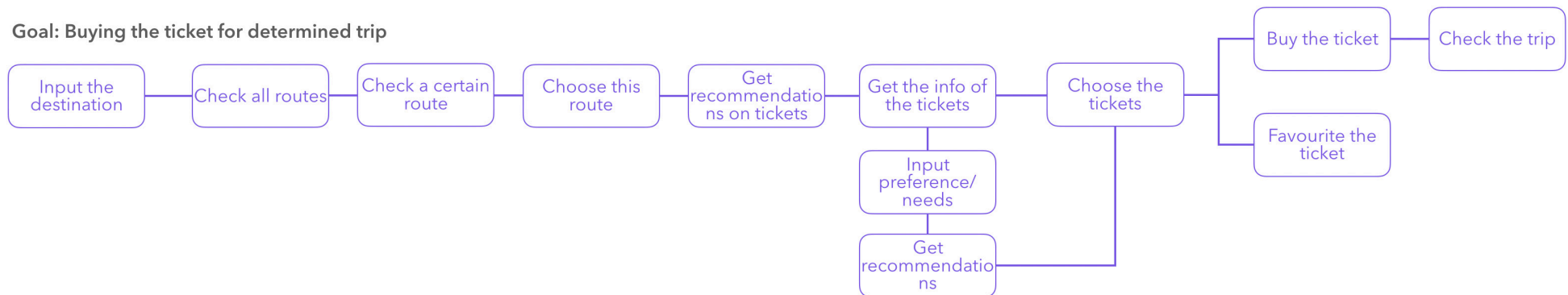


A friend of Li (student alone with large luggage) recommends him to take the train to Delft. So he wants to use the Mini Program to **buy the train ticket** at home and get information after arrival to support his **getting on the train successfully** at Schiphol.

>> **Moving on**

- Provide all alternatives in most of the touchpoints to decrease the pressure of 'getting on a vehicle as soon as possible.'

Goal: Buying the ticket for determined trip



Goal: Getting on the train



Situation C

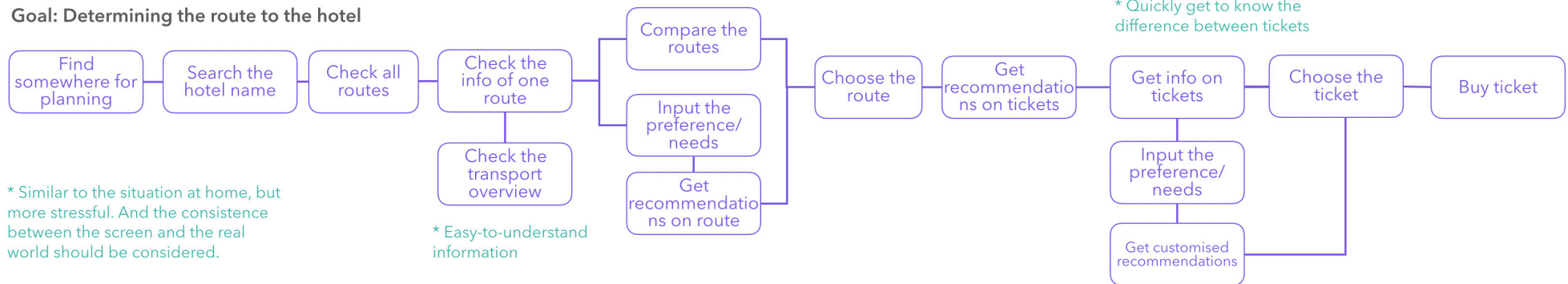


Jia and Wenjun (friends doing no preparation) arrive at Schiphol. They have no idea about transport in Schiphol. They want to find the route to their hotel and buy the most suitable tickets at Schiphol.

>> Moving on

- Enable people knowing nothing understand the information in a second. For instance, avoid 'intercity direct' as the only info for a train.
- The comparison/difference between tickets should be understandable.

Goal: Determining the route to the hotel



Goal: Getting on the train



* Decrease the pressure; indicate 'it's okay to take next train. You can drink a tea and wait.'

Situation D

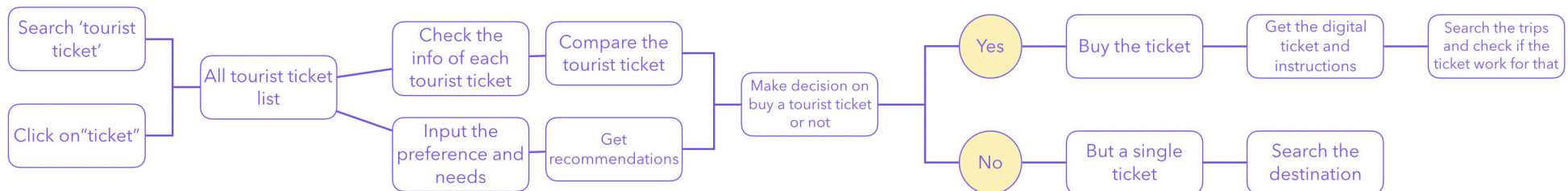


Mrs Chen is reading other's travel guidelines where the 'tourist ticket' is mentioned. So she wants to check the 'tourist ticket' for more detailed information at home.

>> **Moving on**

- Provide solutions in each touch point
- Enable searching function

Goal: Getting information on the travel pass someone mentioned, and choose the suitable travel pass(or other tickets)

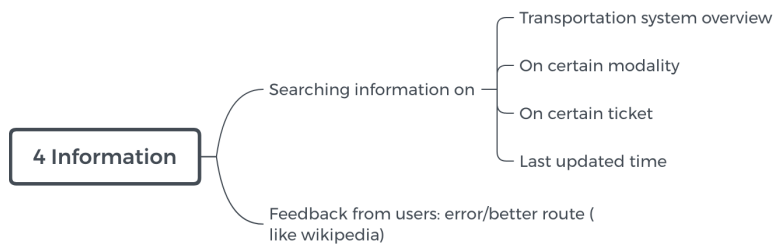
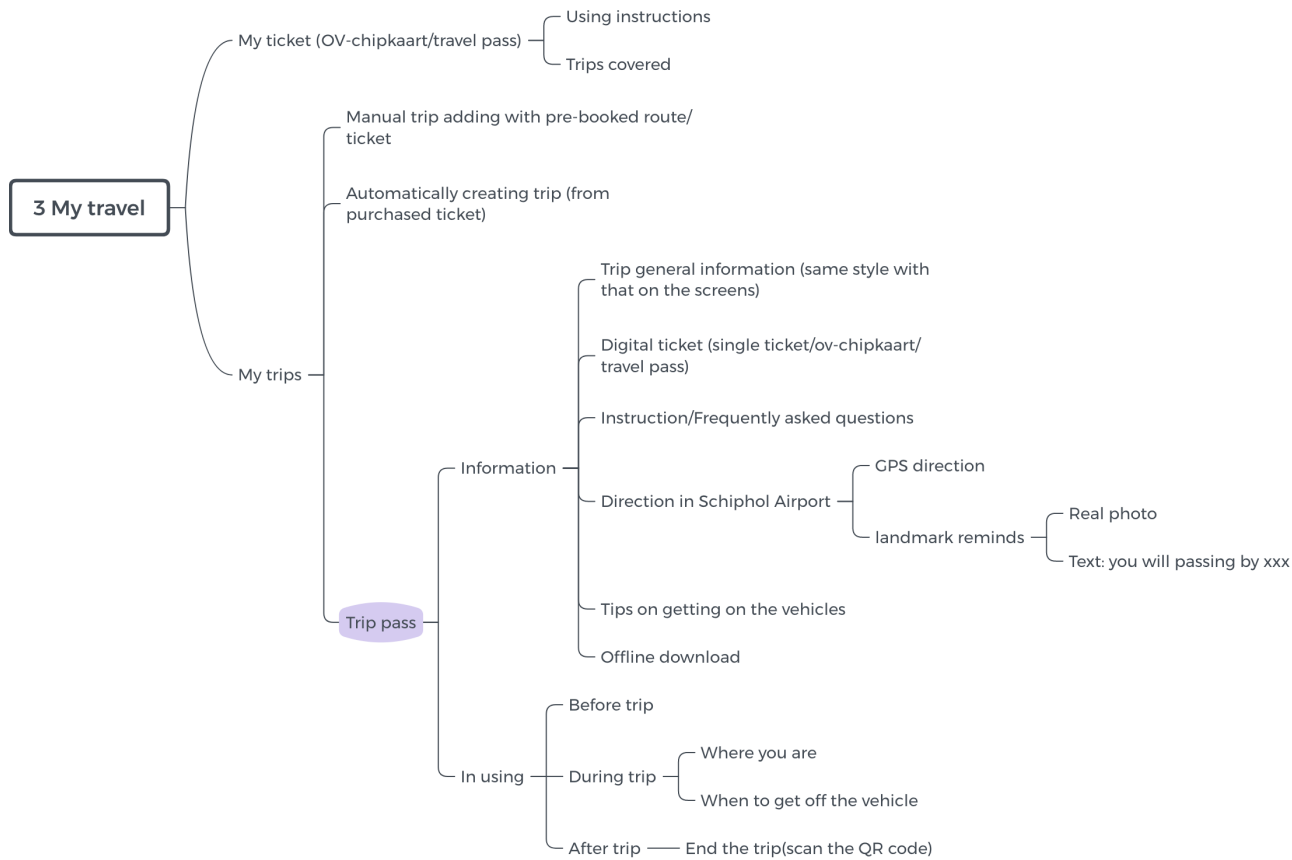


4.5 Functions Structure

Based on the Main Function stated in Product Positioning (4.1) and the reflections after Task Analysis, the final Function Structure is developed (Figure 4.5). The topics in Purple means they are the focus of the concept. Besides the Function Structure, please also see the Screens Flowchart in Appendix J.



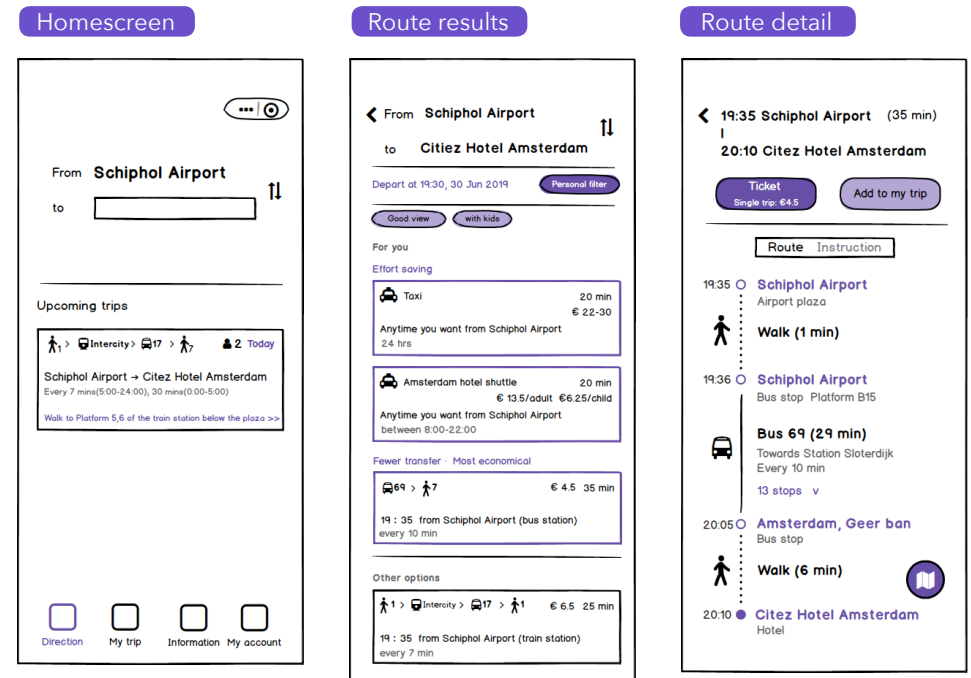
Figure 4.5 Functions structure



4.6 Low Fidelity Concept

Based on the Functions Structure (4.5) together with the Screens Flowchart (Appendix J), the low fidelity wireframes are sketched to show the content, screen layout as well as the interaction of the Mini Program.

Figure 4.6 shows some examples of the wireframes. Please see the full version in Appendix K.



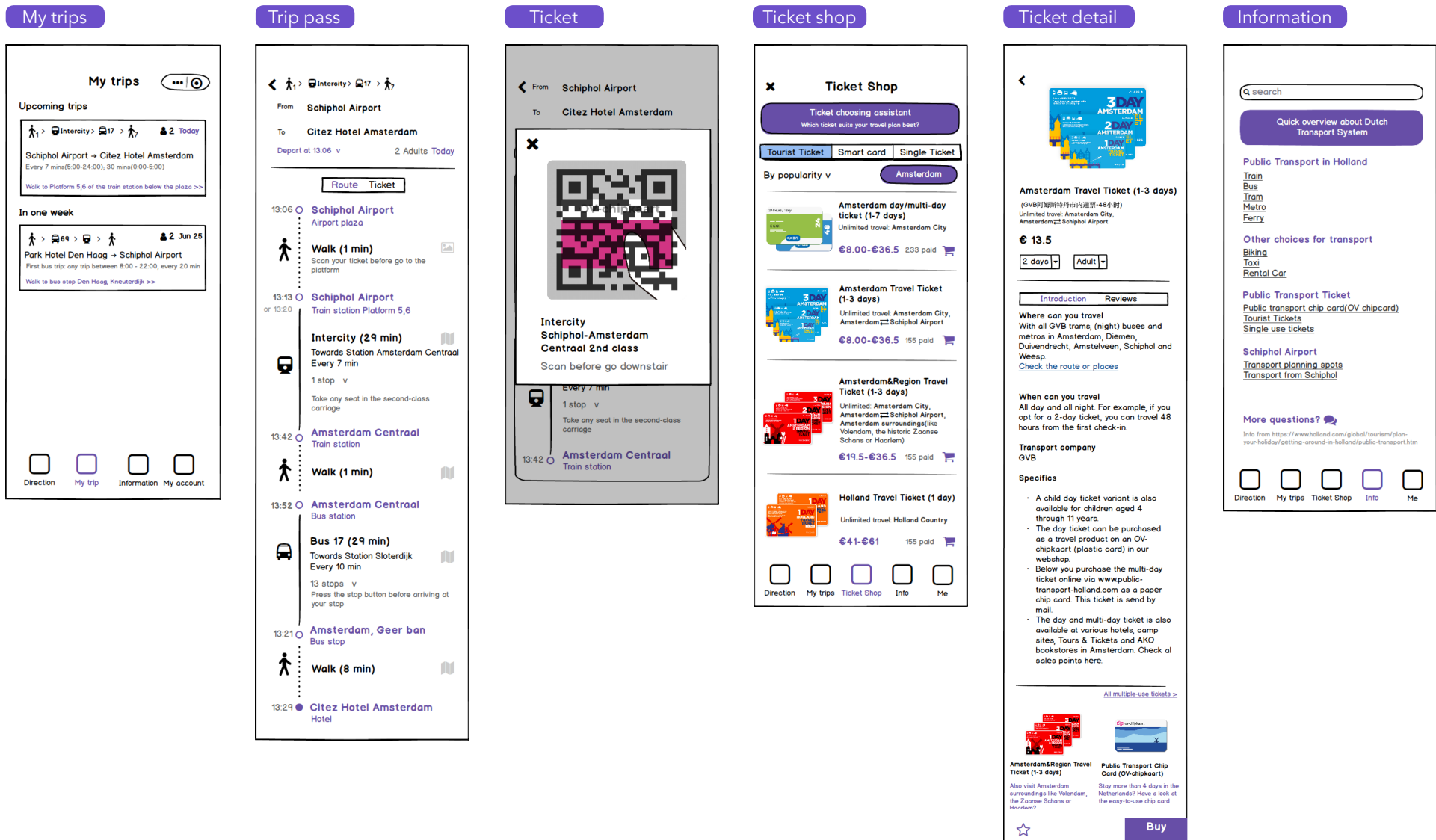


Figure 4.6 Examples of wireframe

4.7 Concept Evaluation

4.7.1 Goal

The goals for the evaluation of the low fidelity concept are:

- Test whether the Design Goal (2.4.2) could be achieved;
- Test whether the Mini Program is easy to use;
- Get answer on some questions raised in the design process (See Appendix L);
- Make a choice on multiple versions of design;
- Get the improvements for the final concept.

4.7.2 Process

The low fidelity wireframes are made into an interactive prototype. Five participants, all designers, are invited to use the prototype to try the prototype, finish tasks like choosing a route, booking a ticket and give opinions on the concept.

Figure 4.7 show the situation of the evaluation.

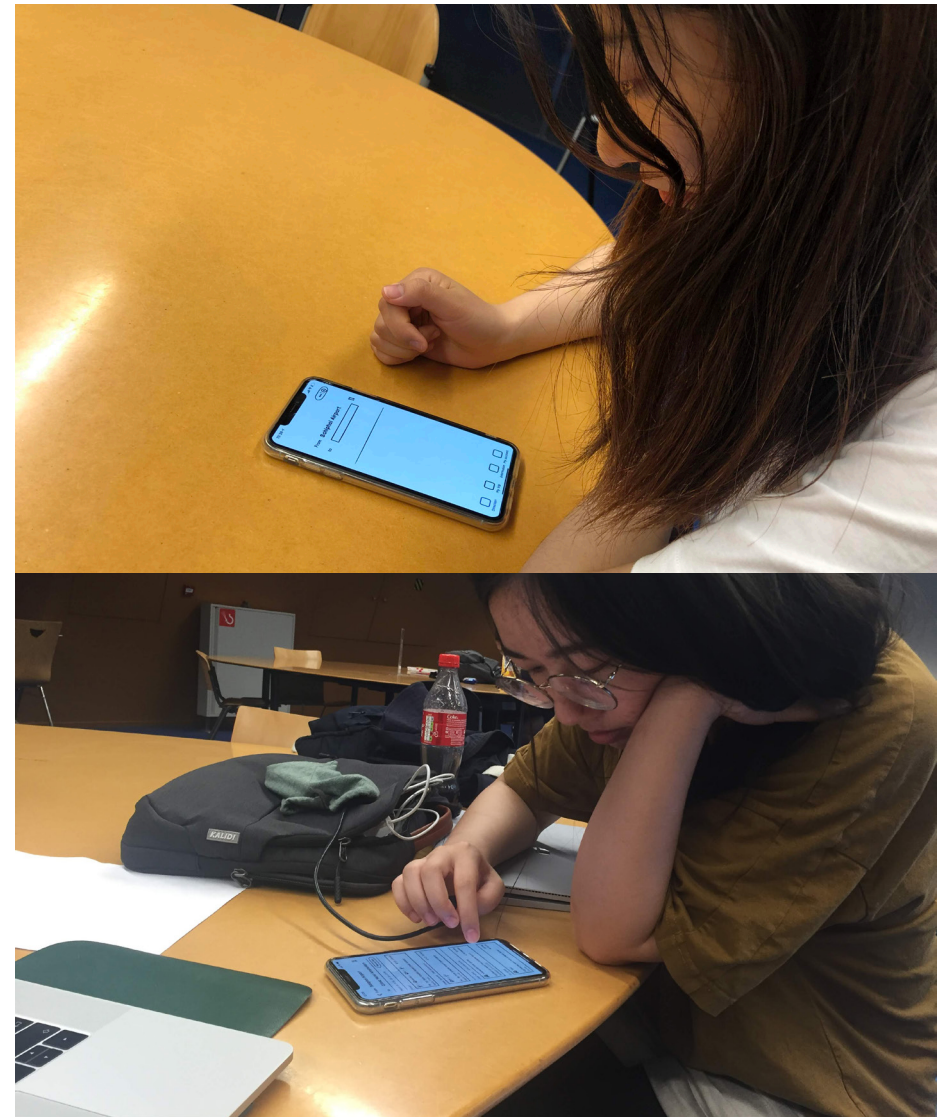


Figure 4.7 Concept evaluation

4.7.3 Result

According to the participants, the Design Goals are partly achieved. For instance, the tips in the Trip Pass could be helpful in the real situation. However, the usability of the Mini Program is not good. Based on the comments from participants, these changes are going to make on the final concept:

Route Result

- Make the tag looks more like a tag rather than the category;
- Collect the necessary information in one time as a User Profile;

Route Detail

- Add a confirmation step before adding the trip;
- Add a sharing function;
- Make the instruction for some route, like the Hotel Shuttle in the first screen;
- Provide information on luggage;
- Design a unique icon for all modalities;

Ticket

- Remove the possibilities of buy one journey of the two journeys;
- Show a map of the target area and enable searching;
- Add content: 'in which situation you should buy this ticket';
- Make the single-use ticket in a different visual layer from the tourist tickets;

My trip

- Visually emphasise the start point and the destination rather than the route;
- Categorise all tips by area rather than time;

- Show whether the user bought the ticket;
- Enable the function of Manual adding;

Trip pass

- Enable 'replan this route';
- Add information module;
- Make the button for Visual Indicator more obvious;
- Refine the images in Visual Indicator;
- Make the ticket more visible and floating;

Ticket store

- Show OV chip-card and tourist tickets in one screen;
- Enable favourite function.

4.8 Visual Style Guide

After the low fidelity concept is developed and evaluated, the Visual Style Guide is also built to finalise the Visual design of the Interface.

A Design Inception Sheet and a Mood Board (See Appendix L) are made to define the Style Tile.

Typography

Avenir Next is chosen as the typeface for the mobile platform. It gives the impression as light, simple, semi-rounded. It also enables all text information presented cleanly.

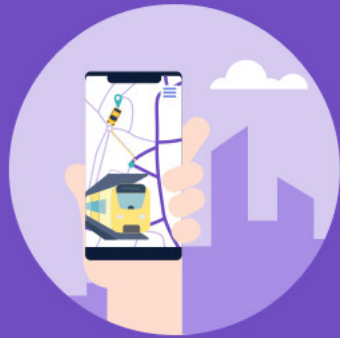
Colour Palette

Blue and orange are chosen as the main colour for the product according to the Design Inception and Mood Board. Blue deliver the message as calming, feeling in control, reliable and free. Orange is confident, friendly, and typical colour for the Netherlands.

Yellow and Green will also be partly used in the App, which is derived from the Design Inception and Mood Board. Please see the Colour Palette in Figure 4.8.



Figure 4.8 Colour Palette



05

Final Design

5.1 Introduction

The previous chapter shows the process of conceptualisation. In this chapter, the final concept is introduced in detail.

The final product is a WeChat Mini Program, named *Schiphol Transport*. It enables users to plan their trips (from and to Schiphol Airport), manage their trip, buy tickets, manage the tickets and get the information they need. Figure 5.1 shows the main functions of the product.

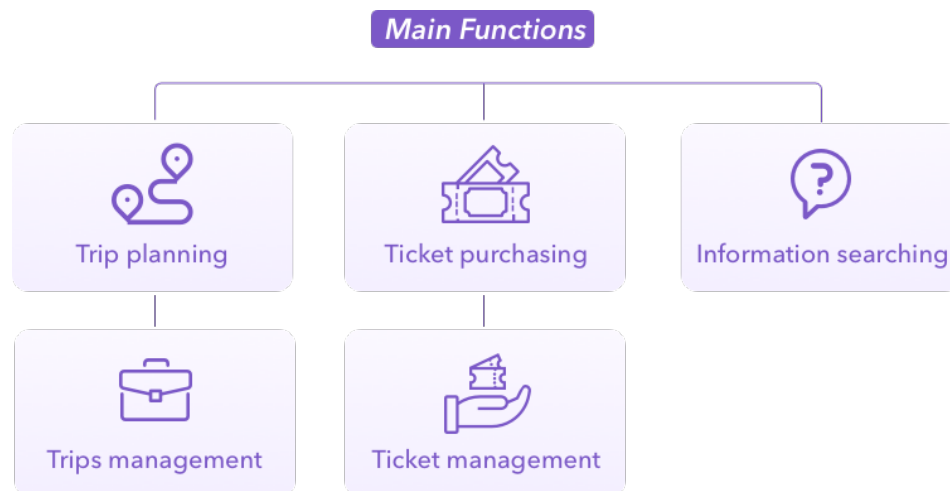


Figure 5.1 Main functions of the WeChat Mini Program Schiphol Transport

5.1.1 User Flow

Based on those main functions, the structure and flow of the product are defined. Figure 5.2 shows four possible user flow of the product.

In different context, the user use the product for different purpose. There are several possible entry points for the user:

- When planning a trip: search a route
- When choosing a tourist ticket: check the ticket
- When going to travel: check the trip
- When encountering a problem: search for relevant information

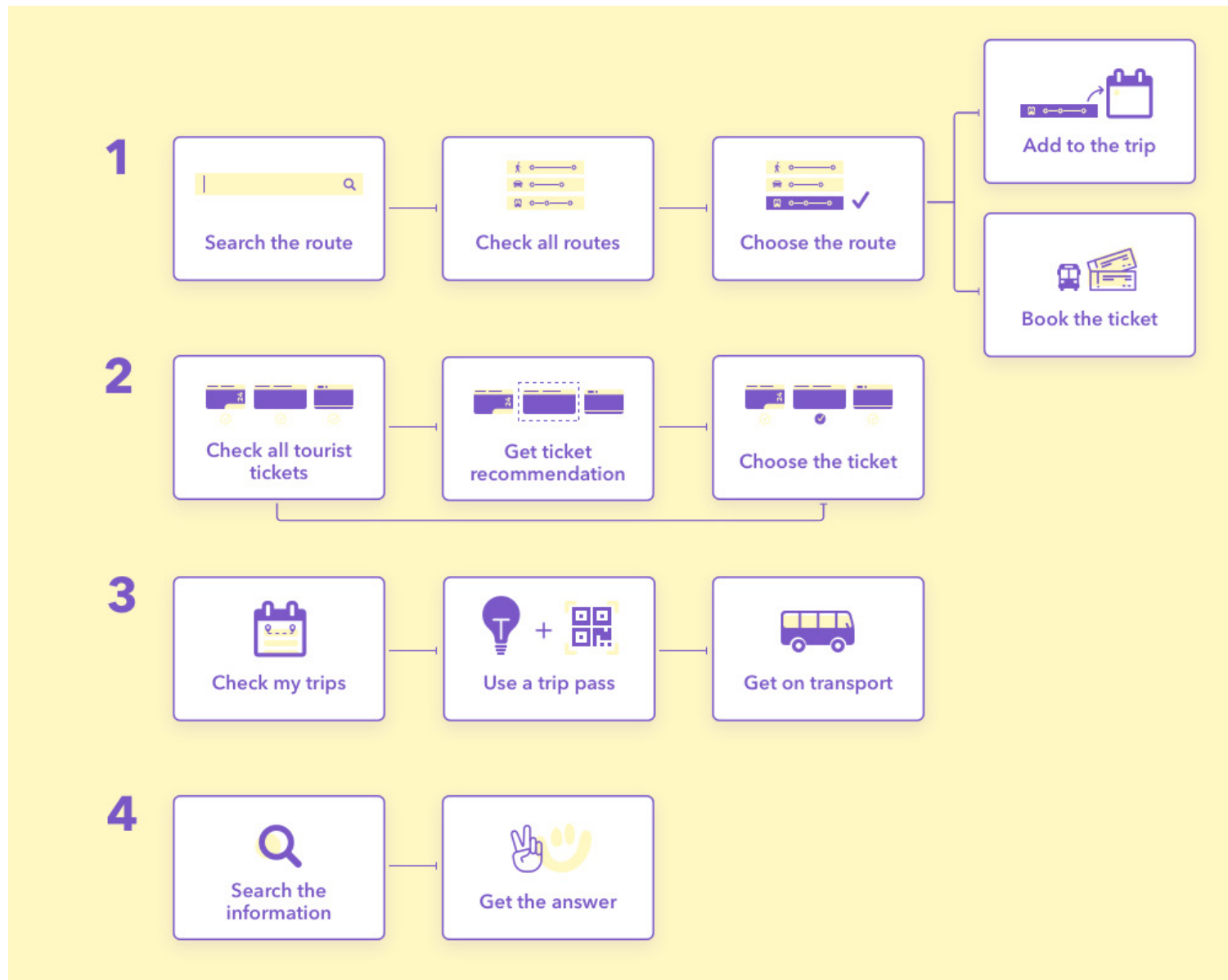
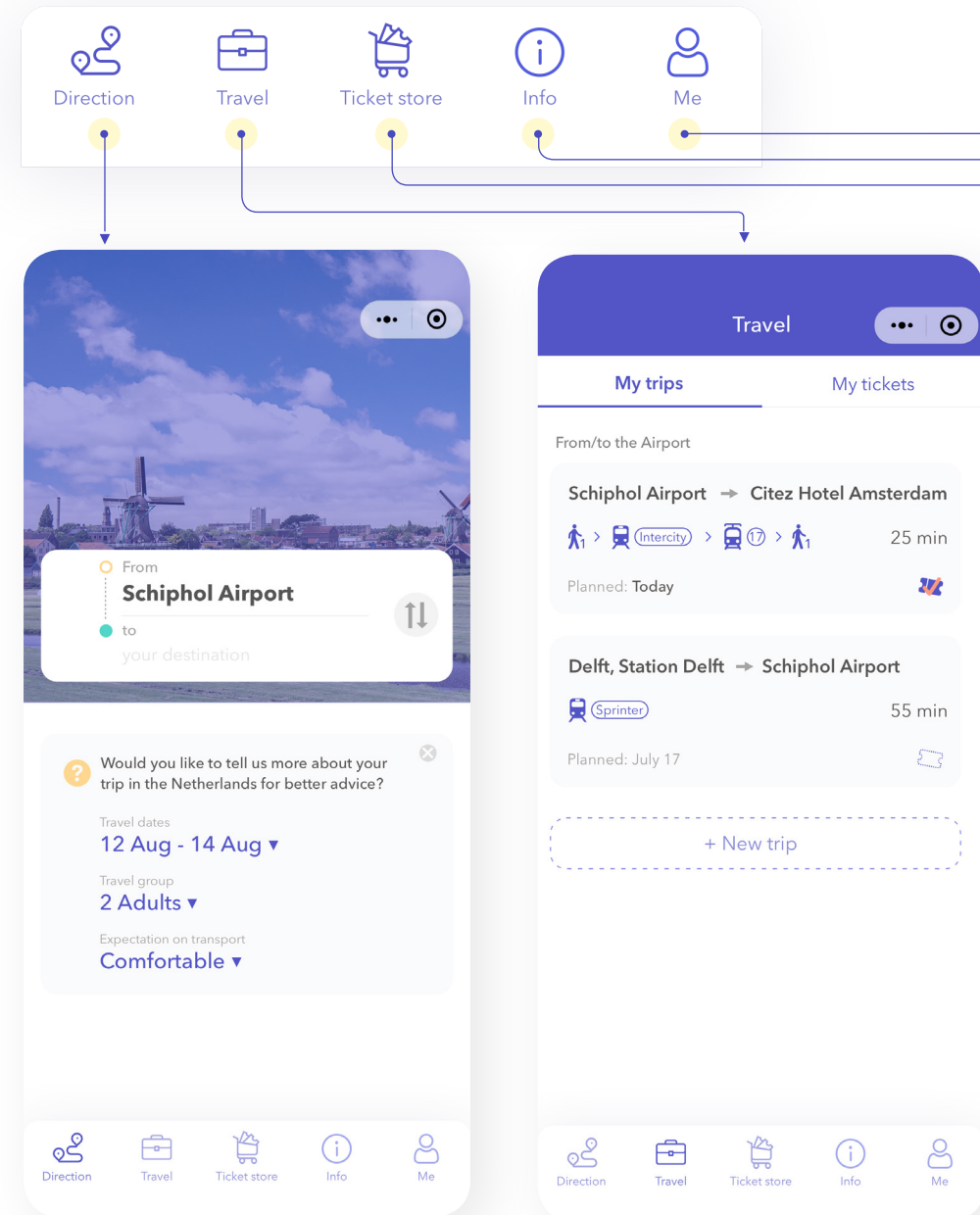


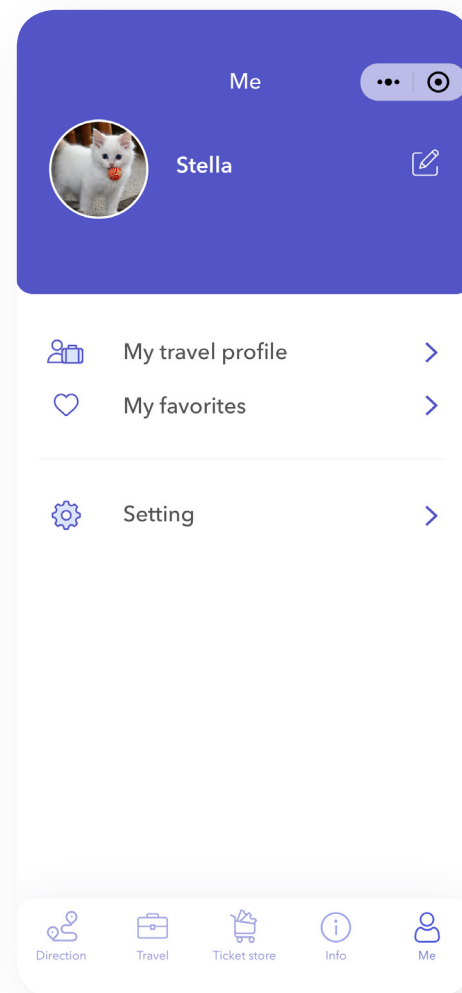
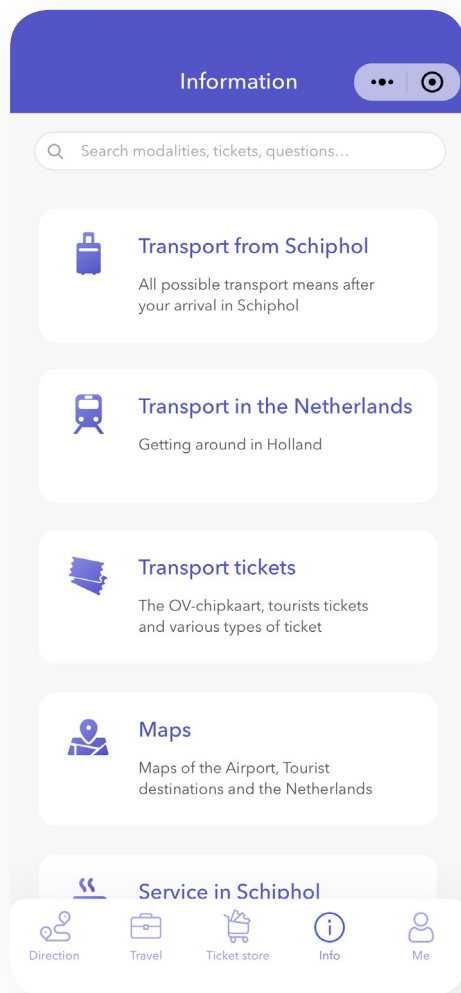
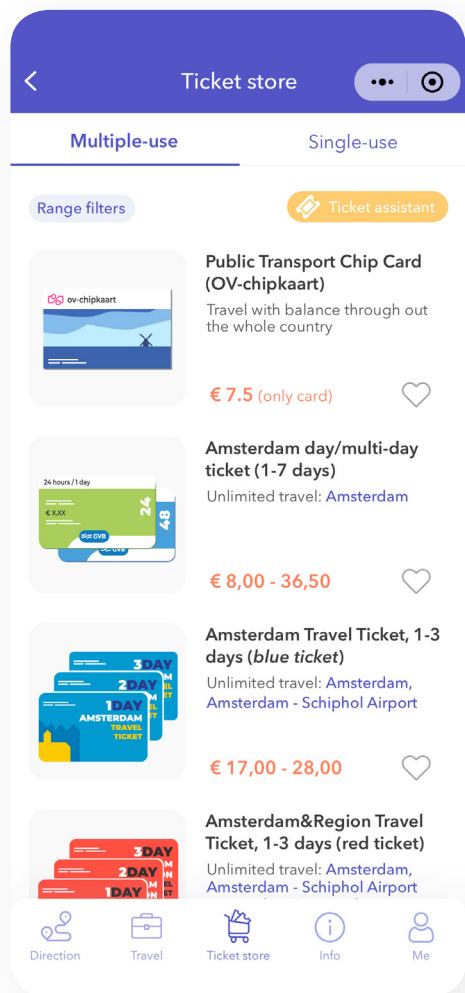
Figure 5.2 User Flow

5.2 The Designs

5.2.1 Navigation

The primary navigation of the Mini Program is the bottom navigation. There are five destinations displayed in the bottom navigation bar: Destination, Travel, Ticket store, Info and Me. Excluding *Me*, the first four destinations are leading to four main flows defined in 5.1.1.





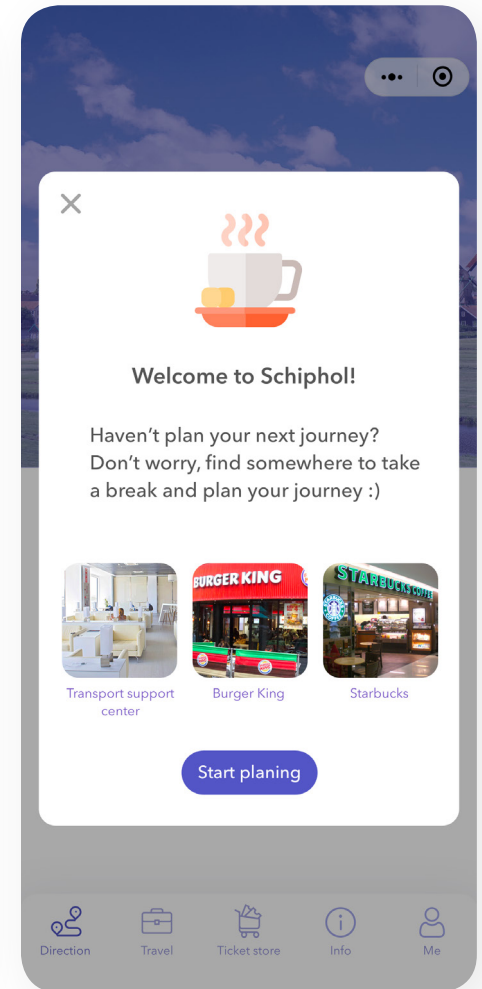
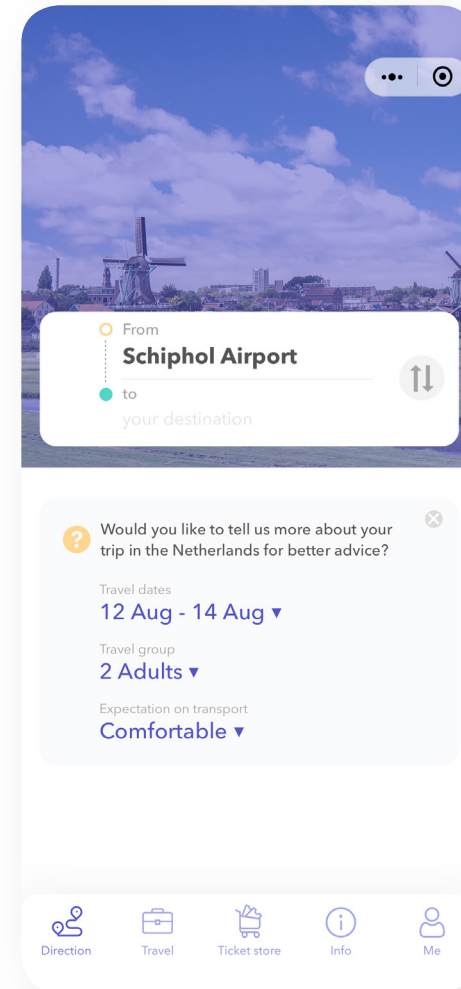
5.2.2 Start point

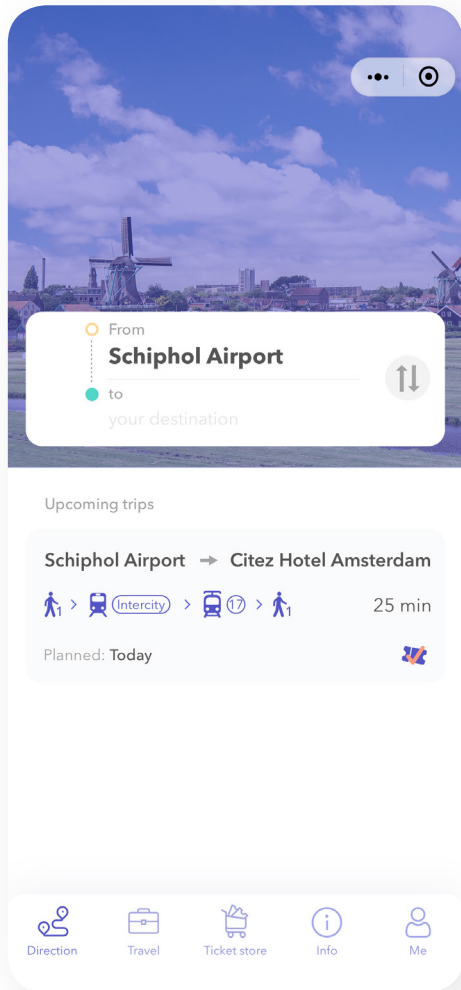
As the start point of the Mini Program, the users get different information in different situations. The Mini Program will ask for permission to detect the location information of the users.

When the user opens the Mini Program at home for the first time, they will be invited to provide the necessary travel information.

When the user first opens the Mini Program in Schiphol Airport, the Mini Program provide some options for the no-preparation passenger to have a break and do the planning.

When the user has already planned a trip, the trip will show in the home screen when the scheduled time is coming.



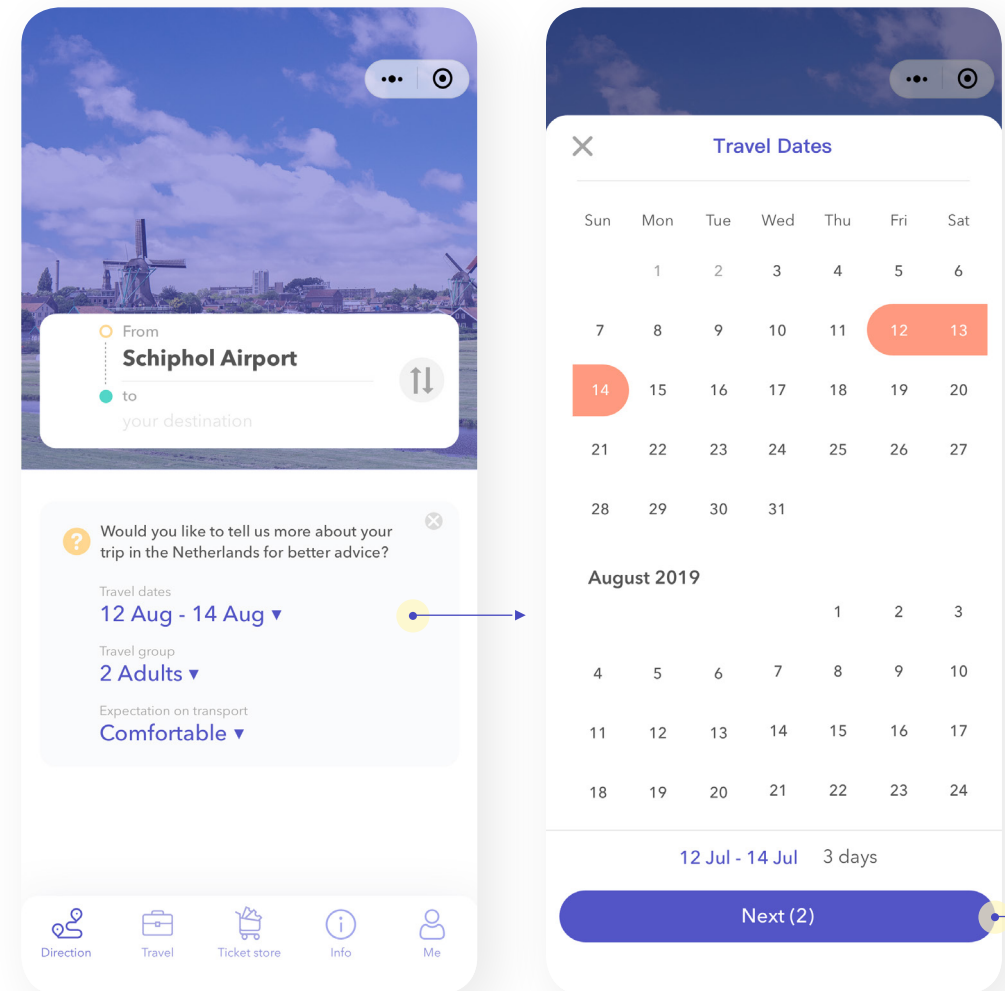


5.2.3 Travel Profile *Homescreen > Travel profile*

Users could create the travel profile, which includes necessary information as well as the individual needs for their trip to the Netherlands. **These types of data will be collected for one time but used for several times.**

The number of people in a travel group indicates which transport modalities will be most suitable, as well as how many tickets they might need in the purchasing stage. The group composition will also be considered by the system when recommending routes. For instance, if there is a baby or someone who has some moving problem, the system will recommend a directer route. The staying duration indicates when will your first trip to the Netherlands start, as well as which type of tourist tickets suit the journey best.

Users always hate inputting; therefore, reducing the frequency of inputting and lowering down the cost of input behaviour are necessary. Then, the default options are given, like the travel groups as 'two adults', and the travel date as one week after the current time, three days duration. Besides, the interfaces enable the user to focus on the essential task, which improves the efficiency of completing a task.



⋮

👤

✕

Travel Group

Adults

⊖

2

⊕

Children

⊖

0

⊕

Ages 2-12

Infants

⊖

0

⊕

Under 2

Someone have moving problem? ▲

♿

🚶

Next (1)

⋮

👤

✕

Expectation on transport

Your transport experience should be

Money-saving

Comfortable

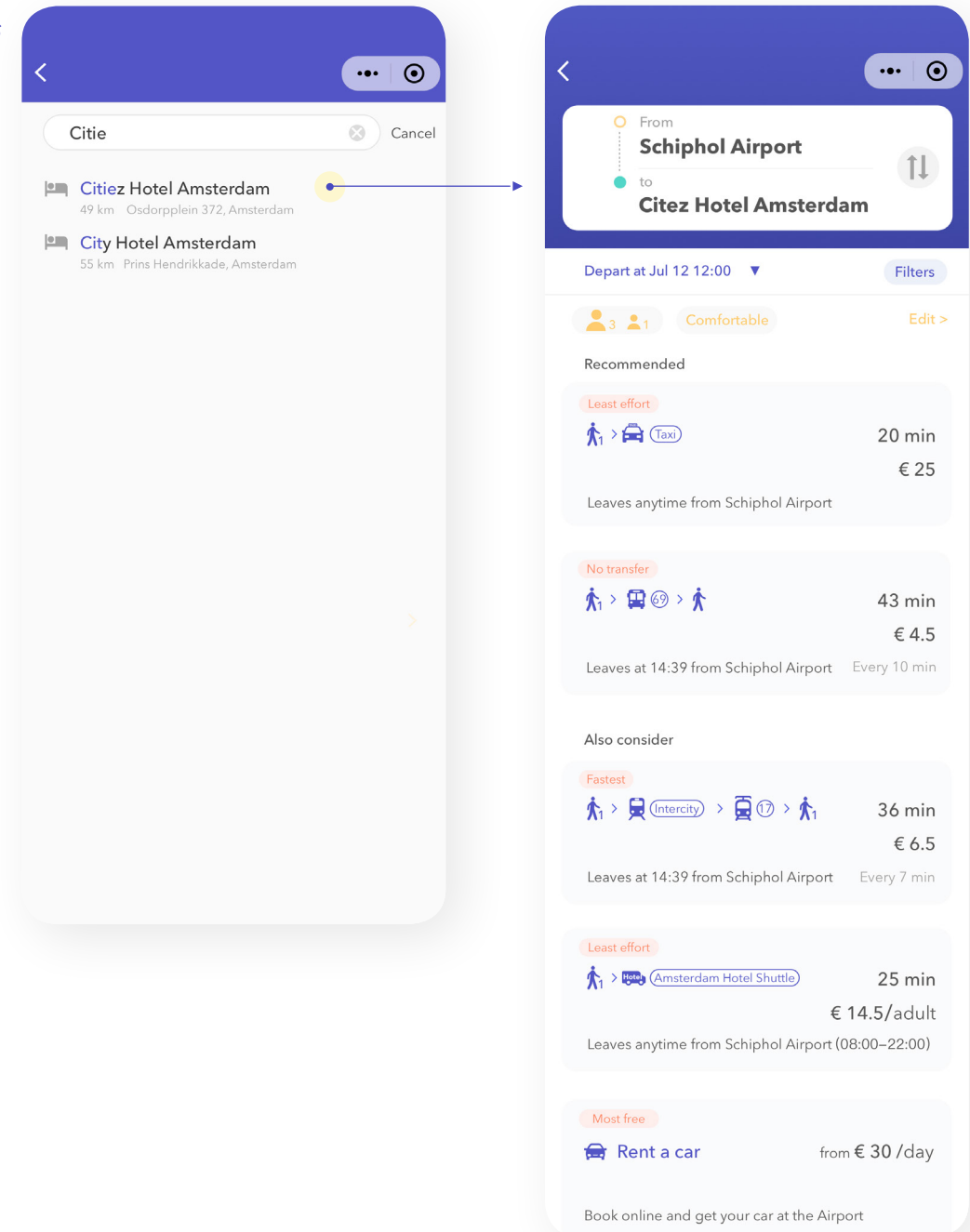
Luxury

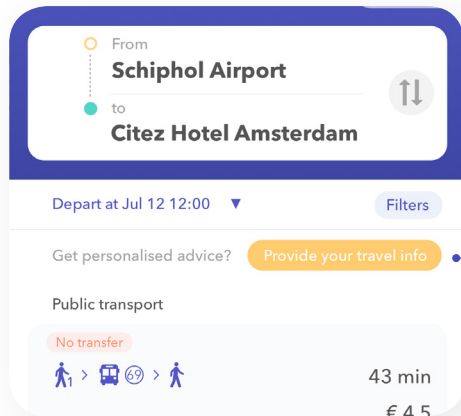
Finish

5.2.4 Route Searching *Homescreen > Searching > Route results*

After texting the destination, all routes show. For each route, the tag in orange shows its trait. Those traits are chosen from those most obvious reasons 'why people choose it in a certain situation'. It also shows the total time and price for the trip, which are two crucial aspects people take into consideration when making a choice.

Once the travel profile built, the default time will be noon on the first day of the trip. Also, the system gives a recommendation based on the needs of the group member.



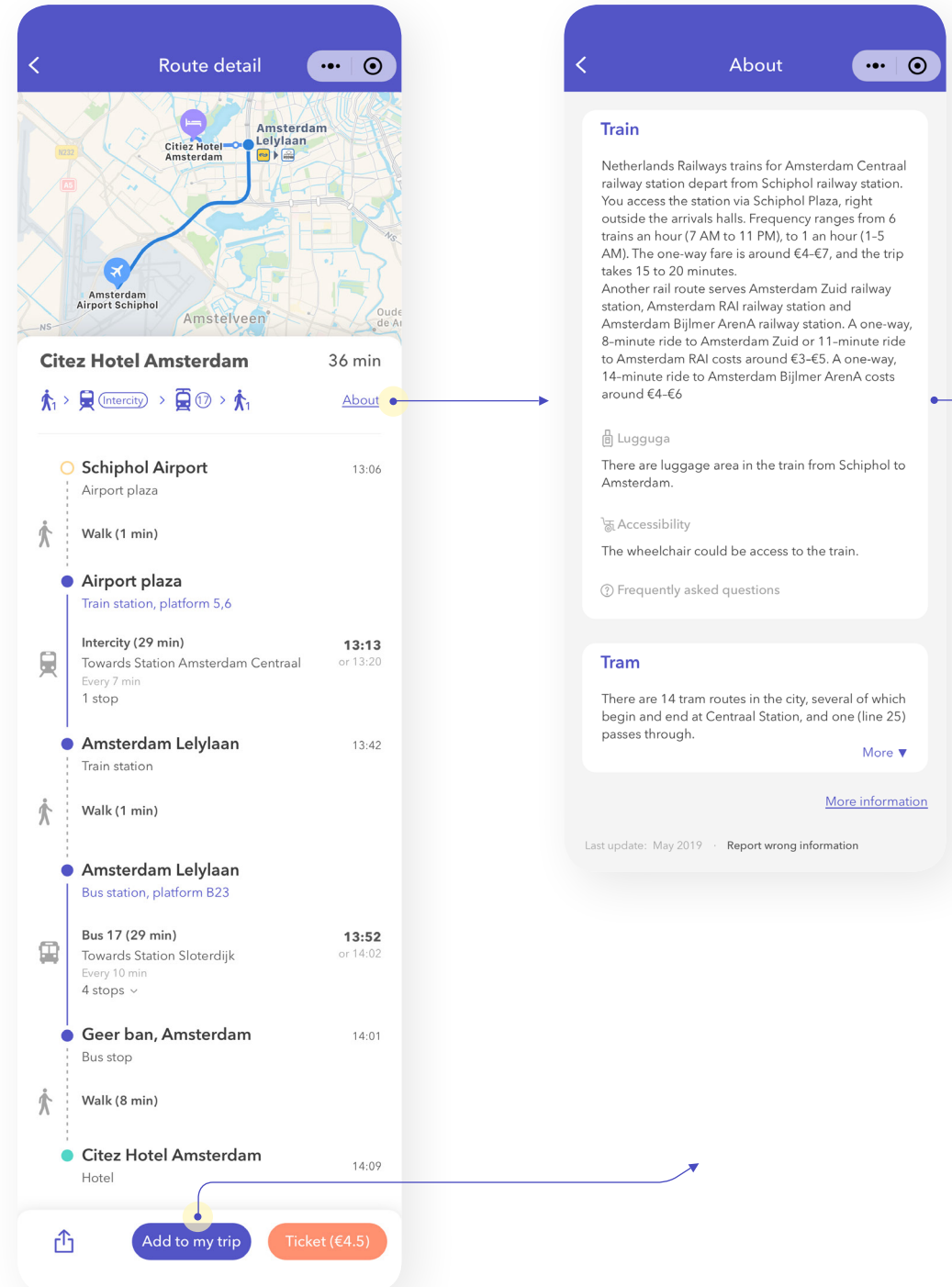


When the travel profile is blank, the entrance shows on the screen.

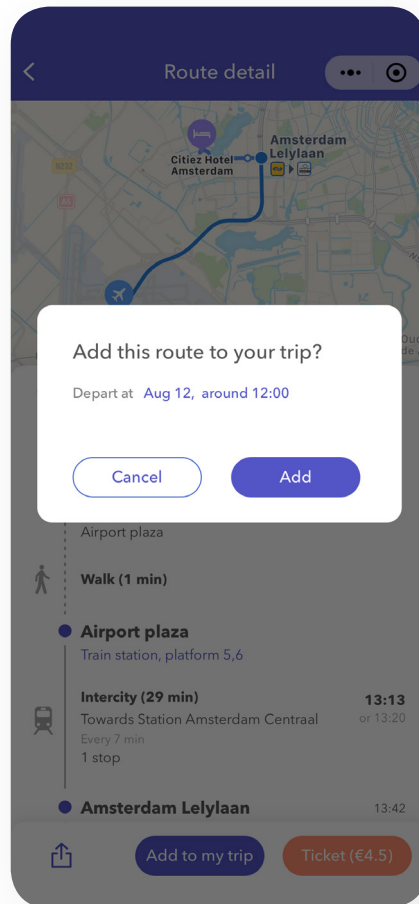
5.2.5 Route Details *Route results> Route Detail*

The user could tap to see the detail of a specific route. It shows the path on the map, the route steps, and provide the way to buy a ticket. Sharing is also available as there is a situation a group of friends making the travel plan together. Besides, the route could be saved as one of 'My trip', which enable users to plan their trip and book the ticket anytime they want.

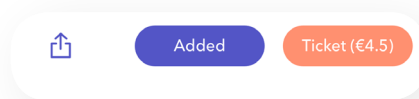
Besides, for each route, there is a relevant information page for those first-time users to check. The last updated time is shown to make the information looks more reliable. Also, it is possible to report the wrong information, which improves the quality of the information the system provides.



The information page shows general information and some topics the passengers care about most



When adding a trip, the time needed to be filled in. It also provide a default time as the noon of the first day (based on the travel profile).



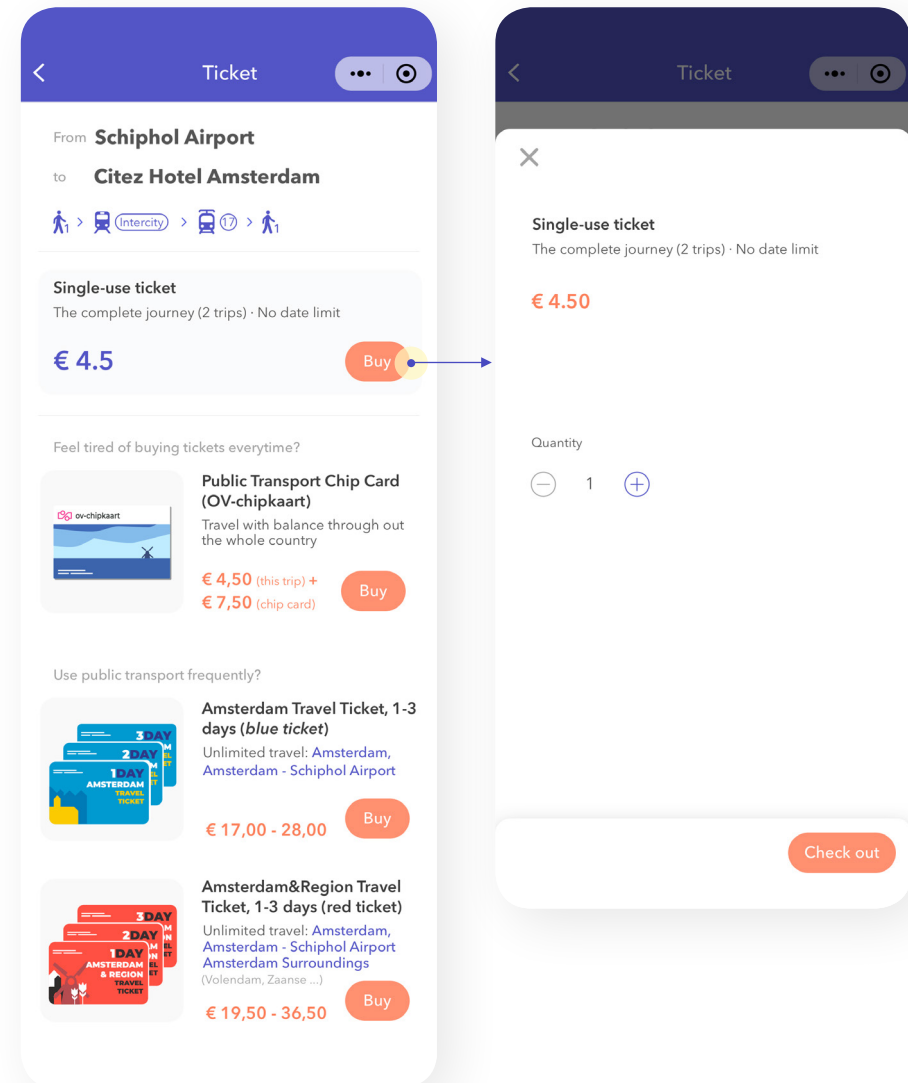
When the trip added, the button texted 'Added'. If tapped again, the trip will be removed.

5.2.6 Buying a ticket for a certain trip

[Route Detail > Ticket](#)

From the Route Details screen, the user could process to buy a ticket for that route. The single-use E-ticket, ticket on an OV chip card and the tourist tickets are available. When you buy a single-use ticket, the number of the ticket could be chosen.

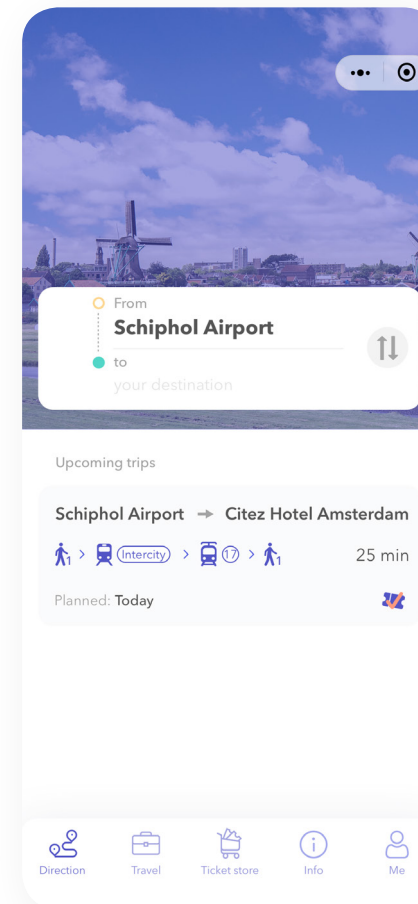
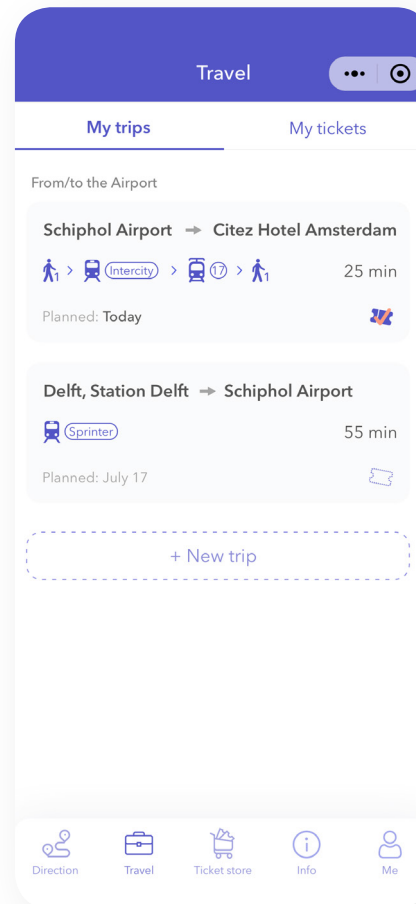
For the tourist ticket screen, please see 5.2.11 for the introduction.



5.2.7 Planned trips [Homescreen > Travel](#)

The trip list shows the basic information about a planned trip, like the starting point&destination, time, date as well as whether you have bought a ticket. Users could add the trips from the route searching part, or add the trip manually by entering the information or scanning a paper ticket.

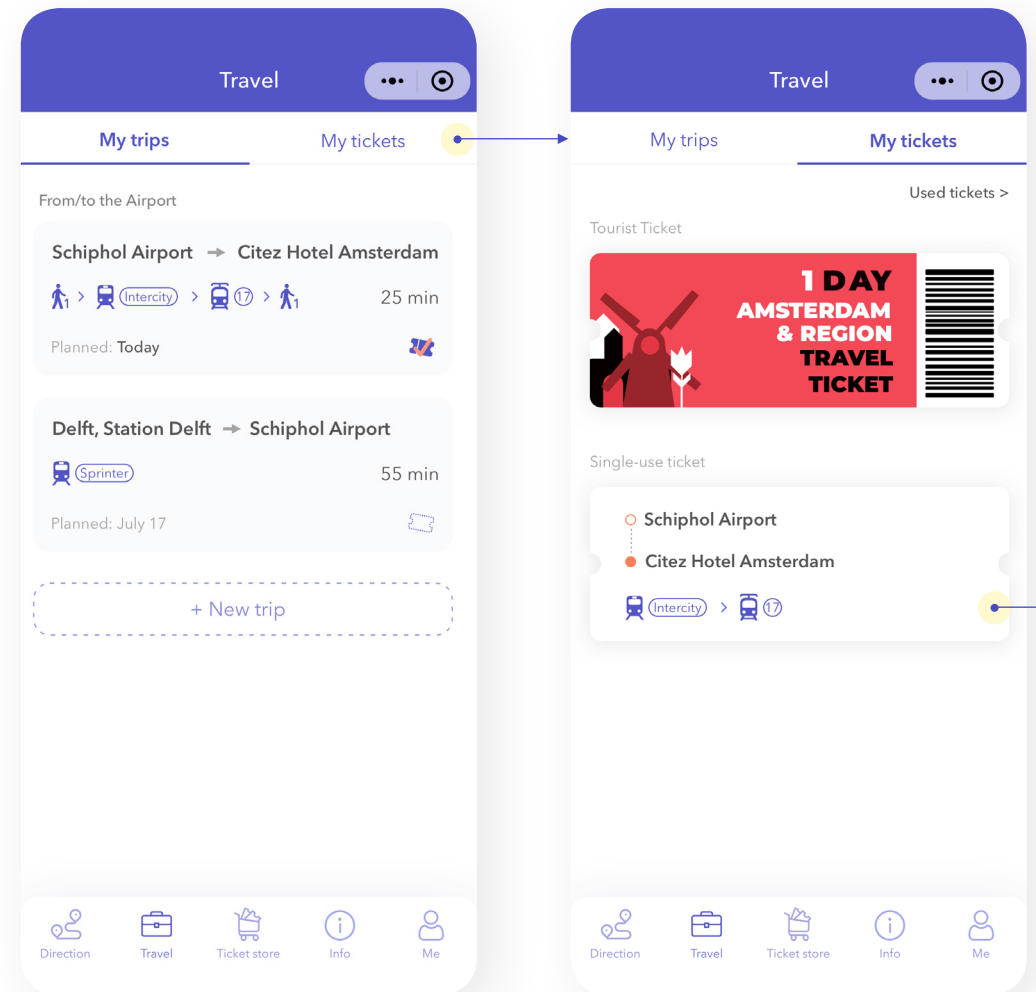
Besides the *Travel* screen, the homescreen also shows those upcoming trips.

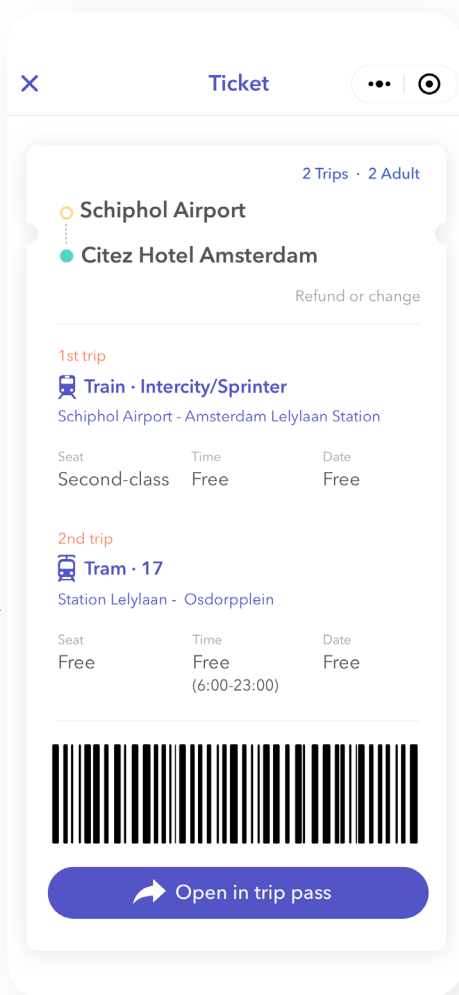


5.2.8 Travel *Homescreen > Travel*

In the second bottom tab Travel, My trips and My tickets show. 5.2.7 introduced My trips. My tickets is where the user could find the ticket they bought. They could use their tourist ticket and the single-use ticket.

When opening a single-use ticket, there would be a short cut which directs the user to the Trip Pass(see 5.2.9).





5.2.9 Trip pass *Travel > My trips > Trip pass*

When opening a planned trip, the Trip Pass shows.

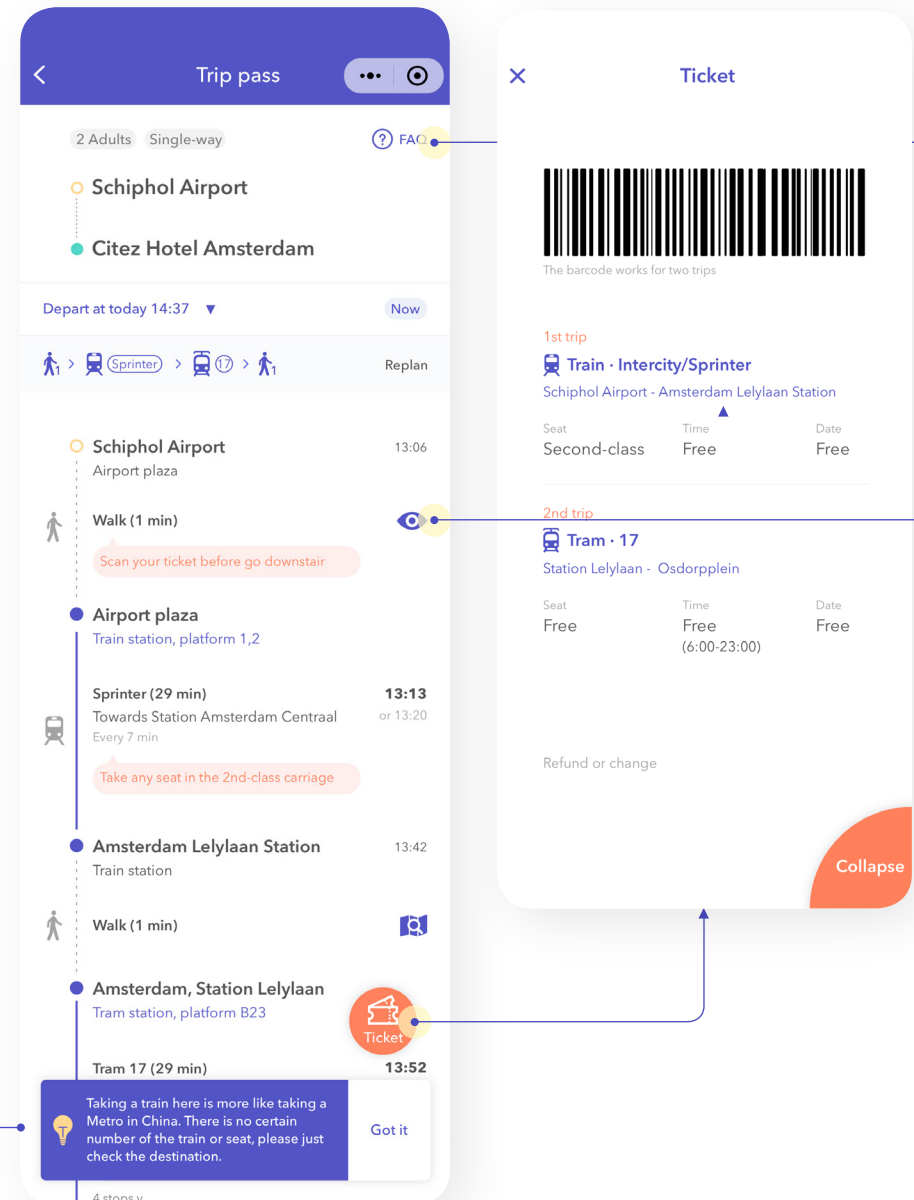
Trip pass is a well-designed combination of ticket, directions and useful tips. For the first-time passenger, they need support for finding the right spot, doing the right things in an anxious mood.

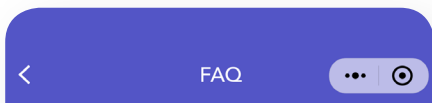
Compared to an ordinary route detail, a Trip Pass provides information which is especially unfamiliar for first-time international passengers, like 'scan your ticket', 'take a seat freely'. Also, the visual reminding will support people to find the right spot in a complex physical environment. While encountering a problem, the user could check the FAQ for the solution.

The ticket is attached in a trip pass, which is freely opened and collapsed.

As there could be many changes and uncertainties in a travelling situation, the Trip Pass is tolerated with adjustments. The ticket is refundable and changeable, and the route planned before could be replanned if the user changes their mind.

When first open the trip pass, the most important tip shows.





How to find my train?

- Please check your trip pass or timetable on the screen in the station for the platform information. When you arrive at the platform, please check the screen for the destination.

What is the difference between First and Second Class?

- First Class has bigger seats and more leg room than Second Class, and there are [additional facilities](#) in a number of trains.

How much luggage can I take with me on the train?

- You could take all your suitcases and bags with you on the train.

- Bicycles, wheelchairs, strollers and sports equipment are all allowed on the train, but please read the [house rules](#) first.

What should I do if I miss my train?

- You do not have to travel at a particular time and can take the next Intercity or local train. You do have to travel on the day on which your ticket is valid and via the route and border crossing shown on the ticket.

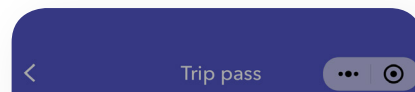
What should I do if I forget to check in?

- Have you forgotten to check in or out? Then you can still do so within 6 hours of your journey using an NS pole or gate. If you are unable to do so within this time period, then you can submit a request for a refund from 24 hours after your journey. You can do this using your Mijn NS account. You can also submit a request without an account. Submit your request within 6 months.

[More](#)

[Information](#)

Last update: May 2019 · [Report wrong information](#)



2 Adults Single-way

[FAQ](#)

Schiphol Airport

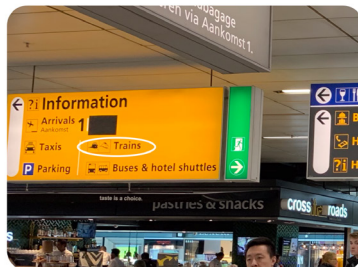
Citez Hotel Amsterdam



Visual Indicator

Schiphol Airport
Airport plaza

Airport plaza
Train station, platform 1, 2



Follow the sinage **Trains**

1 2 3 4



Find the platform entrance

1 2 3 4



Check in with your E-ticket
before go downstairs

1 2 3 4



Find the platform which indicates
your destination

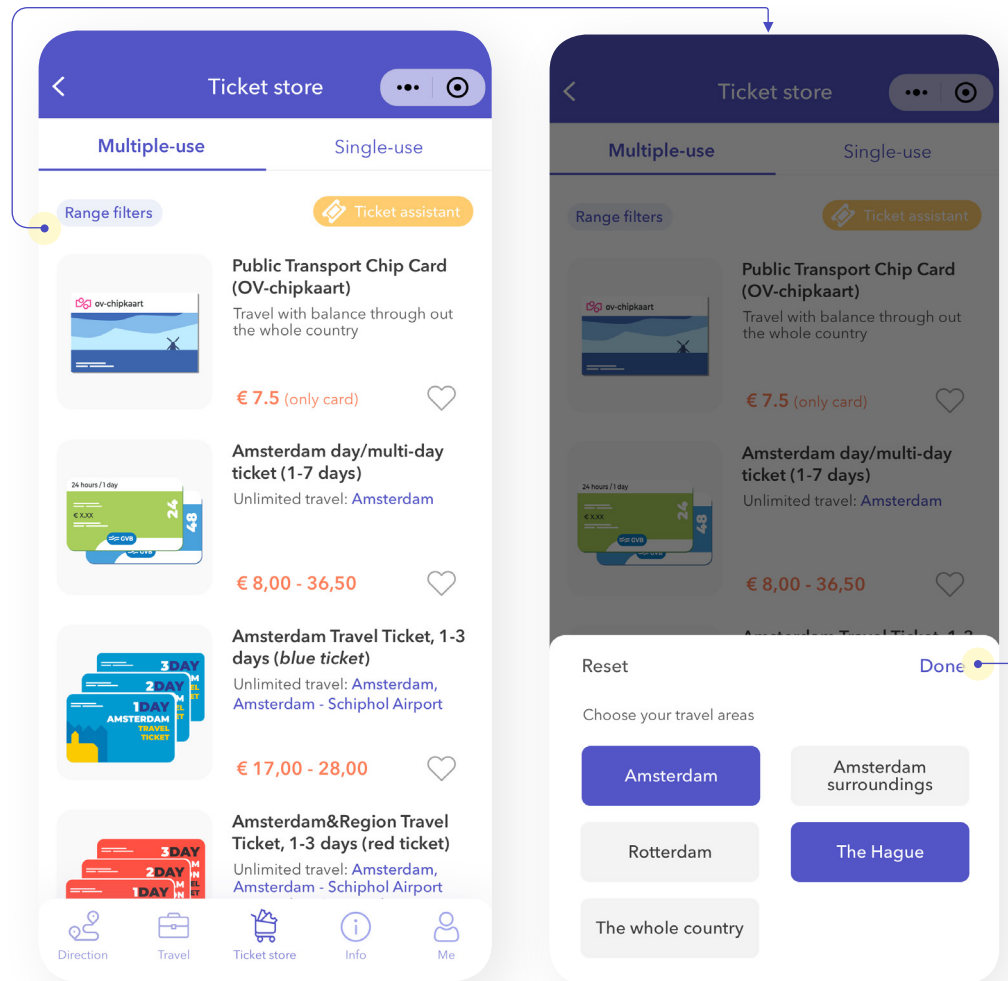
1 2 3 4

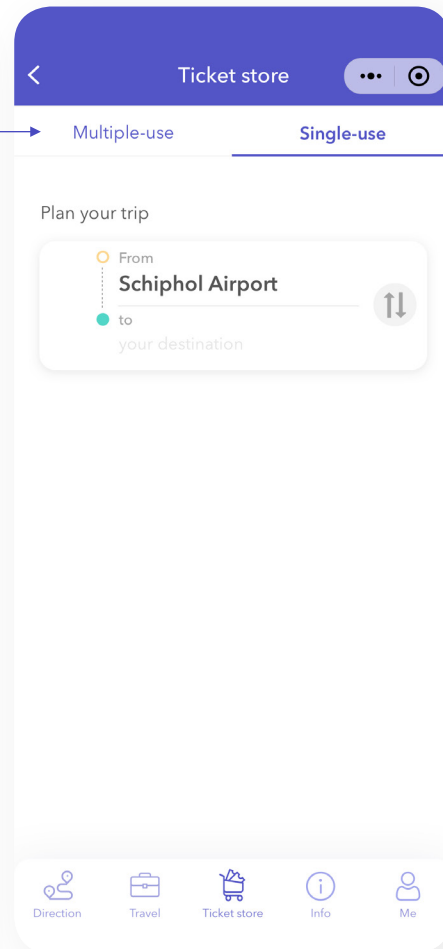
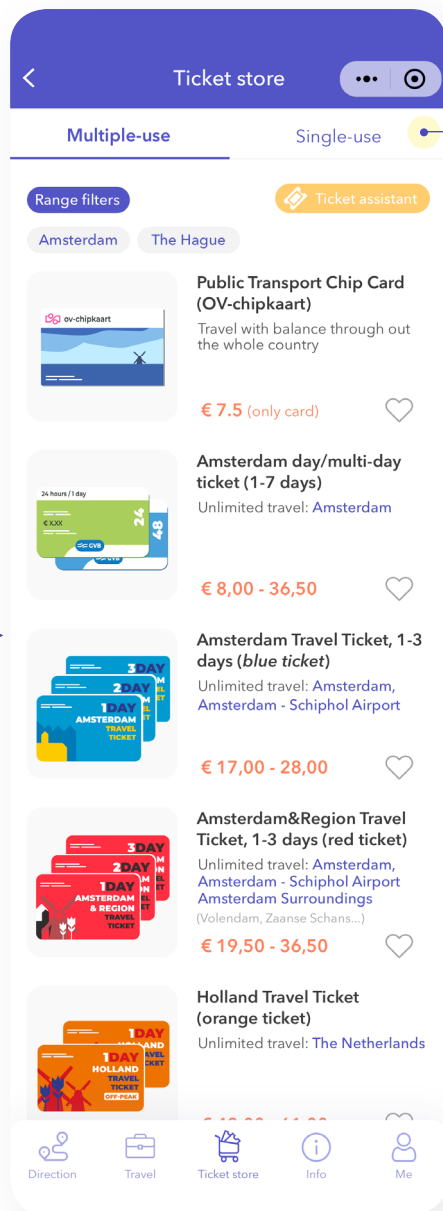
5.2.10 Ticket store Homescreen > Ticket store

For the tourist, a suitable tourist ticket could make the whole journey more convenient and economical. However, in the forest of all kinds of tourist ticket, it is not easy to choose a suitable one. There are solutions.

The price and the area range, the top two important information are highlighted. The range filter could filter the tickets for specific travel area. Users could also favourite the tourist tickets, as they usually could not make the decision immediately.

When buying a single-use ticket, the user search the route and buy ticket in *Route Detail*.





5.2.11 Tourist ticket detail *Ticket store > Ticket detail*

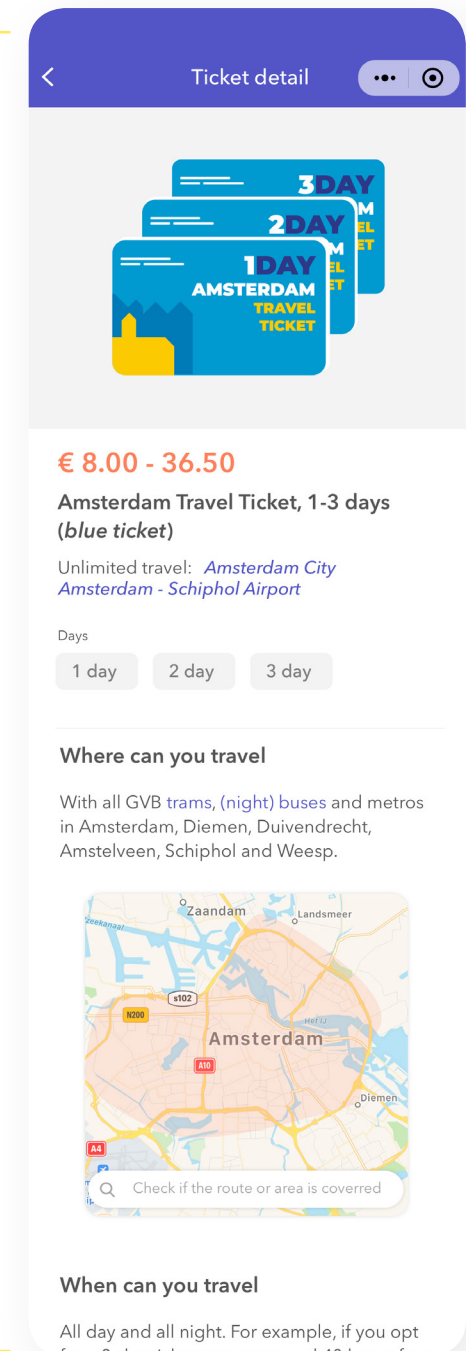
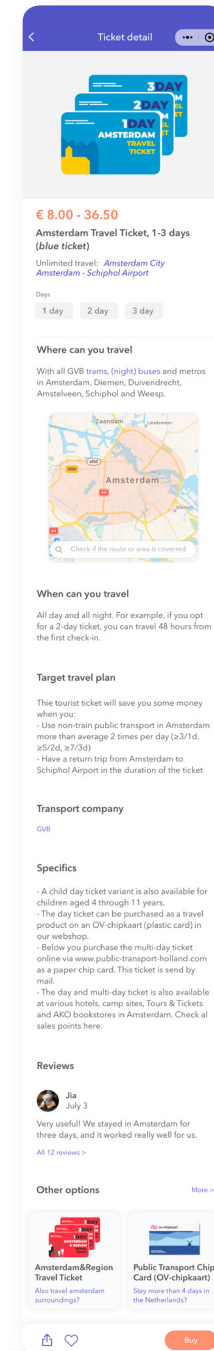
The tourist ticket page shows all necessary information for deciding to choose the ticket or not. The travel range is demonstrated. The user could also search the route or location to check if the ticket covers that.

The 'Target travel plan' clearly indicates in which situation the passenger could use this ticket to save some money.

The reviews from other passengers would be a handy reference for decision making.

It also provides an alternative, while showing the difference between the tickets to help the user make a choice.

The sharing function and favourite function work here.



Check if the route or area is covered

When can you travel

All day and all night. For example, if you opt for a 2-day ticket, you can travel 48 hours from the first check-in.

Target travel plan

This tourist ticket will save you some money when you:

- Use non-train public transport in Amsterdam more than average 2 times per day ($\geq 3/1d$, $\geq 5/2d$, $\geq 7/3d$)
- Have a return trip from Amsterdam to Schiphol Airport in the duration of the ticket

Transport company

GVB

Specifics

- A child day ticket variant is also available for children aged 4 through 11 years.
- The day ticket can be purchased as a travel product on an OV-chipkaart (plastic card) in our webshop.
- Below you purchase the multi-day ticket online via www.public-transport-holland.com as a paper chip card. This ticket is sent by mail.
- The day and multi-day ticket is also available at various hotels, camp sites, Tours & Tickets and AKO bookstores in Amsterdam. Check all sales points here.

Reviews



Jia
July 3

Very useful! We stayed in Amsterdam for three days, and it worked really well for us.

[All 12 reviews >](#)

$\geq 5/2d$, $\geq 7/3d$)

- Have a return trip from Amsterdam to Schiphol Airport in the duration of the ticket

Transport company

GVB

Specifics

- A child day ticket variant is also available for children aged 4 through 11 years.
- The day ticket can be purchased as a travel product on an OV-chipkaart (plastic card) in our webshop.
- Below you purchase the multi-day ticket online via www.public-transport-holland.com as a paper chip card. This ticket is sent by mail.
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Reviews



Jia
July 3

Very useful! We stayed in Amsterdam for three days, and it worked really well for us.

[All 12 reviews >](#)

Other options

[More >](#)



Amsterdam & Region
Travel Ticket

Also travel Amsterdam
surroundings?

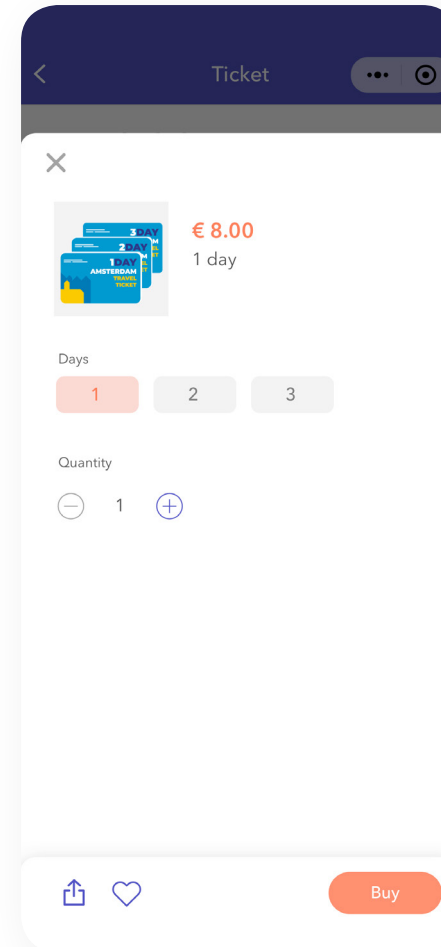


Public Transport Chip
Card (OV-chipkaart)

Stay more than 4 days in
the Netherlands?



Buy



5.2.12 Tickt assistant

[Ticket store](#) > [Ticket assistant](#)

It is hard for a tourist to count if a tourist ticket is money-saving. The ticket assistant is designed to collect necessary information and give advice on which ticket to buy based on the algorithm behind.

The days, transport frequency, as well as travel destinations, are collected fluently. The complete process could be completed in three steps, which make the process more user-friendly.

Besides, a travel frequency calculator is designed to help the user define their travel frequency.

The image displays two mobile app screens for the 'Ticket assistant' interface. The first screen on the left has a title bar with a close button (X), the title 'Ticket assistant', and menu icons. The main content area contains the text 'Do you confused on which ticket to buy?' followed by 'If you already have a travel plan, tell us and get to know which ticket is the best for you :)'. At the bottom is a blue button labeled 'Get advice'. The second screen on the right has a title bar with a back button (Last), the title 'Ticket assistant', and menu icons. It features two sections: 'Days in the Netherlands' with a value of 3, and 'Continuous days in Amsterdam city' with a value of 2. Each section has minus and plus icons for adjustment. At the bottom is a blue button labeled 'Continue (2)'. A blue arrow points from the 'Get advice' button on the first screen to the 'Continue (2)' button on the second screen, indicating the flow of the process.

Screen 1: Ticket assistant

Do you confused on which ticket to buy?

If you already have a travel plan, tell us and get to know which ticket is the best for you :)

Get advice

Screen 2: Ticket assistant

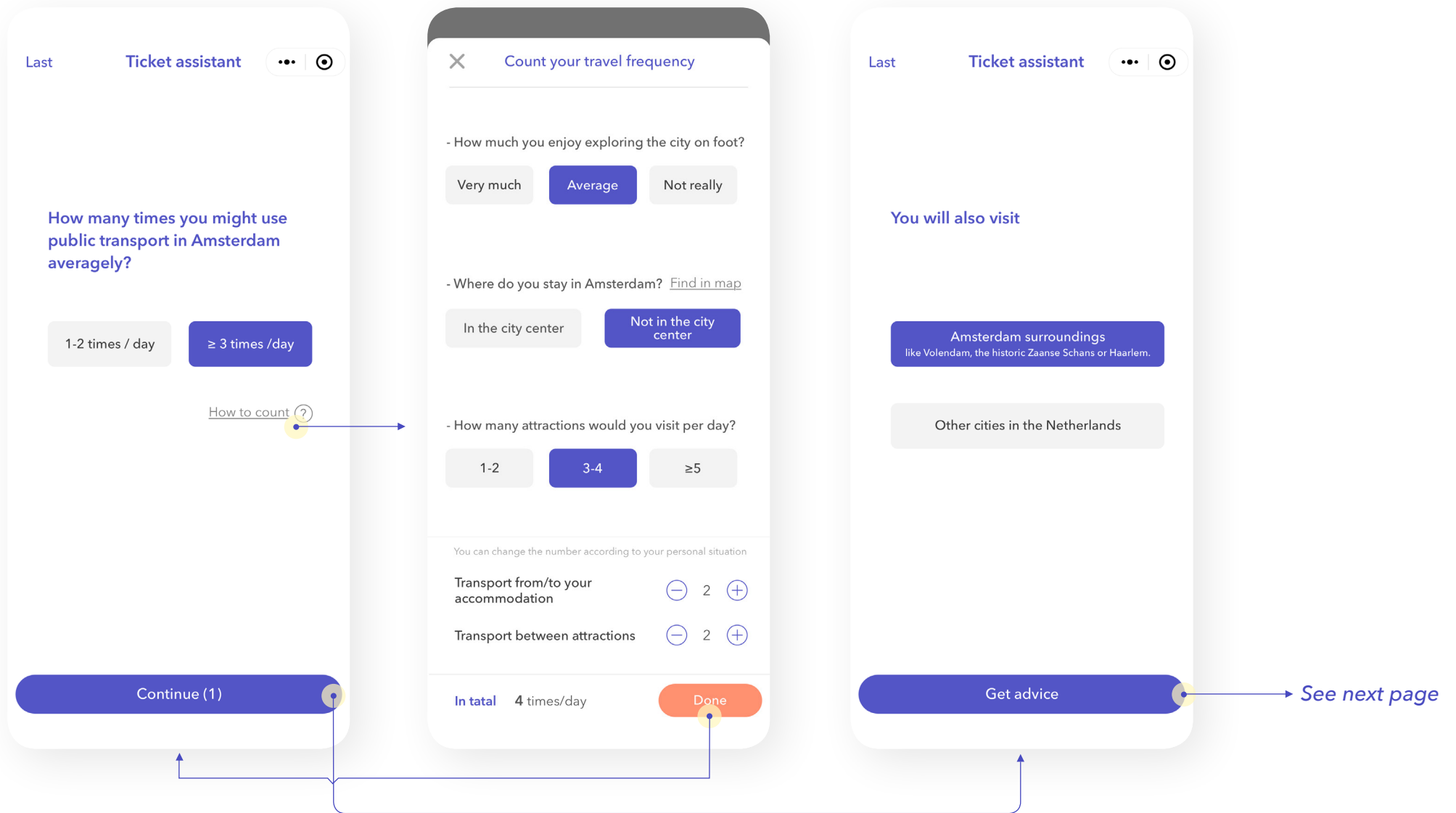
Days in the Netherlands

3

Continuous days in Amsterdam city

2

Continue (2)



The results show the recommended ticket and the reason behind it. After closing the page, the recommended item will be marked.

 Ticket assistant  

Recommendation for your 2-day trip in Amsterdam



Amsterdam day/multi-day ticket (1-7 days)
Unlimited travel: [Amsterdam](#)
€ 13.5 (2 days) 

According to your itinerary, you would travel at least 6 times (about 2.9 euros per ride) in Amsterdam city.

With this ticket you could save at least 4.5 euros during your trip, and save a lot of effort on buying ticket every time.

Recommendation for your trip in Amsterdam surroundings



Amsterdam&Region Travel Ticket, 1-3 days (red ticket)
Unlimited travel: [Amsterdam](#), [Amsterdam - Schiphol Airport](#), [Amsterdam Surroundings](#) (Volendam, Zaanse Schans...)
€ 19,50 - 36,50 

According to your itinerary, you would travel to Amsterdam surroundings like Volendam, the historic Zaanse Schans or Haarlem. If you plan to visit two or more places in one day, the Amsterdam & Region Travel Ticket will suit you.

With this ticket, you would have a care-free journey in Amsterdam Surroundings and save at least 3 euros.

 Ticket store  

Multiple-use

Single-use

Range filters

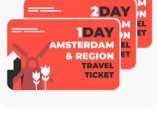


Recommended



Amsterdam day/multi-day ticket (1-7 days)
Unlimited travel: [Amsterdam](#)
€ 8,00 - 36,50 

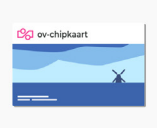
Recommended



Amsterdam&Region Travel Ticket, 1-3 days (red ticket)
Unlimited travel: [Amsterdam](#), [Amsterdam - Schiphol Airport](#), [Amsterdam Surroundings](#) (Volendam, Zaanse Schans...)
€ 19,50 - 36,50 



Amsterdam Travel Ticket, 1-3 days (blue ticket)
Unlimited travel: [Amsterdam](#), [Amsterdam - Schiphol Airport](#)
€ 17,00 - 28,00 



Public Transport Chip Card (OV-chipkaart)
Travel with balance through out the whole country
€ 7.5 (only card) 

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The algorithm of choosing tickets

Situation A. Stay in Amsterdam for several days:

Continuous days in Amsterdam	Total number of trips in Amsterdam		
1	1-2	$\geq 3^*$	/
2	1-4	$\geq 5^*$	/
3	1-6	$\geq 7^*$	/
4	1-8	≥ 9	8
5	1-10	≥ 11	9-10
6	1-12	≥ 13	9-12
7	1-14	≥ 15	9-14
≥ 8	/	/	$\checkmark$





Ticket to choose	Single-use E-ticket	GVB day/multi-day tickets	OV-chip card
------------------	---------------------	---------------------------	--------------

*If the tourist takes a return trip between Amsterdam and Schiphol Airport, the Amsterdam Travel Ticket could be used to replace the GVB day/multi-day tickets.

Situation B. Travel multiple cities

- Use public transport <3 times in each city per day, but in total more than eight times in the whole travel, choose the OV-chip card.
- Use public transport ≥ 3 times in a city, choose the day ticket for that city(Rotterdam, the Hague)

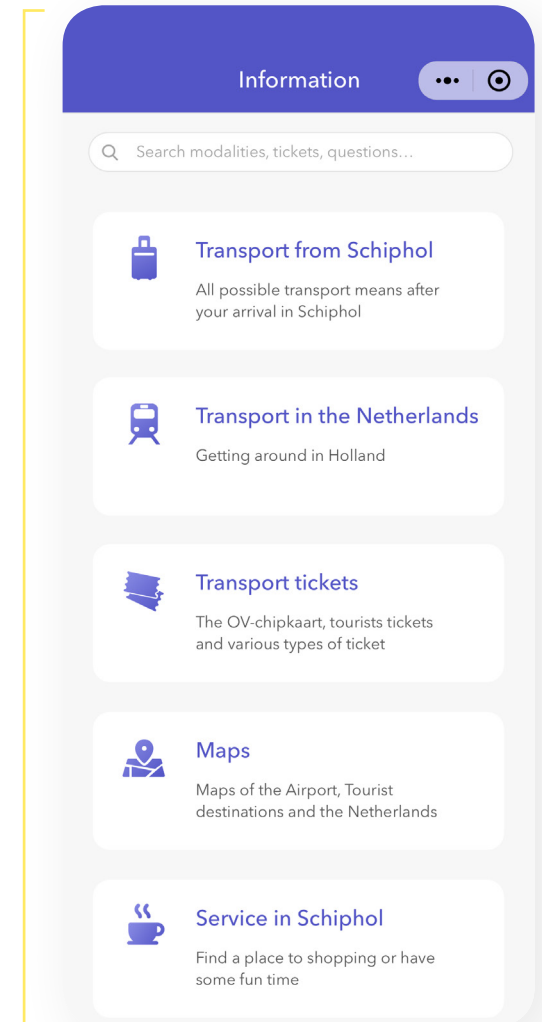
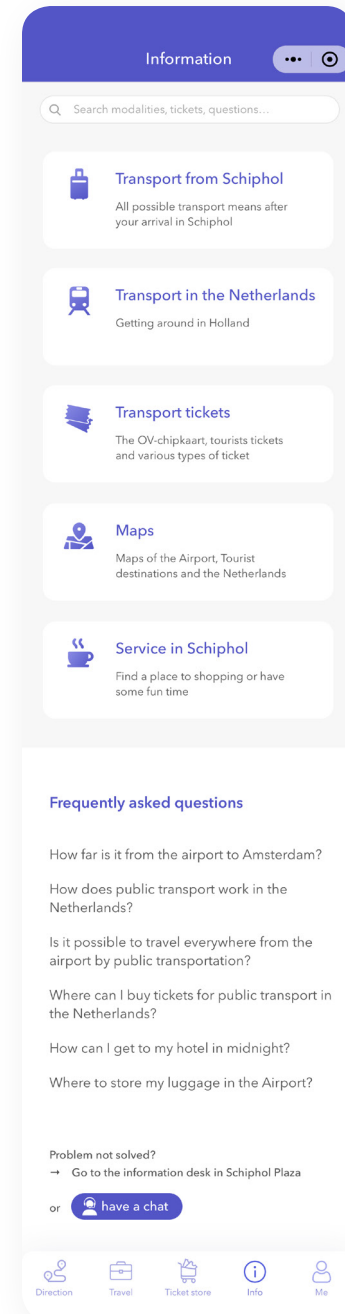
The explanation of the ticket choosing could be seen in Appendix M.

5.2.13 Information *Homescreen > Information*

The information screen provides necessary information for various situations.

They could directly search the keyword, or click the topic to find the detail page or check the frequently asked question to get the answer.

If all solution does not work, it provides the possibilities for staff service online or offline.





Service in Schiphol

Find a place to shopping or have some fun time

Frequently asked questions

How far is it from the airport to Amsterdam?

How does public transport work in the Netherlands?

Is it possible to travel everywhere from the airport by public transportation?

Where can I buy tickets for public transport in the Netherlands?

How can I get to my hotel in midnight?

Where to store my luggage in the Airport?

Problem not solved?

→ Go to the information desk in Schiphol Plaza

or



have a chat



Direction



Travel



Ticket store



Info

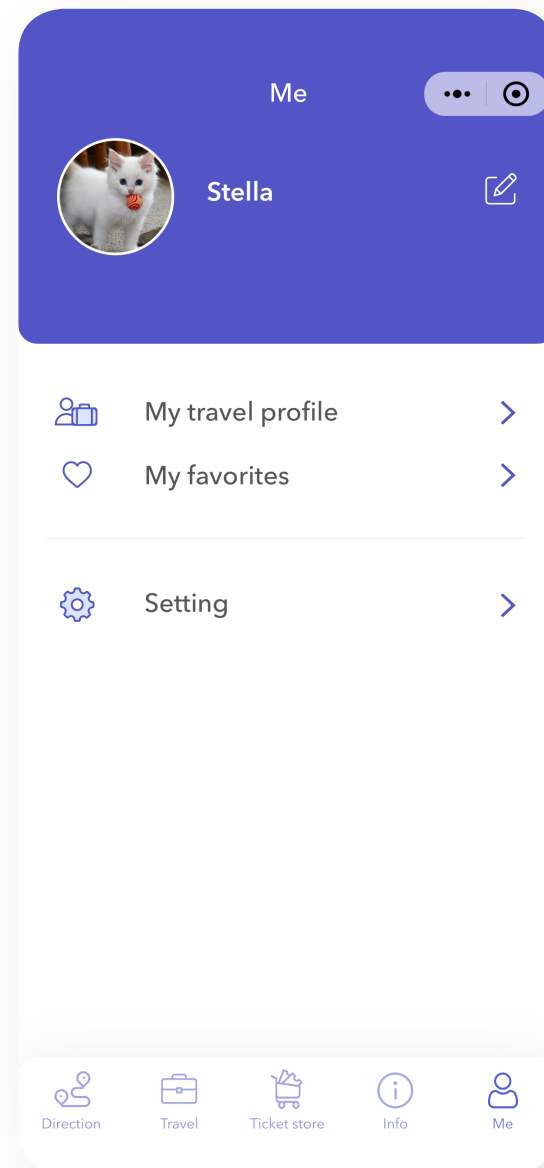


Me

5.2.14 Me

[Homescreen > Me](#)

In the screen of Me, the user could build or change their *travel profile*, and browse those saved tickets in *My favorites*.

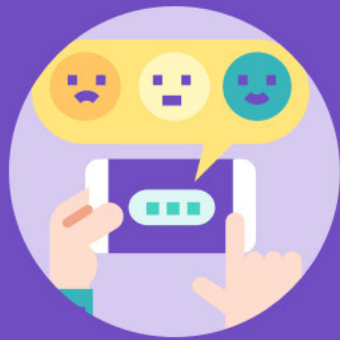


5.2.15 Interactive prototype

Please check <https://share.protopie.io/Bj7KAZHQQCC> for the interactive prototype(Or scan the QR code in Figure 5.3). It is not a fully-function prototype. Due to the prototype cannot store and process the data, it only shows the interaction and visual style. The aspects of recommendation and data processing do not work.



Figure 5.3 QR code of the interactive prototype



06

Evaluation

6.1 Introduction

The previous chapter introduces the final concept as a WeChat Mini Program. In this chapter, a User Test is introduced, which investigates the effectiveness and usability of the concept. The limitation of the whole project and the recommendation for future improvement is stated.

6.2 User Test

6.2.1 Overview

Within a complete international passenger journey from general orientation to leaving the transportation system (Lehr, 2016), the final concept mainly focuses on the steps of transport selection, ticket selection and trip preparation. Therefore, the scope of the user test is the same.

There are three typical travel planning patterns of international passengers, Much-planning travel, Moderate-planning travel and Little-planning travel(see 2.3.2 Personas, Customer journeys). Different travel patterns lead to various cases of using the WeChat Mini Program. Due to the restricted time available for this graduation project, only the much-prepared travel using case and the little-prepared travel using case is tested.

Three types of test are designed to fulfil the overall User Test scope. Test A requires the participant to plan their first trip after arrival at home; Test B assigned the task of getting on the vehicle of a scheduled journey at Schiphol Airport to the participant. Test A and Test B buildup a complete tour of passengers whose travel pattern is much-prepared travel. In Test C, the participant would plan and implement the first transport journey at once at Schiphol Airport.

Figure 6.1 shows the scope and overview of the User Test.

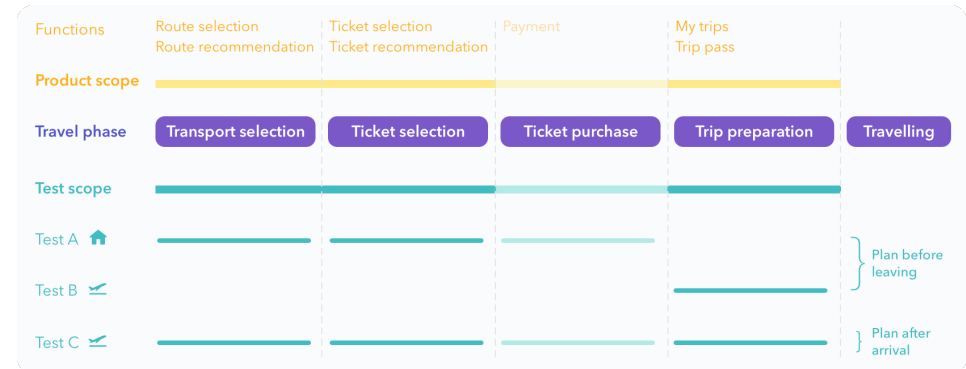


Figure 6.1 Scope and overview of the User Test

6.2.2 Overall objectives

The baseline data about the effect and usability of the final design will be collected in the test. The goals of the test are:

- To assess how well the final design could meet the Design Goals (2.4.2);
- To evaluate the overall effect and usability of the final design for different types of users, in different situations on performing common tasks on aspects: choosing routes, choosing tickets, finding the way and getting on the vehicles, getting information support;
- To identify user's obstacles on completing the tasks mentioned above;
- To determine the design guidelines for improving the product in the future.

6.2.3 Research questions

Based on the Design Goals (2.4.2), the concerns are mapped (See Appendix N). These concerns are sorted, integrated and revised as the research questions below:

Travel phases: Transport selection, Ticket selection, Ticket purchase

- How easily and successfully do users plan their first trip (get options, make choices) in the Netherlands.
- Do the users successfully match their needs to the option (route or ticket) they choose with the mini-program?
- How well does the mini-program support users to find the information they need in each travel stage or touchpoint? (easy to find/ easy to understand/feel useful and reliable)
- Does the mini-program make those 'unknown but nice service', like the transport services provided especially in Schiphol, get known and accepted by users?
- Does the mini-program make sense for users who travel multiple European countries in one time?
- What obstacles do users encounter through their planning?
- What questions do users ask through their planning?

Travel phases: Trip preparation, Travelling

- How easily and successfully do users go to the boarding location of their planned trip?
- How well does the mini-program support users to answer questions

and solve problems through the boarding process?

- How well does the Mini Program get first-time passengers accustomed to a new transport system?
- Does the information in the Mini Program work well together with the physical information in Schiphol Airport?
- What obstacles do users encounter through their boarding?
- What questions do users ask through their boarding?

General usability

- How people experience the Mini Program?

6.2.4 Test set-up

Prototype

To immerse the participants into the real situation, an high fidelity interactive prototype was made with the software Protopie. The prototypes for test are in Chinese. The functions and screens to test were fully-clickable and interactive. As there is no back-end part in the prototype, some information like the time of a trip will be prepared beforehand for each test.

Setting

Test A assessed the Transport selection, Ticket selection parts. It was conducted remotely at the participant's home. The digital prototype was sent to the participant and functioned in the participant's phone. A video call was made to facilitate the test; a camera was used to record the whole process; a screen recording was made to record the interaction with the prototype. The tasks assigned to participants of Test A were to plan their first trip and choose a suitable ticket.

Test B evaluated the Trip preparation part in the final concept as a follow-up of Test A. There was a trip scheduled for the participant. It was facilitated in the open area in Schiphol Airport. The participant used the prototype on the phone prepared by the moderator. With permission, the whole test process was recorded by audio and screen record. Participants of Test B completed the task of finding the right spot to get on the vehicle.

Test C covered the whole experience, from Transport selection to

Trip preparation. It was also conducted in the open area in Schiphol Airport. The participant ran the prototype in the phone prepared by the moderator. With permission, the whole test process was recorded by audio and screen record. The participants were to complete the tasks of both Test A and Test B, from route planning to spot finding at Schiphol Airport.

Figure 6.2 shows an overview of the location and set-up for each test.

	Location	Tasks		
		Transport selection	Ticket selection	Trip preparation
Test A	Participants' home	•	•	
Test B	Schiphol Airport			•
Test C	Schiphol Airport	•	•	•

Figure 6.2 Overview of the settings for three types of test

Participant

Five participants were recruited for the tests. They are all unfamiliar with Holland transport as well as Schiphol Airport. Two for Test A, two for Test B and one for Test C. Overall, each task, or each main function of the final design, were tested by three participants. The distribution of the participants was shown in Figure 6.3.



Figure 6.3 Participants distribution

Session

The general process of each test session is shown in Figure 6.4. There are four steps. Pre-test arrangements, pre-test introduction/interview, tasks and post-test interview/questionnaires. For each test, there is a detailed protocol to follow, see Appendix O. Besides, the document prepared for the test, like the interview questions, scenario information and questionnaire, could be found in Appendix O.

Figure 6.5 show the real situations of these tests.

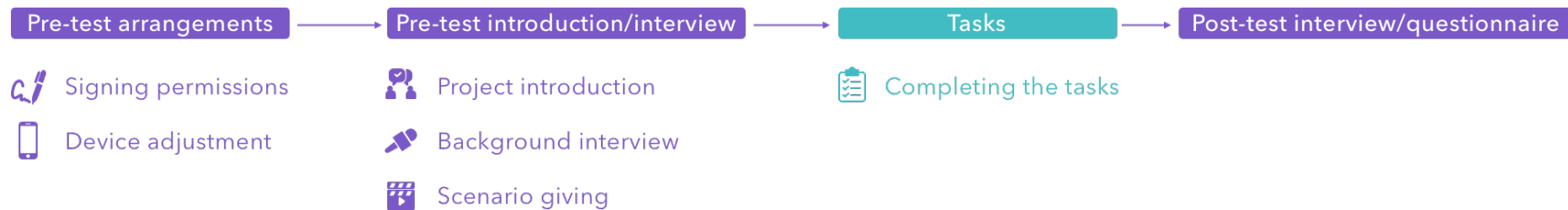


Figure 6.4 General process of each test session



Figure 6.5 User test situations

6.3 Test Results

The Test Results will be shown by answering Research Questions in various topics.

Route/modality Selection

1.1 How easily and successfully do users plan their first trip to the Netherlands?

1.2 Do the users successfully match their needs to the option in route they choose with the mini-program?

All participants successfully planned their first trip. They all thought the Mini Program help them to make a choice. They also successfully match their needs to the route to choose with the information the Mini Program offers.

Feedback score



The yellow circle with number show how many participant give this score. The size of the yellow circle also indicate the numbers of answers. The green circle show the average score.

Insights

- **The key information in the route results list is clear.**

Facts Three in three participants find their ideal route without any questions or hesitation.

Quotes 'I choose this route quickly because I found it needs no transfer and is at a low price. I do find it's best for me' – A2.

'The time of walking is fine for me, so I choose the cheap and convenient route.' – C1

- **Adding a trip is an intuitive step for people who are planning the route.**

Facts Two in two participants successfully add the chosen route to their trip list.

Quotes 'Compared to buying a ticket, adding to the trip seems more flexible for the planning stage. I could still change the plan later.' – A2.

2 Does the Mini Program make those 'unknown but nice service', like the transport services provided especially in Schiphol, get known and accepted by users?

The Mini Program present those service as an option to the user and introduce the advantages of those service like Schiphol Hotel Shuttle. Participants think they are useful.

Insights

- The page of Schiphol Hotel Shuttle gives a clear introduction of this modality.

Facts One in two participants click Schiphol Hotel Shuttle option in the test, even though they finally did not choose it. The reason was they were a four-people group, a taxi was more suitable.

Quotes 'Can I know which hotel is included? Oh yeah, there's the list.' – A1

Ticket Choosing

1.1 How easily and successfully do users choose the ticket with the Mini Program?

1.2 Do the users successfully match their needs to the option in route they choose with the mini-program?

All participants successfully found the ticket they needed with the Mini Program. Two participants mostly agreed that the Mini Program make the ticket choosing easier. One participant gave a neutral attitude on the support from the Mini Program on ticket choosing. They all matched their needs with the option by reading the information and getting recommendation.

Feedback score



Insights

- The Tourist ticket list shows clear necessary information.

Quotes 'The list clearly shows the difference between tickets, and the transport areas are notable.' – C1

'The area range shown here perfectly match my itinerary.' – A2

- The information in the ticket detail page is useful, however sometimes not easy-to-find.

Facts One participant asked whether it was far between the destination, which could be found in the information area.

Quotes 'Not 24 hours, oh that's import for me!' – C1.

'The Area map is nice. I could check the route and destination with it. However, I didn't notice it before.' – A1

- The information about 'what to do next after paying' is missing. Before buying a ticket, people also want to know how to get the ticket and use the ticket.

Quotes 'I don't know it's an E-ticket. I'm looking for information about taking the ticket somewhere.' – A1

'How to take transport with the ticket? Will it help to find the way?' – A2

- The review of other people is a useful reference for making a decision.

Quotes 'The review shows it's a good choice!.' – A2

- The tourist ticket shows on the particular trip ticket screen is confusing. There might be a better option for the whole trip which does not cover a specific trip.

Facts One participant chose tourist ticket A when she tried to find a ticket for the trip she searched. However, she found a better option in the ticket store which did not appear in the searched trip ticket screen.

Insights below are about the Ticket Assistant (5.2.12).

- The entrance is not notable enough.

Facts Two in three participants did not notice it at first sight.

- The questions are sometimes not easy to answer. The meaning of the question is vague or not enough information provided.

Quotes 'I don't know if Amsterdam is a city suitable for walking when I make a choice.' – A1

'What if I stay in more than one hotel? How should I choose?' – C1

'I will leave on the morning of the last day. It's a four-day trip or a five-day trip?' – C1

- The result of recommendation is convincing. However, the way of showing the result is not clear enough.

Quotes 'I cannot understand why it recommends the ticket within Amsterdam city as I will also go around the region area. However, when I saw the second recommendation of the region ticket, I got it.' – A1

Trip Preparation

1 How easily and successfully do users get on the vehicle of their planned trip?

All participant successfully found the spot for boarding. They all thought the Mini Program helpful.

Feedback score



Insights

- People do not understand the concept of 'Trip Pass' immediately. Trip Pass was not in line with people's expectations.

Quotes 'I want to find a route shown on the map for navigation.' – B1

'Will it something shows up when I arrived at somewhere?' – C1

- The tips work well for a real trip.

Facts Three in three participants get useful information like 'take a seat in the second-class carriage', 'press the stop button before arrival'.

Insights below are about the Visual Indicator function in the Trip Pass screen (5.2.9).

- The Visual Indication icon is not apparent and understandable.

Facts Two in three participants did not notice it before reminding.

- The information in Visual Indication is hard to find.

Facts One participant did not find there was more than one image for guidance.

- Once understand how it works, the real photo is helpful for way-finding.

Quotes 'The image perfectly match with the real situation, which makes it super easy to find the spot.' –B2

- It might be hard for people to get all the critical information from an image.

Facts One participant only noticed the looks of platform signage based on the image, but not match the platform number.

- The steps presented in the Visual Indication are too separate with each other.

Facts Two in three participants forget to scan the ticket after they successfully find the platform. The image would not jump to the next one automatically.

2 How well does the mini program get first-time passengers feel at ease in a new environment?

All participants gave the comments that the Mini Program help to make the experience more easier in a new environment.

Feedback score



Participants mostly agree or entirely agree that the Mini Program help them to feel easier in a new Environment.

Information

1 How well does the mini-program support users to find the information they need in each travel stage or touchpoint?

Most of the participants (four in five) give a positive comment on finding information on the Mini Program. One participant took a neutral attitude.

Feedback score



Insights

- There is a large amount of useful information provided; however, sometimes the user cannot find it.

Quotes 'All I want to know is there, but I don't know it is.' – C1

Usability

1 How people experience the design?

The System Usability Scale(SUS) (Brooke, 1996) is used to evaluate the learnability and usability of the Mini Program. As the questionnaire prepared for the test used a seven-point Likert scale, the scores transferred to five-point for final score calculating. The average final score is 74.8. According to research on SUS score (Bangor, 2009), this score represents the usability is 'Acceptable' and 'Good' for users.

Figure 6.6 shows the score for each SUS question.

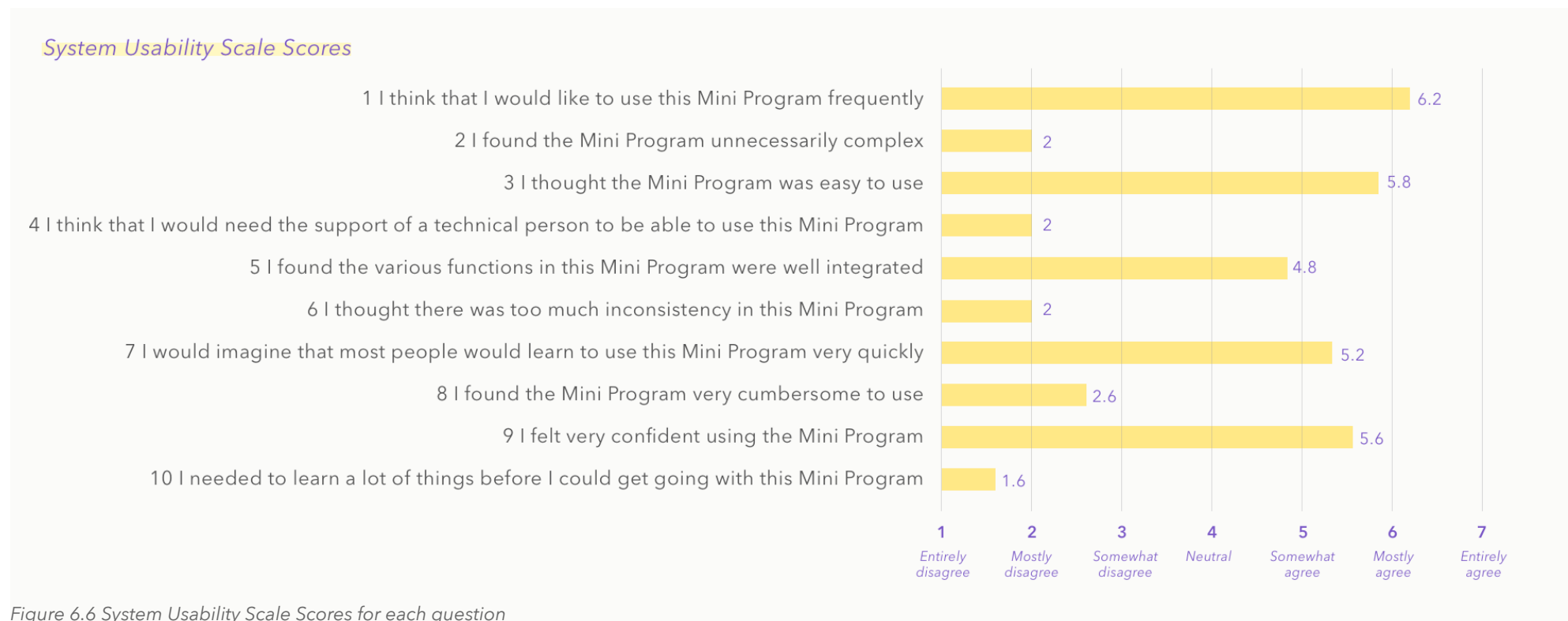


Figure 6.6 System Usability Scale Scores for each question

General comments

Insights

- **The Mini Program would be useful for an outbound travel.**

Quotes 'It's convenient compared with buying a ticket from the window or machine.' – A2

'It give a fluent travel experience to me. I feel good to use it!' – B2

'There's a lot information, and they are indeed what I need.' – C1

- **The Product Positioning is not clear.**

Quotes 'I don't know if I will use it in the future. I find there are just too many Apps to use during travel! It's annoying.' – A1

'At first sight, I cannot know what the App is used for. It's a surprise I could buy a ticket with it.' – A2

6.4 Conclusion of User Test

The answers to those essential research questions are stated in the last section. The results show the final design, the Wechat Mini Program, generally meet the Design Goal proposed in 2.4.2.

First Design Goal: Make passenger even in extreme state feel confident and supported through the whole journey.

- Enable users to quickly adapt to a new, different transport system
- Enable users to make decision in an unfamiliar field easily
- Guide people to finish their tasks intuitively
- Decrease the language barrier in complex situation
- Make all necessary information exists and be easy to find
- Decrease the cost of making mistake

The final design could help the first-time passenger to feel confident and comfortable in the Schiphol Airport. The information provided by the Mini Program could successfully guide people to find the right spot and do the right things in most cases. It also gives solutions to the language barrier by providing the necessary information, especially those that could also be found in real-world in two languages. All participant did not encounter any problem in language.

There is only one sub-design goal is not met: Make all necessary information exists and be easy to find. Based on the results of the User Test, passengers cannot always find the information they need immediately. But in general, the information are clear and useful for the users. Besides, due to the limitation of the test, the part of 'solving the problem the user might encounter in the Airport' was not well tested.

Second Design Goal: Enable passenger to plan their transport journey based on their needs easily and freely.

- Make what people care about matters
- Provide reliable information in the 'user language' at the right moment, right place
- Create the information democracy: people could know everything if they want, and they know they could
- Improve the accessibility of all great resources
- Support passenger with the situation the Netherlands is one destination of their travel in Europe

The final design support people on planning transport based on their needs pretty well. First-time passengers can match their preference and travel planning to the Mini Program and find the optimal option for them. The passenger could also get access to the relevant information they are interested in. The system introduces nice resources to the first-time passenger. The last sub design goal, Support passenger with the situation the Netherlands is one destination of their travel in Europe was not tested due to the limitation of the test.

Besides the effectiveness of the Mini Program in term of the aspects mentioned in Design Goal, the usability is discussed. The ultimate result of SUS is above the average score of 68, according to the industrial standard. It means the usability is acceptable by users.

The User Test shows many limitations. The sample size was too small to make the results rigorous and representative. That is because of the difficulty of getting contact and successfully recruiting Chinese

passengers arriving at Schiphol during the test period. Besides, the test did not make every aspect of the Design Goal involved. That is caused by the time limit of the project and the number of participants.

It is recommended that in the future, the Mini Program should be tested with a larger group of participants. A validation with all stakeholders is also necessary.

6.5 Project Review

As proposed in 1.3, this graduation project aims to create a care-free and seamless transport journey from/to Schiphol from the perspective of first-time Asian passenger. With this aim, multiple types of research are done, and the final concept as a WeChat Mini Program is iteratively developed. The Design Brief is well organised after the Research&Analysis stage, which guides the later design phase pretty well. The final design also meets some of the Design Goals.

Specifically, the result of the Research&Analysis stage is approved by the stakeholder and show some similar patterns with the research Schiphol Airport did before. The research result might able to be a useful reference for future projects development. The final design as a Mini Program proposes a possible solution of enhancing mobility around Schiphol Airport for Asian passengers. The main functions and the visual style could be referred to by the future project. Even though the Mini Program currently only focuses on the journey from or to the Airport, the structure of the product is extendable, which means it could provide service in a broader scope.

6.6 Limitations

This graduation project has some limitations on Research, Design and Evaluation aspects.

Lacking in Literature Review

The initial goal of the Research & Analysis stage is to understand the context, users as well as prepare enough knowledge on related research and design fields. However, due to the time limit, the literature review was not done in a professional academic way. As a result, the solutions in the final design to the Defined Problem is short of the support from academic conclusions. It might be better for the project development if in the early stage the knowledge of service design and information design was systematically researched and made use.

Little access to the stakeholders

At the beginning of the project, the project is defined as a service design project, which means the involvement of multiple stakeholders is crucial. However, due to the large numbers of stakeholder and the difficulties of reaching them, finally, the project more focus on the user perspective rather than take all stakeholders' interest into consideration. That would cause some feasibility problem for implementing the design. In the final verification stage, the stakeholders are not involved either.

Concept of the service in the Schiphol missing

In the early stage, it is expected to develop both digital products as well as a physical concept in Schiphol. In the end, only the digital part of the service is well developed. The missing part of the concept will

influence the effectiveness of the Mini Program. For example, the ideal case of using the Mini Program is the passenger find somewhere to take a break, than plan the journey in a relaxed mood. However, this part is only emphasized in the digital part.

Small group of participant

In the User Test, only five participants get involved. It might influence the objectivity of the results and the abundance of feedback.

The role of this Mini Program in a complete travel journey is not clear

The function embedded in the Mini Program is effective for the target situations, and the Design Goal is generally met in the User Test. However, different functions in the Mini Program is not integrated well. Its role in a travel to Netherlands is not clear enough.

6.7 Recommendations

Based on the feedback from participants in User Test as well as the limitation staged in the last section, some recommendations are proposed for future improvement for this project.

For the process

- Conduct more literature review. Getting valuable knowledge from other's work is also essential.
- Gett closer to the stakeholders. It is not necessary to talk with them face to face, checking their websites, and the previous proejcts could also help to know their needs and visions.

For the final concept

Make the service more complete

- As shown in the aspired situation in the storyboards of Product Positioning(4.2), the service in Schiphol Airport should be proposed. Besides, the pre-service stage could be designed. How people get to know it, why people decide to use it should also be considered.
- The ideas on improving the experience of getting support and solving the problem could be further developed. The design direction F, *Q&A for specific spots/touch-points* and design direction H, *Change the meaning of 'making a mistake'* (See 3.3.1), both possible for future development for improving the concept.

Consider what the user's expectation for each touchpoint

- Make the home screen explain the Mini Program more. Currently,

people cannot recognise what the Mini Program is used for before using it. Some hint could be added, and the structure of the product could be redesigned to solve the problem.

- Improve the flow based on user's habits developed by other products. For example, as people use the Map App a lot, they expect there is a map to show where they are in the Trip Pass screen. Even though the indoor map does not make much sense, add the map to make people feel the sense of safety.

Expand or narrow down the scope of the product

- Currently, in the Mini Program, the function route planning is limited in the trip from or to the Schiphol, while the tourist tickets and information are universal for all transportation in the Netherlands.
- The Mini Program can be expanded to a comprehensive transport supporter for tourist to the Netherlands, and the structure of this Mini Program is designed to be expandable.
- On the other hand, it could also be possible to make the scope smaller. The Mini Program always work well on providing those light but beautiful services. The first option, focusing only on the orientation of travelling in the Netherlands, providing critical information to passengers. The second option might be dividing the first trip from the whole transport experience. Give a quick and if possible, a cheap journey to passengers. The third option is to make the Mini Program work like a bridge between Chinese passengers, and those existed but unknown services, like the Holland.com, NS App, 9292 App. As it is possible to jump to another App in the Mini Program fluently, this

solution might be able to improve the experience of Chinese people on multiple aspects of a travel at the lowest cost.

Recommendation for Schiphol and other transport operator

- Mini Program is an ideal carrier for service provided to Chinese passengers. Mini Program makes it is easier for Chinese passenger to get access to valuable information and service provided by companies in the Netherlands. The Mini Program developed in this graduation project could be a start point to provide better passenger experience to Chinese passenger. However, the scope and focus of the platform need to be adjusted, as mentioned in the last recommendation.
- If a digital platform specially designed for Chinese travellers is developed, the companies might benefit from: (1)Get closer to the target users. Behaviour database could also be built to provide better products or service in the future; (2)Make the advertisement for all aspects of the travel destination easier. Not only for the transport aspects, but other aspects of tourism could also be promoted. Besides, WeChat Mini Program is easy to share in WeChat, the most popular social App in China. In the future, a complete ecosystem of all service in the domain of tourism might be ab
- The results in this report might also be a reference for future product or strategy development. The Results of the Research&Analysis stage could be a good reference to understand Chinese passengers and their travel behaviours. Besides, some ideas and recommendations in First-round evaluation(3.3.1) could be some inspiration for future service development in not only the transport aspects.

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