KLM

PERSONALISED SERVICE RECOVERY

An Enhanced passenger experience during operational disruptions

START HERE

Personalised service recover: An enhanced passenger experience during operational disruptions

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Executive summary

This thesis report represents the result of a graduation project for the master programme Strategic Product Design at the Delft University of Technology carried out in collaboration with KLM Royal Dutch Airlines. This project aims to find out how to create the desired experience for KLM passengers during undesired disruptions. This problem has been tackled with the use of the Double Diamond approach enriched with the ViP approach.

KLM Royal Dutch Airlines is the flag carrier airline of the Netherlands with the ambition to become Europe's most customer-centric, innovative and efficient network carrier. To achieve this ambition, they have to make significant steps forward. KLM decided to do this by striving for operational excellence, creating a long term sustainable growth with products that both stimulate efficiency and provide customer intimacy. At their new department, Operation Decision Support, they embraced this by becoming more data-driven by creating tools to optimize the operation of KLM.

While the airline industry is progressively optimizing and KLM is facing strong competition, there is one area that remains relatively uncharted. What happens to the passengers when disruptions occur? There are many types of disruptions, varying from individual level to operational level. Unexpected mass disruptions, often caused by bad weather, are challenging to solve and result in disastrous customer experience results. During these unexpected disruptions, the Net Promoter Score, which measures the passengers' satisfaction and thus the loyalty for the firm drops drastically. To increase passenger satisfaction, KLM should improve their service recovery when operational disruptions occur. This can be done by giving the passenger their 'perceived justice' which depends on the offer they get, the procedure and the interaction. Pinpointing the needs of the passenger is unfortunately very difficult since every passenger is different: they have different mindsets and travel for different occasions. With the use of a qualitative research method; adaptive storytelling, the passenger needs are found and translated to the perceived justice framework.

The presented solution offering the perceived justice to the passenger is called 'Emma', an automated, digital, ground attendant integrated into the KLM application. She enables passengers to solve their disrupted journey by pro-actively sharing information, offering solutions and giving recommendations. This application is equipped with cognitive abilities; natural language processing, machine learning and intelligent automation to create a personal and tailor-made experience via a mobile device. The application 'Emma' shows the potential to increase the NPS score and therefore, the passengers' satisfaction during operational disruptions. 'Emma' includes many features that enable the passenger to be in control, gives them the feeling of being taken care of and shows the responsibility of KLM by giving detailed and transparent information, giving personalised rebooking options and showing tips to spend their waiting time better.

Creating an application requires the involvement and resources of third parties. This takes time, and therefore, the implementation plan is separated in two years. The first year is focussed on aligning the different teams within KLM and building the features with the available internal resources. The second year, the application will be extended and further optimised with the use of third-party resources. This will enable KLM to launch a service that will be relevant in the future and give the passengers a satisfying service recovery during unexpected operational disruptions.

Reading guide

This reading guide exhibits an overview of the report to assist while reading. Each chapter and subchapter starts with an introduction which announces the topic and the research that is conducted. At the end of every chapter, a conclusion is available that highlights the most important findings.

STRUCTURE

The chapters in this report are structured according to the steps that are taken to complete this graduation project successfully. These steps include Introduction, Discover, Define, Develop, Deliver and Conclusion, each indicated which a specific colour. The fully coloured pages indicate the steps taken during the ViP process. To find more information about both the Double Diamond process and the ViP process, please visit the chapter 1.4 Project Approach.

Introduction	Discover	Define	Develop	Deliver	Conclusion

INSIGHTS, DECISIONS AND CONCLUSIONS
Outlined text contains the most important decisions and conclusions which will be used in the final design and recommendations.

ABBREVIATIONS

ART	=	Agile Release Train
CX	=	Customer Experience
KLC	=	KLM Cityhopper
KLM	=	Koninklijke Luchtvaart Maatschappij
KPI	=	Key Performance Indicator
NLP	=	Natural Language Processing
NPS	=	Net Promoter Score
MVP	=	Minimum Viable Product
OCC	=	Operations Control Center
ODS	=	Operation Decision Support
Pax	=	Passengers
PaxCon	=	Mass Pax Disruption
PNR	=	Personal Name Record
PoC	=	Proof of Concept
SRP	=	Service Recovery Paradox
ViP	=	Vision in Product design

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chapter | 1

Introduction

This first chapter provides an introduction to this thesis to show the relevance of this graduation project. First of all, the company KLM Royal Dutch Airlines and the department Operation Decision Support will be introduced. They initiated this graduation project based on an initial problem they have, which will be explained in the second part. Furthermore, the research approach that is used to tackle this problem will be explained.

chapter 1.1
About KLM

KLM Royal Dutch Airlines is the flag carrier airline of the Netherlands. This year, 2019, KLM celebrates its 100th birthday, which makes it the oldest airline that still operates under its original name. The core of the KLM group is KLM and its subsidiary KLM Cityhopper. The KLM group also includes the owned subsidiaries Martinair and Transavia, of which the last one is the Dutch most important prizefighter. In 2017, the KLM group transported 32,9 million passengers from their hub Schiphol to 87 European and 76 intercontinental destinations generating over €10 billion revenues and employing 32.000 staff from its Amsterdam basis.

ORGANISATION
KLM's organization is under the management of the President and CEO Pieter Elbers, Managing Director and CFO Erik Swelheim and Managing Director and COO Rene de Groot. This organization has a complex structure covering the following main departments: Customer Experience, Transformation, Cargo, Engineering Maintenance, Inflight Services, Flight Operations, Information Services, Human Resources & Industrial Relations and Corporate Center (Figure 1).

KLM NETWORK AND PARTNERSHIPS
KLM is part of a complex network (Figure 2). In 2014 KLM and Air France merged to become the biggest airline group in Europe. Together they focus on three core businesses: Passenger Business, Cargo and Engineering & Maintenance. However, both airlines maintain their own identity, name and brand and will conduct their activities throughout their hubs Amsterdam-Schiphol and Paris-Charles de Gaulle.

Besides this merger, Air France-KLM entered a long-term joint venture with Delta and Alitalia, which makes it possible to offer customers favourable flights between Europe and the United States, Canada and Mexico. This construction of shared revenues, costs and risks will enable the parties to offer a more extensive, efficient and cheaper network. KLM is also a member of SkyTeam, the world's second-largest alliance in this industry. Both KLM and Air France play as members of this alliance a vital role in North America, Europe and Asia. Together they are working on a stronger position in Africa and China as well by partnering up with Kenya Airways, China Airlines and Xiamen Air.
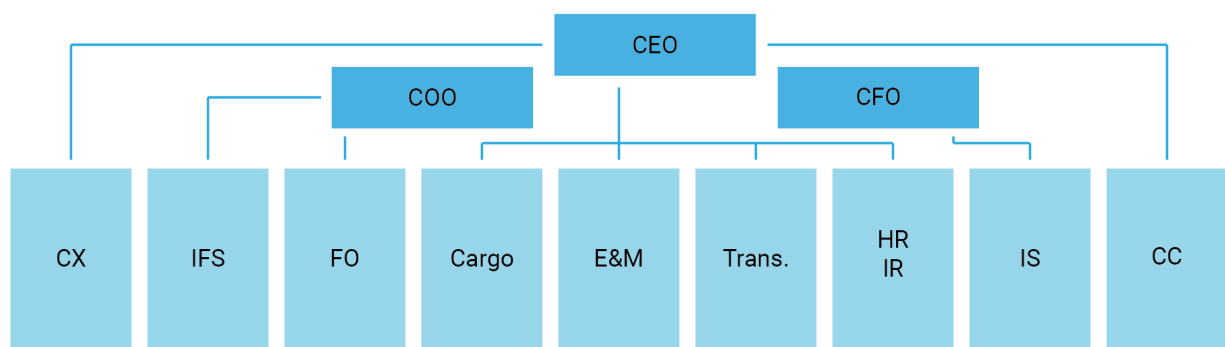

Figure 1 Organisation structure
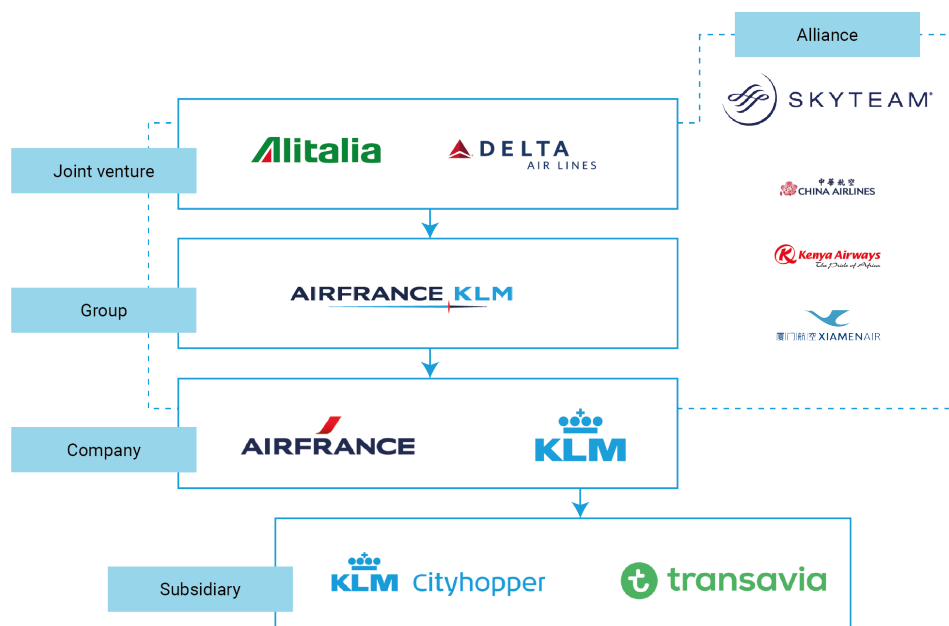
Figure 2 KLM's network

PURPOSE

KLM created a bold purpose "Moving Your World by creating memorable experiences", which is communicated through the whole company. They want their primary focus on its customers, not only to take them anywhere at any time but also to make them feel comfortable, at ease and to touch them with their experiences. Besides that, KLM has a strong identity that is focussed on its Dutch roots. They want to be the aviation pioneers, daring to reach out, initiate and explore new horizons. This is all captured in KLM Compass (Figure 3).

Figure 3 KLM Compass

Problem definition

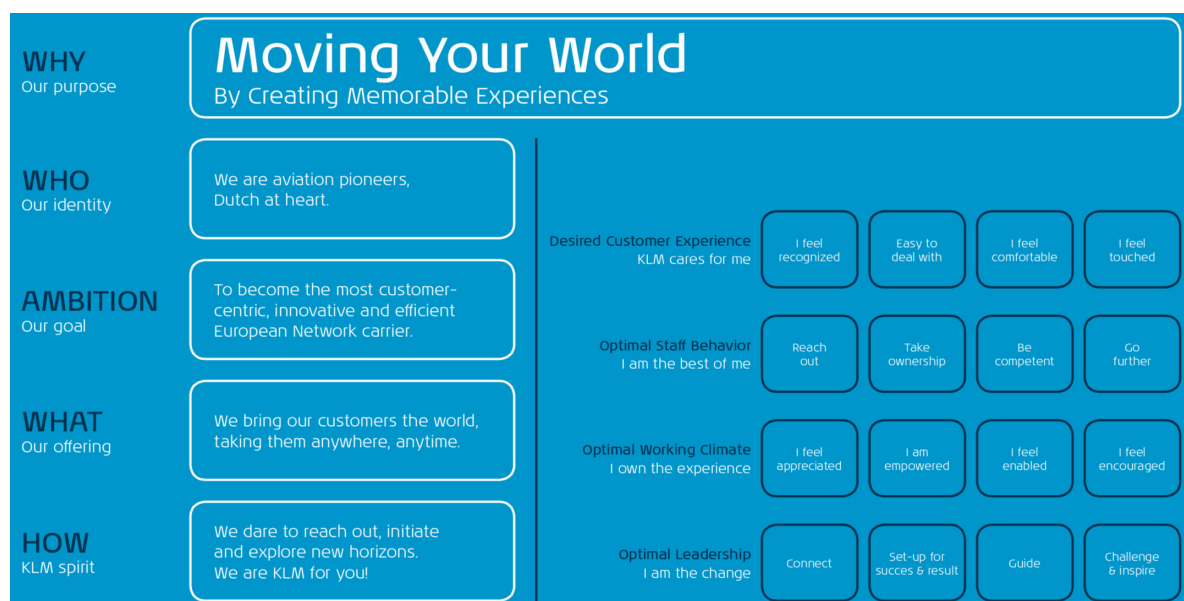*As mentioned before, the ODS department of KLM initiates this project. ODS noticed that as the airline industry is progressively optimizing, one area remains relatively uncharted: what happens to the passengers when disruptions occur?*

Unfortunately, operational disruptions are unavoidable and, if not appropriately managed, can have negative performance consequences for a firm (Hendricks & Singhal, 2005). Triggers which can create these operational disruptions are associated with raw materials, people, technology or external events (Mizgier et al., 2015). In the aviation industry, disruptions are often caused by bad weather. These disruptions can cause significant operational losses with disastrous customer experience results. Currently, the passengers will be compensated; alternative empty seats need to be pinpointed, and arrangements have to be made. There is an instant mismatch between capacity and demand. This process is currently suboptimal for both passenger and the airline.

When looking at the current portfolio of ODS, it becomes clear that they can help other departments making the most optimal decision when a disruption occurs. Sometimes they can even predict that disruption is going to happen, whereby they enable departments to make proactive decisions. These most optimal decisions are nowadays based on speed and costs in operation. These principles might lower the operational losses and the delays, however, it still does not result in a desirable experience for the KLM passengers. Therefore, it is essential for ODS to discover the needs and wishes of KLM's different passengers. These insights will be of enormous value for further product development and innovation within the department.

The topic of operational disruptions has not only become a focus area for the ODS department. Also, many other departments within KLM have to deal with the disastrous consequences of disruptions. With the abundant knowledge available in the company, it is essential to collaborate, although not being limited by each other's priorities while innovating. Collaboration with the other stakeholders will enable ODS to find out what the desired recovery is for its passengers' journey when operational disruptions occur and what their role will be in this innovation.

The three lenses of Design Thinking are used to drive innovation during this project; passenger, technology and KLM (Figure 5). The final deliverable should be desirable for the passenger and technologically feasible and viable for KLM to implement.

RESEARCH QUESTION
How to create a desired experience for KLM passengers during undesired disruptions?
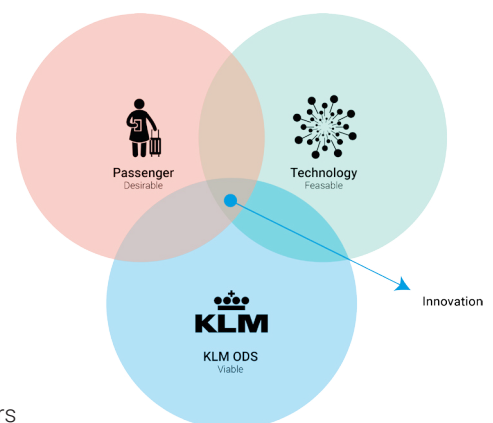

Figure 5 Three pillars

chapter 1.4
Project Approach

This graduation project is inspired by the Double Diamond approach (Design Council, 2005), which is an intensely used approach at the faculty of Industrial Design Engineering at the Delft University of Technology. This approach illustrates an iterative design process of diverging and converging based on the following four phases; discover, define, develop and deliver. The left-hand diamond is essential to find out the right purpose to design for. The right-hand diamond includes developing, testing and refining the ideas, which is an essential part of good design (Design Council, 2005).

However, the left-hand diamond has been enriched by elements of the Vision in Product Design (abb. ViP) approach (Hekkert & van Dijk, 2014) in order to realize this graduation project. The reasons for this addition are:

- Becoming inspired by the possibilities available in a future context for KLM passengers instead of solving the problems of today.

- Being stimulated to create an authentic and disruptive solution that reflects personal preferences, values and beliefs to breaking through the limitations of the different departments within KLM.

- Accomplishing personal learning ambitions since this process is new to the graduate.

THE VIP APPROACH

According to Hekkert & van Dijk (2014), it is more productive and challenging to look for possibilities and opportunities in the future context, rather than creating constraints and limitations. It helps the designer to define 'why' something needs to be designed. KLM has already set many limitations since the context of disruptions is complex. For them, it is interesting to break through these limitations and search for out-of-the-box possibilities.

To be able to find these possibilities, it was necessary to use the future context phase of the ViP approach. The ViP approach represents three levels of description: the context level, the interaction level and the product level of which the context level should enable the designer to discover the possibilities and create a vision how to respond to these possibilities (Figure 6). The first step in the future context phase was to set a domain and the timespan of the project. Secondly, the context factors were generated out of the different analysis tools in the Discover phase. These context factors were clustered into driving forces, a prediction of the future context. After that, the context structure was created by using a framework with two dimensions based on these driving forces. With this framework, a future vision that explains how KLM can respond to this future context could be generated.

ADJUSTED DOUBLE DIAMOND

The ViP approach cannot be integrated directly in the Double Diamond approach since they iterate at different levels. The future context phase touches upon both the Discover phase and the Define phase in the Double Diamond approach (Figure 7).

Step 1 | Defining the domain and time

Step 2 | Generating context factors

Step 3 | Clustering into driving forces

Step 4 | Creating a context framework

Step 5 | Determine the future statement

Context level

Interaction level

Product level

Figure 6 ViP elements

Week 0 - 5
DISCOVER

Week 6 - 10
DEFINE

Week 11 - 15
DEVELOP

Week 16 - 22
DELIVER

PROBLEM

SOLUTION

2.1 Context exploration

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Design Brief
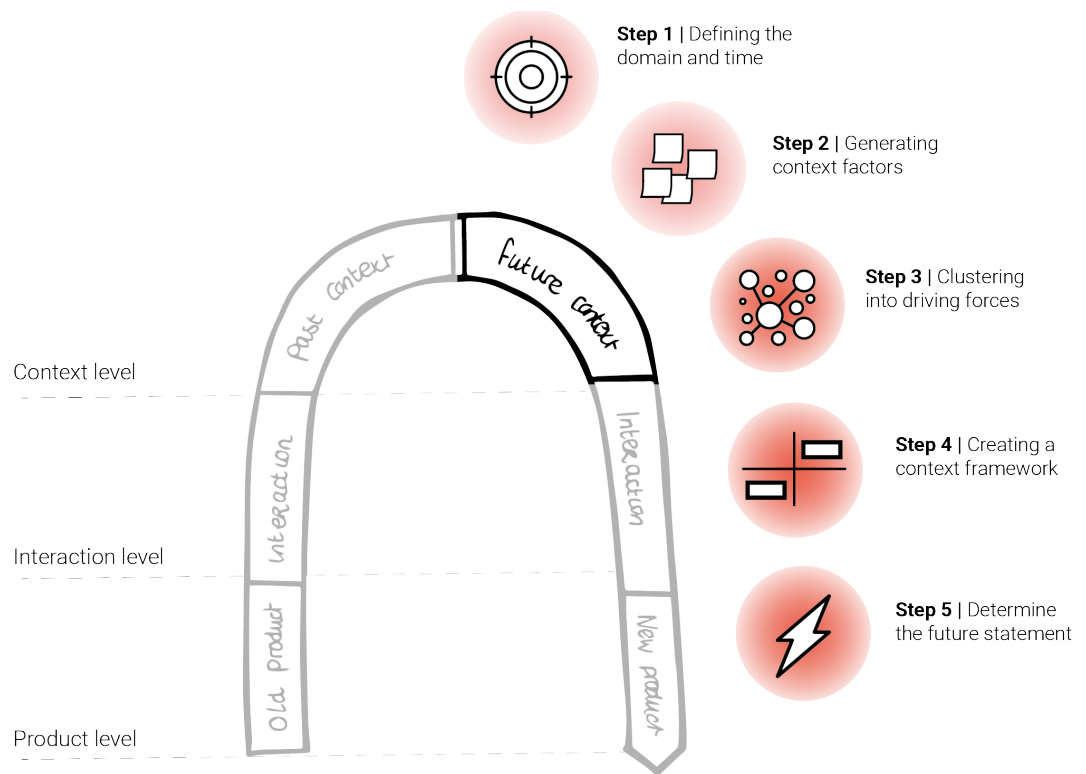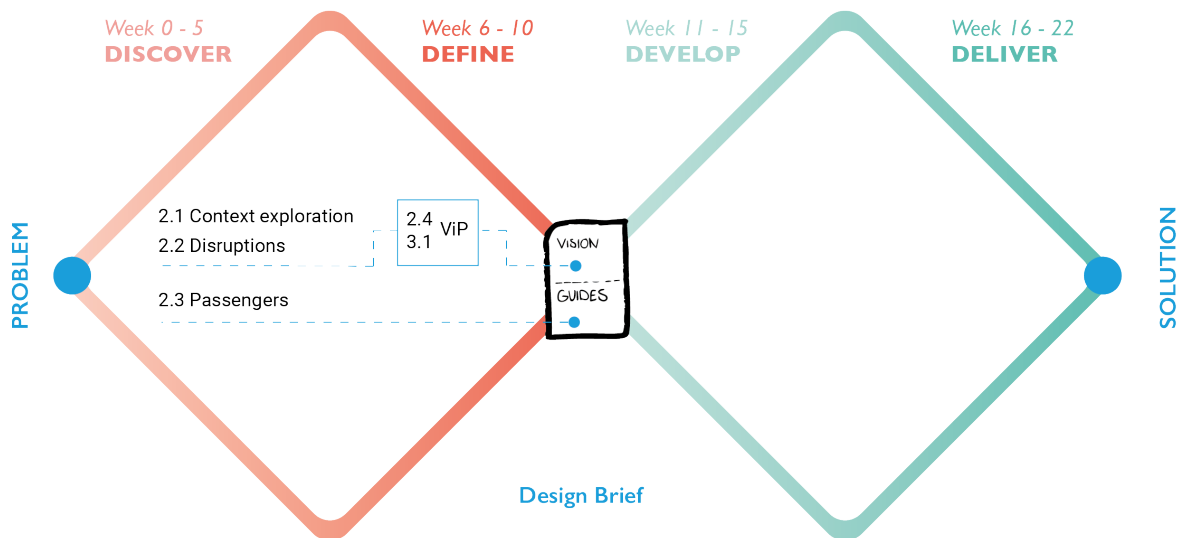
Figure 7 Project approach

DISCOVER

The Discover phase is used to identify opportunities in the future context and the passenger needs in a disrupted context. This exploration uses multiple research methods and tools. First of all, desk research is executed to understand the complexity of a disruption. Secondly, industry analysis is done to understand the current trends, the company KLM and its competitors better. This desk research and analysis have been enriched with in-depth interviews on both management and crew level. This research generated all the context factors in the ViP approach. Lastly, passenger research has been conducted to gain a more extensive understanding of KLM's passengers in a disrupted context.

DEFINE

The Define phase is used to analyze the outputs of the Discover phase. The ViP approach is used to synthesize the findings into a reduced number of opportunities and a future statement. This future statement is the starting point in the design brief that will be supported with design guidelines focussed on the passenger and the company.

DEVELOP

The Develop phase is used to develop the design brief into a product or service for implementation. A brainstorm session and two creative sessions with a group of participants have helped to generate ideas and create early concepts. Many concepts have been evaluated with a group of stakeholders for further iteration. Lastly, the final concept is presented with an extensive description.

DELIVER

The Deliver phase focuses on the final design, including an implementation model. This final design has been both validated by the passenger on its desirability and by KLM stakeholders on its viability and feasibility. The first validation with the passenger was done with a final test at the X-gates at Schiphol. Expert-interviews with KLM employees resulted in the second validation.

METHODS AND TOOLS

Multiple (design) methods and tools have been used in these four phases to increase the validity of this graduation project. The following icons show these different tools and methods of which the colour indicates the phase in which it is used. Desk research and in-depth interviews were needed throughout the whole project.
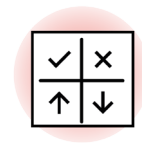

Desk research   In-depth interviews   DEPEST analysis   SWOT analysis

Creative Session   Prototype

chapter | 2

Discover

This second chapter contains extensive research to identify the opportunities and boundaries of the solution space. This research includes both desk- and field research covering the topics: the industry, disruptions and passengers. The subchapter 'context exploration' gives an insight into the current context of KLM, showing their direct and indirect competition, the changing environment with its accompanying trends they operate in and their current position. The second subchapter answers the main questions about disruptions. What kind of disruptions is causing horrible experiences at the airport? How do they come into existence? What is going wrong at the airport?

chapter 2.1
Context exploration

The world is changing rapidly, which makes it essential for KLM to keep up-to-date and adapt to this by continuously innovating. In this subchapter, this changing context is explored with the use of the trend analysis DEPEST. Next, the competitive environment of KLM is analysed to discover all its direct and indirect competitors. Finally, the strengths and weaknesses of KLM will become apparent, which clarify the positioning of the company compared to its competitors.

2.1.1 TREND ANALYSIS

Trends are changes in society that occur over more extended periods (Boeijen et al., 2014), which are related to both people's evolving preferences and developments in the economy, politics and technology. For this trend analysis, the DEPEST method is used to analyse over a period of five years. This DEPEST method structures the findings in the following topics: demographic (D), ecological (E), political (P), economic (E), social (S) and technological (T). This method is executed both on the global level and mobility level.

DEMOGRAPHIC

The middle class is growing. According to Kharas et al. just over 50% of the world's population, lives in households with enough discretionary expenditure to be considered 'middle class', which marks September 2017 as global tipping point where, for the first time, the poor and vulnerable are no longer the majority of the world (2017). This middle-class expansion has also spurred growth in air travel, as more people can afford flights for holidays or business-related travel (Oxford Business Group, 2019). According to Boeing (2018), commercial airlines experienced annual average passenger growth of 6.2% between 2012 and 2017, and this demand is expectedly growing for the next twenty years.

ECONOMICAL

While the 'middle class' seems to spend their money on experiences, the leading low-cost carriers such as Ryanair and EasyJet are still growing. A reason might be that travellers buy their tickets online via platforms such as Expedia and Kayak, by ranking the options on price. Smaller low-cost carriers, on the other hand, are struggling. At the start of 2019, more than ten carriers collapsed, including Germania, WOW air and Primera Air (Bailey, 2019). The rising jet fuel price, which doubled this year, might influence this occurrence. Another reason might be the free competition in this low-cost sector, which results in rising operational costs that are difficult for the carriers to absorb. It is hard to explain this phenomenon, but it might that the leading carriers with bigger fleets have the ability to negotiate discounts on commodities and services where the smaller airlines cannot. Despite the bankruptcies, a potential fare war lies in wait, where also the economy class will participate in since they have to match their prices, with the consequences of sobering down the airline (Hawkings, 2018). To adapt to the increasing demand, the development of main port Amsterdam-Schiphol is vital for the position of the Netherlands in the airline industry. Lelystad Airport will be open in 2020 for holiday flights in Europe, to create space for business flights and intercontinental flights at the main port Amsterdam-Schiphol (Ministerie van Algemene zaken, 2019).

ECOLOGICAL

This expected growth in air travel also has a downside, since flying on kerosene-based fuel is very polluting and

counts for 2% of annual global carbon emissions (Bachman, 2018). Besides that, travellers are becoming more aware of sustainable journeys. A report of Booking (2018) indicates that the green travel trend continues to gain momentum with a vast majority of global travellers (87%) stating that they want to travel sustainably, and 39% confirming that they often or always manage to do so. Mainly, because many Northern Europeans, of which 41% of the Swedes, have "flying shame" and stay preferably on the ground while travelling. Both reasons make rail travelling increasingly popular on short distances (Airport Watch, 2018). To reduce both carbon emissions and the reliance on fossil fuels, airlines have been experimenting with biofuels in the last years (Bachman, 2018). Besides that, the Dutch airline industry presented a sustainable plan that also includes: optimising flight routes and procedures, encouraging cleaner aircraft by levying airport fees, radical fleet renewal, emission-free airports and deploying international train service and other sustainable means of transport over short distances (Luchtvaart Nederland, 2018).

TECHNOLOGICAL

The hyperloop initiated by Elon Musk is a technical concept of the last years, that aims to make a cost-effective, high speed, public transportation system for use at moderate distances (Nicol, 2018). This trend will become an attractive alternative for short haul flights in the future. Another alternative in the future might be the autonomous vehicle, which will be more convenient and easy to hop on and off than an airport experience. The airline industry, however, can adapt their current services to coming technological trends, to enhance the customer experience. Data, for example, is rapidly becoming the backbone of the infrastructure sector. It is vital to create value out of this big data (Bacellar, 2018). Currently, no party owns all the data required for smart decision making. To enable this, it becomes vital to share this data openly and transparently (Threlfall, 2018). Fjord predicts that this rise of data enables companies to better quantify human experiences in physical spaces. Physical spaces are acknowledged as a powerful way to engage audiences, and in this way, they can meet their increasingly personalized demands by creating new ones (Fjord, 2018).

POLITICAL

A lot is happening in Europe's politics. Sustainability rises on the agenda and plans are being made in the Netherlands to pursue the 600 measurements written in the Paris Agreement (De Volkskrant, 2019). This measure is needed to reduce the carbon footprint with 50% in 2030. However, international aviation is not included in this agreement but is left to the International Civil Aviation Organization (ICAO). They presented a global climate action plan that is voluntary for the states from 2021. After 2027 it will be mandatory for the states, which is not a revolutionary approach to reach climate goals (Murphy, 2016). Next to sustainability is privacy, an essential topic in Europe. The most significant change in data privacy regulation in 20 years is the GDPR, Europe's General Data Protection Regulation, which is approved in 2016. The GDPR aims to protect all EU citizens from privacy and data breaches in today's data-driven world (EU GDPR, 2016). Data sharing, which would be interesting in the airline industry, will not be possible now but might be more flexible in the future when governments create more open frameworks for data sharing and collaboration (Threlfall, 2018).

SOCIAL

Not only the environment changes but the people living in this environment as well. There is a dramatic escalation in the rate at which people disconnect with their digital environment to feel mentally healthier. People check their email 27% less than in 2016 and many youngsters are turning out Facebook (Wasserman, 2018). By shutting down notifications and alerts, companies should focus on designing products that meet customers' holistic needs, shaped to sit favourably within the ecosystem of other products competing for attention (Fjord, 2018). Besides this, many people are interested in purchasing personalised products/services. However, only 22% is satisfied with the current personalisation they receive nowadays (Gilliland, 2019). People would be open to sharing the needed data to personalise products unless the company designs for transparency and shows that the data

is used and stored responsibly (Fjord, 2019). Focussing on mobility, travellers want to have a seamless, unified transit experience that covers their whole journey from A to B. Companies should focus on consolidating mobility services within a single, coherent ecosystem built on real-time needs (Fjord, 2019).

2.1.2 COMPETITIVE ENVIRONMENT

The identification of the competitive environment KLM is currently operating in, gives insights on how KLM is currently differentiating itself in the market from its direct- and indirect competitors. KLM wants to become the most customer-centric, innovative and efficient European network carrier, but to fulfil that wish it is essential to take a look at the direct competition. Besides that, indirect competition should be taken into account to assure that other mobility providers are not entering KLM's market. The competitive environment is divided into four levels (Figure 8). The first level focuses on the organisation itself. The second level shows the direct competitors of KLM, which also operate in the target market: business and economy class. Lastly, the third level shows all the other players in the airline industry, which are focussing on other target groups but are offering a similar product. The fourth level is the operating environment of KLM, which shows other forms of mobility to similar destinations as KLM.

LEVEL 1: MY ORGANISATION

There are a few different travel classes in the airline industry: la premiere, business class, premium economy, mini-economy and European low-cost. When excluding KLM Cityhopper and the wholly-owned subsidiary Transavia, KLM is mainly focussing on the business class and premium economy class in the European market. According to Skytrax, the international air transport rating organisation, KLM holds the 5th place in the European ranking of best airlines and the 19th place in the world ranking (Zhang, 2018). It owns this place for the quality of its onboard products and staff service, and their airport service at Schiphol. The quality of their customer service is furthermore their key differentiator. Besides that, KLM became one of the most punctual airlines in the world (AOG, 2019) and became one of the frontrunners in sustainable development in the airline industry (RobecoSam, 2018).

LEVEL 2: MY MARKET

KLM has many direct competitors who are all trying to conquer the European market. Lufthansa, the largest airline in Europe, is currently on top in the European rankings because of its exceptional service and overall product quality. Also, they took home the prize for best Business Class in Europe and Best Cabin Crew. Other Lufthansa Group owned airlines such as Swiss International Airways and Australian Airlines also scored high on the rankings. However, the differences between all the airlines in figure XX are small, which makes the competition at this level is extremely hard.

LEVEL 3: MY INDUSTRY

The competition for KLM is not only high between all the direct competitors. There is a threat coming from two sides. The Asian and Middle Eastern airlines are becoming very popular among passengers on long haul flights. These airlines are often focussing on more luxurious products and onboard entertainment to make the flight as pleasant as possible. The other threat for KLM is the rise of the low-cost carriers. This segment, which is targeted by Ryanair and EasyJet, is still experiencing continuous growth (Lambowsky et al., 2018).

LEVEL 4: MY OPERATING ENVIRONMENT

The final level of indirect competitors is the operating environment. For KLM this is the European passenger transport market. Nowadays, passengers do not have to go by aeroplane to comfortably and fastly arrive at their desired destinations. The high-speed train network is expanding. It started with the connection between Amsterdam, Brussels and Paris with the Thalys, which brings the passenger to its destination in 3 hours and

20 minutes. This train connection is followed by the Eurostar, who is currently riding frequently to London at an average of 6 hours. There are also parties such as Interrail who are offering connected train rides through whole Europe as an unforgettable journey on itself. Besides high-speed train connections, there is the advent of the Hyperloop. Virgin group expects to launch its commercial system called DevLoop already in 2021 (Steward, 2018). Not only public transport modes will compete with the airline industry in the future. Also, the automotive industry will try to enter KLM's short-haul industry in the future. An example is Volvo, who made his first move by presenting its concept car called 360c, which is fully electric, autonomous and connected (Volvo cars, 2018).

Figure 8 The four levels of competition

2.1.3 POSITIONING KLM

Due to the competition mentioned above and after a period of declining profitability, KLM realized that they have to make significant steps forward to achieve their ambition; becoming Europe's most customer-centric, innovative and efficient network carrier.

Therefore, KLM decided to strive for operational excellence, creating a long term sustainable growth with products that both stimulate efficiency and provide customer intimacy (). At KLM, they believe that focussing on both efficiency and customer intimacy is the fastest way to differentiate the company from the market. It will enable them to move away from competitors in their industry, such as the low-cost carriers Ryanair and EasyJet and the luxury airlines Etihad Airways and Emirates. This strategy steers to user centred products and services that are designed based on the end user's needs. Benefits of high customer intimacy include improved tailored problem-solving capabilities, a greater adaptation of new products and higher customer loyalty.

To make this shift from being a conventional company to a company that leverages operational excellence is a slow process for KLM. This slow process is partly due to a large number of employees and the siloed company structure. ODS, on the other hand, operates alongside the other departments together with their partner BCG and can drive innovation faster.

chapter 2.2

Disruptions

Disruption is a disturbance or problem that interrupts the smooth travel experience of the passenger. These disruptions are unexpected, which is often recognized by the passenger as unpleasant. Unfortunately, operational disruptions are unavoidable, and if not appropriately managed, they can have negative performance consequences for a firm (Hendricks & Singhal, 2005). These consequences make it very important to get an understanding of the situation and to find out where the blind spots are.

2.2.1 DISRUPTION TYPES

There are multiple types of service failures or disruptions. Besides operational disruptions, people can experience commercial issues and product/service issues. KLM recognises the following 11 different types of disruptions:

- Delay: It will take longer for the aeroplane to take off. Often the passenger needs to wait before boarding. Even a minute of delay can create a feeling of disruption.

- Cancellation: The aeroplane will not take off, and passengers are expected to rebook their flight.

- Denied boarding: Some passengers will be denied boarding because the aircraft is overbooked.

- Downgrade: Passengers will get a downgrade in the aeroplane. An example of a downgrade at KLM is going from Business class to Economy class.

- Seat allocation: The passenger has to change seats. This change can especially have an impact on people travelling with others.

- Checked-in luggage: A problem occurred with the passenger's checked in luggage. It might not be onboard or lost at an airport.

- Cabin luggage: A problem occurred with the passenger's cabin luggage. They might have to check it in due to lack of space.

- Seat: A problem with the appointed seat.

- Catering: The catering is not what the passenger asked for. An example can be the question of getting a special (vegetarian) meal.

- In-flight entertainment: Their entertainment is not working properly during the flight.

These disruptions, however, do not all result in a drop in the Net Promoter Score (abbr. NPS). A delay does not have a negative effect on the NPS average (Figure 10). Cancellation, however, has a large share in the lowering NPS average. There are days that more than 50% of the flights need to be cancelled. These days are called mass disruption days or PaxCon situations. Passengers perceive service failures, especially during these unexpected events. On 28 February 2018 for example, KLM received the lowest NPS during a power outage at Schiphol, resulting in 83% of the passengers perceiving a service failure.

- Third party issues: Problems with local transport networks connecting to the airport, for example, can lead to a build-up of late passengers in departures.

- Natural disasters: Strain on operations involving mass evacuation during treacherous weather conditions.

- Civil unrest: Rioting and terrorism. Any threat to passenger safety will bring operations to a halt.

According to a product owner at ODS, the weather is the most common cause of a PaxCon situation. Unfavourable weather has an enormous impact on the runway capacity, which is the main reason for the disruption. The runway capacity can be decreased to half of the standard capacity, which results in thousands of people waiting to continue their journey.

2.2.3 DISRUPTION SCENARIOS
A mass disruption often results in a domino effect that affects the operation in the whole world (Gershkof, 2016). The first order of disruption, has an impact on the original airport delay. The second order are the secondary flights that are affected due to the disruption. Even on third and fourth order, flights can be disrupted, which are often regional flights.

On passenger level, this can result in three different disruption scenarios; a disrupted direct flight, a disrupted transfer flight and a disrupted flight that results in a missed connection. These three scenarios can both contain people travelling to their destination and people returning home. In two of the three scenarios, both KLM and Schiphol Airport, play an important role.
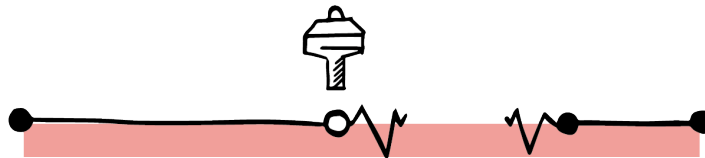
Scenario 1: These passengers will depart to either their final destination or returning home with a direct flight on short/medium haul distances. This direct flight, however, is disrupted at Schiphol Airport due to a cancellation. KLM passengers with a direct flight from Schiphol cover 30% of the total amount of KLM passengers. These passengers are somehow familiar with the Netherlands and have an idea of where to go since they either live there or visited the country.
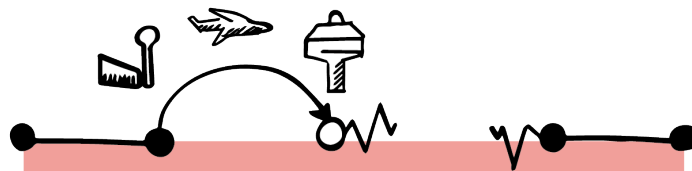

Scenario 2: These passengers often have a long haul flight with a transfer at Schiphol Airport to their final destination. Their second flight will be disrupted due to cancellation. These passengers did not plan to be in The Netherlands and have nowhere to go. KLM's transfer passengers cover 70% of the total amount of KLM passengers at Schiphol.
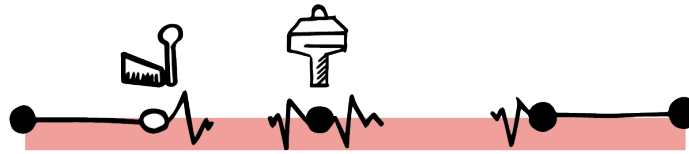
Scenario 3: The passengers in this scenario often have a long haul flight, but due to the first cancelled flight, they will miss their connecting flight as well. Also, these passengers will be able to either go home or go to their accommodation, unless they had a flight with more than one transfer.

2.2.4 DISRUPTION HANDLING

The current disruption handling is already different than five years ago. Nowadays, more people travel by aeroplane, which results in a packed operation with narrow margins (Creedy, 2018). Tighter schedules require a faster and more automated procedure. Ground personnel face and interact with the passengers during these disrupted days. Six interviews with the ground personnel of KLM Cityhopper (abbr. KLC) have been executed to understand the current disruption handling and its problems better. These KLC gate agents have to cope with similar problems during operational disruptions as KLM gate agents but do not own their service desk. However, there is flexibility expected from them, and they are aware of the overall problems at the airport. The study design and extensive research results can be found in Appendix XX. According to the six gate agents, there is still a lot to improve in the current disruption handling. In the following scheme, the steps taken by KLM are explained, plus the problems that occur according to the gate agents.
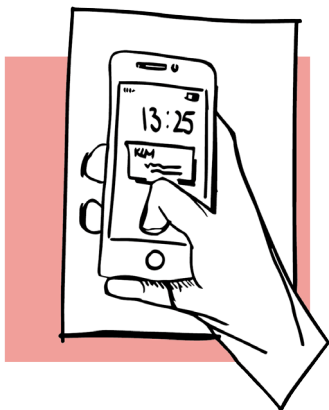

1. KLM sends a message that the passenger's flight is cancelled.
KLM announces the passenger through their mobile devices that their flight has been cancelled. This announcement includes a short description of the reason behind the disruption.

> The passenger does not always believe the message that KLM send to them. It is not satisfying for them to read the cause of the disruption, without seeing the cause.

> The passenger sometimes gets the information faster than the ground crew, which makes it hard for the crew to keep the passengers informed.
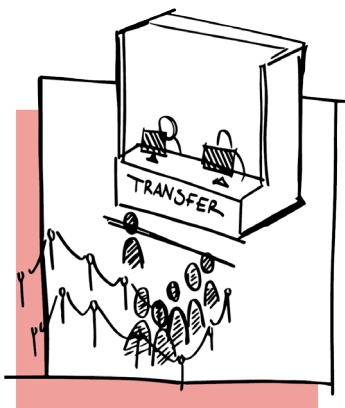
2. KLM arranges a new flight with the OPR tool.
KLM rebooks the passengers with the new OPR tool that automatically relocates the passenger to a seat when their original flight is cancelled. Rebooking the passengers was a manual and time-consuming task a year ago.

> There are long queues in front of the service- and transfer desks because the passengers do not understand the rebooking and want to talk with a real person.

> Even though the passengers have got a new flight, they still think that they can get more out of it. They are never fully satisfied.

3. KLM provides the passenger with extra's

KLM compensates the passengers with vouchers to spend at Schiphol Airport for food and drinks. The passengers with an unexpected overnight stay will be offered a free hotel and transportation to that location.

> KLM has some partnerships with hotels, but since disruptions are often unexpected, the hotels are often fully booked, which results in not being able to offer passengers accommodation.

4. KLM might offer compensation in certain situations when the passenger claims it.

KLM offers compensation when passengers fill in the claim document online. The passengers can do this afterwards. When the claim is sufficient, they will get a certain amount of money, depending on the situation.

> When the disruptions handling is insufficient, the amount of claims increases.

2.2.5   INVOLVED DEPARTMENTS

There are five different departments within KLM working on solutions concerning disruptions (Figure 11). Interviews with these different departments turned out that everybody has its interests and priorities, while the problems concerning disruption cannot be isolated. This study focussed on their department and current way of coping with disruptions, the changes over the years in the airline industry and the future of flying. The interview guide is formulated through Sanders' model, asking questions about their experience in the past first, before talking about their vision. The study design and extensive research results can be found in Appendix XX.

Disruption affects both the operation and the passenger (Serrano et al., 2017), which makes it essential to aligning all individual priorities together. Currently, CX and Digital are both using the passenger as the centre of attention, using four different pillars when solving a disruption. The OCC and ODS are focussing more on the operation itself. There is a working group including CX, Digital and OCC, to talk about disruptions once in a while and stay connected, which can be extended in the future.

CONCLUSION

>>Disruption types

There are many types of disruption varying from individual level to the operational level. Not all these disruption types have a negative influence on the NPS. Especially cancellation during PaxCon situations, will decrease the average score. These situations can have multiple causes, of which bad weather is the most common. Therefore, this project will focus on these unexpected mass disruptions where often half of the runway capacity cannot be used.

>>Disruption scenarios

There are three scenarios described which include both direct passengers and transfer passengers. The transfer passengers who cover 70% of the total amount of KLM passengers are facing the most difficulties during disruptions. These passengers had a flight already and did not plan to be in The Netherlands. This scenario is the most difficult for KLM since these passengers have nowhere to go, do not have any information about the country and do not want to be there. For that reason, this project will focus on this scenario. Schiphol plays a vital role because the passengers will be stuck at this airport.

>>Disruption handling

According to the KLM gate agents, there is still a lot to improve during the current disruption handling. The try to offer information, which is essential according to passenger needs. Unfortunately, this results in massive queues at the transfer- and service desks. Besides, these desks rebook the passenger on a new flight and arrange hotels if the passengers have an overnight stay. The passenger, however, is not always satisfied with the rebooking and hotels are often fully booked. This disruption handling needs to become better for both the gate agents and the passengers.

>>Involved departments

The KLM departments need to work together to solve the problems regarding operational disruptions since this cannot be isolated. Especially when implementing innovations, it is essential to align each other priorities.

It has been researched that disruption handling can be used as a loyalty tool. This tool is also called the service recovery paradox (abbr. SRP)(Figure 13). SRP is a situation in which the passenger thinks more highly of a company after they have corrected a problem with their service, compared to how they would have operated without facing any problems (Krishna et al., 2014). This situation can result in a more happy customer, but the current NPS scores show that KLM is not able to successfully recover the journey yet. In order to do so, it is essential to fulfill the passenger's needs when operational disruptions occur.
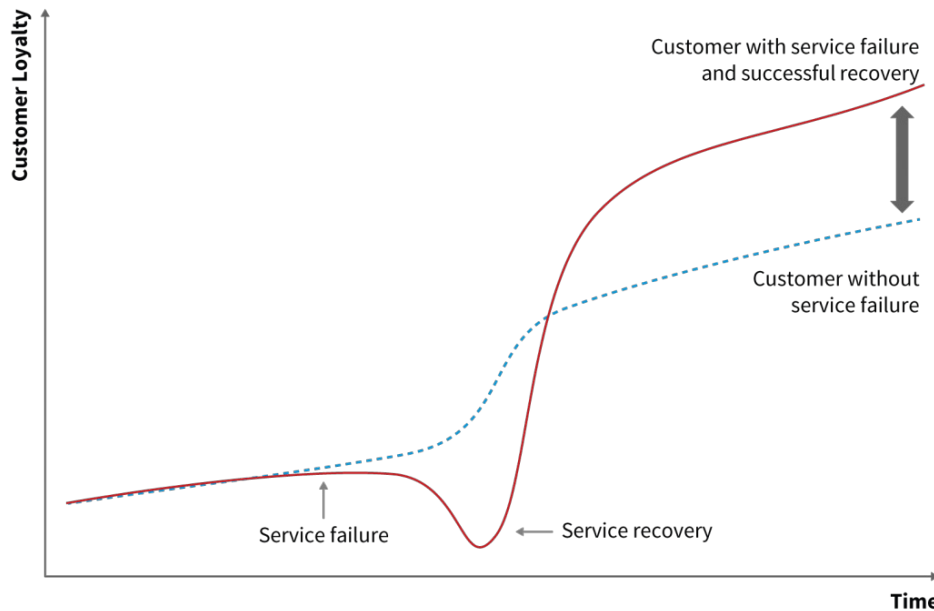
Figure 13 Service Recover Paradox

2.3.2 PERCEIVED JUSTICE

Passengers who are facing a service failure tend to seek for a 'perceived justice' (Hocutt et al., 1997). This perceived justice is when passengers' weight their inputs against their outputs when forming their recovery evaluations. If KLM wants to recover the passenger's journey desirably, they should take the three components of 'perceived KLM needs to find out how these components of 'perceived justice 'will be positively evaluated by the passenger.

Distributive justice

What does KLM offer to the passenger when a service failure occur?
Does this offer offset the costs and inconvenience of this service failure?

Procedural justice

What is the procedure for the passenger to get to this final offer?
Is this process convenient in terms of time and effort for the passenger?

Interactional justice

How is the service recovery implemented and presented to the passenger?

KLM needs to find out how these components of 'perceived justice 'will be positively evaluated by the passenger. This perceived justice is based on the passenger's needs, which differ in every situation. There are overarching needs, that (almost) every passenger encounters when being disrupted. Besides that, there are specific needs which are influenced by two variables; the passengers' typology and the occasion (AFKL group, 2015). None of KLM's passengers is the same; they differ in gender, age, nationality and attitude. These differences are captured

in different passenger typology. However, that same passenger might have different needs during different occasions, which is the second variable; the duration of the trip, the purpose of the trip and the itinerary (Figure 14). The same passenger (with a specific mindset) can travel for example from Amsterdam to Paris to a business meeting for three days or go on a family holiday to Indonesia for a month, and in both situations, different needs occur.
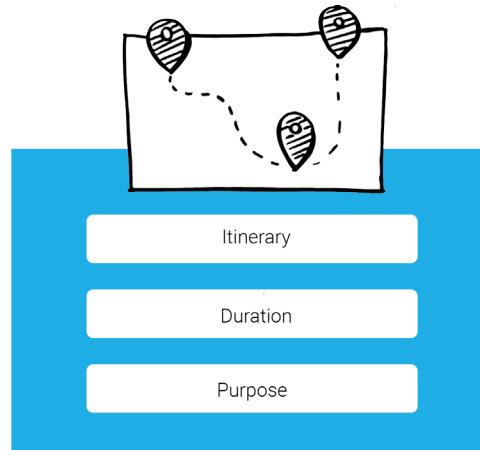
Figure 14 Occasion variables

2.3.3 ADAPTIVE STORYTELLING WITH KLM PASSENGERS

These KLM passenger typologies, which are mentioned in the Demand Spaces study, have its flaws according to this thesis. They are focussed on travelling by aeroplane in general, while different needs occur during disrupted situations. Besides that, their purpose is already intertwined into the typologies, while this is part of their occasion. According to Tobias Kruse, Regional Business Design Director at Fjord Accenture (2018), it is important to take a look at people's mobility mindsets. These mindsets will help to understand what people drive to make certain decisions and explain their behaviour in mobility. Fjord's mobility study resulted in six different mindsets: the penny pusher, the comfort seeker, the joy maker, the planner, the risk evader and the humanitarian. Unfortunately, these mindsets do not specifically show insights about disruptions either.

To fully understand the needs in the context of operational disruptions, qualitative research is executed at Schiphol Airport with seventeen passengers with different nationalities. The passengers were interviewed with the use of adaptive storytelling: creating disruption scenarios based on the flight information of the participant. The goal of this adaptive storytelling research is to gain insights about the passengers in the current disrupted context, to find out how to recover their journey desirably. The insights gained in this research also enriched the different mobility mindsets which show specific needs.

THE STUDY DESIGN

The adaptive storytelling research method has been created, especially for this thesis. Disruptions are unexpected, and therefore, it is difficult to test with the passengers in the real context. This research method enabled passengers to imagine themselves in a disrupted situation. Stimulating the imagination has been done with the use of scenario cards that were filled in by the interviewer with the personal data of the passenger (Figure 15). After selecting a statement card that fit them the best, the passengers would read the scenario where they were the main character, which made it easier to answer the questions that were asked. The scenarios were based on fictitious events that could have happened. The interview guide includes three different topics; the passenger mindset, the disruption scenario and the offered solution. This disruption scenario and the offered solution were created based on the information in chapter XX Disruption Handling. The extensive research study, the results and the evaluation can be found in Appendix XX. Key insights; disruption scenario

KEY INSIGHTS; DISRUPTION SCENARIO

The topic: disruption scenario, focuses on how passengers respond when they get the message that their flight has been cancelled. What is their first reaction? How do they want to continue their journey? What do they expect from KLM in such situations? What are they willing to undertake themselves? The following key insights have been obtained from the research:

KI1. Every passenger responds differently to a disruption. Some passengers cry because they are tired; some are shocked and think it is a total disaster; others find it okay and believe that this is part of life; they have to be patient.

KI2. Passengers believe it is not the fault of KLM and tend not to be angry. It is not their fault either, and therefore they want KLM to take responsibility.

KI3. Passengers want information about the disruption and the flight plan to be in control. They want to know what happened and how they can continue.

KI4. Passengers are searching for desks where they can find a representative of the airline to be sure they get trustworthy information.

KI5. Some passengers make sure they have basic supplies such as food and water in case it runs out.

KI6. Some passengers call their family/company to bring them up-to-date about the situation since they have planned to pick them up.

KI7. Every passenger wants to leave the airport as fast as possible to continue their journey. However, depending on the situation, they might consider alternatives that make them feel at ease.

KI8. Passengers believe that the fastest way to continue their journey is by aeroplane.

KI9. Passengers want to spend their waiting time outside Schiphol depending on how much time they have, but do not always know where to go, since they did not plan to end up in Amsterdam.

KEY INSIGHTS; CURRENT SOLUTION

This topic focuses on the current solution that is given by KLM according to the gate agents: offering a new flight, hotel accommodation if possible and providing vouchers. How do the passengers respond to this solution? What do they want to see differently? What would be the ultimate solution? The following key insights have been obtained from this research:

> KI10. Most passengers are happy if KLM offers them a new flight, hotel accommodation and vouchers.

> KI11: Passengers believe it is more important that KLM gives them the feeling of being taken care of to show respect for their journey.

> KI12. Some passengers want to choose a solution (flight and hotel) themselves instead of being forced to take one.

> KI13. Some passengers think it is more convenient and fast to find a solution themselves instead of waiting for help.

> KI14. Some passengers expect KLM to give a refund for unforeseen costs.

> KI15: Some passengers want to have guidance with a simple, organized plan to feel secure and comfortable again.

THE PASSENGER MINDSETS

Some of these insights show general needs, while others are personal and therefore specific. The following five mindsets (Figure 16) have been obtained from the research results which all include their own beliefs, behaviour and needs during disruptions. The enhanced passenger mindsets can be found in Appendix XX. These mindsets can be used to enhance the specific needs of the passenger in a disrupted situation. An individual passenger might possess the characteristics of several mindsets and therefore cannot be generalised according to one mindset out of five. A personality profile can enhance less generic mindsets and is furthermore an opportunity to create a foundation for the personalisation of KLM offers.

Planner
"I need to plan my journey"

Comfort Seeker
"I need to be cofortable during my journey"

Penny Pusher
"I need to spend my money wisely"

Joy Maker
"I travel because I enjoy it"

Risk Evader
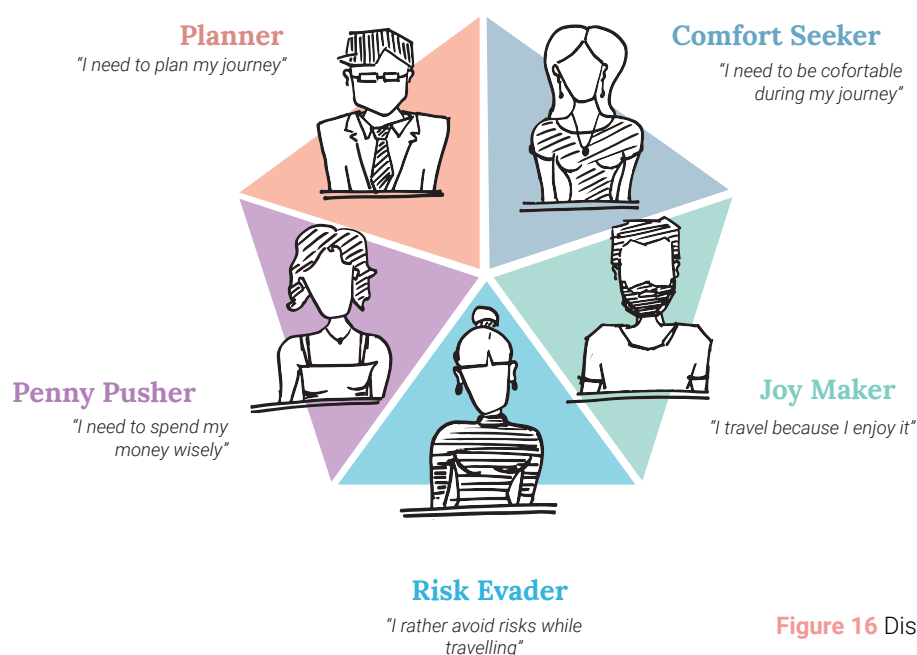*"I rather avoid risks while travelling"*

Figure 16 Disruption mindsets

2.3.4 FINAL PASSENGER NEEDS

The previous key insights showed passenger needs that could be translated into a framework based on the 'perceived justice' literature (Figure 17). The colours indicate whether an insight is general (blue) or mindset specific (orange). Further research should be done to be able to translate the other insights into this framework as well. This is explained in chapter XX Recommendations. The framework shows whether the need should be generally fulfilled or need to be personalised for a specific passenger.
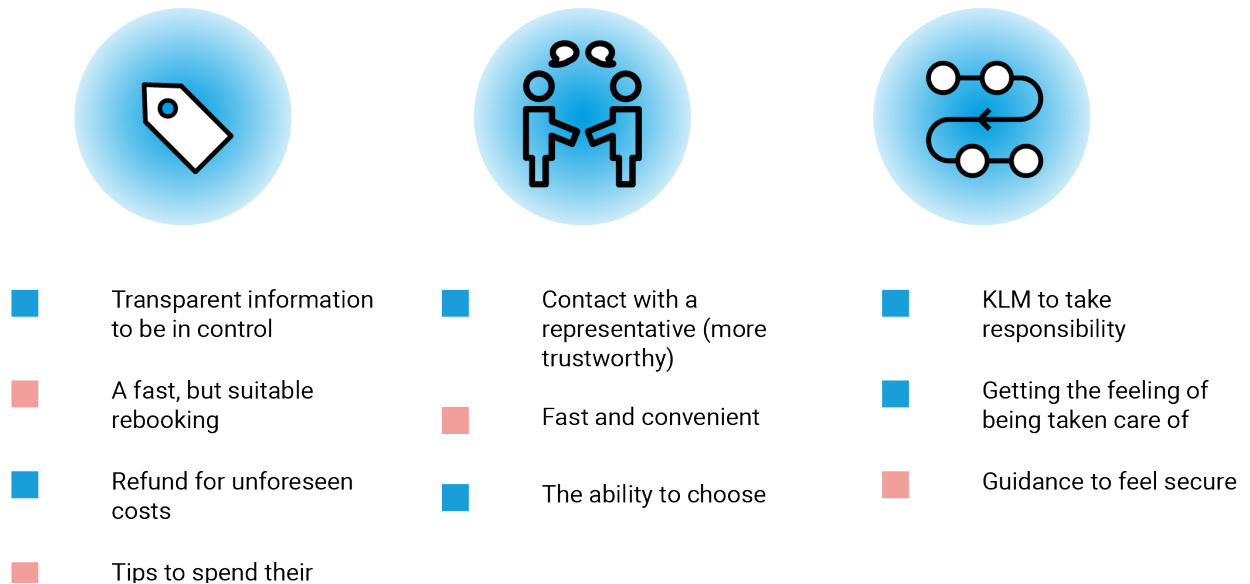

- ■ Transparent information to be in control
- ■ A fast, but suitable rebooking
- ■ Refund for unforeseen costs
- ■ Tips to spend their

- ■ Contact with a representative (more trustworthy)
- ■ Fast and convenient
- ■ The ability to choose

- ■ KLM to take responsibility
- ■ Getting the feeling of being taken care of
- ■ Guidance to feel secure

Figure 17 Perceived justice framework

CONCLUSION

>> Customer intimacy and perceived justice

Customer intimacy is one of the most important drivers for KLM, and therefore, it is necessary to measure the NPS every year. This score indicates the customer loyalty and thus indirectly the customer satisfaction of the KLM passengers. The NPS is increasing every year, but unfortunately, the NPS goals have never been reached due to perceived service failures. Passengers who are facing a service failure tend to seek for perceived justice. KLM should offer the desired offer, according to the desired procedure while providing the desired interaction to fulfil the passengers' perceived justice. This interaction will eventually lead to more satisfaction.

>>Adaptive storytelling research

Every passenger is different, and therefore, it is difficult to find out what they need when they are disrupted. To find out what the passengers' needs are in a disrupted context, qualitative research has been executed at Schiphol Airport with 17 KLM passengers. Operational disruptions often happen unexpectedly, and therefore, the passenger was interviewed with the use of adaptive storytelling. This new research enabled them to imagine themselves in that situation and explain what they need or desire in that situation.

>> Passenger needs

The key insights from the adaptive storytelling research could be implemented in the perceived justice framework (Figure 17). These colours indicate whether an insight is general (blue) or mindset specific (orange).


ViP 2.4
Discovering the future context

The ViP approach is used to discover the building blocks that will be the foundation of the future context. This approach has two steps covering the Discover phase (Figure 18). Step 1 starts with determining the domain and time for this future context. Step 2 is about the building blocks, which are found in the analysis and the interviews that have been executed with the gate agents and KLM management.
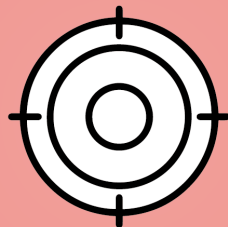
Step 1 | Defining the domain and time
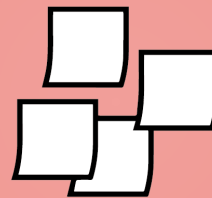
Step 2 | Generating context factors

ViP steps in the discover phase

2.4.1 DOMAIN AND TIME

Before the start of filtering context factors directly from all the information sources, the domain and time for the future context are determined. This domain is a descriptive area, where KLM will aim to contribute. For this project, the domain will be:

"Coping with disruption in mobility"

Many stakeholders are involved in a disrupted situation, and everybody responds differently to this occurrence. The primary stakeholder is the passenger when operational disruptions occur. However, as explained before, the gate agents are of great importance during these days since they have interaction with the passenger. Next, many departments have 'improving disruptions' on their agenda.

However, as shown in the trend analysis in chapter 2.1.1, disruptions are not only happening in the airline industry. Every mobility provider is coping with an undesired interruption in the experience they want to deliver to their customers. The NS, for example, has to cope with similar types of disruptions as KLM. When bad weather is announced, they have to decrease their rail capacity. Therefore it is interesting to expand the scope from discovering building blocks in the airline industry to discovering building blocks in mobility.

Besides the definition of the domain, it is also essential to assess how far into the future, the final design will be projected. For this project, the design needs to be implemented right away. However, it is important that KLM can connect with the future and offers a solution that continues to be relevant in this fast-changing environment. That is why the timespan will be:

"From now till 2025"

2.4.2 CONTEXT FACTORS

To be able to build the future, the 'building blocks' or so-called the 'context factors' have been generated. These factors are observations, thoughts, theories, beliefs and opinions found in the research that has been done in this chapter. These factors all have their relevance to the determined domain and time. However, sometimes, it might not be directly clear why they are relevant. Context factors all have a value-free description that shows the relevance of this world phenomena in this domain. This list of context factors, including their description, can be found in Appendix XX. All these ±80 factors can be divided into trends, developments, states and principles in a specific field (Figure 19). Trends and developments are things that are changing over time, where trends are specifically about the changes in human behaviour. States and principles, on the other hand, are fixed phenomenon. Something that was in the past and will stay the same in the future. All these context factors together are a great source of rich data and inspiration but should be turned into composition before making sense in the future.

FIELDS →

TYPES ↓

	Technological	Economical	Psychological	Demograpical	Cultural	Ecological
Developments [D]	7	1	-	3	3	2
Trends [T]	2	-	2	-	3	1
States [S]	2	2	4	1	4	2
Principles [P]	1	3	18	2	5	-

Ordening context factors

FROM STRUCTURE TO FLEXIBILITY

Good communication is key

During disruptions nothing is as it should be

People tend to love closure

There is a blurring boundary between jobs in KLM

Many hands make light work

Staff is important for passengers' well being

A disruption affects everything

KLM has a complex organisation

KLM is behind with digitalisation

People want to be heard

A SHIFT TO BECOME VISUALLY TRANSPARANT

Seing is believing

People can understand disruptions

People are favouring more visual communication

Information brings people peace of mind

Transparancy is a competitive advantage

Trust will increase loyability

Communication is key

MORE DEPENDENCY ON WORKING TECHNOLOGY

KLM depends on many other companies

Technology will decrease workload

A ticket means moving forward for people

Staff is important for passengers' well being

There is a growing digital target group

There is less staff due to self-service

Silence = gold

A disruption affects everything

Increasing volume of passengers

Disruptions stay forever

Increased technical calamities

Trust will increase loyability

NECESSARY FLIGHTS ONLY

The weather is changing due to climate change

Trains will run every 10 minutes

Stagnancy is an abatement

Airline industry is polluting

More branded sustainable alternatives

A disruption means less runway capacity

There is a rising sustainable awareness

KLM is comparable with the NS

Commercial incentive triggers to get things done

THE INCREASING POWER OF THE INDIVIDUAL

Uncertainty stimulates emotion

Do not force an option to passengers

KLM is a customer centric airline

Passengers are becoming more independent

Vurnerability on social media

Authorities are often undermined

There is an angry movement going on

Passengers want to be in control

Who yells the loudest is right

People are selfish creatures

Choices are highly personal

MOVING BEYOND THE BORDERS OF SCHIPHOL

Schiphol is small during disruptions

People want to use there time usefully

There are more and more information sources

Transfer passengers are 70% of the total and therefore important

New experiences create uncertainty among people

Passengers are becoming more independent

Symbiosis between KLM and Schiphol

Nothing is like home

KLM is a customer-centric airline

DIGITAL TAKEOVER BY OUTSIDERS

KLM should adapt to a changing environment

We are living in an accelerating world

KLM is the oldest airline operating under its original name

KLM makes the transition to become data driven

Outsiders enter the airline industry

KLM is behind in digitalisation

Development costs time

KLM has a complex organisation

KNOW YOUR PASSENGER LIKE A BEST FRIEND

Travelling is a stressful matter

People are never fully satisfied

Transfer passengers are 70% of the total and therefore important

You learn from your mistakes

Robots are helping in the operation

New experiences create insecurity

Culture creates different mindsets

Staff is important for passengers' well being

Commotion creates herd behaviour

The privacy law secures peoples' data

KLM is making the transition to become data driven

Knowledge brings peace of mind

FEAR OF LOSING TIME

People want seamless transit experiences

We are living in an accelerating world

Speed improves the experience

Trains will run every 10 minutes

Waiting means more trustworthy information

People want to use their time usefully

KLM is making the transition to become data driven

Knowledge brings peace of mind

>>ViP: Discovering the future context

The ViP approach is used to discover the building blocks, which are the foundation of the future context. The domain for this project is 'coping with disruption in mobility' because disruptions are not only happening in the airline industry, and previous research showed that there are many opportunities outside this industry. KLM wants to be able to implement the solution straight away. However, KLM should connect with the future and offers a solution that will be relevant in this fast-changing environment. Therefore, the timespan will be from now till 2025.

The context factors that have been generated include all the observations, thoughts, theories, beliefs and opinions discovered in the research explained in the chapters Context Exploration and Disruption. These factors together are a source of rich data and inspiration but should be turned into a composition to make sense of the future.

chapter | 3

Define

The third chapter Define includes the converging process towards the future statement and design guidelines for this project. The first subchapter shows the ViP steps that are used to create a future context. The ViP exist of clustering the context factors into driving forces, creating a framework and deciding the future statement for KLM. After that, this future world of travelling is shown, with a vision of how KLM should anticipate in this world. This vision is supported with guidelines, which can be helpful for the design process.

ViP 3.1
The future world of travelling

The ViP process has three steps that belong to this Define phase (Figure 20). First, the context factors are clustered into driving forces that are predicting the future context. These forces are all part of a whole, but also includes some friction. This friction is plotted against two axes in step four. This framework includes all the different driving forces and shows four spaces that KLM could focus on in the future. In step five, a focus space for KLM is chosen with an accompanying future vision.

Step 3 | Clustering into driving forces

Step 4 | Creating a context framework

Step 5 | Determine the future statement
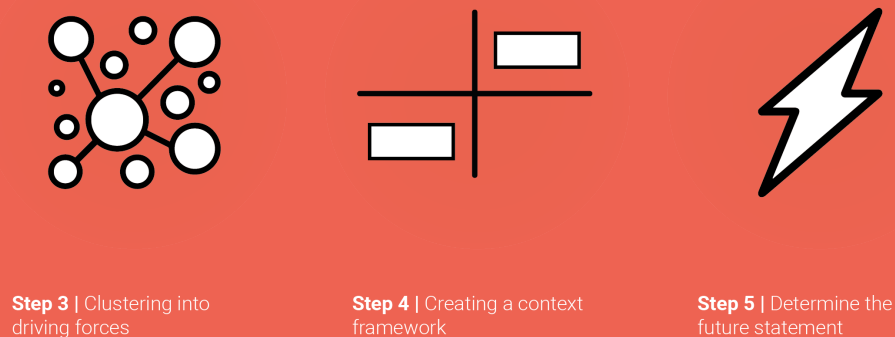
Figure 20 ViP steps in the define phase

3.1.1 DRIVING FORCES

The list of context factors showed in chapter 2.4.2 does not create a context that can be designed for yet. A coherent structure needs to be created that explains how all the separate elements can be connected. Clusters called 'driving forces' create this structure. These emergent-quality clusters exist of different context factors, that together create a new, comprehensive factor that has an impact on the future context.

FROM STRUCTURE TO FLEXIBILITY

KLM is running a continuous operation of gigantic and complex nature. Such operations were traditionally handled by making clear rules and protocols, which is traditionally part of KLM's organization structure. With the rise of digital tools such as the iPad, working at Schiphol airport becomes more flexible, and KLM employees are expected to take more responsibility. This flexibility also includes that they have to adapt fast to new situations and have to continue learning.

"We have to work on more different tasks than in the past. Arranging hotels, vouchers, rebookings. With the iPad, we can do a lot more, and we are coaching to understand these services and possibilities." - gate agent 1.

There is a blurring boundary between the different jobs, which will become even vaguer in the future.

However, during a disruption, nothing is as it should be. It creates chaos at the airport, and the original protocol is not followed up anymore. Only one thing is important; the passengers need to get off Schiphol as fast as possible.

"Normally you have to calculate everything. What is the amount of money that the passenger paid for its ticket? During a disruption, there is only one thing that counts; the passenger needs to leave the airport" - gate agent 5.

The passengers want to be heard, so KLM management shoves its employees from different departments to places where help is needed. However, these employees lack control and knowledge in these situations.

"When a PaxCon situation is announced, I am leaving the office/my home to provide help where needed with the D-Team at Schiphol airport." - KLM digital

A SHIFT TO BECOME TRULY TRANSPARANT

With the rise of big data, guided by the use of social media and easy access to information, transparency is becoming a competitive advantage. Being honest as a company can create customer loyalty. However, people often believe things when they visually see something happening. This visualisation might be the reason why people are favouring visual platforms nowadays. In order to give people peace of mind, it is necessary to show the available information in an honest and visual way.

Passengers can understand the disrupted situation when they see the cause of the disruption. This visualisation is not always visible, unfortunately.

"When there is a storm, they often understand the cancellation because they see it. When there is a side wind that makes it difficult to take off, runway capacity will be decreased. Passengers often do not believe that the aeroplane cannot leave." - gate agent 3.

Nowadays, mobility providers tell the cause of the disruption briefly, but the impact does not become evident for the passengers. KLM employees spend lots of time explaining the situation to their passengers and give them up-to-date information to give them peace of mind. This way of working costs too much time when many passengers are waiting for this information.

"Sometimes, it is a difficult, technical case of why their flight is disrupted. I take the time to explain it to the passenger, till they finally understand it. Explaining the case in detail costs lots of energy, but it is important for them to get that information. - gate agent 3".
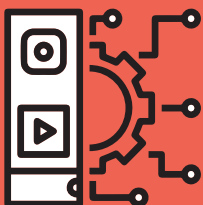
MORE DEPENDENCY ON WORKING TECHNOLOGY

The volume of the passengers that are flying is growing [bron - of in trends]. New technologies that enable self-service can improve this growing passenger flow and decrease the workload for the ground personnel. Especially because soon (almost) everybody will travel with a mobile device, it will become more convenient for the passenger to use it.

"There are still passengers who travel without a mobile device. When even this group has become digital, it will be a real game changer. We will be able to reach everybody" - KLM CX

However, this growth in the use of technology increases also the dependency on technology

in the operation section. Besides that, many passengers feel more in control when they get personal service from the airline.

"I do not believe that a robot is a future. I have the feeling that passengers do not want that. When they have to board themselves through the gates, they often look at us with panic in their eyes." - gate agent 3

A disruption often goes hand in hand with technical calamities.

"Intuitively, we have to cope with more calamities such as disturbances in the luggage hall etc." - KLM Passage

Technical disturbances are very tricky when the whole operation depends on working technology since it will make the disruption even worse. It is vital for KLM to find the right balance between digital and analogue or create a good backup plan. KLM can also create control and peace of mind by staying personally connected with the passenger in the operation. KLM should balance the convenient and fast tools with labour intensive tools to create the optimal disruption proof operation.

NECESSARY FLIGHTS ONLY

Climate change has not only an increasing impact on weather-related disruptions in the airline industry but also on the attractiveness of this industry. There is a rising awareness of sustainability, and the airline industry is, in that sense, very polluting.

"People will find flying by aeroplane very polluting in the future. Moreover, indeed, it is very polluting!" - KLM ODS

Incentives to fly might become time and necessity instead of convenience, especially because the feeling of guilt among (frequent) flyers is increasing. The change in incentive makes sustainable alternatives such as the high-speed train more attractive for trips within Europe in the future. The driving force behind this is because these alternatives are becoming faster and more comfortable.

KLM, however, is still focusing on the commercial incentive of their deeds.

"I think sustainability can be an opportunity for the marketing and branding of KLM. The passenger will not accept certain products anymore in the future. The overall appearance of KLM needs to be sustainable too. Commercial incentives always work when you need money for a project." - KLM ODS

Disruptions, on the other hand, are an expensive matter, so a collaboration with other transportation modes to transport passengers to their destination is desired. It might increase the likelihood that passengers will choose the sustainable alternative in the future.

THE INCREASING POWER OF THE INDIVIDUAL

The society we live in today is different from five years ago, and norms and values are changing. People are becoming more mature, selfish and stand up for their rights. Authorities are often undermined because people have the feeling that they know everything better.

"Passengers are more mature which has its consequences. People are better informed through social media etc. Often even faster than we have the most up-to-date information. This lack of up-to-date information can make you (as a gate agent) feel uncomfortable." - gate agent 3.

When authorities do their work that is not in line with the person's norms and values, they can get angry, and they will show this to the public. With the use of social media, one voice can reach a million people.

KLM's primary focus is on its passengers and does everything to make their journey as pleasant as possible. Mainly by giving them the feeling of being in control during their journey. During a disruption, KLM cannot take care of all the individual wishes of the passengers due to the volume.

"The most difficult things are the volume and edge cases. There are many passengers with different stories, and the solution might not always work how it should be." - KLM CX

These edge cases stimulate all kinds of emotions which can have a negative influence on KLM's reputation. There is a chance that the individual does not appreciate the offered solution and shows this online.

"Passengers can get angry when the weather is bad, and their flight is cancelled. Others are sad or some even cry. They can yell at you, and scream things like 'fuck'." - gate agent 1

MOVING BEYOND THE BORDERS OF SCHIPHOL

KLM and Schiphol are often mentioned in the same sentence by their passengers, which is logical because of the symbiosis between them in terms of quality. They are both dependent on each other. Especially because 70% of the KLM passengers are so-called 'transfers', who arrive at Schiphol, but not necessarily want to be there since Amsterdam is not their final destination.

"Most people that get stuck at Schiphol Airport did not plan to be in The Netherlands. They have to stay here but might not have a visa, do not speak the language or do not know where to go" - KLM digital

These passengers, however, are becoming more independent, because they have access to many information sources that can help them go their way to spend their time usefully.

During a disruption, Schiphol becomes relatively small because all these transfers are stuck and the airport becomes overcrowded. The accumulation of people often results in a negative experience for the passengers. However, it is KLM's job to focus on their passengers in such a situation. Together with its passengers who have access to many information sources, KLM might be able to create comfortable waiting time outside the borders of Schiphol.

DIGITAL TAKEOVER BY OUTSIDERS

KLM has a rich history and a significant amount of experience in the airline industry, but nowadays, an airliner needs to offer more than its original product. The world is accelerating, and digital products are becoming unimaginable when moving around. People have the feeling that KLM is behind this digitalisation trend.
"The whole airline industry is in the initial phase concerning digitalisation". - KLM Digital

To stay relevant in the airline industry, KLM has to adapt fast to this changing environment. Especially now outsiders such as Google try to enter this industry. Unfortunately, development costs time, especially when working in such a complex organisation as KLM.

In cases of disruption, passengers might find it easier and more trustworthy to solve their problems via other digital platforms, because they are more familiar with it.
"A danger would be when other parties such as Google would offer flights. Passengers might trust Google faster than the airline itself". - KLM CX

Besides this, the information provided by more advanced platforms is often faster available. KLM needs to adapt fast if they want to keep ahead of this competition, but there is a chance that they are not fast enough.
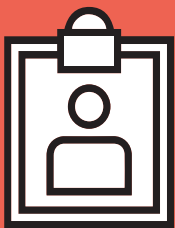
KNOWING YOUR PASSENGER LIKE A BEST FRIEND

People will never be fully satisfied, but to offer the best products to the clients, it is important to adapt to individual wishes. These wishes are different in every situation and for every individual. With the ongoing innovation concerning useful data and machine learning, KLM will be able to offer the best customer care. In cases that the crew is limited in their knowledge, robots, for example, can learn exceptionally well from all the things they encounter. Besides that, these smart machines can understand situations without even asking for it.

Travelling is a stressful matter for many passengers. Especially when a disruption occurs, people tend to stop thinking and are just following the crowd to seek for assistance. This behaviour often ends up in immense queues at the transfer desks where the crew will take care of their well being. Smart machines will become very valuable in these kinds of situations since this service will be less time consuming and convenient. However, it is not sure if the passengers have enough trust in these machines in the future.

THE FEAR OF LOSING TIME

The world is accelerating. People are moving around faster than ever with the use of different kinds of transportation modes. Everything is connected to make the passenger's journey as seamless and smooth as possible. Passengers want to spend their precious time usefully by doing multiple things at once. At the airport, this often results in people doing work while waiting for their flight.

Disruptions do not only cause a considerable delay, but it also creates uncertainty due to the lack of trustworthy information. This information is needed to give the passengers peace of mind and enable them to adapt their plans. KLM is making the transition to becoming data-driven and makes proactive decisions when disruptions are predicted. However, with longer waiting times, information becomes more trustworthy. KLM should find a balance between the two.

"The weather is very unpredictable. ODS wants to wait as long as possible with making a proactive decision because the weather information will be more trustworthy". - KLM ODS

3.1.2 FRAMEWORK

It is impossible for a company to respond correctly to all these individual driving forces. These driving forces are all part of a whole, also seen as the future. There is friction between a few of them, which makes it necessary to choose a direction within this future. The correlation between the driving forces is integrated into a framework (Figure 21). This framework makes clear how KLM can position itself in the future world of disruption.
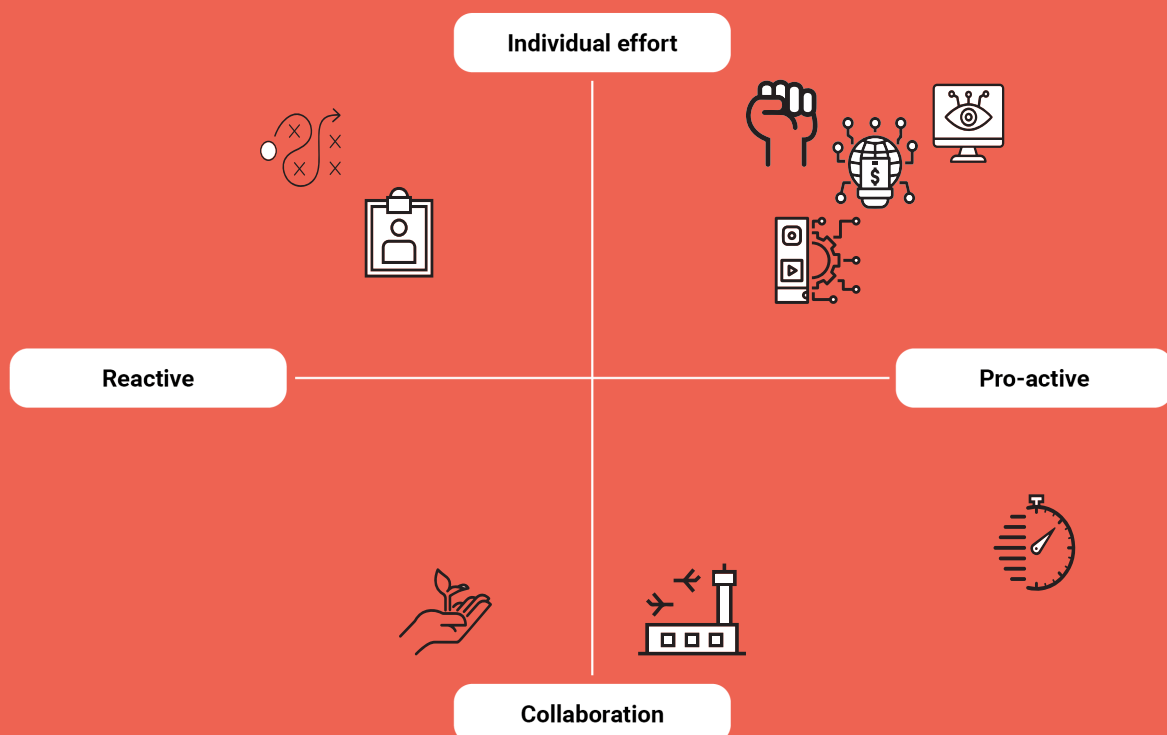
Figure 21 Framework

AXIS

The horizontal axis shows the way KLM can execute operational excellence. To stimulate operational excellence, operating both efficiently and being customer intimate, is the ultimate positioning of KLM, which is explained in chapter XX Positioning. The driving forces show that this can be executed in both a reactive and a proactive way. The left side shows that KLM is becoming more flexible with technology, which enables them to approach more passengers. Besides that, they can use smart machines to adapt to the needs of using foreigners in their language. The right side shows smart innovations to prevent passengers from seeking help such as becoming more transparent and pushing the passenger automatically faster through the system.

The vertical axis shows the ownership of the solution that is given during an unexpected disruption. KLM can use either their strengths and assets to anticipate to the passenger needs or collaborate with interesting parties that can solve the problem together with KLM.
The upper side shows the own strengths of KLM; their customer-centric personnel, their own (smart) automated machines and their digital platform. The lower side shows attractive alternatives and opportunities outside Schiphol Airport.

DIRECTIONS

KLM can take on several roles to respond to this future (Figure 22).

1. Supporter

"Recovering by personally comforting a disrupted passenger who needs it"

Providing every passenger who asks for help with individual and personal support when operational disruptions occur. This support includes being visible and approachable for the passenger, so they know where they can go to when they cannot continue their journey. It includes staying positive, even though it is not possible to provide the passenger with a solution. This service will give the passengers the feeling that they are being heard.

2. Advisor

"Recovering by giving extensive advice to the disrupted passenger who needs it."

Providing every passenger who asks for help with deliberate advice when operational disruptions occur. This advice takes all the available options that are in the scope of the passenger's needs into account. There will be no distinction between the different options that can be provided by collaboration between the different parties. The passenger will be able to choose their desired choice.

3. Preventer

"Recovering by creating preventive solutions in the operation phase for every passenger."

Creating smart solutions into their operation to prevent the passenger from feeling personally touched when operational disruptions occur. These smart solutions might not directly offer a solution for a cancelled flight since it only makes use of KLM's assets, but can make the passenger feel at ease again.

4. Connector

"Recovering by pushing the most suitable solution for every disrupted passenger."

Pushing the best possible solution to every disrupted passenger when operational disruptions occur. KLM will make use of both its assets as the assets of other parties. By proactively pushing a solution to every passenger, it will be faster to get everybody off the airport.
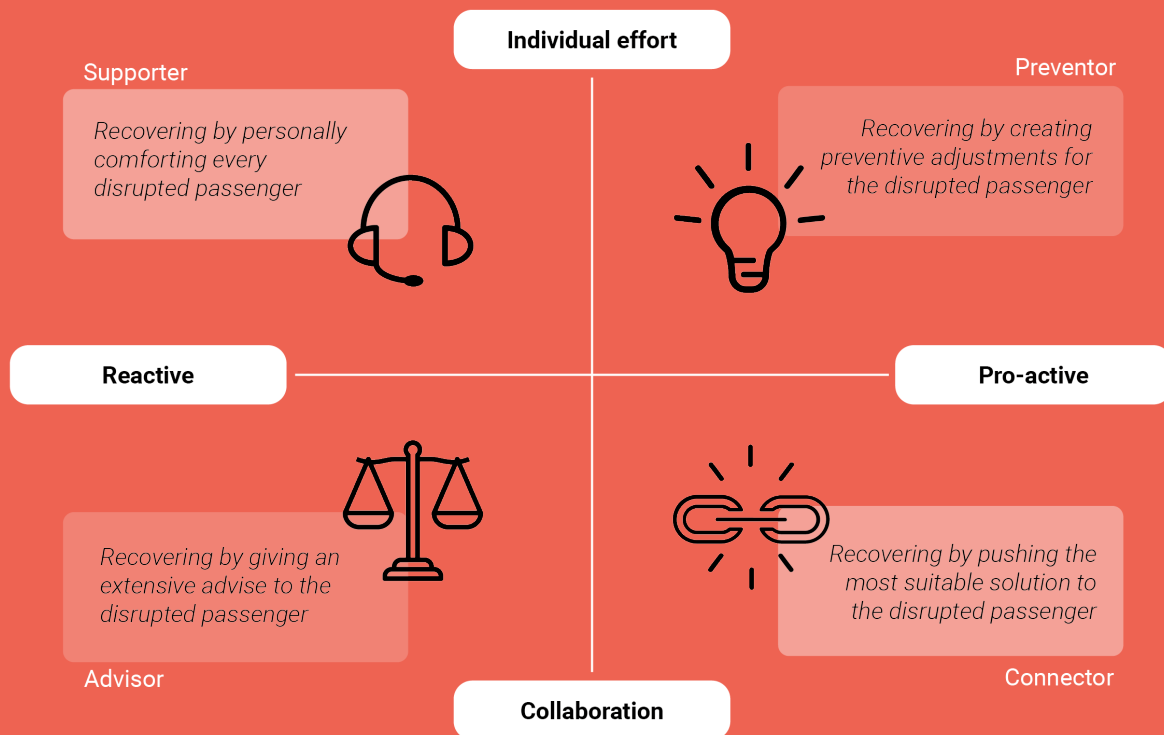
Individual effort

Supporter

Recovering by personally comforting every disrupted passenger

Preventor

Recovering by creating preventive adjustments for the disrupted passenger

Reactive

Pro-active

Recovering by giving an extensive advise to the disrupted passenger

Recovering by pushing the most suitable solution to the disrupted passenger

Advisor

Connector

Collaboration

Figure 22 Directions in framework

KLM'S FUTURE ROLE

The disruption workgroup showed a clear interest in positioning itself proactively in the future of disruptions. They have seen the latest improvements in other tools that are proactively helping both the KLM crew and the passengers.

"The last time we have worked on proactive solutions, such as proactive cancellation. This is working out very well for both KLM crew and the passengers" - KLM CX.

They want to continue with this approach since they see the benefits of arranging everything beforehand. It is, on the other hand, difficult for them to decide whether they want to make use of their assets or make use of the assets and services of other parties. The working group oversees the benefits of collaborating with other parties. However, they might be scared that these parties do not share the same values as KLM. Besides that, it might influence the loyalty of the disrupted passenger in the future. They might choose the products of competitors in the future when they have the feeling that it was not KLM who solved their disruption.

Therefore, it is decided to move towards the direction of the connector to push the best suitable solution to every disrupted passenger with the use of external parties. It is only important to show KLM's identity through the whole process and stay connected to the passenger.

chapter 3.2

Design brief

This design brief sets the starting point for the innovation that solves a disrupted situation in the future. The criteria exist of both the future statement, which is extracted from the ViP process and the design guidelines focussing on the passenger needs.
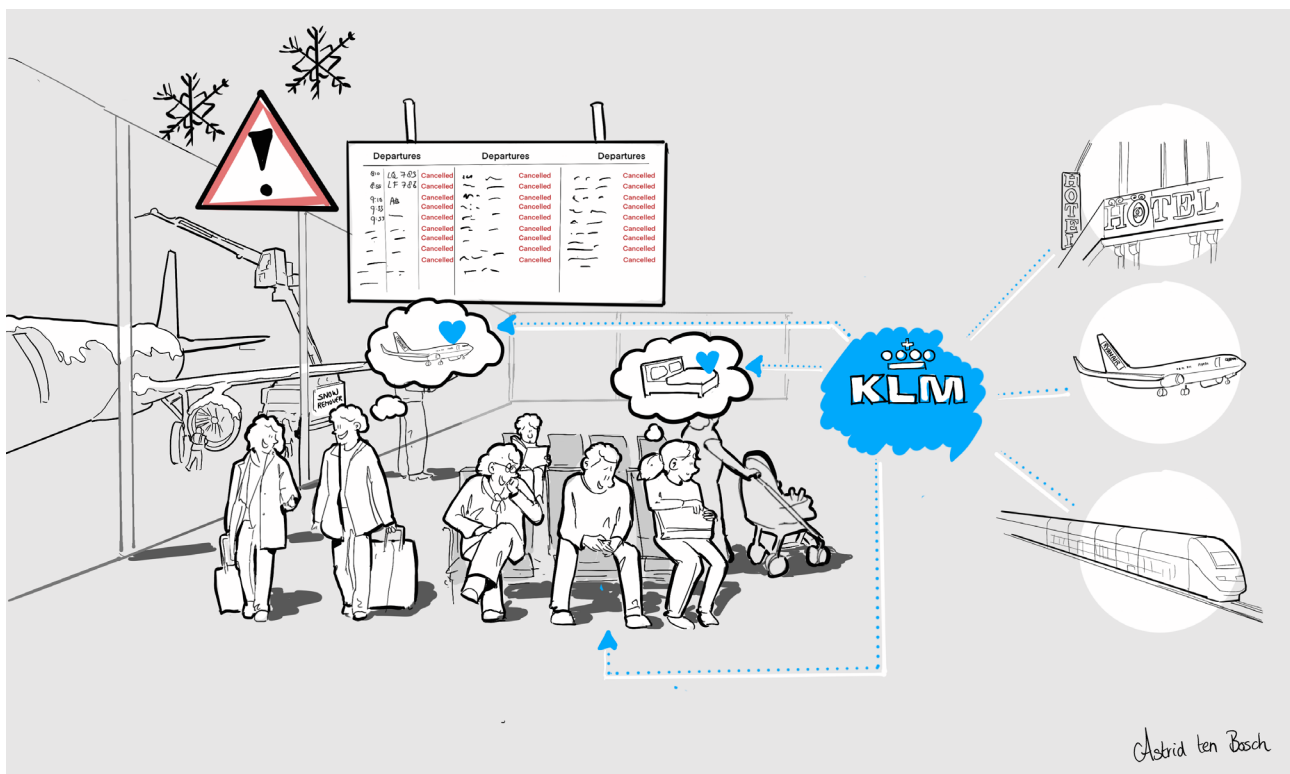
Figure 23 Future vision

3.2.1 FUTURE VISION

"KLM needs to recover a disrupted journey by pushing the best suitable solution to the passenger by collaboration with external parties while staying true to their own identity."

The future vision illustrated in (Figure 23), is based on a role from the framework. KLM needs to articulate itself as a Connector, pushing the best suitable solution to the passenger when they are disrupted. The best suitable solution can be generated based on the availability of KLM and external parties. These external parties include other airlines both within and outside SkyTeam, alternative transportation, other airports and hotel accommodations. The best possible solution depends on the passenger needs. It is important that KLM stays true to its identity while pushing the solution, to clearly show that it is KLM who helped them during this unpleasant experience.

3.2.2 DESIGN GUIDELINES BASED ON THE PASSENGER

Besides the insights captured in the vision, a research has been conducted to understand the disrupted passenger. These insights are captured in the passenger guidelines. To push the best suitable solution, the needs and wishes of the passenger need to be taken into account, which are covered in the perceived justice framework (Figure 24). The solution should be available for every disrupted transfer passenger. This group accounts for 70% of KLM's passengers, whom all suffer the most from operational disruptions.

- *The design should offer desired distributive, procedural and interactional justice to the passenger.*
- *The design needs to take the needs and wishes into account of every individual passenger.*

■ Transparent information to be in control	■ Contact with a representative (more trustworthy)	■ KLM to take responsibility
■ A fast, but suitable rebooking	■ Fast and convenient	■ Getting the feeling of being taken care of
■ Refund for unforeseen costs	■ The ability to choose	■ Guidance to feel secure
■ Tips to spend their		
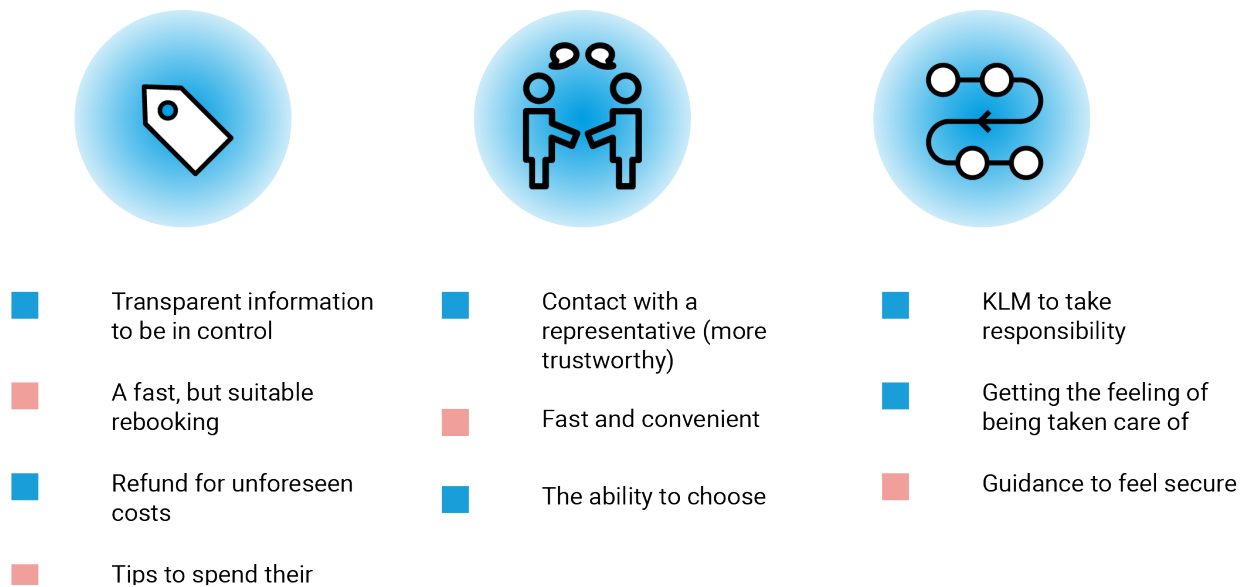
Figure 24 Perceived justice framework

chapter | **4**

Develop

This fourth chapter is focussed on generating ideas based on the guidelines that are set in the define phase. The creative sessions resulted in seven concept ideas, which are shown in the first subchapter. Secondly, these concept ideas have been evaluated and ranked based on specific selection criteria. Based on these results, one concept idea has been chosen to be further developed in combination with interesting elements of other concept ideas.

chapter 4.1

Concept ideas

Many ideas have been generated during three different creative sessions (Figure 25). The conclusions derived from the previous chapters served as a starting point for ideation. The first creative session took half a day and existed of two teams of six participants working on their own formulated research questions. The second session was a pressure cooker brainstorm with two people to generate as many ideas as possible. The third and last session involved a group of 5 people brainstorming about a few relevant questions and creating concepts around these ideas. The creative session approaches, rough ideation material, original ideas and photos can be found in Appendix I. The seven most promising ideas were intuitively selected and further developed into the following concept ideas. The extended version of the ideas can be found in Appendix D.

○ Creative session 1 (2x6 pers)

○ Brainstorm session (2 pers) ─────── ○ Selecting and eleborating

○ Creative session 2 (5 pers)
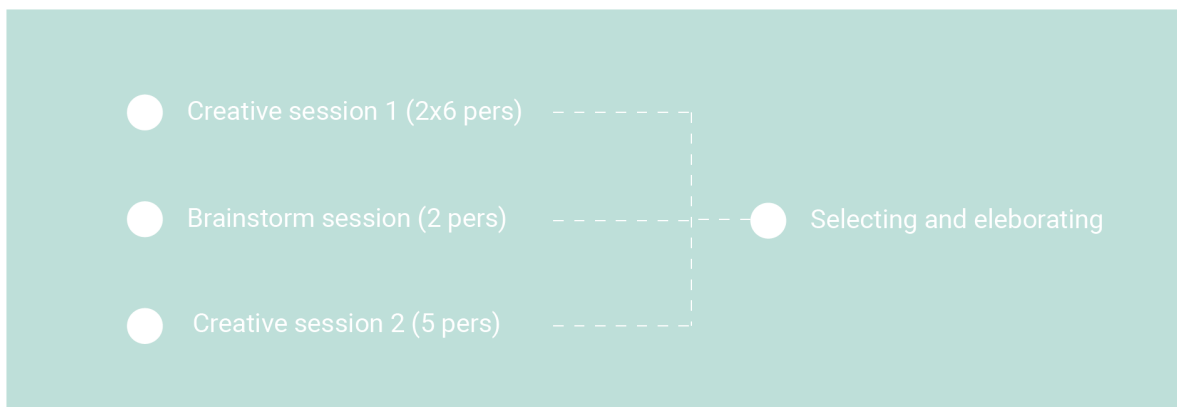
Figure 25 Creative sessions

JOURNEFY
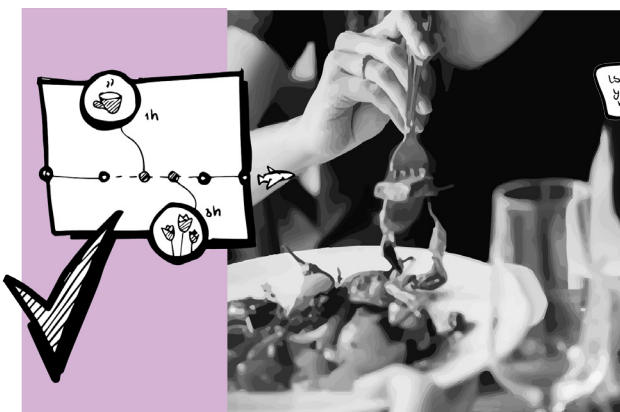
KLM OFFER

TRAVEL POUCH

CONNEKT

DESTINATION SPACE

YOUR PGA
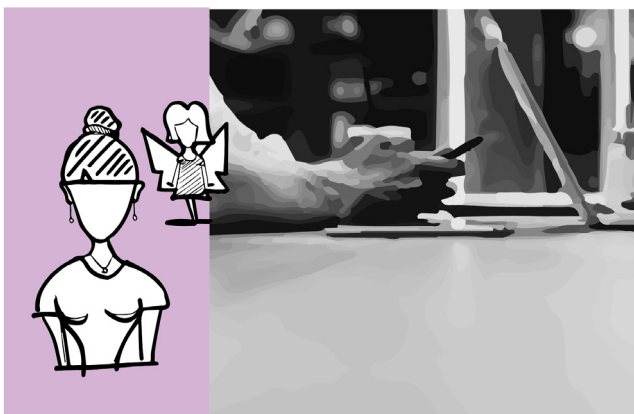
THE EXTRA MILE CLUB

chapter 4.2
Concept choice

This selection of concept ideas have been evaluated based on the three lenses of Design Thinking; desirability, feasibility and viability, which have been previously discussed in chapter 1.3 Problem definition. Besides these lenses, an extra lens 'originality' is added (Figure 26). This lens is based on gut feeling, to evaluate if people get a spark from this idea. Originality can differentiate the product from the rest. These pillars all include selection criteria, which are both evaluated by the graduate and the working group 'Disruption. The graduate used the knowledge gained during this project to evaluate the concepts. The stakeholders intuitively rated the concepts.
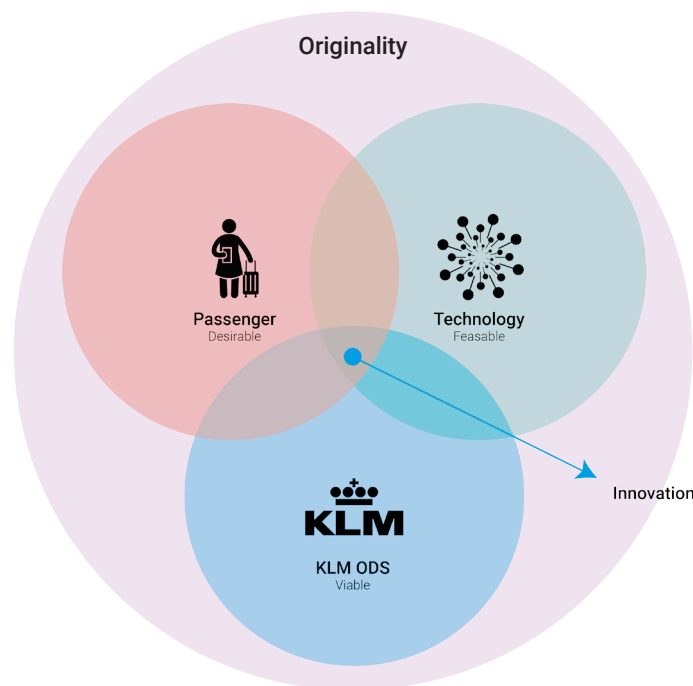
Figure 26 Criteria lenses

4.2.1 SELECTION CRITERIA

Desirability (D)

To what extent does this concept idea fulfil the needs of a disrupted passenger? (D)
> *Is this concept idea applicable to every individual? (D1)*
> *Does this concept idea gives the passenger justice? (D2)*

The desirability is dependent on the mindset and the occasion of the passenger which has been shown in chapter 2.3.2 perceived justice. Every passenger has different needs and it is, therefore, important to evaluate the number of passengers that will be captured with the relative concept idea. Besides that it is important to take the general

Feasibility (F)

To what extent is this concept idea technologically feasible? (F)
> *Is the technology used in this concept available for the company in the near future? (F1)*
> *Is the technology used in this concept adapted by the passenger? (F2)*

The feasibility is focussed on the technology that needs to be implemented for the relative concept idea. In the driving forces it became clear that technology is changing rapidly and will be more advanced in the future. It is important to take the possibilities in the near future, 2025, into account, but also if the involved parties will be able to use this technology. Besides that, it is also essential to take the adaptation of technology by the passenger into account.

Viability (V)

To what extent is this concept idea viable for KLM? (V)
> *Is this concept idea aligned with the current vision and strategy of KLM? (V1)*
> *Do the stakeholders want to invest in this concept? (V2)*

The viability is dependent on the clear vision and positioning of KLM. The relative concept idea should fit this vision and strategy to make stakeholders want to invest in this concept idea. Besides that, it is essential that the stakeholders accept the concept idea to increase the change of implementation.

Originality (O)

To what extent is this concept idea original? (O)

As said before, this lens represents the spark people feel for the concept idea. A like factor that arises when something is presented that is novel or uncommon. This spark might make a product or service more difficult to reproduce by competitors.

4.2.2 RESULTS

The Harvey balls represent the number of points a concept can receive based on the different criteria (Figure 27). The first ball represents 'none'; it does not meet the requirement. The last ball represents 'all'; it fully meets the requirement. Seven participants, from the working group 'Disruption' at KLM, have intuitively filled in the evaluation form based on their knowledge. The extensive results of this evaluation session with the stakeholders can be found in Appendix XX. The evaluation form is also filled in by the graduate based on the background knowledge of this project.

| 0 | 1 | 2 | 3 | 4 |
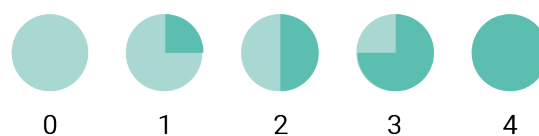
The results of both the working group (Figure 28) and the graduate (Figure 29) show that the KLM PGA and Journefy have the potential to be further developed in a concept. The results do differ a lot based on the criteria. Feedback from the stakeholders shows that the desirability of Journefy is questionable. On the one hand, they think it is great to inform them about the possibilities during their waiting time. However, they are sceptical if it is possible to have a proper solution for every passenger. Besides that, the rules for leaving the airport need to be clear. Otherwise, the passengers might still be too late for their new flight. Additionally, they question if people are not too insecure to leave the airport.

The KLM PGA, on the other hand, scores high on the criteria 'desirability', but low on the criteria 'feasibility'. They see the benefits of tailor-made help and think that this will increase the loyalty of the customers. They question if

it is possible to give the personal touch via an online platform. Besides that, the platform needs to get to know the passengers very well to create value, which takes time.

The other concepts were rated lower than the two concepts above. However, they all contain interesting features. The Travel Pouch has benefits for the passenger by having all the personal and up-to-date travel documents and receipts together. These features do already exist, and this concept is, therefore, not revolutionary. KLM Offer seems to be interesting for a commercial viewpoint. The stakeholders are not assured that the disrupted passenger will be positively influenced by the nudge. The Destination Space scores relatively low because this is a solution that works for a small target group, the business traveller. The platform 'Connekt' is a favoured idea but seems to be hard to realize. Every stakeholder mentioned different elements that might be tricky such as the privacy law, the likelihood that the passenger will use it during a disruption and the connection with KLM. The final concept, 'The Extra Mile Club', is interesting since it acknowledged the disrupted journey of the passenger. The tone of voice is an element which has to be carefully examined. KLM wants to stay positive, but it should not be exaggerated since that will stimulate negative emotions to the passenger.
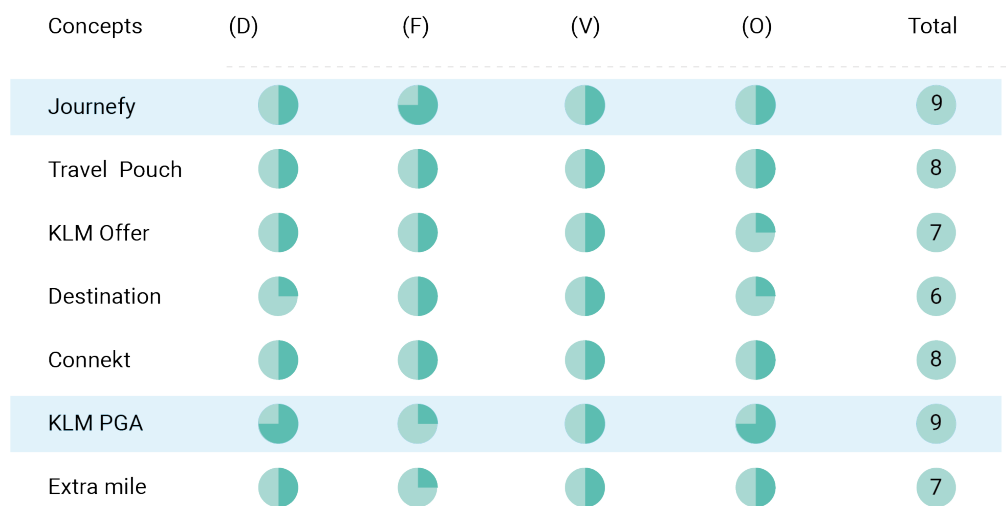
Figure 28 Results working group
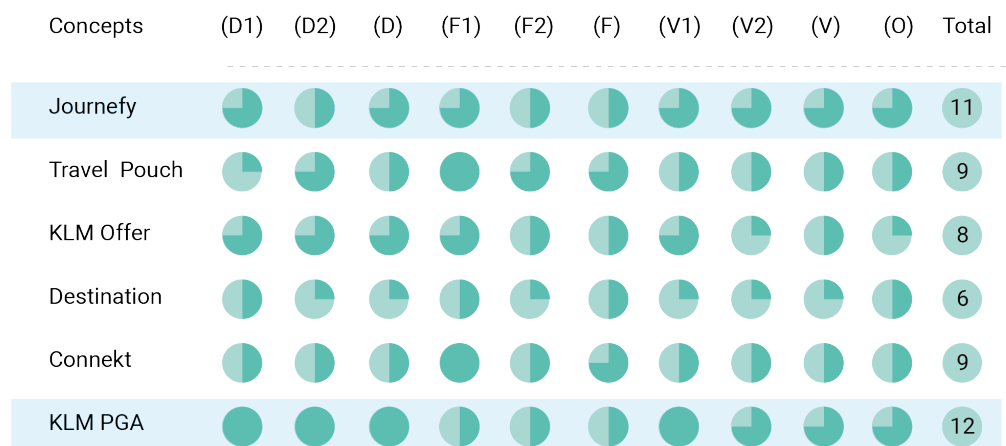
Figure 29 Results graduate

4.2.3 CONCEPT COMBINATION

Based on the outcome of the assessment, 'Your Personal Ground Attendant' (PGA) has been selected to become the foundation of the final concept. It both has the highest score and the potential to increase the satisfaction of the passengers during undesired disruptions. Other concepts, however, included features that can be easily implemented in this concept, without becoming too complicated.

The PGA focuses on the passengers' feeling of being treated personally while being disrupted. It is, however, limited to giving information about the disruption and the rebooking process. The information can be extended by recommending activities and places during their waiting time. When 'Your PGA' is arranging everything for you, it is easy to implement the perks of your Travel Pouch, since sending transactions to companies already exist. This concept will be described more extensively in the following chapters.

CONCLUSION

>> Concept choice

Three different creative sessions generated many ideas, of which the seven most promising concepts have been chosen. The working group and the graduate ranked these concepts according to the three lenses; desirability, feasibility and viability. Besides that, the lens 'originality' has been included to take gut feeling into account when deciding which concept is best. Both the concepts 'Journefy' and 'Your PGA' were rated high. This first concept 'Journefy' focuses on spending the waiting time well, by enabling the passenger to fill in their own desired journey. This concept will eventually be verified by KLM to give the passenger a secure feeling. The working group questioned the desirability of this concept. The second concept 'Your PGA' is based on giving the passenger the feeling of being treated personally while being disrupted, by giving personal information and a personal rebooking. His digital ground attendant will guide the passenger. The feasibility of this concept was questioned because personalisation should be excellent in a disrupted personalisation. It has been decided that 'Your PGA' has the most potential to increase the satisfaction of the passengers. However, this concept will be extended with features of other concepts to make it better.

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chapter 4.3
Meet 'Emma'

This subchapter explains the concept based on the questions; what is this concept? Why do we need this concept? How does this concept work? By answering these questions, it will become clear what this concept gives to the disrupted passenger, how it fits the future vision and the passenger guidelines and which technology is needed to make it work.

4.3.1 WHAT IS THIS CONCEPT?
INTRODUCE 'EMMA'

'Emma' is an automated, digital, KLM ground attendant, integrated into the KLM app, who knows exactly how to give her beloved passengers back the control during unexpected and unpleasant situations. She enables passengers to solve their disrupted flight when a PaxCon scenario is announced by pro-actively sharing information, offering solutions and giving recommendations. Emma sends a push notification to the disrupted passenger to inform him or her about what is happening. To be able to give the best possible information to the passenger, this platform includes an enhanced passenger profile containing both a mindset indication and the occasion of the journey. After creating the passenger profile, the platform will be able to recognise the type of passenger in front of him and can provide the passenger with tailor-made help.

As the service is equipped with cognitive abilities; natural language processing, machine learning and intelligent automation, this platform will learn from its own experiences and therefore will become more advanced over a period of time. This application can provide passengers with its services 24/7, which is necessary during unexpected situations. 'Emma' is customer focussed and meets every individual's wishes and demands by giving them the control and the power to make their undesired journey desired again. This app will be available for iOS and Android on mobile and tablet devices (Figure 30).
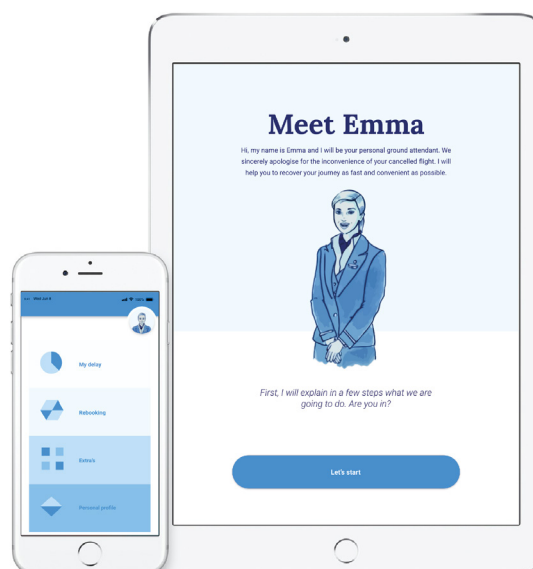
Figure 30 Mobile devices

Providing information

Providing solutions

Providing recommendations

Providing information

The platform pro-actively shares up-to-date information about the disruption to the passengers via its mobile device. The passenger can choose whether he or she wants to go quickly through the system or goes step-by-step through the information.

The first push notification will share the cause of the disruption and the consequences of it briefly. After that, the passenger will receive updates about the disruption when KLM can share this. This up-to-date information will be live and transparent.

Providing solutions

The platform pro-actively provides solutions to continue their journey. When the device knows what kind of passenger is in front of him, it can recommend ways to fulfil the journey. The passenger will be rebooked on the best possible flight according to his personal profile. However, the passenger needs to confirm the option and will be able to see the other options as well to change it when something else is desired.

These options are available with the help of the collaboration between KLM and other parties such as hotel platforms, other airlines, other airports and alternative transportation providers.

Providing recommendations

The platform enables the passenger to spend their waiting time pleasantly by recommending activities, places, et cetera. The transfer passengers often have no idea where to go, since they did not plan to strand in The Netherlands/Schiphol. KLM will enable them to go out of Schiphol and change their undesired experience into a desired one by using their valuable time.

APP SCENARIO

The app scenario is briefly described below, according to the key features that have been explained previously. This scenario includes the four main activities:

1. Receiving a push notification with information
2. Creating an enhanced personal profile
3. Rebooking the journey
4. Showing waiting time inspiration

1. Receive a push notification with further information

Passenger:
A personal message on their mobile device notifies the passenger about the mass disruption. This message redirects to a virtual gate agent in the KLM application, who explains the situation and the steps the passenger should take to solve the disrupted journey together with KLM.

Platform:
Send a push notification to every disrupted passenger. When clicking on the notification, the message should redirect the passenger to the KLM app and make the hidden features for disruption visible for the user.
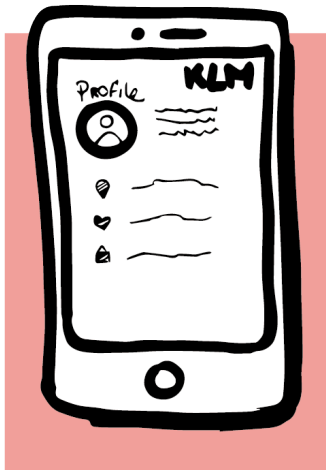
2. Creating an enhanced personal profile

Passenger:
The passenger needs to fill in the gaps in its enhanced personal profile if that was not done before. Therefore, it needs to fill in or click on the drop-down menus, depending on the information that is needed.

Platform:
Throughout the whole journey, data will be gathered that says something about the passenger. The platform will generate the mindset and the occasion and therefore, the specific passenger needs. Also, this data will be saved to recognise patterns in the future.
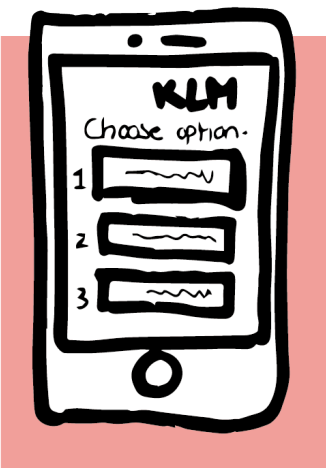
3. Rebooking the journey

Passenger:
Firstly, the passenger needs to rebook its flight. The rebooking will be done by accepting an option. The default option will be the one that fits the passenger's profile the best. Other options, however, will be shown in the order of expected desirability. Emma will explain the motivation and advantages of the selected option when the passenger wants to get more information.

Platform:
With the use of the API's of other airlines, alternative mobility providers and hotels, Emma can generate all possible options for the passenger. These options will be compared with the passenger's profile and ranked on the desirability. All these options will be evaluated on feasibility (logistics) and viability (costs) too. All the costs will be redirected to KLM after the booking.

4. Showing waiting time inspiration

Passenger:
When the passenger finalises the rebooking, the app displays the actual waiting time. Based on this waiting time, the passenger will receive tailor-made inspiration on what to do, where to go, and how to get there to make their time as pleasant as possible. This inspiration can be both inside Schiphol Airport and (nearby) Amsterdam.

Platform:
The platform needs to calculate the waiting time from their new booking, including a safety margin. After that, it can recommend places and activities, based on the time they will spend and their personal preferences. Therefore, they need the API of the public transport systems, the API of TripAdvisor and a GPS tracker. The system needs to make assumptions with a safety factor how long each activity will last (dinner 3 hours, musea 4 hours et cetera).

4.3.1 WHY IS THIS CONCEPT NEEDED?

The concept 'Emma' fits both the future vision for KLM and the design guidelines based on the passenger needs, which are the criteria in chapter 3.2 Design Brief.

VISION

"KLM needs to recover a disrupted journey by pushing the best suitable solution to every passenger by collaboration with external parties while staying true to their own identity."

The application 'Emma' adapts to the individual wishes of the passengers during unexpected disruptions. The best suitable solution is possible with the collaboration between KLM and external parties to expand the availability and the variety of the offers. When being limited by KLM's portfolio, there are not enough options available to help all the disrupted passengers. Personalised help will be even harder to offer with such a limited amount of options.

The application pushes the personalised help to all the disrupted KLM passengers that travel with a mobile device. In this way, KLM proactively approaches every individual and let them decide whether they want to accept digital help.

It is essential for KLM to stay true to their own identity while collaborating with external parties. With 'Emma' KLM retains their identity by showing a customer-centric approach while offering a self-service. The personal assistance of the digital ground attendant gives the passenger the feeling of taken care of.

THE DESIGN GUIDELINES

1. The design should offer distributive, procedural and interactional justice to the passenger.
The key features of this concept are to provide information, provide a solution and provide recommendations. These features are all in line with the offer that the passenger wants to get their distributive justice. The procedural justice is given by offering rebooking options, instead of forcing passengers to take an option. Besides that, the passenger can recover its journey with this self-service. This service is more convenient and faster than standing

in a queue in front of the service desk. When 'Emma' proactively contacts the passenger and provides them with this service, the passenger should have the feeling that KLM takes responsibility when operational disruptions occur. By showing this via a digital gate agent, KLM can give the passenger the feeling of being taken care of.

2. The design needs to take the needs and wishes into account of every individual passenger.
This concept is personalised and can adjust the options and recommendations to every individual passenger. By giving personalised options, the passengers have the feeling that it is convenient for them. The extent of guidance through the app also depends on the passenger type, because some are more dependent than others.

4.3.3 HOW DOES THIS CONCEPT WORK?
The application 'Emma' makes use of both internal resources and external resources in combination with several cognitive technologies to enhance integrated automation to optimize the service recovery for the disrupted passenger.

INTERNAL RESOURCES

'Emma' will be integrated into the current KLM application that is available for all the passengers. Among various components of the passenger's journey, KLM can collect data that is relevant for the personalisation of the service recovery (Figure 31). This data includes the Passenger Name Record data (abbr. PNR) which becomes available after the ticket purchase. The PNR exist of primary personal data such as the name of the passenger, the travel agent, ticket details, the itinerary etcetera. This data will be collected and stored in the current KLM application. Besides that, the passengers are asked to manually fill in the empty boxes in their personal profile, which results in more input. Furthermore, 'Emma' needs to give the passenger information passengers during a disruption. The data needed to give this information is based on the real-time decisions made at the OCC and is available in the Centry API.
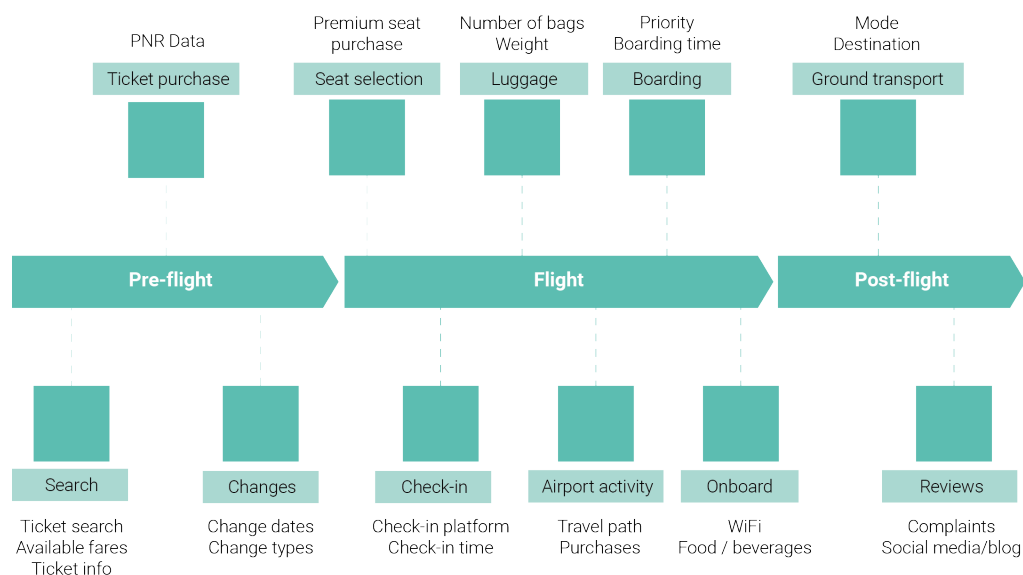
Figure 31 Data collection passenger journey

EXTERNAL RESOURCES

In order to generate the rebooking options, it is crucial to have real-time availability input of the airlines and other transportation providers. As part of SkyTeam, KLM has the data available for the flight ability of all SkyTeam members. However, all other transportation providers and hotel accommodations are not openly available, and therefore, a partnership should enable KLM to get access to this data.

According to Lester et al. (2017), cognitive technologies can be broadly separated into three key pillars; engagement, insight and automation. These technologies can be used to sense and shape processes and sometimes exceed complex human thoughts. Technologies from the three pillars together can enable integrated automation within KLM during operational disruptions (Figure 32).
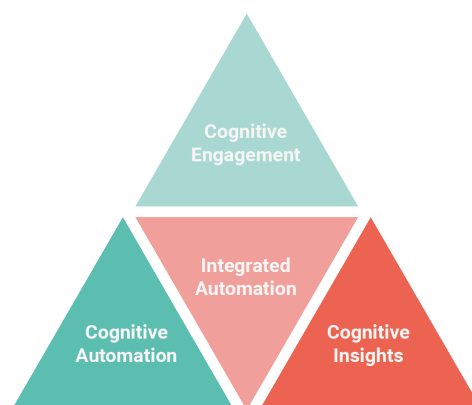
Figure 32 Cognitive technologies

Cognitive Engagement

These technologies can be used by KLM to engage with the passengers in case of disruption. They enable KLM to deliver mass consumer personalisation through communication methods. In this case, it is used for the contact between the passenger and Emma to improve the customer experience. The contact is possible via a chatbot with the use of Natural Language Processing (abbr. NLP). NLP is a branch of artificial intelligence that deals with the interaction between computers and humans using natural language. It applies algorithms to identify and extract the natural language rules in a way that unstructured language data can be converted into a form that is understandable for computers (Garbade, 2018). In the case of Emma, this will be mostly done out of the text that will be sent, but this is also possible with voice messages.

Cognitive Insights

Cognitive insight technologies are capable of developing patterns out of large scale data sources. The sources KLM needs for the application 'Emma' are mentioned above. Machine Learning, the cognitive insights technology used for 'Emma' can change the algorithms over multiple iterations to optimise the testing process. This optimisation will eventually lead to a highly advanced target system (Lester et al., 2017). Such a system will use the passengers' history in choosing options and the other data information of a passenger to sort them in specific 'target groups' to generate the best possible rebooking options.

Cognitive Automation

With the use of intelligent automation, the combination of artificial intelligence and automation, the rebooking process can be entirely automated while achieving a high level of efficiency and quality. The current OPR-tool is already making use of intelligent automation, by rebooking massive amounts of groups in a short amount of time, which was done manually a year ago. The application 'Emma' will be even smarter, with taking personal preferences automatically into account when offering options to the passenger.

>> What?

'Emma' is an automated, digital, KLM ground attendant, integrated into the KLM application, who knows how to give her beloved passengers back the control during unexpected disruptions. She enables the passengers to solve their disrupted flight when her key features announce a PaxCon. These features include pro-actively sharing information, offering solutions and giving recommendations. This interaction will be done according to the application scenario: sending a push notification with information, creating an enhanced personal profile, rebooking the journey and showing waiting time inspiration.

>> Why?

The design brief includes the criteria set for the concept focussing on the future vision and the design guidelines. 'Emma' perfectly fits the vision to recover a disrupted journey by pushing the best suitable solution for every passenger by collaboration with external parties while staying true to their own identity. Besides that, the application contains features that fulfil the passengers needs to get justice, which are stated in the design guidelines.

>> How?

The application 'Emma' makes use of both internal resources and external resources in combination with several cognitive technologies to enhance integrated automation to optimise the service recovery for the disrupted passenger. In order to personalise the platform, the app gathers data of the passenger and saves it along their journey. Also, external resources are used to make the rebooking happen, including the data of other airline availability and time schedules. The cognitive technologies; Natural Language Processing, Machine Learning and Intelligent Automation enable 'Emma' to communicate with the passenger, arranges everything automatically and become smarter over time.

chapter | **5**

Deliver

This fifth chapter provides the validation of 'Emma' and the realisation of this application. The validation has been done with both KLM passengers to validate the desirability of the service recovery and with KLM to validate the viability and feasibility of the application. In the second subchapter Realisation, the final design is shown based on the insights and implications found in the validation studies. Besides that, the implementation plan of the application is discussed.

chapter 5.1
Validation

The application has been validated with KLM customers via interviews, to find out if they would be satisfied after using the application. The interview guide included the three levels of perceived justice. The second validation has been done during a demonstration of the application with KLM employees, to find out whether the platform is feasible and viable for KLM.

5.1.1 PASSENGER VALIDATION

The main question of this thesis is: *How to create the desired experience for KLM passengers during undesired disruptions?* Qualitative research is conducted to identify whether 'Emma' has the potential to increase the NPS score by offering KLM passengers their perceived justice.

Through interactive interviews with thirteen KLM customers, insights regarding the three different levels of perceived justice were obtained. Since this is personal for every passenger, passengers are asked to answer the questions through the eyes of a persona. There were two persona's: a businessman called Chris Parker () and a family with mother Sarah Bueckendorf (). With these insights, the application 'Emma' can be further optimized. Afterwards, the average NPS is calculated and compared with the previous NPS during a disruption. The validation set-up and interview guide can be found in Appendix XX.

AIM OF VALIDATION

Topic 1: Offer
This topic validates whether the passenger gets its perceived distributive justice. According to the passenger insights in the perceived justice framework, KLM should offer information to the passenger to make them feel in control. Besides that, they should offer a fast rebooking, thus suitable in their situation. Next, they have to give a refund for unforeseen costs and lastly they should give tips to enable the passenger to spend their time wisely. This research shows to what extent the passengers were satisfied with these offers.

Topic 2: Procedure
This topic focuses on the perceived procedural justice of the passenger. The process of the service recovery should be convenient in time and effort for the passenger. According to the passenger research, this can be fulfilled with a self-service and by having contact with a representative that the passenger trusts. Besides that, the passenger seems to want to choose an option instead of being forced to take one.

Topic 3: Interaction
The last topic focuses on perceived interactional justice. The passenger should be satisfied with the way the service recovery is implemented and presented. The service recovery should give the passenger the feeling of being taken care of. KLM should show their responsibility in this disrupted situation. Lastly, the passenger should be guided to a certain extent, to feel secure.

Topic 4: NPS
The NPS score measures customer satisfaction and customer loyalty. This measurement can be done by asking one question: On a scale of zero to ten, how likely are you to recommend flying with KLM to a friend or colleague? This qualitative research will indicate the application has the potential to be further developed.

RESULTS PERCEIVED JUSTICE

Topic 1: Offer

All the participants were very positive about KLM's offers in a disrupted situation. The participants felt that the information was very detailed, and they understood why their flight was cancelled. Some passengers felt more in control with the transparent communication about the cause of the cancellation. Others were not specifically in control with the information that has been given, but more with the ability to choose how to continue their journey. Overall, the application seemed to be very structured and included everything the user needs to continue the journey.

The participants were happy with the options the app generated, and they all felt that the default option in the rebooking was the most suitable or fast option for their persona. In the case of the family, they had the feeling it was either a fast option or a suitable option and not both. For the businessman, they all taught that the train was a logical solution, and it was great that this transportation mode was included. All the 13 participants agreed that the right option had been selected as the default option for their persona, but the clear overview of other options was a definite plus.

The vouchers to cover part of the passenger's unforeseen costs are interesting to most passengers, but some participants mentioned that not everybody might use them. Passengers that are offered an overnight stay might go directly to their hotel. However, the fact that they are offered shows a good service to the passengers, and therefore it should be better promoted.

The tips that were shown in extra's are great, so you do not have to figure it out yourself. Especially, because it is possible that they have never been on Schiphol Airport or Amsterdam before and their waiting time might be more than 6 hours. The participants think it is good to know the waiting time and the things you can do within this time, but the recommendations might not be all useful for the passenger. Therefore, the tailored recommendations should be highlighted with the possibility to search for more. Food and drinks are a good suggestion, because everybody needs this during their delay.

> Implications:
> After your push notification, the passenger does not know which header has priority in the menu.
> It is not clear to the participant whether they or KLM have to pay for the expenses of the new flight/train, the hotel and the transportation to the hotel.
> Non-citizens are not familiar with the NS, which might scare them because the railway systems abroad are not that trustworthy.
> Passengers have appointments (such as hotel check-in), that are affected and not taken into account.
> It feels like these are the only options of which the first one fits you best, but it is not sure whether there are more options available which not have been shown.
> The fastest option when the weather is bad can be risky. The participant thinks that the passenger still wants to have this option, but needs a warning that the weather might not be good enough to depart.
> The vouchers are hidden and should be better promoted to the passengers.
> The vouchers might not be interesting to all the passengers, because they might go directly to their hotel.
> The vouchers are only available within Schiphol Airport, but it might be better to also offer something outside the airport.
> The recommendations should be ordered on desirability for the passenger to really trigger them.
> The recommendations should include more than the current options such as workspaces for businessmen.
> Besides the time, passengers need floor-plans or city-maps to know how to get somewhere.
> Nothing is mentioned about the compensation you might be entitled to.
> The noise at the airport during the disruption might affect the passengers experience.

Topic 2: Procedure

The participants all trust the application when everything works like the prototype because it is fast, and you do not have to stand in a queue with dissatisfied passengers. It is great to do everything in your own pace, without having people behind you that are rushed and having a tired ground attendant. Besides that, it is faster than searching for options yourself.

The current generation talks to virtual people very often, so there is not a barrier between them and their digital device. The language spoken by the virtual ground attendant is clear and semi-formal, which seems to be trustworthy. It does not feel like a corporate, which is pushing you the most commercial options. The gate agent is not the only part that creates trust. The confirmation that has been sent with the boarding passes creates trust either. According to two participants, this would be even better when they can choose for an email confirmation too.

Everybody is delighted with the ability to choose an option, instead of being forced to take one. This choice gives them the feeling that they have a say in this situation. Having three options is pleasant. Too much choice might become difficult for the passenger.

Implications:
The trust of the virtual gate agent depends on the speed of answering the questions (an indication of 2 minutes has been given by a participant)
A real person is more trustworthy than a chatbot that generates an answer on the passenger's questions.
Another confirmation is needed outside the app to comfort the passenger. (for example email)
Showing an option that is not the fastest/most suitable, might result in a reverse outcome, because the passenger might check it on the internet.

Topic 3: Interaction

Almost all the passengers (11/13) had the feeling that KLM is showing responsibility by proactively explaining everything in detail and providing the passenger with a solution. The application is clear, easy to work with and structured, which gives the feeling that the application is secure and KLM is doing everything to help you. Two passengers are sure that this sense of responsibility would not be offered by other airlines.

The application 'Emma' shows a personal touch, recognised as a KLM touch, which gives a few passengers the feeling of being taken care of. However, this is digital and not physical, which resulted in the feeling of being thought of.

The guidance is very good through the application, but it can be a bit slower to make sure the passengers make the best decision.

Implications:
Emma should be of more value, by being pushier to people who seem to need something. This will increase KLM's sense of responsibility.
Transparency is important to show that it is of the passenger's best interests and not KLM who is a commercial company.
KLM does not really take care of the people, since this feeling includes personal and more human contact and this application is more general.
Inside the airport everything is arranged well, but outside you need better guidance (with for example Google Maps).

Topic 4: NPS

The passengers are all very likely to recommend flying to their friends and colleagues even though they had encountered a service failure, which shows that the application is positively evaluated. 3/13 participants were passive, thus positive about the experience. They highlighted the fact that they were still disrupted, which made them choose a grade between the 7 - 8. Most participants, however, would rate KLM higher with this service recovery. 10/13 participants were promoters of KLM and scored the airline between an 8 - 9 (Figure 33).
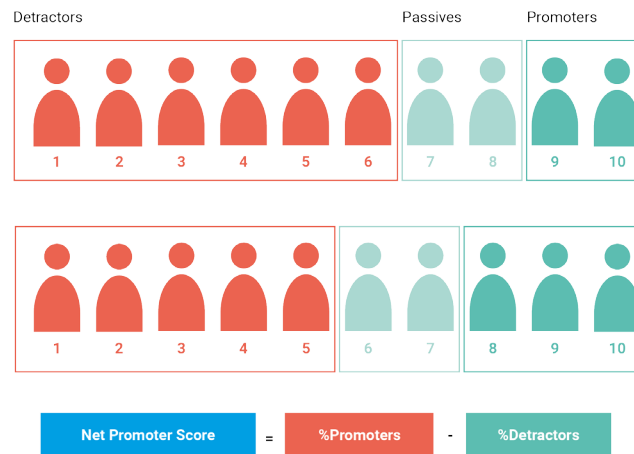
This promotion results in a Net Promoter Score of 77.

This score indicates the potential for Emma to succeed, but cannot be directly compared with the current NPS scores when a flight gets cancelled (which is -27). The main reason is the fact that they did not continue their journey. During this new journey, many things can go wrong, which influences their perceived justice, especially because KLM is not always the executor of the journey. The goal of KLM to reach an average of >43 NPS will be even reached with, for example, six promoters (vs five passives). This shows that the application has a chance to be adapted by the passenger and create satisfaction among them.

5.1.2 TECHNOLOGY AND BUSINESS VALIDATION

The application 'Emma' was presented during a weekly demo at the department ODS to about 40 KLM employees. The background of these employees varied from data scientists, data engineers, software developers, business consultants and product owners. In order to validate both the feasibility and viability of the application, provocative statements have been presented to the audience. This interactive demonstration of the application steered the employees to give feedback about the following topics from a business and technology perspective:

Feasibility

What are the possible opportunities and challenges with regard to the realisation of Emma?
What do they need to realise this project and how long will it take?

Statement   "Emma can be live in 6 months"

Viability

To what extent is the customer loyalty more important than the costs?
To what extent is the application Emma supported by KLM employees?

Statement   "Emma should offer a personalised default option no matter the costs"

Statement   "Emma is valuable for KLM and its passengers"

>>Passenger validation

This validation aimed to identify whether 'Emma' has the potential to increase the NPS score by offering KLM passengers their perceived justice. 13 KLM customers tested this justice throughout an interview with questions about the offers they get from KLM, the procedure to get their service recovered and the interaction they have with Emma. Afterwards, the new NPS was calculated, which resulted in an average of 77. This score cannot be compared with the current scores but indicates that Emma has the potential to succeed. All the passengers were enthusiastic about the application, stating that KLM gave them indeed their perceived justice. They were very positive about the detailed and transparent information in the application, their rebooking (in particular the ability to choose an option) and the tips shown in extra's including their waiting time. Besides that, they believe that the self-service in this situation is desirable and talking with virtual people should not be a barrier in this era. They have the feeling that KLM shows responsibility during disruptions with this application. However, there were a few minor points which should be reconsidered in the final design. These points include the visibility of the vouchers, the order and tailored recommendations, a chatbot vs a real person, confirmations outside the application and the guidance outside the airport.

>>Technology and business validation

The application was demonstrated at the department ODS to validate the business and technology included in the concept with ±40 KLM employees. This validation has been done with provocative statements about the application. The employees questioned the feasibility of the mindset personalisation in a short time. They can create more general personalisation with their current data stored in the data lake 'Blue Lagoon'. Over time, this can be further optimised with a machine learning model. Secondly, they questioned the available third-party information. Before getting this information, partnerships should be established, which costs time. These limitations should be taken into account in the timespan of the implementation plan. The employees all thought that 'Emma' is a valuable application for both KLM and its passengers. They only were not sure whether customer loyalty is more important than the costs because KLM is a commercial business. Besides that, the application includes tasks that will not be executed by ODS, such as the front end design. Therefore, the implementation plan should also include the multiple teams should work on this project and the activities and meetings in which these topics will be discussed.

chapter 5.2
Realisation 'Emma'

This subchapter shows the final design of 'Emma' based on the insights and implications gathered from the validation interviews and the demonstration with the KLM passengers. The personalisation of the application is shown in different scenarios. Furthermore, this chapter contains an implementation plan to realise the application 'Emma' successfully.

5.2.1 FINAL DESIGN

The final design presented in this subchapter has been partly used during the validation interviews with the passengers and the demonstration with KLM employees. However, it contains adjustments based on the insights found during this validation to develop the application. 'Emma' is integrated into the current KLM application. Therefore, it needs to show consistent interaction patterns and visual representations. In order to create an integrated whole, the UX and UI design guidelines of KLM are taken into account. Besides that, the application contains multiple languages to enable the transfer passengers to be assisted in their native language.

Opening the app

The application 'Emma' is available for passengers who have installed the KLM application and who are disrupted. The passengers can start using the application by clicking on the push notification that will be sent to every disrupted passenger. They can also click on the application's icon.

Passengers without the original KLM application, might want to use this service too. Therefore, the passenger receives a text message about their delay and the possibility to download the application.
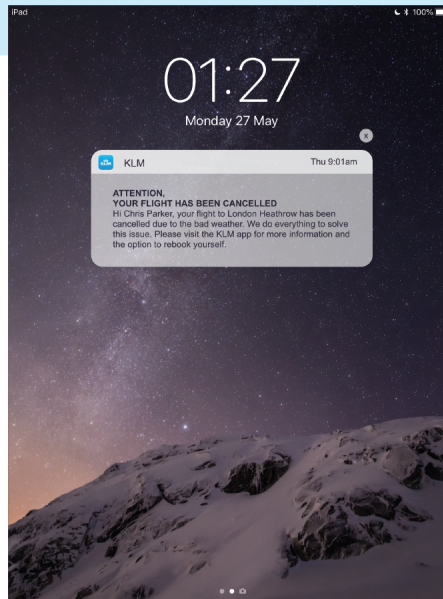
Onboarding processs

This screen explains to the passengers what they can expect and what they can find in the new application. The onboarding process is explained by the virtual ground attendant and includes every topic on the menu. The passenger is asked to update their personal profile for a better and tailor-made experience.

For the experienced and fast passengers, there is the option to skip the onboarding process and go directly to the menu.
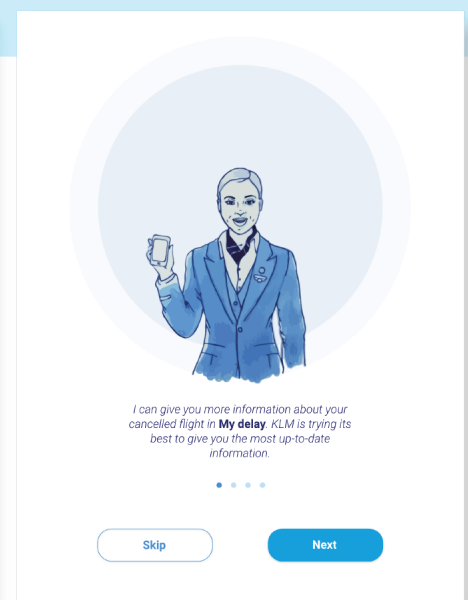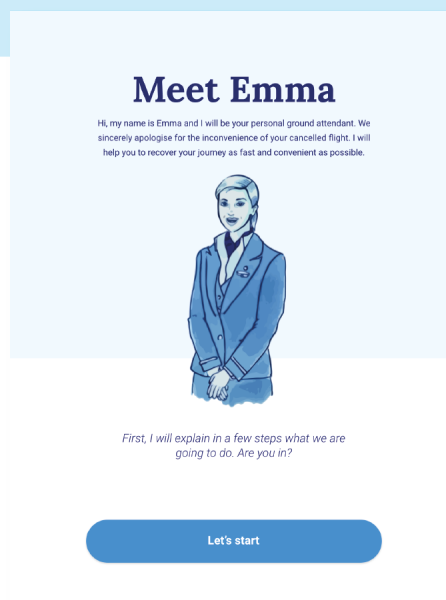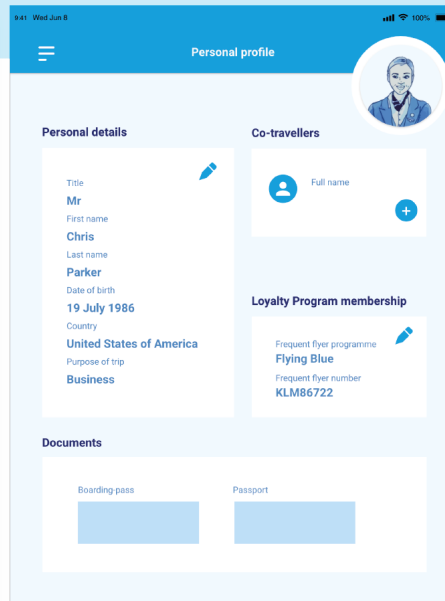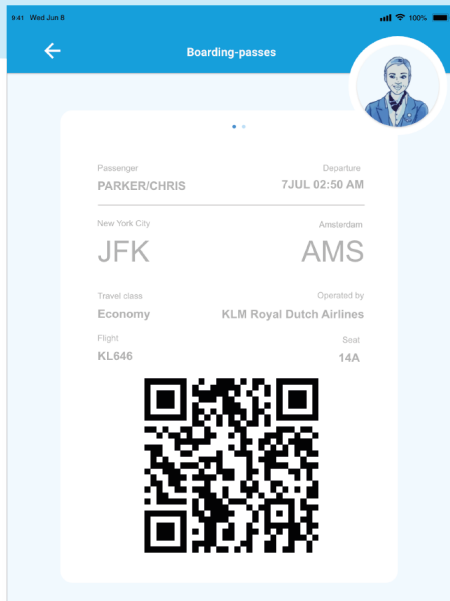
The personal profile includes the passenger's personal details which are imported from the original KLM application. The information can also be imported from the passenger's documents such as the boarding passes. The passenger needs to fill in the blank fields manually with the drop-down menu. The full, online booking is included in this application, which enables the passenger to see the information of their co-travellers too.

I will try to make sure that you can continue your journey by offering personalised rebook options in Rebooking. Besides that I will make your waiting time as pleasant as possible in Extra's. You can also find your vouchers here.

Skip   Next

First I want to ask you to check your profile and fill in the gaps, so I can make sure everything runs smoothly and you get a tailor made solution. Please feel free to ask me anything. I will stay with you in the top right corner.

Menu   Personal profile

My delay

In the menu it is visible that the information in 'My delay' has priority to the passenger with a red exclamation sign. When clicking on this button, the passenger will get the information about their delay. The announcement about the delay is visible in red, to highlight the seriousness of the disruption. The part that is disrupted is visually shown in red too. The original timeslots of the journey are struck through to prevent the passengers from being confused.

KLM will send announcements regularly to the passenger to keep them informed.
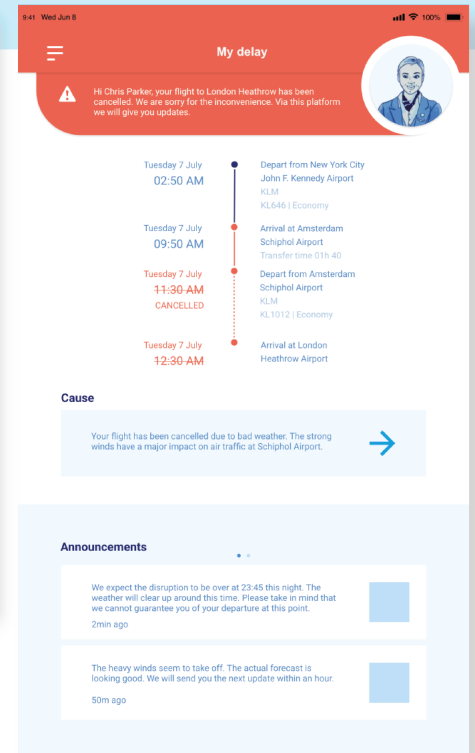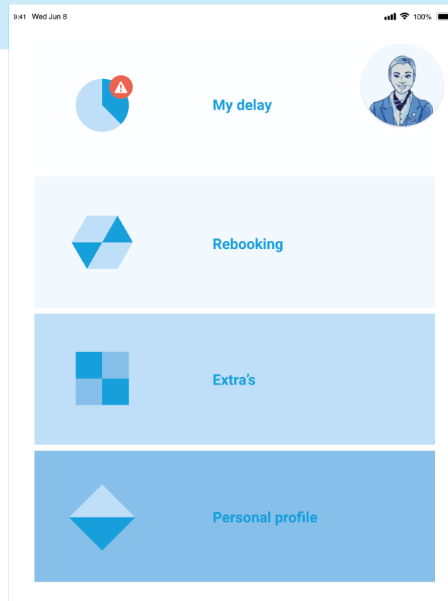
Rebooking

Before the passenger is going to rebook himself, Emma will highlight the fact that the options will be free of charge unless they choose for some additional options. At the top, the passenger will see how far he is in the rebooking process.

The passenger starts in the 'select' phase of the rebooking. The rebook options are shown in this phase, with the default option highlighted. This option is the best suitable option for that passenger. The passenger can click on the accompanying arrow for more information about that option.

The passenger has to click on the option itself to select their prefered choice and can continue by confirming it.
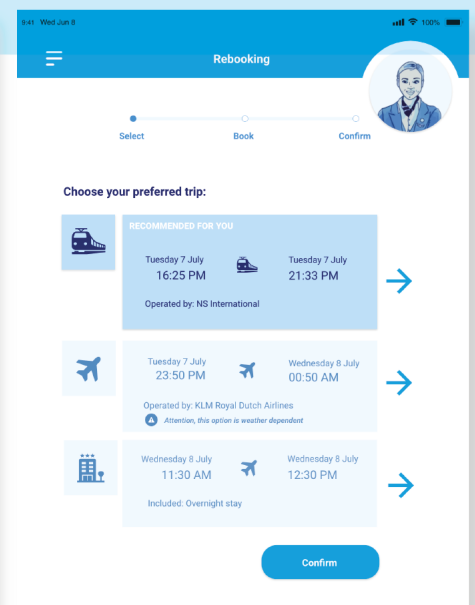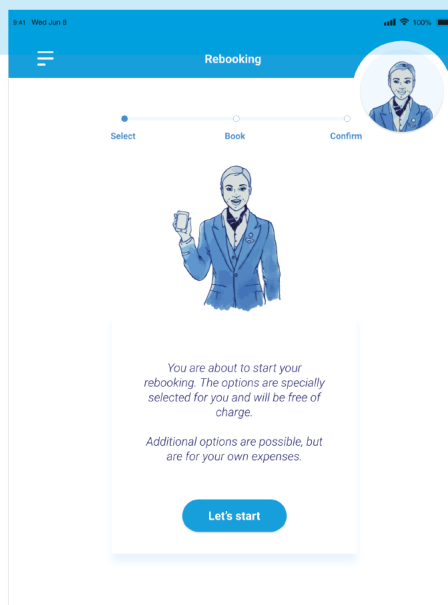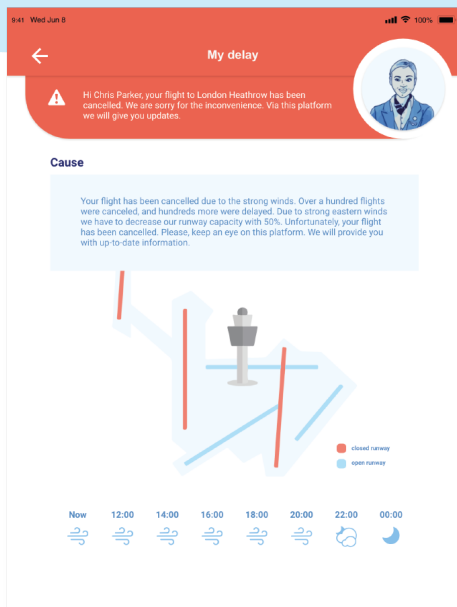
The passenger can click on the information tab 'cause' to get more information about the disruption and the runways that are not active anymore. In the case of weather-related disruptions, the passenger will see the weather forecast to get an impression about how long it will take.

In the last phase, the passenger has to confirm their rebooking. Emma will show the passenger that they success-fully rebooked themselves by giving the option to the passengers to see their new boarding passes which will be automatically imported.
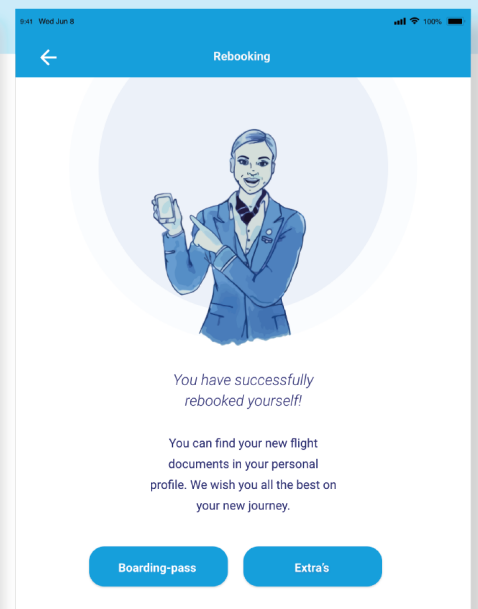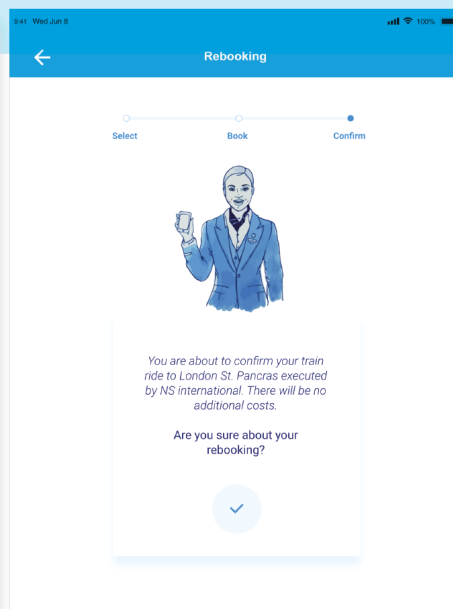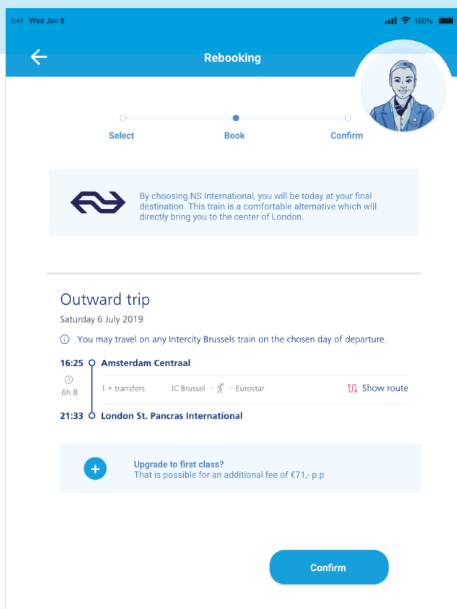
Add. rebooking

Depending on the scenario, the passenger continues in the 'book' phase, where the seats are shown (in case the selected option concerns a flight). This screen will also be shown in case the passenger does not have a choice, to be transparent about the possibilities and to make sure the passenger is satisfied with the solution.

If the passenger chose the option with an overnight stay, they are able to book their own hotel. Booking.com is integrated into this part of the KLM app. All the details about their stay are automatically filled in. The passengers can filter the hotel options based on the current Booking.com filters.
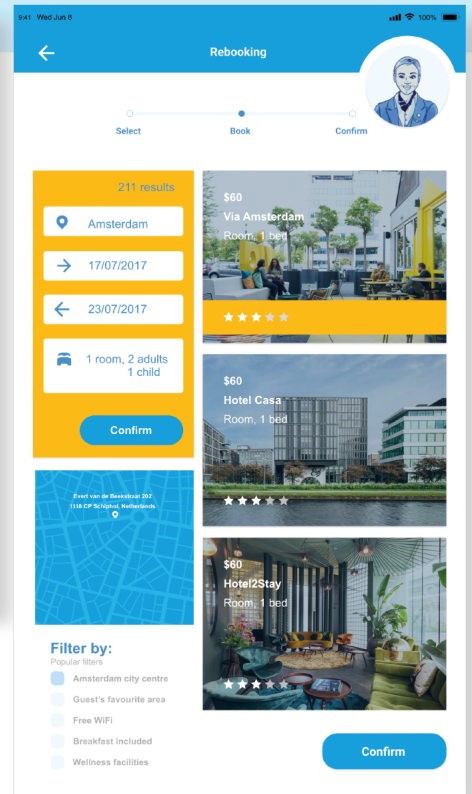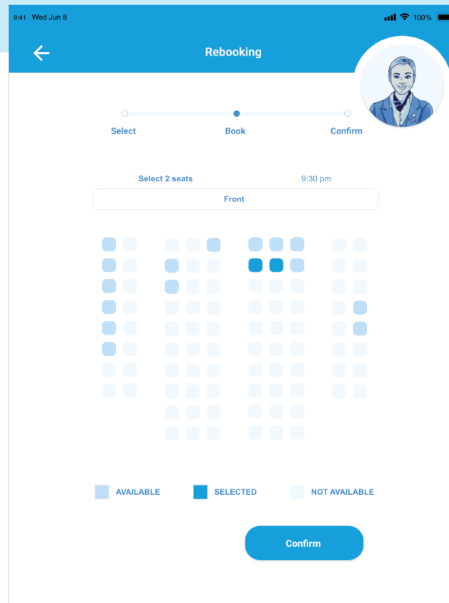
Extra services

To give the passenger more security, they can send their new boarding passes to their external email address too, to ensure them of their new journey. If passengers with a certain profile (such as risk evaders) do not respond to this function, Emma can push it to them. That is similar to the available vouchers. If for example a Penny Pusher, not respond to a voucher for free coffee, Emma will send a reminder.
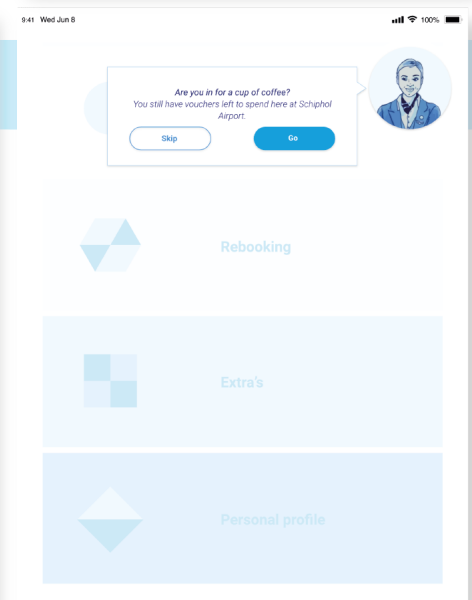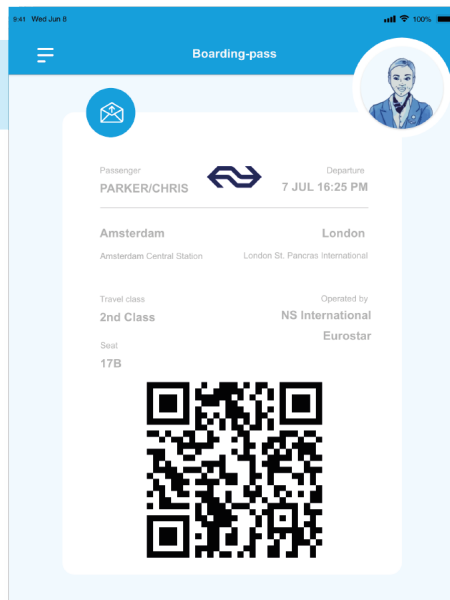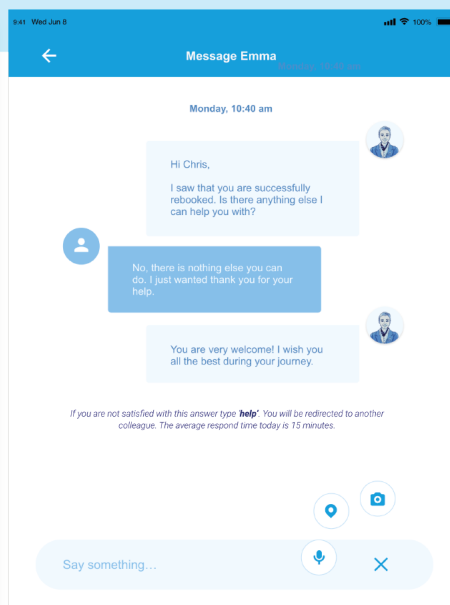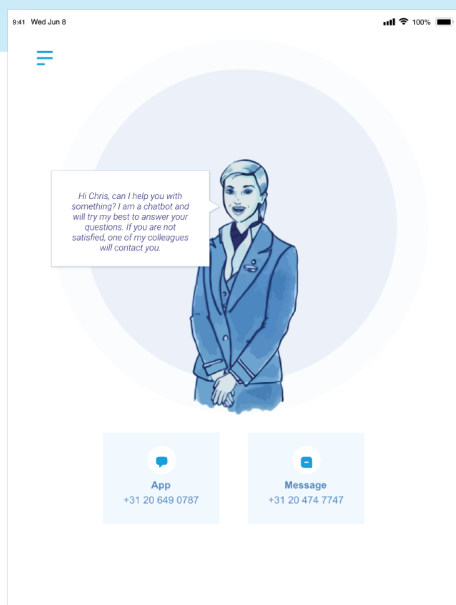
The passenger can always contact the digital gate agent when they need more help and assistance. This assistance can be given via WhatsApp and an incorporated message system. The question will first be answered by a chatbot. When the question is not satisfying, the passenger can be redirected to a real person. This can take a while depending on the size of the disruption.

The passenger can use both voice and type functions to communicate with the chatbot. The passenger can share their location to enable the digital assistant better facilitation.
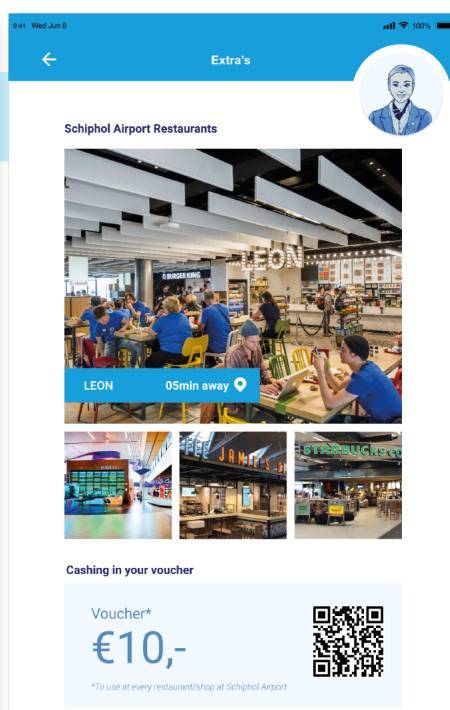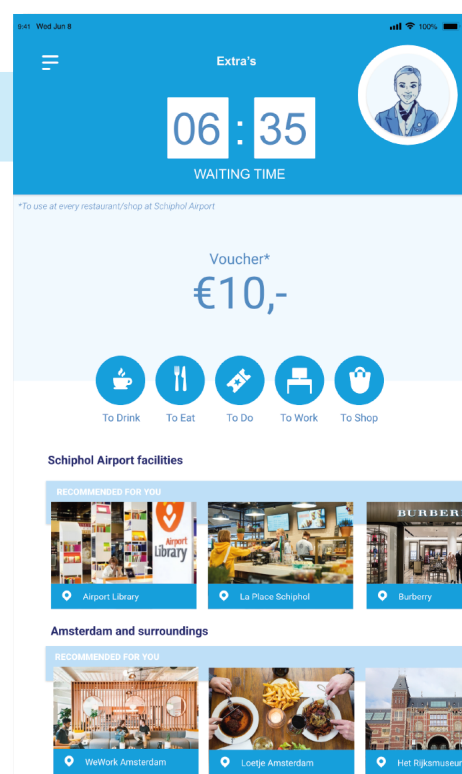
The passenger sees their waiting time obtained from their new boarding pass. They can see both recommendations within Schiphol Airport and outside the airport. These recommendations are obtained from TripAdvisor.

By clicking on the desired topic such as 'to eat', the passenger sees an overview of restaurants, filtered on their desirability. Besides that, they see the time it takes to get there. They can pay at the restaurants with the vouchers offered by KLM as compensation.

5.2.2 IMPLEMENTATION PLAN

The application Emma includes three important tasks: providing information, providing rebooking options and providing recommendations. To be able to fulfil the mentioned tasks, much data is needed, which is available both within the company and externally from third parties. The overarching plan to implement 'Emma' exists of two years of development, of which the first year is focussed on the basic features (Figure 34). These key features can be built with the data that is already available within the company. The second year is focused on expanding and optimizing the application with the use of third parties. These partnerships will be established mid — the first year. After the second year, the product development continues, but KLM will have reached their vision *"Recovering a disrupted journey by pushing the best suitable solution to every passenger by collaboration with external parties while staying true to their own identity"*.
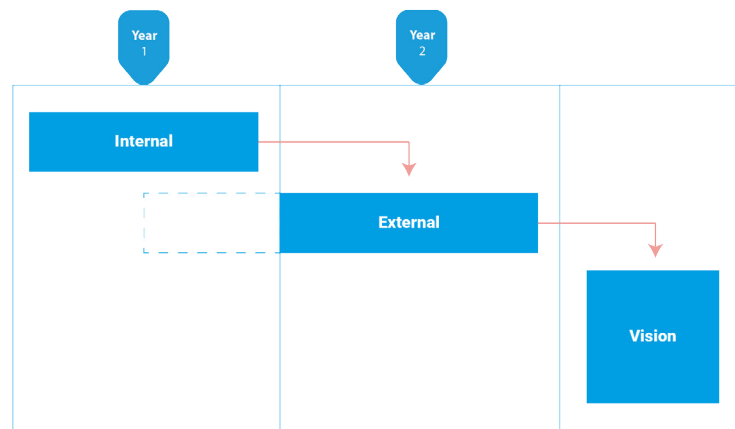

Figure 34 Global implementation plan

PARTNERSHIPS

To launch 'Emma', KLM should collaborate with third parties to serve all the disrupted passengers (Figure 35). The first part shows the alternative airlines, and the second part shows alternative transportation modes, the third part includes digital platforms to accommodate passengers and give them recommendations and the fourth part shows a company that transfers the money of the extra costs. The circles indicate the fit with KLM.

Figure 35 Partnerships

Transportation

The transportation providers can be used to bring the passengers to their final destination. KLM should make use of the availability of SkyTeam members because these airlines share the same customer centricity as KLM. Besides that, these flights will be slightly cheaper than other airlines. Transportation by train is interesting for passengers who had a European flight originally. Passengers can continue their trip to London, Paris, Antwerp, Brussels, Cologne, Berlin and Dusseldorf directly and comfortable. This way of transportation is also very sustainable.

Airlines outside SkyTeam are more expensive and share different values than KLM does. Therefore it is not the most favourable option for KLM to rebook passengers on these flights. During a PaxCon situation, it might be necessary to use these options as well due to the number of passengers. Intercity coach services such as Flixbus are available to many destinations and are relatively cheap. Using the bus, however, is a real downgrade for many passengers, which is an obstacle for KLM. This way of transportation is, on the other hand, the least vulnerable to disruptions.

Digital platforms

The digital platforms TripAdvisor and Booking.com are essential to collaborating with because they are well known among travellers and offer the specific services KLM needs for 'Emma'. The collaboration between KLM and Booking.com is already in an advanced stadium and has a great chance to be successful. To offer the passenger a smooth and free of charge service, KLM should collaborate with TravelPerk, a company that redirects the travel costs and accommodation costs for individuals to larger businesses. In this case, the costs for the rebooking will be redirected to KLM.

WAY OF WORKING

To launch the application, the KLM team should work according to Agile principles. These principles are already in use by many software development teams within KLM, who mainly work through the Scrum methodology. Scrum is a framework for developing, delivering and sustaining complex products. With the use of Scrum, KLM can employ an iterative, incremental approach to optimize predictability and control risk, which is vital for such a complex and big company (The Scrum Guide, n.d.).

The heart of Scrum is a sprint, a set time-box no longer than a month. The sprint length ODS adapted is two weeks. This time-box cannot be extended, to ensure that an appropriate amount of time is well-spent without allowing waste in the process. The sprint starts with planning for the coming two weeks. During this sprint, the teams built the features they have stated in this sprint planning. At the end of every sprint, the team reflect on their process and create a plan for improvements for the next sprint. The sprint will be closed with a demo, a demonstration to show the final product made during the sprint. This demo will also be used to align the stakeholders and getting them on board.

This project does include not only the ODS department but also CX, Passage, Digital and the OCC. Therefore, the implementation plan does include not only the sprints for ODS but also the plans that need to be executed by other departments in order to deliver a desirable, feasible and viable service recovery for KLM. The working group Disruptions (chapter 2.2.5) can function as an Agile Release Train (abbr. ART), a team of Agile teams who align all the different departments to a common business and technology mission (Scaled Agile, 2018).

In the first year, the focus is on the internal alignment between ODS and the other departments. ODS will execute a significant part of the application but need the help and input of the other teams. The planning of the first year (Figure 36) is split up in three rough teams; the ART (blue), ODS (green) and other (orange). 'Other' includes mainly digital and customer experience, who focus on the passenger specifically.
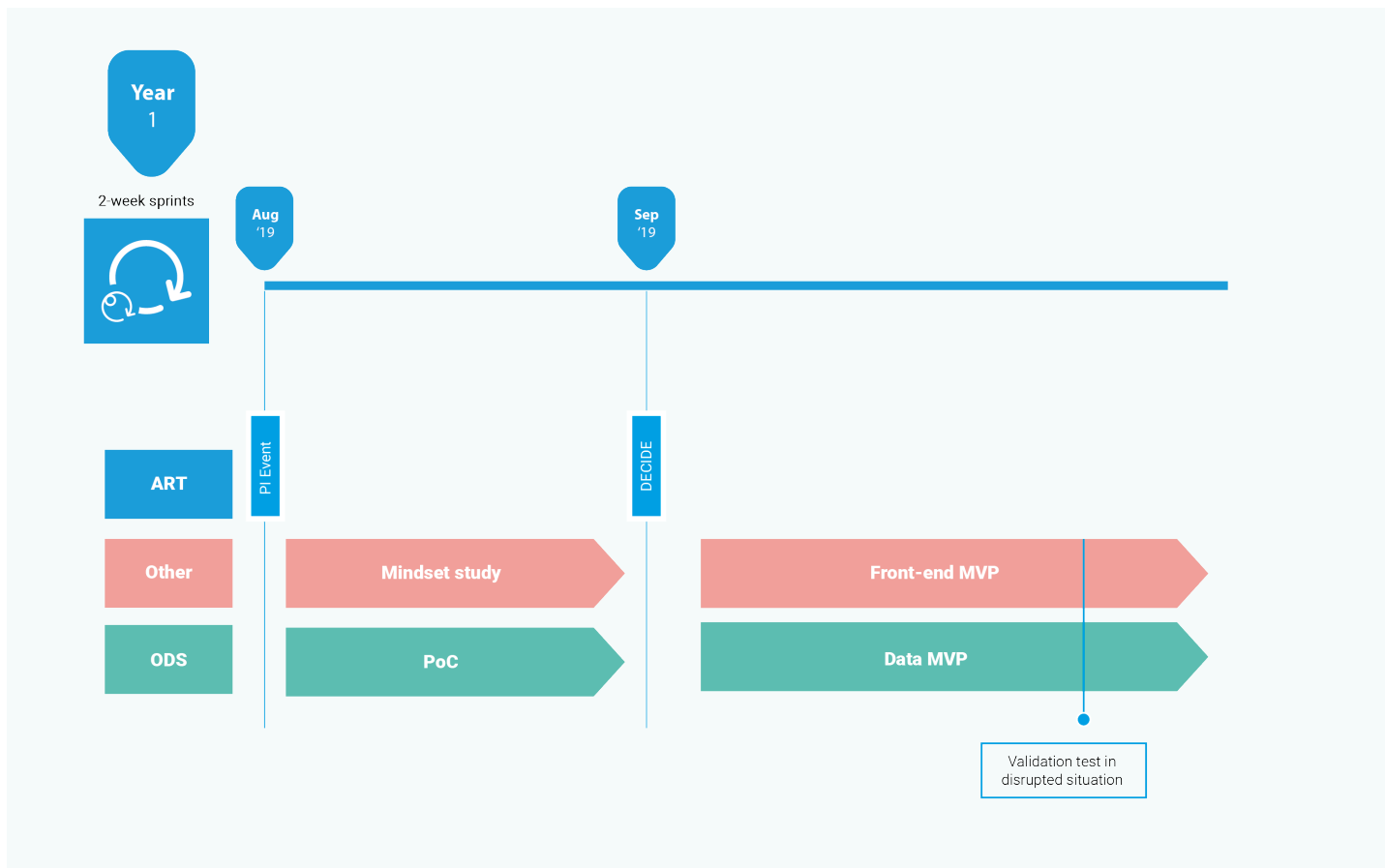

Year 1 - Internal

Events

PI Event - 2 days

The Program Increment Planning (abbr. PI), aligns all the teams on the ART to a shared mission and vision (Scaled Agile, 2018). During this event, the team will create the roadmap, review the future vision and make decisions concerning customer loyalty versus costs. Besides that, they will review the global planning, distribute the tasks and responsibilities and identify the program-level risks and impediments that could impact their objectives.

Decide

During these meetings, the ART should review whether the teams deliver enough value to continue the project. The first meeting will mainly focus on the feasibility of the project based on the insights of the PoC of ODS. The second meeting depends on both the status of the application and the validation test with the passengers. The last meeting is the final decision about whether to continue with third parties.

Figure 36 Year 1 internal planning

Jan '20

Sep '20

DECIDE

Contacting 3rd parties

DECIDE

Prototype

Live pilot with frequent flyers
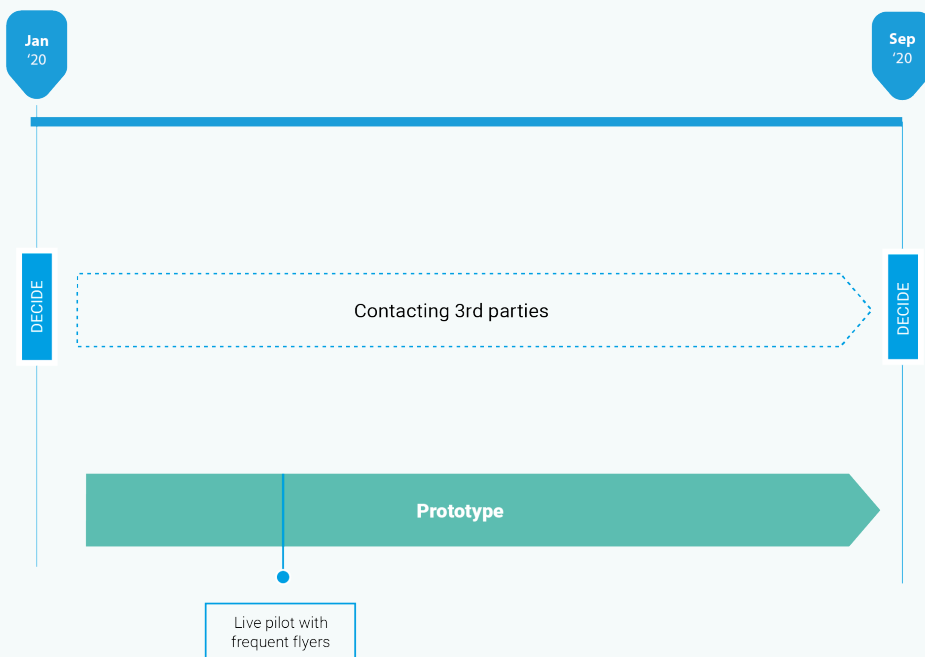
Deliverables

Mindset study - 1/2 months

It is beneficial to conduct a mindset study early in the process to use these results while creating the personalisation of the application. However, it is important that this study is executed in a disrupted context. For more information about this test, see the chapter Recommendations XX. This study should be the responsibility of the CX department.

PoC (Proof of Concept) - 1/2 months

The goal of this Proof of Concept (PoC) is to demonstrate Emma's feasibility in a short period and will be executed by ODS. Therefore, a simple prototype based on the available data in the Blue Lagoon will be used to prove that Emma can generate information and to generate rebooking options based on assumptions. The final PoC does not have to be bug-free, but should ultimately demonstrate the functionality of the concept. The functionality does not include personalisation in this phase. This PoC shows internally if this project will be successful before jumping into development.

MVP (Minimum Viable Product) - 3/4 months
The minimum viable product (MVP) is an early version of Emma that includes enough features to satisfy early adopters and to provide feedback for further development. These features include providing information, generating personalized rebook options and showing Schiphol airport facilities. This MVP is split up in two versions both built by another team. One version is based on the feedback of the PoC and expanding the features. The other version includes the front-end design that will be used by the passengers. These two versions need to be integrated before validating it with the actual customer in operation during disruptions.

Prototype - 8 months
The prototype is often the official launch of an optimizer at ODS. This prototype will only be the live available for frequent flyers of KLM. These passengers are most important for KLM and often have the application download beforehand. Because the third party data is not available yet, the options might not be that exclusive already. Therefore, a certain amount of people can get special treatment.

Year 2 - External
After a year there should be decided with the departments whether they are delivering enough value to continue to the second year. When there is decided to continue the project, the product will be expanded with the use of third-party data of which the partnerships are already created. This expansion will be implemented according to the products delivered in the first year; a proof of concept, an MVP and a prototype. These products are necessary to prevent the product from failure, which increases the risk concerning passenger satisfaction and the established partnerships.

CONCLUSION

The involvement of third parties is required to implement the application 'Emma'. These third parties include transportation provides and digital platforms. The establishment of partnerships with these parties costs time. Therefore, a global implementation plan of two years is needed. The first year is focussed on aligning the teams within KLM and building with the available internal resources. The second year, the application will be extended with the use of third-party resources. To employ an iterative, incremental approach, the teams involved will work according to Agile principles which are already used within ODS.

There are four important deliverables within this first year; the results of the mindset study, the PoC, the combined MVP and the prototype which are executed by multiple teams within KLM. After every deliverable, the ART will decide if the service delivers enough value to KLM and its passengers to continue to the second year. This fast and feedback focused way of working should result in reaching the vision as fast as possible.

chapter | **6**

Conclusion

This final chapter of this thesis answers the research question, which is stated in the problem statement. Furthermore, this chapter includes the limitations of this research project according to the three Design Thinking lenses; desirability, feasibility and viability. Besides that, recommendations have been given to KLM for further product development. Lastly, this chapter contains a personal reflection which discusses the process of the graduate according to the personal ambitions.

chapter 6.1
Conclusion

To conclude this thesis, the research question set at the start of this project is answered: how to create a desired experience for KLM passengers during undesired disruptions? To be able to answer this question, research has been executed to understand the future context of disruptions in mobility and the current passenger needs when disruptions occur.

Disruptions are often unexpected, and especially cancellations can result in disastrous customer experience. To be able to solve this, KLM should make use of the opportunities in the future context of disruptions. Adapting to future trends and developments will not only solve the problem of disruption but should also enable KLM to differentiate themselves from its competitors and stay relevant in the future. The discovered future context showed that best way for KLM to recover a disrupted journey in the future is by; pushing the best suitable solution to the passenger by collaborating with external parties while staying true to their own identity.

The 'best suitable solution' should give the passenger the desired experience if they perceive justice. This justice depends on the offer that has been given by KLM, the procedure they have to go through and the interaction with KLM. Every passenger is different depending on the mindset the travel with and the occasion. Therefore, they all have different needs and wishes which influence the perceived justice. KLM should dive deeper into the characteristics of the five different mindsets and registration patterns to adequately fulfil the passenger needs.

To give every passenger their perceived justice and bring the vision into reality, the application 'Emma' is proposed. This application pro-actively approaches the passengers on their mobile device when a disruption occurs. 'Emma' offers detailed and transparent information, a tailor-made rebooking and tailor-made recommendations to spend their waiting time. These offers are possible with the resources of third parties. 'Emma' shows KLM's identity by being customer-centric to stay involved while offering other options. By approaching the passenger pro-actively and providing them with a tailored solution, passengers will have the feeling that KLM takes responsibility and wants to take care of them. By offering this self-service digitally, all the passengers can quickly recover their disrupted journey instead of spending valuable time in a queue in front of the transfer desk. This enhanced passenger experience will eventually lead to a higher NPS average and thus, more loyal customers.

The benefits of the application 'Emma' will reach further than enhancing the passenger experience. This application reduces the workload for the KLM gate agents during disrupted days and enables them to help the passengers who need it. Besides that, this automated rebooking process will perfectly balance the costs and personal preferences, which will result in more suitable and cost-reducing decisions for the airline.

Recommendations

The thesis encountered a few limitations, which should be taken into account when considering further development for this application. These limitations are focussed on the lenses: desirability, feasibility and viability. Besides that, this project has been scoped to obtain the best results in time. Therefore, exciting topics can be considered for further research or further product development.

LIMITATIONS

Desirability

A mindset study has been carried out with seventeen passengers, to find out more about KLM passengers during disruptions. The context of disruption was explained by written scenarios, since interviewing in a real disrupted setting was impossible. This research gave promising insights into the differences between the passengers and their needs. However, more research results should be obtained to find clear patterns and improve the reliability of the mindsets. Besides that, there should be more focus on key characteristics that can be automated. Therefore, it is recommended to conduct a similar study with >100 participants in a real disrupted setting.

When these mindsets and characteristics are discovered, it is important for KLM to decide how far they can go by showing empathy, while considering ethics. The GDPR protects personal data nowadays, but cognitive technologies are becoming more advanced, and many people are not aware of the consequences of sharing their data. Therefore, it is essential that KLM takes the lead when offering personalised experiences, to stay trustworthy and honest to their passengers.

Feasibility

For the realisation of this application, KLM is dependent on the establishment of various partnerships. These partnerships should benefit from the new service recovery of KLM as well. Within this research, it has been assumed that these partners, such as the NS and other airlines, will be cooperative to offer trips to disrupted KLM passengers. Especially because nowadays this is already happening. However, this application has not been validated with any of the third parties that might be involved. Therefore, it is recommended to gauge the willingness of third parties, before officially contacting them.

Viability

The service recovery should ultimately decrease the enormous costs and increase passenger satisfaction to KLM during operational disruptions. However, the potential profit and loss statement has not been calculated, and thus, it has not been validated in this study. The main reason to not incorporate a business model is the difficulty of finding the costs for third-party options, the likelihood that a passenger will choose a specific option and the consideration how passenger satisfaction and costs are balanced. Therefore, a business model was not feasible within the project's time frame. However, this is important to take into consideration.

CONSIDERATIONS

This thesis has been scoped to get reliable and in-depth results within the set timespan. However, by scoping this project, multiple facets have been excluded from the research and thus within the application. KLM should deliberately decide whether they want to consider the following aspects to expand or strengthen the service recovery:

- **Direct passengers**
  This project has been focussed on transfer passengers because this is 70% of KLM's current passengers. Besides that, this target group faces the most problems during their disrupted journey, since they have nowhere to go and did not plan to stay at Schiphol Airport. However, there is still 30% of direct passengers who encounter problems as well and need to get their perceived justice too in order to be loyal to KLM. Therefore, KLM should find out what they can offer to these passengers next to providing information and providing them with a new trip. Recommendations will probably not satisfy this target group.

- **Luggage**
  The luggage of the passengers has been deliberately excluded from this research because that would have been too complex for this thesis. However, it should be taken into account in the application. Passengers mentioned luggage during the interviews and also the gate agents said that passengers want to know where their luggage is at that point and if it will be on time at their final destination.

- **Integration OPR tool**
  The OPR tool, part of the Altéa Suite provided by Amadeus, currently rebooks groups of passengers in a short time on different flights. This tool is in use by KLM since this year and is positively evaluated by the KLM employees. However, this tool does not contain the desired features that 'Emma' does. Amadeus is a well-known and established IT provider for the travel and tourism industry. KLM should consider to integrate the key features of 'Emma' into the OPR tool, to make use of the available data of other airlines and transportation providers.

- **Physical space**
  During operational disruptions, the environment at Schiphol Airport is overcrowded, noisy and overwhelming. This application makes it possible to leave the airport as fast as possible since it is not a place where people want to stay. However, passengers need to use this application in this context. Therefore, the application is adjusted with using minimal sound and ultimately type functions to improve the usability on a mobile device. However, it is not sure whether passengers can make decisions without the possibility to sit down. Therefore, KLM should decide to what extent they want to make adjustments to the physical spaces at the airport too.

- **Perceived disruption**
  This application is fully focussed on the passengers that are involved in a PaxCon situation because that is a worst-case scenario. However, there are also multiple cases in which only a few flights are cancelled. In that case, the application is still valuable; thus, the self-service might not be the desirable option for a few passengers. Besides that, research showed that many passengers perceive a service failure which leads to a lower NPS, while there is operationally nothing going on. It might be interesting for KLM to dive deeper into this phenomena.

chapter 6.3
Personal reflection

In this chapter, I look back at an incredible, five-month experience with a steep learning curve. During this period, I can say that I developed myself in both a personal and professional manner. As stated in my project brief (appendix F), my personal ambitions for this project were to learn (parts of) the design approach ViP. Secondly, I wanted to make use of an MVP soon in the process to test and validate my concept ideas. Thirdly, I wanted to bring my new creative facilitation skills into practice with non-designers. My final ambition was to bridge the gap between technology and business in an established company with the use of design.

I believe that every project needs an adjusted approach to get the best solution possible. KLM wished for an approach to break through the limitations of the company and come up with radical innovation and therefore, I decided to integrate the ViP approach into the Double Diamond approach. ViP was new to me, and I found out that integrating this approach was a difficult task, since the stages of both approaches were not in line with each other. By carefully selecting the relevant stages, I believed that I had the right approach to make radical innovation happen. Of course, innovation is also dependent on the execution of the tools and methods used. It was the first time for me to use this approach deliberately and therefore, I made a few decisions which might have led to less radical innovation. A crucial decision is the axis choice in the ViP framework on page XX. These axes now unintentionally include solutions, while if they only captured insights, the vision would have been open for out-of-the-box solutions. During this approach, I have been in contact with a ViP expert to validate some stages I have been through. In the future, I will especially ask for some extra help with creating and validating this framework since this was the most challenging part of the process.

Another thing of which I experienced some difficulties is focussed on project management. It was challenging to plan a five-month project and decide the final deliverable beforehand. I am proud to see that I finalized the project as planned, but this was not without any struggles. During this project, I planned to do many interviews, tests and creative sessions to gather insights and feedback. Testing and validating was also one of my personal ambitions that I have set beforehand. I have noticed that making appointments in an established company takes longer and are less reliable than in a university setting. Especially the dependency on Schiphol to do research and test the MVP did not work well due to security reasons. In the future, I will avoid the dependency on third parties and people at management level when I have a tight planning. However, I believe that I have become better in creatively changing plans and improvisation while getting the right input.

At the start of this project, I decided to involve all the stakeholders that have to cope with disruptions. I did this via interviews and creative sessions to give them the feeling of having input and influence in the project. Stakeholder involvement should accelerate and increase the likelihood of the adaption of the concept. Besides the difficulty of making arrangements with the stakeholders, I noticed that I want to please everybody and take all the insights into account, which increases the workload. The next time, I will focus on expectation management and prioritize the information to relieve myself from lots of work and stress to fulfil the promises I have made.

Furthermore, I am proud to see how I have finished this project. I sincerely hope that this project triggered KLM and specifically ODS to use design. Besides that, I hope that this project is a stepping stone for further collaboration between the different departments to work on excellent service recovery for the passengers.

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