

Seamless transitions from plane to train

Designing a 'phygital' journey to improve the transition of international tourists from Schiphol Airport to Amsterdam with NS (Dutch Railways)

Author

Kaya Mette Knipscheer

Master thesis

Delft University of Technology
Faculty of Industrial Design Engineering
Msc. Strategic Product Design

In collaboration with Fabrique

Anna Offermans as company supervisor

A case for NS

Ralf Lambie as company supervisor

Graduation Committee

Erik-Jan Hultink
Gert Hans Berghuis

Februari 2024 - Augustus 2024

TITLE DESCRIPTION

Seamless transitions from plane to train

Designing a 'phygital' journey to improve the transition of international tourists from Schiphol Airport to Amsterdam with NS (Dutch Railways)

Seamless transitions

Facilitating barrier-free travel from booking flights to arriving in Amsterdam

'Phygital'

Combining digital and physical touchpoints to create the desired phygital journey for international tourists

International tourists

English-speaking tourists who are independently travelling to Amsterdam and have never interacted with NS services before



Preface

When I joined Fabrique, I had a clear goal: to explore how digital products contribute to the experience in the physical world, and how both can enhance each other. When the opportunity to collaborate with NS (Dutch Railways) appeared, I was immediately excited. What made this project for NS so engaging was the recognisability of the problem. How often have I almost forgotten to check in or out at Schiphol before going on holiday? Many times, I have thought: when will they finally install check-out gates?

Even though, every time I arrive at Schiphol, I get a special feeling. It symbolises new adventures and opportunities. A positive start to the journey. If I can contribute to this same feeling for international tourists arriving at Schiphol for the first time through this project, I will consider it a success. To achieve this, I want to create practical solutions for NS, that are seriously considered to be implemented.

Initially, this project seemed very much like a Design for Interaction (DFI) project, focussing on improving the interaction with NS services at Schiphol for tourists. Through qualitative research with NS and international tourists, underlying problems and missed opportunities emerged, turning this into a strategic project after all. I focused on creating new business models and strategies to recover missed costs. Thomas and Mark, I want to thank you for challenging me to think like a true strategy consultant. And my favourite and only brother Job, thank you for sharing all your SEO and SEA marketing insights with me and explaining how the Google Ads platform works.

Erik Jan and Gert-Hans, thank you for your positive feedback throughout my report. Especially the fun but effective bi-weekly meetings will stay with me. I want to thank you for the trust you placed in me and this project from the beginning.

In addition, I want to thank my colleagues at Fabrique for the fun while writing my thesis. Especially Anna, thank you for your personal support throughout my project, but also outside of my project. Pien, thank you for always offering help when needed, whether it was to brainstorm about the project, validate solutions, or tell me I needed a coffee break.

Working on this project for six months sounds long, but I could have easily spent another six months on it. I also want to thank Ralf, Mathilde, and Pascal from NS for your interest in my project, for involving me in meetings, and for allowing me to present my insights to stakeholders and colleagues within NS. I have learned a great deal from this.

I see this project as a beautiful closing of six years of studying at TU Delft, which have truly flown by. Now, enjoy reading my thesis, part of my thesis, flipping through my thesis, or looking at the pictures in my thesis.

🍷 Cheers,
Kaya Knipscheer

Summary

The reason for this project is the introduction of the new NS sprinter between Schiphol Airport and Amsterdam at the end of this year. Because of this new train, with a new design and a new role for the conductor, questions arose about how we can make this service more accessible to international tourists. This project aims to increase the intuitive access to NS services for international tourists, transferring from Schiphol Airport to Amsterdam.

The research comprised four qualitative studies, totalling 42 interviews. Initially, 13 semi-structured interviews were conducted at Schiphol Airport to identify the challenges faced by international tourists travelling to Amsterdam. Subsequently, seven semi-structured interviews were conducted to explore these challenges and ambitions from the perspective of NS. To address discrepancies in the findings, additional research included six semi-structured interviews with NS service employees at the check-out gates at Amsterdam Central Station and 16 semi-structured interviews with tourists who travelled without a valid ticket from Schiphol to Amsterdam.

The initial research revealed that tourists often fail to notice the check-in points at Schiphol, with only one out of 13 interviewees successfully checking in their ticket. Contrary to expectations, most tourists could locate the trains without significant issues. However, NS executive employees reported frequent problems with tourists boarding trains without tickets and subsequently facing closed gates at their destination. Interviews with NS service employees confirmed that many tourists travel without valid tickets from Schiphol Airport, but mention that even more tourists travel with a GVB ticket instead on an NS ticket. Further investigation revealed that tourists either missed the check-in points at Schiphol or mistakenly believed they could purchase tickets on the train. Additionally, a large part of the tourists had indeed pre-purchased GVB tickets, assuming they were valid for the train journey.

These findings indicate that tourists often end their journey at closed gates in Amsterdam, resulting in a negative experience. For NS, this translates to lost revenue as a significant number of tourists travel without valid tickets. The revised aim of this project focuses on ensuring tourists understand the necessity of having a valid ticket before boarding the train. The ideation phase generated numerous solutions, which were refined through expert reviews in user experience, marketing, strategy consulting, and stakeholder meetings with NS, ProRail, Spoorbouwmeester, and Schiphol. These discussions highlighted clear requirements for the proposed concepts.

This project presents three concepts that serve as a backlog of innovative ideas for NS, aimed at increasing ticket sales at Schiphol. These include the 'happy flow', focussed on promoting the desired behaviour of tourists, the 'unhappy flow', focussed on addressing the incorrect travel behaviour, mainly caused by the 'GVB planners', and the 'backup flow', focussed on increasing the visibility and visual space at Plaza. The thesis provides actionable recommendations on the implementation plan of these solutions and outlines the necessary steps for successful deployment.

This project concludes by presenting three implementation strategies, each based on different objectives. If NS has the necessary resources, the first strategy recommends implementing the low-hanging fruit first. If resources are limited, the second strategy aims to maximise revenue by focusing on solutions with the highest Return on Investment (ROI). The final strategy prioritises enhancing the customer experience, ensuring a seamless transition from plane to train.

Table of contents

Glossary

UX | User Experience

CICO posts | Check-in Check-out posts

Touchpoint (TP) | Means of interaction between companies and consumers

POC | Proof Of Concept (placing floor stickers to enhance the visibility of the CICO-posts at Plaza)

Phygital | Digital + Physical

Eidra | Consulting collective. Fabrique is part of Eidra

💡 | Insights or thought processes

Introducing the project and process 01

1.1 Introduction of the project and process 13

Understanding the impact of digital transformation on public transport services, travellers, and companies 02

2.1 The impact of digital transformation 19
 2.2 The impact of digital transformation on public transport 19
 2.3 The impact of digital transformation on public transport travellers 20
 2.4 The impact of digital transformation on companies 22
 2.5 The impact of digital transformations: key takeaways 23
 2.6 What is the desired 'phygital' balance for infrequent travellers? 23

Learning from innovative 'phygital' experiences and analysing the current context 03

3.1 Context analysis: Case-based learning 27
 3.2 Context analysis Case-based learning within public transport 30
 3.3 Context analysis: DEPEST analysis 32
 3.4 Company analysis: Overview of the key stakeholders 34
 3.5 Consumer analysis: Different travel options from Schiphol Airport 36
 3.6 Consumer analysis: Five segments of international tourists 37

Identifying opportunities and challenges on the journey through qualitative research 04

4.1 Approach to conduct qualitative research 41
 4.2 Qualitative research with international tourists at Schiphol Airport 44
 4.3 Qualitative research with NS executive employees 47
 4.4 Qualitative research with NS service employees 58
 4.5 Identifying the gap: a discrepancy in consumer and company insights 61
 4.6 Qualitative research with tourists travelling without a valid ticket 63
 4.7 Creating the as-is customer journey 70
 4.8 Defining the problem statement of tourists travelling without a ticket 76

Formulate new journey goals and explore solution areas 05

5.1 Analysing the gap in offering of GVB and NS 81
 5.2 Digital Presence Comparison: GVB vs. NS 84
 5.3 Airport Safari: Understanding the feasibility of new solutions 86
 5.4 Formulate new journey goals 88
 5.5 Ideation and facilitating an ideation workshop 91

Revealing the final concepts: approach to prioritising solutions 06

6.1 Approach to prioritising solutions 95
 6.2 List of requirements 96
 6.3 Airport Safari II: Discussing proposed ideas 98
 6.4 Concept validations with NS 99
 6.5 Determining the preferred payment method 100
 6.6 Bi-weekly TU Delft and UX expert review 102

Seamless transitions from plane to train: Introducing the happy flow, unhappy flow, and backup flow 07

7.1 Happy flow 105
 7.2 Unhappy flow 114
 7.3 Backup flow 122
 7.4 Integrating Solutions into the New Journey 123

Creating value and guidance to implementing the proposed solutions 08

8.1 Implementation strategy: Picking the low-hanging fruit 127
 8.2 Implementation strategy: Maximising Revenue 129
 8.3 Implementation strategy: Focussing on the desired customer experience 131
 8.4 Final advice to NS: Balancing Profit and User Experience 133

Discussion, Conclusion and Personal Reflection 09

9.1 Discussion 137
 9.2 Conclusion 138
 9.3 Personal Reflection 139

References and Appendices 10

01

CHAPTER 01

Introducing the project and process

This first chapter outlines the project and its initial objectives. It introduces the key stakeholders involved in this project and highlights the practical relevance the project holds for them. Additionally, the chapter offers an overview of the project process, detailing insights and the subsequent steps. This overview serves as a guiding rationale throughout the project, explaining how actions and insight build on each other.

Introducing the project and process

1.1 Introduction of the project

This project operates within the context of public spaces, which includes all areas shared by people, ranging from cities to specific spaces within buildings (Carmona, 2019). Public spaces bring together people without distinguishing demographic characteristics. Public transportation, an example of such a space, will be the focus of this project.

Over the past decades, digital technologies integrated into our daily lives, impacting public transportation. Digital transformation became central to enhancing service accessibility for travellers. This led to an increase in digital touchpoints in public transportation services. Despite the accessibility benefits of digitalisation, new digital technologies necessitate new interactions from travellers. Given that public spaces bring together people from diverse demographic backgrounds, not all travellers can or are willing to keep pace with digitalisation in public transport, potentially leading to the exclusion of certain travellers (Durand & Zijlstra, 2020).

1.2 A case study for NS

By the end of this year, a new NS (Dutch Railways) Sprinter will operate between Amsterdam Central Station and Hoofddorp, via Schiphol Airport. This modified Sprinter will run eight times per hour on this route. Unlike the traditional NS Sprinter, this train features an automated departure process, shifting the train operator's role from driving the train to providing service to passengers. This change aims to speed up the train's departure process (NS, 2022).

The introduction of this new train raised several questions within NS: How can this new Sprinter better meet the needs of tourists? Should the train be painted bright orange to highlight the improved 'Airport to City' connection? Quick

responses from other NS departments suggested that making an exception for this route, by colouring it orange, is not the solution. But what is?

The goal of making the journey from Schiphol Airport to Amsterdam more accessible for tourists is clear, but the means to achieve this without confusing domestic travellers remains uncertain. Additionally, there is a need to ensure consistency in touchpoints while adhering to strict regulations regarding signage and branding at stations and on travel information boards.

This case is particularly relevant as international tourists, often unfamiliar with local digital tools like apps, rely more on intuitive interactions with their physical surroundings. By focusing on international tourists travelling from Schiphol Airport to Amsterdam, the project aims to enhance intuitive accessibility for first-time users by integrating digital and physical touchpoints.

1.3 Initial project goals

The initial goal was to design a 'phygital' customer journey to improve the intuitive access to NS's services for international tourists transferring from Schiphol Airport to Amsterdam. This involved investigating the desired balance between physical and digital touchpoints for tourists and how digital touchpoints can support the physical world. The project began by reviewing existing literature on the current effects of digital transformation in public transport.

Subsequently, qualitative research was identified pain points in the current journey and develop solutions. Initially, this project was conceived more as a Design For Interaction (DFI) topic, focusing on analysing and improving the interaction of existing touchpoints.

However, this project ended with strategic insights into new business models and recovering lost revenue.

1.4 Project stakeholders

1.4.1 Fabrique

I started this graduation internship at Fabrique with a clear goal: exploring how digital products contribute to the experience in the physical world, and how both can enhance each other. Fabrique is a digital design agency specialising in strategy, design, and development. Over the past two years, Fabrique has consolidated its in-house expertise to form a team specialised in UX in public spaces. As digitalisation progresses, Fabrique aims to reinforce its expertise in 'phygital' experiences for future projects, ensuring public spaces are accessible to everyone. This case provides Fabrique with insights into the desired balance of digital and physical touchpoints among diverse public transport users. These insights can be applied to other public areas and serve as a knowledge repository for future projects. Additionally, it maintains a relationship with NS and offers the potential for continued collaboration post-graduation.

1.4.2 NS

This project is conducted in collaboration with NS and aims to enhance accessibility for international tourists without disadvantaging domestic travellers. The case is particularly relevant as international tourists, often unfamiliar with local digital tools, rely more on intuitive interactions with their physical surroundings. By focusing on international tourists travelling from Schiphol Airport to Amsterdam, the project aims to enhance intuitive accessibility for first-time users by integrating digital and physical touchpoints. This project provides NS with qualitative research insights into the challenges of the current journey and offers clear guidelines to improve

the launch of the new Sprinter.

1.5 Project kick-off

The formal start of the project began after submitting the graduation project brief. Appendix 1 presents this brief.

1.6 Meetings

The project involved bi-weekly meetings with my mentor, chair, and the Fabrique company supervisor, as well as bi-weekly meetings with the NS company supervisor. Additionally, I joined two interactive 'Airport Safaris' with NS, ProRail, Spoorbouwmeester, and Schiphol. In addition, I facilitated an ideation workshop with colleagues at Fabrique. In addition, I conducted four individual stakeholder requirement meetings with NS, ProRail, and Spoorbouwmeester. The project also included five days of working at the NS office in Utrecht and four internal presentations, two within NS, one with stakeholders (NS, Spoorbouwmeester, ProRail, and Schiphol) during the Airport Safari, and one at Fabrique.

1.7 Project approach

The Double Diamond model represents the divergent and convergent phases of the design process, forming a double diamond shape. This model is also known as the 4D model, as it comprises four phases: Discover, Define, Develop, and Deliver. The first phase, Discover, involves exploring new opportunities, markets, and trends. The Define phase merges these insights, selecting and refining ideas while considering the broader context of the identified opportunity. The Develop phase returns to divergence, and iterates and tests solutions. Finally, the Deliver phase converges on the final concept, which undergoes final testing, and eventually product launch (Tschimmel, 2012).

Although this double diamond presents as a linear journey, it is iterative, involving constant back-and-forth adjustments. Therefore, I have reservations about the Double Diamond model as presented, as it oversimplifies the project process. The two diamonds contain continuous incremental points of divergence and convergence. Consequently, my approach, as illustrated in Figure 1.1, is a three-fold diamond model. This overview serves as a guiding rationale throughout the project, explaining how actions and insight build on each other.

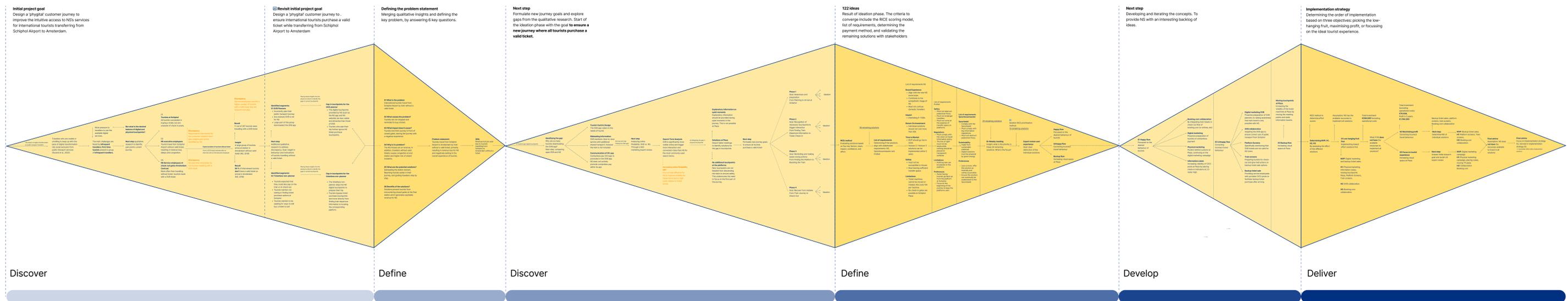


Figure 1.1: a three-fold diamond model

CHAPTER 02

Understanding the impact of digital transformation on public transport services, travellers, and companies

This first chapter explains the impact of digital transformation on public transportation, travellers, and companies. It questions the ideal balance between digital and physical experiences for infrequent travellers, such as first-time tourists. By synthesising existing research, this chapter aims to answer questions about the effects of digital transformation, laying the groundwork for future research.

02

CHAPTER 02.1

The impact of digital transformation

A context, consumer, and company perspective

2.1.1 Approach to conducting a literature review

The literature review approaches the impact of digital transformation from three different perspectives. Figure 2.1 involves a context, consumer, and company perspective. The following research questions aim to understand the context this project operates:

- 01** What is the impact of digital transformation on the public transport domain?
- 02** What is the impact of digital transformation on travellers in public transport?
- 03** What is the impact of digital transformation on companies?

2.1.2 Introduction of digital transformation

Over the last few years, digital technologies significantly integrated into our everyday lives. Around 20 years ago, smartphones, social networks, and artificial intelligence were not well known. Gong & Ribiere (2021) describe digital transformation as “a fundamental change process enabled by digital technologies that aim to bring radical improvement and innovation to an entity to create value for its stakeholders by strategically leveraging its key resources and capabilities”. The pace of digital transformations accelerated by the COVID-19 pandemic when

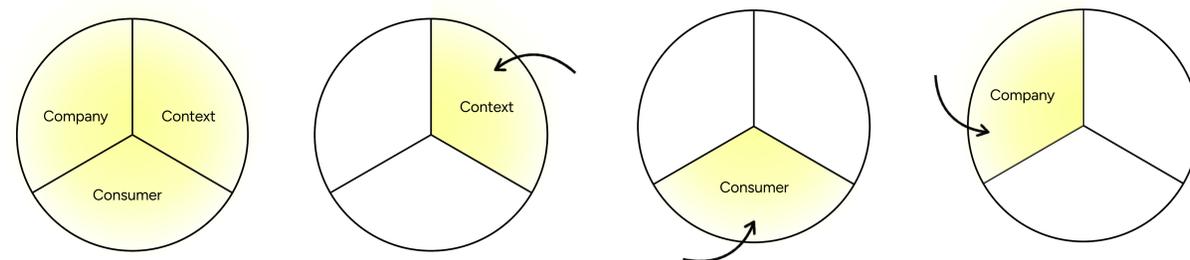


Figure 2.1: involving the impact of digital transformation from a business, context, and consumer perspective

face-to-face interactions gave way to digital solutions (Del Vecchio et al., 2023).

In the context of public transport, digital touchpoints take a central role in the accessibility of services for travellers. Consequently, digital touchpoints become more available (Durand & Zijlstra, 2020). However, the question remains what the desired balance of digital and physical experiences is for inexperienced travellers, like tourists?

2.2 The impact of digital transformation on public transport

2.2.1 Digital transformation in transport services throughout the years

The digital technologies we interact with in public transport today stem from years of developments, which have been gradually implemented (Durand & Zijlstra, 2020). Figure 2.2 provides an overview of the evolution of basic worldwide landmarks of digitalisation and its reaction in the transportation sector. This figure shows that digital transformation landmarks closely align with the response to digital transformation in public transport services.

2.2.2 Benefits of Digital Touchpoints Public transport

The benefits of digital technologies in public transport have become clear over the last decades (Durand & Zijlstra, 2020). For example, accessing online travel information increased the convenience of public transport services, as travellers can now obtain information from any location at any time. Additionally, mobile networks enable travellers to receive updates during their trip. This motivates infrequent travellers to use public transport services.

Access to real-time travel information also enhances the feeling of security and support. Furthermore, digital technologies offer numerous options for personalisation, providing tailored assistance to support infrequent travellers. Digital public transportation services can also offer tools to help with language barriers or disabilities. Finally, digital access to information reduces the need for direct interaction with fellow travellers, which can be beneficial for people with communication barriers or low social skills (Durand & Zijlstra, 2020).

2.2.3 An increased pressure to go digital

However, these benefits increase the dependence on digital touchpoints in public transport. This results in more pressure to use the available digital services (Durand & Zijlstra, 2020). Their study explains this reliance on digital touchpoints from a user perspective. The study mentions the club, fleet, and network effects of digital dependency:

1. A club effect. The access to digital touchpoints through (for example) smartphones offers benefits to a ‘club’ that doesn’t exist in the physical world. For example, online users can access shared mobility services or access public transportation without paying a fee (for example, on physical tickets).
2. A fleet effect. If more people access digital services in public transport, digital services and products are also increasingly developed to keep serving those people.

3. The network effect. The more consumers that use digital touchpoints in public transport, the more benefits it will deliver to other users and public transport operators. Which stimulates them also switch to digital.

Key takeaways

- Digital technologies offer numerous options for personalisation, providing tailored assistance to support infrequent travellers, like tourists
- The shift towards digital touchpoints offers travellers benefits compared to physical public transport users. However, this also creates pressure to switch to digital amongst reluctant travellers.

2.3 The impact of digital transformation on public transport travellers

2.3.1 Transport disadvantages and the risk of social exclusion through public transport

Despite the growing pressure to go digital, physical touchpoints play an important role in making public transport services available for everyone. Some people rely entirely or partially on public transportation to meet their mobility needs, underscoring the importance of ensuring public transport services are inclusive for everyone. Therefore, public transportation can emerge or reinforce social inclusion (Durand & Zijlstra, 2020).

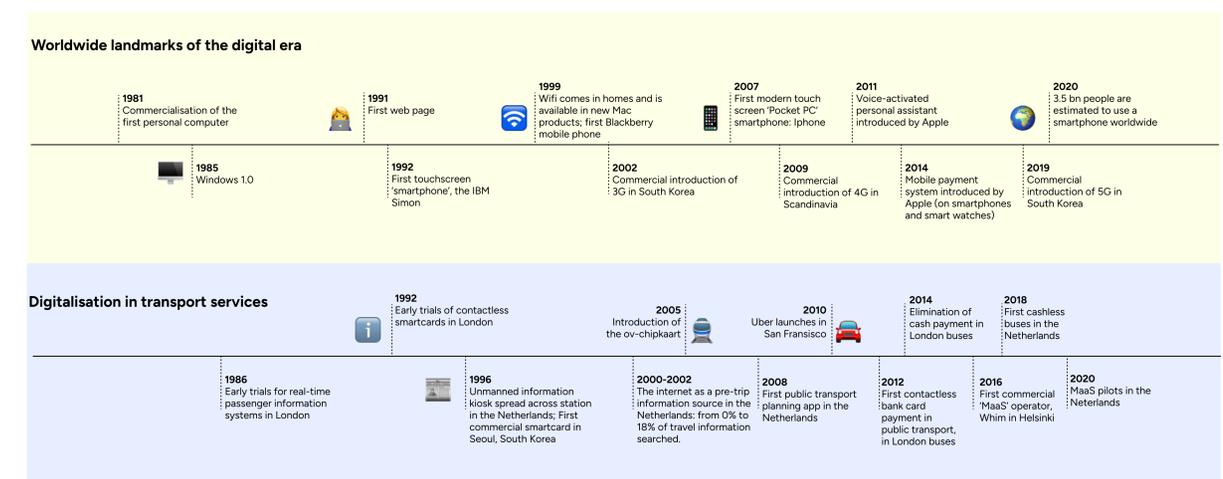


Figure 2.2: the timeline of digitalisation in transport services (Durand & Zijlstra, 2020).

2.3.2 Digital by default

Travellers are increasingly expected to use digital touchpoints. This means that travellers are, for example, expected to buy their tickets online or find online travel information. Physical touchpoints often require more money, energy, or time, making the available digital touchpoints more appealing. Especially when responding to disruptions in the timetable, the pressure to rely on digital touchpoints causes concerns for infrequent travellers. Travellers who are unable or unwilling to keep up with this pace of digital transformation risk social exclusion from public transport services (Durand et al., 2022).

2.3.3 Digital inequality

Available materials, digital skills, and personal experience significantly influence travellers' ability to engage with (constantly changing) digital technologies (Durand & Zijlstra, 2020). Durand et al (2022) created a model inspired by van Dijk (2005) (see Figure 2.3). This model shows the challenges of travellers when interacting with digital touchpoints. It establishes connections between travellers and technology and assumes that benefiting from digital technologies happens through different levels. The following section explains this model.

01 Motivations and attitudes: lack of motivation and fear

The first level focuses on the problems

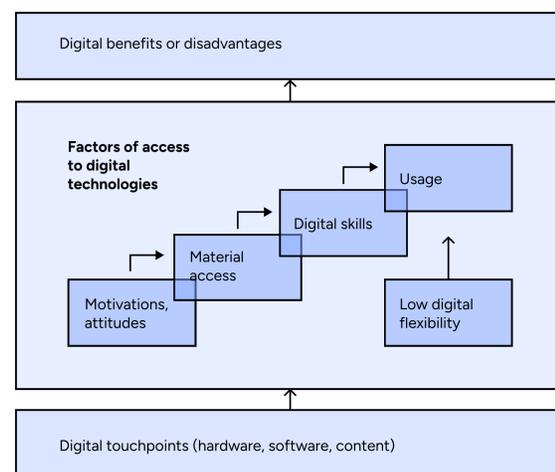


Figure 2.3: the challenges of travellers when interacting with digital touchpoints (Durand et al., 2022) based on (Van Dijk, 2005).

associated with digital transformation. Pangbourne et al (2010) found a gap between the information that is provided online and the information that travellers are seeking. Especially infrequent or non-public transport travellers reveal that investing time to understand the available digital touchpoints is often not worth it. Lastly, the fear of cybercrime affects these travellers to perform online activities, such as buying e-tickets.

02 Material access - Inadequate devices

The following challenge describes the usage of poor devices to complete online interactions. For example, outdated software, unstable connections, low battery, limited data bundles, no WiFi and high costs make it harder to do online interactions on the go.

03 Digital skills - Low digital skills

Next to poor material access, some people lack the digital skills to interact with the available digital touchpoints. Although they are basic digital skills, such as downloading an app or connecting to mobile data or another public network, they are essential for further interactions. Van Dijk (2005) identified challenges in the use of touch screens, making the right choices, and making corrections of wrong choices.

04 Usage - not using digital technologies on the go

One of the benefits of digital services in public transport is the ability to access personalised travel information on the go. However, some travellers are unable to use their mobile phones outside of their homes. Stress, low digital skills or inadequate devices especially cause trouble when disruptions occur. Therefore, not every traveller can access information on the go.

05 Low digital flexibility

Dealing with constantly changing digital technologies requires digital flexibility. Digital flexibility determines how easily users can switch between different digital touchpoints. However, not all public transport travellers have a high digital flexibility. Some travellers have trouble keeping up with the fast pace of digital transformations. They express concerns about

the decreasing number of public transport employees at stations and the growing expectation that customers need to access trip information themselves. These expectations trigger the belief that a smartphone is necessary for travel. In addition, some travellers think that certain physical touchpoints disappeared. This contributes to the idea that physical touchpoints are increasingly moving to the background.

2.3.4 How do travellers cope with digital challenges?

Lazarus and Folkman (1984) explained how travellers cope with the aforementioned challenges in public transport. Durand et al (2023) explain this as follows:

01 Seeking support

1. Support through social networks. This includes asking for help from partners, children, parents, friends, colleagues, etc. Help from social networks comes with benefits as the support is easy to ask for.
2. Support through guidance. It includes guidelines, recommendations, and feedback on how to use specific digital services, such as the websites or apps of public transportation providers.
3. Support through substitution. This refers to people that help travellers in need in performing specific tasks, without trying to educate them. Travellers experiencing challenges can use this support to receive help for a specific, one-time action. For example: experiencing difficulties with installing an app, booking the right ticket, getting on the right train, etc.
4. Emotional support. Help from your social network can serve as a motivation or a safety net when interacting with digital touchpoints. It gives people the confidence to use or try to use a new digital touchpoint because they know help is near when needed.

However, these types of support come with challenges. First, seeking help from other people does not encourage learning, especially when getting help for a specific one-time action. Second, depending on a personal social network is tricky as family and friends are not always able to help.

02 Finding support from employees

Public transport employees can also offer support. Their study explains that a big part of public transport users regularly rely on this type of support. For example, to obtain travel information, purchase a ticket or ask for reassurance. In this case, service desks create large impacts for travellers. Non-public transport users cannot "imagine starting using public transport without being able to directly talk to a member of staff" (Durand et al., 2023).

03 Other coping strategies

Users who are unable or unwilling to access support develop alternative coping mechanisms. For example fare evading. This means not buying a ticket or buying the wrong ticket. Although this can be both intentional and unintentional (Delbosc and Currie, 2019), fare evading often stems from difficulties that users experience with a ticket machine, confusion about how to purchase the right ticket, or not being able to find a ticket machine nearby.

Key takeaways

- Travellers who are unable or unwilling to keep up with this pace of digital transformation risk social exclusion from public transport services (Durand et al., 2022).
- Especially infrequent or non-public transport travellers reveal that investing time to understand the available digital touchpoints is often not worth it (Pangbourne et al., 2010).

2.4 The impact of digital transformation on companies

2.4.1 The impact of digital transformation on customer experience

Digital technologies quickly integrated into our society, impacting consumers' expectations and behaviours. Today, consumers are more connected, informed, empowered, and active. New digital technologies and platforms like social media significantly contribute to consumer interconnectivity. Digital technologies are pushing businesses to enhance their customers' experience and challenge existing business models (Del Vecchio et al., 2023).

2.4.2 The increased complexity of customer journeys

The increase of digital technologies in our everyday lives increases the complexity of customer journeys (Verhoef, 2020). The large number of digital touchpoints customers can choose from makes it harder to reach out to customers and manage customer journeys. Previously, customer journeys entailed a “linear funnel, a customer path that ends with the purchase of a certain product” (Lemon and Verhoef, 2016). With the adoption of digital touchpoints, customer journeys now entail a non-linear process marked by ‘continuous loops, channel switching, and dropouts’. Here, customers can choose touchpoints in different orders. Customer journeys can span months and contain various touchpoints. This influences the duration and complexity of the journey (Mele et al., 2021). According to Lemon and Verhoef (2016), ‘customer experience is a complex concept that encompasses a customer’s cognitive, emotional, behavioural, sensory, and social responses to a company’s offerings throughout the entire purchasing journey. The notion is that customer journeys have become increasingly complex due to the increasingly integrated digital touchpoints.’

Digital technologies affect consumer behaviour and expectations. These technologies enable consumers to interact with organisations and stakeholders. The change in consumer behaviour and expectations triggers strategic responses from companies. It stimulates companies to iterate on existing products and services into new (digital) offerings to retain a competitive advantage. An important benefit of the usage of digital technologies is the generation of data. By leveraging data analytics, organisations can better respond to their customers’ needs, or automate processes to maintain competitive advantage. Digital technologies enable changes in value creation. However, digital technologies alone do not add significant value to an organisation (Vial, 2021).

Key takeaways:

- *The notion is that customer journeys have become increasingly complex due to the increasingly integrated digital touchpoints*
- *Digital technologies affect consumer behaviour and expectations. This stimulates companies to iterate on existing products*

- *and services into new (digital) offerings to retain a competitive advantage (Vial, 2021).*

2.5 The impact of digital transformations: key takeaways

The following section revisits the initial research questions and provides a brief answer to them.

01 What is the impact of digital transformation on the public transport domain?

The benefits of digital technologies in public transport services reinforce the usage and development of digital touchpoints. This increases the reliance on digital touchpoints, resulting in more pressure to use the available digital services.

02 What is the impact of digital transformation on travellers in public transport?

Despite the growing pressure to go digital, the possibility of using physical touchpoints plays an important role in making public transport services available for everyone. Travellers who are unable or unwilling to keep up with this pace of digital transformation risk social exclusion from public transport services (Durand et al., 2022). Especially infrequent or non-public transport travellers reveal that investing time to understand the available digital touchpoints is often not worth it (Pangbourne et al., 2010).

03 What is the impact of digital transformation on companies?

The large number of digital touchpoints makes it harder for companies to reach customers and manage customer journeys. The integration of digital touchpoints increases the complexity of customer journeys. In addition, digital technologies affect consumer behaviour and expectations. This stimulates companies to iterate on existing products and services into new (digital) offerings to retain a competitive advantage (Vial, 2021).

2.6 What is the desired ‘phygital’ balance for infrequent travellers?

The digital transformation in public transportation reveals several challenges for

infrequent travellers. These travellers struggle to respond to last-minute changes in the timetable. Interacting with digital touchpoints often requires time, which infrequent travellers frequently find not worthwhile. The “digital by default” approach reveals issues for this group, as they are not experienced with digital systems.

First-time tourists present a group of infrequent travellers. They engage with the available touchpoints for the first time and often do not stay long enough to become familiar with the system. This prompts the question: to what extent do tourists, who can be considered infrequent travellers, benefit from the digital changes in public transportation? In other words, what is the desired balance between physical and digital touchpoints for tourists?

2.6.1 Designing the preferred ‘phygital’ experience

Although public transportation focuses on digital touchpoints, physical and digital touchpoints should not replace but complement each other. Phygital (physical + digital) experiences emerge as a concept that uses technologies to connect the digital and physical worlds (Neuburger et al., 2018). Phygital experiences can be described as “a holistic and integrative blueprint that adopts a consumer standpoint as a starting point and then integrates the desired combination of physical, human, digital and media content elements, platforms, technologies, and extended realities, among others; the goal of phygital is to offer unique and compelling customer experiences that should guarantee a coherent continuum in the delivery process of consumer value (intrinsic/ extrinsic) provided from digital to physical and vice versa” (Batat, 2022).

This project investigates the desired balance in digital and physical or ‘phygital’ experiences in the context of public transportation.



CHAPTER 03

**Learning from innovative
'phygital' experiences and
analysing the current
context**

This chapter continues analysing the project from a context, company, and consumer perspective. It uses case-based learning to explore innovative 'phygital' concepts and how public transport services can learn from them. The chapter delves deeper into the project's context, presenting a DEPEST analysis. Following this, a stakeholder map outlines the relationships between the key stakeholders. The chapter then examines the different tourist segments targeted in this project, identifying who the travellers are and what alternative options they have when using public transport to travel to Amsterdam. This chapter builds the foundation for the qualitative research.

CHAPTER 03.1

Context analysis

Case-based learning

3.1.1 Analysing innovative 'phygital' experiences through case-based learning

Case-based learning analyses specific examples to create new concepts or develop problem-solving strategies. It gathers insights into a specific area by discussing concrete examples, which can serve as analogies for future situations. Analogies reveal the similarities between different cases and show how they hold up in other contexts. Therefore, recalling and applying insights through case-based learning enhances understanding when solving problems in new contexts (Gentner et al., 2003).

3.1.2 Retail is pioneering

New concepts like 'phygital retailing' shape innovative brand experiences. Phygital retailing bridges the gap between physical and digital contexts, allowing customers to seamlessly navigate in-store and online experiences simultaneously (Bonfati et al., 2023).

3.1.3 Approach for discussing innovative cases in the retail segment

The following section presents innovative 'phygital' retail experiences. The retail cases are linked to the study by Bonfati et al. (2023). This study illustrates different balances of digital and physical retail customer experiences. They mention the need for utilitarian, hedonic, social, and playful experiences. Figure 3.1 describes these four types of experiences by linking them to the cases.

01 NIKE Weather stations

01 Description of the concept

In 2021, Nike's brand experience team introduced 'weather stations' to demonstrate a new fabric technology called 'FitADV', by testing the products in various weather conditions (Panaia, n.d.).

02 Innovativeness of the case

The 'weather stations' are immersive, multi-sensory climate simulators. They replicated real-world weather conditions using immersive reality, interactive media, sounds, virtual environments, and projections. This allowed customers to experience different clothing items in different weather conditions (Panaia, n.d.).

03 Insights gathered from the case

A key insight from this case is that creating an immersive experience can help customers find the best products for their specific needs. By trying out products in realistic scenarios, customers can make informed decisions about whether a product meets their intentions.

04 Analogy for the public transport domain

This 'simulation' insight explains the help and guidance of customers to find the product best suited for their specific needs, by simulating the intended use of products.

02 Tommy Hilfiger Store of the future

01 Description of the concept

Tommy Hilfiger (2020) implemented an innovative retail strategy that combines innovative in-store experiences with traditional retail (physical products), digital interaction (connecting online and offline to showcase products), and a social environment (bringing people together for fun and engaging experiences).

02 Innovativeness of the case

Customers can take a "fit quiz" to find their size and model. Or interactive mirrors in the fitting room assist customers in checking size availability, different colour options, and similar items, with in-store employees bringing requested items directly to the fitting room. (Tommy Hilfiger, 2020).

03 Insights gathered from the case

The 'phygital' interactions enable customers to navigate the store more independently. They use digital support and are less dependent on employees for assistance.

04 Analogy for the public transport domain

The 'independence' insight can be linked to the

NIKE Weather stations 01

Simulation Hedonic

Hedonic experiences emphasise the need for emotional, sensory, and immersive shopping experiences (Bonfati et al., 2023). Nike's 'weather stations' exemplify how to satisfy the need for hedonic experiences by offering immersive environments to test products.



Tommy Hilfiger Store of the future 02

Independence Utilitarian

Utilitarian experiences highlight the need for customers to independently gather information about products while in-store (Bonfati et al., 2023). Tommy Hilfiger exemplifies how to meet this need by letting customers interact with digital technologies instead of interacting with employees.



IKEA IKEA Kreativ 03

Interactive spaces Playful

Playful experiences emphasise the need for customers to engage in live, interactive experiences that mimic their daily routines (Bonfati et al., 2023). IKEA Kreativ exemplifies this by allowing customers to play and interact with their own spaces.



Apple Today at Apple 04

Social interaction Social

Social experiences highlight the importance of building relationships with in-store employees, who become product specialists through the use of digital devices (Bonfati et al., 2023). Apple shows this through in-store workshops, where employees engage with customers using digital tools.



public transport domain by providing travellers with options to discover and seek advice without relying on human interaction. This approach can help travellers find the right products and services more efficiently.

03 IKEA IKEA Kreativ

01 Description of the concept
IKEA Kreativ is a digital tool that helps customers design their own living spaces. IKEA's strategy enables customers to personalise and modify their physical spaces through digital technologies (Ingka Group, 2023).

02 Innovativeness of the case
The IKEA Kreativ tool uses 3D mixed reality, machine learning, and AI technologies to let customers design their own homes. This tool transforms the interior design process into a personalised and immersive experience (Ingka Group, 2023).

03 Insights gathered from the case
A key insight from this case is how customers can digitally interact with the physical around them. By bringing the physical space into digital devices, customers can modify it according to their needs.

04 Analogy for the public transport domain
The 'interactive spaces' insight can be interesting for the public transport domain when customers can virtually interact with the space around them. For example, finding the right touchpoints, wayfinding, or interacting with physical touchpoints from their phones.

04 Apple Today at Apple

01 Description of the concept
'Today at Apple' is an initiative that hosts workshops to educate customers of all levels about Apple products and software. These sessions promote social interaction and human connection, supported by digital technologies such as iPads and interactive displays (Apple, 2024).

02 Innovativeness of the Case
'Today at Apple' improves the customer experience by connecting individuals, helping them discover new passions, or enhancing their skills. The program aims to provide a fun and enlightening experience for all participants (Apple, 2024).

03 Insights Gathered from the Case
A key insight from this case is the value of human interaction. This concept highlights the supportive and educational role of human employees in interacting with digital products.

04 Analogy for the public transport domain
The 'social interaction' insight can be applied to the public transport sector to emphasise the need for human interaction and guidance in a digitally focused environment. In public spaces, people may still value human interaction for information and advice about interacting with digital touchpoints.

Key takeaways
When it comes to 'phygital' experiences in the retail industry, the balance of digital and physical touchpoints varies. Experience vary from immersive, independent, playful, and social interactions, all mentioning a different balance of digital and physical touchpoints.

CHAPTER 03.2

Context analysis Case-based learning within public transport

In addition to examining innovative cases from the retail industry, the following section explores best practices within the public transport sector. This subchapter presents three cases. Figure 3.2 shows the benefits and visuals of Inspirational Airport-train connections.

01 Arlanda Express Distinctive branding and wayfinding

01 Unique value proposition for customers
The Arlanda Express is a train connection between the Stockholm Arlanda Airport and Stockholm Central Station. The Arlanda Express is an inspirational example of branding and wayfinding within public transport. They distinctively use of a yellow colour across all touchpoints at the airport. This consistent branding ensures that travellers experience a recognisable brand journey from the moment they arrive. Furthermore, the placement of initial touchpoints behind customs allows tourists to purchase tickets in advance and proceed directly to the train.

The concept describes a distinctive branding to guide tourists towards specific train routes. Rebranding the train from Schiphol Airport to Amsterdam could enhance its visibility to tourists. However, this is in conflict with providing a coherent brand experience across all NS touchpoints.

02 Hong Kong Airport A door-to-door service

01 Unique value proposition for customers
The Hong Kong Airport Express is a train that departs every 12 minutes from Hong Kong Airport. The train stops at multiple stops in the city. At those stops, complimentary Airport Express Shuttle buses are available to transport travellers to the main hotels. The uniqueness of this case provides a door-to-door solution to international travellers.

Extending the focus from guiding travellers to the right train, to ensuring a door-to-door service aligns with NS's strategic objectives (NS report, 2020).

03 Flytoget Oslo Focus on Airport travellers

01 Unique value proposition for customers
The Flytoget is a high-speed train connecting Oslo Airport to Oslo city. The uniqueness of this train service is that it focuses on the needs of air passengers. Screens on the train show flight arrival and departure information. This responds to the needs of travellers from and towards the Airport, preparing them for the rest of their journey.

This case provides specific travel information to respond to the needs of international tourists can be interesting. Qualitative research should point out if this is interesting for international tourists at Schiphol.

CHAPTER 03.3

Context analysis

DEPEST analysis

3.3.1 What is a DEPEST analysis?

The DEPEST method analyses the organisation's business environment. It includes the demographic, economic, political and legal, ecological, social, and technological factors that directly and indirectly impact the business context. The DEPEST method helps organisations gain insights into their market position and immersing trends (Dwyer & Tanner, 2002).

3.3.2 Demographic: Numbers of international tourists from Schiphol to Amsterdam

This section estimates of the number of international tourists travelling by train from Schiphol Airport to Amsterdam per year. This includes international tourists who interact with NS for the first time.

7.5 million international tourists visited Amsterdam in 2019 (Het Parool & Roele, 2023). Figure 3.3 shows that 47% of all tourists arrive in Amsterdam by plane (Statista, 2019). In addition, Figure 3.4 shows that 47.1% of international tourists arriving at Schiphol Airport choose public transport to travel from the airport (Statista, 2020). This leads to a total of 1.660.275 international tourists who take public transportation from Schiphol Airport to Amsterdam per year (138.4K monthly).

However, not all of these tourists are travelling to Amsterdam for the first time, and not all travellers take the train from the Airport, as busses are also an option. I expect the group to choose the train over the bus to be the largest, accounting for 80%. In addition, I expect that 60% of the group to be travelling to Amsterdam for the first time. This leads to a total of 796.932 international tourists annually (66K monthly).

3.3.3 Economic: recovering from the financial effects of the COVID-19

NS is recovering from the financial effects of

Distribution of domestic and international tourism in the Netherlands in 2019

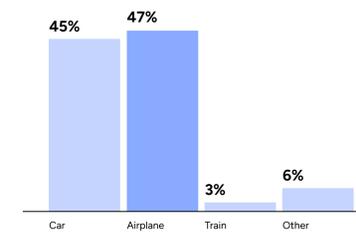


Figure 3.3 Distribution of domestic and international tourism in the Netherlands by 2018 (Statista, 2019)

Passengers' choice of transport to and from Amsterdam Schiphol Airport in the Netherlands in 2019

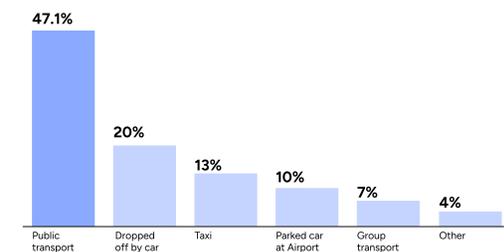


Figure 3.4 Passengers' choice of transport to and from Amsterdam Airport Schiphol in 2019 (Statista, 2020)

the COVID-19 pandemic. In 2023, the operating loss was €191 million. This is less than the losses of €421 million in 2022, €952 million in 2021, and €890 million in 2020. Figure 3.5 presents an overview of this underlying result since the COVID-19 pandemic. The NS mentions expecting more financial difficulties in the coming years (NS, 2023).

In addition, ProRail increased railway fees by 10.5% in 2024, following a 12% increase in 2023 (ProRail, 2023). Rising energy and material expenses caused this increase. While NS has kept ticket price increases in line with inflation, they will raise fares by an additional 3.5% annually in 2025 and 2026. This means that consumers will pay more for their tickets and subscriptions.

Economically, NS is facing challenges. This potentially limits the financial flexibility of the final solutions in my project.

<p>Arlanda Express 01</p> <p>Stockholm</p> <p>Branding Reach before exit</p> <p>+ Distinctive branding and consistent touchpoints</p> <p>+ Reaching the tourists before they exit the Plaza: when they disembark the plane</p>	 <p style="text-align: right;"><i>(Thomas Wever)</i></p>
<p>Airport Express 02</p> <p>Hong Kong</p> <p>Door-to-door Human service</p> <p>+ Door-to-door travel service</p> <p>+ Focussed on human support by driving the tourists to their hotels</p>	 <p style="text-align: right;"><i>(Marcus Wong)</i></p>
<p>Flytoget 03</p> <p>Oslo</p> <p>Travellers needs Informative</p> <p>+ Focus on traveller needs</p> <p>+ Providing informative and explanatory information to prepare tourists for their next steps</p>	 <p style="text-align: right;"><i>(Flytoget)</i></p>

Figure 3.2: Benefits and visuals of Inspirational Airport-train connections

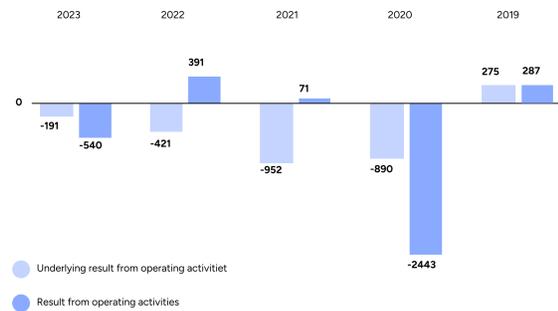


Figure 3.5 An overview of this underlying result since the COVID-19 pandemic (NS, 2023)



Figure 3.6 An overview of the key rail routes in the Netherlands (Kompeer & NOS, 2023)

3.3.4 Political: main rail concession grant

The Dutch Government granted NS the main rail network concession for 2025-2033. This gives NS the exclusive right to operate on key rail routes in the Netherlands until 2033 (see Figure 3.6). However, the European Commission questions this preferential treatment. By allowing NS to operate on the main rail network without a public tender, the Dutch Government may have violated European competition rules. The European Commission believes the concession should have been open to other companies like Arriva, Keolis, and Qbuzz. These competitors also wish to expand their services on the main rail network. (Rijksoverheid, 2023).

This indicates that the next allocation of the main rail network concession may be examined more closely regarding its grant to NS. This means NS may need to demonstrate that they deserve this position more than the years before, putting more pressure on new solutions.

3.3.5 Ecological: Emission-free by 2030

The Dutch public transport industry aims to become fully emission-free by 2030. This means that by 2030, all public transport operators in the Netherlands will use green energy and have adopted circular construction, maintenance, and management services. Zooming in on primary resources, the public transport sector is expected to have halved its use of primary resources and be fully circular by 2050 (Ministry of Infrastructure and Water Management et al., 2019).

3.3.6 Social: Urbanisation and violent incidents

01 Urbanisation and densification of cities
Urbanisation will be one of the main societal challenges in the next 15 years. To maintain liveability within cities, public transport provides and important means to regulate this growing number of people and maintain accessibility (Ministry of Infrastructure and Water Management et al., 2019). In addition, the surge of tourists visiting the Netherlands will put more pressure on public transport services. The number of international tourists in the Netherlands is expected to reach 29 million by 2030 (Solanki, 2018).

02 Rising number of violent incidents

Aggressive incidents between NS and passengers increased by 8% compared to 2022 (NS, 2023). These incidents arise most when passengers are checked for tickets. The types of incidents include spitting employees in the face, threatening them with a weapon, resisting help, sexual or physical violence, and employee discrimination (NS, 2023). NS employees, particularly those on trains and at stations, frequently fall victim to these incidents.

The increase in tourists and passengers results in busier trains, which can compromise safety. Especially trains from and to the Airport, like the new Sprinter, might show challenges here.

3.3.7 Technological: Contactless payment and MaaS

01 Contactless public transport

The Netherlands launched a nationwide contactless payment system for public transport. With this so-called OV-pay, passengers can now tap in and out using their debit card, credit card, or mobile pay. This system is available on all forms of public

transport, including trains, buses, metros, and trams (Mastercard, 2023).

Mobility as a service (MaaS)

Mobility as a Service (MaaS) is an increasing trend in public transport services. MaaS combines many forms of transportation into one mobility platform. MaaS offers supplementary services including booking reservations, making payments, and organising trips, all on the same platform. Through the combination of several forms of transportation, MaaS aims to move the emphasis from ownership-based transportation to an access-based model (Hietanen, 2014).

MaaS apps provide companies with interesting data. Analysing consumer data generates valuable insights. Travellers benefit from these insights as they contribute to more efficient and sustainable travel solutions. With MaaS, travellers can choose the transport mode at any given time, considering factors like cost, duration, flexibility, and sustainability. Figure 3.7 shows that the market size of MaaS is forecasted to reach €500 billion in 2030 (Statista, 2024a).

Introducing new payment methods like contactless payments alleviates the pressure on traditional methods such as ticket machines. Additionally, MaaS focuses on integrating various transport modes, which is relevant to this project as it connects air travel with train services.

Mobility-as-a-service (MaaS) market size worldwide in 2021 with a forecast for 2030 (in billion euros)

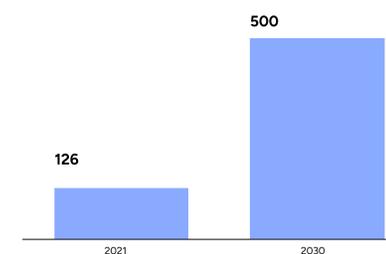


Figure 3.7 Mobility-as-a-service (MaaS) market size worldwide in 2021 with a forecast for 2030 (Statista, 2024a)

CHAPTER 03.4

Company analysis

Overview of the key stakeholders

The following section introduces the key stakeholders in this project. This stakeholder overview is derived from multiple meetings throughout the project. This section explains the direct stakeholders involved in implementing new solutions within this context. Figure 3.8 presents an overview of the interrelationships between these stakeholders. This subsection will introduce the main stakeholders depicted in the figure.

01 Spoorbouwmeester

Bureau Spoorbouwmeester is an initiative created by the directors of NS and ProRail in 2001. It acts as an independent advisory panel between NS and ProRail to create consistent and recognisable experiences in the whole rail sector in the Netherlands (Bureau Spoorbouwmeester, n.d.).

02 ProRail

ProRail manages the railway infrastructure. ProRail is responsible for the maintenance, renewal, expansion, and safety of the Dutch railway network (ProRail, n.d.).

03 Schiphol Airport

Schiphol is the main international airport of the Netherlands. Royal Schiphol Group owns and manages Schiphol. Royal Schiphol Group also Rotterdam The Hague Airport and Lelystad Airport, and has the majority of shares for Eindhoven Airport (Royal Schiphol Group, n.d.-c).

04 Rover

Rover is an association of and for travellers, dedicated to advocating for good and affordable public transport for everyone. They represent the interests of users of trains, trams, buses, metros, and other sustainable transport options (Rover, n.d.).

05 Domestic and international travellers

Both domestic and international travellers pass through Schiphol Airport for various purposes, such as commuting to work, returning home, or starting and ending their flights.

06 Dutch Government

The Ministry of Finance is the owner and sole shareholder of NS. The Ministry of Infrastructure and Water Management is the most important client of NS and provides subsidies. (NOS, 2023b).

3.4.1 Analysing the model

The primary stakeholders who must approve new solutions in this context include NS, ProRail, Spoorbouwmeester, and Schiphol. It is important to note that for NS and ProRail, and indirectly Spoorbouwmeester, the Dutch government is the sole shareholder. This underscores the public and societal interests of these stakeholders, in contrast to Schiphol's more commercial interests. What connects these stakeholders is their commitment to serving the traveller who journeys by train to, from, or via Schiphol.

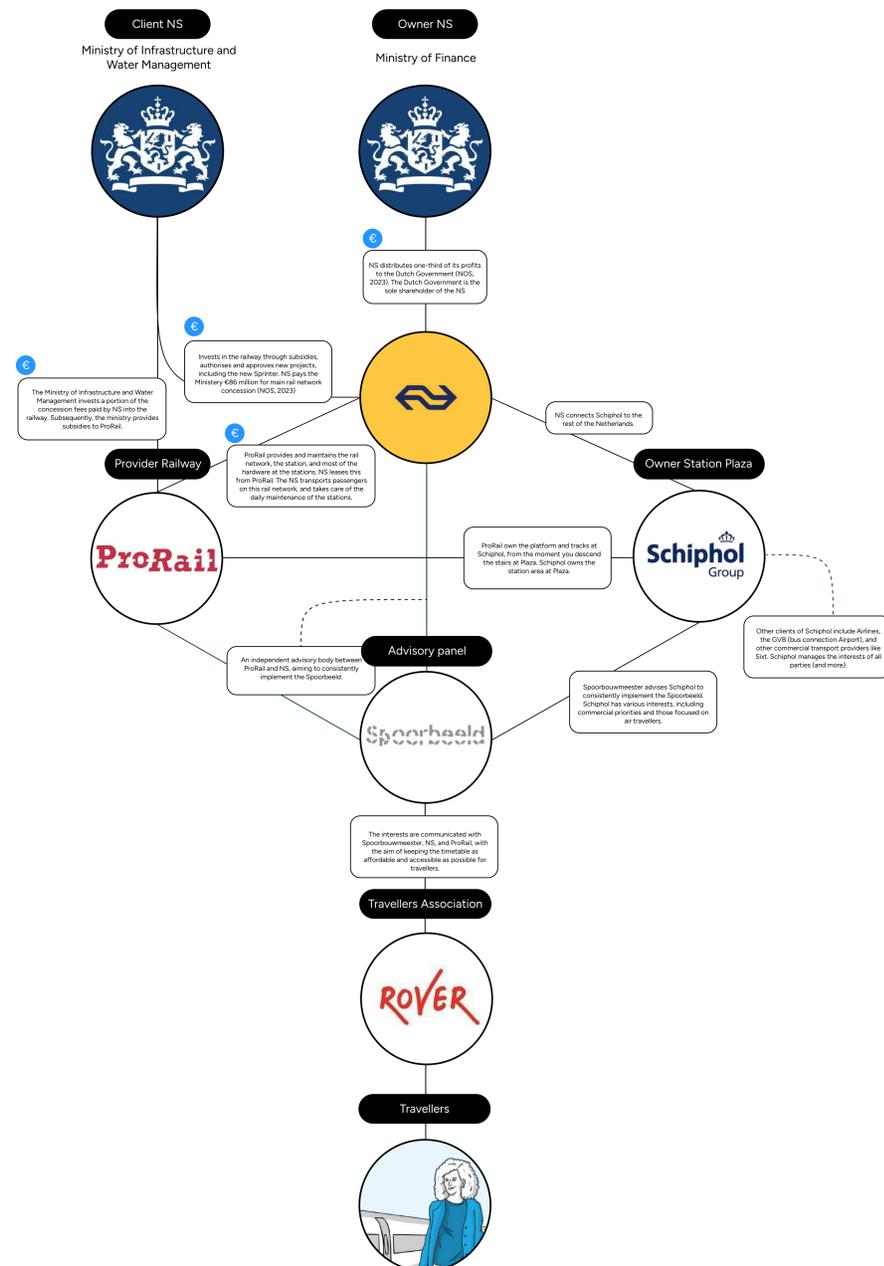


Figure 3.8: An overview of the interrelationships between the key stakeholders Own figure, inspired by NOS (2023b)

CHAPTER 03.5

Consumer analysis
Different travel options from Schiphol Airport

The following section describes the consumers of this project. It mentions the different travel options tourists have at Schiphol Airport and presents five customer segments. These segments provide insight into the various types of tourists converging at Schiphol. These insights aim to identify areas where NS can enhance its services to better support international tourists.

3.5.1 Different travel options from Schiphol Airport

When international tourists arrive at Schiphol Airport, they can choose between different transportation options to reach their final destinations. These options include trains, buses, taxis, ride-sharing services, car rentals, or pick-up by acquaintances. Figure 3.9 presents the transport options from Schiphol Airport from a tourist perspective.

In this model, the axes on which consumers base their transportation decisions are convenience and price. Convenience includes factors such as travel time, accessibility, frequency of service, and comfort. For instance, travellers choose trains for their speed and direct routes, while others prefer taxis for their door-to-door service. The price axe is an important consideration, especially for budget-conscious travellers. For example, buses and trains are more affordable than taxis and car rentals.

3.5.2. Importance for this project

Understanding the motivation and options available to consumers at Schiphol helps to analyse why travellers might choose alternatives to the train. This helps identify gaps in convenience or other areas where improvements can be made. For example, if research indicates that international tourists opt for taxis due to convenience, providing clearer information on the travel time of trains to Amsterdam (16 minutes straight into the city centre) could make the trains more attractive.

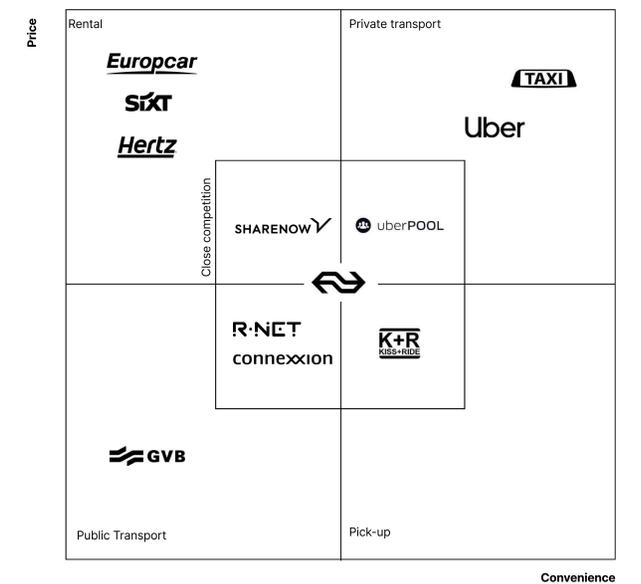


Figure 3.9 Competition frame alternative travel options from a consumer point of view

CHAPTER 03.6

Consumer analysis

Five segments of international tourists

The following subsection outlines the various consumer segments of international tourists at Schiphol Airport. This chapter provides stereotypical visualisations of these segments, inspired by a 2020 study conducted for NS (Van Der Velden et al., 2020). The study involved 158 surveys at Schiphol Airport, from which distinct groups were subsequently identified.

Using this data, the chapter presents the following five segments: The Careless tourist, the Confused Tourist, the Prepared Tourist, the

Convenience Tourist, and the Passive Tourist. Figure 3.11 presents their customer segments, their goals and perceived pain points.

It is important to note that the demographic factors visualised alongside these segments are derived from the aforementioned quantitative study. These factors are stereotyped to enhance clarity and provide a more vivid depiction of each segment. However, these characteristics are not confined to specific countries.

3.7.2 What do these segments mean for the rest of my project?

These segments provide insight into the various types of tourists converging at Schiphol, who will ultimately use the proposed solutions of this project. It is crucial to understand their different needs and approaches to public transport. While some tourists embark on their journey independently and well-prepared, having downloaded the app or purchased tickets in advance, another group is more passive and takes things as they come. For this latter group,

clear communication is essential, and they potentially will require more guidance. This group is likely to experience more pain points during their journey, which must be carefully considered.

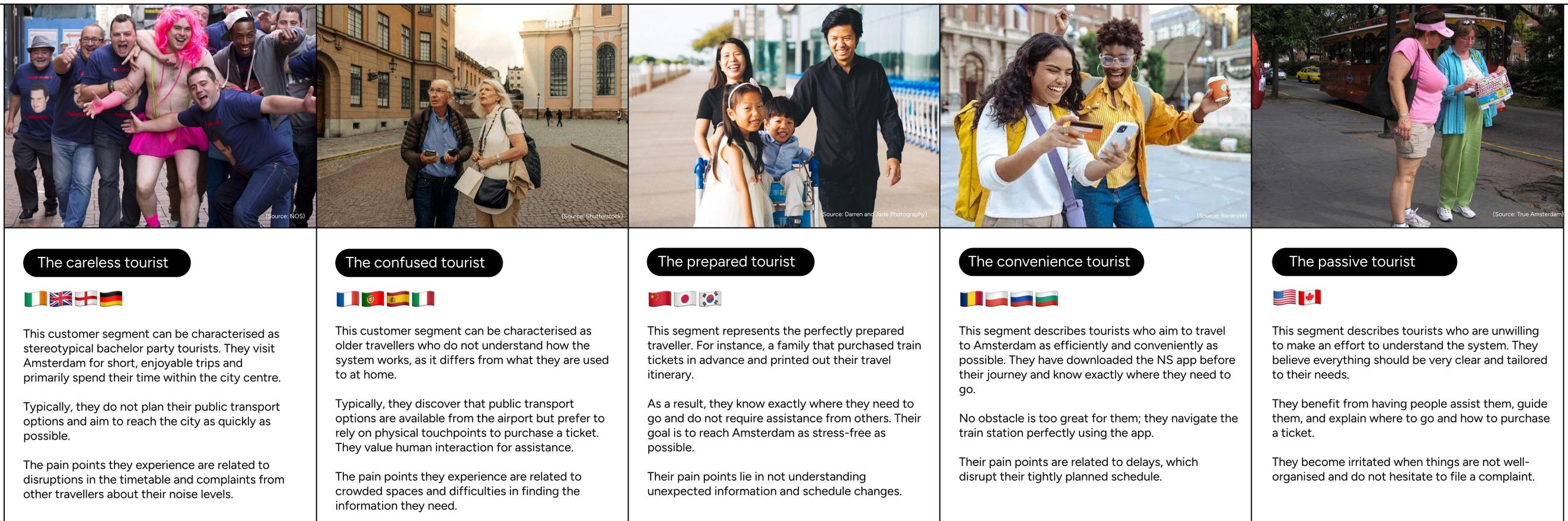


Figure 3.11 Customer segments, their goals and perceived pain points



CHAPTER 04

Identifying opportunities and challenges on the journey through qualitative research

This chapter outlines the approach to conducting qualitative research. The goal of this research is twofold. The first objective aims to understand the challenges international tourists experience when travelling from Schiphol Airport to Amsterdam by train. The second objective aims to identify the challenges and opportunities on the journey from NS employees' perspective. This chapter includes the methodology, research questions, insights, and deliverables for conducting research with international tourists, NS executive employees, and NS service employees.

CHAPTER 04.1

Approach to conduct qualitative research

A context, consumer, and company perspective

This first chapter presents the goals and approach to conducting qualitative research. It presents three types of qualitative research. The first with international tourists at Schiphol Airport, the second with NS executive employees at the NS office in Utrecht, and last with service employees at the check-out gates at Amsterdam Central Station. This chapter presents the qualitative research objectives, and the data analysis approach and highlights the practical relevance of this research.

4.1.1 Conducting qualitative research

“Qualitative research aims to address questions concerned with developing an understanding of the meaning and experience dimensions of humans’ lives and social worlds.” (Fossey et al., 2002). In this project, qualitative research aims to understand the challenges and opportunities that tourists and the NS experience on the journey from Schiphol Airport to Amsterdam.

This project presents three types of qualitative research. The objectives for the different types of research include:

01 International tourists

This research aims to understand the experiences of international tourists during their journey from Schiphol Airport to Amsterdam, avoiding any bias from the perspective of the NS.

02 NS executive employees

This second research aims to understand the perspective and motivation of NS regarding improving this journey for international tourists. It identifies their ambitions and challenges on this journey.

03 NS service employees

This research aims to leverage the insights and experiences of service employees stationed at check-out gates at Amsterdam Central Station. Because they help international tourists daily, they possess interesting insights into tourists’ pain points.

4.1.2 Overview of different qualitative research methods

Table 4.1 presents an overview of these three types of research methods. All interviews contain a semi-structured approach. The length of the interviews depends on the type of research. Interviews with international tourists and service employees ranged from 3 to 10 minutes, whereas research with NS executive

	01 Consumer interviews	02 NS executive employee interviews	03 NS Service employee interviews
Research	Qualitative	Qualitative	Qualitative
Interview style	Semi-structured interviews	Semi-structured interviews	Semi-structured interviews
Time per interview	5-10 minutes	36 - 62 minutes	3 - 5 minutes
Location	Schiphol Airport	NS office & online teams meeting	Amsterdam CS at check-out gates
Number of respondents	13	7	6
Sampling method	Purposeful sampling (Patton, 2015)	Purposeful sampling (Patton, 2015)	Purposeful sampling (Patton, 2015)
Sampling method	International tourists. First-time travellers with NS, variety in journey length & country of residence, age	NS employees working on and responsible for (a part of) the journey	NS service employees at check-out gates (Amsterdam Central Station)
Language	English	Dutch	Dutch

Table 4.1: an overview of the three types of research.

employees ranged from 36 to 62 minutes. This project employs a purposive sampling strategy to ensure the inclusion of specific categories of cases in the final sample (Patton, 2014). For example, the international tourist sample includes a variety in journey length travelled, age, and country of residence. All NS executive employees work closely on (parts of) the journey from Schiphol to Amsterdam. Only the interviews with international tourists are conducted in English.

I conducted three pilot test to test the interview guides. Colleagues in the UX team at Fabrique participated in the pilot test for NS executive employees. Norwegian friends visiting Amsterdam in April participated in the pilot tests for international tourists, and roommates participated in the pilot tests for NS service employees. These pilot tests helped clarify the structure of the interview guide. Additionally, these tests helped familiarise the structure of the interview guides.

4.1.3 Data Analysis Approach

All interviews were audio recorded and transcribed. Before the interviews, the interviewees provided oral consent for the audio recording. The analysis of the transcriptions aims to develop a grounded theory through inductive coding (Glaser and Strauss, 1967). The coding process of each research type consists of two rounds (see Figure 4.1). In the first cycle of coding, the transcriptions are coded in vivo. This means that the codes are derived straight from the interviewees' words. These codes are clustered, compared, and merged into a codebook. In the second cycle of coding, a joint analysis compares the clusters and gathers insights from the interrelationship of the clusters.

4.1.4 Visualising the data insights

Visualising data insights from qualitative research ensures clear, coherent, and credible insights. Pratt (2009) emphasises that a well-structured presentation of qualitative data helps to validate and understand the research. His template for presenting qualitative data insights includes the following components:

- **Construct:** this is the main theme derived from the qualitative data. It represents a cluster or idea that emerged during the analysis.

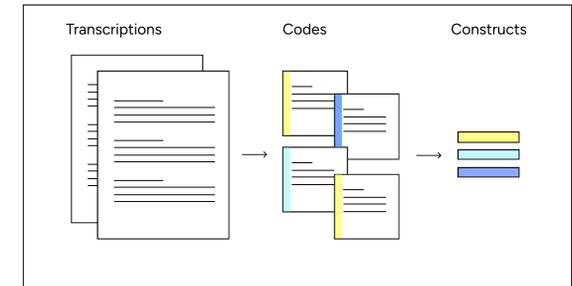


Figure 4.1: an overview of the coding process

- **Description:** This section explains the construct. It elaborates on what codes the construct entails.
- **Proof Quote:** To substantiate the construct, Pratt (2009) suggests using direct quotes from the data. These quotes serve as evidence, illustrating how the construct is grounded in the interviewees’ experiences or responses.
- **Link to Literature:** This step involves connecting the construct to existing literature. It shows how the new findings align with or extend current studies.
- **Differentiation of Literature:** Finally, this component highlights how the findings differ from the existing literature.

4.1.5 Research deliverables

The following deliverables ensure that the research insights can be used for future communication with the client and substantiate choices and considerations throughout the design process.

01 Creating an overview of the business perspective

Creating the ‘layers of strategy’ model* to visualise the business perspective and goals on this journey. This model serves as the guideline and strategic guide for new design solutions.

02 Identifying the gap - Venn diagram

Comparing the challenges identified by international tourists with NS’s identifies potential discrepancies or similarities. This ensures that the problem statement is a match from both consumer and business points of view.

03 Creating the as-is customer journey

Visualising the current customer journey. This model presents an overview of tourists’

*I’ve used and worked with this model during a year of working in the strategy team of DEPT® agency.

experience, company pain points, and the gap between touchpoints in the current context at Schiphol. It places consumer and business challenges in the current context and connects them with available touchpoints.

4.1.6 Practical Relevance of this qualitative research for Fabrique and NS

For Fabrique, the practical relevance entails gathering insights into the pains and gains in the experiences and interactions of new users in the public transport sector. Insights in this target group can be translated into other domains in which Fabrique (UX in the public space team) engages.

For NS, practical relevance entails gathering insights into the identified challenges encountered by international tourists. In addition, insights into identified gaps and differences between customer and company perceived challenges will be communicated, including the different perspectives within NS. The different perspectives will be communicated through the 'layers of strategy' model, offering insight into the combined perspectives of the interviewees.

CHAPTER 04.2

Qualitative research with international tourists at Schiphol Airport

The following chapter presents the approach, results and insights from qualitative research with international tourists at Schiphol Airport. This chapter identifies the challenges these tourists face when interacting with NS touchpoints throughout their journey. The insights stem from 13 semi-structured interviews at Schiphol Airport.

4.2.1 Research Objective

The goal is to identify and analyse the challenges that international tourists face when transferring from Schiphol Airport to their destinations in Amsterdam by train. This research aims to answer the following research question:

What are the challenges international tourists face when transferring from Schiphol Airport to (end-destination in) Amsterdam by train?

4.2.2 Methodology for Data Collection

The data includes 13 qualitative, semi-structured interviews with international tourists at Schiphol Airport. This approach allows the exploration of individual experiences and perceptions in-depth. I probed further based on the interviewees' responses. Table 4.2 shows an overview of the international tourists interviewed for this research. Appendix 2a presents the interview guide that was used to conduct these interviews. Appendix 2b presents the codebook.

4.2.3 Expected Outcomes

These insights contribute to the creation of an informed problem statement. In addition, it provides an understanding of the pain points and areas for improvement in the current journey, from a consumer perspective.

4.2.4 Approach at Schiphol Airport

For this research, I approached the international tourists at Schiphol Airport without any prior arrangement. I interviewed them at different stages in their journey: before and after ticket purchase, near the travel information screens, and on the platforms. To include a wide variety of travellers and assumed stress levels, the research took place both in the (early) morning, (late) evenings, and during the day. In addition, the sample includes a variety of travel time completed, as seen in Table 4.2. Research by Griffin & Hauser (1991) reveals the needed number of respondents until saturation is

Interviewee	Country of residence	Current travel time	Location interviewed
1.1	Minnesota, USA	8 hours	After ticket purchase
1.2	UK (Ukrainian)	6 hours	After ticket purchase
1.3	Florida, USA	11 hours	Before ticket purchase
1.4	Budapest, Hungary	5 hours	Platform 1/2
1.5	Bristol, UK	9 hours	Platform 1/2
1.6	Dublin, Ireland (Indian)	>24 hours	Platform 1/2
1.7	Manchester, UK	9 hours	Platform 1/2
1.8	Dubai	10 hours	Platform 1/2
1.9	Spain	4 hours	Stairs to platform
1.10	Germany	5 hours	After ticket purchase
1.11	Abu Dhabi	9 hours	Stairs to platform
1.12	New Zealand	29 hours	Platform 2
1.13	Canadian	16 hours	After ticket purchase

Table 4.2: Overview of the international tourists interviewed for consumer research

reached. They explain that saturation means that additional data does not generate new insights. Their research describes that respondents revealing new needs exponentially decreased after 13 interviewees. Therefore, 13 interviews are conducted for this research.

4.2.5 Identifying the challenges of first-time international tourists in the current journey at Schiphol Airport

The following part presents insights from consumer research with international tourists at Schiphol Airport. Table 4.3 presents an overview of their main identified challenges. The pain points international tourists face consist of two main constructs. The first construct presents the unawareness of the need to check in a purchased ticket. The second construct presents some difficulty in finding the right platform.

O1 Unaware of the need to check in a ticket
The first construct reveals the unawareness of

international tourists to check in their purchased train tickets. This includes the lack of awareness among tourists regarding the necessary steps to successfully travel with the NS. Of the 13 interviews with a total of 25 interviewees, only 1 tourist mentioned a successful check-in.

Pangbourne et al (2010) mention that especially for infrequent or non-public transport travellers, investing time to understand the available digital touchpoints is often not worth it. In this context, tourists are unaware of the needed touchpoints and therefore don't learn to understand them.

After probing for the underlying reason for this unawareness, the following 3 reasons emerged as the most important. The first reason entails tourists believing that if check-in was needed, check-in gates or barriers would be present. The second motivation entails the assumption that ticket purchase options are available in later stages of the journey, for example on the platform or on the train. Additionally, some tourists mention scanning your ticket at check-out is sufficient, thereby negating the need for an initial check-in. The third motivation involves

tourists who were aware of the need to check in but were unable to locate these check-in posts at Schiphol Plaza. They mention that the check-in posts were not visible enough or intuitive to find. In some cases, tourists noticed the check-in posts but did not realise they had to interact with them.

O2 Some tourists struggle to find the right platform

The second construct reveals that some tourists struggle to find the right platform. Of 25 interviewees, 8 interviewees mentioned some difficulty in finding the right platform (information). Lazarus and Folkman (1984) mention that when travellers experience challenges, they use support through substitution to receive help for a specific, one-time action. However, in this case tourists often figure out what to do on their own. They rather ask for reassurance than help for a specific action.

After probing for underlying motivations, the following 2 reasons emerged as the most important. The first motivation covers some tourists who struggle to find platform information. For instance, they struggle to

locate the digital train departure screens at Plaza (located on the sides of the elevators or above ticket and service desks). The second motivation covers tourists struggling with understanding the platform and whether their train will depart from platform 1 or 2. However, the majority of the interviewees did not mention struggles in finding platform information.

4.2.6 Answering the initial research question

This research aimed to identify and analyse the challenges international tourists face when transferring from Schiphol Airport to Amsterdam by train. The insights reveal that international tourists primarily struggle due to their unawareness of how to check in their tickets. This results in travelling without a valid ticket, and ending their journey in front of closed gates at Amsterdam Central*.

**During this research, I assumed that tourists could not check out if they had not checked in their tickets. This assumption stemmed from communication with my company supervisor at NS. Later, I discovered that it is possible to check out with such a ticket, which invalidates the relevance of this pain point for consumers.*

Challenges among international tourists at Schiphol Airport

Construct	Unaware of the need to check in a ticket	Some tourists struggle to find the right platform
Definition	There is a lack of awareness among tourists regarding the necessary steps to successfully travel with NS. This primarily includes the need to check in their purchased ticket, which is not apparent to many international tourists.	Some tourists experience difficulty in quickly and intuitively finding the right platform (information).
Proof quote	<i>Well, I didn't think we had to check in at all since we already had the printed ticket. But do we? ... We would have never thought of that. How were we supposed to know? (Interviewee 1.1)</i>	<i>So I would like to see, ok I just bought the ticket this was good this was easy, but now what to do or where to go? (Interviewee 1.2)</i>
Link to existing literature	Especially infrequent or non-public transport travellers mentioned that investing time to understand the available digital touchpoints is often not worth it. (Pangbourne et al., 2010)	Travellers experiencing challenges can use this support through substitution to receive help for a specific, one-time action (Lazarus and Folkman, 1984).
Differentiation from literature	Tourists are unaware of the physical touchpoints and therefore don't learn to understand them.	In this context, tourists often figure out what to do on their own. Only 3 interviewees asked staff members for help.

Table 4.3 : overview of the pain points faced by international tourists

Qualitative research with NS executive employees

The following chapter presents the strategic insights derived from qualitative research with NS executive employees, visualised through the 'layers of the strategy model'. This chapter offers an understanding of NS's perspective on enhancing the journey of international tourists from Schiphol to Amsterdam, detailing the ambitions, goals, restrictions, needs, pain points, and solution areas identified through 7 semi-structured interviews.

4.3.1 Research Objective

This research aims to understand the perspective and motivation of NS on improving the journey for international tourists. This research adds to the consumer research by including the business perspective. This ensures that new solutions are desirable for the consumer, and viable for NS.

4.3.2 Required Insights

Insights present the ambitions and goals of NS to improve the intuitive access to NS's services at Schiphol Airport. In addition, it presents insight into the challenges and restrictions that impact these potential new solutions in this context. The following research questions describe this:

01 What are the ambitions and goals of NS to improve the intuitive access to NS's services at Schiphol Airport?

02 But what are the main challenges and restrictions that impact these potential new solutions in this context?

4.3.3 Methodology for Data Collection

The data includes 7 qualitative, semi-structured interviews with NS employees working on (parts of) this journey. The interview guide used to conduct these interviews can be found in Appendix 3a. Appendix 3b presents the codebook. Table 4.4 gives an overview of the interviewees. The respondents have different expertise, like brand experience, travel information, customer research, train design, and check-in and checkout. I contacted all interviewees through email. Subsequently, I scheduled the interviews with the interviewees. The interviews ranged from 36 minutes to 62 minutes.

Interviewee	Expertise	Location	Duration
2.1	Responsible for the consistent translation of the NS brand throughout the entire customer journey.	NS office Utrecht	41 minutes
2.2	(Co-)responsible for travel information boards.	NS office Utrecht	38 minutes
2.3	Responsible for train design. Responsible for the design of the new "Airport Sprinter".	Online teams meeting	36 minutes
2.4	Specialising in data visualisation and information design (routing, signing, and branding)	NS office Utrecht	49 minutes
2.5	(Co-)responsible for travel information.	Online teams meeting	40 minutes
2.6	Responsible for Check-in & Check-out. Also first contact towards Schiphol Airport and Prorail.	NS office Utrecht	41 minutes
2.7	Researcher, specialised in customer research, waiting time experience	Online teams meeting	62 minutes

Table 4.4: overview of NS executive employees interviewed for company research

4.3.4 Expected Outcomes

The gathered insights identify the main pain points that need to be addressed from the company's point of view. In addition, it provides a guideline for potential solution areas and the ambition & goals for the new journey. The insights help future communication with the client and substantiate choices and considerations throughout the design process.

4.3.5 Identifying the perspective and motivation of the NS on improving the journey for international tourists

Figure 4.2 presents the 'layeres of strategy' model. This is an overview of the strategic insights from qualitative research with NS employees. As illustrated in the interview guide in Appendix 3a, the topics in the layers of the strategy model align with the interview guide topics. This alignment is intentional, as these topics are crucial for understanding the goals, ambitions, pain points, and limitations encountered on this journey.

This model shows an overview of NS's perspective on improving the journey of international tourists at Schiphol. The model starts at the top with the overarching ambition

and reads down to specific solution areas. The following subchapters explain the ambition, goals, restrictions, needs, consumer pain points, NS pain points, and solution areas in detail.

01 Ambition

Table 4.5 presents the ambition of NS executive employees for the journey of international tourists.

Facilitating barrier-free travel

The construct explains the ambition to facilitate barrier-free travel, by creating an understandable journey that allows travellers to move from points A to B in a relaxed and straightforward manner. It alleviates the burden of travellers and provides them with a stress-free and seamless experience. The ambition ensures that the journey is accessible for all travellers. The NS transportation plan (2023b) also mentions barrier-free travel but describes it as 'easy access to all public transportation and chain services fast door-to-door travel', instead of describing barrier-free as reducing stress and uncertainty.



Improving the current journey for international tourists at Schiphol Airport

Ambition	Facilitating barrier-free travel		
Goals	By creating an intuitive and predictable journey	By providing the traveller only with relevant information at the right times	By creating an inclusive environment
Restrictions	Taking into account strict regulations from complex stakeholder field		Taking into account tourists unfamiliar with our systems
Needs	A positive travel experience	Feeling at ease	Feeling secure
Pain points	While tourists stand in front of closed check-out gates	While tourists have to deal with crowds and information overload at Schiphol Airport	While taking the right steps is perceived as unclear by tourists
Pain points NS	Revenue lost due to tourists without a (valid) ticket	Delay and danger of congestion from tourists who don't understand how to get through the gates	Violence incidents due to confusion and ambiguity about tourist tickets
Solution areas	By clearly delineating the station domain at Schiphol Airport	By being able to reach and inform the tourist even before the station domain	By guiding the tourist step by step through the entire journey

Figure 4.2: the 'layeres of strategy' model: an overview of the strategic insights from overall ambition to concrete solution areas

Ambition

Construct	Facilitating barrier-free travel
Definition	Facilitate barrier-free travel by creating an understandable journey that allows travellers to get from A to B in a relaxed and straightforward manner.
Proof quote	<i>"En wat daar het streven in is, is om eigenlijk gewoon zo drempelloos mogelijk ervaring te bieden. Dus dat je het eigenlijk gewoon niet door hebt: dat je bepaalde touchpoints door moet. Dat je het eigenlijk gewoon allemaal zonder na te denken stressloos gebeurt."</i> (Interviewee 2.3)
Link to existing literature	The 2024 NS transportation plan states that barrier-free travel is about easy access to all public transportation and chain services fast door-to-door travel (NS, 2023b).
Differentiation from literature	Barrier-free travel in this journey is more about reducing stress and uncertainty, and less about providing the fastest door-to-door option.

Table 4.5: the ambition NS executive employees have regarding the journey of international tourists

02 Goals

Table 4.6 presents the goals to achieve the overarching ambition of facilitating barrier-free travel.

Creating an intuitive and predictable journey

The first construct involves guiding and communicating as simply as possible. It emphasises on delivering a predictable process and making the journey intuitive for everyone. In addition, it ensures tourists automatically know where to go by providing them with information as quickly as possible. Lazurus and Folkman (1984) suggest that public transport users need support through guidance. This includes guidelines, recommendations, and feedback on how to use specific digital services. In this context, the NS not only focuses on digital interactions but emphasises a need for more physical touchpoint support.

Providing relevant information at the right times, through the 'less is more' principle

The second construct explains the principle of 'less is more'. This aims to limit choices to make the journey easier for travellers as it reduces errors. In addition, communication should be unambiguous for tourists on this journey. The 'less is more' principle ensures not 'overloading' the traveller but only giving travellers the necessary information (Bureau Spoorbouwmeester, 2023). The research insights contribute to this by mentioning that executing the 'less is more' principle also contributes to the right behaviour of the tourist. Because, due to limited choice, they can only make the right choice.

Creating an inclusive environment

The third construct addresses the coexistence of domestic and international travellers. It highlights the importance that public transportation should be accessible to everyone, with stations being non-discriminatory environments for everyone involved. Durand & Zijlstra (2020) mention that public transport is a means through which the social inclusion of travellers can emerge. However, this construct also includes the station as a non-discriminatory environment for stakeholders, like GVB or Airlines.

03 Restrictions

Table 4.7 presents the restrictions challenging the execution of the ambitions and associated goals.

Strict regulations from complex stakeholder field

Strict regulations from a complex stakeholder field, including ProRail, Spoorbouwmeester, and Schiphol, challenge the implementation of the ambition and associated goals in this context. The convergence of these monopolistic entities makes it difficult to implement new solutions that are beneficial for everyone. Examples of these regulations include the unfeasibility of installing check-in gates at Schiphol Airport due to financial constraints and limited capacity. In addition, ProRail prohibits the placement of additional touchpoints at the platforms, as they are too narrow. The context of Schiphol Airport provides additional challenges in stakeholder management as Schiphol, and not ProRail, owns the station. Schiphol has fewer interests in consistently executing the Spoorbeeld due to higher commercial interests.

Goals

Construct	Creating an intuitive and predictable journey	Providing relevant information at the right times, through the 'less is more' principle	Creating an inclusive environment
Definition	Creating an intuitive and predictable journey by taking the tourist by the hand and communicating as simply as possible.	Relevant information - less is more, as little choice as possible so that only the right choice can be made.	Inclusive by meeting the expectations of domestic and foreign travellers.
Proof quote	<i>"De vraag is: hoe kunnen we op een station of in een stationsomgeving zo intuïtief mogelijk juist die internationale reizigers ook aan de hand meenemen?"</i> (Interviewee 2.5)	<i>"Zet letterlijk in, less is more. Wat je weg kan laten, laat het weg. Ga gewoon voor zo min mogelijk keuze. En ik denk, als ik dan nu redeneer aan jouw eerste vraag. Het is een soort van doctrinatie geworden voor mij dan in die zin: Het is zo makkelijk mogelijk maken voor mensen"</i> (interviewee 2.4)	<i>"Hetgeen wat ik goed in hand moet houden is dat we er niet voor zorgen dat in één traject of de ene wordt voorgetrokken ten opzichte van de ander, maar dat gewoon, dus inderdaad non discriminatoire wordt geregeld en zo alle belangen eigenlijk gewoon even belangrijk ter harte nemen. Dat is dan eigenlijk het belangrijkste."</i> (interviewee 2.5)
Link to existing literature	Lazurus and Folkman (1984) suggest that public transport users need support through guidance. It includes guidelines, recommendations, and feedback on how to use specific digital services.	In the RSB handbook, the design principle is that "less is more" is used to not 'overload' the traveller and only give travellers the necessary information (Spoorbeeld, 2023)	Public transportation is acknowledged as a means through which social inclusion can emerge or be reinforced (Durand & Zijlstra, 2020).
Differentiation from literature	In this context, the NS not only focuses on digital interactions but emphasises a need for more physical touchpoint support.	More choice for the traveller leads to more errors made by them.	In addition to travellers, the station should also be a non-discriminatory environment for stakeholders involved.

Table 4.6: the goals to achieve the overarching ambition of facilitating barrier-free travel

Restrictions

Construct	Strict regulations from complex stakeholder field	Taking into account that tourists are unfamiliar with our systems
Definition	Strict regulations arise from the different interests of various stakeholders at Schiphol	Tourists don't know our systems, so NS cannot expect them to take everything into account when going through the journey for the first time.
Proof quote	<i>"Daar zit ProRail en Spoorbouwmeester. En dan ook nog eens Schiphol. Ja. En daar hebben we andere wet- en regels gelden, maar ook de wet- en regels die van spoorbouwmeester. Maar eigenlijk is het zo in Nederland dat het gaat langs wat we daar doen moeten we afstemmen met ProRail en Spoorbouwmeester." (Interviewee 2.1)</i>	<i>"Je kan ook niet van reizigers verwachten dat ze overal rekening houden. Nee. Vooral ook als je vermoeid bent en misschien ook wel gestrest. Eh. Ja. En dan ook nog een, een veelvoud aan keuzes." (interviewee 2.4)</i>
Link to existing literature	Bureau Spoorbouwmeester, operating independently, collaborates with NS and ProRail to establish and oversee a unified and consistent experience and implementation standards for all stakeholders in public transport, guided by a shared vision known as Spoorbeeld (Bureau Spoorbouwmeester, n.d.).	Infrequent or non-public transport travellers mentioned that investing time to understand the available digital touchpoints is often not worth it (Pangbourne et al., 2010)
Differentiation from literature	Station Schiphol Airport offers unique challenges as Schiphol owns this station, and has different interests in the use of the space.	Especially for tourists, who are often tired when interacting with new touchpoints are also not expected to invest time in understanding the touchpoint.

Table 4.7: the restrictions challenging the execution of the ambitions and associated goals.

Taking into account that tourists are unfamiliar with our systems

The NS cannot expect tourists to understand their systems and take everything into account the first time they are going through the journey. They express doubt about whether new tourists are aware of the NS app and if it is attractive for them to download it. In addition, they mention that tourists are unaware of contactless pay and struggle with the inevitable language barrier. Pangbourne et al (2010) mention that infrequent travellers often do not invest time to understand the available digital touchpoints in public transport. Especially tourists, who are tired after a long journey and are not expected to invest time in understanding the touchpoints provided to them.

04 Consumer needs

Table 4.8 presents the needs of international tourists on this journey. The NS identified these needs, stemming from (confidential) internal research and data sources.

Positive travel experience

A positive travel experience focuses on the convenience of NS services throughout the journey. It emphasises on the part of the journey from train to final interactions with NS. The last interaction with the NS accounts for the most memorable experience of the whole journey. This is supported by the understanding that end-of-experience evaluations significantly influence overall satisfaction and future behaviour (Kahneman et al., 1993; Fredrickson & Kahneman, 1993). However, the interviews emphasise that also the train journey (middle part) contributes to the overall satisfaction of

Consumer needs

Construct	Positive travel experience	Feeling at ease	Feeling secure
Definition	A positive travel experience focuses of the convenience or NS services throughout the journey	A stress-free and clear journey makes tourists feel at ease.	Tourists have no doubt but know which steps to take intuitively.
Proof quote	<i>"Dus het midden en het eind, dat onthouden mensen altijd hè. En laat dat dan net het laatste stuk van je reis zijn. Ja. En de laatste dingen dus, het eerste contact met de NS, maar het laatste van de hele reis die mensen meemaken. En dan gaan wij het verprutsen voor die mensen." (Interviewee 2.7)</i>	<i>"Wat ze nodig hebben is rust. Dat is enorm belangrijk." (Interviewee 2.6)</i>	<i>"Echt het zorgen dat de reiziger weet dat het zich zeker voelt... En ook een reiziger die net van Schiphol komt, die hoeft niet de snelste te hebben. Die wil gewoon de juiste hebben." (Interviewee 2.2)</i>
Link to existing literature	End-of-experience evaluations significantly influence overall satisfaction and future behaviour, such as the likelihood of repeat purchases or recommendations (Kahneman et al., 1993; Fredrickson & Kahneman, 1993).	Stress, no access to a network connection, not enough data, ergonomic difficulties, low digital skills or an outdated phone especially cause trouble when disruptions occur (Durand et al., 2023).	Kamga et al. (2013) show that more online information makes travellers feel more secure and confident in their trips.
Differentiation from literature	Not only do end-of-experience evaluations significantly influence the overall satisfaction, but the train journey contributes to this.	Each traveller has unique needs and approaches, and both physical and digital touchpoints must address them and offer tourists backup options.	Digital touchpoints are not mentioned as the only reason to make travellers feel secure.

Table 4.8: the needs of international tourists on this journey.

tourists (Durand et al., 2023).

Feeling at ease

Feeling at ease involves facilitating a stress-free and clear journey. It ensures tourists feel calm while interacting with NS touchpoints. The 'less is more' principle limits confusion by providing clear communication. The journey at Schiphol presents a lot of stressful moments. No network connection, not enough data, ergonomic difficulties, low digital skills or an outdated phone enhance these stressful moments, especially when disruptions occur (Durand et al., 2023). To respond to all unique travellers, both physical and digital touchpoints must address backup options to deal with disruptions.

Feeling secure

The third construct involves providing a feeling of certainty, ensuring tourists know they have taken the right steps. This means that tourists have no doubt but know which steps to take intuitively. Confirmation, such as a physical ticket, provides reassurance. Taking the right steps provides tourists with a better sense of security compared to taking the fastest options. Kamga et al. (2013) mention that more online information makes travellers feel more secure, but this research reveals that digital touchpoints do not present the only reason to make travellers feel secure.

05 Consumer pain points

Table 4.9 presents the pain points of international tourists on this journey. NS identified these pain points derived from (confidential) internal research and data sources.

Closed check-out gates

The first pain point mentions that tourists are ending their journey in Amsterdam in front of closed check-out gates. Not purchasing a valid ticket at Schiphol Airport causes this pain point. This construct explains an important pain point as end-of-experience evaluations significantly influence overall satisfaction and future behaviour (Kahneman et al., 1993; Fredrickson &

Kahneman, 1993). Additional research should point out whether this identified negative experience also influences negative word-of-mouth among tourists.

Crowdedness at Schiphol

The crowded environment at Schiphol Airport makes touchpoints hard to find and reduces their attention value. The increase of digital technologies in everyday life increases the complexity of customer journeys (Lemon and Verhoef, 2016). Within the context of Schiphol Airport, the excess of triggers and physical touchpoints makes this particular journey even more complex.

Unawareness and ticket confusion

The third construct explains that tourists are often unaware that they need to purchase a ticket or they expect to do so elsewhere. Research shows that tourists primarily travel without a ticket because they threw away their ticket before check-out, or because they thought they could buy a ticket on the train (NS, 2018). However, qualitative research with the consumers at Schiphol does not provide similar insights in the 2018 study, as all tourists purchased a valid ticket.

💡 This shows a discrepancy in research insights, which should be investigated later.

06 NS Pain Points

Table 4.10 presents the pain points experienced by NS on this journey, caused by international tourists travelling without a valid ticket.

Revenue lost due to tourists without a (valid) ticket

NS loses revenue when tourists travel without a valid ticket. Currently, conductors don't check train tickets on this route, preventing fines from being issued. NS deploys full-time service employees to help these tourists exit the gates, all adding to the lost revenue due to fare-evading tourists. Fare evading can be intentional and unintentional (Delbosc and Currie, 2019). In this context, the ignorance in needing a ticket results in not finding ticket machines or check-in posts.

Delay and danger of congestion in front of gates

Tourists ending up in front of closed check-out gates cause delays and congestion at the end station. They block the passage through the gates for other travellers. Peak-hour congestion remains an urgent issue and NS will continue to engage with stakeholders on options to spread passengers in other ways (NS, 2023). In this context, tourists without valid ticket cause additional congestion, adding to the congestion at peak hours.

Violence incidents due to confusion and ambiguity

Not having a ticket leads to confusion among travellers. This potentially results in violent incidents with (ignorant) travellers, especially when confronted with their behaviour. The NS annual report (2023) mentions an 8% increase in

incidents involving aggression. However, within this context, due to high-risk confrontations with tourists, conductors do not check on this route, and service employees help tourists out of the gates without consequence.

💡 There is a contradiction here: on one hand, missing income could be addressed through strict control on this route. However, this control often results in incidents of violence and unwanted discussion, leading conductors to avoid checking on this trajectory.

07 Solutions areas

Table 4.11 presents the solution areas identified by the NS to respond to the pain points on this journey. The solution areas contribute to ensuring tourists travel with a valid ticket.

Delineating the station domain

Creating a clear distinction between the train and flight domains at Schiphol makes the station and associated interactions more apparent to tourists. This aims to motivate tourists to purchase a ticket, addressing the issue of lost revenue. The Arlanda Express in Stockholm uses distinctive branding to communicate their train to tourists. This results in a clear understanding of which ticket is needed for the train. However, the NS wants to offer a consistent brand experience to all travellers, thereby rejecting the idea of a different branding for the train to Amsterdam.

💡 Additionally, NS aims to create a consistent experience where no one is given priority over others. They are concerned that treating this route differently could set a precedent for other exceptional routes. NS wants to avoid this and ensure that domestic passengers, who will also be using this train, are not confused.

Consumer pain points

Construct	Closed check-out gates	Crowdedness at Schiphol	Unawareness and ticket confusion
Definition	Tourists often end their journey in Amsterdam in front of closed check-out gates because they did not purchase a valid ticket at Schiphol Airport.	The crowdedness of the environment makes touchpoints hard to find and reduces their attention value.	Tourists are often unaware that they need to purchase a ticket or they expect to do so elsewhere
Proof quote	<i>"En dan komen ze bijvoorbeeld voor een gesloten poortje bij Amsterdam Centraal, weten ze niet hoe ze uit moeten checken. Dus eh, opstoppingen, onduidelijkheid, eh, en wat er vaak gebeurt is dus zwartrijden, dus dat je zonder geldig vervoersbewijs in of uitcheckt"</i> (Interviewee 2.6)	<i>"Maar wat het effect ook is op de reiziger is dat het zo'n cacophonie wordt dat er geen aandacht meer aan de juiste touchpoints besteed wordt, dus je verliest totaal de attentiewaarde"</i> (Interviewee 2.5)	<i>"Er zijn ook mensen die hebben geen kaartje gekocht, die denken ik stap in de trein. Want Amsterdam, Amsterdam-Schiphol. Ja. Het is toch hetzelfde. Dus die verwachten een soort van, dat je in het buitenland wel eens hebt, dat je van terminal naar terminal kan reizen"</i> (Interviewee 2.4)
Link to existing literature	End-of-experience evaluations significantly influence overall satisfaction and future behaviour, such as the likelihood of repeat purchases or recommendations (Kahneman et al., 1993; Fredrickson & Kahneman, 1993).	The increase of digital technologies in everyday life increases the complexity of customer journeys. The large number of available digital touchpoints makes it harder to reach out to customers and manage customer journeys (Lemon and Verhoef, 2016).	Research shows that many tourists travel without a valid ticket. Primarily because they have thrown away their ticket before check-out, or because tourists thought they could buy a ticket in the train (NS, 2018)
Differentiation from literature	The research does not indicate whether this leads to negative word-of-mouth among tourists.	At Schiphol, not only does the increase in digital technologies make the space more complex, but especially the convergence of physical touchpoints (of commercial parties) makes this journey very complex.	Qualitative research with the consumers at Schiphol did not provide similar insights in the 2019 study, as all tourists purchased a valid ticket

Table 4.9: the pain points of international tourists on this journey.

Reach and inform the tourist even before the station domain
Focusing on information and ticket sales earlier in the journey reduces crowdedness at the Plaza. NS aims to provide tourists with information and instructions before they reach the busy Plaza, addressing the issue of information overload at Schiphol, where touchpoints currently have low attention value. Mobility as a Service (MaaS) integrates various

transportation options into a customised mobility plan, including features like trip planning, booking, and payment processing, all accessible through a unified platform (Hietanen, 2014). Currently, MaaS platforms commonly do not integrate plane travel with local public transport, showing opportunities for new business models.

Guiding the tourist step by step

NS aims to sell more tickets by providing tourists with instructions throughout the journey, guiding them step-by-step. NS emphasises the importance of displaying a clear and intuitive step-by-step plan from the start of the journey. They want to use visual and instructional cues to direct travellers to the next steps. Lazurus and Folkman (1984) suggest that public transport users need support through guidance, including guidelines,

recommendations, and feedback on how to use specific digital services. In this context, NS not only focuses on digital interactions but also emphasises the integration of digital and physical touchpoints.

NS Pain Points

Construct	Revenue lost due to tourists without a (valid) ticket	Delay and danger of congestion in front of gates	Violence incidents due to confusion and ambiguity
Definition	NS loses revenue when tourists travel without a valid ticket on this route. In addition, conductors don't check train tickets on the train.	Closed check-out gates cause delays and congestion at the end station due to the many tourists struggling to check out.	Not having a lack of a ticket leads to confusion and can result in violent incidents with (ignorant) travellers without a ticket.
Proof quote	<i>Aan de andere kant herken ik dan wel, en dat is ook vanuit het Airportsprinterproject, dat het natuurlijk van, dat op Schiphol Airport je niet door poortjes heen gaat, maar je moet gewoon bij zo'n paal inchecken en dan vervolgens sta je in Amsterdam, waar je wel door een poortje heen moet. En dat ze daar wel merken dat ze echt wel zeker van toeristen inkomsten missen die niet inchecken. Of een kaartje kopen. (Interviewee 2.5)</i>	<i>Zie je dat het alleen maar opstookt. Ja. En het komt dus ook weleens voor dat het zo druk wordt. Denk aan Pride, Koningsdag, whatever. Of dat de poorten dus open moeten worden gezet omdat er gewoon opstoppingsgevaar ontstaat. Ja. En verdrukkingsgevaar. (Interviewee 2.6)</i>	<i>En wat je dan ziet is dat je dan op Amsterdam, als je hier een vliegtuig vol met mensen zonder kaartje hebt, dat kan leiden tot discussies. En we weten ook uit onderzoek dat geweldsincidenten gebeuren vaak bij de controle aan kaartjes. (Interviewee 2.4)</i>
Link to existing literature	Fare evading can be intentional and unintentional (Delbosc and Currie, 2019). Fare evading often stems from difficulties that users experience with a ticket machine, confusion about how to purchase the right ticket, or not being able to find a ticket machine nearby.	Peak-hour congestion remains an urgent issue and NS will continue to engage with stakeholders on options to spread passengers in other ways (NS, 2023).	An 8% increase in incidents involving aggression. 4449 passenger reports received by NS control centre (NS, 2023).
Differentiation from literature	Similar to literature, fare evading often stems from difficulties in finding a ticket machine. However, this is not because they are not located nearby, but because tourists are ignorant and do not put in the effort to find a ticket machine.	In this context, tourists without valid VVB also cause congestion, adding to the congestion at peak hours, for example at Amsterdam Central Station.	Due to high-risk confrontations with tourists, conductors do not check on this route, and service employees help tourists out of the gates without consequence.

Table 4.10: the pain points experienced by NS on this journey.

Solution areas

Construct	Delineating the station domain	Reach and inform tourists before the station domain	Guiding the tourist step by step
Definition	Creating a clear distinction between the train and flight domains at Schiphol, making the station (and associated interactions) more apparent to tourists.	By focusing on information or ticket sales earlier in the journey we can reduce congestion in the Plaza.	NS aims to sell more tickets by providing tourists with instructions throughout the journey, guiding them step-by-step
Proof quote	<i>"Om in ieder geval het stationstermijn, dus de palen, zichtbaarder te maken voor de reizigers. Van hé, oké, ik betreed nu een ander domein, moet ik opletten, moet ik inchecken, oh, even checken bij kaartautomaat bijvoorbeeld." (Interviewee 2.6)</i>	<i>"Kijk, je kunt heel veel ellende voorkomen. Dat mensen bijvoorbeeld al vooraf een kaartje hebben. Ja. Dat ze met hun vliegticket ook gewoon met de trein kunnen reizen. Dat ze een soort deal maken of dat met agences, dat ze dat kaartje al van tevoren kunnen maken. Alleen mensen willen dat last minute, ze willen van tevoren niet gaan uitzoeken hoe dat zit. Hoe cool zou het zijn als je een ticket boekt en er zit gewoon vervoer vallen naar de luchthaven in?" (Interviewee 2.7)</i>	<i>Ik denk dat het meest ideaal zou zijn, los van of het haalbaar is inderdaad. Maar bij wijze van je stapt het vliegtuig uit en je weet dat je naar de trein moet. Hoe kom je bij de trein? Dat het daar eigenlijk al begint en soort van echt bij iedere stap onderweg meegenomen wordt. Oké, je komt nu de stationshal binnen. Je hebt een kaartje nodig. Hoe ga je die kopen? (Interviewee 2.5)</i>
Link to existing literature	The Arlanda Express in Stockholm offers a distinctive branding to communicate their train to tourists.	Mobility as a Service (MaaS) integrates various transportation options into a customized mobility plan. This service also encompasses additional features like trip planning, booking, and payment processing, all accessible through a unified platform (Hietanen, 2014).	Lazurus and Folkman (1984) suggest that public transport users need support through guidance. It includes guidelines, recommendations, and feedback on how to use specific digital services.
Differentiation from literature	NS wants to offer a consistent brand experience to all travellers.	Currently, MaaS platforms commonly do not integrate plane travel with local public transport.	In this context, the NS not only focuses on digital interactions but emphasises the integrations of digital and physical touchpoints.

Table 4.11: the solutions areas identified by the NS to respond to the pain points on this journey.

4.3.6 Summarising the insights by answering the initial research questions

This subchapter presents the initial two research questions and summarises the answers to these questions.

01 What are the ambitions and goals of NS to improve the intuitive access to NS's services at Schiphol Airport?

NS aims to facilitate seamless travel. They aim to execute this ambition by creating an intuitive and predictable journey, providing travellers with only relevant information at the right moments, while creating an inclusive environment.

02 But what are the main challenges and restrictions that impact these potential new solutions in this context?

The main challenges include revenue loss due to tourists travelling without a (valid) ticket, which leads to delays and the risk of congestion caused by tourists who do not understand how to navigate the gates. Additionally, incidents of violence could arise from confusion and ambiguity regarding tourists tickets.

Strict regulations from a complex stakeholder field constrain the development of new solutions together with the fact that tourists are unfamiliar with our systems, making it harder to expect immediate comprehension. Potential solution areas to respond to these challenges include delineation of the station area, reaching tourists before entering Plaza, and offering step-by-step guidance.

CHAPTER 04.4

Qualitative research with NS service employees

The following chapter presents the strategic insights derived from qualitative research with NS service employees. The insights aim to leverage the insights and experiences of service employees stationed at check-out gates that help international tourists daily, identifying consumer pain points from their perspective. The insights include 6 semi-structured interviews.

4.4.1 Research objectives

The incentive for this research stems from findings by NS indicating that the primary issues are caused by tourists who do not purchase tickets and, consequently, cannot pass through the gates. Service employees stationed at check-out gates, such as those at Amsterdam Central Station, have the most direct interaction with these tourists and are therefore best positioned to provide valuable insights.

4.4.2 Required Insights

The primary objective aims to gain an understanding of the main challenges identified by NS service employees regarding tourists arriving from Schiphol at Amsterdam Central Station. The accompanying research question reads:

What are the main challenges identified by NS service employees among tourists arriving from Schiphol at Amsterdam Central Station?

4.4.3 Methodology for Gathering Insights

To obtain these insights, I conducted interviews with 6 service employees stationed at the check-out gates at Amsterdam Central Station. These interviews will be structured to reveal insights about the specific challenges and issues they observe among international tourists travelling from Schiphol. Appendix 4a presents the interview guide used to conduct these interviews. Appendix 4b presents the codebook.

4.4.4 Expected Outcomes

The findings from these interviews serve to either confirm or refute previously identified insights. This research acts as a validation, helping to identify potential gaps or inconsistencies across different research methods. By triangulating these insights, the study provides an understanding of the challenges faced and informs potential solutions.

4.4.5 Identifying the observed pain points among tourists from a service employee perspective

Table 4.12 presents the main cause for tourists not travelling with a valid ticket, identified by service employees at Amsterdam Central.

Tourists arrive at Amsterdam Central valid ticket

Construct	No physical check-in gates at Schiphol
Definition	Service employees mention the absence of gates at Schiphol to cause the problems of tourists travelling without a ticket
Proof quote	<i>"Dat is eigenlijk het grootste probleem. Er zijn geen poortjes daar. Ja. Want het is makkelijker zonder de poortjes. Ja, alleen, er staat ook overal aangegeven dat je een kaartje boven kan kopen. Maar ze zijn zo gewend aan het buitenland"</i> (Interviewee 3.2)
Link to existing literature	Especially infrequent or non-public transport travellers mentioned that investing time to understand the available digital touchpoints is often not worth it (Pangbourne et al., 2010)
Differentiation from literature	In this context, tourists do not take time to understand both digital and physical touchpoints.

Table 4.12 presents the main cause for tourists not travelling with a valid ticket, identified by service employees at Amsterdam Central.

No physical check-in gates at Schiphol
Service employees mention that the absence of gates at Schiphol causes the problem of tourists travelling without a ticket. They add that it is not well indicated at Schiphol Airport that a ticket is needed and that it's easy for tourists to walk straight onto the train. Especially infrequent or non-public transport travellers state that investing time to understand the available digital touchpoints is often not worth it (Pangbourne et al., 2010). The service employees mention that the lack of clarity and non-existence of needed touchpoints causes tourists to not understand the system.

Motivation for not purchasing a valid ticket (according to service employees)

Table 4.13 presents the motivation NS service employees observe among tourists arriving at Amsterdam Central Station.

Tourists are ignorant about travelling with a valid ticket

Tourists arrive at the check-out gates at Amsterdam Central, unaware that they need a ticket to exit the station. The literature explains that fare evasion can be both intentional and

unintentional (Delbosc and Currie, 2019). Service employees add that we cannot expect too much from tourists, because everything is new to them.

A lot of tourists buy a GVB ticket instead of an NS ticket

The service employees mention, that more often than tourists travelling without a valid ticket, they mistakenly believe they can use a GVB ticket to travel with NS. They attempt to check out with the GVB ticket. Especially infrequent or non-public transport travellers state that investing time to understand the available digital touchpoints is often not worth it (Pangbourne et al., 2010). Contrary to what the literature suggests, a group of tourists does take the time to understand the available digital touchpoints; however, their comprehension is incorrect, as the app they use is not sufficient for train travel.

 *Service employees allow tourists without tickets to go through the check-out gates without consequence. By doing so, NS fails to address its stated pain point of missing revenue. Additionally, the service employees mention that a large group of tourists travel*

with a GVB ticket. This is not mentioned during the interviews with NS executive employees. This reveals that the NS is potentially unaware of the insights service employees have long accumulated on this journey.

4.4.6 Summarising the insights by answering the initial research questions

This part presents the initial research question and summarises the answers to this question:

What are the main challenges identified by NS service employees among tourists arriving from Schiphol at Amsterdam Central Station?

The absence of check-in gates at Schiphol causes tourists to travel without a valid ticket. However, it appears that even more often, tourists are travelling with a GVB ticket instead of an NS ticket. Research with the NS executive employees did not reveal this insight.

Motivation for not purchasing a valid ticket (according to service employees)

Construct	Tourists are ignorant about travelling with a valid ticket	A lot of tourists buy a GVB ticket instead of an NS ticket
Definition	Tourists arrive at the check-out gates at Amsterdam Central, unaware that they need a ticket to exit the station.	Many tourists think they can use their GVB ticket to travel with the NS and try to check out with their GVB ticket.
Proof quote	<i>"Want de meeste mensen hebben geen kaart bij Schiphol. Dus sowieso, heel veel mensen weten dat niet." (Interviewee 3.3)</i>	<i>"Wat ik vaak tegenkom inderdaad, is zonder kaartje. Ja. Maar er zijn er ook een heleboel die een GVB kaartje hebben." (Interviewee 3.2)</i>
Link to existing literature	Fare evading can be both intentional and unintentional (Delbosc and Currie, 2019). Fare evading often stems from difficulties that users experience with a ticket machine, confusion about how to purchase the right ticket, or not being able to find a ticket machine nearby.	Especially infrequent or non-public transport travellers mentioned that investing time to understand the available digital touchpoints is often not worth it (Pangbourne et al., 2010).
Differentiation from literature	Service employees mention that we cannot expect too much from tourists, as everything is new to them.	Different from what the literature suggests, a group of tourists takes time to understand the available digital touchpoints, however, the comprehension is wrong as this app is not sufficient to travel by train.

Table 4.13: the motivation NS service employees identified among tourists arriving at Amsterdam Central Station.

Identifying the gap: a discrepancy in consumer and company insights

This chapter compares the key findings from the qualitative research. It determines whether the challenges identified by tourists align with those identified by NS, ensuring a consistent problem statement from both perspectives.

Figure 4.3 presents a comparative analysis, highlighting a key discrepancy: while NS employees reveal several challenges due to tourists travelling without a valid ticket, consumer research only addresses those with tickets. In addition, service employees mention that a large group of tourists travel with a GVB ticket instead of an NS ticket, which is not mentioned by NS executive employees. This gap underscores the need for further research to fully align the problem statement.

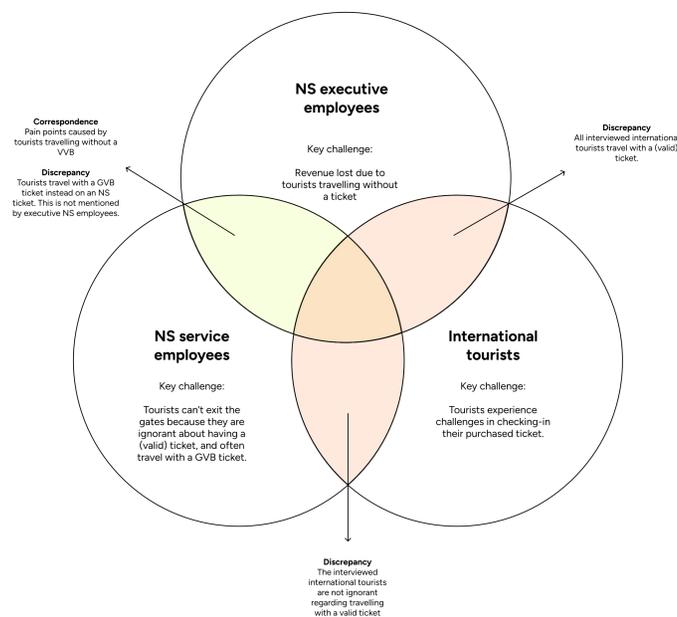


Figure 4.3: correspondence and discrepancies between research methods

4.5.1 Reason and reflection for this discrepancy

The gap in insights that emerged during the research prompted me to reflect. I analysed various factors that could have contributed to this discrepancy, examining both the methodology and the context in which I collected the data. The following insights potentially reveal this gap in insights:

- I conducted the consumer research at Schiphol Airport on a Monday, Tuesday, and Wednesday. Although I considered various times of the day for the research, the sample size did not include 'weekend' tourists. For example the careless tourists (Chapter 3.6) includes tourists who come to Amsterdam for (bachelor) parties. These groups may have different values and approaches to the train journey.
- Additionally, the location where I engaged with respondents may have influenced the findings. Approaching people at Plaza who were first-time travellers to Amsterdam by train was challenging. Consequently, I ended up speaking with individuals near the ticket machines, and thus who had already purchased a ticket.

These reflections highlight the importance of considering the timing, location, and sampling methods in qualitative research. By addressing these factors, future studies can achieve a more representative understanding of the challenges.

4.5.2 Next steps to ensure the problem statement benefits both consumer and company perspective

This found discrepancy highlights the importance of conducting additional research to gain insights into the challenges and behaviour of the group of tourists who travel without a valid ticket.

After the interview at the NS office with interviewee 2.6, I received several studies related to the identified pain points (that tourists arrive in Amsterdam without a valid ticket). In 2018, NS conducted a quantitative study to determine how many tourists travel from Schiphol Airport to Amsterdam Central without a valid ticket. The research included the main reasons behind this behaviour. I reviewed this study and extracted insights that will form the foundation for my additional research.

4.5.3 Gaining insight into travellers without a valid ticket, NS research 2018

The following chapter presents the findings of this quantitative study from 2018.

4.5.4 Key insights into motivations and numbers of tourists travelling without a valid ticket

The quantitative research from 2018 conducted 397 surveys with tourists at the checkout gates at Amsterdam Central Station. Among these, 233 tourists did not have a valid ticket upon arrival at Amsterdam Central. This equals to 64% of the tourists. The biggest part, 19% of the respondents were from the England. Of the 233 travellers without a valid ticket, the primary reason shows that tourists had discarded their ticket on the train or platform (45%). 40% believed they could purchase a ticket on the train. Only 11 out of 397 tourists travelled with a GVB ticket instead of an NS ticket. Figure 4.4 presents they key findings of this research.

This difference shows a discrepancy in the insights from the interviews with NS service employees, and the 2018 study. Figure 4.5 presents an overview of this discrepancy. This discrepancy suggests a need for further investigation to bridge these differing perspectives. It is essential to understand whether the service employees' observations are isolated incidents or if they reflect a broader, yet underreported, trend.

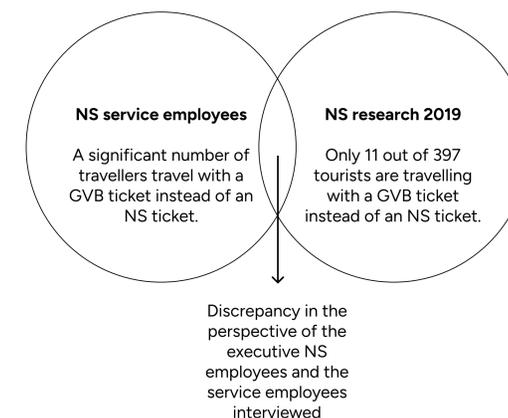


Figure 4.5: Discrepancy in perspective of number of travellers with GVB ticket

64% Percentage of tourists without a valid ticket upon arrival at Amsterdam Central

19% Percentage of tourists without a valid ticket came from the England. Followed by 2.1% from Scotland.

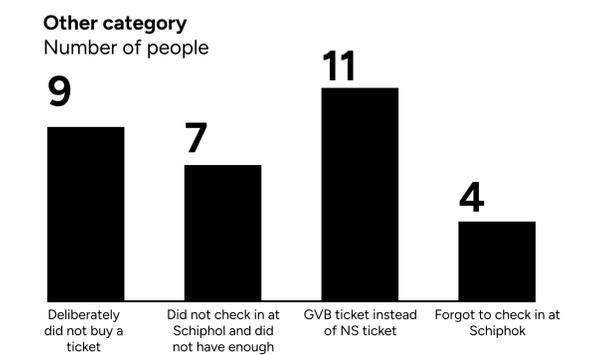
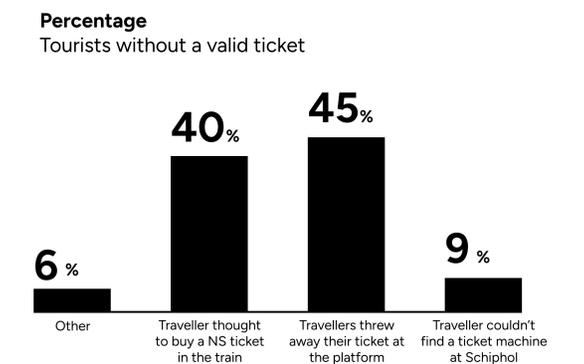


Figure 4.4: numbers on travellers without valid ticket (NS, 2018)

Additional qualitative research with tourists travelling without a valid ticket

The following chapter presents the strategic insights derived from additional qualitative research with tourists travelling without a valid ticket. They are interviewed at the check-out gates at Amsterdam Central. The insights include 16 semi-structured interviews with a total 41 respondents.

4.6.1 Research Objective

This research addresses a discrepancy identified among respondents in the initial studies. The group of respondents I initially interviewed, does not provide insight into the challenges identified by NS. Secondly, there is a discrepancy in the perceived number of tourists travelling with a GVB ticket compared to an NS ticket.

4.6.2 Required Insights

This research explores the motivations and behaviours of tourists who cause issues for NS by not purchasing tickets. The research questions entails:

What are the underlying causes, motivations, and behaviours of tourists who fail to purchase the correct train ticket?

4.6.3 Methodology for Data Collection

To obtain these insights, I conducted 16 semi-structured interviews. I approached tourists travelling without a valid VVB at the check-out gates at Amsterdam Central Station, as they were unable to exit the check-out gates.

4.6.4 Expected Outcomes

The findings provide a deeper understanding of the pain points experienced by tourists travelling without a valid ticket. This will enable the creation of a problem statement that

addresses the needs of both the consumer and the company. In addition, I expect the findings to give insight into the significance of the group of tourists travelling with a GVB ticket instead of an NS ticket.

4.6.5 Approach to conducting this additional qualitative research

Table 4.14 presents an overview of the respondents interviewed for this supplementary research. Appendix 5a details the interview guide and the new research objectives to conduct this study. Appendix 5b presents the codebook. I conducted 16 interviews with 41 respondents who travelled without a valid ticket. The research took place over two Fridays, totalling six hours. I analysed the data using the same method as discussed in Chapter X.

4.6.6 Identifying the challenges of tourists without (valid) tickets: two types of travellers

01 Ticketless Non-Planners

This research identified two main groups of tourists who travel without a valid ticket. The first group present the "Ticketless Non-Planners". They consist of tourists who embark on their journey without prior planning and fail to purchase a valid ticket or scan their bank card to check in at Schiphol Airport.

02 GVB Planners

The second group, referred to as "The GVB Planner," includes tourists who purchase a GVB ticket before their trip, mostly through the app, and mistakenly assume that the train is included in this ticket. This reveals the digital presence of this group.

The following section presents insights into the characteristics and behaviours of both identified groups. The ticketless non-planners represent the first insights.

4.6.7 Insights: Motivation and behaviour of the ticketless non-planner

01 Motivation ticketless non-planner

Table 4.15 presents the motivation of the ticketless non-planner for not purchasing a ticket, or not checking in through contactless pay.

Tourists expect ticket purchases at a different location

The first construct reveals that tourists travel without a valid ticket because they assume they can purchase a ticket on the train or pay at the check-out gates. They mentioned that in their home countries, such as Scotland or England, tickets are sold on the train. They therefore expect that this is also the case in the Netherlands. Tourists expect the conductor to come around for tickets or believe they could tap on when boarding the train. The assumption that ticket purchases can be deferred until later in the journey also contributes to fare evasion, even if unintended. Fare evasion can be both intentional and unintentional (Delbosc and Currie, 2019).

Tourists miss the available touchpoints at Schiphol

The second construct highlights that tourists did not see options to purchase a ticket at Schiphol Airport. They reported looking for payment options but found none at Schiphol Plaza. Observing others descending directly to the trains without stopping to pay reinforced their behaviour. Tourists also expected barriers at Schiphol, which would signal the need for a ticket. The absence of these barriers led them to believe they could pay later. Pangbourne et al. (2010) identified a gap between online information and what travellers seek. Tourists primarily focus on boarding the right train, often missing ticket purchase touchpoints.

02 Behaviour ticketless non-planner

Table 4.16 presents the behaviour of tourists after realising they are travelling without a valid ticket.

Realising fare evading

The first tourists realise they travel without a valid ticket on the train. Other tourists mention only realising when they see the check-out gates. Tourists seem to feel a bit awkward and

Interviewee	Country of residence	Type of ticket	Number of tourists
4.1	England	GVB ticket	5
4.2	Sweden	GVB ticket	2
4.3	USA	No OV-pay	2
4.4	South-Korea	GVB ticket	2
4.5	Serbia	Thrown away ticket	1
4.6	Australia	No ticket purchase	4
4.7	Sweden	No OV-pay	3
4.8	Germany	GVB ticket	2
4.9	Ireland	No ticket purchase	2
4.10	Scotland	No ticket purchase	2
4.11	Valencia	No OV-pay	1
4.12	Hong Kong	GVB ticket	3
4.13	England	No ticket purchase	2
4.14	Scotland	No ticket purchase	2
4.15	England	No ticket purchase	2
4.16	France	GVB ticket	5

Table 4.14: an overview of respondents interviewed for the supplementary research

uncomfortable after realising they haven't purchased a ticket. They mention that this is not the best start of their trip and that they feel a bit lost. End-of-experience evaluations significantly influence overall satisfaction and future behaviour, such as the likelihood of repeat purchases or recommendations (Kahneman et al., 1993; Fredrickson & Kahneman, 1993). Additional research should point out whether this identified negative experience also influences word-of-mouth communication.

Fixing mistakes

This construct indicates that tourists, after

realisation of travelling without a valid ticket, try to find ways to still purchase a ticket to exit the check-out gates. After looking around for ticket machines, many tourists asked the service employees if they could still purchase a ticket. In addition, they express the need for more communication at Schiphol regarding buying a valid ticket before boarding the train. Literature suggests that travellers experiencing challenges can use support through substitution to receive help for a specific, one-time action (Lazurus and Folkman, 1984). Before asking service employees for help, tourists first seek physical touchpoints.

Motivation ticketless non-planner

Construct	Tourists expect ticket purchases at a different location	Tourists miss the available touchpoints at Schiphol
Definition	Because many tourists assume that a VVB can also be purchased on the train. Also, tourists expect that they can still pay at the check-out gates.	Tourists say they have not seen options to buy a VVB at Schiphol. The absence of gates at Schiphol causes people to "not know" they need a ticket.
Proof quote	<i>"We thought it was pay at the end of the journey. Like on the subway in London, you could just pay at the end sometimes. Or the other thing is maybe there would be a conductor on the train that came round." (Interviewee 4.13)</i>	<i>"Couldn't see one. Yeah. So I just went straight on the train. Came here." (interviewee 4.10)</i>
Link to existing literature	Although this can be both intentional and unintentional (Delbosc and Currie, 2019). Fare evading often stems from difficulties that users experience with a ticket machine, confusion about how to purchase the right ticket, or not being able to find a ticket machine nearby.	Pangbourne et al (2010), found that there is a gap between the information that is provided online and the information that travellers are seeking.
Differentiation from literature	Fare evading is caused by the assumption that ticket purchase will be needed later in the journey.	Tourists are primarily looking to board the right train, causing them to skip ticket purchase touchpoints.

Table 4.15: the underlying motivation for not travelling with a valid ticket

Behaviour ticketless non-planner

Construct	Realising fare evading	Fixing mistakes
Definition	Tourists realise they haven't purchased a ticket on the train when no options to purchase a VVB are available or at the check-out gates. They say they feel awkward and uncomfortable after the realisation	Tourists indicate that they look for ways to still be able to go through the gates with a VVB. They also indicated that they needed more communication regarding buying a valid VVB before boarding the train.
Proof quote	<i>"Basically, as soon as we sat down on the train. And then we wondered if it was free or not." (Interviewee 4.6)</i>	<i>"Would have been a lot clearer, because on the train we asked, like, how do you pay? Yeah. We were looking around asking, like, how do you pay, but there was nothing there." (Interviewee 4.14)</i>
Link to existing literature	End-of-experience evaluations significantly influence overall satisfaction and future behaviour, such as the likelihood of repeat purchases or recommendations (Kahneman et al., 1993; Fredrickson & Kahneman, 1993).	Travellers experiencing challenges can use support through substitution to receive help for a specific, one-time action (Lazurus and Folkman, 1984).
Differentiation from literature	The research does not indicate whether this leads to negative word-of-mouth among tourists.	Before asking service employees for help, tourists first seek physical touchpoints.

Table 4.16: the behaviour of tourists after realising they are travelling without a valid ticket.

4.6.8 Insights: Motivations GVB planner

01 Motivation GVB planner

The following insights pertain to the second identified target group: the GVB planners. Table 4.17 presents the underlying motivation for not travelling with a valid ticket.

Ignorant that a GVB ticket is not valid for the train

The first construct explains that tourists are unaware that a GVB ticket is not valid for the train from Schiphol to Amsterdam. They expect their GVB ticket to cover all public transport in Amsterdam, including trains. Some tourists noted that the GVB app did not inform them they needed a separate ticket for the train, even though the app recommended the train. Tourists assumed the GVB ticket included everything but did not thoroughly research to confirm this. Pangbourne et al. (2010) found a gap between the information provided online and what travellers seek. While the information is available online, tourists do not retain it because they are not specifically looking for it.

Tickets are not checked at Schiphol Airport
The absence of gates allows tourists to travel without the correct ticket. They mention the need for ticket barriers to prevent them from boarding the train without ticket check. Without resistance, tourists did not consider buying another ticket, especially with the rush of people at Schiphol and lack of obvious check-in gates. They expressed a need for clear communication about what the GVB ticket includes, particularly within the GVB app. Literature explains that fare evasion often results from difficulties with ticket machines, confusion about purchasing the right ticket, or the inability to find a ticket machine nearby (Delbosc and Currie, 2019). In this case, it also stems from overlooking important information provided through digital touchpoints.

02 Behaviour GVB planner

Table 4.18 presents the behaviour of tourists after realising they are travelling with the wrong ticket.

Realising fare evading

Tourists assume they are travelling with the correct ticket and are surprised and confused

when they cannot exit the gates with their GVB QR code. They repeatedly try their QR code before realising it does not work, leading to them feeling surprised and confused. End-of-experience evaluations significantly influence overall satisfaction and future behaviour, such as the likelihood of repeat purchases or recommendations (Kahneman et al., 1993; Fredrickson & Kahneman, 1993). Additional research should determine whether this negative experience also affects word-of-mouth communication later.

Willingness to download the app

This construct reveals that the majority of the interviewed GVB planner target group downloaded the GVB app before flying to Amsterdam. They bought a GVB ticket because it's cheaper, includes museum discounts, or was recommended by a friend. The app allows users to buy tickets for public transport by the hour and caters to tourists' needs with features like museum discounts and highlight-to-highlight routes. Infrequent or non-public transport travellers often find it not worth investing time to understand available digital touchpoints (Pangbourne et al., 2010). However, tourists do

take the time to understand and use these digital touchpoints when they offer sufficient benefits to meet their needs.

Motivation GVB planner

Construct	Ignorant that a GVB ticket is not valid for the train	Tickets are not checked at Schiphol Airport
Definition	Tourists indicate that they expect their GVB ticket to be valid for NS as well.	Because there are no gates, tourists are not checked that they are travelling with the correct VVB. They express a need for clear communication of what is and is not included in the GVB ticket.
Proof quote	<i>"I searched for trains in the GVB app from Schiphol and I found this train. Then I thought, of course, it should be included" (Interviewee 4.3)</i>	<i>"I really needed the ticket barriers to stop you being able to walk straight, yeah I think that was the thing there was no resistance" (Interviewee 4.1)</i>
Link to existing literature	Pangbourne et al (2010), found that there is a gap between the information that is provided online and the information that travellers seek.	Fare evading often stems from difficulties that users experience with a ticket machine, confusion about how to purchase the right ticket, or not being able to find a ticket machine nearby (Delbosc and Currie, 2019).
Differentiation from literature	The information can be found online, but the tourists do not store it because they are not looking for it.	Fare evading stems from overlooking important information provided through digital touchpoints.

Table 4.17: the underlying motivation for travelling with a GVB ticket

Behaviour ticketless non-planner

Construct	Realising fare evading	Willingness to download the app
Definition	Tourists assume they are travelling with the correct ticket. As a result, they are very surprised and confused when they do not come out of the gates with their QR code.	68% of the tourists spoken to have downloaded the GVB app. On this app you can buy ticket for public transport by the hour, and it caters to tourists' needs (museum discounts, highlight to highlight routes)
Proof quote	<i>"When I tried the barcode... I was surprised and I'm trying to find a place to buy a ticket." (Interviewee 4.2)</i>	<i>"So this ticket is also for the museums and just everything kind of combined. So we were just like okay lets get it. And you get free public transport ofcourse" (Interviewee 4.5)</i>
Link to existing literature	End-of-experience evaluations significantly influence overall satisfaction and future behaviour, such as the likelihood of repeat purchases or recommendations (Kahneman et al., 1993; Fredrickson & Kahneman, 1993).	Infrequent or non-public transport travellers mentioned that investing time to understand the available digital touchpoints is often not worth it (Pangbourne et al., 2010)
Differentiation from literature	Additional research should point out whether this identified negative experience also influences word-of-mouth communication later.	Tourists actually take time to understand and use available digital touchpoints, when provided with enough benefits to their needs.

Table 4.18: the behaviour of tourists after realising they are travelling with the wrong ticket.

4.6.9 Summarising the insights by answering the initial research question

This subchapter presents the initial research question and summarises the answers to these questions. The research question mentioned:

What are the underlying causes, motivations, and needs of tourists who fail to purchase the correct train ticket?

The answer to this question is twofold, as the research identified two different segments of travellers. For the Ticketless Non-Planner, the motivation for not purchasing a ticket stems from their expectation of a different location for ticket purchase. In addition, they find the current touchpoints at Schiphol difficult to locate. They want to rectify their mistake of not buying a ticket.

Conversely, the GVB Planner's ignorance causes thinking that the GVB ticket is also valid for the train. Their GVB ticket was not checked before boarding, leaving them unaware it was incorrect. This group needs clearer communication regarding the validity of the GVB ticket for train travel. Their behaviour indicates a high adoption rate of the GVB app.

4.6.10 Comparing research insights to create a clear problem statement

Figure 4.5 presents a Venn diagram comparing the iterated qualitative studies. It suggests that the problem statement will focus on the target group that ends their journey in Amsterdam without a valid ticket.

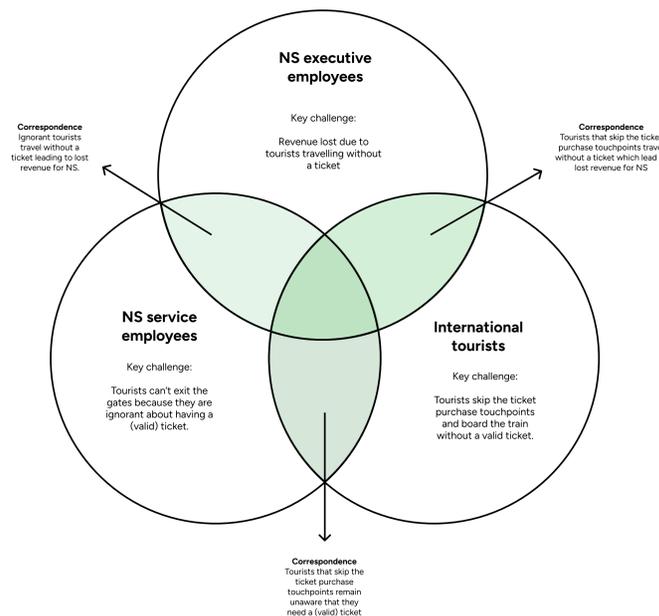


Figure 4.5: correspondence in different research methods

CHAPTER 04.7

Creating the as-is customer journey to put the research insights to the physical context

This chapter presents the customer journey for the two identified target groups. This final deliverable provides an overview of the current consumer challenges, the associated company pain points, and connects this to the gaps of the existing touchpoints at Schiphol Airport.

4.7.1 The as-is journey objective

The qualitative research provides insights into the issue of travelling without a valid ticket from Schiphol Airport to Amsterdam. By placing these insights within the project's physical context, I can better understand the current touchpoints and identify the gaps, finding areas for improvement. Figure 4.6 presents the as-is customer journey for de ticketless non-planner. Figure 4.7 presents the as-is customer journey of the GVB-planner.

4.7.2 Description of as-is customer journey steps

The following section outlines the context of the steps for both journeys.

Step 1 Planning and orientation

The journey begins at home, where the idea of the trip arises and flight tickets and accommodation are booked. Therefore, digital touchpoints are most significant in this phase.

Step 2 Arrival at Schiphol Airport

The second step involves arriving at Schiphol Airport. This step covers the journey from when tourists land until they exit the customs area and the arrival halls. It primarily concerns the physical space at Schiphol Airport, including gates, baggage claim, customs, toilets, and long walkways leading to the exit.

Step 3 Entering Schiphol Plaza

The third step pertains to tourists entering the busy plaza from the arrival hall. This step focuses on the first impression of the space. This step influences how tourists navigate the space, which touchpoints they see and recognise, and where their focus is directed.

Step 4 Finding train departure information

This step involves locating the correct train information on the available digital boards or via digital touchpoints on mobile phones. The information boards are positioned perpendicular to the walking direction from the arrival halls, placed on the back of the lifts, and above the tickets and service desks.

Step 5 Finding the right platform

This step involves locating the correct platform in the busy plaza. It includes identifying the access points to the platforms and validating the correct platform number and corresponding train when they are on the platform.

Step 6 Boarding the train

This step involves recognising the correct train as it arrives and boarding it. This can be a stressful situation, especially for tourists with a lot of luggage and limited time to board the train (Van Hagen, 2021).

Step 7 Journey in the train

The train journey starts from the moment tourists board the train until they arrive at their final station. It includes boarding and alighting from the train and receiving communication provided in the train, such as on digital screens or via announcements.

Step 8 Arrival at end-station

This step covers the period from when tourists alight from the train until they reach the check-out gates.

Step 9 Check-out

This step involves tourists standing at the check-out gates, unable to check out. It includes locating the available touchpoints that could help them purchase a ticket and interacting with service employees who ultimately assist them in exiting the station.

The following sections explain the key insights derived from the as-is customer journey.

4.7.3 The as-is customer journey for the ticketless non-planner.

? What is the difference between digital and physical touchpoints?

I will use the definition provided by NS. According to bi-weekly meetings with NS employees, NS defines physical touchpoints as all touchpoints placed in the physical space, including digital screens. Digital touchpoints are described as contact moments that occur digitally, often via tourists' own devices, such as websites, apps, and emails.

Ticketless non-planner

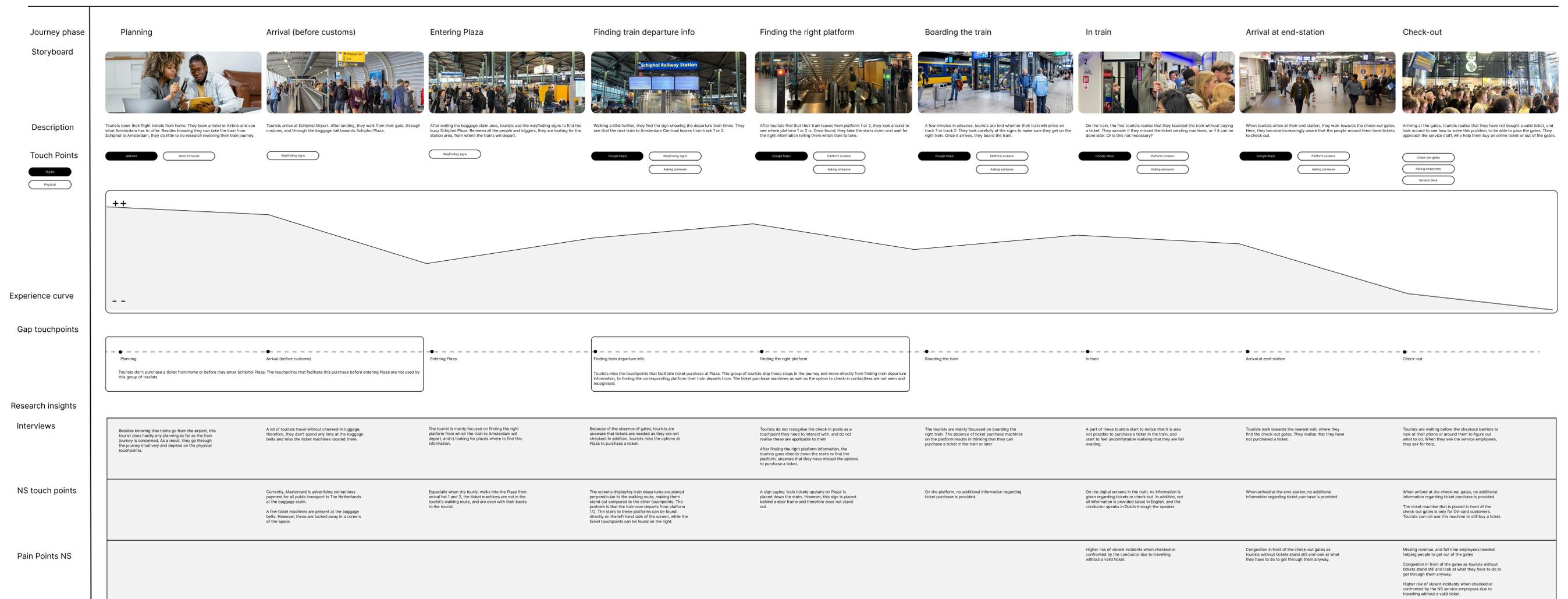


Figure 4.6: The as-is customer journey for the ticketless non-planner.

4.7.4 The as-is customer journey for the GVB planner

GVB planner

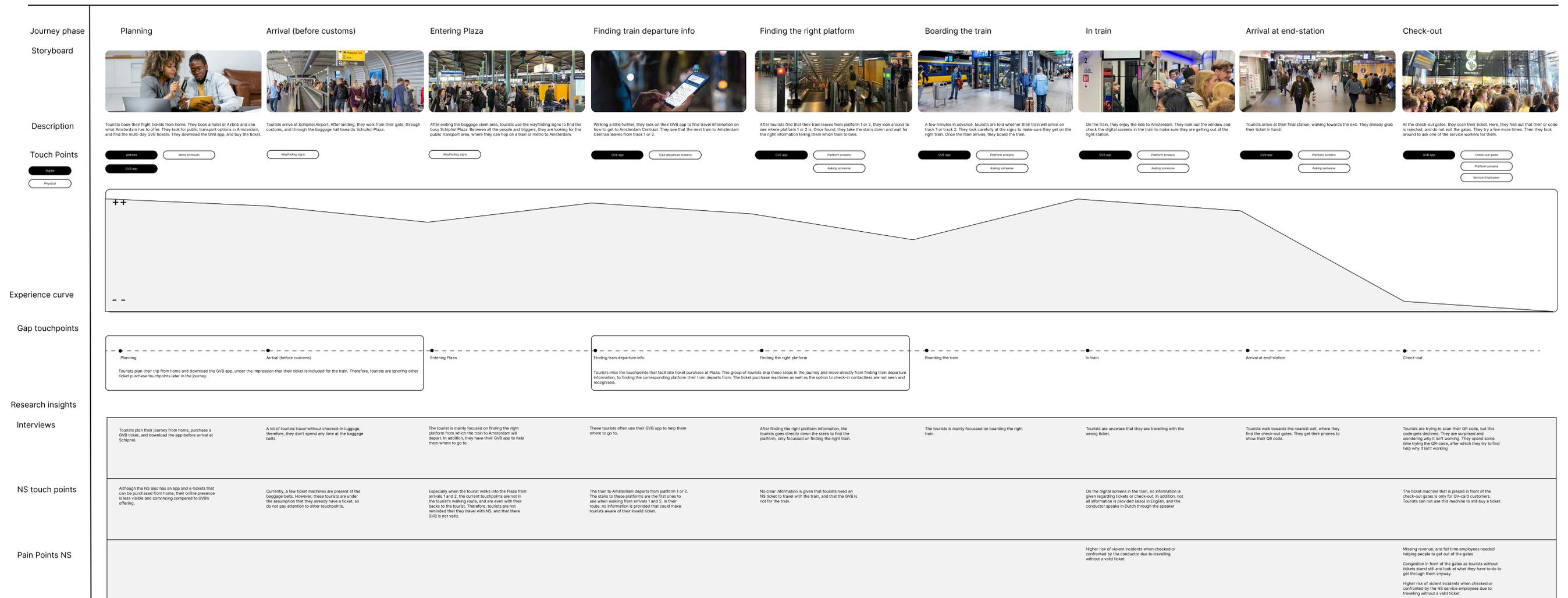


Figure 4.6: the as-is customer journey for the GVB planner

4.7.5 Identifying the gap in current touchpoints throughout the journey

01 A gap in touchpoints for the ticketless non-planner

Although digital touchpoints such as the NS website or the NS app facilitate ticket purchase in this step, the ticketless non-planner does not make use of these touchpoints. The question arises whether tourists miss these touchpoints, or that they inadequately respond to their needs.

The second gap describes that tourists bypass the steps intended for ticket purchase and move directly from finding train departure information to the corresponding platform. They do not see or recognise the ticket purchase machines or the option to check in contactless. This leads to a gap in the journey, as these tourists are unaware of the available options to buy a ticket or check in.

02 A gap in touchpoints for the GVB planner

The first gap in NS touchpoints for the GVB planner arises at home when tourists plan their trip to Amsterdam and download the GVB app. This insight reveals a gap because the digital touchpoints provided by NS are less prominent than those of GVB. This highlights a potential solution for NS to improve the visibility and usability of their digital touchpoints to ensure tourists are aware of the correct ticketing options from the start of their journey.

Tourists who plan their trip from home and download the GVB app believe this ticket includes the train. Consequently, they ignore other ticket purchase touchpoints later in the journey. Even if they notice these touchpoints, they skip them, assuming they already have the correct ticket. This misunderstanding creates a gap later in the journey, as these tourists skip NS's touchpoints at Plaza.

03 Negative experiences and the recency effect

The as-is customer journeys for both groups travelling without a valid ticket reveal that they end their journey with a negative experience, as they are unable to exit the check-out gates. Research indicates that end-of-experience evaluations significantly influence overall satisfaction and future behaviour, such as the likelihood of repeat purchases or recommendations (Kahneman et al., 1993; Fredrickson & Kahneman, 1993). This is supported by the recency effect, where individuals recall the last information more easily than earlier information. The recency effect happens because the most recent items are still within the short-term storage of working memory, making them more accessible for recall (Baddeley & Hitch, 1974).

CHAPTER 04.8

Defining the problem statement of tourists travelling without a ticket

Research reveals that the main challenges are caused and experienced by tourists travelling from Schiphol Airport to Amsterdam without a valid ticket. The following chapter explains the identified challenge. It provides an estimate of lost revenue for NS and creates a design challenge that serves as a starting point for the next phase, the ideation phase.

To articulate the problem effectively, the following topic explains the identified problem from different perspectives.

01 What is the problem?

The problem is that international tourists are travelling from Schiphol Airport to Amsterdam by train without a (valid) ticket.

02 What causes the problem?

The problem is caused by the absence of check-in gates at Schiphol Airport. This results in not reminding, checking, and enforcing tourists to travel with a valid ticket.

03 What impact does it cause?

This problem primarily results in lost revenue for NS, as tourists travel without a (valid) ticket. In addition, not being able to exit the check-out gates also causes delays and congestion. Additionally, the lack of a ticket leads to confusion and can result in violent incidents, especially during confrontations.

04 Why is it a problem?

NS reported an underlying operating loss of €191 million in 2023. Tourists not paying for a valid ticket adds to this. In addition, it also causes the customer journey to end with a negative experience, resulting in poor overall satisfaction and future behaviour.

05 What are the potential solutions?

The research revealed three solution areas. These include guiding travellers step by step, reaching them earlier in their journey, and delineating the station domain, intended to make travellers aware that an NS ticket is needed and trigger interaction.

06 Benefits of the solutions?

Solutions aim to provide international tourists with a clear understanding of the necessary steps to travel with NS, preventing them from encountering closed gates at the final station. In addition, it generates equitable revenue for NS on this route.

In short, the problem statement mentions:

“Tourists travel from Schiphol Airport to Amsterdam by train without a valid ticket, primarily resulting in revenue loss for NS and negatively adding to the overall experience of tourists”.

4.8.1 Revenue lost because of tourists without a valid ticket

The problem statement indicates that the problem primarily impacts the missed revenue for the NS. Therefore, it is crucial to determine the financial sum of this problem.

Figure 4.7 presents an overview of the key numbers to determine the annual loss of 385 thousand euros. Given the arrival times of planes at Schiphol Airport, tourists travel by train to Amsterdam for 15 operational hours daily. Based on the qualitative research observations, I estimate that eight tourists per hour travel without a valid ticket from Schiphol, resulting in a daily total of 120 ticketless tourists. Approximately 70% of these tourists use the IJ-Side exit, where I conducted my research, leading to 171 tourists. Of these, I estimate that around 80% are headed to Amsterdam Central Station, bringing the total number of tourists to all stations in Amsterdam to approximately 214 per day. Over a year, this amounts to 78,475 tourists. With a ticket price of €4.90, the annual revenue loss is estimated at €384,537.50, or roughly €385,000.

This calculation does not include tourists travelling to other popular cities in the Netherlands, such as Utrecht, The Hague, or Rotterdam. It also does not account for domestic travellers who forget to check in their OV-chipcard at Schiphol Airport. This indicates that the overall lost revenue caused by travellers from Schiphol Airport will be even higher. Additional quantitative research should reveal this total number of travellers.

4.8.2 Defining design challenges to respond to the two identified target groups

This chapter presents the design challenges related to the experienced challenges of identified each group.

01 The Ticketless Non-Planner

The Ticketless Non-Planner is a tourist who boards the train without purchasing a ticket because they miss the touchpoints that should prompt them to buy one.

The key question here is:

How can we enhance the visibility and effectiveness of these touchpoints to ensure tourists understand that a valid ticket is required to travel by train?

02 The GVB Planner

The GVB Planner is a tourist who prepared for their journey but is unaware that they are travelling with the wrong ticket.

The critical question for this group is:

How can we make tourists aware that a GVB ticket is not valid for train travel?

4.8.3 Refocus of the initial project topic

Reflecting on the initial research question and objective of this project, the goal was to 'improve the intuitive access to NS services of international tourists' by better integrating physical and digital touchpoints. The research shows that the main challenge in intuitively interacting with the needed touchpoints in the journey are caused and experienced by tourists travelling without a valid ticket. Therefore, the rest of this project details the focus by committing to the identified group of tourists.

170

Number of tourists travelling from Schiphol Airport to Amsterdam Central without a ticket.

215

Number of tourists travelling from Schiphol Airport to Amsterdam without a ticket.

79k

Number of tourists travelling from Schiphol Airport to Amsterdam without a ticket per year.

385k

Revenue lost per year due to tourists travelling from Schiphol to Amsterdam without a ticket

Figure 4.7 presents an overview of the key numbers to determine the annual loss of 385 thousand euros.



CHAPTER 05

Formulate new journey goals and explore solution areas

This chapter outlines the strategic objectives for each phase of the new journey, transforming the problem statement into actionable opportunities. It explores digital solution areas through a digital marketing analysis and physical solution areas through 'Airport Safaris'—collaborative meetings held at Schiphol with key stakeholders. Additionally, this chapter covers the ideation phase including an ideation workshop.

CHAPTER 05.1

Analysing the gap in offering of GVB and NS

Qualitative research indicates that a large group of tourists travel with a GVB ticket instead of an NS ticket. Most of these travellers find the digital GVB offerings during the initial step of the journey (planning and orientation) and download the GVB app. Consequently, these travellers embark on their journey under the impression that they've already purchased a train ticket, ignoring NS touchpoints. Therefore, it is important to understand why such a considerable number of travellers opt to download and use the GVB app. This chapter explores how GVB presents itself digitally and provides insight into the findability of the GVB app.

5.1.1 Analysing the offering of the GVB compared to the NS

Figure 5.1 presents an analysis of the GVB and NS apps. Screenshots of various pages explain the apps, thereby highlighting their relative advantages. The key insights from this analysis are as follows:

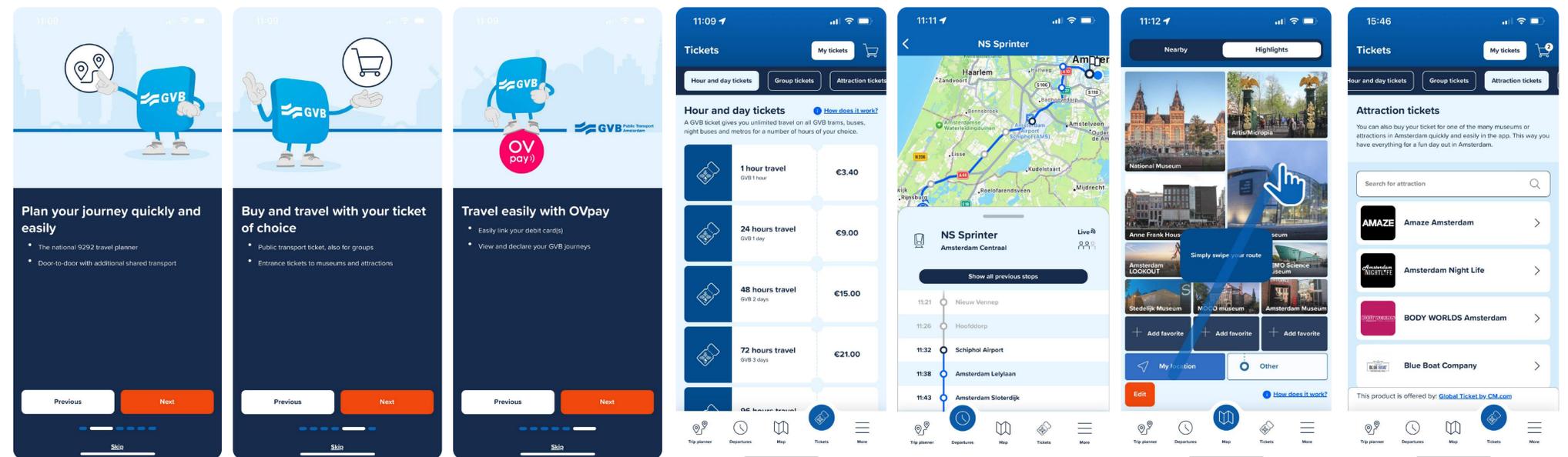
01 Tourist-Centric Design

The GVB app taps into to the needs of tourists. It provides easy access to travel advice between tourist attractions in Amsterdam. Additionally, the GVB app allows users to purchase tourist attraction tickets, such as museums and experiences. However, the NS does not offer tourist-specific tickets or benefits, revealing a gap in responding to this target audience. This gap suggests that the NS is less effective in catering to the needs of tourists. This insight can be supported by the quote of interviewee 4.5 in their GVB ticket:

"So this ticket is also for the museums and just everything kind of combined. So we were just like okay let's get it."

02 Challenges and misleading information

The GVB app also presents competitive



Offer 'door-to-door with additional shared transport'. Misleading into thinking all public transport options are available

Benefit: also tickets for groups, and entrances to musVoordeel: ook kaartjes voor groepen en toegang tot musea en attracties.eum and attractions.

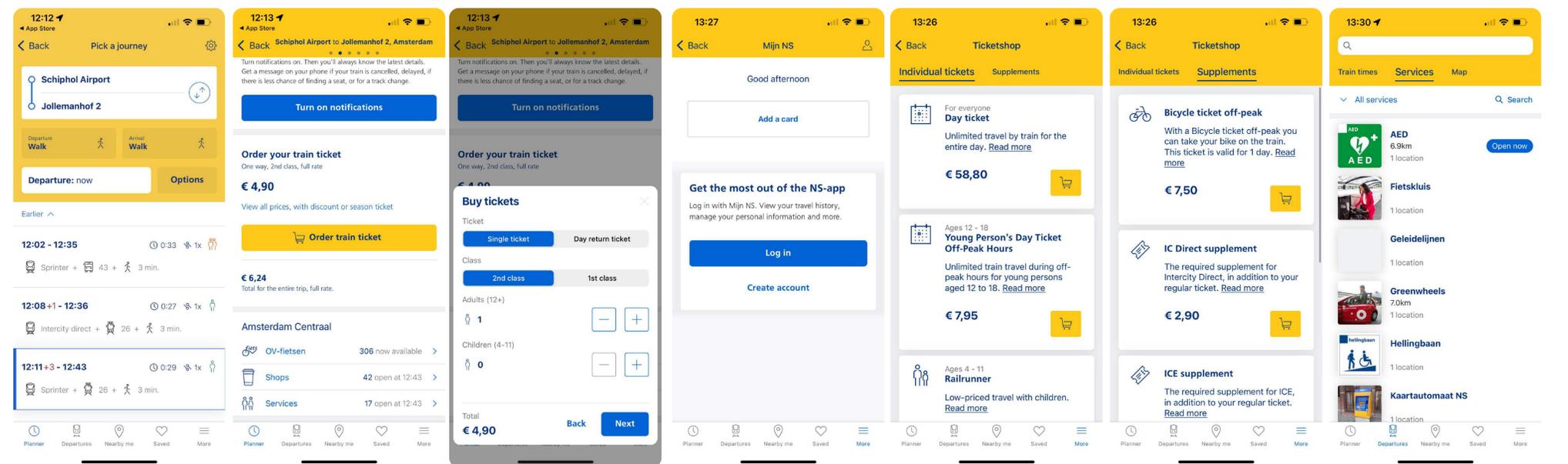
Promoting OV-pay before entering app.

Benefits: tickets per day or per hour. Direct check-out flow, and QR codes available in the app

Gives travel information for the train from Schiphol Airport to Amsterdam Centraal, misleading as no communication tells this is not included in GVB offering.

Benefit: tailored for the needs of tourists, easy navigation through popular tourist attractions.

Benefit: App also provided opportunity to purchase attraction tickets, some for a reduced price.



Offer 'door-to-door with additional shared transport'. Also offering the services of GVB, without clear communication this is not part of the NS offering

Option to already purchase the train ticket for this trip, not possible to purchase a GVB ticket from the NS app.

Option to add train tickets in the app, depending on amount of travellers.

Users can create an account on the website to get personalised travel advice and recommendations.

Similar to the GVB offering, NS also offer unlimited travel day tickets. However, the prices in this offering compared to the NS have a big difference.

Option to add supplements for your trip, for example when you are travelling with a bike.

Overview in app of services nearby you.

Figure 5.1: an analysis of the GVB and NS apps.

challenges with NS. For instance, the app mentions offering 'door-to-door service with additional shared transport,' which can be misleading for first-time international tourists who still need to learn about the Dutch public transport systems. Moreover, the app recommends taking the train from Schiphol Airport to Amsterdam, which is separate from GVB's offerings. This 'door-to-door' service suggests that all public transport options are available.

However, the NS offers a similar service, including door-to-door travel advice through the NS app, which integrates additional public transport providers. The primary difference is the target audience. While many NS travellers are familiar with our system, the GVB primarily serves international tourists unfamiliar with our system. Consequently, the NS may face more disadvantages from the similar service provided by the GVB. This insight can be supported by the quote from interviewee 4.3 on their GVB ticket:

"I searched for trains in the GVB app from Schiphol and I found this train. Then I thought, of course, it should be included"

03 Communication of OV-pay

The third insight pertains to the difference in the communication of contactless payments between GVB and NS. GVB promotes contactless pay (OV-pay), indicating the added value of this feature. NS does not actively promote contactless pay within its app. This presents a gap in communication strategy.

"I wonder why NS made the choice not to actively promote contactless pay, as it does have many advantages for both the traveller and NS (pressure from ticket machines, fewer long lines, etc)."

5.1.2 Relevance

These insights will be used in the ideation phase. The insights are turned into how might we's:

- How might we make the NS offering more tourist-centric?
- How might we ensure the door-to-door service from GVB is not confusing for tourists?
- How might we communicate on contactless payment for tourists?

CHAPTER 05.2

Digital Presence Comparison: GVB vs. NS

The previous insights don't address how this significant group of tourists find the GVB app. According to qualitative research insights, GVB planners find the GVB app online. Therefore, it is interesting for NS to understand how the GVB presents itself, and why such a significant group of tourists find their offering. To understand how GVB positions itself digitally compared to NS, I sought assistance from my brother, Job Knipscheer, a senior SEA and SEO specialist at an online marketing startup. Together, we used the Google Ads platform to assess GVB's visibility on Google.

5.2.1 GVB's Online Visibility

Qualitative research indicates that this group of tourists finds GVB online and download the GVB app, over finding NS and downloading the NS app. To evaluate GVB's online visibility, we undertook the following steps (see Figure 5.2).

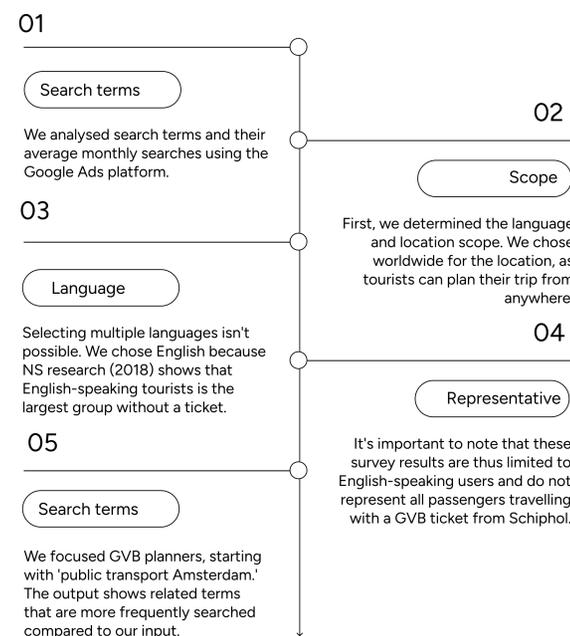


Figure 5.2: steps to evaluate GVB's online visibility

The most popular search terms and their average monthly search volumes are as follows:

- Public transport Amsterdam (12.1K)
- Amsterdam Transit (12.1K)
- Amsterdam public transport (12.1K)
- Amsterdam Local transport (12.1K)
- Amsterdam mass transit (12.1K)

5.2.2 Organic Search Analysis insights GVB

Organic search refers to the process by which a search engine identifies and ranks website content based on its natural relevance and quality, without the influence of paid advertisements (Similarweb, n.d.). Using a British VPN, we examined the organic search results for the most popular search terms. GVB appears at the top of the page, while NS ranks 16th. This indicates that GVB is significantly more visible than NS for the most commonly used search terms.

5.2.3 Cost Analysis for Improved Visibility

We assessed the potential costs for NS to appear higher on the page using the Google Ads platform. The top-of-page bid (cost per click) ranges from €0.12 to €2 per click. Given that a train ticket costs €4.90, and not every click results in a ticket purchase, an average click cost of €1 is not profitable.

"This is an interesting insight, as this means that NS needs to reach the GVB planners differently."

5.2.4 NS's online findability

However, it is also interesting to compare these insights to the online findability of NS presents. This helps to understand why fewer people find the NS website and app online, which can result in recommendations and new how might we's for the ideation phase. Therefore, we also analysed the most commonly used search terms and their volumes related to the train from Schiphol to Amsterdam:

- Amsterdam Airport train (5.4K)
- Train Schiphol Amsterdam (5.4K)
- Amsterdam Airport to city centre (3.6K)
- Schiphol to Amsterdam (2.9K)
- Schiphol Airport to Amsterdam (2.9K)

5.2.5 Organic Search Analysis insights NS

Using the same VPN, we found that Schiphol appears at the top of the page organically, with

NS ranking second and GVB at 53rd. On these search terms, there is thus no competition between NS and GVB. The top-of-page bid (cost per click) ranges from €0.08 to €0.74, averaging 40 cents per click. Since NS and Schiphol are already well-ranked organically, investing to appear higher on Google is not cost-effective. However, NS should ensure that its online offerings include clear calls to action and adequately address tourists' needs. Which could show the gap with GVB.

 The following 'how might we' presents the starting point of the ideation phase:
How might we use the NS landing page (when looking for the mentioned search terms) to better respond to tourists' needs and trigger more action?

CHAPTER 05.3

Airport Safari: Understanding the feasibility of new solutions at Schiphol

This subchapter presents insights into stakeholder perspectives on the feasibility of potential solutions within this context, derived from the so-called 'Airport Safaris'. These were interactive meetings with representatives from the key stakeholders, including NS, Schiphol, ProRail, and Spoorbouwmeester.

5.3.1 The reason for the Airport Safari's

After interviewing Interviewee 2.4 from NS, I understood that the NS is exploring a specific approach to address the identified solution area: delineating the station domain (see chapter 4.3). They are considering placing floor stickers at Plaza, extending through the check-in posts (see Figure 5.3). The main goal of this initiative is to enhance the visibility and recognisability of the station domain within the Plaza. The 'Airport Safari' primarily focused on discussing this floor sticker concept with key stakeholders who needed to approve new ideas at Plaza before implementation. After our informal conversation post-interview, Interviewee 2.4 and I agreed that attending the 'Airport Safari' would benefit my project.

My goal was to understand how the stakeholders assess the feasibility and implementation of new solutions in this context. The meetings consisted of NS, ProRail, Schiphol, and Spoorbouwmeester representatives. The total group included 10 people.

5.3.2 Results of the Airport Safari on the Floor Stickers Concept

During the first 'Airport Safari' meeting, we discussed various options for the new floor stickers (see Figure 5.4). NS initially proposed the text 'to the trains'. However, this was misleading as the stickers delineate the station area through the CICO posts, not guiding



Figure 5.3 The proposed placement of floor stickers at Schiphol Plaza (figure made by interviewee 2.4)

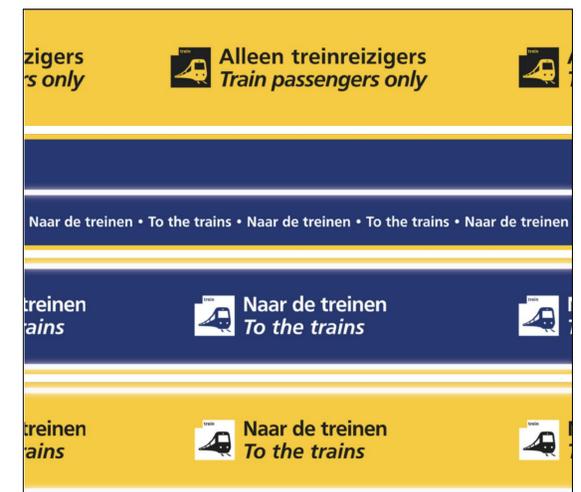


Figure 5.4 Various options for the new floor stickers

travellers to the trains. I raised this issue supported by my insight from qualitative consumer research, which showed that tourists generally find the trains and platforms easily but struggle with the visibility of ticket sales and check-in points. Spoorbouwmeester agreed, emphasising that the stickers should prompt action without adding extra information.

In the second 'Airport Safari' meeting, NS presented revised iterations of the floor stickers (See Figure 5.5). The text now reads 'check in train/ check out train' and includes both train and check-in/out icons. This Proof of Concept (POC) will be implemented this autumn as a pilot to test its impact on the visibility of check-in/check-out points.

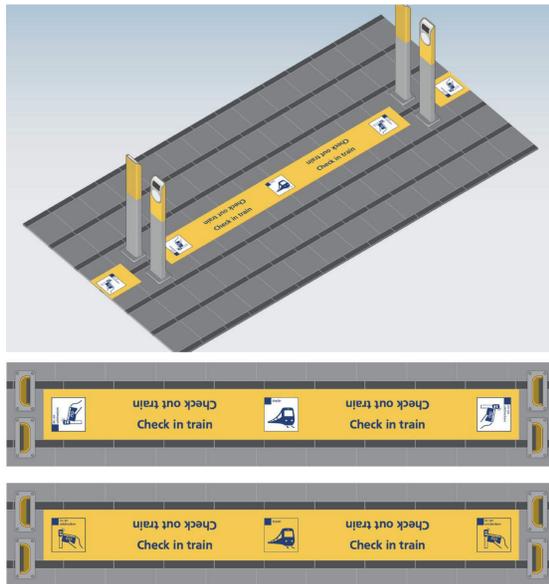


Figure 5.5: Iterations of the floor stickers

💡 These developments in delineating the station area influence the solution space for my project. As this POC is set to be tested, it is crucial to consider its potential permanence.

5.3.3 Stakeholder perspectives on the public space and the proposed solution by NS

The following section responds to my personal learning goal in these meetings and explains the stakeholder perspectives on implementing new solutions at Schiphol.

01 Spoorbouwmeester

Spoorbouwmeester advocates for a minimalist 'less is more' approach, suggesting that the stickers should be as unobtrusive as possible and align with NS branding colours. The aim is to maintain a calm environment in the busy Plaza space. Therefore, they rejected the floor sticker versions with reflective light strips (see Figure 5.4).

They further explain that when travellers enter the Plaza, there is no more time to explain how the different touchpoints work. The abundance of information at Plaza can detract from the attention and recognition of essential touchpoints. They stress that informative content about travelling with NS should be provided during quieter moments in the journey when travellers can take a moment to look around, not during moments of interaction.

ProRail

ProRail's primary objective is to ensure traveller safety and promote seamless transit on the platforms. They emphasise that this is particularly challenging at Schiphol due to the narrow platforms. They explain that implementing new touchpoints on the platforms is not possible, as it could conflict with safety regulations. While ProRail is not convinced that floor stickers at Plaza are a long-term sustainable solution, they recognise the need to increase the visibility and recognisability of the station area at Schiphol.

Schiphol

Schiphol is keen to collaborate to optimise the Plaza area for all types of travellers and views the floor stickers positively. The Schiphol representative was unaware of the challenges train passengers face in the Plaza, such as the impact of commercial parties overshadowing NS's touchpoints. Schiphol is very interested in understanding Spoorbouwmeester's regulations and exploring possible improvements to create a more consistent experience for train passengers in the Plaza.

5.3.4 Design insights

The following insights present how these stakeholder perspectives impact the solution space of this project.

01 Explanatory information on quiet moments

Explanatory information about the necessary touchpoints on how to travel successfully with NS should be provided during quiet moments in the journey when tourists have time to read and take in the information. When travellers enter Plaza, it is too late to offer explanatory information on how the system works. The surplus of touchpoints and triggers at Plaza results in additional information-heavy touchpoints that will not stand out. Additionally, it is crucial to encourage quick transitions rather than having travellers stand still at the Plaza.

02 No additional touchpoints at the platforms

New touchpoints are not feasible from the moment travellers descend the stairs due to the narrow platforms and the need to ensure safety. This underscores the importance of tourists having a valid ticket before descending the stairs.

CHAPTER 05.4

Formulate new journey goals to ensure the required actions per journey phase

The insights from the Airport Safari helped understand the solution space. This subchapter outlines the goals to ensure the required actions per journey phase.

5.4.1. New goals to respond to the pain points from qualitative research

The new journey must address the challenges identified in the qualitative research and during the Airport Safari meetings. This approach ensures that I can adequately respond to the needs and pain points of tourists and NS at every stage of the journey. Figure 5.6 gives an overview of the journey phases and its goals. The following sections explain these different phases.

01

Awareness and preparation

Phase 1: From Planning to Arrival at Schiphol

The current 'as-is' journey reveals that tourists either do not purchase a ticket from home or buy the incorrect (GVB) ticket. Therefore, the objective in this phase of the journey is twofold. Firstly, it is crucial to inform the GVB planner that the GVB ticket is not valid for the train journey from Schiphol Airport to Amsterdam. Secondly, it is essential to ensure correct travel behaviour by proactively preparing tourists (ticketless non-planners) for their NS train journey to Amsterdam, making them aware that an NS ticket is required.

💡 The following 'how might we' presents the starting point of the ideation phase:
How might we effectively inform and prepare tourists to ensure they understand that an NS ticket is required for their train journey from Schiphol Airport?

02

Recognition of necessary touchpoints & trigger interaction

Phase 2: From Finding Train Departure Information to Ticket Check-In

The next phase mentions the the step where tourists, upon arriving at the Plaza, seek train departure information and (should) proceed to check in with their ticket or bank card. When tourists arrive at the Plaza, the goal is to ensure they understand the necessary actions they need to take, recognise the required touchpoints, and are encouraged to interact with them. Given the busy environment of Plaza, providing detailed explanations on how to use the touchpoints is not possible (as understood during the Airport Safari). Instead, clear and concise instructions can support the required actions in this phase.

The current 'as-is' journey (Chapter 4.7) revealed that tourists skip the ticket purchase and check-in steps, as they are either focused on performing another task (finding the right platform) or are mistakenly under the impression that they've already purchased the right ticket (GVB ticket). This objective underscores the importance of the previous phase, where awareness and preparation for the correct touchpoints can be established.

💡 The following 'how might we' presents the starting point of the ideation phase:
How might we encourage the recognition of necessary touchpoints at Plaza and trigger interaction?

03

Reminding and making tourists aware of their wrong actions

Phase 3: From Finding the Platform to Boarding the Train

Once tourists descend to the platforms without a valid ticket, they skipped the ticket purchase or check-in touchpoints. Currently, there are no further options to purchase a ticket during the remainder of the journey, leading to tourists encountering closed gates in Amsterdam. Therefore, the goal of this phase is to ensure that tourists are reminded to purchase a valid ticket before boarding the train. This objective is twofold. For the ticketless non-planner, the goal is to ensure the realisation that ticket purchase

is only possible upstairs at Plaza. For the GVB planner, it is important to create awareness that a GVB ticket is not valid for NS trains.

💡 The following 'how might we' presents the starting point of the ideation phase:
How might we effectively inform and remind tourists that they need an NS ticket before boarding the train?

04
 Recover from the mistake of travelling without a valid ticket
 Phase 4: From Train Journey to Check-Out

Qualitative research revealed that tourists want to be able to rectify their mistake of travelling

without a valid ticket. Additionally, research revealed that tourists often become aware of their mistakes only while on the train or at the check-out gates. The goal of this final phase is to address this need by providing tourists with opportunities to correct their mistakes. This includes making tourists aware of their incorrect behaviour before they cause congestion at the check-out gates, and ensuring they understand the steps they need to take to exit the check-out gates equitably.

💡 The following 'how might we' presents the starting point of the ideation phase:
How might we ensure that tourists can recover from their mistake of travelling without a valid ticket?

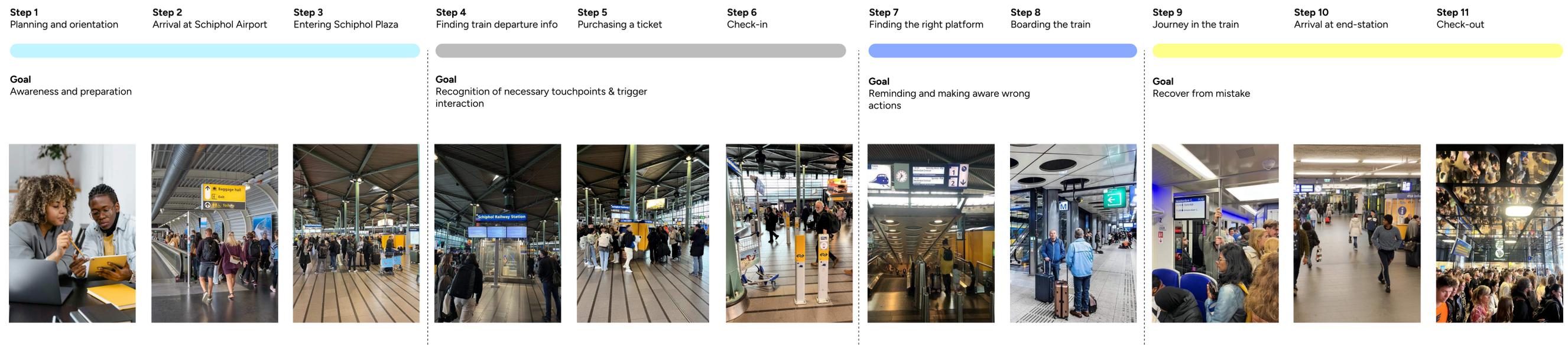


Figure 5.6: An overview of the journey phases and its goals.

Ideation and facilitating an ideation workshop

With the goals for each new journey phase established and a clear understanding of what the new solutions should aim to achieve, the ideation phase could begin. The following subchapter presents the ideation phase.

5.5.1 Considerations before starting ideation

The qualitative research with NS employees, the biweekly meetings with Ralf, the additional meetings with interviewees 2.4 and 2.6, and the Airport Safaris provide an understanding of the perspectives and desires of various stakeholders regarding the journey. However, during the ideation phase, it is crucial to temporarily set aside these perspectives to avoid constraining the creative process.

5.5.2 Brainstorming and ideation workshops with colleagues at Fabrique

01 Brainstorming

The 'how might we's throughout this project formed the starting point of this brainstorming session. The brainstorming session presents a total of 115 ideas. Appendix 6 presents an overview of all concepts per journey step. These ideas varied from placing an Arlanda Express-inspired ticket stand at the gates at Schiphol to placing horizontal signs above the ticket machines to increase visibility, and from deploying employees at Schiphol to check tourists' tickets to creating a new service desk at Amsterdam Centraal to receive all tourist without a valid ticket.

02 Ideation workshop

In addition to independently brainstorming concepts for each journey step, I hosted an ideation workshop at Fabrique. Engaging colleagues in the ideation process served as an interactive way to include their perspectives in

the project. I facilitated an ideation workshop during the bi-monthly UX meet-up, providing a 45-minute session for collaborative ideation (see Figure 5.7).

Given the limited time, I prepared a clear workshop plan and agenda. The session began with a brief introduction and recap of the project, highlighting key insights from consumer research and providing essential instructions for the day's activities. Appendix 7 presents these presentation slides. I divided the UX designers into groups of three to foster discussion and collaboration. I provided them with sticky notes and pens to write down their ideas and place them on the relevant journey phase. As the groups worked, I circulated among them, occasionally posing critical questions to understand their thought processes and encourage deeper reflection and thorough exploration of their ideas.

5.5.3 Insights from the Ideation Workshop

While the workshop was fun and engaging, it resulted in only a few new concepts that I didn't consider during the brainstorming phase (now 122 ideas). However, these few concepts presented interesting new insights.

For example, one concept suggests the significance of prominently featuring NS's visual identity and communicating it through all new steps emerged as a key point. The goal is to consistently expose tourists to the NS brand, creating a breadcrumb trail that would help them recognise and navigate the touchpoints more effectively.

Another concept involves allowing tourists to choose the ticket purchase method that suits them best. There are three different ways for tourists to purchase a ticket: through ticket machines, via contactless payment, or an e-ticket through the website or app. The concept suggests that three different methods should always be provided in three, offering tourists a way to choose their preferred methods themselves. For example, showing posters with the message: 'How are you taking the train from Schiphol Airport? E-ticket, Contactless pay, or Ticket machines.'

 *This raised a critical question: which payment method should have the focus, or should all three be options?*

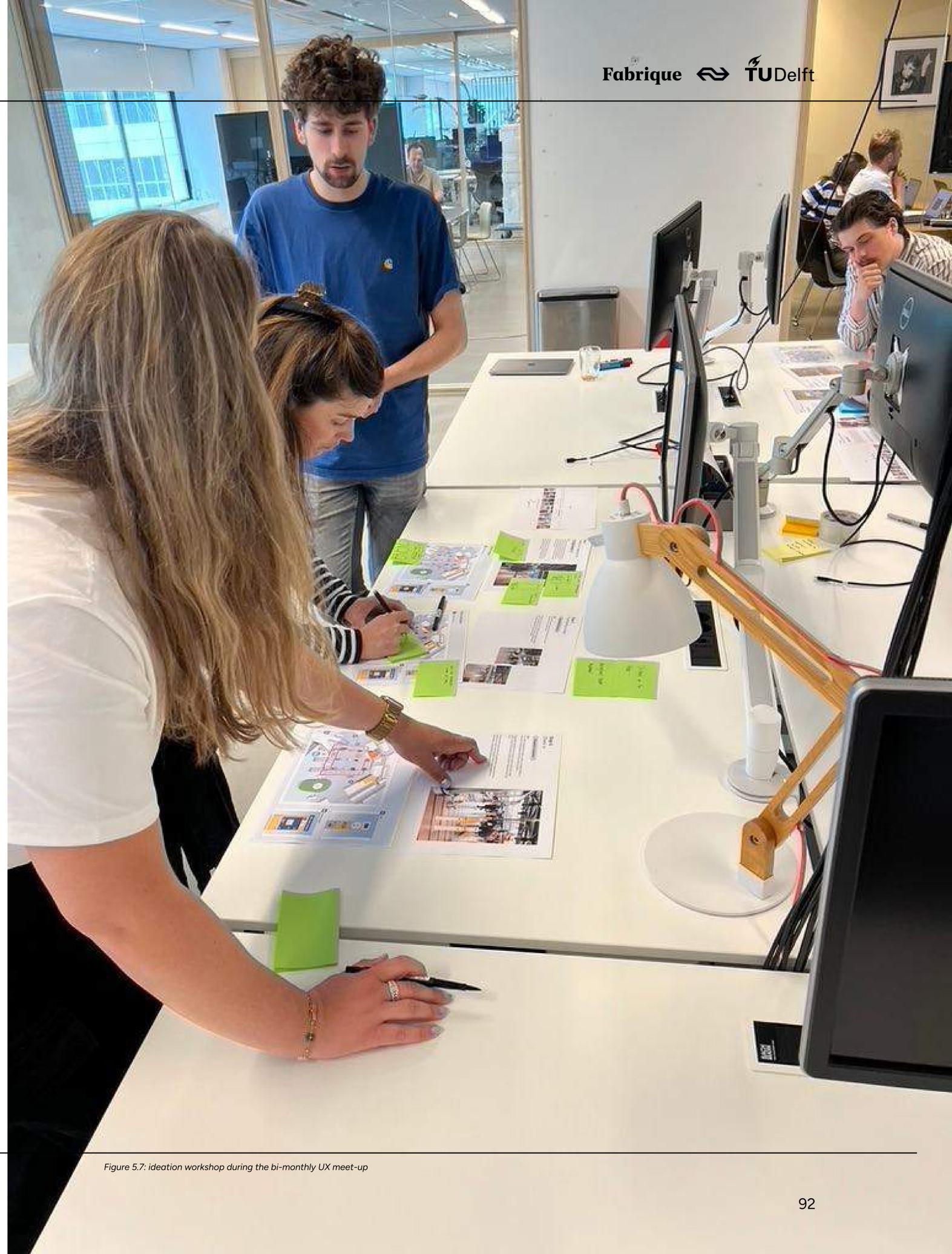


Figure 5.7: ideation workshop during the bi-monthly UX meet-up



06

CHAPTER 06

Revealing the final concepts: approach to prioritising solutions

The following chapter presents the approach to prioritising the ideas from the ideation phase into three journey concepts for further development and iteration. The steps include applying the RICE prioritisation method and meeting various stakeholders to identify the requirements. Additionally, this chapter sharpens the focus on the consumer, particularly regarding payment methods.

CHAPTER 06.1

Approach to prioritising solutions

This chapter presents the approach to prioritising the ideas from the ideation phase. Figure 6.1 presents an overview of the steps taken to prioritise the ideas.



Figure 6.1: Overview of the steps taken to prioritise the concepts

6.1.1 RICE prioritising method

The first prioritising method presents the RICE scoring model. This model is a prioritisation method to evaluate the concepts based on four factors: reach, impact, confidence, and effort. The RICE model provides three advantages: it facilitates data-driven decision-making, mitigates personal biases, and supports the rationale of priorities to stakeholders (ProductPlan, 2022b). Appendix 8 presents an overview of the RICE prioritising method. The formula of the RICE prioritisation method reads: $(Reach \times Impact \times Confidence) / Effort = RICE$

01 Reach

This estimates the number of people the concept reaches within a specific timeframe. In this case, it presents the number of tourist impressions a concept generates per month.

02 Impact

Impact measures quantitative numbers (for example the number of positive word-of-mouth conversations). Since it is difficult to determine the impact of specific solutions, I use a five-tier scoring system (ProductPlan, 2022b). Reaching from minimal impact (0.25), low impact (0.5), medium impact (1), high impact (2), and big impact (3). In this case, how the identified consumer needs and pain points are addressed, determines the impact score.

03 Confidence

Confidence accounts for the reliability of the data supporting the reach and impact scores. The factors categorise confidence levels into high (100%), medium (80%), and low (50%) (ProductPlan, 2022b). In this case, insights mentioned by multiple stakeholders and supported qualitative research, present a higher confidence score than insights only mentioned by a small part of the interviewed tourists.

03 Effort

Effort represents the denominator in the RICE formula and quantifies the resources required to complete the concept. It is measured in time-to-market and associated investments (ProductPlan, 2022b). Concepts that require collaboration with other companies are also considered to have a higher effort score.

This prioritisation method reduced the number of ideas from 122 to 59.

CHAPTER 06.2

List of requirements

The following step presents the stakeholder requirements. A series of meetings with the different stakeholders identified these requirements. These include two meetings with NS: one with Ralf Lambie lasting one hour, and another with interviewees 2.4 and 2.6 lasting 1.5 hours. Additional meetings with Spoorbouwmeester and ProRail, lasting 45 minutes each, identified these requirements. Figure 6.2 presents the list of requirements. The following section explains these requirements.

6.2.1 NS requirements

NS primarily focuses on the return on investment and the minimal impact (measured in monetary value) that the solutions must achieve. Additionally, the concept must contribute to and align with the current brand experience of NS. This means that all solutions must adhere to NS's branding guidelines and should not confuse or disadvantage domestic travellers. Furthermore, the concepts must be secure, particularly in terms of resilience against cybercrime. The Minimum Viable Product (MVP) of this project must be ready to launch in 2025, parallel with the introduction of the new sprinter train. Horizon 2 and Horizon 3 solutions should be implemented within the next five years (2030).

6.2.2 ProRail requirements

ProRail's primary requirement is that the solutions must not compromise passenger safety. This ensures that the solutions do not obstruct pedestrian flows or reduce the already limited space on the platforms. Additionally, the

solutions must comply with the guidelines set by Spoorbouwmeester, which specify that sightlines must not be obstructed and that nothing should be placed on transparent surfaces. As previously mentioned, new touchpoints on the platforms are not possible. ProRail prefers minimising the movement of tourists from the platform back to the Plaza, emphasising the need to ensure tourists have valid tickets at the beginning of their journey.

6.2.3 Spoorbouwmeester requirements

Spoorbouwmeester required that the solutions must comply with the Spoorbeeld, particularly the Routing, Signing, Branding Handbook, and Information Regulations. For example, information boards must always be placed at a height of 2.5 meters. Additionally, Spoorbouwmeester emphasised the requirement for sustainability. New solutions must be made from sustainable materials and be recyclable. Digital solutions must be powered by green energy.

6.2.4 Utilising the requirements and gathering insights

The ideas that do not align with the requirements remain on the backlog of ideas but are not recommended for further implementation. This process ensures that only the most viable and feasible concepts move forward. However, some concepts presented a significant RICE score but did not (totally) match the stakeholders' requirements. For example, ProRail prohibits the installation of new touchpoints on the platforms. Nevertheless, some of my high-scoring RICE concepts utilise existing platform touchpoints. While ProRail does not prefer this, discussions with ProRail and later with NS revealed some flexibility to move forward with these ideas and assess their impact on passenger safety.

Requirements NS

Brand Experience

- Solutions must align with the new NS brand style.
- Solutions should be in line with the brand house.
- Solutions should contribute to the sympathetic image of NS, especially considering the tone of voice.
- Must not confuse domestic travellers; solutions should not come at the expense of domestic travellers.

Impact

- Solutions are interesting if they can make a difference of +100k.

Return On Investment

- Individual solutions should not cost more than 50k.

Time to Market

- MVP should go live in 2025.
- Horizon 2 / Horizon 3 solutions can be implemented within 5 years.

Safety

- Solutions must not be susceptible to misuse, such as cybercrime.
- Solutions must be physically feasible within the available space, leaving sufficient transfer space.

Limitations

- Ticket machines cannot be moved or rotated; this costs 10k per machine.
- No check-in gates are possible at Schiphol Plaza.

Requirements Spoorbouwmeester

Spoorbeeld

- Must (be able to) comply with the Spoorbeeld, where compliance with the RSB handbook is important.
- Must comply with key information regulations.
- Must not obstruct pedestrian flows.

Sustainability

- Solutions should be made from sustainable materials, preferably recycled or bio-based. Digital solutions must be powered by green energy.

Preferences

- Less is more; offer the solution as neutrally and calmly as possible.
- Ensure the solution can eventually be scaled back to the Spoorbeeld, but also consider leaving it aside for now.

Requirements ProRail

Safety

- Must not obstruct pedestrian flows.
- Must not endanger travellers.
- Must not come at the expense of transfer space on platforms.

Regulations

- Must comply with the vision on travel information policy.
- The line of sight must not be obstructed; nothing should be placed on transparent surfaces.

Limitations

- Nothing new can be placed on the platform.

Preferences

- Avoid having tourists go back up from the platform at Schiphol. Focus on the journey up to the ascent points to avoid disrupting platform dynamics.
- Focus on the beginning of the journey to keep the platforms calm.

CHAPTER 06.3

Airport Safari II: Discussing proposed ideas

Additional meetings with the key stakeholders (NS, Spoorbouwmeester, ProRail, and Schiphol), validated the remaining concepts. By discussing solutions with them, for example during the second Airport Safari, I gained a thorough understanding of the viability and feasibility of the solutions.

6.3.1 Presenting qualitative insights and discussing solutions

Before the second Airport Safari, interviewee 2.4 reached out via email, inviting me to present my qualitative insights at Schiphol. I was happy to accept this opportunity.

This presentation focussed on the insights of the tourists travelling without a valid ticket. Initially, the plan was to only present the research findings. However, following my presentation, the questions and discussions about potential solutions continued to flow. Since I was already developing the solutions at this point, I took the opportunity to present them. This provided a unique chance to discuss the concepts interactively with Schiphol, NS, Spoorbouwmeester, and ProRail.

6.3.2 Results from stakeholder discussions

This discussion revealed that the feasibility of the ideas was received more positively than anticipated. The stakeholders were particularly enthusiastic about the solutions proposed for the first phase of the journey. They saw potential in the collaboration with companies such as Easyjet and Booking.com. In addition, Erik from Schiphol expressed optimism about placing posters behind customs, at the gates, and immediately suggested discussing this with the Schiphol Media team. However, some nuances emerged in the proposed solutions. For example, one solution suggests placing posters above the stairs at Schiphol (see Figure 6.3). Prorail and Spoorbouwmeester rejected this due to safety concerns, as people might not watch

their steps and could fall. Despite this, other moments in the journey were identified as ideal opportunities for poster placement.

Another idea suggests relocating the meeting point and static information boards at Plaza (see Figure 6.4). Schiphol was optimistic about relocating these touchpoints. They explained that Plaza has a system floor, making it easy to move these touchpoints. However, Spoorbouwmeester clarified that it is legally required to keep the static information boards next to the ticket machines, so complete relocation was not possible. Despite this, the arrangement of the boards could be changed to improve visibility from Arrivals 1 and 2, allowing the ticket machines to be seen more clearly. All stakeholders agreed upon the proposal to relocate the meeting point.



Figure 6.3: Declined solution by Spoorbouwmeester and Prorail: posters should not be placed above or next to stairs

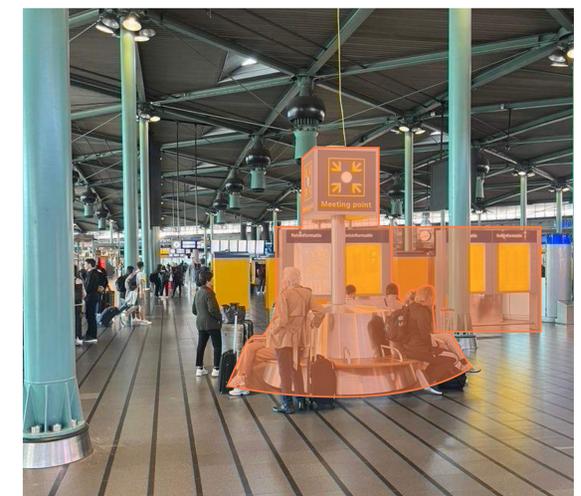


Figure 6.4: The meeting point and the static departure boards block the view of the ticket machines

Figure 6.2: List of requirements: NS, Spoorbouwmeester, and ProRail

Concept validations with NS

In addition to the Airport Safari, meetings with Ralf, Interviewees 2.4 and 2.6 provided an iteration of the proposed solutions. This chapter presents the insights that emerged from these meetings.

6.4.1 Solutions requiring collaboration

Firstly, solutions requiring collaboration with other companies, such as GVB, need thorough substantiation. NS is unsure about GVB's willingness to adjust its app without a compelling reason. Therefore, it is essential to explain the added value for GVB in such collaboration. Additional quantitative research should play a role in reinforcing these proposals. This approach is equally relevant for collaborations with companies like EasyJet and Booking.com, as other solutions suggest. The challenge is to make these solutions appealing to all parties involved, not just to NS.

6.4.2 Ensuring safety

One of the solutions involved using the digital screens on the train to direct tourists to the NS website, for example through a QR code, for backup ticket purchases. However, Ralf pointed out that this could lead to system abuse by domestic travellers. He raised this concern following an internal meeting about the use of digital screens. Allowing passengers to buy tickets on the train could result in travellers avoiding ticket purchases at the start of their journey, opting instead to buy tickets only when they see a conductor approaching.

6.4.3 Preferred payment option

While I began to form a clear understanding of which solutions were promising and which required further iteration, I still lacked informed choice on the preferred communication strategy for payment options (as identified in Chapter 5.5). To address this, I sought feedback from Ralf and interviewees 2.4 and 2.6. Interestingly, their perspectives on payment methods varied. Ralf advocated for pushing tourists towards the app and focusing on e-tickets. He provided the following rationale:

"When you are logged in, we know more about your travel details. We can better inform you based on your travel history. This is something we aim to leverage more in the future. For instance, we can proactively notify you of issues on your regular route or suggest a more suitable subscription. Additionally, app usage is convenient for tourists as they can enable notifications for their journey (delays, cancellations, etc.) even without an account."

Conversely, interviewees 2.4 and 2.6 favoured contactless payment as the easiest option for tourists as it also is universally applicable across public transport in the Netherlands. However, they stressed the necessity of maintaining ticket machines as a backup for groups reliant on traditional touchpoints, such as families without multiple credit cards for contactless check-ins. Contradictory, they also emphasised the need to reduce the reliance on ticket machines due to their high maintenance costs, making them a less viable option for NS.

💡 The differing views on payment methods, from personal observations, stem from each individual's focus on their respective disciplines and goals within NS, rather than the needs and objectives of the consumer. These meetings underscored the importance of objectively evaluating which option best aligns with both business and consumer goals.

Determining the preferred payment method

This chapter aims to determine the preferred payment method for tourists at Schiphol. The goal is to respond to the needs of both target groups: 'GVB planners' and 'ticketless non-planners'. Therefore, balancing the goals of NS and the target groups is crucial for developing a payment communication strategy. This means choosing between the focus on ticket machines, e-tickets and tickets through the app, or contactless payment. Figure 6.5 presents an overview of the benefits and disadvantages of the different payment methods. This chapter elaborates on this Figure.

6.5.1 Focusing on Ticket Machines

As mentioned in the previous subchapter, meetings with NS reveal the need to reduce the pressure on ticket machines due to their high maintenance costs and the unwanted queues they create at Plaza. Therefore, focusing on ticket machines is not interesting for NS (even though they remain important as backup ticket options for families etc). In addition, placing or moving ticket machines is a highly cost-worthy process (see Chapter 6.2), and therefore not preferred by NS.

6.5.2 Digital-First Approach

Another payment strategy is a digital-first approach, which focuses on promoting the app or selling e-tickets. This aligns with NS's objective to gather more travel data and provide better information based on travel history. For tourists, the app could be convenient as it allows them to receive notifications about their journey (delays, cancellations, etc.). Literature indicates that real-life notifications enhance the feeling of security and support (Durand & Zijlstra, 2020). Additionally, this creates more

customer data for NS, enabling them to reach their customers more effectively. Buying an e-ticket or downloading the app requires digital interactions. Research indicates that GVB planners, although incorrectly, plan their public transport from home. This group thus shows potential to purchase an e-ticket or download the app, if NS succeeds in enhancing its online presence and better addresses tourists' needs (see Chapter 5.1). However, marketing insights suggest that enhancing the online presence of NS is a too cost-worthy option. In addition, the RICE scoring method suggests that focusing on a digital-first approach has a limited reach, capturing only part of the GVB planners and not the ticketless non-planners. Therefore, this payment does not have the most benefits for tourists and NS.

6.5.3 Contactless payment

The final option is contactless payment. Contactless payment offers numerous advantages in public transportation, including increased convenience, reduced transaction times, and enhanced passenger flow (Dahlberg, Guo, & Ondrus, 2015). This method requires only one action to board the train: tapping a bank card at a CICO post. However, preliminary research indicates that tourists do not recognise the CICO posts and do not interact with them (see Chapter 4.2). Therefore, focusing on these payment options requires educating tourists about the CICO posts. If proposed solutions ensure that tourists recognise the CICO posts, this option provides the most seamless transition. In addition, it builds on the POC, which includes floor stickers at Plaza.

Another benefit of this payment strategy is that contactless payment applies to all public transport in the Netherlands (see Chapter 3.3). This ensures that tourists become familiar with the Dutch public transport system. Therefore, promoting this type of payment immediately removes the added value of a GVB ticket, as tourists can use their bank card for every public transport option in the Netherlands, including buses, trams, and metros.

CHAPTER 06.6

Bi-weekly TU Delft and UX expert review

The following chapter presents the insights from a bi-weekly meeting with my thesis mentor and company supervisor. In this meeting, I explained the solutions that remained after the prioritisation methods. However, the feedback still suggested a lack of focus. The following sections presents the next steps taken to determine this focus.

6.6.1 RICE iteration

First, I iterated on the RICE prioritisation method, recognising that my previous cut-off value was too low, resulting in a large number of promising ideas. By critically reassessing and raising the cut-off value, I realised that not all solutions held equal value. For example, making clearer landing pages only applies to tourists who are already actively seeking to purchase a ticket or prepare for their trip. Additionally, I examined concepts that were nearly identical but differed in small nuances, such as placing posters behind customs versus placing them in restrooms, near baggage carousels, along walkways, etc. This process enabled me to reduce the number of ideas from 29 to 10 solutions.

6.6.2 From 10 individual solutions to three final concepts for implementation

A meeting with Anna Offermans helped to get an overarching perspective on the remaining

solutions. Her expertise in UX in the public space enabled me to distinguish the 10 remaining solutions into three concepts. The first concept includes focussing on the desired behaviour—the happy flow—rather than instructing tourists on what not to do – the unhappy flow. Research indicates that positive reinforcement is more effective in shaping behaviour than highlighting negative actions (Skinner, 1953). This insight was valuable, as my solutions aligned with either approach (focussing on the right steps for the ticketless non-planner and making the GVB planner aware of what not to do). Additionally, one solution addressed a backup option: enhancing the visibility of ticket machines. Although NS prefers not to focus primarily on ticket machines, these solutions remain crucial for families and individuals who rely on traditional payment methods. This meeting allowed me to converge all solutions into three final concepts. The following chapter introduces these three final concept journeys.

Following this meeting, everything started to fall into place. The focus that my solutions lacked returned by clearly distinguishing each solution and thus creating a division among the different concepts.

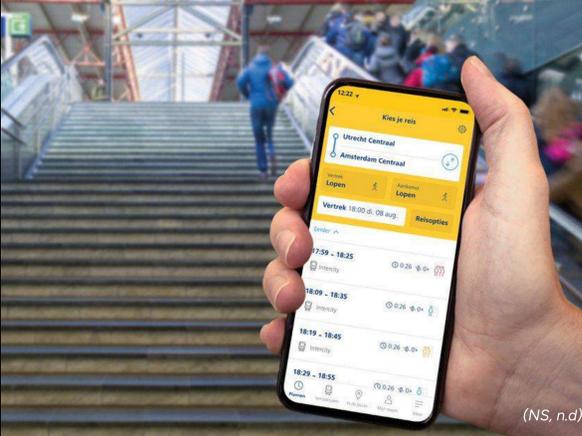
<p>Payment method 01 Ticket machines</p> <ul style="list-style-type: none"> + Important as backup ticket options for example families travelling with multiple children. - High maintenance costs -Unwanted queues 	 <p>(Schiphol, n.d.)</p>
<p>Payment method 02 Digital first: NS app</p> <ul style="list-style-type: none"> + Customer data + Tourists get real-life journey updates -Low reach -Cost-worthy marketing 	 <p>(NS, n.d.)</p>
<p>Payment method 03 Contactless payment</p> <ul style="list-style-type: none"> + Convenience, reduced transaction time, enhanced passenger flows* + Builds on POC + Applies to all public transport in the Netherlands, reducing the need for a GVB ticket -Tourists don't understand the CICO posts 	 <p>(Schiedamsche Dijsma)</p>
<p>*Chosen method: Contactless payment</p> <p>Provided that the solutions ensure that tourists are prepared before they enter Plaza so they recognise the CICO-posts and are aware of the required interactions.</p>	 <p>(Nu.nl, 2024)</p>

Figure 6.5: An overview of the benefits and disadvantages of the different payment methods



Schiphol Airp

07

(NRC, n.d.)

CHAPTER 07

Seamless transitions from plane to train

Introducing the happy flow, unhappy flow, and backup flow

This chapter presents the final three concepts. They entail a backlog of interesting solutions for NS. The first concept focuses on encouraging the desired behaviour of tourists, representing the 'happy flow.' The second concept responds to the incorrect behaviour of the GVB planner, the 'unhappy flow'. The third concept provides a 'backup flow' to enhance the visibility of physical touchpoints at Plaza. This chapter serves as the foundation for the testing phase of this project, which is the next step for NS to take to implement the solutions effectively*.

**Testing prototypes at Schiphol requires permission from various stakeholders, which is achievable but not within the timeframe of this project. Consequently, the testing phase focused on validating and iterating concepts through continuous meetings key stakeholders and by expert reviews with Anna Offerman (user experience designer), Thomas Wever (strategy consultant), Mark Jonker (strategy consultant), and Job Knipscheer (digital marketing specialist).*

CHAPTER 07.1

Happy flow solution 01

Integrating flight tickets or hotel bookings with NS train tickets

Happy flow

Step 1 Planning and orientation
Goal Awareness and preparation

This first section presents the happy flow. It includes four individual solutions; integrating flight tickets or hotel bookings with NS train tickets, a proactive contactless payment marketing campaign, placing posters from the gates to baggage claim at Schiphol Airport, and placing informative cubes at Plaza. The solutions are presented in order of the journey.

7.1.1.1 Introducing the first solution

This first solution proposes a collaboration with airlines or travel booking platforms. This chapter uses EasyJet and Booking.com as examples. The solution allows tourists to purchase a flight ticket or hotel booking and a train ticket to Amsterdam in one transaction. Consequently, tourists can directly board the train using their boarding pass or hotel confirmation (see figure 7.1).*

7.1.1.2 Solution rationale

All tourists travelling to Amsterdam by plane must book a flight and accommodation. This solution reaches tourists through these, requiring no additional effort on their part. It reaches all tourists, whether they plan their public transport (GVB planner) or not (ticketless non-planner). For NS, this solution is interesting as it reaches tourists before they enter the station domain (see Chapter 4.3). For tourists, it offers certainty, as they already possess a train ticket before embarking on their journey.

7.1.1.4 Considerations and iterations

This solution proposes a collaboration with other companies. Establishing a valuable

collaboration necessitates the development of a new business model. To gain insights into effective business model creation, I conducted an expert review meeting with Thomas Wever, strategy consultant at Eidra. The following insights and iterations emerged from this meeting:

01 Business Case Analysis

The current business case from Schiphol to Amsterdam is not appealing to Booking.com or EasyJet due to its low revenue potential. Additionally, the costs of integrating this solution into the checkout flow must also be taken into account. Thus, the business case must be larger to create attractive collaborations.

02 Current Offerings Analysis

Booking.com and EasyJet currently offer additional transport options in their checkout flows. Booking.com provides taxi services and EasyJet offers car rentals. This is advantageous for EasyJet because car rentals are available at every airport. For Booking.com, taxi services are available in every country. Thus, adding mobility options is interesting as long as it can be scaled to other markets.

To further develop this concept, I will focus on a collaboration with Booking.com for the scope of this project.

03 Link with NS

This presents an opportunity for a new business model, where NS and Booking.com (both Dutch

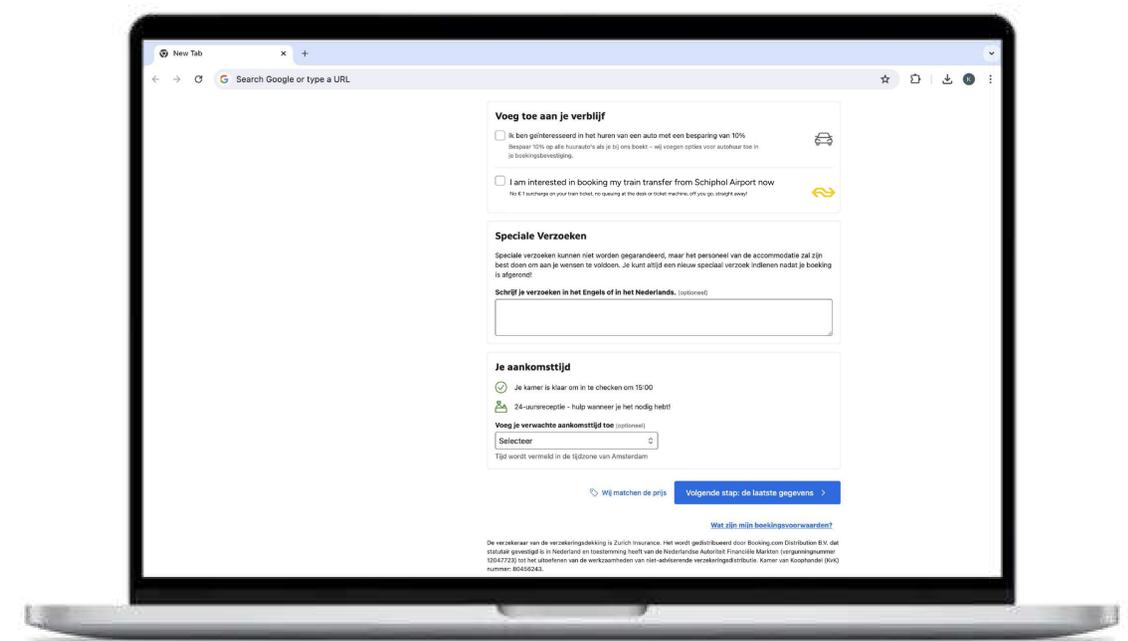
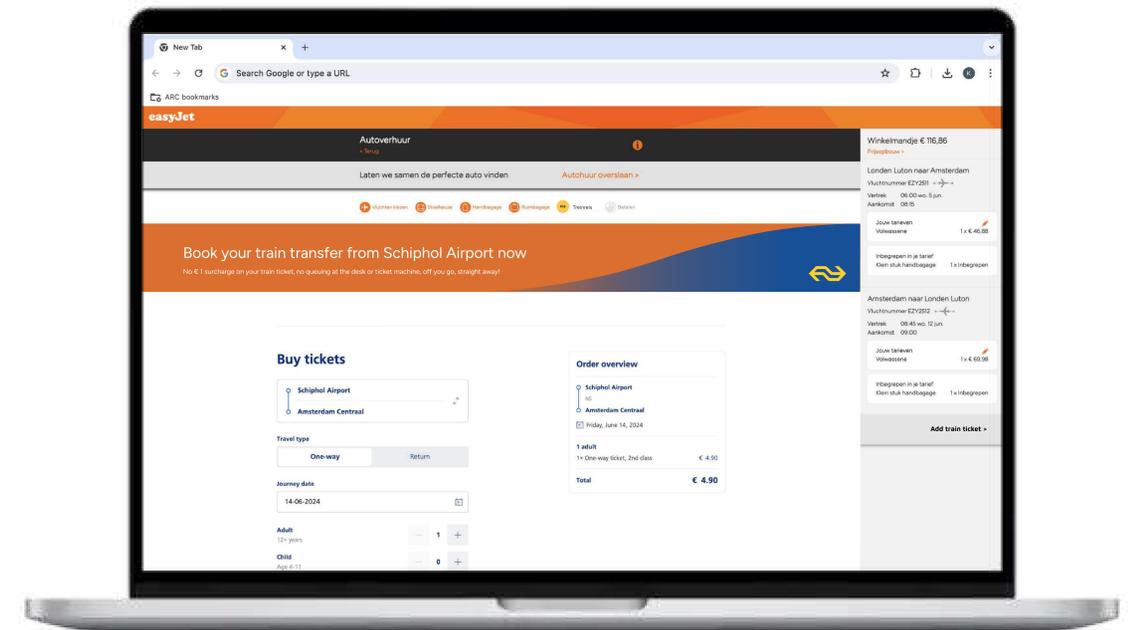


Figure 7.1: Potential interface for this feature, showing how tourists can easily select the option to add a train ticket

*This integration aligns with the current e-commerce flow, where it is logical to offer a train ticket as part of the overall travel package, compared to focusing on contactless payments in further solutions.

companies) could provide a door-to-door mobility service for the whole Netherlands through the Booking platform, integrating the NS train journey into the check-out flow. If successful, this could be scaled to other countries (with different train operators) making it more interesting for Booking.com.

04 Value Exchange

This solution relies on collaboration with partners to create a new business model. Figure 7.2 presents a business model canvas showing the potential collaboration. The value proposition for Booking.com includes incremental revenue from each train transaction, an expanded service and mobility platform supporting sustainable door-to-door travel, and a scalable use case for other markets. Additionally, it showcases Booking.com's innovative character by integrating door-to-door travel advice into their platform. The value for NS is evident: increased train ticket sales and better anticipation of train occupancy.

7.1.1.4 Implementation strategy

Implementing this solution begins with opening the conversation with Booking.com. I advise the NS to create a clear offer in terms of cost structure and revenue streams of the new business model that would be profitable for NS. I advise substantiating this by research to build a strong case.

If the potential is proven, this solution can be gradually integrated into the Booking.com platform. By analysing this data, adjustments can be made to the offering, and the potential of the solution can be determined. Metrics such as conversion rates will indicate the concept's attractiveness to tourists and Booking.com.

<p> Key partners</p> <p>NS Booking.com (and their partners)</p>	<p> Key activities</p> <p>Marketing activities Managing network Customer experience /support Platform growth Expanding platform</p>	<p> Value propositions</p> <p>Users: Offering total trip service all in one platform Cheapest prices Low effort Sustainable travel</p>	<p> Customer Relationships</p> <p>Booking: Commissions User: Customer experience, ease of use, unburdening</p>	<p> Customer Segments</p> <p>Booking.com Hotels, partners</p> <p>Users: Domestic and international tourism in the Netherlands</p>
<p> Key Resources</p> <p>Booking.com website, Booking.com app, CRM management</p>	<p>Booking.com:</p> <ul style="list-style-type: none"> Incremental revenue MaaS platform, preferred vacation platform Innovative pioneer Usecase for scalable implementation Sustainable image 	<p> Key Channels</p> <p>Marketing channels Website App Partner channel</p>	<p>Revenue Streams</p> <p>Booking.com receives a % on every ticket sold through their platform. NS sells more ticket by exposure Booking.com platform.</p> <p>Commission based revenue stream for Booking.com.</p>	
<p> Cost Structure</p> <p>Marketing efforts Platform development CRM management and data analytics</p>	<p>Revenue Streams</p> <p>Booking.com receives a % on every ticket sold through their platform. NS sells more ticket by exposure Booking.com platform.</p> <p>Commission based revenue stream for Booking.com.</p>			

Figure 7.2: Business model canvas showing the potential collaboration with Booking.com

Happy flow solution 02

A proactive contactless payment marketing campaign

Happy flow

Step 1 Planning and orientation
Goal Awareness and preparation

7.1.2.1 Introducing the second solution

This concept recommends proactively targeting tourists to prepare them for their train journey from Schiphol Airport to Amsterdam. It targets tourists through a digital marketing campaign. The aim is to make tourists aware of contactless payment before embarking on their trip to Schiphol. This solution uses digital channels, like Google and Social Media (see Figure 7.3).

7.1.2.2 Concept rationale

Research indicated that tourists without valid tickets either don't prepare for their journey (ticketless non-planner) or incorrectly plan their journey (GVB-planner). This solution addresses

this issue by proactively preparing them. Additionally, communicating that all public transport in the Netherlands accepts contactless payment eliminates the need for a GVB ticket.

7.1.2.3 Implementation Strategy and Steps

To effectively reach tourists, insights into a suitable marketing strategy are essential. Job Knipscheer (SEO/SEA specialist) helped to set up a marketing campaign for this solution:

01 Internal coordination

Engage the NS marketing department to pick up the project. Develop the visual concept with a designer and copy writer, considering:

- **Call to Action (CTA):** Use "Taking the train?" to grab attention and encourage further reading.
- **Visual Image:** Show a photo of a CICO post with a bank card. This visual explanation helps tourists recognise the interaction they need to perform at Plaza.
- **Information:** Convey the ease of travel by scanning a bank card with the text "Easy check-in and check-out by tapping your bank card."
- **Bank Logos:** Display accepted bank cards and the contactless payment icon to help

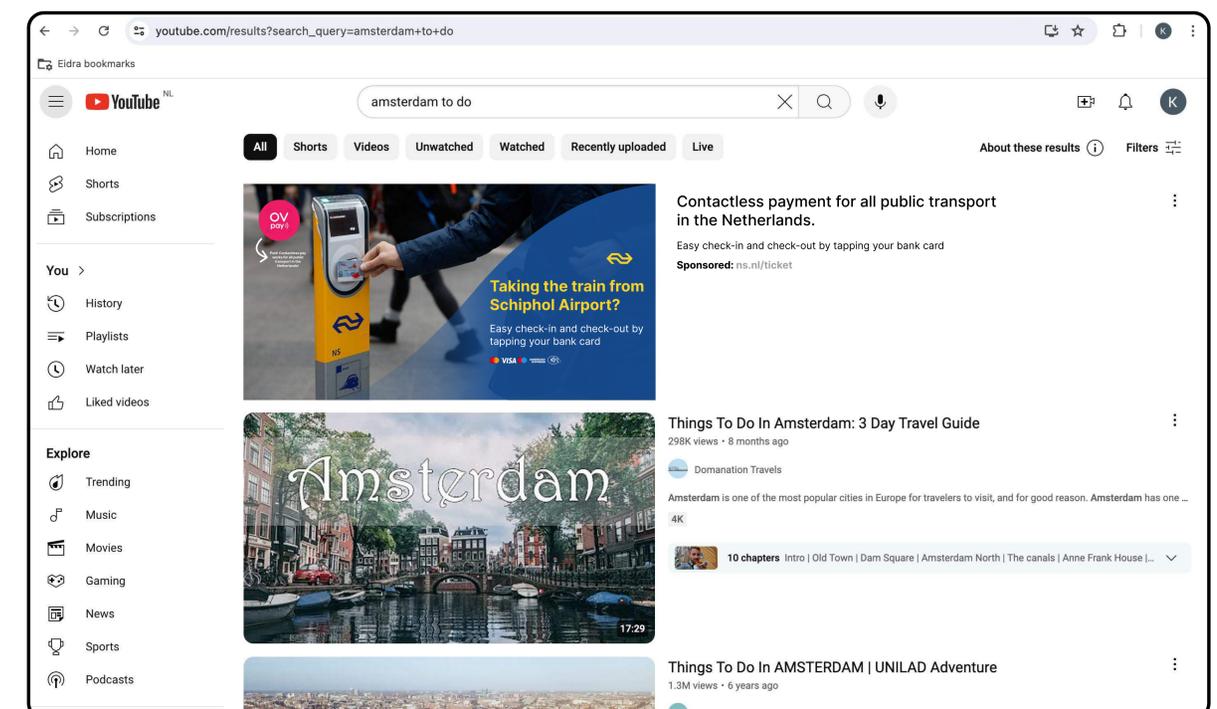


Figure 7.3: Potential advertisement on through Google Ads to promote contactless payment to international tourists.

- tourists understand that contactless payment is accepted.
- **NS branding:** Use NS's blue and yellow colours and logo to introduce tourists to NS's visual identity. Repeated exposure to these colours at Schiphol builds a breadcrumb trail that helps tourists associate them with NS (chapter 5.5).
- **OV Pay Logo:** Educate tourists about the OV-pay system, explaining that it facilitates contactless payment for all public transport in the Netherlands.
- **Testing and iterating:** I advise a quantitative survey to test the effectiveness of the advertisement with potential end-users. Ask questions on clearness, intended interaction, and attention value. Iterate the advertisement accordingly.

02 Campaign Setup

Target tourists via the Google ecosystem and social media platforms like Instagram and TikTok. It is important to define a targeting strategy, for example:

- **Target Audience:** Focus on tourists arriving at Schiphol and heading to Amsterdam.
- **Targeting Criteria:** Users with browse history in the EasyJet or Booking.com checkout flow to Amsterdam.
- **Frequency:** Aim for 5 impressions per traveller over five days, 25 in total.

7.1.2.4 Testing, Data, and Iteration

A baseline measurement should be taken to track current CICO post usage at Schiphol. After launching the marketing campaign, it is important to monitor changes in check-ins. In addition, track key performance indicators (KPIs) like the Click Through Rate (CTR), to see how appealing the ads are to tourists. Consequently, adjust the marketing campaign based on these results. Lastly, NS should ensure a well-designed landing page when users click on the advertisement.

Happy flow solution 03

Placing posters from the gates to baggage claim at Schiphol Airport

Happy flow

Step 2 Arrival at Schiphol Airport
Goal Awareness and preparation

7.1.3.1 Introducing the third solution

This solution recommends placing posters behind the customs area at Schiphol Airport. Tourists encounter multiple NS posters from the moment they disembark from the plane until they exit the arrivals hall. These posters will extend the digital marketing campaign, using the same visual identity to inform and prepare tourists about easy check-in with contactless payment. Implementing this solution requires collaboration with Schiphol. The Schiphol media team will help determine the best locations for these posters. Figure 7.4 illustrates the proposed poster design and advised placement at Schiphol.

7.1.3.2 Concept rationale

This addresses the solution area of reaching

tourists before they enter the station domain at Plaza. The goal is to repeatedly inform tourists about contactless payment and how to use it. Initially, tourists are reached through marketing channels, and the same message is reinforced in this step. Since all tourists taking the train must pass through these corridors, it also targets other tourists who might have otherwise bought a ticket, encouraging them to use their bank cards instead.

7.1.3.3 Considerations and iterations

The following insights and iterations emerged from feedback during Airport Safari's and bi-weekly meetings:

01 Travelling with Children

The concept promotes contactless payment, but not all tourists can use this method. For example, families with multiple children might not have enough bank cards. Therefore, the poster now includes the text: "Travelling with more people than credit cards? No problem! Buy your tickets at ns.nl." A link to the website is used instead of a QR code due to cybersecurity requirements.

02 Placement of Posters

During the Airport Safari meetings, Spoorbouwmeester and ProRail noted that posters should not be placed above or next to stairs (see Figure 7.5). Spoorbouwmeester suggested that posters have more impact when

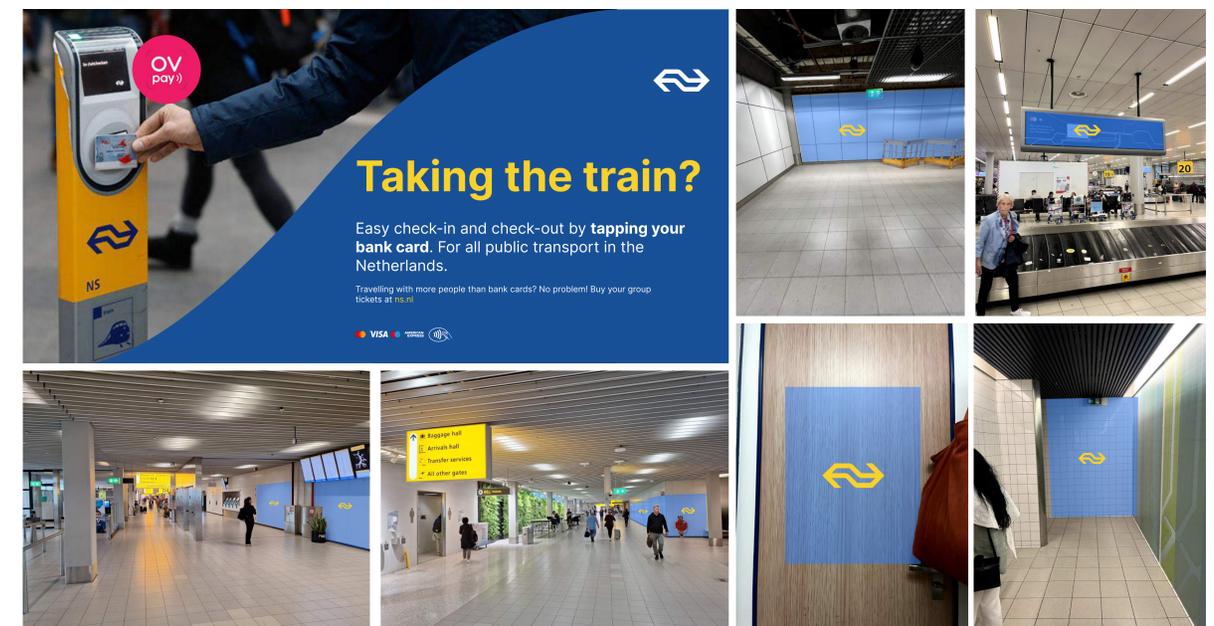


Figure 7.4: the proposed poster design and advised placement at Schiphol

placed perpendicular to the walking route. Other interesting locations include placing posters in restrooms, as this is a moment when people can absorb information calmly (recommended by interviewee 2.7) In addition, placing posters next to the baggage belt information screens results in more attention value as tourists need to check on which belt their baggage arrives.

7.1.3.4 Value exchange

This concept requires approval from the Schiphol media team, as explained by the Schiphol representative during the Airport Safari meeting. The feasibility and cost of placing posters behind customs must be assessed in collaboration. Especially since this solution aims to place posters outside the designated commercial areas at Schiphol. Although the Schiphol representative indicated that Schiphol is open to this collaboration, it requires them to make an exception for NS. Therefore, it is important to demonstrate the value this solution brings to Schiphol. I advise NS to focus on the following arguments.

01 Improved airport transitions

By providing tourists with clear tools to navigate through the busy Plaza more efficiently, the flow train passengers is freeing up space for air travellers, Schiphol's primary customer. I advise supporting this by conducting additional qualitative research at Plaza, showing that the current situation is suboptimal for both air and train travellers.

02 Connecting the Netherlands with the world
Schiphol's mission is to connect the Netherlands with the world (Royal Schiphol Group, n.d.-a). Facing increasing competition, Schiphol must deliver excellent service quality, ensuring a safe, seamless, and memorable journey (Royal Schiphol Group, n.d.-b). This collaboration with NS offers a unique opportunity to bind the two transport modes, providing a seamless experience from the airport to the final destination.

7.1.3.5 Implementation Strategy and Steps

Implementation can start with only testing the solutions for a specific arrival gate, such as the M gates used exclusively by EasyJet (and therefore most British tourists arrive here). By tracking the timing of arrivals and subsequent check-ins at Plaza, the effectiveness of the posters can be measured. Based on the data, the solution can iterated or scaled to other gates.

Happy flow solution 04

Placing informative cubes at Plaza

Happy flow

Step 3 Entering Schiphol Plaza
Goal Awareness and preparation

7.1.4.1 Introducing the fourth solution

This solution advises NS to increase the visibility of the CICO posts at Plaza. The concept suggests placing information cubes next to the CICO posts. These cubes, positioned at a height of 2.5 meters, are visible from a distance. This allows tourists to easily recognise the touchpoints as they enter the busy Plaza. Figure 7.6 on the next page illustrates the design of these cubes.

7.1.4.2 Concept Rationale

This solution builds on the floor sticker concept that will be implemented this autumn. While the stickers increase the attention value of the CICO posts up close, these cubes have higher visibility from a distance. The cubes will be strategically placed next to the train information boards. This ensures that tourists, who naturally look upward for departure information, will also see the check-in indicators.

This approach taps into the identified solution area of clearly defining the station domain. This step ensures step-by-step guidance of the touchpoints, with the digital and physical marketing campaign to prepare the tourists, the cubes to increase direct recognition from a distance and the stickers to trigger interaction up close.

7.1.4.3 Considerations and Iterations

Currently, the proposed cubes are used to indicate transfer options (see Figure 7.7). In this context, a different icon must be placed on the cubes. A consultation with Spoorbouwmeester is necessary to create a new icon that effectively signals the CICO posts from a distance. The icon should not confuse domestic travellers who also need to check in and out with their OV-chipkaart at the same posts. Therefore, I advise placing the same icons on

the cube as on the CICO post: the universal contactless payment icon and the OV-chipkaart icon. The interpretation and clearness of this new icon should be tested by international and domestic travellers.



Figure 7.7: Current use of the cubes: to indicate transfer options (own photo)

CHAPTER 07.2

Unhappy flow solution 01

A proactive marketing campaign for GVB planners

Unhappy flow

Step 1 Planning and orientation
Goal Awareness and preparation

This subchapter presents the unhappy flow. It includes five individual solutions; a proactive marketing campaign for GVB planners, collaboration with GVB, messaging on platform boards, messaging on digital train screens and still enabling backup ticket purchases at the final train station. Again, this chapter presents the solutions in order of the journey.

7.2.1.1 Introducing first solution

The first solution is an extension of the marketing campaign focused on promoting contactless payment. This concept recommends launching an additional

marketing campaign specifically targeting GVB planners. The campaign will proactively reach these tourists through the same channels. The aim is to make GVB planners aware that their GVB ticket is not valid for train travel in the Netherlands. Figure 7.8 illustrates how this might look. The goal is to highlight the strengths of NS without pointing out any mistakes by GVB.

7.2.1.2 Concept rationale

It is crucial to inform individuals who have purchased a GVB ticket online that it is not valid for their train journey. Without this information, they may unknowingly board the train with the wrong ticket, leading to unresolved issues.

7.2.1.3 Implementation Strategy

The same digital marketing approach as aforementioned is applied here, but the marketing campaign is slightly expanded to specifically reach GVB planners. The first step to test and implement this solution is to develop the visual concept with a designer, considering:

- **Sparking interest:** Use "Taking the train from the Airport?" to attract and catch the attention of travellers going to Schiphol.
- **Raising Awareness** Emphasise that travelling by train from Schiphol is only possible with

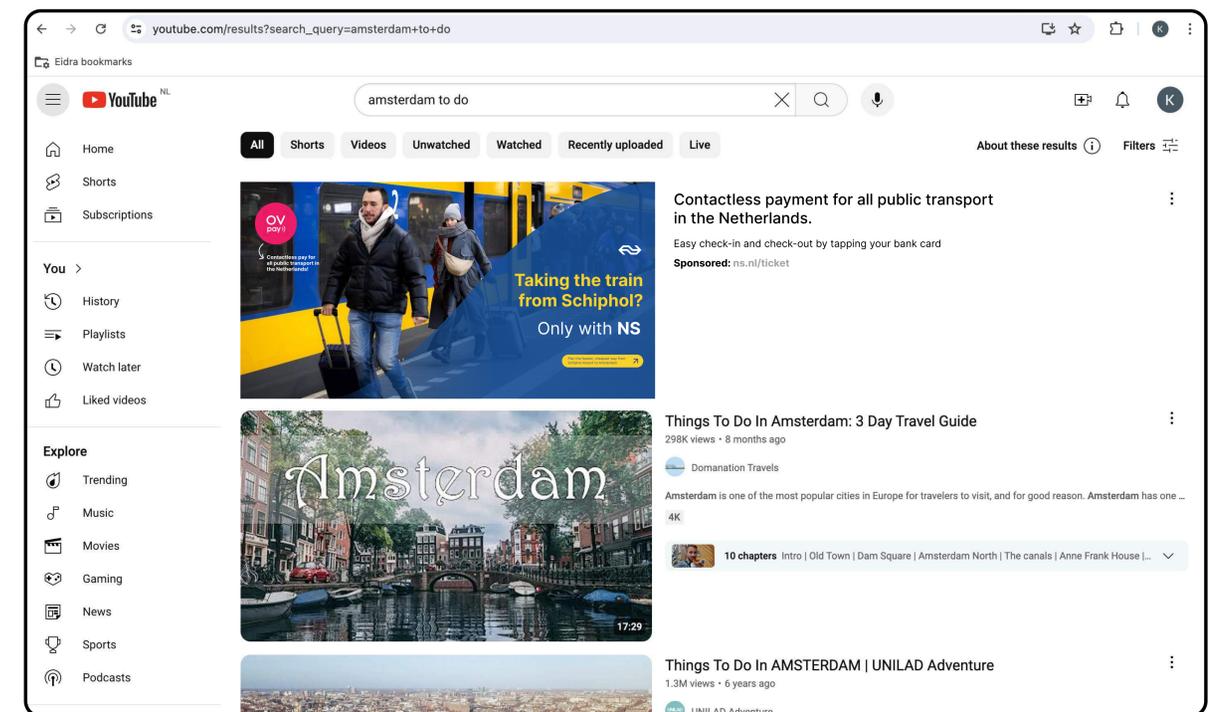


Figure 7.8: Advertisements communicating that train travel is only possible with NS

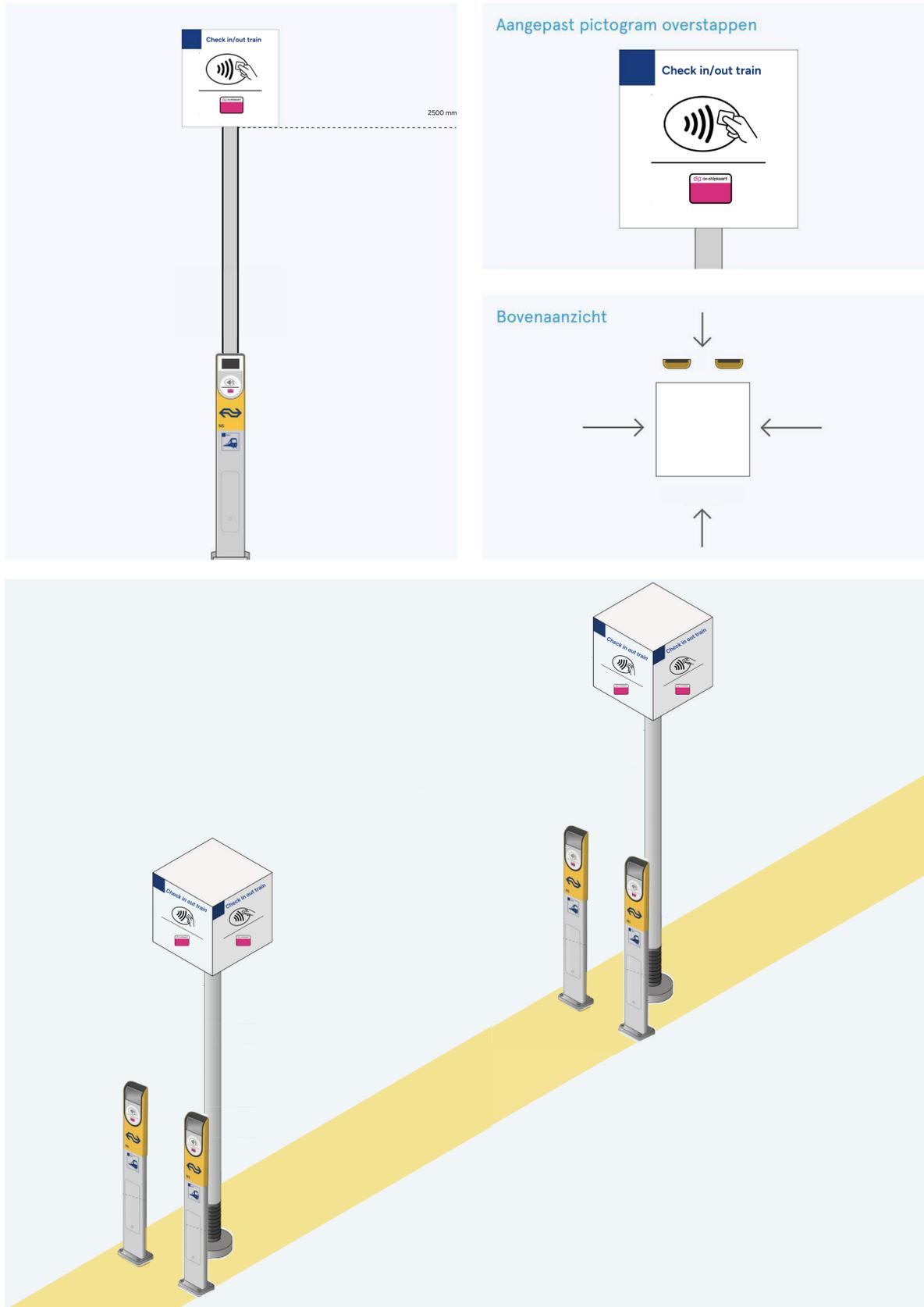


Figure 7.6: The design of the information cubes at Plaza, building on the floor sticker concepts (Inspired by Spoorbeeld, n.d)

- NS. The goal is to focus on NS's strengths and contribute to its brand experience.
- **CTA:** Provide a link to a website where travellers can plan their journey. Create a specific landing page for this group, explaining that NS is the only train service from Schiphol to Amsterdam and that contactless payment is available, but also enable online ticket purchases. This is important, as qualitative research indicates that this group of travellers plans their public transport options online, and is willing to purchase an e-ticket or download the app.
- **OV Pay Logo:** Highlight that contactless payments is available for all public transport in the Netherlands. This helps tourists understand that the OV-pay system applies to all public transport options, including GVB.
- **Branding:** Use NS colours and train images on the poster to ensure tourists recognise NS trains on the platform.
- **Targeting Setup:** The goal is to reach tourists who plan to or have already purchased a GVB ticket. This adds another category to the previous targeting strategy:
- **Target Audience:** Users who have browse history in the GVB checkout flow, in addition to those in the hotel and airline checkout flows.

Unhappy flow solution 02

Collaboration with GVB to clarify the offering

Unhappy flow

Step 4 Finding train departure information

Goal Recognition of necessary touchpoints & trigger interaction

7.2.2.1 Introducing second solution

This solution proposes a collaboration with GVB to ensure tourists use public transport from Schiphol correctly. The main idea is to leverage the GVB app, which is popular among GVB planners, to inform tourists that their tickets are invalid for NS trains. This can be achieved through a warning when a train is recommended in the travel advice (see Figure 4.9).

7.2.2.2 Concept rationale

This solution specifically targets GVB planners through their digital channels. Qualitative research indicates that GVB planners often check the app for train advice and mistakenly believe the train is included in their ticket. Consequently, they board the train, ignoring NS touchpoints. This solution intervenes at this step by providing a warning in the app that the train is not included. Additionally, GVB planners expressed a need for clearer communication in the app regarding the validity of their tickets for trains. By informing them directly in the app, this solution ensures that GVB planners understand their ticket is not valid for train travel.

7.2.2.3 Considerations and iterations

Various iterations explored the collaboration with GVB. All solutions depend on GVB's willingness to participate. Discussions within NS, particularly with Ralf and his team lead (Passenger Experience), revealed doubts about GVB's willingness to collaborate. This highlights that the concept proposed is an ideal scenario from NS's perspective. Ultimately, the final implementation must be a joint effort with GVB. Therefore, several iterations aim to make this solution more attractive to GVB without overhauling the entire app, for example, by providing location-based warnings. This includes tracking the user's location (with permission) and only displaying an NS warning if the tourist

is actually at Schiphol.

7.2.2.4 Implementation Strategy

The first step to implement this solution is to raise awareness and educate GVB about the problem caused by GVB planners. To do so, I advise conducting quantitative research to substantiate this case. The following section provides steps for this research:

01 Qualitative research

Conduct a quantitative study to gather data on the number of GVB planners arriving in Amsterdam without a valid ticket. This can be similar to the 2018 study, where tourists who did not exit the check-out gates were briefly interviewed. Key points to investigate include:

- Number of travellers with a GVB ticket.
- Reasons for choosing a GVB ticket and where they found it.
- Reasons for downloading the GVB app.
- Issues encountered at Schiphol that prevented them from buying a ticket.

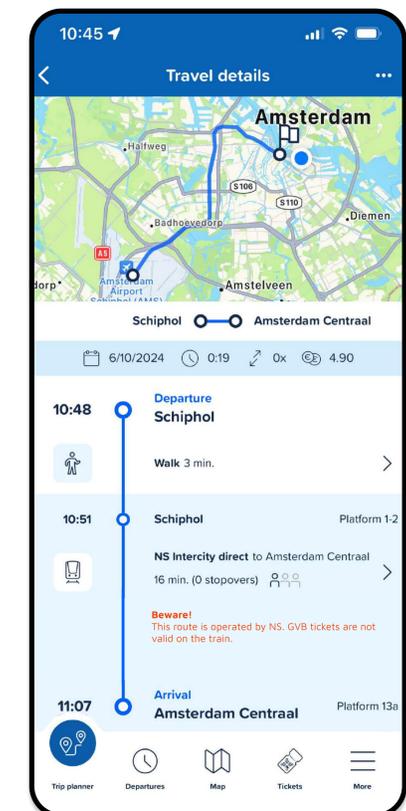


Figure 7.9: Potential collaboration with GVB

02 Meeting Preparation

- **Data Presentation:** Use the quantitative insights to create a clear picture of lost revenue of NS due to GVB, serving as an initial incentive for discussions with GVB.
- **Brand Impact:** Specifically ask GVB planners about the impact on their brand experience. This can demonstrate that tourists may have a negative perception of GVB due to the lack of clear information about NS travel. Highlighting this can show that the current situation negatively affects GVB's brand image.

7.2.2.5 Value Exchange

Since the only shareholders of GVB are the Municipality of Amsterdam and the Amsterdam Transport Region (GVB, 2024), they inherently serve the public interest, including that of tourists. Therefore, I advise NS to approach GVB by highlighting the negative brand image of GVB planners when facing closed check-out gates in Amsterdam.

The potential collaboration offers value to both. For NS, the value lies in enhancing customer experience and recovering lost revenue. For GVB, it means offering a better travel experience and demonstrating transparency and prioritisation of tourist interests.

Unhappy flow solution 03

Messaging on platform boards

Unhappy flow

Step 8 Boarding the train

Goal Reminding and making aware of wrong actions

7.2.3.1 Introducing the third solution

This solution advises the use of platform boards and platform speakers to communicate that GVB tickets are not valid on NS trains (see Figure 7.10) This message is communicated while tourists wait for their train on the platforms. Currently, tourists who have purchased a GVB ticket often unknowingly board NS trains, assuming they have the correct ticket. This step uses the last chance of intervention to ensure tourists can go back upstairs to purchase a valid ticket.

7.2.3.2 Concept Rationale

This solution targets tourists while they are waiting for their train. Tourists must look at digital screens to confirm their train's departure platform, making these screens effective touchpoints for delivering this message. Additionally, tourists without tickets are all waiting on the platform, ensuring a broad reach for this group. The same message will also be announced via platform speakers to ensure it is

repeatedly communicated. This way, even if tourists miss the information on the screens, they will be reminded through the announcements. An additional benefit is that ticketless non-planners will also be reminded that a ticket is required before boarding the train.

7.2.3.3 Considerations and Iterations

Domestic travellers and other tourists also see and hear this message. Therefore, I discussed the messaging with Anna Offermans and Ralf, to ensure that the messaging won't be confusing. The following considerations were made to arrive at the final message shown in Figure 7.10. The starting point was focussing on the desired actions of GVB planners.

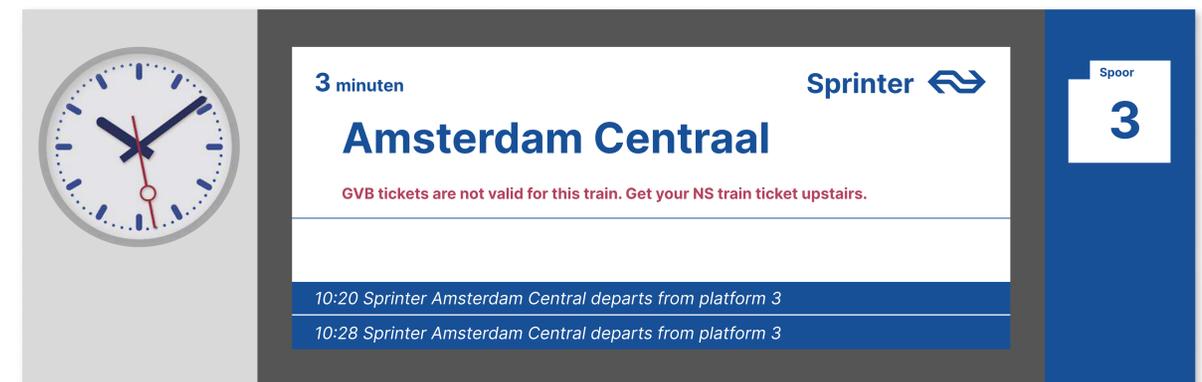
"You need a valid NS ticket to board the train. Get your tickets upstairs."

- *This message focuses on the desired behaviour but is confusing for tourists who have checked in with their bank cards. It is also confusing for OV-chipkaart holders who do not have a separate ticket.*

"Validate your ticket or bank card upstairs at Plaza before boarding the train."

- *However, GVB travellers cannot check in their QR code at the CICO posts, which work with a chip, leading to further confusion.*

We realised that focusing on the correct action could be confusing. Therefore, we decided to specifically target GVB travellers to avoid confusing other passengers.



"Dear passengers, please beware that GVB tickets are not valid for NS trains. Please buy your NS train tickets upstairs at Plaza."

Figure 7.10: Using platform boards and speakers to communicate that GVB tickets are not valid on NS trains

"GVB tickets are not allowed on this train. Buy your NS ticket upstairs at Plaza."

- However, "not allowed" is too negative as NS aims to maintain a sympathetic image. Additionally, as noted by my thesis mentor, tourists may not know what "Plaza" refers to, which could also confuse them.

"GVB tickets are not valid for NS trains. Get your NS train ticket upstairs."

- This message clearly states that GVB tickets are not valid for the train and directs tourists to go upstairs to purchase an NS ticket. This is the awareness we aim to convey to tourists.

7.2.3.4 Implementation Strategy

ProRail expressed concerns about this solution due to potential safety risks on narrow platforms. If the concept works as intended, it would mean that several tourists would need to walk back up to Plaza to purchase a ticket. ProRail finds these upward flows undesirable as they could compromise safety. Therefore, it is crucial to develop a test plan for this concept and evaluate the negative effects. The following factors must be considered:

- **User Testing:** First, the messaging on the platform should be tested and validated with both domestic and international travellers. Therefore, I advise conducting user tests to understand how the solution is interpreted before testing it on the platform.
- **Quantitative Research:** Conduct a quantitative study to determine how many tourists walk back up to Plaza to buy a ticket, assessing whether the concept achieves the desired effect.
- **Safety Assessment:** Evaluate the impact of tourists walking back up to ensure they do not pose a danger to other tourists.
- **Announcement Frequency:** Determine the optimal frequency for speaker announcements. During the Airport Safari, the Schiphol representative mentioned that announcements could be linked to the arrival times of flights. Targeting these announcements to the times when international travellers arrive reduces the need for frequent messaging at other times.
- **Make adjustments:** Based on the findings, adjust the frequency and content of the announcements to optimise effectiveness and safety.

x

Unhappy flow solution 04

Messaging on platform boards

Unhappy flow

Step 9 Journey in train
Goal Recover from their mistake

7.2.4.1 Introducing the fourth solution

This fourth solution recommends using the screens and speakers on the train to prepare tourists for exiting the check-out gates at their end station. The solution aims to raise awareness that tourists will face closed gates if they travel without a valid ticket. This accounts for both the ticketless non-planner and the GVB planner. The goal of this solution is to provide tourists with an action plan when they travel without valid ticket, preventing them from causing congestion at the check-out gates. Figure 7.11 shows what this digital screen in the train could look like.

7.2.4.2 Concept rationale

This solution targets tourists during quieter moments in their journey while sitting on the train. Tourists already use these screens to check when they are approaching their station. This increases the attention value of the message. The attention value is further enhanced by adding speaker announcements. This solution aligns with NS's goal of maintaining a sympathetic image, as tourists are informed about their mistakes without being fined and are instead helped to purchase the correct ticket (see next solution).

7.2.4.3 Implementation strategy

I recommend NS take the following steps to implement this solution:

- **Internal coordination:** Engage the NS marketing department to pick up the project. Develop the visual concept with a motion designer and copy writer.
- **User Testing:** Conduct user tests to evaluate how the message is interpreted. Iterate based on feedback to better address tourists' needs.
- **Train Testing:** After user testing, implement the solution in the train, during specific moments. Survey tourists to gather feedback on the messaging.

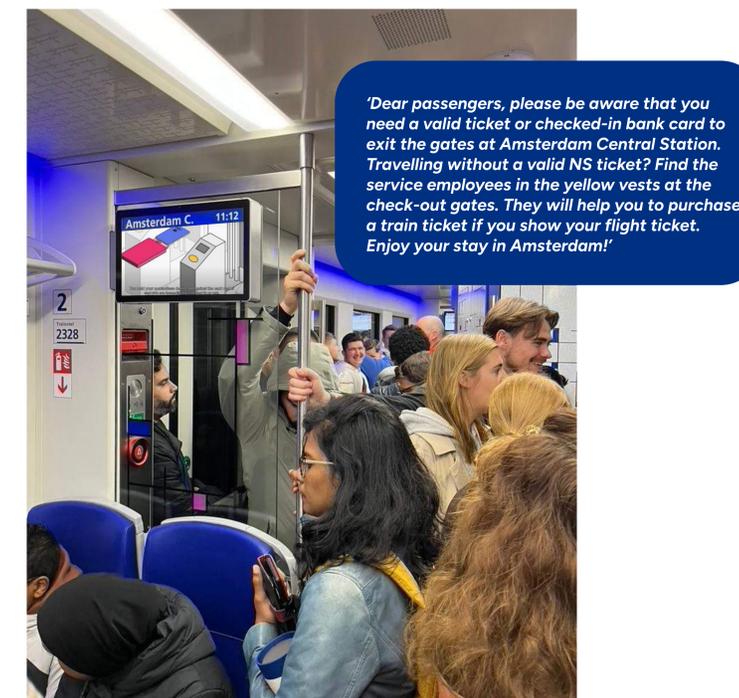


Figure 7.11: Using platform boards and speakers to communicate that GVB tickets are not valid on NS trains

Unhappy flow solution 05

Still purchasing a ticket at your final destination

Unhappy flow

Step 11 check-out
Goal Recover from their mistake

7.2.5.1 Introducing fifth solution

This solution enables tourists to purchase a valid ticket at their end station even after travelling without one. Service employees, who are currently stationed full-time next to the check-out gates, will be equipped with portable CICO posts. This allows tourists to easily scan their bank cards and pay for their tickets on the spot. This solution recovers (a large part) of the missed revenue for NS.

7.2.5.2 Concept rationale

This solution builds on insights from qualitative research indicating that tourists want to rectify their mistakes and still purchase a valid ticket after arriving at their end station. This concept was discussed after presenting my research insights to NS on July 15th. Interviewee 2.7, who attended this meeting, saw potential in this idea. He noted that this approach enhances the end-of-journey experience. Currently, tourists end their journey feeling they have done something wrong. He explained that this contributes to ending the journey with a positive experience rather than a negative one. Allowing them to purchase a ticket at the normal fare, with messaging that they are not being fined but are appreciated for paying now, contributes to NS's sympathetic image and leaves tourists feeling positive about their journey.

7.2.5.3 Considerations and iterations

Initially, this concept suggested directing tourists to a service desk to purchase a ticket. However, this approach has drawbacks, as tourists may struggle to find the desk (with only one per hall), leading to unnecessary walking and congestion in the station halls.

7.2.5.4 Implementation Strategy

I recommend NS take the following steps to implement this solution:

01 User testing

- **User Testing:** Before implementing the solution, conduct user tests to evaluate how tourists interact with the portable CICO posts.
- **Method:** Set up a controlled environment where tourists can use the portable CICO posts. Gather feedback on usability, clarity of instructions, and overall experience.
- **Iteration:** Based on the feedback, make necessary adjustments to improve the user experience.

02 Pilot Implementation

- **Location:** Start with the purchase of two portable CICO posts and test them at one of the exits at Amsterdam Central Station, such as the IJ-side where my research was conducted.
- **Monitoring:** Track how many people report to the service employees and how many backup tickets are sold.
- **Data Collection:** Gather data on where these individuals come from and why they do not have a ticket. Conduct quantitative research to understand the demographics and reasons behind ticketless travel.

03 Feedback Loop

- **Service Employees:** Establish a clear feedback loop between service employees and NS to identify any other issues that may arise, such as non-Schiphol travellers needing assistance.
- **Qualitative Research:** Implement a qualitative research plan to assess the current experience of tourists who can now purchase a ticket. Evaluate how tourists perceive this service.

04 Safety Considerations:

- **Employee Safety:** Consider the safety of service employees. Research indicates that confronting travellers without tickets can lead to violent incidents. The test phase should determine if this is a concern.
- **Alternative Solutions:** If safety concerns arise, explore alternative methods for purchasing backup tickets, such as installing a ticket machine near the check-out gates.

CHAPTER 07.3

Backup flow solution 01

Moving current touchpoints at Plaza

Backup flow

Step 3 Entering Schiphol Plaza
Goal Awareness and preparation

This first subchapter presents the backup flow. It includes one last individual solution; moving current touchpoints at Plaza.

7.3.1.1 Introducing first solution

This solution advises NS to relocate two touchpoints at Plaza: the meeting point and the static departure boards. Currently, the meeting point and the static departure boards block the view of the ticket machines (see Figure 7.12). The goal is to create a clear line of sight from Arrivals 1 and 2 to the ticket machines. This will make the ticket machines, which are currently overlooked, more visible. The visibility will be further enhanced by placing stickers on the back of the machines with the text "train tickets".

7.10.2 Concept Rationale

Research shows that ticketless non-planners often miss the ticket machines. The meeting point and static departure boards are located in front of the ticket machines, blocking their visibility from Arrivals 1 and 2. The ticket machines do not stand out above the crowd and are particularly hard to see when the Plaza is busy. This solution addresses the consumer pain point by reducing the overload of triggers at Plaza. It also contributes to the better delineation of the station domain. The meeting point, in particular, attracts many people, blocking the station area's view. The concept aims to create visual space in Plaza, following the "less is more" principle. Ideally, all static departure boards would be relocated or removed. However, the Airport Safari revealed that this is not possible due to legal requirements. They must remain in the same location. Therefore, only the two leftmost

departure boards will be moved parallel to the two rightmost boards. This concept was validated through discussions during the Airport Safari, where all stakeholders recognised its value.

7.10.3 Implementation Strategy

Considerations for developing this concept include identifying a new location for the meeting point touchpoint, that remains highly visible. The new location must be carefully selected to ensure it is easily findable without detracting from the visibility of NS touchpoints. I recommend conducting an Airport Safari III, focusing on collaboration with Spoorbouwmeester and Schiphol to identify a better location for this meeting point. Spoorbouwmeester will ensure the new location does not compromise the experience of train passengers, while Schiphol will ensure it remains an identifiable spot that supports air travellers.

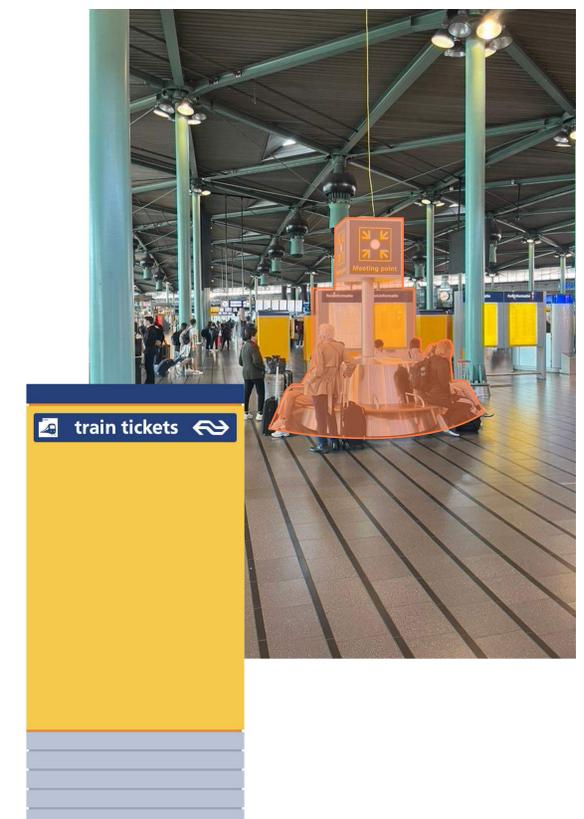


Figure 7.12: The meeting point and the static departure boards block the view of the ticket machines

CHAPTER 07.4

Integrating Solutions into the New Journey

Figure 7.13 presents the overview of how the different concepts come together in the new journey. As seen in Figure 7.12, the focus is primarily on the beginning of the journey, as insights from qualitative research with NS indicated.

However, these three concepts don't include insight into the order in which these solutions should be implemented. The following chapter explains the advised order of implementation.

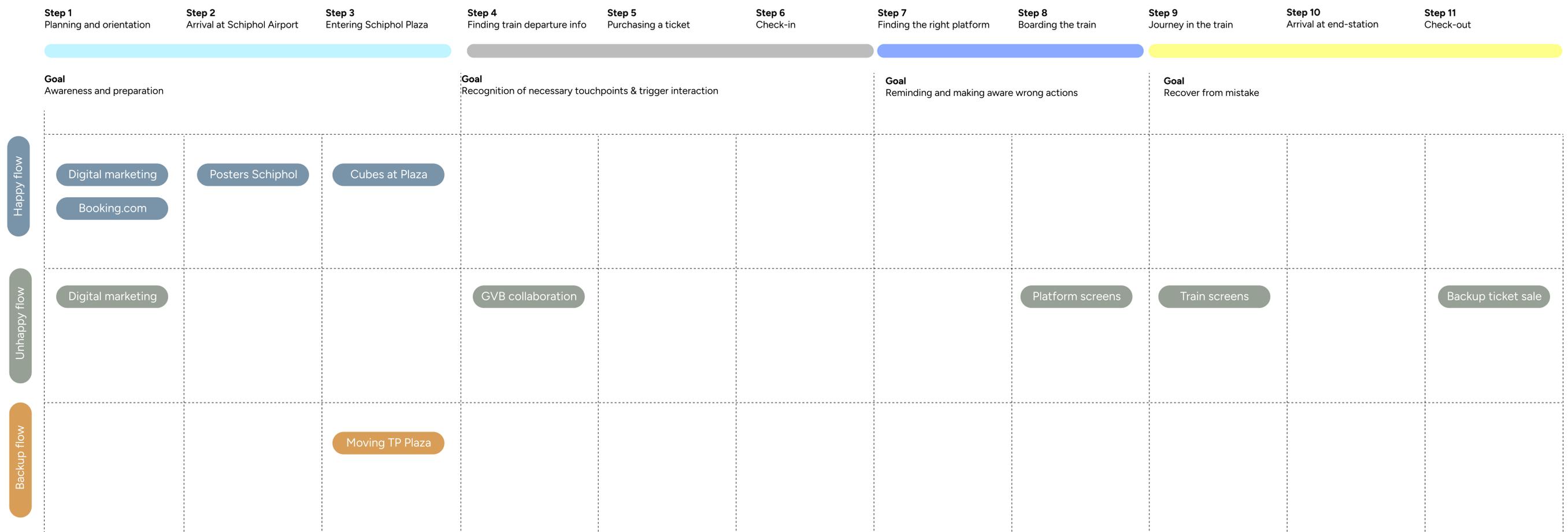


Figure 7.13: Overview of how the different concepts come together in the new journey



08

CHAPTER 08

Final advice to NS Three implementation strategies based on different objectives

The previous chapter introduced three concepts. However, these concepts do not provide NS with a clear order of implementation. This chapter presents three implementation strategies to address this gap. It first outlines the sequence in which solutions should be implemented, categorised into Minimum Viable Product (MVP), Horizon 1, Horizon 2, and Horizon 3 solutions. If NS lacks sufficient resources to implement all three new journeys in parallel, this chapter offers additional implementation strategies. It provides insights on which solutions to prioritise based on two different objectives: generating the most revenue or creating the desired customer journey.

01 Implementation strategy: picking the low-hanging fruit 🍊

The first implementation strategy advises the parallel execution of the three concepts provided NS has the required resources. This strategy is structured around a Minimum Viable Product (MVP), Horizon 1, Horizon 2, and Horizon 3 solutions. The objective of this strategy is to focus on the low hanging fruit, or implementing the solutions with the lowest effort first.

8.1.1 What is an MVP?

Eric Ries introduced the concept of the Minimum Viable Product (MVP) in his book The Lean Startup. He defines an MVP as "the version of a new product that allows a team to collect the maximum amount of validated learning about customers with the least effort". An MVP

enables a company to validate a concept without fully implementing it but also helps save time and resources that might otherwise be spent on potentially unsuccessful solutions (Ries, 2011).

8.1.2 What are Horizon 1, 2, or 3 solutions?

The three horizons model, developed by McKinsey, is a growth strategy framework designed to determine a project's implementation roadmap (McKinsey & Company, 2009). Horizon 1 solutions involve relatively short-term projects that could be implemented within 1-3 years, from the end of 2025 to 2028. Horizon 2 solutions take 2-4 years to implement, from 2027 to 2029. Horizon 3 solutions include long-term implementation, taking 3-5 years (from 2028 to 2030). These typically involve non-incremental innovation, such as new business models and large-scope projects (Board of Innovation, 2024).

8.1.3 Implementation strategy

Figure 8.1 presents the MVP and three horizons of innovation. The place of the solutions are determined based on their effort scores (see Appendix 8). It includes the implementation of the Happy flow (blue), the Unhappy flow (green), and the Backup flow (orange).

8.1.4 MVP

The MVP involves implementing push marketing strategies and facilitating backup ticket purchase options. This provides the NS to learn about international tourists through marketing KPI's (key performance indicators), and change their more permanent marketing efforts accordingly. This while quickly earning back the lost revenue by facilitating backup ticket purchase options.

8.1.5 Horizon 1

Horizon 1 solutions include the physical means at Schiphol, such as posters before customs, placing cubes at Plaza, and relocating the meeting point and static departure boards. It also focuses on the messaging on platforms via screens and speakers, and digital screens in trains.

8.1.6 Horizon 2

The Horizon 2 solution presents the potential collaborations with GVB, including options to better inform users via the GVB app.

8.1.7 Horizon 3

The Horizon 3 solution advises a collaboration with Booking.com (or EasyJet, etc), creating a new business model that expands past the Schiphol Airport to Amsterdam train route. A note is that the concepts placed in the Horizon 1, Horizon 2, or Horizon 3 rows do not imply that implementation will only begin in 1-5 years. This overview indicates when individual solutions can be implemented if steps are taken today.

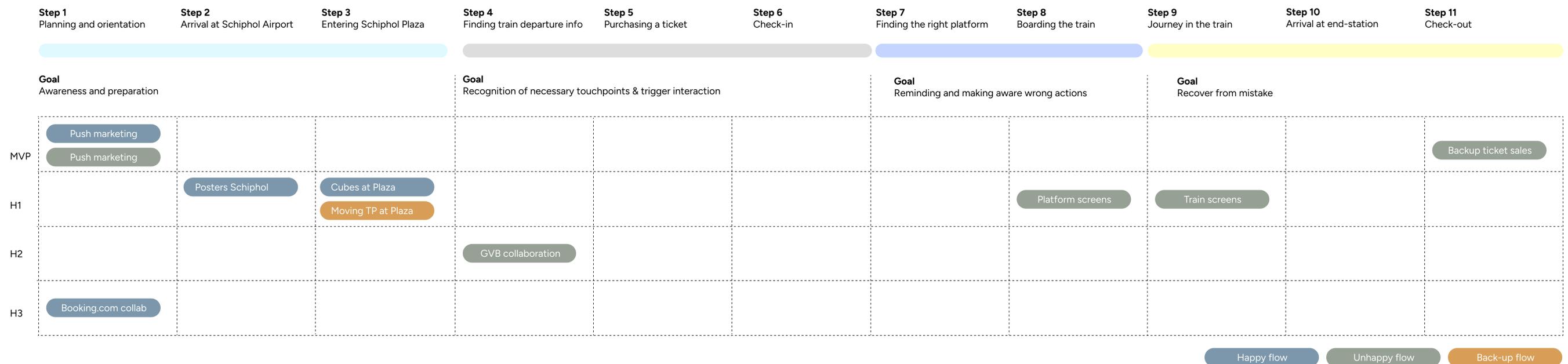


Figure 8.1 : the MVP and three horizons of innovation for this project's solutions.

02 Implementation strategy: Maximising Revenue

This second implementation strategy aims to maximise profit. The chapter presents the return on investment (ROI) of individual solutions, highlighting the most profitable opportunities for NS.

8.2.1 Determining the return on investment

This section explains the implementation strategy if NS does not have the recourses available to invest in all the proposed solutions. The return on investment (ROI) helps to evaluate the profitability of investments. ROI is calculated by dividing the profit or loss generated by a solution by its investment cost, then multiplying by 100 to create a percentage. This percentages enable comparison between different solutions (Birken & Forbes, 2022).

8.2.2 Number and assumptions before determining the ROI

To calculate the ROI, estimates of the required

investments and potential revenue for each solution are necessary. Mark Jonker, strategy consultant at Eidra, provided professional guidance on these estimates. Additionally, an Airport Safari attendee from NS gave insights into the costs associated with placing or relocating physical touchpoints at Plaza. Appendix 9 details the assumptions regarding investments and revenue for each solution.

8.2.3 Overview of ROI of individual solutions

Figure 8.2 presents the ROI calculations for each solution. These calculations suggest that the following solutions are the most profitable: integrating flight tickets or hotel bookings with NS train tickets, messaging on platform boards, messaging on digital train screen, and still being able to purchase a ticket at your final destination. The first solution, integrating flight tickets or hotel bookings with NS train tickets not only focuses on the journey from Schiphol to Amsterdam but also expands the business case by exploring new business models. The journey from Schiphol to Amsterdam becomes just a small part of a larger strategy. Additionally, this solution serves as a usecase between the NS and for Booking.com, but could be scaled to other partnerships, such as with EasyJet or KLM.

Notably, the following two solutions, messaging on the platform screens and on the digital train screens, show exceptionally high ROIs. These

solutions leverage existing touchpoints, requiring no additional investments. Their impact is significant as tourists already use these touchpoints, ensuring high attention value. However, NS must evaluate whether the operational costs, not included in this calculation (see Appendix 9), are worth the anticipated revenue. The last solution, ticket sales at check-out gates, also shows a high ROI. This solution addresses a primary pain point for NS by ensuring tourists who travel without valid tickets are now able to still purchase them. This method effectively recovers the lost revenue, as tourists who cannot pass through the gates must seek assistance from service employees anyway.

8.2.4 Implementation strategy

Figure 8.3 presents the order of implementation when focussing on maximising revenue. Following the same structure, the Minimum Viable Product (MVP) for this strategy involves buying portable CICO devices, which can be deployed immediately to generate quick revenue. The next implementation step involves testing and developing messaging on platform and train screens. These solutions require a clear test plan and can be implemented subsequently. The collaboration with Booking.com needs more time for collaboration and development, and thus can be implemented in Horizon 3. Implementing these solutions means a total investment of **€70.000**, and a profit of **€1.784.200** per year (in 2030).

Concept	Solution	Investment	Revenue	Profit	ROI
Happy flow	Booking collaboration	€50.000	€1.500.000	€1.450.000	2900%
Happy flow	Digital marketing	€110.000	€38.500	-€71.500	-65%
Happy flow	Posters Schiphol	€50.000	€77.000	€27.000	54%
Happy flow	Cube Plaza	€22.000	€19.250	-€2750	-12.5%
Unhappy flow	Digital marketing	€12.000	€19.250	€7250	60%
Unhappy flow	GVB collaboration	€21.000	€38.500	€17.500	83%
Unhappy flow	Platform screens	-	€57.750	€57.750	5774900%
Unhappy flow	Train screens	-	€19.250	€19.250	1924900%
Unhappy flow	Tickets at checkout	€20.000	€172.480	€152.480	760%
Backup flow	Moving TP at Plaza	€11.000	€38.500	€27.500	250%

Figure 8.2: The ROI calculations for each solution

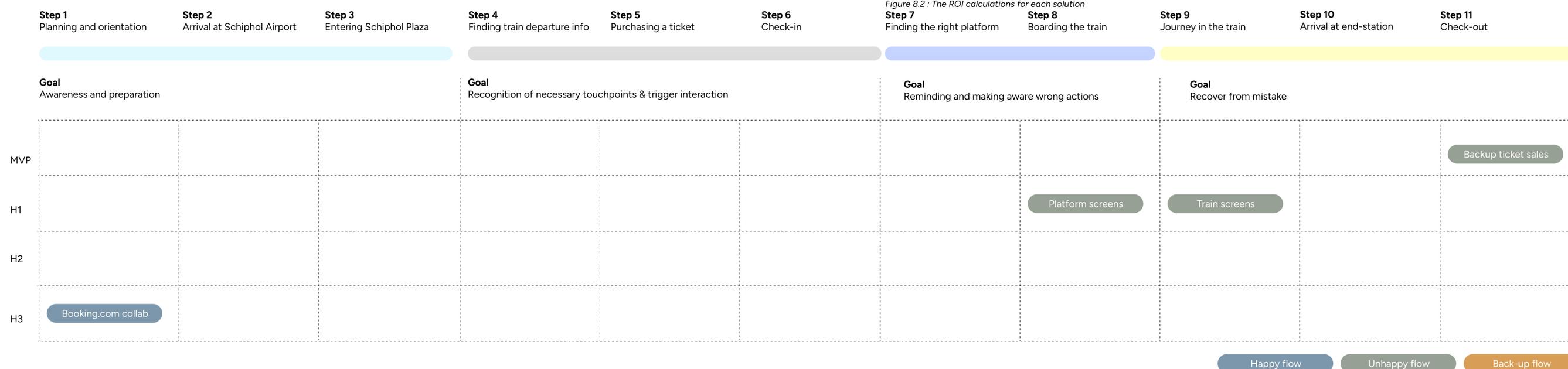


Figure 8.3: The order of implementation when focussing on maximising revenue.

03 Implementation strategy Focussing on the desired customer experience 🧘

The following chapter presents the third implementation strategy, focussed on creating the desired experience for the international tourist on this journey.

8.3.1 Answering the initial research question

This final implementation strategy revisits the initial project goal and the rationale for NS to start this project. The primary focus was on how the new Sprinter could better meet the needs of tourists. The initial goal of my project to react to this was to design a 'phygital' customer journey to enhance the intuitive access to NS's services for international tourists transferring from Schiphol Airport to Amsterdam.

When comparing these goals with the proposed concepts and solutions, two journeys emerge as

the most effective. This decision is based on the user experience review with Anna Offermans, as well as research indicating that positive reinforcement is more effective in shaping behaviour than highlighting negative actions (Skinner, 1953). Therefore, to improve the current journey at Schiphol for international tourists, I advise NS to implement the 'happy flow' and the 'backup flow'.

Additionally, the qualitative research conducted with executive NS employees, which reveals the ambition for a seamless travel experience through predictable and intuitive journeys, supports these solutions. The ambition is to avoid confusing domestic travellers and to provide only relevant information at the right moments, following the 'less is more' principle (chapter 4.3). This strategy prioritises the user, serving the public interest and societal needs of the traveller.

8.3.2 Implementation strategy

Figure 8.4 presents the order of implementation when focussing on the desired customer experience. The Minimum Viable Product (MVP) for this strategy implementing a push marketing campaign focussed on contactless payment options. Horizon 1 solutions include placing physical touchpoints at Schiphol, such as the posters behind customs, and the information

cubes at Plaza, but also moving the meeting points and static departure boards at Plaza to create visual space. The collaboration with booking.com is also included in this strategy, as it unburdens the tourists before even embarking on the trip.

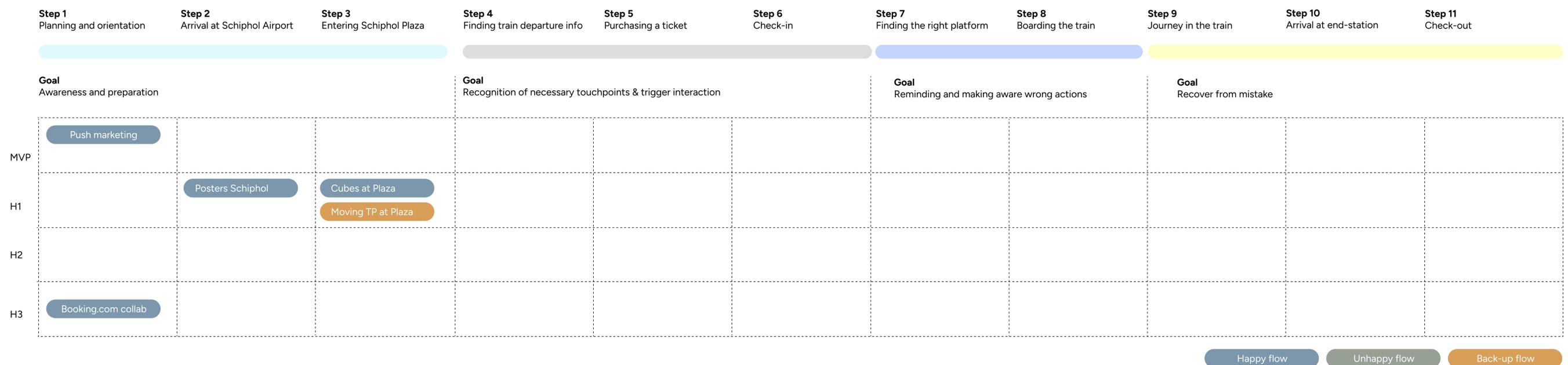


Figure 8.4 : The order of implementation when focussing on the desired customer experience.

Final advice to NS Balancing Profit and User Experience

This last section provides NS with final advice on the implementation strategy, balancing revenue generation with delivering the best user experience. This advice is based on NS **not** having the recourses in place to implement all the solutions (DEPEST analysis 3.3).

To optimally serve travellers and enhance their journey experience, I recommend focusing on implementation strategy 03. This strategy prioritises the desired journey for tourists, encouraging positive traveller behaviour and aligning with qualitative research from both NS and consumers. However, addressing NS's primary pain point, lost revenue due to tourists travelling without a valid ticket, implementation strategy 02 seems most promising. While this does not directly align with the ambition of a seamless, intuitive journey, it addresses a critical revenue issue.

Therefore: I advise NS to first implement Strategy 02, focusing on the most profitable solutions. This approach will build a financial buffer, allowing NS to reinvest profits into Strategy 03. This dual approach ensures both immediate financial viability and long-term value creation for consumers and NS.

To conclude, Figure 8.5 presents an overview of all the investments and perceived profit (excluding operational costs) per implementation strategy.

	MVP	H1	H2	H3
01 Implementation strategy: picking the low-hanging fruit 🍌	Investment: €141.000	Investment: €204.000	Investment: €204.000	Investment: €204.000
	Profit: €192.950	Profit: €324.450	Profit: €341.950	Profit: €1.791.950
02 Implementation strategy: Maximising Revenue 📈	Investment: €20.000	Investment: €0	Investment: €0	Investment: €50.000
	Profit: €257.200	Profit: €334.200	Profit: €334.200	Profit: €1.784.200
03 Implementation strategy Focussing on the desired customer experience 🙏	Investment: €110.000	Investment: €193.000	Investment: €110.000	Investment: €160.000
	Profit: €-71.500	Profit: €-19.750	Profit: €37.500	Profit: €1.487.500

(NS, n.d.)

Figure 8.5 an overview of all the investments and perceived profit per MVP, H1, H2, H3



CHAPTER 09

Discussion, Conclusion and Personal Reflection

09

(NS, n.d.)

Discussion

The main problem on the journey from Schiphol Airport to Amsterdam with NS is caused and experienced by tourists travelling without a valid ticket. This results in lost revenue for NS and a negative end-of-journey experience for tourists. The research identifies two types of tourists travelling without a valid ticket. The first group, "ticketless non-planners," missed the ticket touchpoints at Schiphol and boarded the train, assuming they could buy tickets later. The second group, "GVB planners," mistakenly believed their GVB ticket was valid for the train due to incorrect trip preparation.

9.1.1 Limitations

While the results explain why tourists travel without a valid ticket from Schiphol Airport, they do not provide quantitative insights into the actual number of these travellers. These numbers help to build a business case, which validates the insights of this project. This presents an opportunity for further research. For example, during one of the research insight presentations for a team within NS, one employee suggested that the estimated revenue loss of €385,000 might be a low estimate, although determined based on qualitative research insights. This underscores the need for quantitative research to support the business case and generate momentum within NS to address this issue.

Additionally, although language barriers were not perceived as a significant problem, some international tourists struggled to express themselves fully in English, leading to less insightful responses compared to native English speakers.

Furthermore, while continuous meetings with NS and stakeholders validated the concepts, the real impact of the solutions on tourists still requires testing and validation. In addition, some solutions depend on collaboration with

companies like Booking.com and GVB. The willingness of these companies to collaborate remains uncertain.

9.1.2 Recommendations

The qualitative research indicates that NS loses revenue on the journey from Schiphol Airport to Amsterdam. However, the research only focuses on this specific route, while not all international tourists arriving at Schiphol travel to Amsterdam. Therefore, additional quantitative research should also consider tourists travelling to other destinations without purchasing a ticket, highlighting the broader impact of this problem.

Interviews with service employees at Amsterdam Central Station revealed an interesting insight: many tourists travel with a GVB ticket instead of an NS ticket. Engaging with these employees was very insightful as they help tourists and other travellers daily. Therefore, future research should involve these service employees, also at other stations, to uncover problems and challenges that might not be easily identified through other research methods.

End-of-experience evaluations significantly influence overall satisfaction and future behaviour, such as the likelihood of repeat purchases or recommendations (Kahneman et al., 1993; Fredrickson & Kahneman, 1993). Therefore, it remains important to investigate the actual negative impact on international tourists who encounter closed gates.

Additionally, this research aimed to find the desired balance of digital and physical touchpoints for international tourists. However, I recommend exploring whether the balance of desired digital and physical touchpoints differs for domestic travellers, or if the needs of domestic and international travellers within the context of public transport are similar.

Conclusion

This project aimed to design a 'phygital' journey to enhance intuitive access to NS's services for international tourists transferring from Schiphol Airport to Amsterdam. As the research progressed, the goal evolved to ensure tourists purchase a valid ticket, thereby improving their transition from plane to train. This project aimed to find the optimal balance between physical and digital touchpoints for international tourists.

Neuburger et al. (2018) describe 'phygital experiences' as connections between the digital and physical worlds. Batat (2022) highlights that 'phygital' retail experiences focus on a synergy of digital and physical channels. However, public transport indicates the need for a different focus. The qualitative research suggests that most tourists do not plan their train journey, excluding the possibility of digital touchpoint integration for NS. Tourists encounter physical touchpoints for the first time in the crowded environment of Schiphol Plaza. The first time they see or experience a touchpoint is also the first moment they have to interact with it. This underscores the importance of providing a clear physical journey that triggers recognition and interaction without relying on digital touchpoints.

This project suggests another balance of 'phygital' experiences, compared to those mentioned by Neuburger et al. and Batat. Within public transport, digital touchpoints can reinforce the physical world by preparing tourists for their physical journey. Digital tools can play a crucial educational and preparatory role. For example, proactive digital marketing and integrating NS ticket purchases in the checkout flow of platforms like Booking.com or EasyJet can make physical touchpoints easier to interact with.

The question remains whether public transport is ready to adopt innovative phygital solutions. Durand et al. (2023) revealed that integrating digital technologies could disadvantage

infrequent travellers. For example, when responding to timetable disruptions, relying solely on digital touchpoints causes concerns. Those unable or unwilling to keep up with digital transformation risk social exclusion from public transport services. Infrequent or non-public transport travellers often find that investing time to understand available digital touchpoints is not worth it (Pangbourne et al., 2010). Qualitative research with NS employees supports this, indicating that tourists cannot be expected to understand the system immediately or download the NS app. Therefore, in this context, digital technologies are not the preferred option for this target audience, and the focus should remain on the physical world. However, leveraging channels to proactively reach tourists, like digital marketing or integrating tickets into platforms like Booking.com, could prepare tourists for their physical journey, requiring no additional effort on their part.

However, the research insights also highlight opportunities. Although few tourists downloaded the NS app, many GVB planners downloaded the GVB app, indicating that digital tools can achieve phygital integration. The GVB app is attractive to tourists as it offers public transport tickets, navigation between highlights in Amsterdam, and tickets for museum's all-in-one platform. This shows that an app tailored to specific needs can be more appealing. As public transport users are often on the go, smartphones offer an interesting opportunity for 'phygital solutions'. Further research should determine the desired level of innovativeness for 'phygital' experiences. Should they use immersive technologies, or is the desired balance simply providing real-life personal assistance through an app when travelling with public transport?

Personal Reflection

9.3.1 Research & Process Reflection

The versatility, practicality, and opportunities of this project made me eager to continue working on it. From start to finish, I enjoyed working on this project, with the personal goal of creating practical solutions for NS. Seeing the potential in these solutions and new proposed business models, such as the one with Booking.com, makes me keen to develop them further. It feels unfinished to conclude the project here, but within the given timeframe, I am pleased with the insights and tools I provided to NS. I hope to assist them in implementing these solutions in the future.

9.3.2 Reflection on Research

After the mid-term meeting, it became clear that additional qualitative research was needed. This required me to quickly adapt to the changing context of the project. I am proud of how I managed this by switching fast, setting new goals and acting on them. This flexibility is a valuable skill for future projects, showcasing the ability to adapt to changing project directions. The importance of the qualitative research I conducted became evident through the interest shown by NS, leading to multiple internal meetings to present my insights. These presentations, attended by over ten people per meeting, were also recorded and shared within NS, demonstrating the project's impact. This made me proud, as it showcased the value of my findings.

9.3.3 Personal Goals

I aimed to develop my strengths and ambitions as a strategic designer. Over the past year, my core activities have been on the business side of solving problems and creating digital products. This project provided an opportunity to test these skills in a more user-centred approach. One thing I can confirm is a new interest in qualitative research. I noticed the momentum a comment or proposition can create when backed by research insights. These insights made me more confident in stakeholder

meetings, as my comments and suggestions were supported by consumer insights. This confidence was evident during the Airport Safaris, where I gave feedback on the floor sticker concept based on research insights, leading to new iterations. I am looking forward to seeing these stickers next autumn.

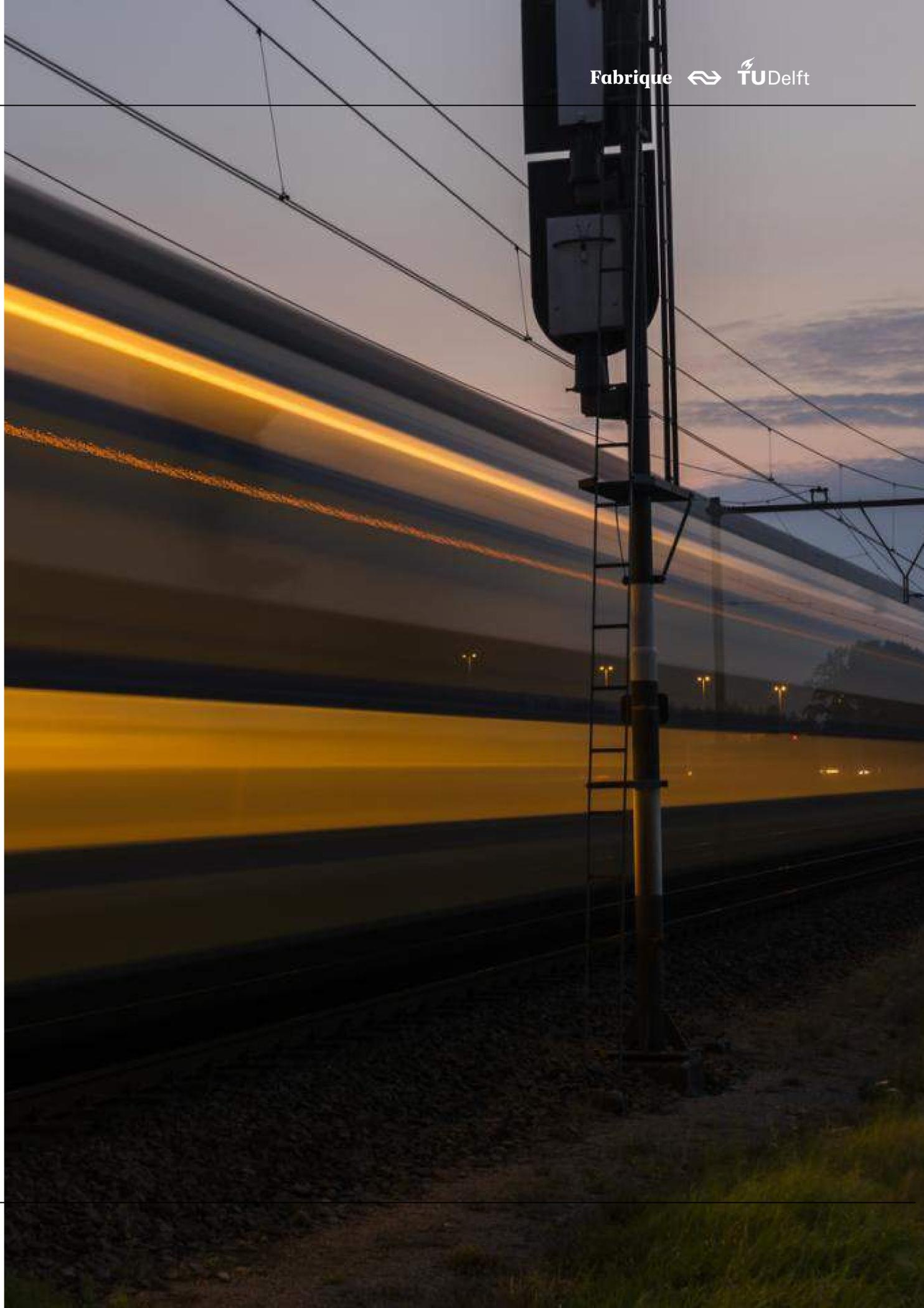
9.3.4 Room for Improvement

I'm satisfied with the final result, but there are areas where I could improve if I were to do it again. Seeing everything I did over the last half year in one finished document made me realise 'Wow, I did a lot'. Although I also consider this a good thing, I also see it as my pitfall: I want to do everything. This leads to focus and sharpness staying away from the important things, and there could have been more focus here. Thereon continuing, I find it challenging to maintain the same level of conciseness in reports as I do in presentations. Balancing the need to support my recommendations with the requirement for clarity and conciseness is a challenge. Writing has always been a challenge for me. Thankfully, Erik-Jan's guidance improved the clarity and structure of the report. I consider my time management skills to be decent, but the order of planning leaves room for improvement. Since writing is not my preferred task, I postpone it until the last moment. Additionally, I sometimes jump from one task to another without finishing the first one properly. This ultimately costs more time than it saves time.

Lastly, I received feedback from Gert Hans that I should accept compliments better. I will now put that feedback into action:

9.3.5 Ending on a positive note

I am particularly proud of my approach towards stakeholders and the positive feedback I received from them. I am proud of the level of involvement I felt, especially from NS. This is demonstrated in the fact that initial one-time interviews led to multiple follow-up meetings. Ultimately, landing a new job at Fabrique, where this thesis was written, demonstrates the quality and potential of the work, as well as the value it created.





CHAPTER 10

References and Appendices

10

(Public Transport Holland, n.d.)

References

- Batat, W. (2022), "What does phygital really mean? A conceptual introduction to the phygital customer experience (PH-CX) framework", *Journal of Strategic Marketing*, pp. 1-24, doi: 10.1080/0965254X.2022.2059775.
- Birken, E. G. & Forbes. (2022, September 28). Return on investment (ROI). Retrieved July 28, 2024, from <https://www.forbes.com/advisor/investing/roi-return-on-investment/>
- Board of Innovation. (2024). 3 horizons model. Retrieved July 22, 2024, from <https://www.boardofinnovation.com/tools/three-horizons-of-innovation/>
- Bonfanti, A., Vigolo, V., Vannucci, V., & Brunetti, F. (2023). Creating memorable shopping experiences to meet phygital customers' needs: evidence from sporting goods stores. *International Journal of Retail & Distribution Management*, 51(13), 81-100.
- Bureau Spoorbouwmeester. (n.d.). Spoorbeeld. <https://www.spoorbeeld.nl/over-ons/bureau-spoorbouwmeester>
- Bureau Spoorbouwmeester. (2023). Handboek routing, signing & branding.
- Carmona, M. (2019). Principles for public space design, planning to do better. *Urban Design International*, 24, 47-59.
- Centraal Bureau voor de Statistiek. (2022, November 10). Recordaantal toeristen boekt overnachting in Nederland. Centraal Bureau Voor De Statistiek. <https://www.cbs.nl/nl-nl/nieuws/2022/45/recordaantal-toeristen-boekt-overnachting-in-nederland>
- Del Vecchio, P., Secundo, G., & Garzoni, A. (2023). Phygital technologies and environments for breakthrough innovation in customers' and citizens' journey. A critical literature review and future agenda. *Technological Forecasting and Social Change*, 189, 122342.
- Delbosc, A., & Currie, G. (2019). Why do people fare evade? A global shift in fare evasion research. *Transport Reviews*, 39(3), 376-391. <https://doi.org/10.1080/01441647.2018.1482382>
- Dwyer, F.R. and Tanner, J.F., 2002. *Business marketing: Connecting strategy, relationships, and learning*. New York: McGraw-Hill.
- Durand, A., & Zijlstra, T. (2020). The impact of digitalisation on the access to transport services: a literature review. *Netherlands Institute of Transport Policy Analysis*, 1-74.
- Durand, A., Zijlstra, T., Hamersma, M., van Oort, N., Hoogendoorn-Lanser, S., & Hoogendoorn, S. (2023). "Who can I ask for help?": Mechanisms behind digital inequality in public transport. *Cities*, 137, 104335.
- Durand, A., Zijlstra, T., van Oort, N., Hoogendoorn-Lanser, S., & Hoogendoorn, S. (2022). Access denied? Digital inequality in transport services. *Transport Reviews*, 42(1), 32-57.
- Dwyer, F.R. and Tanner, J.F., 2002. *Business marketing: Connecting strategy, relationships, and learning*. New York: McGraw-Hill.
- Fossey, E., Harvey, C., McDermott, F., & Davidson, L. (2002). Understanding and evaluating qualitative research. *Australian & New Zealand journal of psychiatry*, 36(6), 717-732.
- Gentner, D., Loewenstein, J., & Thompson, L. (2003). Learning and transfer: A general role for analogical encoding. *Journal of educational psychology*, 95(2), 393.
- Glaser, B. G., & Strauss, A. (1967). The discovery of grounded theory: Strategies for qualitative research. Chicago, IL: Aldine
- Gong, C., & Ribiere, V. (2021). Developing a unified definition of digital transformation. *Technovation*, 102, 102217.
- GVB. (2024, June 10). Corporate governance - Over GVB. Over GVB. <https://over.gvb.nl/organisatie/governance/#:~:text=De%20gemeente%20Amsterdam%20en%20de,%20de%20aan%20aandeelhouders%20van%20GVB.>
- Het Parool, & Roele, J. (2023, February 22). Toeristensector nog niet helemaal hersteld, maar er slapen wel weer meer bezoekers in Amsterdam. Retrieved July 25, 2024, from <https://www.parool.nl/amsterdam/toeristensector-nog-niet-helemaal-hersteld-maar-er-slapen-wel-weer-meer-bezoekers-in-amsterdam~beeba578/>
- Hietanen, S. (2014). "Mobility as a Service"—The new transport model? *Eurotransport*, 12(2), 2-4.
- Ingka Group. (2023, November 29). IKEA launches new AI-powered experience; IKEA Kreativ. Retrieved July 25, 2024, from <https://www.ingka.com/newsroom/ikea-launches-new-ai-powered-experience-empowering-customers-to-create-lifelike-room-designs/>
- Kompeer, J. & NOS. (2023, December 21). Spoorafspraken definitief: tot 2033 alleen NS-treinen op belangrijkste lijnen. Retrieved July 27, 2024, from <https://nos.nl/artikel/2502434-spoorafspraken-definitief-tot-2033-alleen-ns-treinen-op-belangrijkste-lijnen>
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. Springer.
- Lemon, K. N., & Verhoef, P. C. (2016). Understanding customer experience throughout the customer journey. *Journal of Marketing*, 80(6), 69-96.
- Mastercard. (2023, June 7). The Netherlands becomes first country to launch fully contactless public transport payments system nationwide. Retrieved July 16, 2024, from <https://www.mastercard.com/news/europe/en/newsroom/press-releases/en/2023/netherlands-contactless-transit-payments-system/>
- McKinsey & Company. (2009, December 1). *Enduring Ideas: The three horizons of growth*. <https://www.mckinsey.com/capabilities/strategy-and-corporate-finance/our-insights/enduring-ideas-the-three-horizons-of-growth>
- Mele, C., Russo-Spena, T., Tregua, M., & Amitrano, C. C. (2021). The millennial customer journey: a Phygital mapping of emotional, behavioural, and social experiences. *Journal of Consumer Marketing*, 38(4), 420-433.
- Ministerie van Infrastructuur en Waterstaat & Rijksoverheid. (2020, December 21). Hoofdrailnetconcessie vanaf 2025. Retrieved July 25, 2024, from <https://www.rijksoverheid.nl/documenten/publicaties/2023/08/14/hoofdrailnetconcessie-vanaf-2025#:~:text=Eind%20december%202023%20is%20de,de%20Rijksoverheid%20aan%20ONS%20stelt.>
- Ministry of Infrastructure and Water Management, NS, ProRail, Federatie Mobiliteitsbedrijven Nederland, GVB, RET, & HTM. (2019). *Public transport in 2040*. In *Outlines of a Vision for the Future* [Report].
- Neuburger, L., Beck, J., & Egger, R. (2018). The 'Phygital' tourist experience: The use of augmented and virtual reality in destination marketing. In *Tourism planning and destination marketing* (pp. 183-202). Emerald Publishing Limited.
- NOS. (2023, April 24). Kans groot dat reizen in de spits in 2025 duurder wordt. Retrieved July 26, 2024, from <https://nos.nl/artikel/2472698-kans-groot-dat-reizen-in-de-spits-in-2025-duurder-wordt>
- NOS. (2023b, April 24). Kans groot dat reizen in de spits in 2025 duurder wordt. <https://nos.nl/artikel/2472698-kans-groot-dat-reizen-in-de-spits-in-2025-duurder-wordt>
- NS. (2018). *Uitkomsten enquêtes Schiphol-Amsterdam Centraal*.
- NS. (2022, August 11). NS start met testritten Airport Sprinter. <https://nieuws.ns.nl/start-testritten-airport-sprinter/>
- NS. (2023). *NS Annual Report 2023*.
- NS. (2023b). *Vervoerplan NS 2023*.
- NS. (2023c). *Vervoerplan NS 2023*.
- NS. (n.d.). *Verantwoordelijkheid*. Nederlandse Spoorwegen. Retrieved July 26, 2024, from <https://www.ns.nl/over-ns/de-spoorsector/verantwoordelijkheid.html>
- Panaia, B. (n.d.). NIKE FITADV "WEATHER STATION" — BRYON PANAI A. Retrieved July 25, 2024, from <https://visualist.com/NIKE-FITADV-WEATHER-STATION>
- Pangarkar, A., Arora, V. and Shukla, Y. (2022), "Exploring phygital omnichannel luxury retailing for immersive customer experience: the role of rapport and social engagement", *Journal of Retailing and Consumer Services*, Vol. 68, 103001.
- Pangbourne, K., Aditjandra, P. T., & Nelson, J. D. (2010). New technology and quality of life for older people: Exploring health and transport dimensions in the UK context. *IET Intelligent Transport Systems*, 4(4), 318-327. doi:10.1049/iet-its.2009.0106
- Patton, M. Q. (2014). *Patton's 40 Purposeful Sampling Strategies*, visualized by SaraVaca.com (Based on: Patton, M. Q. (2014) *Qualitative research & evaluation methods: Integrating theory and practice*. SAGE Publications.)
- Pratt, M. G. (2009). From the editors: For the lack of a boilerplate: Tips on writing up (and reviewing) qualitative research. *Academy of management journal*, 52(5), 856-862.
- ProductPlan. (2022a, May 27). *Minimum Viable Product (MVP)*. Retrieved July 22, 2024, from <https://www.productplan.com/glossary/minimum-viable-product/>
- ProductPlan. (2022b, December 21). *RICE Scoring model*. Prioritization Method Overview. Retrieved July 17, 2024, from <https://www.productplan.com/glossary/rice-scoring-model/>
- ProRail. (2023, May 16). *ProRail verhoogt gebruiksvergoeding spoor voor 2024*. Retrieved July 25, 2024, from <https://www.prorail.nl/nieuws/prorail-verhoogt-gebruiksvergoeding-spoor-voor-2024#:~:text=ProRail%20heeft%20na%20berekening%20de,%20C5%25%20te%20laten%20stijgen>
- ProRail. (n.d.). *Over ons*. Retrieved July 26, 2024, from <https://www.prorail.nl/over-ons>
- Ries, E. (2011). *The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses*. Crown Business.
- Royal Schiphol Group. (n.d.-a). *Connecting the Netherlands*. Missie. Retrieved July 20, 2024, from <https://www.schiphol.nl/nl/schiphol-group/pagina/missie/>
- Royal Schiphol Group. (n.d.-b). *Focus op 6 strategische pijlers*. Onze Visie 2050. Retrieved July 20, 2024, from <https://www.schiphol.nl/nl/schiphol-group/pagina/strategische-kwaliteiten/>

Royal Schiphol Group. (n.d.-c). Royal Schiphol Group | Connecting your world. Retrieved July 26, 2024, from <https://www.schiphol.nl/nl/schiphol-group/>

Skinner, B. F. (1953). Some contributions of an experimental analysis of behavior to psychology as a whole. *American Psychologist*, 8(2), 69.

Similarweb. (n.d.). Organic Search. Retrieved July 23, 2024, from <https://support.similarweb.com/hc/en-us/articles/9278022408733-Organic-Search#:~:text=Organic%20search%20is%20a%20search,the%20influence%20of%20paid%20advertising.>

Solanki, M. (2018, October 12). Tourism numbers in the Netherlands set to explode to 29 million by 2030. Retrieved May 24, 2019, from I Am Expat: www.iamexpat.nl/expat-info/dutch-expat-news/tourism-numbers-netherlands-setexplode-29-million-2030

Statista. (2019, November). Domestic and international tourism in the Netherlands 2018, by transport. Retrieved July 25, 2024, from <https://www.statista.com/statistics/612565/domestic-and-international-tourism-by-transportation-netherlands/>

Statista. (2020, March). Choice of transport to and from Amsterdam Airport Schiphol the Netherlands 2015-2019. Retrieved July 25, 2024, from <https://www.statista.com/statistics/688080/choice-of-transport-to-and-from-amsterdam-airport-schiphol-the-netherlands/>

Statista. (2024, March 28). Leading hotel booking brands market share in the Netherlands 2021. <https://www.statista.com/forecasts/1297938/leading-hotel-booking-brands-market-share-in-the-netherlands>

Statista. (2024a, February 23). Forecast: MaaS market size worldwide 2021 and 2030. Retrieved July 27, 2024, from <https://www.statista.com/statistics/1180559/global-mobility-as-a-service-market-size/#:~:text=Forecast%3A%20MaaS%20market%20size%20worldwide%202021%20and%202030&text=The%20ascent%20of%20Mobility%20as,reach%20500%20billion%20euros%20worldwide.>

The Interaction Design Foundation. (2024, June 28). What is the Recency Effect? Retrieved July 2, 2024, from <https://www.interaction-design.org/literature/topics/recency-effect>

Tommy Hilfiger. (2020). A CULTURE OF INNOVATION.

Tschimmel, K. (2012). Design Thinking as an effective Toolkit for Innovation. In ISPIIM Conference Proceedings (p. 1). The International Society for Professional Innovation Management (ISPIIM).

Van Der Velden, D., Lucas, E., Al Beiramani, M., & Melissen, R. (2020). De Reis van Jamie.

Appendices Overview

Appendix 1

Graduation project brief

Appendix 2a

Interview guide research Schiphol

Appendix 2b

Codebook consumer research Schiphol

Appendix 3a

Interview guide NS execute employees

Appendix 3b

Codebook NS execute employees

Appendix 4a

Interview guide NS service employees
Amsterdam CS

Appendix 4b

Codebook NS service employees Amsterdam
CS

Appendix 5a

Interview guide tourists without valid ticket

Appendix 5b

Codebook tourists without valid ticket

Appendix 6

Overview of 122 ideas

Appendix 7

Ideation workshop

Appendix 8

RICE prioritisation method

Appendix 9

Considerations and assumptions for
determining investments and revenue per
solution

Appendix 1

Graduation project brief

TU Delft

IDE Master Graduation Project

Project team, procedural checks and Personal Project Brief

In this document the agreements made between student and supervisory team about the student's IDE Master Graduation Project are set out. This document may also include involvement of an external client, however does not cover any legal matters student and client (might) agree upon. Next to that, this document facilitates the required procedural checks:

- Student defines the team, what the student is going to do/deliver and how that will come about
- Chair of the supervisory team signs, to formally approve the project's setup / Project brief
- SSC E&SA (Shared Service Centre, Education & Student Affairs) report on the student's registration and study progress
- IDE's Board of Examiners confirms the proposed supervisory team on their eligibility, and whether the student is allowed to start the Graduation Project

STUDENT DATA & MASTER PROGRAMME

Complete all fields and indicate which master(s) you are in

Family name	<input type="text"/>	IDE master(s)	<input type="checkbox"/> IPD	<input type="checkbox"/> Dfi	<input checked="" type="checkbox"/> SPD
Initials	<input type="text"/>	2 nd non-IDE master	<input type="checkbox"/>		
Given name	<input type="text"/>	Individual programme	<input type="text"/>		
Student number	<input type="text"/>	(date of approval)	<input type="text"/>		
		Medisign	<input type="checkbox"/>		
		HPM	<input type="checkbox"/>		

SUPERVISORY TEAM

Fill in the required information of supervisory team members. If applicable, company mentor is added as 2nd mentor

Chair	<input type="text"/>	<p>Ensure a heterogeneous team. In case you wish to include team members from the same section, explain why.</p> <p>Chair should request the IDE Board of Examiners for approval when a non-IDE mentor is proposed. Include CV and motivation letter.</p> <p>2nd mentor only applies when a client is involved.</p>
mentor	<input type="text"/>	
2 nd mentor	<input type="text"/>	
client:	<input type="text"/>	
city:	<input type="text"/>	
optional comments	<input type="text"/>	

APPROVAL OF CHAIR on PROJECT PROPOSAL / PROJECT BRIEF -> to be filled in by the Chair of the supervisory team

Sign for approval (Chair)

Name H.J. Hultink Date March 1, 2024 Signature

CHECK ON STUDY PROGRESS

To be filled in by SSC E&SA (Shared Service Centre, Education & Student Affairs), after approval of the project brief by the chair. The study progress will be checked for a 2nd time just before the green light meeting.

Master electives no. of EC accumulated in total	<input type="text"/>	EC	<input type="checkbox"/>	
Of which, taking conditional requirements into account, can be part of the exam programme	<input type="text"/>	EC	<input type="checkbox"/>	

	<input checked="" type="checkbox"/> YES	all 1 st year master courses passed
	<input type="checkbox"/> NO	missing 1 st year courses

Comments:

Sign for approval (SSC E&SA)

Name Rik Ledoux Date 13-06-2024 Signature

APPROVAL OF BOARD OF EXAMINERS IDE on SUPERVISORY TEAM -> to be checked and filled in by IDE's Board of Examiners

Does the composition of the Supervisory Team comply with regulations?

<input checked="" type="checkbox"/> YES	<input checked="" type="checkbox"/>	Supervisory Team approved
<input type="checkbox"/> NO	<input type="checkbox"/>	Supervisory Team not approved

Based on study progress, students is ...

<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	ALLOWED to start the graduation project
<input type="checkbox"/>	<input type="checkbox"/>	NOT allowed to start the graduation project

Comments:

Sign for approval (BoEx)

Name Monique von Morgen Date 2/7/2024 Signature

TU Delft

Personal Project Brief – IDE Master Graduation Project

Name student Kaya Knipscheer Student number 4842987

PROJECT TITLE, INTRODUCTION, PROBLEM DEFINITION and ASSIGNMENT

Complete all fields, keep information clear, specific and concise

Project title Integrating digital and physical touchpoints to improve the intuitive access to NS's services for tourists

Please state the title of your graduation project (above). Keep the title compact and simple. Do not use abbreviations. The remainder of this document allows you to define and clarify your graduation project.

Introduction

Describe the context of your project here; What is the domain in which your project takes place? Who are the main stakeholders and what interests are at stake? Describe the opportunities (and limitations) in this domain to better serve the stakeholder interests. (max 250 words)

This project takes place in the public space. Public spaces can be described by all areas people share, ranging from the broader concept of cities to specific spaces within buildings (Cho et al., 2016). Public spaces bring together people without distinguishing demographic characteristics. An example of such a public space is public transport, which will be the focus for this project.

Throughout the last decades, digital technologies are increasingly integrated in people's everyday life. In the context of public transport, digital transformation has taken a central role in the accessibility of services for travelers. Consequently, digital touchpoints have become more prominently available (Durand & Zijlstra, 2020). However, the question remains what the desired balance of 'phygital' (digital + physical) experiences is for travelers.

Fabrique is a digital design agency, specialized in strategy, design and development. Over the last two years, Fabrique has bundled their in-house expertise and formed a team specialized in UX in the public space. As it responds to digitalisation, Fabrique is seeking to reinforce their in-house expertise in the field of phygital for future projects, making public spaces truly accessible to everyone.

To put this matter in a concrete context, this project will be in collaboration with NS (Dutch Railways). NS recently announced the introduction of the 'Airport Sprinter'. This train shuttles between Schiphol Airport, Amsterdam Centraal, and Hoofddorp. Hereby, NS aims to enhance the accessibility on this journey for international tourists, without detriment of the domestic traveler.

→ space available for images / figures on next page

Personal Project Brief – IDE Master Graduation Project

Problem Definition

What problem do you want to solve in the context described in the introduction, and within the available time frame of 100 working days? (= Master Graduation Project of 30 EC). What opportunities do you see to create added value for the described stakeholders? Substantiate your choice. (max 200 words)

Despite the accessibility benefits of digitalization, new digital technologies also require new interactions from travelers. As mentioned before, public spaces bring together people from all demographic backgrounds. Consequently, not all travelers are able or willing to keep up with this pace of digitalisation in public transport, resulting in the (potential) exclusion of travelers (Durand & Zijlstra, 2020).

The case for NS is particularly suited for this problem as international tourists are new users and often not familiar with local digital tools like apps, and thus rely more on their intuitive interaction with the physical world (with digital touchpoints) around them. By scoping the problem frame to international tourists traveling from Schiphol Airport to Amsterdam, the project aims to increase the intuitive accessibility for first time users by integrating digital and physical touchpoints.

For Fabrique, this case presents an opportunity to better understand the desired balance of digital and physical touchpoints among the diverse people converging in public spaces. These insights can be translated into other public areas and serve as a knowledge repository for future projects in the public domain. For NS, this project offers insights minimize confusion in the journey, while taking into account strict rules and regulations.

Assignment

This is the most important part of the project brief because it will give a clear direction of what you are heading for. Formulate an assignment to yourself regarding what you expect to deliver as result at the end of your project. (1 sentence) As you graduate as an industrial design engineer, your assignment will start with a verb (Design/Investigate/Validate/Create), and you may use the green text format:

Design a 'phygital' customer journey to improve the intuitive access to NS's services for international tourists transferring from Schiphol Airport to Amsterdam with NS (Dutch Railways)

Then explain your project approach to carrying out your graduation project and what research and design methods you plan to use to generate your design solution (max 150 words)

The approach for this project will mainly be research focused. I will start doing a literature review and a context analysis to get a clear understanding of the public transport domain and the different interests and values amongst the various stakeholders. After this, I will form key insights from market, consumer, and company point of view that will serve as a guideline throughout my project. Then, I will conduct qualitative research by facilitating in-depth interviews with stakeholders and end-users. Insights will be formed and placed into a theoretical framework.

After this phase, the framework and key insights will be used to transform the as-is journey into a new, intuitive journey. Diverging and converging methods as found in the Delft Design Guide will be used, as well as facilitating co-creation workshops to integrate multiple perspectives on the solution space. The final concept will be prototyped and lo-fi tested to validate the solution and potential for NS.

Project planning and key moments

To make visible how you plan to spend your time, you must make a planning for the full project. You are advised to use a Gantt chart format to show the different phases of your project, deliverables you have in mind, meetings and in-between deadlines. Keep in mind that all activities should fit within the given run time of 100 working days. Your planning should include a **kick-off meeting, mid-term evaluation meeting, green light meeting and graduation ceremony**. Please indicate periods of part-time activities and/or periods of not spending time on your graduation project, if any (for instance because of holidays or parallel course activities).

Make sure to attach the full plan to this project brief. The four key moment dates must be filled in below

Kick off meeting 26 Feb 2024

Mid-term evaluation 22 Apr 2024

Green light meeting 17 Jun 2024

Graduation ceremony 26 Jul 2024

In exceptional cases (part of) the Graduation Project may need to be scheduled part-time. Indicate here if such applies to your project

Part of project scheduled part-time	<input type="checkbox"/>
For how many project weeks	<input type="text"/>
Number of project days per week	<input type="text"/>

Comments:

Motivation and personal ambitions

Explain why you wish to start this project, what competencies you want to prove or develop (e.g. competencies acquired in your MSc programme, electives, extra-curricular activities or other).

Optionally, describe whether you have some personal learning ambitions which you explicitly want to address in this project, on top of the learning objectives of the Graduation Project itself. You might think of e.g. acquiring in depth knowledge on a specific subject, broadening your competencies or experimenting with a specific tool or methodology. Personal learning ambitions are limited to a maximum number of five. (200 words max)

The initial motivation for this project started during my strategy internship at DEPT® agency. After a year in a full digital context, I continuously found myself wondering how digital products interact with the world around us. Although digital touchpoints play an increasing part in customer journeys, I believe physical interactions should not be overlooked. Finding balance in digital and physical realms has therefore gained my interest, foreseeing the relevance of 'phygital' in future digital transformation challenges.

With an eye on my future career, I want to use this project to develop my skills in service and user experience design, as well as designing in complex public spaces. Graduating at Fabrique offers me the opportunity to work with a lot of skilled UX and Service designers, and I am keen to use their expertise by hosting co-creation workshops to integrate their point of view in my project.

By delving into these domains, I aim to broaden my perspective on where my strengths and ambitions lie as a strategic designer. For the last year, I've taken more the business perspective on complex problems, but I am interested to learn if the skills I've built hold up when broadening my perspective to a more user-centered approach.

Appendix 2a

Interview guide

research Schiphol

Demographic vragen

- Hi, can I ask you something?
- Are you taking the train to Amsterdam?
 - And this your first time taking the train in the Netherlands?
- The reason I'm asking is because I am doing research for NS (Dutch Railways) to improve the journey from Schiphol Airport to Amsterdam for international tourists. Can I maybe ask you some more questions? It will take maybe 5-10 minutes and after, I can help you take the right train 🙄
- Btw, is it ok to record this conversation so I can remember everything afterwards?
- Did you just arrive here by plane?
 - Where did your journey start?
 - How long on the way in total?
 - Where are you going?

Experience

- How are you experiencing (the ease of use of) taking the train to Amsterdam at Schiphol Airport?
 - Wayfinding experience
 - Ticket purchase experience
 - Checking in experience
 - Finding the right platform / train experience
- What are you experiencing as unclear or difficult?
 - Why?
- What would you like to see differently to make taking the train at Schiphol Airport easier for you (international tourists)?
 - Why?

Planning

- How did you prepare for the journey from Schiphol Airport to Amsterdam?
 - When did you start planning / thinking of transportation options from Schiphol Airport to Amsterdam?
- When did you end up choosing the train?
 - And why? What convinced or motivated you to choose the train?
- Did you do any research before?
 - What were things you wanted to know beforehand?

Phygital

Digital

- What digital tools of NS have you already used or seen?
- What is your experience with them?
- What digital tools are you looking for right now?
 - Why?

Physical

- What do you think of the location and accessibility of trains from luggage point to trains?
- What would help you to make the access to the train more clear?
- What are non-digital things that you are missing here?

Last questions

- Thank you so much, we are almost done!
- Just to be sure I interview people from different countries and ages:
 - How old are you?
 - Where are you from?
- Thank you so much! Is there anything I can help you with regarding taking the right train or purchasing a ticket?

Appendix 2b

Codebook consumer

research Schiphol

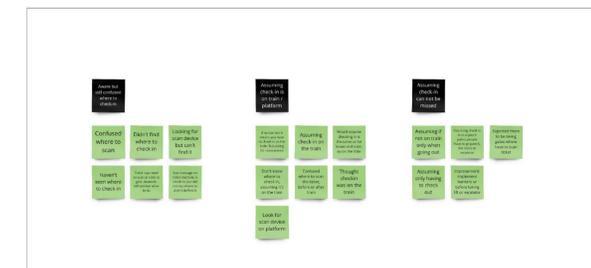
Checking-in



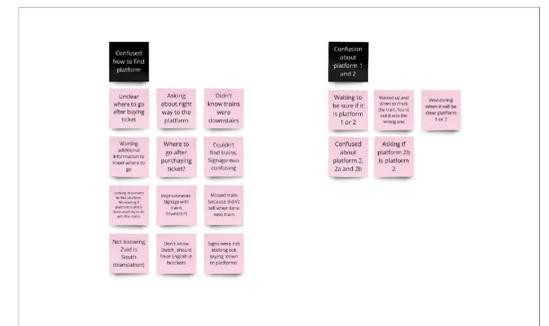
Improvements



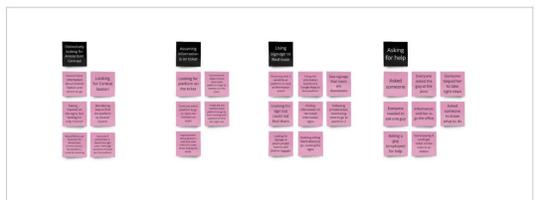
Approach



Finding platform



Approach



This Appendix presents the challenges among international tourists at Schiphol Airport.

Green post-its present the codes building the 'Unaware of the need to check in a ticket' construct.

Pink post-its present the 'Some tourists struggle to find the right platform' construct.

Appendix 3a

Interview guide NS execute employees

Interview vragen NS

Hi, allereerst wil ik je nogmaals bedanken dat je mee wilt doen aan mijn onderzoek voor mijn afstudeerproject aan de TU Delft.

Eerst geef ik nog even een korte introductie naar mijn afstudeerproject en mijn doel van dit interview.

Introductie
Ik ben namelijk onderzoek aan het doen hoe we de journey van Schiphol Airport naar (eindbestemming in) Amsterdam gemakkelijker kunnen maken voor internationale toeristen. Het gaat hier om internationale toeristen die voor het eerst in aanraking komen met de NS en geen eerdere ervaring hebben met het nemen van de trein vanaf Schiphol. Dit betekent dat ze dus intuïtief deze journey moeten doorlopen vanaf het moment dat ze landen op Schiphol.

Doel
Het komende interview zal maximaal een uurje duren. Zoals ik al in de mail had geschreven, heb ik een opzetje gemaakt van topics die ik graag met je zou willen bespreken. Hierbij is het belangrijk dat je me de inzichten geeft vanuit jouw expertise. Zodat ik aan het eind van alle interviews die ik ga doen een goed en holistisch beeld kan schetsen en de meerdere perspectieven binnen NS samen kan brengen. Dit beeld kan ik vervolgens koppelen aan de geïdentificeerde pijnpunten van de internationale toeristen (na onderzoek op Schiphol zelf), om zo een passende oplossing te kunnen ontwerpen voor zowel NS als de internationale toeristen.

Voor we beginnen: ik zou dit gesprek graag opnemen zodat ik het later kan terugluisteren en niet belangrijke informatie vergeet. Is dat ok? Dan start ik nu de opname.

Dan, voor we echt beginnen, heb je nog vragen voordat we gaan beginnen?

Ambitie

- Als alles mogelijk zou zijn, en je dus de internationale toerist de ideale journey kan bieden waarbij geen rekening gehouden hoeft te worden met restricties vanuit NS, Schiphol, of andere stakeholders.
 - Hoe zou vanuit jouw expertise, deze ideale journey er dan uit zien?
 - Waarom? Wat is de onderliggende reden hierboe?
 - Wat zou je internationale toeristen willen bieden?

Doelen / visie NS

- Bedankt voor je antwoord! En je benoemt dus [ideale situatie en wat je de internationale toerist wilt bieden], als we dit nu terugkoppelen naar de visie van NS, of de situatie waar NS naar streeft. Hoe past jouw ideale situatie dan binnen de visie en doelstelling van de toekomst van NS?
- Welke concrete doelen / strategieën horen hierbij vanuit NS?
 - Welke kernwaarden liggen hieronder?

Beperkingen en hoe gaan we hier mee om?

We hebben het nu natuurlijk gehad over de ideale situatie, en daarna de situatie waar NS naar streeft. Ik ben nu heel benieuwd waar jullie rekening mee moeten houden / restricties waar rekening mee gehouden moet worden als veranderingen zouden willen doorvoeren op Schiphol Airport.

Obstakels:

- Waar zitten dan obstakels (voor implementeren van nieuwe oplossingen)?
 - Wat zijn deze obstakels?
 - Hoe ga je met deze obstakels om?
 - Wat zijn de eisen / requirements vanuit NS waar voldaan moet worden?

Team:

- Hoe ziet de samenwerking er binnen NS uit om nieuwe oplossingen te bedenken of te implementeren op Schiphol Airport (voor internationale toeristen).
 - Met welke mensen binnen NS werken jullie samen?
 - Met welke stakeholders moet er rekening gehouden worden? (Zowel intern als extern NS)
 - Hoe ziet deze samenwerking eruit?

Pijnpunten

Bedankt voor je antwoorden. Ik wil nu graag even inzoomen op de huidige internationale toerist journey op Schiphol.

- Want als we nu kijken naar deze internationale toerist journey, waar zien je (vanuit jouw expertise) nu de grootste pijnpunten in deze journey?
- Waar lopen mensen tegenaan?

- Waarom denk je dat ze hier moeite mee hebben?
 - Wat gaat er mis / is er onduidelijk vanuit NS?
- Welke impact heeft dit op NS?
 - En stakeholders?

Needs

- Als we dan nu echt kijken naar deze internationale toerist. Wat denk je dat hun behoeftes zijn op het moment dat ze interactie uitvoeren met [expertise].
 - Waarom?
- Welke gevoel wil je aan het overdragen?
 - Waarom?
- Zijn er op dit moment denk je onvervulde behoeftes?
 - Zo ja, welke zijn dit?

Jobs-to-be-done / features

Gekeken naar de pijnpunten en behoeftes van de internationale toerist in deze journey die je net hebt genoemd. [herhalen pijnpunten en behoeftes].

- Hoe kunnen we inspelen op de behoeften en pijnpunten van de internationale toeristen?
 - Hoe ziet dit eruit?
 - Welke interacties zijn dan mogelijk?
 - Over welke product iteraties hebben we het dan?
- In welke stappen zou dit gezet moeten worden om hier te komen, gekeken naar product iteraties?
 - Wat zou bijvoorbeeld een MVP (minimum viable product) kunnen zijn?
 - Hoe wordt deze MVP uitgevoerd naar de gewenste eindsituatie?

Value

Dan zou ik graag als laatste deel even samenvattend eigenlijk alles samen willen brengen. Want als we holistisch kijken naar deze de ideale journey, huidige pijnpunten, maar ook visie en bedrijfsvoering vanuit NS, en wat wel en niet mogelijk is.

- Welke overkoepelende waarde wil je leveren aan de internationale toerist (value proposition)?
- Met andere woorden: welke waarde heeft jouw product of dienst voor de internationale toerist?
 - Hoe willen jullie gezien worden door de internationale toerist? Wat willen jullie voor hen betekenen?
 - Waarom?
- Op welke manier kan NS een onderscheidende ervaring bieden aan de internationale toeristen?
 - Hoe is de interactie uniek?

- Of hoe kan deze uniek zijn?

Bedankt voor je tijd! Dit was mijn laatste vraag. Zijn er nog vragen vanuit jou? Is er nog iets waar we het niet over hebben gehad maar je wel graag toe zou willen voegen aan het interview?

Dan wil ik je graag heel erg bedanken. Ik denk dat ik meer dan voldoende inzichten uit deze meeting heb gehaald, mochten er toch nog wat vraagjes oppoppen, kan ik je dan via de mail bereiken?

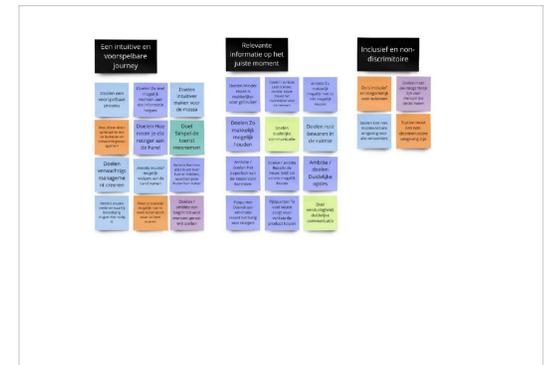
Appendix 3b

Codebook NS execute employees

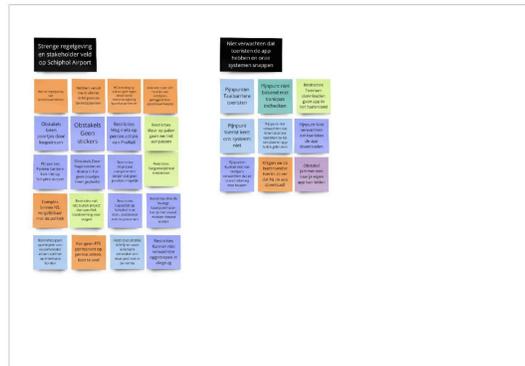
Ambitie



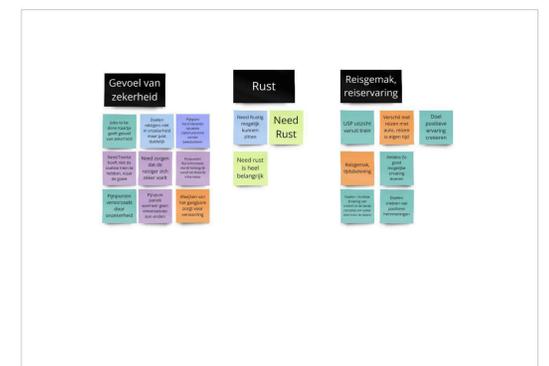
Doelen / Hoe



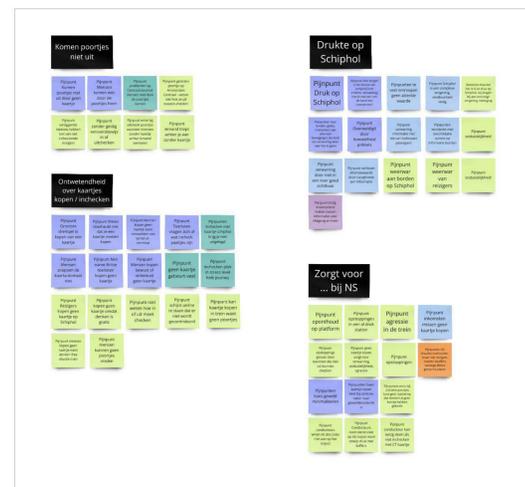
Obstakels / rekening gehouden met...



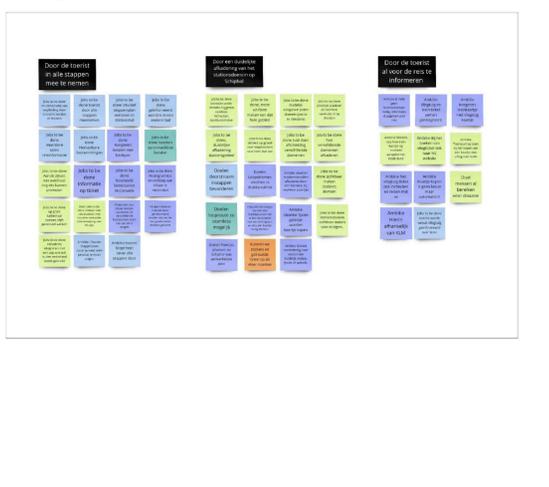
Needs



Pijnpunten



Oplossingen / Jobs to be done



Appendix 4a

Interview guide NS service employees Amsterdam CS

Introductie

Hoi, zou ik je wat mogen vragen? Ik doe onderzoek voor de NS naar hoe we de de treinen vanaf Schiphol voor toeristen beter en duidelijker kunnen maken. Aangezien u natuurlijk elke dag deze toeristen opvangt en aan het helpen bent hier op Amsterdam Centraal, weet u vast heel goed waar al die toeristen vanaf Schiphol vooral moeite mee hebben. Zou ik u daar een paar vragen over mogen stellen?

Pijnpunten

1. Welke vragen worden het meest aan u gesteld door toeristen vanaf Schiphol?
2. Waar hebben toeristen vanaf Schiphol het meeste moeite mee?
 - a. Waarom gaat dit fout?
3. Snapt u dat ze hier moeite mee hebben?
 - a. Hoe lost u dit op?
 - b. Wat vertelt u aan de toeristen?

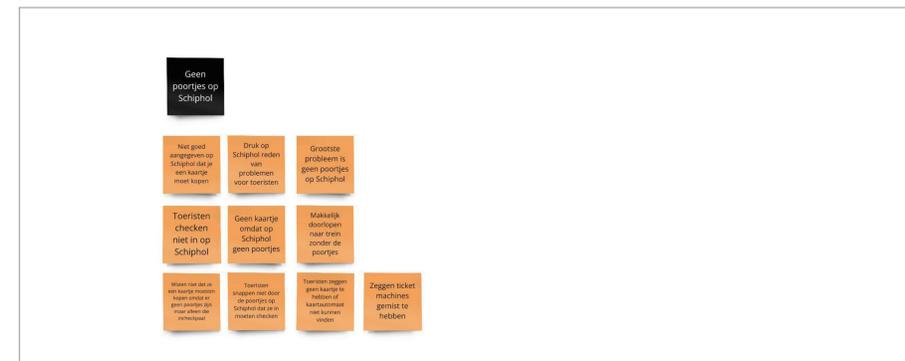
Oplossingen

4. Wat zou er volgens u beter moeten vanaf Schiphol tot hier, om de toeristen eerder al beter te kunnen helpen?
5. Waar denkt u dat toeristen behoefte aan hebben op Schiphol?

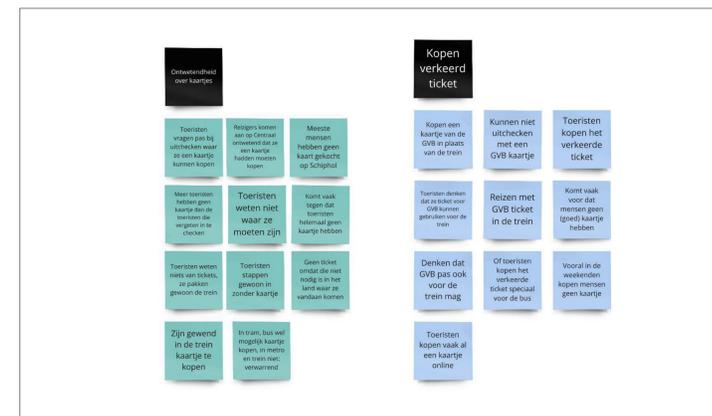
Appendix 4b

Codebook NS service employees Amsterdam CS

Aanleiding problemen Schiphol op toeristen Amsterdam Centraal



Motivatie kopen verkeerd of geen ticket



CHAPTER 6

Appendix 6

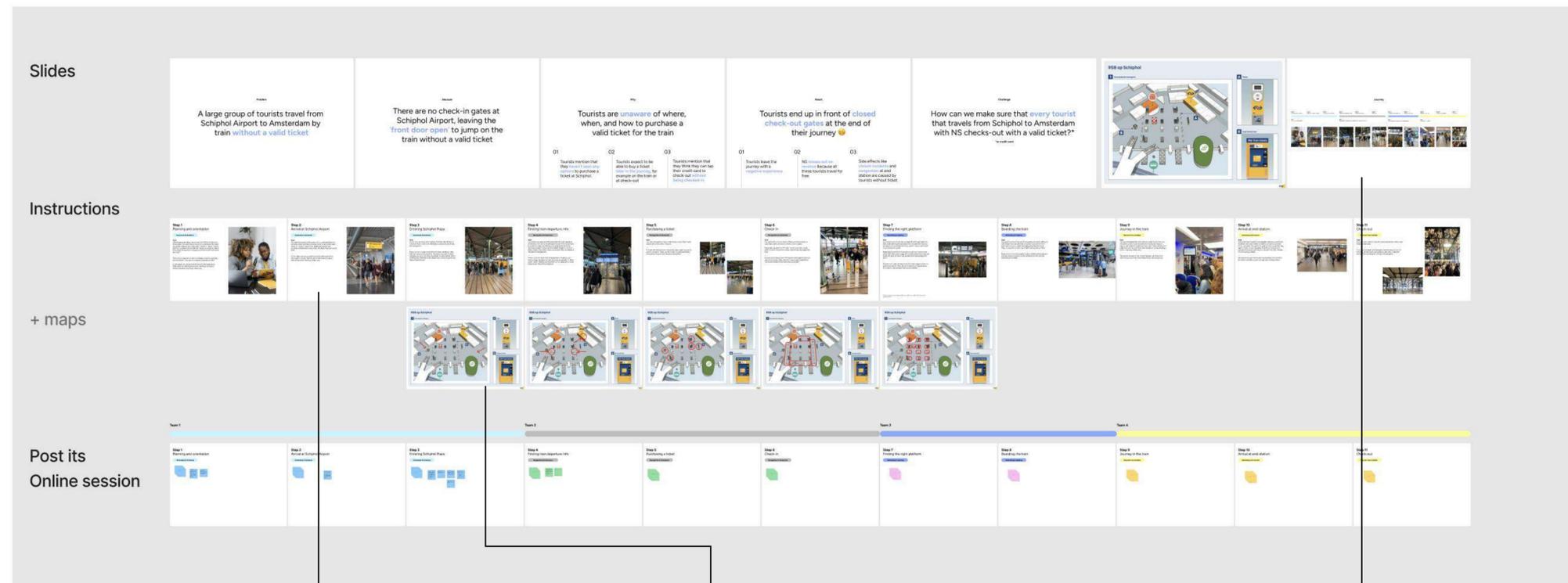
Overview of 122 ideas after brainstorming

Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7	Step 8	Step 9	Step 10	Step 11	
Planning	Arrival	Entering Plaza	Train information	Purchasing ticket	Check-in	Finding platform	Boarding train	In train	Arrival at end-station	Check-out	
Google Maps branded journey from Schiphol to Amsterdam CS. Use of yellow colors to show the route, and mention NS. To give a clear first introduction to the brand. Mention price here as well.	A stand with employee selling NS tickets at a quite moment in the journey. This little service desk can help them answer questions but also sell tickets. Stand in NS branding	Create a clear view towards the ticket machines from arrivals 1 and 2. Move travel information signs from arrival 1 and 2. These are blocking the view towards the ticket machines. In addition, move the meeting point away from the ticket machines, so the view is clear to the machines.	Train departure information screens way bigger, making more room for other information on the departure screen. For example, ticket-specific information, or trains to Amsterdam Specific information.	Clear information on GVB public transport machines at Plaza that this is for bus, metro and tram. Regulate that they can't put 'public transport tickets' on the machine, this is confusing	Signs above cico poles, saying tap CC & go on train. Clear call to action of what to do / check-in and out the way you want		Scaring strategy: A fine of 50 euro's will be charged when you travel without a ticket. Get your tickets upstairs at Plaza, or on ns.nl				
Collaboration GVB, highlighting in app, that this app is not included for the train. If the trip planner recommends a train, make it clear that the train is not included	Sound message through speaker. 'Dear passengers, the train to Amsterdam leaves from platform 3, make sure to buy your NS ticket online or at Plaza'. Or 'Dear passengers, a ticket is needed to exit your end-station. Get your ticket here'.	Moving OV-information desk, although can't move ticket machines, but ov-information stand can be faces more at the entrances of the Plaza, saying 'train information' making it more clear to people that they need a train ticket, and they can help them where and how to buy them	Different colour of tiles on floor, showing that you are going into a different area. More attentional value on NS station. For example, whiter/light grey or blue tiles	Voice message on ticket machine after ticket purchase (same as in supermarket) saying: please remember to check in. With a video on screen how you should do that			Train departure screens on platform, dedicating a space on the screen to show 'Train tickets needed to board the train'. Similar to toeslag needed voor ICD. Written in red				
NS website landing page showing travel information from Schiphol to Amsterdam CS. Option to buy e-ticket or download app	Arlanda Express stand, in which an e-ticket can be bought quickly via a QR code / link to the app. Herewith clear NS branding. NS travel information about the 'airport sprinter' and that it departs every 6 minutes. Show benefits of e-ticket over ticket machine.	POC on stickers on Plaza. Stickers should say: Train station, get your NS ticket here. Railway station - get your tickets before the train. Validate your ticket / credit card before boarding the train.	Signage on the lift behind travel information boards. Clear message: get your train tickets before boarding the train. With an arrow to where the ticket machines can be found. Or focus on online, and have a sign saying: purchase your ticket online on the app (with app mockup). AB test on both of the lifts	Create a clear view towards the ticket machines from arrivals 1 and 2. These are blocking the view towards the ticket machines. In addition, move the meeting point away from the ticket machines, so the view is clear to the machines.	POC stickers in between cico poles saying 'scan your bank or credit card' Or 'scan your ticket or credit card'. Or 'easy check-in and check-out with our ticket or credit card'	Smart camera's or sensors. If a person goes down the stairs without a ticket, an alarm goes off	QR code on screens saying: 'Didn't buy a ticket? Scan the QR code and still purchase an e-ticket. Without a ticket, you won't be able to pass the gates. Thanks!'	NS service office, being able to sell tickets to tourists that didn't purchase a ticket. They have to show their boarding pass, to show that they came from Schiphol. In order to pay a ticket.		The NS service employees that are helping people to check out, have a portable cico post, which tourists can scan and are then checked in. They can use their CC to still purchase a ticket. And check-out directly after. Making sure that this is just the normal ticket price	
Schiphol website landing page. More explanation and how-to content. Link to ns website or app to purchase an e-ticket	Posters on toilets and bathrooms. Out moments where tourists can read the information. Link to purchase ticket/download app. Focus app communication on benefits. How are you travelling with NS? Show options for OV-pay or e-ticket	Wayfinding stickers and signs specifically for NS, guiding tourists to the ticket machines and platforms. Stickers showing NS logo, NS colours, ticket needed awareness	Use space on travel information signs, at the bottom, saying: 'NS tickets are required on the train'	Horizontal signs above the ticket machines with NS logo, train sign, and check-in check-out sign / signage: paying with CC, tap your card here	NS employees standing in front of the stairs to check passengers for train tickets	QR codes on walls or posters, saying you need a ticket to exit your next station, make sure you have a valid ticket. More symphatiek: We don't want you to end up before closed gates, get your ticket at ns website, or upstairs at Plaza	On screen, later also messaging. Have you boarded the train without paying? You need a ticket to exit your end station. Scan the QR code and still purchase an e-ticket	Ticket machines, where tickets can still be sold. Maybe it should have a validation that you are coming from Schiphol, like boarding pass or flight number. But tourists are still able to purchase a train ticket at a machine. Somewhere near the check-out locations.	NS Service employees don't open the gates for tourists but guide them to the NS website. Where they still need to buy a ticket. They can scan a QR code, given by the employee, that will guide them directly to a landing page where they can buy a ticket.		
NS collaboration with Easyjet (or other Airline). Integrating NS e-ticket purchases in easyjet purchase flow, so your plane ticket is also your train ticket	Ads Posters on the way to Plaza. Showing options of how to travel by train. As people are walking here, no time to scan a QR code, so more focus on OV-pay.	Train tickets' signage on back of ticket machines, so the train tickets are more visible from each direction	Use an entire screen, or add a screen (underline) saying that you need a ticket and how to do it	Stickers on ground guiding people to the ticket machines	Move location of check-in posts, closer to the stairs of the train. Supported by a sign saying 'scan your ticket or credit card'	Speaker message saying: dear passengers, you need a ticket to exit station to travel by train. Make sure to purchase a ticket at ns.nl, or upstairs at Plaza	Cico poles in train, making it possible for tourists to still check in their CC for the train.	Posters on the way to the exit, explaining what tourists should do when they didn't purchase a ticket. Directed to the NS website, or asked to download the app.	A ticket machine is placed next to the check-out locations. Message saying, 'tap your card and get the next train', or 'tap your card here', or 'train tickets? just tap your card here' or 'taking the train? check-in here'		
NS collaboration with Easyjet / KLM etc. Integrating NS e-ticket purchases in easyjet email / easyjet dashboard communication. So tickets can also be purchased later.	Collaboration with Easyjet / KLM etc. Providing information in plane, for example on screen or in flyers. Provides a flyer with QR code to already purchase a train ticket, or give explanation on OV-pay	A horizontal sign above ticket machines mentions that train tickets can be bought here. Visible from both sides. Mentioning 'Train', in combination with NS sign, and tickets	Placing a ticket machine and cico pole directly underneath the travel information screens. So people can look for information and purchase a ticket at the same time	On back side of ticket machines, signs saying ticket machines, potentially shining more light on the ticket machines.	Communication e-ticket on website or app that checking-in is not mandatory, automatically checked in when buying ticket online	Make the stairs and branding to go down the stairs, on to the platform yellow. In branded NS colors. Making it clear that a NS ticket is needed	Train departure screen, showing a red line text with: a NS ticket is mandatory for this train. Similar to the message of toeslag nodig met ICD	Explanation video on how to check out at end-station. No check in at Schiphol. Standard fare will be deducted from bank card.	Horizontal sign on top of the check out ports. The cico poles are now. People can still walk around, but with stickers on ground saying to the trains	Employees on top of platform 3, checking peoples ticket or asking them if they have purchased a ticket	
NS x Booking (similar companies, or hotels) integrate train ticket options from Airport in the booking flow, so you can purchase an e-ticket with your hotel	Posters / stickers near baggage belts, directing people to the ns website / app while waiting	Moving meeting point - ticket machines are at eye-height. A lot of people standing there block the view and way to the ticket machines	Moving meeting point at eye-height. A lot of people standing there block the view and way to the ticket machines	Bruna store and other locations selling physical GVB tickets, must draw attention on the fact that this ticket is not valid for the train, when the ticket is sold at Schiphol Airport	Changing location of cico poles in a line towards the train departure information	On ceiling, similar to lightstrip, showing text that: you need a ticket before boarding this train, or You must have a valid proof of ticket for this train	Advertisement for the NS app. Showing top tourist locations like Zaanse Schans, Etelinge, etc. And how easy it is to get deals etc and book all trips within the app. Scan the QR code for the app, or download in appstore	Horizontal signs above checkout ports, saying "get your NS / Eurostar ticket ready" to show people to companies of tickets they can check out with. People with GVB tickets should sense that they can't check out with their ticket.	NS service employees directing the tourists to the service desk, so they can purchase a ticket there.		
NS x Booking, integrating train ticket options in confirmation emails, or later in hotel/booking dashboard.	Posters on quiet moments, before customs. Explaining how to travel with NS. Focus on OV-pay or e-tickets. This can be posters or large ads showing how to travel with NS.	Minimising over-shouting by commercial operators. Making strict rules on light and colors used in the plaza, and within the train domain at Plaza. Goal to maintain the visual peace.	Zone speakers. When looking at travel information, speakers that cover a certain area: dear passengers you need a ticket before boarding the train	Speakers at Plaza, saying 'dear passengers, to travel by train you need a NS ticket. Buy your ticket at the yellow machines, or on ns.nl.	Tickets bought at Schiphol are already checked-in when you buy them at a ticket machine, taking away the need to check-in. Will still 'work' like normal when you do check them in for domestic travellers	Stickers on floor of the platform. Similar to POC, but that on platform. Saying: get train ticket before boarding the train. Train tickets mandatory beyond this point	Conductor checking tourists strictly in the train. 'Special service to buy a ticket in the train'. Offering them an option to scan the CC with the conductor, and not paying a fine.	A little store dedicated to people that didn't purchase a ticket or a GVB ticket. Service employees can guide them to that store, and here they are helped to still purchase a ticket, how they like, either online, ticket machine, or cico poles	NS service employees have a QR code specifically made for tourists from Schiphol, so they can quickly still purchase a ticket if they didn't do that already		
Social media (TikTok, Insta) campaign with explanation on how to travel from Schiphol to Amsterdam CS, with link to purchase tickets, download app NS app for tourists. Add options in the current NS app to make it more appealing for tourists. Tips and details to go to tips in the Netherlands, for example Zaanse Schans. Goes together with good SEO and SEA and landing page focussed on USPs	Big horizontal signs saying train tickets with ticket machines at the baggage belts. Copy: buy your train tickets here.	Use of commercial space, big ads with lights saying get your ticket before boarding the train	GVB online, app location tracker. When arriving at Schiphol, integrate a message, linked to location, that trains are not included in the GVB app. Regulations when they promote train travel, that the ticket is not valid.	Same layout ticket machines (4 with back to each other) if you come from arrivals 1 and 2. So passengers walk straight against those ticket machines.	More clear communication on ticket machines when a ticket is bought, that you need to check in. More clear image of a cico pole.	Branding on the walls when descending the stairs. Have your NS ticket ready. Get your tickets upstairs at Plaza.	Employees on platform, checking people if everyone purchased a ticket	Conductors are strictly going to check every route towards Amsterdam Central, and getting fines when people don't pay a ticket. Deploying more people, so conductors can always work in pairs.	A NS service desk stand, that is already available, to sell tickets to tourists when they can show platform, check your ticket here	Collaboration email from easyjet / booking.com Video/ cartoon email communication, showing how to check-in and out with CC from home.	

Appendix 7

Ideation workshop

Ideation workshop



Step 2

Arrival at Schiphol Airport

Awareness & Guidance

Goal
You want the tourist to be aware and to understand how to correctly travel with NS (purchase ticket or use credit card - check in - travel - check-out). Ideally the tourists can purchase a ticket before they enter the Plaza. How can we do this?

In this stage, we can provide the tourist with explanatory information on train travel as this is relatively quiet place, before they enter the (busy) Plaza area.

RSB op Schiphol

1 Conceptuele weergave

A Palen

B Kaartautomaat

Train tickets

Journey

Appendix 8

RICE prioritisation method

Step 1 Plannig					
Project name	Reach	Impact	Confidence	Effort	RICE score
Idea 1	1200	2	80%	1	1920
Idea 2	2400	2	80%	2	1920
Idea 3	4800	3	100%	3	4800
Idea 4	4800	2	80%	4	1920
Idea 5	4800	3	100%	4	3600
Idea 6	4800	2	80%	4	1920
Idea 7	6000	1	80%	1	4800
Idea 8	2100	3	50%	5	630
Idea 9	3000	1	50%	1	1500
Idea 10	2100	3	100%	2	3150
Idea 11	3000	1	50%	2	750
Idea 12	4200	1	80%	2	1680
Idea 13	2000	2	80%	2	1600
Idea 14	1200	2	80%	1	1920
Idea 15	1000	2	80%	2	800
Idea 16	2000	2	80%	2	1600
Idea 17	2100	3	100%	2	3150
Idea 18	4800	2	80%	2	3840

Step 2 Arrival					
Project name	Reach	Impact	Confidence	Effort	RICE score
Idea 1	6000	2	80%	6	1600
Idea 2	2000	2	80%	1	3200
Idea 3	4800	1	80%	1	3840
Idea 4	6000	1	50%	2	1500
Idea 5	3000	2	80%	2	2400
Idea 6	4800	2	80%	2	3840
Idea 7	2000	1	50%	4	250
Idea 8	6000	1	50%	1	3000
Idea 9	6000	2	50%	5	1200
Idea 10	6000	1	50%	1	3000
Idea 11	2000	1	50%	1	1000
Idea 12	6000	1	50%	4	750
Idea 13	4000	2	50%	4	1000
Idea 14	6000	2	80%	4	2400
Idea 15	2000	2	80%	1	3200
Idea 16	6000	2	80%	2	4800

Step 3 Entering Plaza					
Project name	Reach	Impact	Confidence	Effort	RICE score
Idea 1	6000	2	80%	4	2400
Idea 2	4000	2	50%	4	1000
Idea 3	3000	1	80%	1	2400
Idea 4	4200	2	80%	3	2240
Idea 5	4800	2	50%	4	1200
Idea 6	5000	1	50%	1	2500
Idea 7	5000	2	50%	4	1250
Idea 8	4000	2	80%	2	3200
Idea 9	4200	2	80%	3	2240
Idea 10	6000	1	50%	6	500
Idea 11	4200	2	50%	6	700
Idea 12	5000	3	100%	12	1250
Idea 13	6000	2	80%	4	2400

Step 4 Train information					
Project name	Reach	Impact	Confidence	Effort	RICE score
Idea 1	4000	2	50%	2	2000
Idea 2	4000	2	80%	1	6400
Idea 3	4000	3	50%	2	3000
Idea 4	4200	2	50%	6	700
Idea 5	5000	1	80%	2	2000
Idea 6	6000	1	80%	3	1600
Idea 7	2100	3	80%	2	2520
Idea 8	1000	3	100%	1	3000
Idea 9	4200	2	50%	6	700
Idea 10	4200	2	50%	3	1400
Idea 11	4000	2	50%	4	1000
Idea 12	4000	2	50%	2	2000
Idea 13	4000	2	50%	4	1000

Step 5 Purchasing ticket					
Project name	Reach	Impact	Confidence	Effort	RICE score
Idea 1	3000	2	80%	2	2400
Idea 2	4200	2	80%	3	2240
Idea 3	4000	2	50%	4	1000
Idea 4	4200	2	80%	3	2240
Idea 5	900	3	100%	1	2700
Idea 6	4000	1	50%	1	2000
Idea 7	3000	2	80%	2	2400
Idea 8	3000	1	50%	1	1500
Idea 9	900	2	80%	2	720

Step 6 Check-in					
Project name	Reach	Impact	Confidence	Effort	RICE score
Idea 1	6000	2	80%	4	2400
Idea 2	4200	2	80%	3	2240
Idea 3	4000	1	50%	4	500
Idea 4	600	1	80%	1	480
Idea 5	4200	2	50%	4	1050
Idea 6	6000	3	100%	4	4500
Idea 7	6000	2	50%	2	3000
Idea 8	3000	2	50%	4	750
Idea 9	900	2	80%	2	720

Step 7 Finding platform					
Project name	Reach	Impact	Confidence	Effort	RICE score
Idea 1	6000	3	50%	6	1500
Idea 2	3000	2	80%	3	1600
Idea 3	6000	2	80%	2	4800
Idea 4	6000	1	50%	3	1000
Idea 5	6000	2	50%	4	1500
Idea 6	4200	2	80%	3	2240
Idea 7	6000	1	50%	4	750
Idea 8	4000	3	80%	4	2400

Step 8 Boarding the train					
Project name	Reach	Impact	Confidence	Effort	RICE score
Idea 1	5000	2	50%	2	2500
Idea 2	2000	1	50%	1	1000
Idea 3	5000	2	80%	1	8000
Idea 4	5000	2	80%	2	4000
Idea 5	5000	2	50%	4	1250
Idea 6	6000	2	50%	4	1500
Idea 7	2000	2	80%	2	1600
Idea 8	1000	1	50%	1	500
Idea 9	4000	3	50%	2	3000
Idea 10	5000	2	80%	2	4000
Idea 11	5000	2	50%	4	1250
Idea 12	5000	1	80%	4	1000

Step 9 In train					
Project name	Reach	Impact	Confidence	Effort	RICE score
Idea 1	5000	2	80%	1	8000
Idea 2	3000	2	80%	1	4800
Idea 3	6000	2	80%	6	1600
Idea 4	3000	3	80%	1	7200
Idea 5	3000	1	50%	1	1500
Idea 6	6000	3	100%	4	4500
Idea 7	6000	3	100%	4	4500

Step 10 Arrival at end-station					
Project name	Reach	Impact	Confidence	Effort	RICE score
Idea 1	6000	2	80%	8	1200
Idea 2	6000	2	50%	4	1500
Idea 3	3000	1	50%	1	1500
Idea 4	4000	2	80%	4	1600
Idea 5	6000	2	80%	4	2400
Idea 6	3000	3	80%	4	1800
Idea 7	3000	3	80%	1	7200

Step 11 Check-out					
Project name	Reach	Impact	Confidence	Effort	RICE score
Idea 1	6000	3	100%	8	2250
Idea 2	6000	2	80%	4	2400
Idea 3	6000	2	80%	6	1600
Idea 4	6000	1	80%	4	1200
Idea 5	6000	3	100%	4	4500
Idea 6	6000	3	100%	4	4500

The light green highlights present the first round of the RICE prioritisation method. The dark green highlights present the second round of the method.

Appendix 9

Considerations and assumptions for determining investments and revenue per solution

Happy flow

Solution 01: Integrating flight tickets or hotel bookings with NS train tickets

- The investment assumption is based on the development costs of integrating the solution in the check-out flow of booking. These development costs are mentioned because the development efforts or not done in-house but outsourced to Booking or development partners. The booking.com development investments are assumed to be 50K.
- In 2022, 8.6 million tourists booked accommodation in the Netherlands (Centraal Bureau voor de Statistiek, 2022). Booking.com accounts for 35% of these bookings (Statista, 2024). I assume that the average NS ticket in the Netherlands costs €10. This means €20 for a two-way ticket. Say Booking.com earns 20% of each sold ticket, and 10% of the booking.com users are adding a train ticket, this translates to nearly €1.2 million yearly, or a little over €100 thousand monthly for booking.com. Assuming the profit on a two-way €20 ticket is €5, NS will earn over €1.5 million yearly.

Happy flow

Solution 02: A proactive contactless payment marketing campaign

- The push marketing strategy costs are determined via CPM (cost per 1000 impressions). With approximately 138.4K tourists arriving monthly at Schiphol and heading to Amsterdam (see Chapter X), the campaign requires 3.5 million impressions per month (138.4*25). At an average CPM of \$3.12, the monthly cost is approximately

- €9920.
- The revenue is determined based on the assumption that 10% of the travellers travelling without a valid ticket will now use their bank card to check in at Schiphol Airport.

Happy flow

Solution 03: Placing posters from the gates to baggage claim at Schiphol Airport

- The cost of posters will be determined after the meeting with the Schiphol media team. Costs depend on the feasibility and any additional charges for using 'non-commercial' space behind customs, I assume a minimum of 25K for this. Based on the assumption that POC floor stickers cost €50K and considering that the posters need to be of high quality but cover less surface area, it is estimated that the posters will cost approximately €25K. Therefore, these solutions will cost around 50K.
- The revenue is determined based on the assumption that 20% (high reach and high impact) of the travellers travelling without a valid ticket will now use their bank card to check in at Schiphol Airport.

Happy flow

Solution 04: Placing informative cubes at Plaza

- The investments for this solution are derived from contact with Laurens Mojet, who indicated that placing an individual cube will cost around €5500. Placing four cubes will thus be €22000.
- The revenue is determined based on the assumption that only 5% of the travellers travelling without a valid ticket will now use their bank card to check in at Schiphol Airport.

Unhappy flow

Solution 01: A proactive marketing campaign for GVB planners

- Approximately 6665 GVB planners face closed gates at Schiphol monthly. Target these users with 166,625 impressions per month (6665*5*5). At an average CPM of \$3.12, the monthly cost is about 520 (€480). Including a 50% margin (as this targeting setup doesn't only reach the GVB planners travelling without valid tickets), the total is €960 per month.
- The revenue is determined based on the

- assumption that 5% (low reach) of the tourists travelling without a valid ticket, now will travel with an NS ticket.

Unhappy flow

Solution 02: Collaboration with GVB to clarify the offering

- If a collaboration (as proposed) is established, the main investments will involve developing modifications for the GVB app. However, these costs will largely depend on the level of GVB's participation. The development costs are assumed to be around €20K.
- The revenue is determined based on the assumption that 10% (low reach, but high impact) of the tourists travelling without a valid ticket, now will travel with an NS ticket.

Unhappy flow

Solution 03: Messaging on platform boards

- This solution makes use of existing touchpoints. Therefore, there are no additional investments needed to implement this solution. However, this solution needs a lot of operational costs due to research, testing, and development, which are not considered here. The NS should determine whether the needed recourses are worth the perceived revenue of these solutions.
- The revenue is determined based on the assumption that 15% of the tourists travelling without a valid ticket, now will travel with an NS ticket.

Unhappy flow

Solution 04: Messaging on digital train screens

- This solution makes use of existing touchpoints. Therefore, there are no additional investments needed to implement this solution. However, this solution needs a lot of operational costs due to research, testing, and development, which are not considered here. The NS should determine whether the needed recourses are worth the perceived revenue of these solutions.
- The revenue is determined based on the assumption that 5% of the tourists travelling without a valid ticket, now will travel with an NS ticket.

Unhappy flow

Solution 05: Still purchasing a ticket at your final destination

- The investments for this solution are derived from contact with Laurens Mojet, who indicated that placing a CICO post at Schiphol account for €7500. Considering we only need electronic part of the posts, and won't be placed on the floor, they are considered to cost €2000 each. Starting with 10 of these devices, this accounts for €20K investment.
- The revenue is determined based on the assumption that 90% of the travellers without a valid ticket are reached and 80% of the travellers eventually pay for a ticket. This accounts for €277200.

Backup flow

Solution 01: Moving current touchpoints at Plaza

- The investments for this solution are derived from contact with Laurens Mojet, who indicated that moving 2 static digital screens will cost around €5500. Considering this price, the meeting point is perceived to be the same price. Therefore the total investment will be €11000
- The revenue is determined based on the assumption that 10% of the travellers travelling without a valid ticket will now purchase a valid ticket at Schiphol Plaza.

**The Appendix gives an overview of all the investments per solution. However, these investments do not include operational costs such as developing or testing the solutions, in-house marketing, or development costs. Consequently, the ROI might be lower than initially estimated. Additionally, the reduction in pressure on ticket machines, which is beneficial for NS due to their high maintenance costs, has not been factored into these calculations. The potential savings from this reduction are also not included in the ROI estimate.*