Designing Tracy

a conversational holiday recommender for Generation Z

TU Delft

transavia

Master thesis: Designing Tracy, a conversational holiday recommender for Generation Z

Delft University of Technology, faculty of Industrial Design Engineering, master Design for Interaction. In cooperation with Transavia. April 15th, 2019

Author
Hekon van Duijvendijk

Chair	**Mentor**	**Company mentor**
Dr. ir. Wilfred van der Vegte	Dr. Elif Ozcan Vieira	Bart Luttikhuis

Table of contents

I. Preface

It is an exciting time for design graduate students like myself with a strong fascination with novel technologies. Virtual assistants, virtual- and augmented reality, artificial intelligence; each challenges designers to think outside the box and explore new experiences for the end user.

I decided to write my thesis about virtual assistants to find out how conversational interactions could enhance existing-, or provide new user experiences. As far as I know, no other theses on this topic were written at my faculty of Industrial Design Engineering at the moment I started writing. That made it exciting to be the first to set foot in this territory. However, as you will read in my thesis, this also brought along some risks. New design tools- and methods which I was unfamiliar with had to be mastered, as those I have gotten comfortable with over the last years did not readily apply to designing for virtual assistance.

While I was preparing my graduation project I got in touch with the Dutch airline Transavia. The company was actively exploring new ways of connecting with their customers, and had a specific interest in voice technology. In early stages of my project the design goal was defined only as: ‘How should Transavia utilise voice technology?’. Therefore, the first months were spent figuring out which touch points of the customer journey had the most potential for a virtual assistant to make an impact. I am happy to see that this undetermined starting point transformed into a concrete scope, a working prototype, user insights, personal skill development and hopefully a valuable contribution to Transavia’s innovative strategy.

Despite the unexpectedly limiting technology and tools, and the fact that this project took much longer than everybody hoped for, it has been a pleasure overcoming the design hurdles of virtual assistants.

II. Acknowledgements

I am very grateful for the contribution of a number of people who assisted me during this journey. Their ideas, brainstorms, supervision or support in any other possible way have been of great value:

My supervisory team

Dr. ir. Wilfred van der Vegte (Chair)

Dr. Elif Ozcan Vieira (Mentor)

Bart Luttikhuis (Company mentor)

Coworkers at transavia

Vanja Mlaco

Dario Lo Conte

Jochem Meijer

Annemieke van Ramshorst

Helene Hallebeek

BlueLink Prague

Mirabeau

Personal

Mom and dad

Ella van der Mespel

Roxanne Kiel

Tirza Allijn

Innovattic

III. Executive summary

Virtual assistants are rapidly growing in popularity, triggering businesses around the world to explore their applicability. From a user perspective,, having a conversational interaction with technology has certain advantages, as it is easy to use, hands-free and eye-free. Despite the fact that Transavia already released its first steps with the assistant, there is still minor knowledge about how it can be used effectively to engage with the customer.

A techy, social and young customer group - often referred to as Generation Z - is interacting with technology and brands in a very different way than Millenials. As a starting point, a preliminary design goal is formulated which links the technology and the user to an early touch point in Transavia's customer journey: *"Design a virtual assistant for Transavia that offers added value in helping Generation Z with finding and/or booking flights".*

The contexts of four aspects are analysed: business, process, user and technology, which together lay the foundation for the subsequent user studies. The studies show the flight finding and -booking behaviour of Generation Z, as well as their current and preferred interactions with virtual assistants.

Based on the outcomes the witty assistant 'Tracy' is conceptualised and piloted using the Google Assistant and Lenovo Smart Display. Tracy focuses on the moment right before booking called pre-booking, and recommends Generation Z affordable trips based on their availability. Alongside user tests the prototype goes through three iterations to optimise various aspects of the design: tone-of-voice, product personality, content and conversational flow.

The final design is intended to be feasible for a short term release, and proved there lies true potential in using a conversational interface to engage with Generation Z in the pre-booking phase. Finally, recommendations are proposed for Transavia to support them when continuing with either Tracy or with virtual assistance in general.

1. Introduction

The starting point of this thesis is concerned with how virtual assistants can be utilised to offer Generation Z a more personalised flight finding and/or booking experience. All explorations will be carried out in cooperation with Dutch airline Transavia, meaning that the needs of both the end user and the company needed to be satisfied. In this introduction the problem, preliminary design goal and structure of this thesis will be discussed.

1.1. Problem definition

Four challenges are assigned to illustrate the relevance of this thesis. Each aspect affects Transavia, or at least touches with the aviation industry in some way. Together, these support the idea that there lies potential in combining virtual assistance, flight finding/booking and Generation Z: 1. Surviving in a competitive landscape (business), 2. simplifying the booking flow (process), 3. engaging with Generation Z (user) and 4. virtual assistants (technology).

- **Business**

  As a consequence of the expanding aviation industry, the landscape in which airlines operate has gotten increasingly competitive (Alderighi, Cento, Nijkamp & Rietveld 2012). Their core business of flight tickets is not a unique product in itself, forcing airlines to be creative, differentiate and find a unique position in the market. Strategies can for example focus on offering lower prices, add luxury services or offer users an accelerated check-in process. Even though Transavia currently has a strong market position, its ambition to stay innovative will be one of its valuable attributes in the future.

- **Process**

  Finding and booking flight tickets can be a long and complex process requiring many different user actions. Although going on a trip is an exciting moment for many people, it can also evoke negative emotions like stress or insecurity.

- **User**

  One of Transavia's goals for 2018 has been to engage with Generation Z, the generation born in the late nineties. This age group is often characterised as being *techy* and socially interactive, which requires companies to think about new approaches. It is important to cater to different types of users and adjust customer journeys accordingly. Personalisation in design and content management are hot topics today in software

design, but might apply even more to these younger generations. For example, studies have shown that Generation Z consumes very differently from Millennials, and it has other expectations of brands and technology (Premack 2018).

- **Technology**
  Over the last years virtual assistants like Apple's *Siri* and *Google Assistant* have become much smarter and more popular. Only recently it appeared that gradually users see virtual assistants as a reasonable alternative to websites and apps. Due to the novelty of the technology nobody knows the impact it will have, but it is undeniably getting a lot of attention from leading brands. Although Transavia has released its first virtual assistant for Amazon Alexa and Google Assistant, there is still a lot of unexplored territory from a user-centered design perspective.

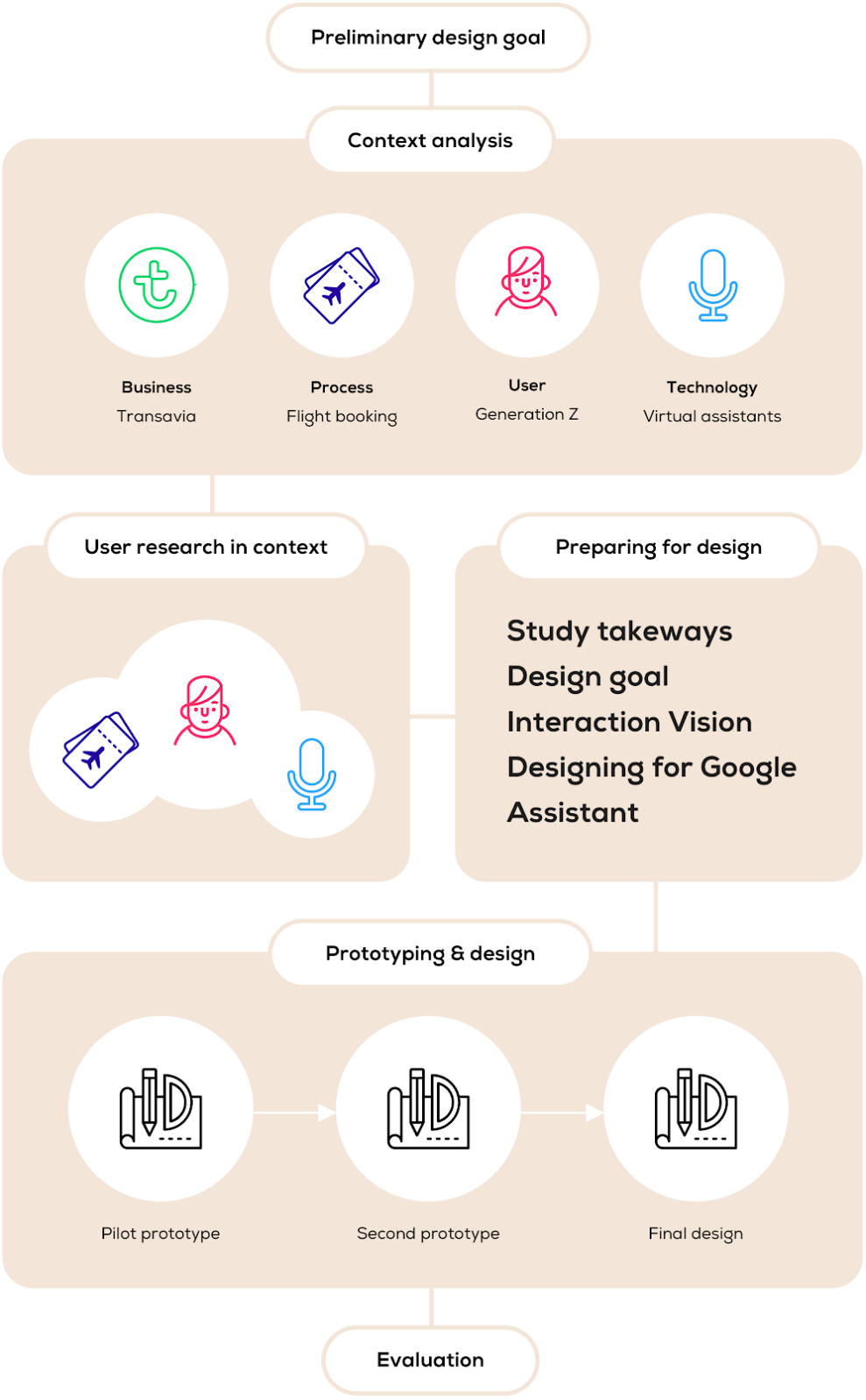
1.2. Preliminary design goal

The aforementioned challenges define the scope of my research. This means my goal is not to take on the corresponding challenges as a whole, as they go far beyond this scope, but instead they were used to shape a preliminary design goal. Additionally, this goal originates from my hypothesis that a virtual assistant can offer added value to Generation Z in the flight finding and/or booking process. After the context analysis in chapter 2 and 3, this preliminary design goal will be refined. Until then, the goal is as follows:

"Design a virtual assistant for Transavia that offers added value in helping Generation Z with finding and/or booking flights."

Instead of designing for a specific problem encountered by Transavia today, this thesis will explore the potential advantages of the virtual assistant for the end user through user research and design iterations. To compose the final design goal, first a better understanding of the context is required to find out the exact potential to design for. In chapters 2 and 3 the business, process, user and technology aspects of my topic are studied individually. Chapter 4 synthesises the outcomes of these studies into a design goal, interactions vision. The main requirement of the design is that it gives Transavia new insights to further the company's strategies concerning both Generation Z and virtual assistants. Secondly, the design will be created within the capabilities of a designer with non-expert coding experience. Additional requirements come from design principles and values discussed in paragraph 4.3.1.

1.3. Thesis structure



2. Context analysis

This chapter aims to obtain fundamental understanding of these four aspects: business (Transavia), process (flight finding/booking), user (Generation Z) and technology (virtual assistants). In the following paragraphs each aspect will be elaborated on individually. The paragraph on Generation Z is used as a starting point on that aspect, and only explains how literature defines Generation Z. Chapter 3 focuses on the generation in the context of this research. The knowledge gained from both chapters will be used as a foundation for my own design explorations later on.

2.1. Business analysis: Transavia

2.1.1. Company and passenger profile

Transavia is a Dutch low-cost airline that has been established in 1965. As of 2003, the company is a member of the Air France-KLM Group, and is now operating scheduled and charter flights to 33 different countries in Europe and the Mediterranean region (Transavia 2018). Today, Transavia's fleet of 73 aircrafts is taking 10 million passengers across 110 destinations per year.

Figure 1: One of Transavia's Boeing 737-800's

About 50% of the company's business takes place in The Netherlands, with its headquarters located at Schiphol Airport. Apart from Schiphol, Transavia is also based at three other airports: Eindhoven, Rotterdam and Groningen. The other half of Transavia's business is situated in France.

When looking at the average passenger, most people choose to fly with Transavia for their sunny destinations. For example, about 42% of all passengers in 2016 flew to Spain. Also Italy and Portugal are popular destinations (both 12%). Of all passengers, only 20% is travelling for business purposes (figure 2).

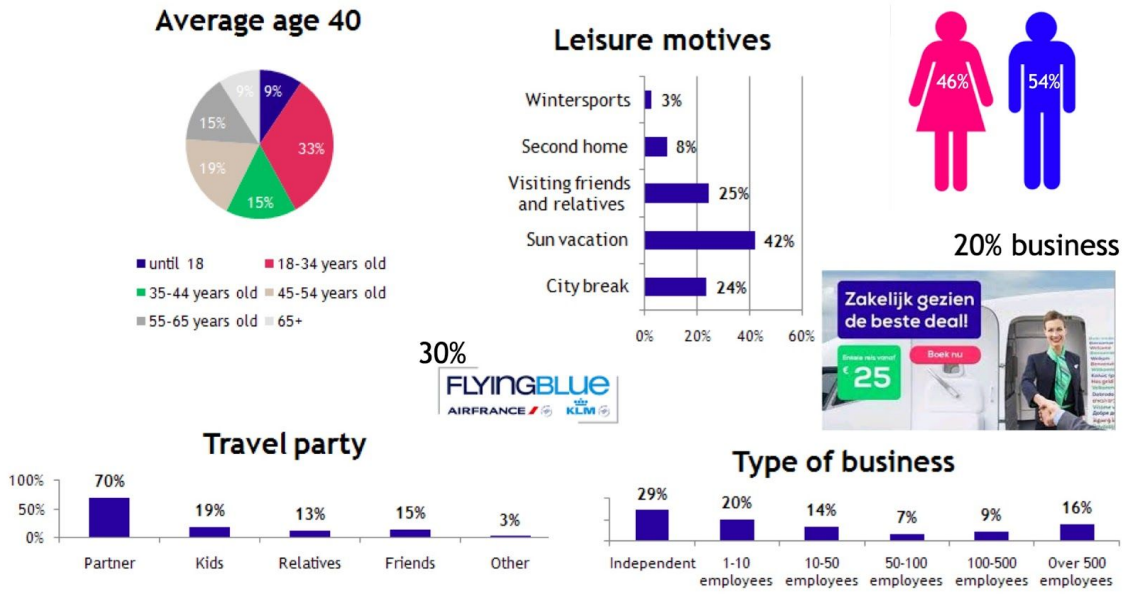


Figure 2: Transavia customer profile of 2016

2.1.2. Goals for 2018

To occupy a unique position in the competitive aviation landscape, Transavia invests in improving customer experiences along its customer journey, instead of overly participating in the price war. Especially larger budget airlines like EasyJet and Ryanair - two of the main competitors of Transavia - are commonly known price fighters. Transavia is keeping an eye on any digital innovation that has the potential to improve customer satisfaction at any touch point of their customer journey. In 2018, the company has set up three specific challenges which are relevant for this thesis:

1. **How can Transavia offer its customers personalised experiences?**
   Personalisation is a recent trend often found in digital design and -marketing. Many companies are shifting from a one-size-fits-all approach to one that aims to offer specific content to specific users.

2. **How can Transavia engage with younger generations?**
   Among many companies, Transavia is willing to experiment with new tools to engage with younger generations, often referred to as Generation Z.

3. **How can Transavia strengthen its friendly appeal to its customers?**
   Airlines are limited in how they can distinguish themselves from competitors, as they all offer a similar service. Transavia want to utilise its friendly appeal (figure 3).

Figure 3: Transavia's value compass: friendliness, enthusiasm, responsibility and vigor

2.2. Process analysis: finding and booking flights

2.2.1. Current market of commercial flights

The last few decades tickets have become more affordable and the customer journey has improved as a whole. As a result, flying as a means of transportation is more popular than ever before (IATA 2017). Whereas the market used to rely on traditional brick and mortar stores, it is now a business dominated by the internet. In 2017 traditional stores only held about 4% of the

booking landscape (CTV News 2017). A majority of travellers nowadays consults the web first for travel inspiration, finding flights and booking tickets.

Airlines and *meta-search engines* offer slightly different approaches for finding destinations and comparing prices. Meta-searches are generally independent providers which compare flights from different airlines, in return for a small fee which is sometimes added to ticket prices. For convenience, any customer that is not loyal to a particular airline could start at a meta-search for a quick offering overview. Popular examples of such meta-searches are *Skyscanner*, *Momondo* and *Kayak*. A relative newcomer in the meta-search landscape is *Google Flights*. Although its market share is still relatively small, analysts predict it is poised grow indicated by the significant number of younger people using it (CTV News 2017).

Lastly, travel agencies moved part of their businesses online to offer complete packages including flights or accommodation, aiming at customers looking for all-inclusives. In response, many airlines also offer additional options to compete with travel agencies by offering car rental deals or hotel bookings.

2.2.2. Online customer journey

Before a user completes an actual booking, he or she has already gone through a few other steps. First the user has been inspired to travel, has explored some options and finally has decided to purchase tickets for a specific flight. At Transavia these initial steps of the customer journey are split into three phases: the *trigger* phase, the *pre-booking* phase and the *booking* phase, containing the following steps (figure 4):

- **Trigger phase**
    1. Inspiration
- **Pre-booking phase**
    2. Consider
    3. Create a shortlist
    4. Discuss
- **Booking phase**
    5. Find the best deal
    6. Book and pay flight + any extras

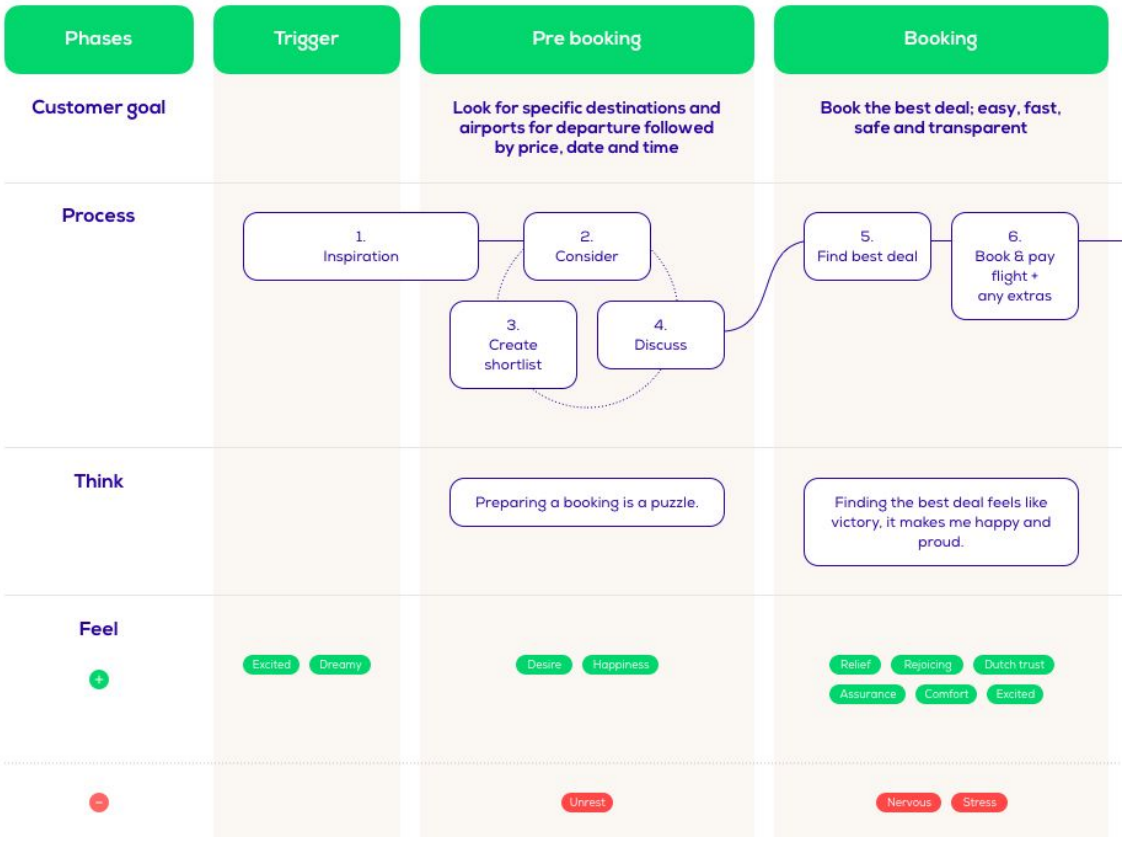


Figure 4: First three phases of Transavia's customer journey (Transavia 2018)

The trigger phase is the very first phase of traveling and entails the intangible moment of (1) getting inspired to go on a trip. A trigger can come from anywhere; reading a travel magazine, getting a tip from a friend or just feeling you would like to have some time off. This phase is most relevant to leisure travelers. Triggers often occur outside of an airlines' reach, therefore I will focus on the pre-booking and booking phases, as these are more eligible for a design intervention.

After being inspired to travel, the user finds himself in the puzzling *pre-booking phase*. Users are concerned with finding, comparing and discussing different destinations, airports, prices, dates and times. During pre-booking the user goes through a loop of three steps: considering (2), creating a shortlist (3) and discussing (4). In short, the user is concerned with pondering a few different destinations, airports, prices, dates and times.

In practice, this phase can contain interactions with many different people, devices and online platforms alternately. For example, someone talks with a friend about his experiences with a certain destination, then looks up prices online and then adds it to his destination shortlist. Some weeks later he learns from a travel magazine that this destination is not something for him.

Although users can feel excited by the idea of going on a trip, it can also cause a feeling of unrest or stress. This phase is often longer for leisure than for business.

Considering typically occurs online through an airline's website or one of the meta-search engines. The information users have to input to begin searching is quite similar. In general, the user is prompted to specify departure, destination, departure date, return date and travel party. Transavia offers an alternative search option which takes price range, flexible dates and multiple destinations into consideration. In the end, the goal of this phase is to select a specific one-way or return flight to continue with in the booking phase.

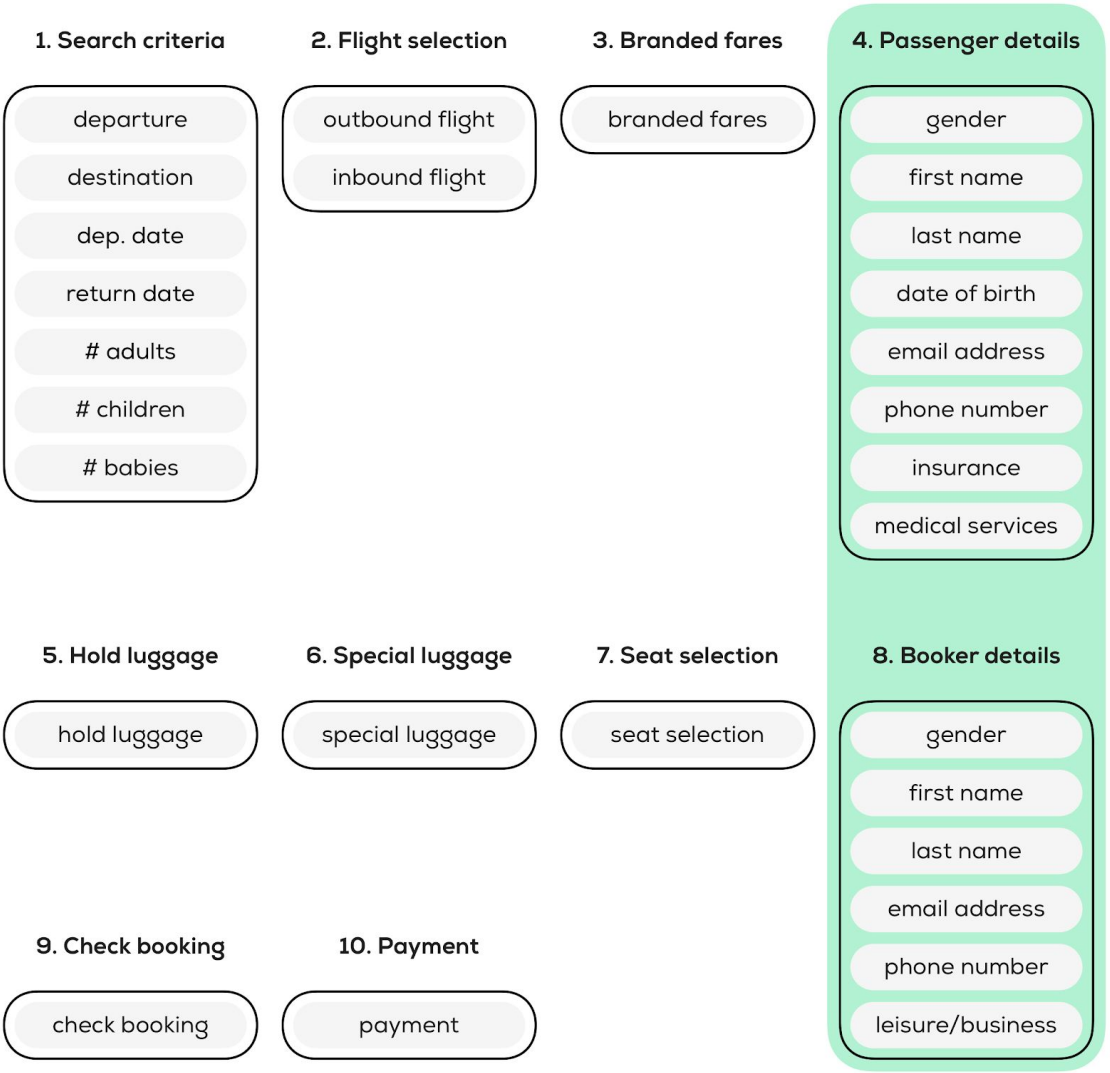


Figure 5: Required steps for booking at Transavia.com

Finally, during the booking phase the user enters additional details about each passenger, luggage, seats and the payment are required to finalise the booking. At Transavia.com, the input

fields for these details are divided over ten pages (figure 5). On the Branded Fares page users have to select either the Basic, Plus or Max fare. The latter two have some extra benefits for reduced costs. Special luggage includes for example musical instruments, pets or skiing gear. Alternatively, users have the option to sign up for a *MyTransavia* account. Part of the user's personal details can be stored in here to simplify future usage. These details are highlighted in figure 5. This comes in handy especially for recurring customers who can save some effort of entering every detail again and again.

2.3. User analysis: Generation Z

Literature and news articles found online often illustrate a generic view on what is defined as Generation Z. Just like Baby Boomers, Generation X and Millennials, Generation Z (GenZ or Post-Millennials) is born in the same historical age and therefore shares beliefs and behavioural forms (Törőcsik, Szűcs & Kehl 2014). It is a very rough generalisation, but the term is widely adopted in many industries nonetheless. Although there is no official time frame, generally is assumed that Generation Z is born between 1995 and 2010 (Turner 2015), which corresponds today with the ages 8 to 23.

Figure 8: Generation Z is often portrayed as digitally bonded to the internet and smartphone

Generation Z is very proficient with most technologies as they have grown up with them. According to a study by Google (2016) services like YouTube, Spotify and Netflix are very popular amongst Generation Z. In general this group is much more connected than Millenials and interacts regularly with friends through social media.

Looking at Transavia, approximately 17.2% of Transavia's customers are Generation Z individuals. For this thesis the ages 16-23 are considered relevant. Younger children fly mostly with parents and are therefore unlikely to be the ones determining the destination. These ages correspond with 11.8% of Transavia's customers (figure 9).

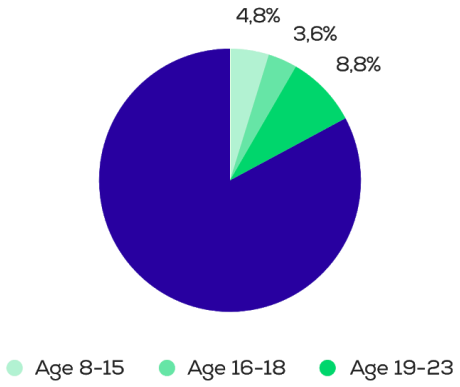


Figure 9: Customer base that is part of generation Z

2.4. Technology analysis: virtual assistants

2.4.1. Upcoming of a new technology

Today most people with a smartphone have probably used a virtual assistant, or at least heard of one. Assistants like *Amazon Alexa*, *Apple Siri* and *Google Assistant* are often mentioned by trend watchers as some of the biggest game changers of the next decade (PWC 2018), revolutionising the way people interact with products and services.

People have gotten used to *graphical user interfaces (GUI)* by using our fingers, mouse or keyboard as a means of input. Interaction with a virtual assistant often takes place by using commands. Depending on the used device, users can command the assistant to do something by either speaking to it or by typing the command. Assistants then respond by speaking with a

synthesised, digital voice using *text-to-speech (TTS)* technology or display a textual response on screen. Especially the voice recognition and output is what makes virtual assistants so distinct from other technology. Additionally, images and audio can be embedded in responses. When the interaction with an assistant is type-only the term *chatbot* is used. Again, the exact interaction is dependent on the device, as some do or do not have a display or keyboard. Also, Alexa, Siri and Assistant have different capabilities and processing and thus provide different results.

Virtual assistants can be used for a variety of tasks. For example, searching the web, setting a timer or ordering a Domino's pizza. This last example requires additional design from the respective company to work. As the technology driving the assistants is continuously improving, it is expected that much more capabilities will be released in the future. For example, during Google's most recent *Google IO* event the company announced that the assistant might be able to make phone calls by itself on the user's behalf (Welch 2018).

The millions of dollars tech giants like Google, Amazon, IBM and Microsoft are investing in the technology indicate that they have great expectations from virtual assistants. But what is driving the interest in the technology?

1. **From a user perspective**
   Speech is considered an intuitive and frictionless way of interacting, meaning there lies potential to enhance existing human-product interactions and explore new ones.

2. **From a technology perspective**
   Artificial intelligence and machine learning have reached a level which made the assistant much more reliable and smarter than before. Assistants are now capable to interpret and process predefined human spoken phrases precise enough to enable fast interactions.

3. **From a marketing perspective**
   Companies expect assistants to help them provide their customers with new human-like experiences. For example, customer support could partly be taken over by an assistant to lower expenses.

Aside from the high expectations there is skepticism too. Gartner for example foresees a downfall as it may not live up to the user's expectations (figure 10). Assistants apparently show similarities with virtual- and augmented reality which major breakthroughs also held off until now.

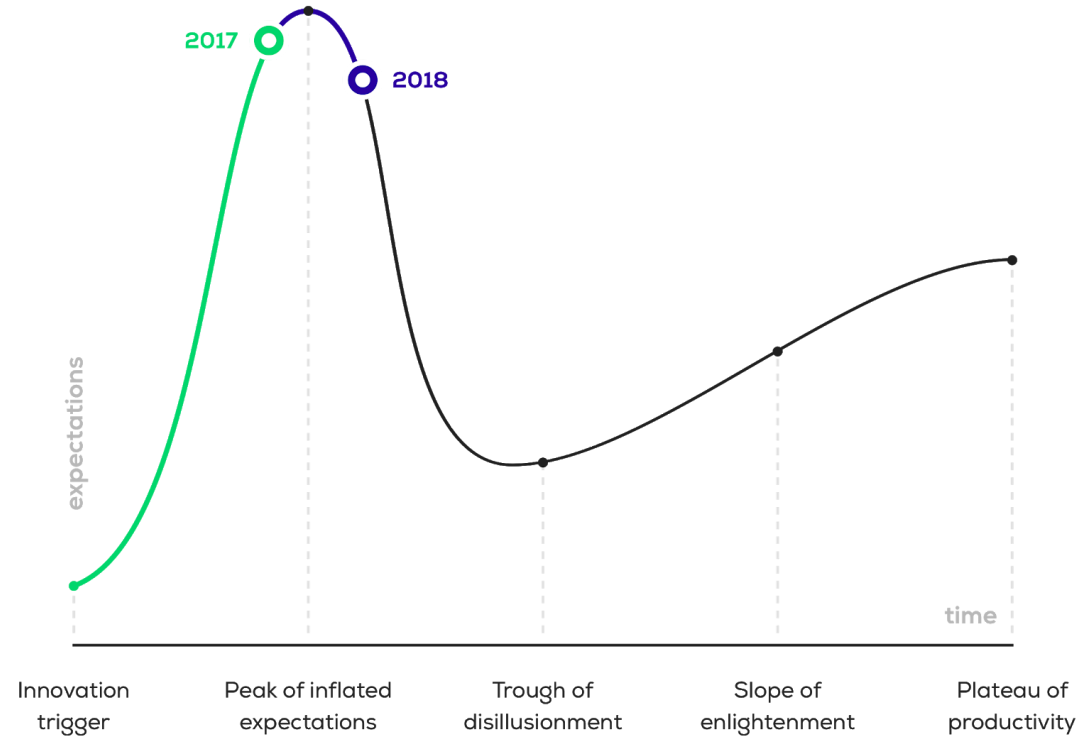


Figure 10: Gartner Hype Cycle places virtual assistants around the peak (Gartner 2017, 2018)

2.4.2. Logic

Figure 11 explains how a virtual assistant operates on a more technical level. Any interaction with the assistant is initiated by its user, who invokes the assistant through an app or device. Each query is interpreted and processed by the corresponding *agent*. Agents contain different intents, which all describe a portion of the interaction. The virtual assistant has to successfully interpret the user's query and match it to the correct intent. The assistant will then output the response as described in the intent's design. For more complicated tasks, the agent should be able to make the right API calls or connect to the right databases. For example, a Transavia booking agent has to be able to collect up-to-date information regarding ticket availability, prices, times, etcetera.

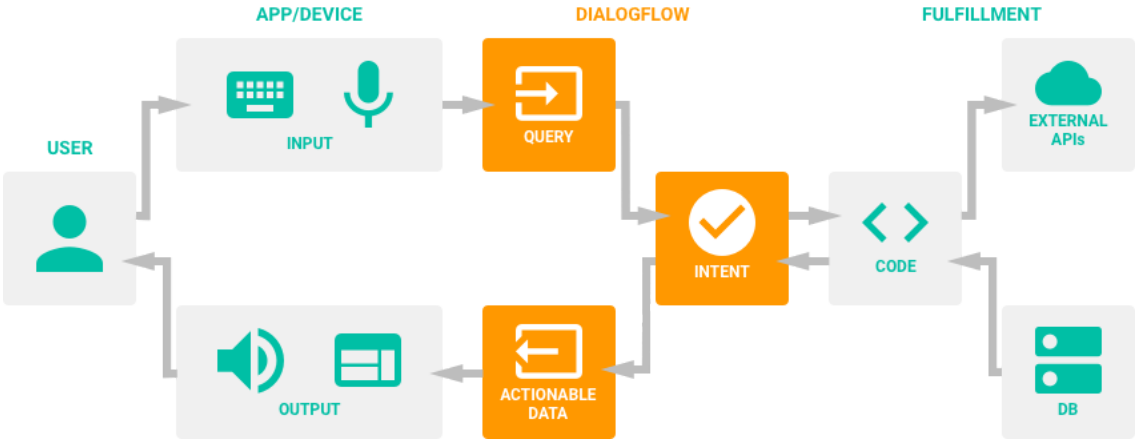


Figure 11: Logic of a virtual assistant (Google 2018)

2.4.3. Pros and cons of virtual assistants compared to websites and apps

Virtual assistants become growingly popular because of the advantages they bring, but they have disadvantages too. Before designing it is important to understand what the potential exactly is for the user, and which downsides there are to take note of. Knowing both sides also helps with comparing virtual assistants to alternative technologies.

Pros

One of the most often mentioned advantages is that interacting through speech is very natural for human beings, giving it a gentler learning curve than other interfaces. Voice interactions are hands-free, eye-free and in some cases faster, more convenient or more fun than other interactions. In a study from Emerce (2017) the benefits of interacting with a virtual assistant over a real human was compared. Users preferred the politeness and unbiasedness of the virtual assistant. Lastly, voice appears to be especially beneficial for low-literate, elderly or visually impaired users.

Cons

First of all, users can experience discomfort when prompted to say privacy sensitive matters out loud. Or, it can distract or disturb the users environment. Also, the assistant can misinterpret user input in noisy environments requiring the user to correct this. A high cognitive load can be put on the user when the assistant presents too much information which needs to be remembered. This problem is partly solved on devices that have a display so that the user can maintain overview more easily. Additionally, users find that many third party applications are gimmicky, making them pointless to use. As a result, users consult their Amazon Echo or Google Home primarily for simple, native tasks like setting a timer, checking the weather or playing a song (Emerce 2017).

Finally, virtual assistants are growing in popularity globally, but today most of the users are located in the United States. The reason for this is that assistants are only fully supporting a handful of languages if which English is developed furthest. Although more languages are being released, assistants are not operational yet in every country.

2.4.4. Available assistants and supported devices

There is a wide selection of assistants for people to choose from, but Google Assistant, Amazon Alexa, Apple Siri and Microsoft Cortana together make up for nearly the whole virtual assistant market (Statista 2019). Reports online do no fully agree on which assistant has the most potential nor which which one currently has the biggest market share (Kinsella 2018; Bharwaj & Gal 2018). A common statistic is that Google and Siri are used most frequently in the US as these come pre-installed with any new Android or iOS smartphone. When comparing the assistants, most find that Google Assistant is most successful in answering a wide variety of questions correctly. This intelligence combined with Google's huge user base is expected to lead Google Assistant to the most used assistant in the future (Koetsier 2018).

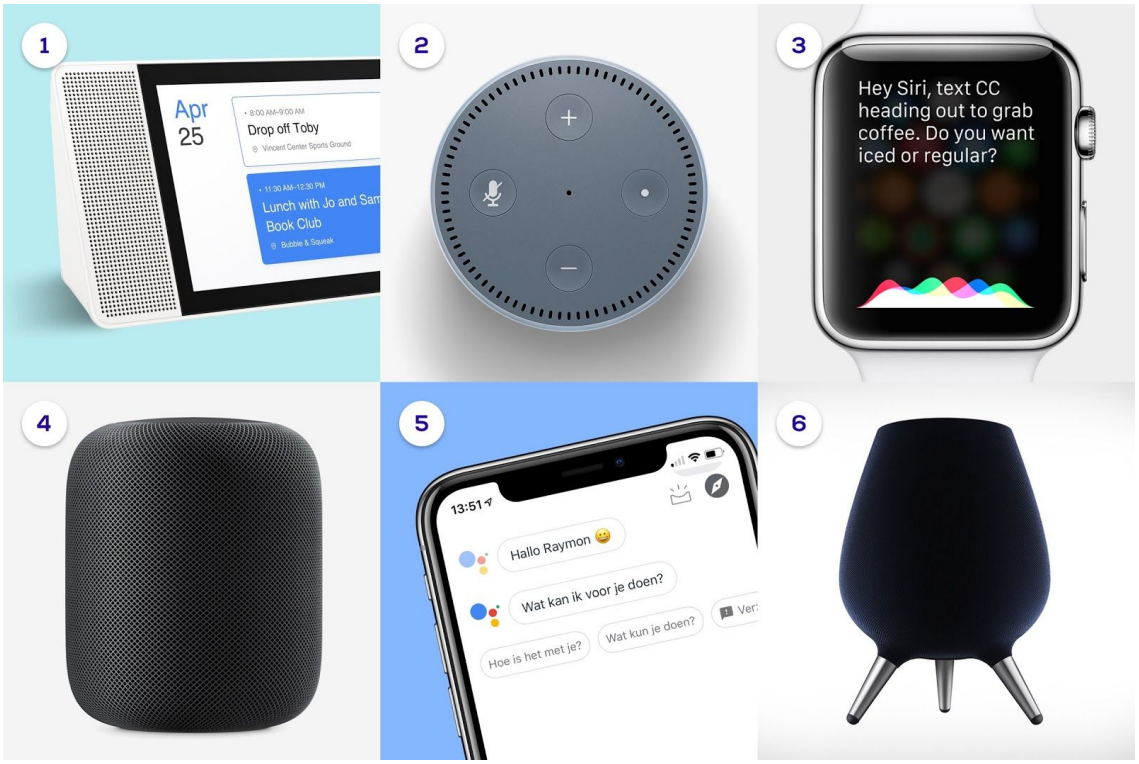


Figure 12: Examples of devices with a virtual assistant: 1. Lenovo Smart Display, 2. Amazon Alexa, 3. Apple Watch, 4. Apple Homepod, 5. Smartphone and 6. Samsung Galaxy Home.

Apart from smartphones, other devices that support a virtual assistant are getting more popular as well. The most recognisable of them are the *smart speaker* and *smart display*, both intended to occupy a prominent place in people's living rooms. The interactions with a smart display can

be multimodal, which is expected to grow in popularity over voice-only interactions (Boogert 2018). Virtual assistants can also be found in cars, on laptops, smartwatches or even on refrigerators (Fingas 2018). Figure 12 gives an impression of devices that are currently for sale.

2.4.5. Existing virtual assistants in aviation

In August 2018 Transavia released its booking assistant for Google Assistant, similar to the skill that was released on Amazon Alexa. With both, users can book flights on specific dates and if they do not know where to go yet it can give suggestions. These are based on a handful of characteristics the user can say, like: *'beach destinations in July'*. The assistant is fully functional, but according to Transavia there are still many things to improve on character, features and tone-of-voice.

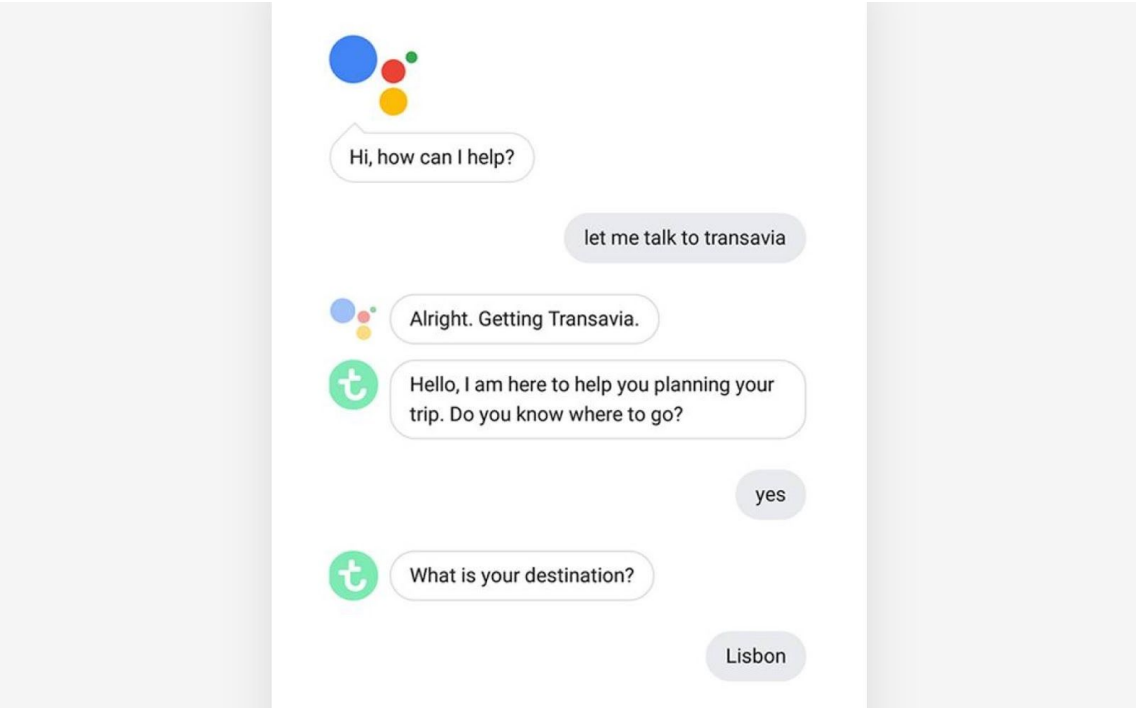


Figure 13: Transavia's current Google Assistant, released August, 2018

Transavia is not the only airline experimenting with virtual assistants. Among others, KLM (KLM 2018), AirFrance (Allianz Partners 2017) and Air New Zealand (Wilkinson 2018) have recently released an assistant to help their customers with various tasks. *BB* from KLM assists users with packing their bags or booking flights tickets through Google Assistant. The chatbot *Louis* from AirFrance operates in Facebook Messenger and is capable of answering questions regarding luggage size. Air New Zealand offers similar functionalities with answering questions about luggage and check-in.

3. Understanding the user in context

Section 2.3 provided a theoretical basis about the user. This chapter explores how the user is related to the other aspects in the context of this thesis. It is imperative to get a more detailed image of the user in relation to (pre-)booking and virtual assistants. Three different studies were carried out to obtain both qualitative and quantitative results. One of these studies did not yield sufficient relevant results and is therefore only included in Appendix C.

3.1. Current user experiences with (pre-)booking and virtual assistants

3.1.1. Goal

This first user study focuses on current behaviours and previous experiences related to (pre-)booking and virtuals assistants. The goal is to discover how exactly Generation Z has booked flights in the past and how they use virtual assistants. Besides, I want to collect some initial thoughts on what their ideal virtual assistant would look like. Finally, this study also helps assessing the overall potential my hypothesis and whether to design for pre-booking, booking or both. The following research questions will be answered:

1. What is Generation Z's current flight booking behaviour and which positive and negative experiences with previous bookings do they have?
2. What role does a virtual assistant play in the life of Generation Z and what is their perspective on it?
3. How does Generation Z imagine the ideal way of (pre-)booking flights through a virtual assistant?

3.1.2. Setup

Flight finding and flight booking is an infrequent activity and therefore naturally difficult to observe. As mentioned in 2.4.3., real interactions with a virtual assistant are often volatile and privacy sensitive and thus unfit for real time observation as well. Alternatively, this study taps into previous actions of Generation Z related to (pre-)booking.

An online survey was set up to ask participants to reflect on both topics. Apart from questions about (pre-)booking and virtual assistants, I wanted to know more about how participants

describe the personality of their current virtual assistant and which personality is preferred. Product personality plays a crucial role specifically with products that show human aspects, like a voice (Manthorpe 2017), so it is included in this study early on. The survey is concluded with an open question about how the participant imagines his or her ideal (pre-)booking through a virtual assistant.

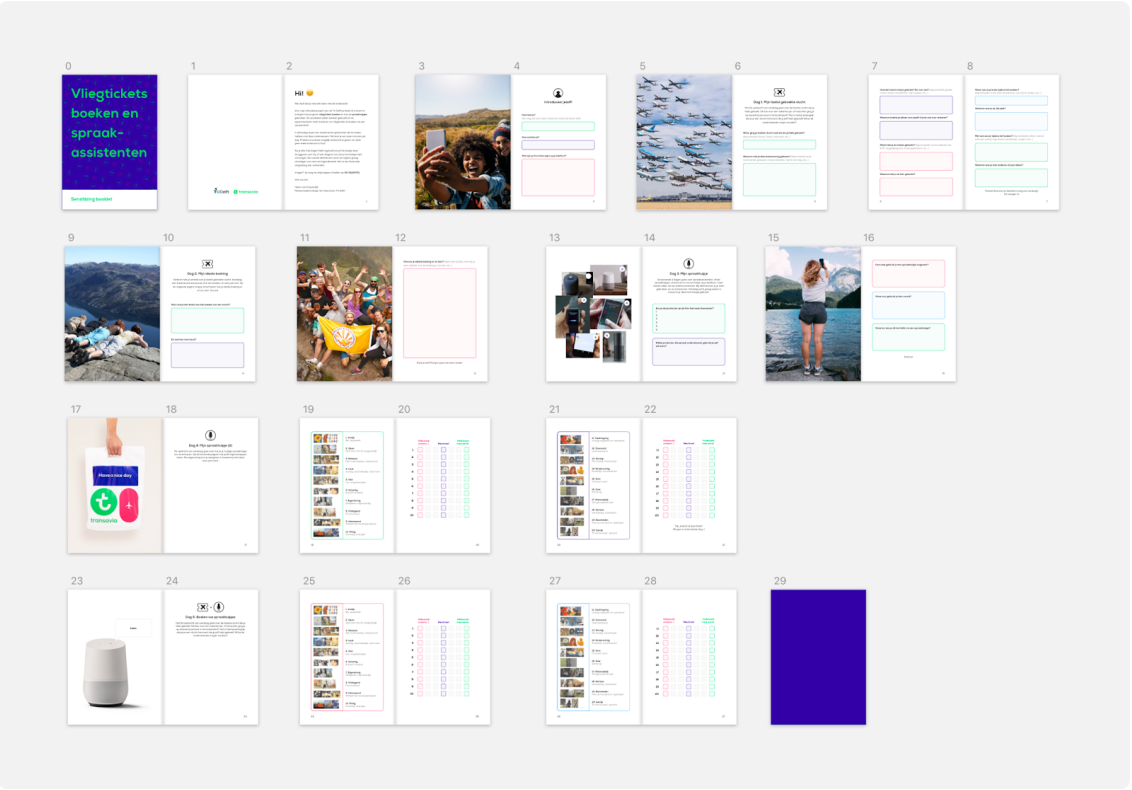


Figure 10: Survey booklet used for test run (details in Appendix A)

Before carrying out the actual study I ran a test with a printed version (Appendix A) of the survey with two participants. This booklet was organised so that participants had to answer the questions spread out over four days to help them get sensitised more easily with the topics; a technique used in context mapping (Van Boeijen & Daalhuizen 2010). However, both participants found that the printed format was inconvenient to use and that the four day structure had a negative effect on their will to finish the survey. Based on their feedback I translated the booklet to an online version, requiring minor changes to a few questions.

An English and a Dutch version were distributed, the full English survey including every response can be found in Appendix B. The survey was structured in as follows:

	Topic	Content summary	Questions
-	Introduction	Experience with topics Age / email (for raffle)	3
A	Your most recent booking	Recent destinations, booking location, booking party, decision-making	13
B1	Your virtual assistant	Product knowledge, usage, negative and positive aspects	5
B2	Virtual assistant's product personality (current)	Current virtual assistant with reference to product personalities	20
B3	Virtual assistant's product personality (preferred)	Ideal virtual assistant with reference to product personalities	20
C	Your ideal flight booking assistant	The ideal flight booking experience through a virtual assistant	1

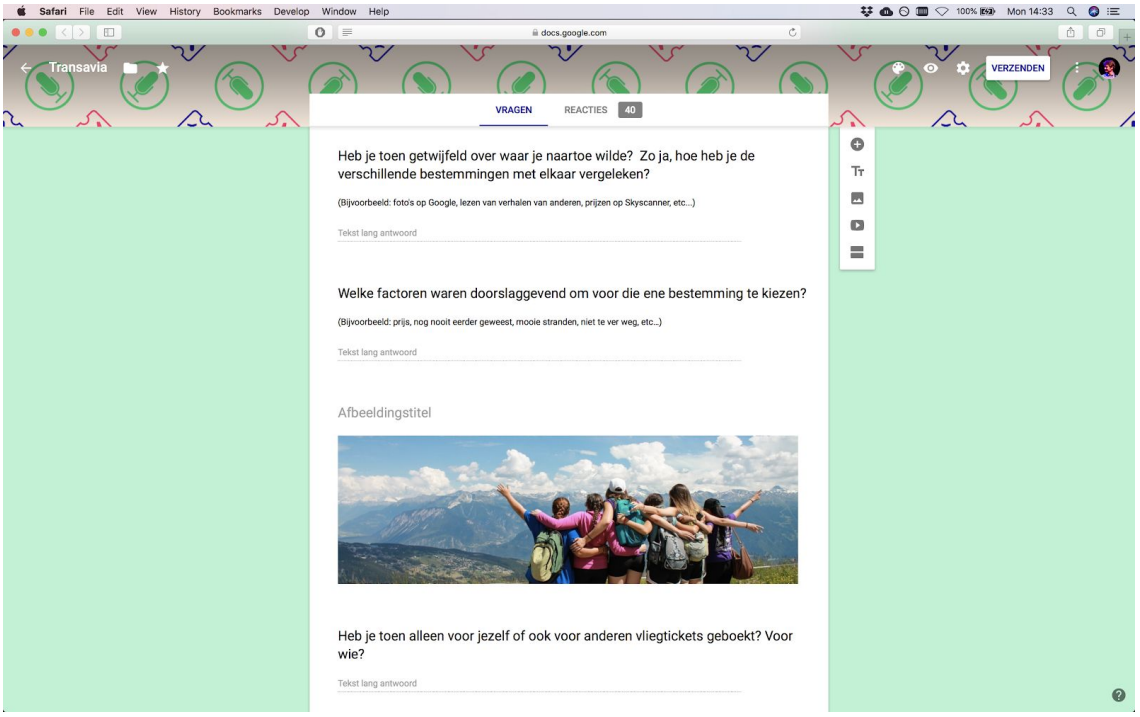


Figure 11: Screenshot of the online survey used for this study

Participants were approached at the Schiphol Terminal, via acquaintances and various faculties of *Delft University of Technology*, *Hogeschool Utrecht* and *Haagse Hogeschool*. To be eligible for participation, individuals were selected by age. Also, participants were first asked whether they had booked at least one flight in the past and/or if had any experience with virtual assistants.

All participants met this requirement. In total 37 people from within the age group filled in the questionnaire:

Age	Number of participants	Male	Female
16	5	3	2
17	6	4	2
18	6	2	4
19	10	5	5
20	3	2	1
21	4	1	3
22	2	1	1
23	1	0	1
	37	18	19

3.1.3. Results

The responses from all participants were collected in one spreadsheet and analysed to find patterns and recurring themes. This spreadsheet can be found in Appendix B.

3.1.4. Interpretation

I have translated the results into the following findings. Only answers that were mentioned by at least two participants were used for further analysis. These are written from the participants' perspective to emphasise with the user and are grouped per topic:

Figure 12: Clustering insights from the survey

A. Your most recent booking

Pre-booking phase

- I consider flights based on ticket pricing, visual impressions, vlogs and recommendations from friends.
- I have a desire to go to destinations I have not been before.
- I start searching flights at a metasearch.
- I find comparing options complex and time-consuming, but I accept that this is how it goes.
- I have no desire to compare everything, just a few options at metasearch.
- I enjoy searching for destinations and flights together with friends.
- I enjoy the anticipation of going on a new adventure.

Booking phase

- I find booking all-inclusive holidays most convenient through a travel agency.
- I prefer booking all tickets at once to ensure I can sit next to my friends.
- I tend to book again at a certain airline if I had good experiences with it.
- I prefer to book at a table/desk at home in silence to help me focus.

- I often book with my parents around, to do the payment or to double check.

B1. Your virtual assistant

- I am very familiar with virtual assistants on mobile, but not as much with smart home speakers *(only 25% of the users).*
- I consult my virtual assistant less than once per month. *(50% of the users)*
- I use my virtual assistant for quick interactions e.g. search, set timer, play music.
- I use a virtual assistant because it is more fun, faster and handsfree, or I just like to explore the limitations of the system.

B2, B3. Virtual assistant's product personality

- I find the personality of my current virtual assistant: boring, serious, open, honest, and aloof.
- I find the ideal personality of a flight booking virtual assistant: honest, relaxed, open, pretty, serious, cheerful, lively and easy-going.

C. Your ideal (pre-)booking assistant

- I want the assistant to leave me enough freedom of choice, or trust it to have the intelligence to make the best decision on its own.
- I want the interaction to feel similar to interacting with an actual human being.
- I want transparency and clear feedback during finding and booking flights.
- I want a very relaxing interaction during the pre-booking phase
- I want a fast interaction during the booking phase

3.1.5. Discussion

First off, it seems that there is potential to pursue design explorations for (pre-)booking using a virtual assistant for Generation Z. Participants saw advantages of the technology and some used it occasionally, especially on their mobile phone. Clearly though, virtual assistants are not as popular (yet) as in the US. Traveling by plane is also quite common for any participating age, and users confirmed the assumed struggles of pre-booking and booking. It is interesting that on one hand both phases are intertwined, but also very different. The term 'booking' is often associated with anything related to finding and booking tickets, while in practice both phases have separate goals and are experienced very differently.

Looking at the reasons why Generation Z is currently using a virtual assistant at all seems to be most fitting with the pre-booking phase, as this phase is considered to contain the most fun and rich interactions. To some extent the assistant is comparable to a travel agency employee giving advice: during orientation the employee can best use his or her expertise.

Concerning product personality, Generation Z demonstrates no unexpected preferences. In short, users would like to be assisted with a happy attitude without sacrificing on seriousness and honesty.

As a concluding question, 'Your ideal booking assistant' (C) was added to the survey to gather some early design ideas. I hoped that participants might have suggestions despite the fact that they can not refer to an actual related (pre-)booking experience with a virtual assistant. An interesting takeaway is that there are mixed opinions on how much freedom the user should have. Participants had preferred the assistant to suggest one best option, some preferred to choose themselves. Furthermore they support my view on focussing on pre-booking by stating that this phase is more forgiving to longer interactions. Still, their ideas on the ideal situation are based on quick, personal assumptions which need further elaboration. Therefore, the next study aims at observing Generation Z during an interaction which is also conversational: booking at Transavia through its call center.

3.2. Online booking behaviours and user preferences

3.2.1. Goal

Transavia's website is the main gateway for customers to find and book flights, or to find any flight related information. Whenever a user completes a booking, his input is stored on a server which can then be used for data analysis by the company. Among others, flight details, baggage amount, seat price and used payment method is collected. The goal of this study is to analyse these data to see whether Generation Z has different preferences than other age groups in terms of destinations, flight times, pricing, etcetera. If the outcomes are significant they can be used to help personalise the virtual assistant specifically for Generation Z. For this study the following research questions were defined:

1. Which destinations are popular among Generation Z and how can they be characterised?
2. In which period(s) does Generation Z book and fly most often?
3. In which group size does Generation Z fly most often?
4. Which additional options are popular among Generation Z?

3.2.2. Setup

Data of every seat sold online at Transavia.com to 16-18 year-olds between the 1st of January and the 31st of December 2017 were analysed, which corresponds with 4.601.965 million passengers. The analysis tool of the database does not distinguish who has done the booking and who is only a passenger, so I had to bypass this constraint. Ages 0-15 were filtered out of the data set as they

often travel with parents, which makes it less likely that they have booked. Due to technical limitations the age group 16-18 was selected to represent the target group. The 2017 time frame was chosen to be able to detect season-specific user behaviour while still making use of recent data. Whenever possible, significance of outcome is determined by plotting ages 16-18 versus other ages. All values from the data set were collected, exported, plotted in a spreadsheet and finally visualised.

3.2.4. Interpretation

Destination

According to figure 13, the top 10 destinations among 16-18 year olds were Barcelona, Alicante, Faro, Malaga, Valencia, Nice, Lissabon, Ibiza, Girona and Innsbruck. When looking at relative numbers (figure 14) Pula, Heraklion, Samos, Girona, Reus, Toulon, Verona, Montpellier and Split are most popular.

Period

There is a significant correlation between week of departure and age. Spare time of 16-18 year olds is clearly bound to school holidays. Figures 15 and 26 show six peaks which correspond with spring holidays (1), May holidays (2), school-free period after exams (3), summer holidays (4), autumn holidays (5) and Christmas holidays (6).

Figure 16 shows that Innsbruck and Salzburg are almost exclusively popular during winter, whereas other destinations see travelers throughout the year, peaking during summer. Furthermore, about 35% of 16-18 year olds stay at their destination for five to nine days. About 23% stay for two to four days. About 18% stay 10 days or longer (Figure 17). Although 16-18 year olds are less likely than other ages to book their ticket in the last 40 days before departure, during this period still the most tickets are sold (Figure 18).

Travel party

Passengers older than 18 years book most often (42%) for two people. 16-18 year olds book often for larger group sizes, likely indicating they travel in groups of three or more (Figure 19). 24% of 16-18 year olds fly alone.

Seat

A majority of 78% of 16-18 year olds chose for a regular seat, of which more than half paid the reservation fee (Figure 20).

Luggage

As can be seen in figure 22, higher age correlates with heavier luggage. Although 16-18 year olds show a similar line as other age groups, it can be concluded that they most often travel with only hand luggage (59%) or hold luggage of 20 kg (28%).

3.2.5. Discussion

The goal of this study was to find out whether Generation Z shows unique behaviour during booking at Transavia.com. If so, significant outcomes could help shaping the design requirements. For example, the recommended destinations could be based on the preferences that the user group currently exhibits.

It is not obvious why the absolute and relative outcomes regarding destination show so little overlap. From all 16-18 year old customers of Transavia, most of them fly to Barcelona. This could indicate the city is Generation Z's most preferred destination. However, Barcelona is one of Transavia's busiest routes, meaning absolute numbers are not reliable for a destination popularity comparison. Alternatively it could indicate that meta-search users who are interested in Barcelona often end up booking at Transavia. When comparing both graphs, 16-18 year-olds tend to fly to cheaper destinations. South-eastern European places like Croatia, Greece and Malta are popular, but also Reus, which is the cheaper alternative to Barcelona.

Significant findings regarding period are users traveling almost exclusively during school holidays and staying approximately a week at this destination. When it comes to seats and luggage, Generation Z again prefers the inexpensive options. Finally, the results show a vast majority does travel with at least one companion.

4. Preparing for design

Up until now my explorations were based on the preliminary design goal that a virtual assistant can offer added value in helping Generation Z with finding and/or booking flights. This chapter synthesises the design takeaways from all previous chapters to formulate a design goal and interaction vision. These together narrow down the scope of this thesis and will act as the foundation for any design activity.

4.1. Key takeaways from context and user analysis

4.1.1. Design for pre-booking

Pre-booking and and *booking* are two inseparable phases with very different user goals. The following four arguments appear to be conform my findings from study one, all in favor of pursuing a design intervention in the pre-booking phase:

1. **Pre-booking is the less meticulous and privacy-sensitive phase**
   Many user inputs are required during the booking during the phase, some of which demand a high level of precision. One typo and the user's passport can potentially be refused at the airport during check-in, which is clearly undesirable. Entering privacy sensitive information with your voice is inconvenient as well. This could be bypassed by using a *MijnTransavia* account to pre-enter personal details. However, as Generation Z is less inclined to travel, it is unlikely they already have an account. Signing up would add extra steps to the user journey.

2. **Pre-booking has richer content and more time to work with**
   Users want booking to be as quick as possible, but during pre-booking speed is not as much of an issue. Instead of having to fill in an uninspiring list of details, pre-booking contains richer content and is more time-forgiving. Together, a design intervention for pre-booking has more potential to offer an positive experience which better fit the user and the current features of virtual assistants.

3. **Pre-booking offers a new way of brand positioning**
   Generation Z generally comprises of impecunious travelers, so their search for flights begins at meta-search engines to find the lowest prices. As a result, potential customers

are outside of Transavia's domain during pre-booking. A virtual assistant might offer an alternative, exciting experience and thereby involve the user earlier on.

4. **Pre-booking with virtual assistance is unexplored territory**
   Some airlines have yet released a virtual assistant which focuses on booking. Although these are not aimed at Generation Z specifically, it is still more interesting to explore pre-booking for both myself and Transavia.

4.1.2. Design for positivity during decision making

Pre-booking is filled with considerations about destination, pricing, dates and times. Friends, websites, vlogs, magazines are consulted to ultimately come to one booking. Users are aware of this complex and sometimes stressful process, and could benefit from a tool that helps them making the ideal decision.

4.1.3. Design according to the user's travel preferences

Generation Z is almost exclusively traveling when they have time off from school, so the design will focus fully on leisure traveling. During their holidays the user is not so much concerned with where they are going, as long as it is cheap. The user is generally flexible in all respects, making the required design more of a holiday recommender than just a destination recommender. Also other travel preferences from study 3 can be considered for personalisation.

4.1.4. Design a multimodal experience with Google Assistant

As mentioned in chapter two, there are many different assistants and devices available. From my research I conclude that multimodal experiences have more potential when comparing destinations that voice-only interactions. This means I will focus on devices with a display, being: smartphone and/or smart display. For prototyping I will work with Google Assistant as Google offers currently the best design tools and expectedly the largest user base in the future.

4.2. Design goal and interaction vision

Based on the takeaways the design goal is reformulated to:

"Design a fun to use conversational holiday recommender that assists Generation Z with finding affordable holiday flights."

This design goal is supported by the interaction vision:

“The interaction should feel like being shown around your best friend’s new place”, with the interaction qualities: *witty* and *inspiring*.

4.3. Designing for Google Assistant

Virtual assistants are constantly under development, as well as the design tools used to buidl them. In their current state each platform has technical limitations which determine boundaries for designers and developers working on it today. The following paragraphs will briefly lay out the basic methodology, values and components that are available for Google Assistant. This means that these technical limitations should be respected during the design process, to warrant a possible short term release. Chapter 7 will go in deeper on recommendations for future design.

4.3.1. Principles and values

Before starting creating concepts, it is important to understand how designing for a virtual assistant actually works. The final deliverable will be a prototype of a service, and since this service lives in a new technology there will be additional design principles and/or values to take into account. In one of the presentations of Microsoft's Purna Virji, she underscores four important principles when designing a conversational experience. These were derived from studies done within the company itself (Virji 2018):

- **Clarity**
  As for any interface, it is important to let the user spend its time with it doing things, instead of finding out how to do these things. This means usage of clear language and picking the right words. Optimise questions for the ear instead of the eye, avoid robot speak and always let the assistant ask questions to clarify how the user should respond.

- **Character**
  Creating a persona for the assistant can help designing a coherent tone. Don’t trick users into thinking they are interacting with a real human, but be honest about it being a bot. This helps creating a trustworthy bond and the user will be more forgiving towards the assistant.

- **Compassion**
  Despite being a bot, including a friendly greeting, small talk or compliments can make the interaction more pleasurable. How exactly is totally depending on what you want to achieve as a designer.

- **Correction**
  In case of an error or misunderstanding, do not say ‘sorry’ too often. Rather offer alternatives or explain what went wrong and how to proceed.

Sophie Kleber (2018) concludes from her user research four personality traits that should be taken as guidelines when developing this persona:

- **Subordinate**
  The assistant has no own agenda and always supports the will of the user. Hereby the user stays in control of the conversation.

- **Conscientious**
  It is important that the assistant reassures and empowers the user by having the skills, knowledge and trustworthiness required.

- **Empathic**
  In essence, the assistant should evoke a feeling that the user is understood or even cared for. This empathy makes the user relate to the assistant and vice versa.

- **Good humoured**
  In order to sympathise with the user, the assistant has characteristics to lighten the mood. This is different for every assistant, but could include elements of humour, surprise and extrovertedness.

The majority of voice assistants have these four in common as the are universally accepted and preferred. These traits, combined with Transavia’s friendly appeal and the preferred product personalities from the user studies, will be used to narrow down the persona used for the pre-booking assistants for Generation Z.

4.3.2. Workflow

When designing for a virtual assistant some design methodologies and approaches will be more suitable than others. During this design phase I will use similar principles often used in software development, agile and lean startup (figure 27): iterate fast and involve users in early stages to check whether the concept is going in the right direction. In practice this means starting off working towards a testable prototype which is just elaborate enough to gather valuable feedback. Especially since the user has not much experience yet with a similar assistant, user feedback is even harder to predict.

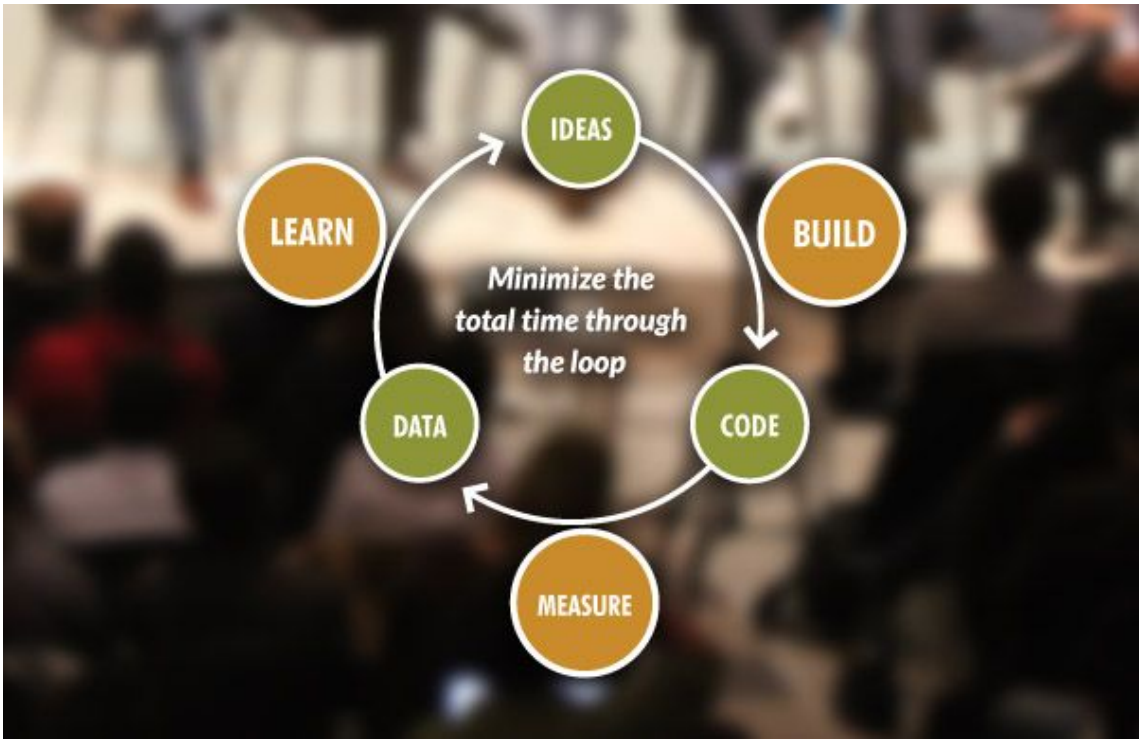


Figure 27: Lean startup process diagram (The Lean Startup Methodology 2019)

Design tools (SDK's)

Sketching of design ideas will be done in using the principles of flowcharting and script writing, as the most important part of the design itself will consist of diagrams and textual dialogs. Google provides designers with its own software development kit (SDK) called *Dialogflow*, formerly *Api.ai* and *Speaktoit*. This will be used to build the actual interactive prototype. It has evolved over the last years to a more versatile tool for designers, but is still somewhat buggy and still works best for building simple interaction flows. More complicated features that require complex interactions or a connection with an API or database can only be done with more professional coding skills. Dialogflow can export designs (or agents) to the *Actions on Google* platform, enabling the maker to preview the interaction on any supported device.

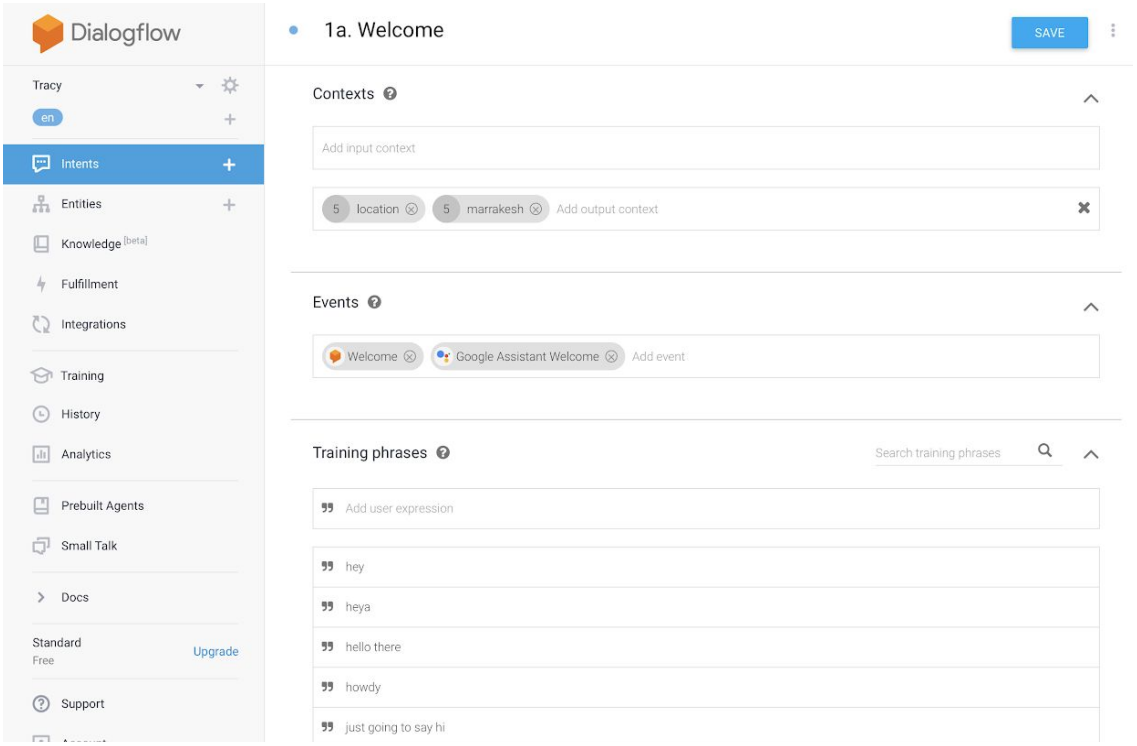


Figure 28: Example of a workspace in Dialogflow (Google 2019)

4.3.3. Dialogflow components

The design can only be built using ingredients that are supported by *Actions on Google*. Although this is one of the most comprehensive platforms out there, it still has its limitations. Text-to-speech is the most common element, which is basically the system pronouncing any text that it is told to use.

Building a structure

There are also options to style these responses. No matter what the exact content of the design is, any agent built with Dialogflow includes some basic components. For this project *intents*, *contexts* and *entities* are relevant and briefly elaborated upon here. Generally, an intent represents one dialog turn within the conversation (Dialogflow 2019). Per intent you can specify which words the agent has to recognise and match to the intent. When there is a match, the agent will return the response defined by the designer. The first intent, often named *welcome intent*, has to be matched to trigger the agent to start at all. For example, *"Talk to Transavia"* triggers Transavia's current agent. In case something the user says is misunderstood or mismatched, there should be a *fallback* intent to catch this too.

Entities are used to extract specific pieces of information, like dates, colours, amounts etc. This comes in handy when collecting all the information required to complete a booking for example.

Finally, contexts are used to demarcate where in the flow the user is located. It carries information from one intent to the next one, and if done correctly, it prevents similar words used for multiple intents to be matched to the wrong one.

Voice type

Google is supporting more and more languages, but at the time of writing the English ones are still most extensive. Therefore my design will use one of the English voices that are available on Actions on Google. Today, fourteen English voices can be used which have the same vocabulary, but a different sound:

- American English (2 male and 2 female voices)
- British English (2 male and 2 female voices)
- Australian English (2 male and 2 female voices)
- Indian English (1 male and 1 female voice)

Speech Synthesis Markup Language

Responses can be customised using a markup language called Speech Synthesis Markup Language (SSML) which is based on XML. SSML can help with making a response more engaging, dynamic and entertaining. For example, you can add pauses between sentences, audio clips, change vocal pitch and accentuate certain words. A customised response can look something like this:

```
<speak>
  <par>
    <media xml:id="question" begin="0.5s">
      <speak>Have you thought about Barcelona?</speak>
    </media>
    <media xml:id="followup" begin="question.end+2.0s">
      <speak>I feel it might be something for you!</speak>
    </media>
    <media repeatCount="10" fadeInDur="0.5s">
      <audio src="https://url.com/.../example.mp3">
    </media>
  </par>
</speak>
```

It is too comprehensive and unnecessary to mention the whole list of elements in this thesis, but it can be found in Google's Developer Docs. Alternatively I will state the most important ones here:

- **Pauses**
  By default, the time between words and syllables is based on the linguistic context. For instance, a period symbol indicates a pause, just like how we are used to read. With the `<break>` element you can customise pauses in milliseconds anywhere in responses.

- **Word emphasis**
  With the `<emphasis level="value">` element emphasis can be added to specific words by using the *strong*, *moderate*, *none* or *reduced* values.

- **Pitch, rate and volume**
  Vocal pitch, speaking rate and output volume are controlled by the `<prosody attribute="value">` element. Values can be defined relatively (low, medium, high, etc.), exact (semitones or decibels) or with percentages.

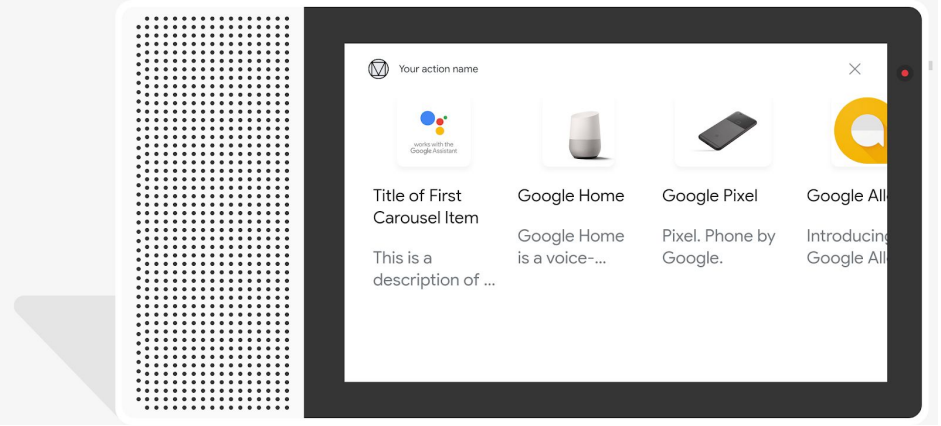
- **Audio clips**
  Apart from the regular text-to-speech output, audio clips can be inserted in responses. Standard file types like .mp3 and .wav are supported. Additional attributes can be added to the code which for example define whether the audio should be looped, or what the volume should be. This is defined by the `<audio attribute="value">` element.

- **Sequential and parallel media**
  The assistant can output media types sequential or parallel. This means that if you choose to respond using multiple media types after each other or at the same time. For example it is possible to speak a text sentence while the sound of an airplane is playing in the background. This is done using the `<seq>` and `<par>` elements.

- **Visuals**
  When the user invokes the assistant on a mobile device of smart display, a screen brings the opportunity to show visual content. Then exact behavior of this content depends on the surface that is used. Again there are specific components to work with:

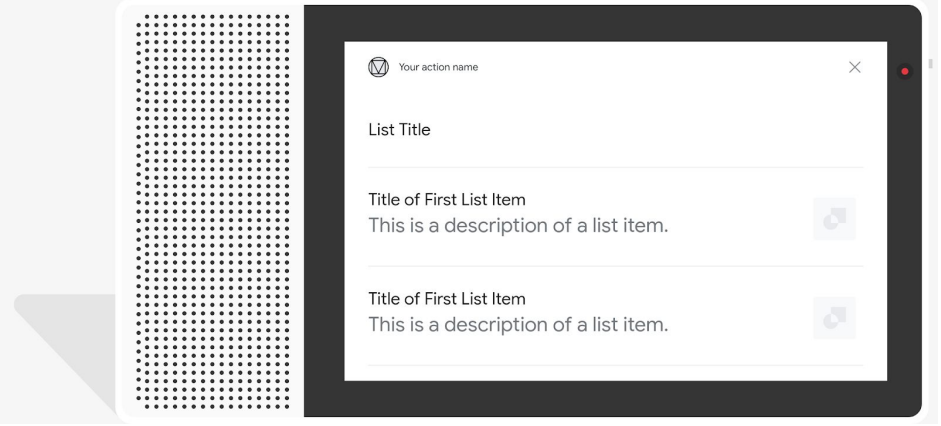
  - **Cards**
    In between text responses, cards can be added which consist of an image, a title and a some short body text. Pressing a card, or speaking out the title of the card further continues the conversation. One card can be presented (*basic card*),

which is mostly used to navigate to a web page. Multiple cards are scrollable horizontally (*carousel*). Finally, the *table card* allows to display a table with multiple columns and rows.



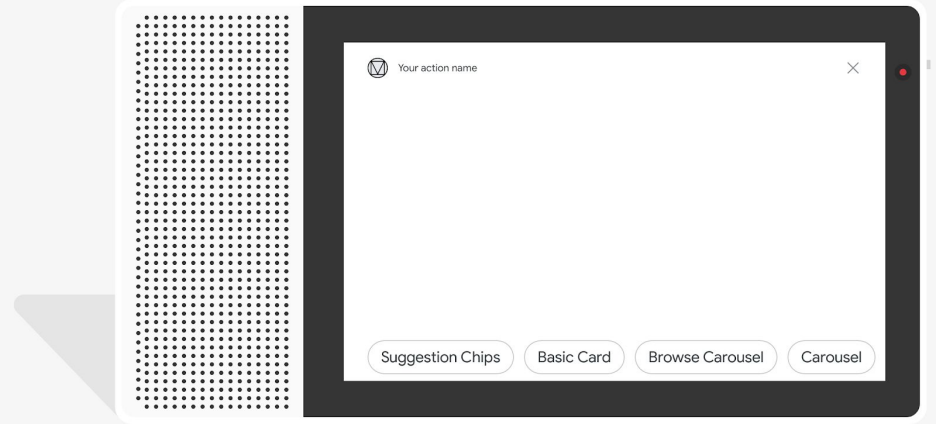
- **List**

  Similar to a carousel, a list element contains smaller items and scrolls vertically. A list prompts the user to select one item to pivot the conversation. An item represents a word or phrase which is matched to an intent similarly as spoken user input.



- **Suggestion chips**

  To hint the user which responses are supported, suggestion chips can be added below a question. These chips are only supported by devices with screens. Questions asked by the assistant during audio-only interactions have to be clear enough to take away the need for suggestions.



- **Fonts and colours**

  When it comes to creating an overall visual appeal for the assistant there are very limited options. It would be interesting to play with elements of Transavia's corporate style but at time of writing these options were either absent or unstable. In the near future Google is expected to add the possibility to edit background colours, typography and other customisation.

5. Prototyping

With a specified design goal, interaction vision and better technological understanding, it is time to start with design. This chapter contains the concepts and corresponding design iterations. As mentioned in chapter 4, the goal is to start building and testing quickly and collect feedback about many aspects of the prototype simultaneously. The prototypes are interactive to let the participants experience the true feel of Google Assistant, but will be partly simulated (Wizard of Oz). This way, the design can be tested without having to fully develop it. Finally, learnings are collected and implemented in the final design in chapter 6.

5.1. Pilot prototype

5.1.1. The concept

The assistant is called Tracy, which is a hybrid from the words Transavia and Generation Z. Tracy represents a young, female character with a lot of travel experience. She takes the role of a travel advisor who is excited to assist the user while finding his or her ideal trip. Her tone-of-voice is optimistic, somewhat witty and to the point. She recommends those trips that are most likely interesting to the user, presented in a way that appeals to the user: In this concept Tracy amplifies her responses using e*mojis*, and elements of gamification as can be seen on other platforms where Generation Z is active on, like Instagram and Snapchat.

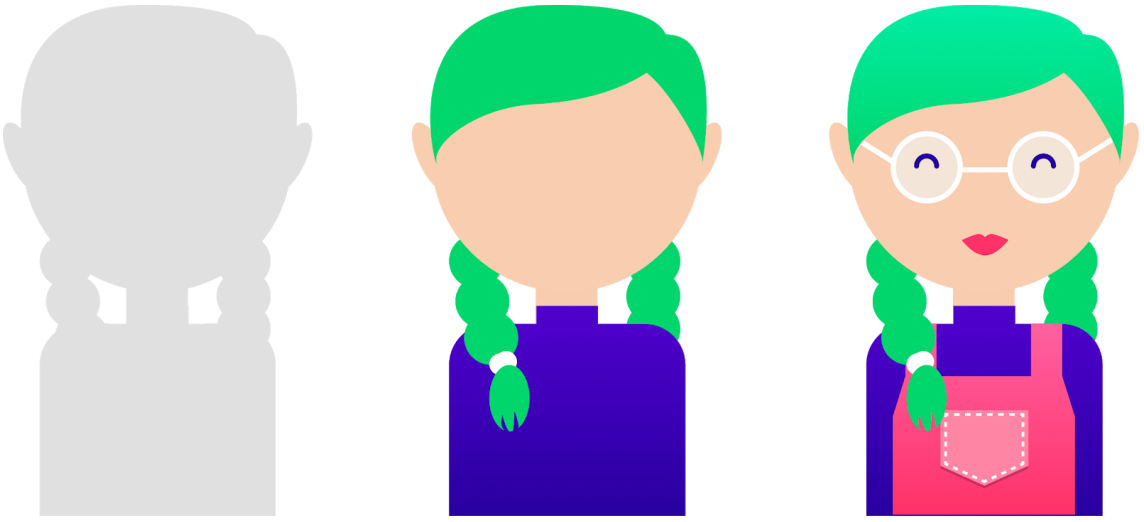


Figure 29: Visual appearance of Tracy

Although Tracy is mostly an invisible character, but she will be represented by a visual in some situations, for example on devices with a display. Her look contains the four primary colours of Transavia's colour scheme: Green, Blue, Ruby and Champaign. The combination of her friendly eyes with her static posture stand for her witty character trait. Human characteristics, but with a robotic touch.

Next to Tracy's personality, the way and order in which the flow is organised also defines the characteristic of the design. Coming to a (set of) recommendation(s) requires at least some information about the user. Tracy has to ask the user, or collect it from the user's Google account or GPS location for example.

Information	Collection method
Length of stay	Prompt the user for preferred school holiday / exact dates
Holiday type	Prompt the user for preference on cultural, outdoor or beach trips
Destination	Prompt the user for preferred photo's during a comparison game
Departure airport	Detect user's current location

Tracy is invoked by saying: "*Talk to Travelling Tracy*" to any device supported by Google Assistant. The word *'travelling'* is due to unknown technical errors that pop up without using a second word.

5.1.2. Structure and happy flow script

To give an idea of the design, below the overall structure and an example script a of the happy flow are written out. The actual prototype consisted of a few more options and fallback intents to support the user during an unforeseen error.

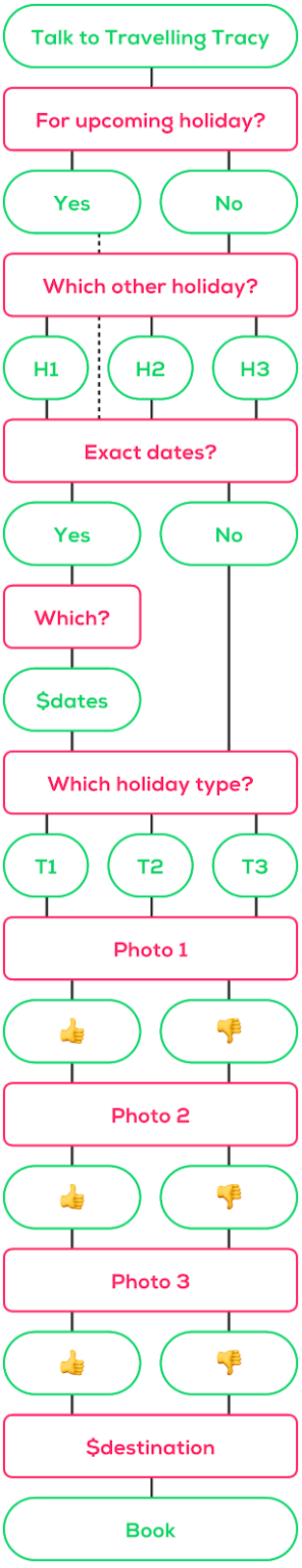


Figure 30: Conversation structure of pilot prototype

Context	Actor	Lines
Welcome	Tracy	Hi! I'm Tracy. So, I've heard you're looking for a cheap summer holiday destination. Shall I help you decide? [Let's do it! 😎 / Nah, I'm good 👋]
	User	Sounds good
Dates	Tracy	Great, are you looking for something for the upcoming Christmas holidays? [Yes! 🎄 / No, for another holiday 🌱☀️🍂]
	User	Yes, I am
	Tracy	Christmas it is. Do you have exact dates in mind?
	User	I do
	Tracy	Ok, when would you like to leave?
	User	December 27th
	Tracy	Noted! And when would you like to go back?
	User	The fifth of January
	Tracy	Thanks! I will look for trips from December 27 to January 5, is that correct?
	User	All good
Holiday type	Tracy	Now what kind of trip are you looking for? Cultural, adventurous or beach holiday?
	User	Let's do a cultural one
Recommendations	Tracy	Awesome! Ok, now let's play a game. Let me know if the following photos describe your holiday: [Photo 1]
	User	Like
	Tracy	Ok, and this one? [Photo 2]
	User	Don't like

	Tracy	Hmm ok, how about this then? [Photo 3]
	User	That looks nice
Book trip	Tracy	That helped me a lot! I found this trip to Barcelona for you. Would you like to book it? [🇪🇸 Barcelona]
	User	Yes
	Tracy	Great! Click the following link to go to the website: [Button]

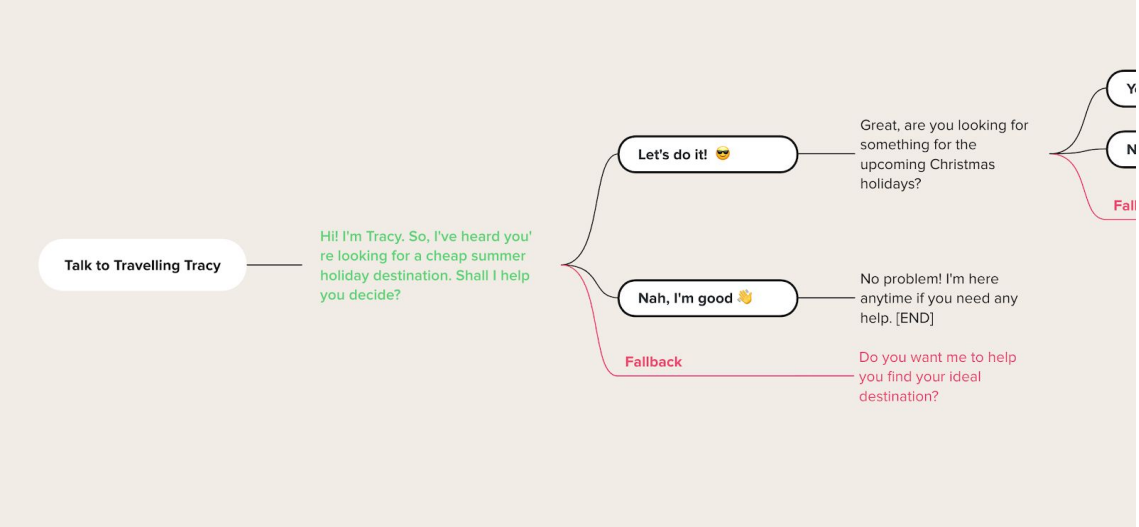


Figure 31: First part of the flowchart

The photos used to recommend trips showed characteristics of the style user by Generation Z, like selfies, filtered photos or showing people of their age. Suggestions chips are shown for almost every intent, and contain emojis. The end of the conversation leads the user to the Transavia website with details about the flights and the possibility to book.

5.1.3. User tests

This prototype was tested with four participants of the user group to get feedback on a number of different aspects. The following research questions, on macro- and micro level of the design were answered:

- What does the user think of the idea of a holiday recommender virtual assistant?

- Would the user consider consulting Tracy? If not, what has to change to improve usability?
- What does the user think of Tracy's voice, tone, and phrasing?
- What device does the user prefer to use such a service on?

Each participant got the same scenario (Appendix D) on paper, with which they had a run through the whole flow. First, Tracy was invoked on the Lenovo Smart Display, afterwards the same prototype was shown on an iPhone. The sessions were audio recorded, observed and concluded with a set of questions (Appendix D)

5.1.4. User feedback

Concerning the overall impression of the idea, all participants were generally interested and enthusiastic about interacting with Tracy. This was partly caused by the fact that they had never seen a Smart Display before, which made them eager to discover what the device was capable of. Participant 2 mentioned that she would see a recommending virtual assistant to be *"fun to use with friends during the beginning of planning a holiday"* and *"I think it is good that it suggests cheap trips and not just the destination"*, and participant 3 said: *"I have happily flown with Transavia quite often in the past, so I would try this out"*. Participant 1 and 4 were more sceptical, but were interested to try a released version out nonetheless. Their main concern with Tracy was that it only offered Transavia flights, which deprives them of potentially finding better recommendations at other airlines.

Concerning the actual design of Tracy every participant had ideas on things that had to change. The most important design takeaways were:

- The photo 'game' is too vague, the user is confused what one photo means and the translation of their preferences to recommendations makes Tracy feel random and unreliable. The photos themselves do give a nice extra to the written/spoken text. (4/4 participants)
- The experience on the smart display is preferred, but smartphones will be used on the short term as these are already in their possession. (4/4 participants)
- Choosing a holiday type is undesirable as holidays are practically not grouped in such simplified categories in practice. (3/4 participants)
- Searching based on school holiday is a nice and unique idea, but it makes more sense to ask for specific dates before instead of after. Also, the assistant should be flexible with those dates in case there are cheaper options a day before or after. (2/4 participants)
- Users want more recommendations to choose from, and be able to see information about the recommended trips. (2/4 participants)

- Suggestion chips on phone take away from the conversation in simple yes/no questions. Also, the emojis in these chips do not add character to Tracy, as they are reponse suggestions for the user. (1/4 participants)

5.2. Second prototype

5.2.1. The concept

It seems there is potential for a service like Tracy if she is designed properly. Generation Z seems to be interested in trying it out just for the fact that is a 'new' experience, but also because it suggests trips they are looking for: cheap and not per se based on exact dates as most websites do. Users are happy with the overall character Tracy, requiring only minor updates on her tone-of-voice.

Changes were made to meet the user's feedback on each phase of the flow. Holiday types have been removed, the photo game now lets the user choose between two photos, date selection has changed, Tracy now gives three recommendations and information per trip, suggestion chips have been removed in most cases and emojis were added to Tracy's lines. Finally, the interaction starts now with a welcoming message to briefly explain users what Tracy does.

5.2.2. Structure and happy flow

The happy flow and conversational structure were changed as follows:

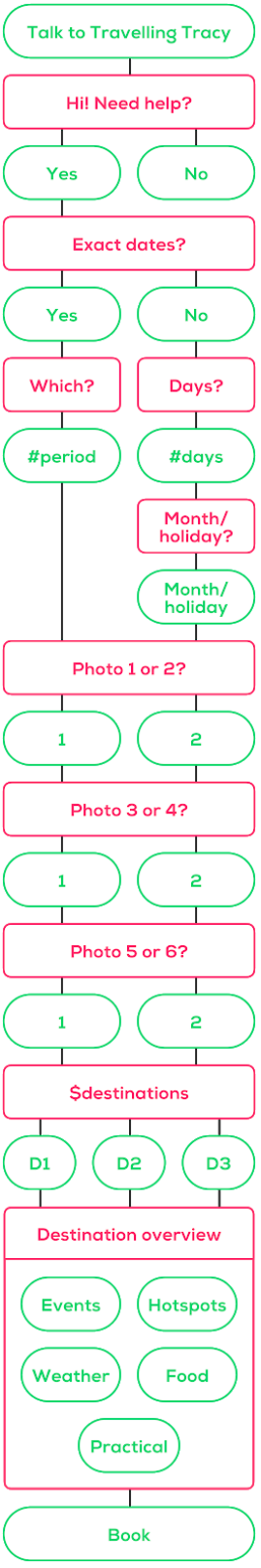


Figure 32: Conversation structure of second prototype

Context	Actor	Lines
Welcome	Tracy	Hi! I'm Tracy! I can help you find the perfect holiday destination! Shall I help you decide? 😎
	User	Let's do it!
Dates	Tracy	Ok! Do you have exact dates in mind for your trip? 🗓️
	User	Not really
	Tracy	Good, that makes things easier for me! How many days would you like to go?
	User	About 6 days
	Tracy	... and in which school holiday or month?
	User	My summer holidays
	Tracy	I will look for 6 day trips in your summer holiday. Ok? 👌
	User	Perfect
Recommendations	Tracy	Awesome! Ok, now let's play a game. Which of the following photos describes your holiday best? [Photo 1 / Photo 2]
	User	The second photo
	Tracy	Ok, choose again! [Photo 3 / Photo 4]
	User	The left one
	Tracy	Got it. How about these then? [Photo 5 / Photo 6]
	User	The one with the cyclist
	Tracy	Good! I will search for trips in that period... Done already! I've found these options for you: [🇪🇸 Barcelona / 🇲🇦 Marrakesh / 🇭🇷 Pula]
	User	Marrakesh
Choose	Tracy	🇲🇦 Marrakesh: Enchanting palaces, breathtaking mosques, colourful markets and a square to excite all your senses: welcome to magical Marrakesh! What do you want to know more about?

		[🎟️ Events / 👀 Hotspots / 🍽️ Food / 🌤️ Weather / ℹ️ Practical / Book now!]
	User	How is the weather that week?
	Tracy	You are lucky, during your stay the weather in Marrakesh will be quite sunny: around 23 degrees! ☀️ Only on Saturday you might want to bring an umbrella into town... ☂️ [🎟️ Events / 👀 Hotspots / 🍽️ Food / 🌤️ Weather / ℹ️ Practical / Book now!]
	User	Sounds good, any tips for me?
	Tracy	Here is some info you should check before you go: ... [🎟️ Events / 👀 Hotspots / 🍽️ Food / 🌤️ Weather / ℹ️ Practical / Book now!]
Book trip	User	Ok thanks, let's book!
	Tracy	I'm happy I got you excited about Marrakesh! Click the link below to proceed with your booking! [Go to my booking]

5.2.3. User tests and feedback

This second user test used the same setup as the previous test, but focused mostly on the changes that were made. This time, the test was executed with five participants. The most valuable outcomes were:

- Users often wanted to go one or more steps back in the flow, something the prototype was not capable of. (5/5 participants)
- Users are (still) not convinced by the updated photo game. Despite the fact that the Generation is visually driven, photos are not effective nor fun to use when getting recommendations. (4/5 participants)
- Users are happy with choosing from three recommendations (3/5 participants)
- User overall liked that there was some basic info to find about a destination, but were least interested in learning more about local food and cuisine. Some suggested that having a small, easily consumable set of information catered to them is a desired function. (2/5 participants)

6. Final design

Based on the user feedback from chapter 5, one last iteration was prototyped as a final deliverable for this project. The design has evolved in a few iterations to get closer to the user's needs, while staying true to what is possible with Google Assistant today, and within the capabilities of me as a designer. As design is never done, there is still plenty of room for optimisation. This will be elaborated on in the evaluation in the next chapter. Below, a visual impression of Tracy on a smart display, the conversation structure and script are presented. Appendix E shows the logic behind the design used in Dialogflow.

Figure 33: Welcome screen of Tracy on Lenovo Smart Display

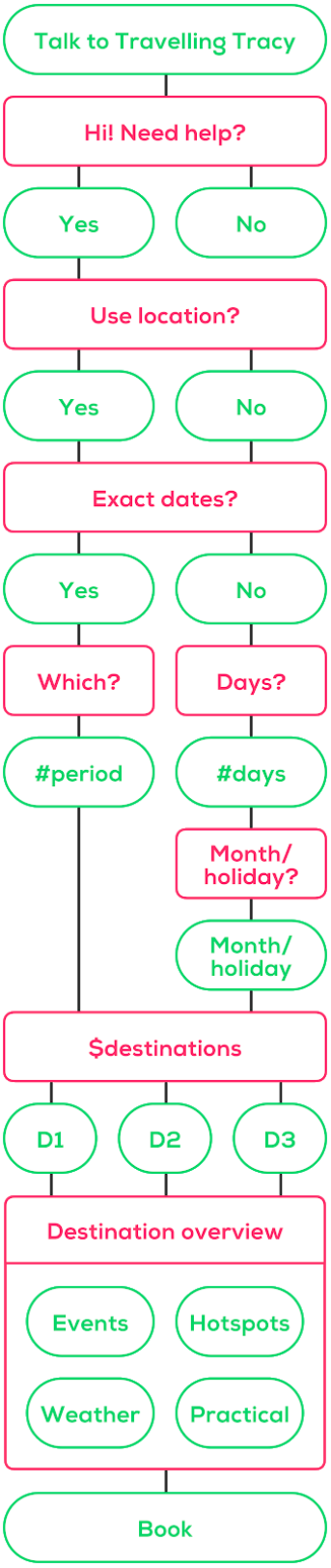


Figure 34: Conversation structure of final design

Context	Actor	Lines
Welcome	Tracy	Hi! I'm Tracy! I can help you find the perfect holiday! Shall I help you decide? 😎
	User	Let's do it!
	Tracy	Fun! Is it ok if I check your location so I can give better suggestions? 📍
	User	Sure
Dates	Tracy	Ok! Do you have exact dates in mind for your trip? 📅
	User	Not really
	Tracy	Good, that makes things easier for me! How many days would you like to go?
	User	About 4 days
	Tracy	... and in which school holiday or month?
	User	August
	Tracy	I will look for 4 day trips in August. Ok? 👌
	User	Perfect
Recommendations	Tracy	Good! I will search for trips in that period... Done already! I've found these options for you: [🇪🇸 Barcelona / 🇲🇦 Marrakesh / 🇭🇷 Pula]
	User	Marrakesh
Selected trip	Tracy	🇲🇦 Marrakesh: Enchanting palaces, breathtaking mosques, colourful markets and a square to excite all your senses: welcome to magical Marrakesh! What do you want to know more about? [🎟️ Events / 👀 Hotspots / 🌤️ Weather / ℹ Practical / Book now!]
	User	How is the weather that week?
	Tracy	You are lucky, during your stay the weather in Marrakesh will be quite sunny: around 23 degrees! ☀ Only on Saturday you might want to bring an umbrella into town... ☂ [🎟️ Events / 👀 Hotspots / 🌤️ Weather / ℹ Practical / Book now!]
	User	Sounds good, any tips for me?

	Tracy	Here is some info you should check before you go: ... [🎟️ Events / 👀 Hotspots / 🌤️ Weather / ℹ Practical / Book now!]
	User	Ok thanks, let's book!
Book trip	Tracy	🇲🇦 I'm happy I got you excited about Marrakesh! Click the link below to proceed with your booking! [Go to my booking]

7. Evaluation

The final design of this project will be evaluated on its feasibility, viability and desirability, which include recommendations and foreseen challenges for Transavia regarding Tracy. Furthermore, short- and long term recommendations are formulated which guide the company when proceeding with virtual assistance in general. The chapter is concluded with a personal reflection about my role in this project.

7.1. Final design

7.1.1. Feasibility

Each step of designing and prototyping Tracy has taken the capabilities and limitations of the Google Assistant in mind. As a result it can be assured that the production of a fully working version is feasible, even with today's state of the technology. However, before releasing Tracy more development is required on mostly a technical- and content management level. The logic behind trip recommendations, collecting user locations and deep-linking to the website to finalise the booking need communication with Transavia's API's. The knowledge to build these connections is yet available at the company, meaning it only requires time, dedication and resources to take these final steps.

A bigger challenge is the creation and curation of the content that Tracy uses to do her work properly. Every destination contains events, must-sees, photography and weather/climate information which requires a lot of up-to-date content that is, tailored to Generation Z. Plus, for every phrase and fallback that Tracy knows, alternatives have to be made to keep her interesting to interact with a second time, thus not reusing the same script in every dialog. Apart from the workload to create this, it also requires someone with good script writing skills to make Tracy really come to life. Content managers at Transavia could fulfill this role, but might need to team up with interaction designers, storytellers, writers or professionals from similar related fields of expertise. The same goes for imagery or audio content that should be chosen carefully with the end user in mind. A strong content collection transforms Tracy into a real usable service instead of a gimmick. This is important for Transavia if it wants to utilise Tracy to make an impact in the pre-booking phase. She has to offer something different to users than what is already available. If not, customers will divert to Google Search or one of the meta-searches to find suggestions and destination information.

To tackle the workload It is advised to create content for the most popular destinations first, which are stated in paragraph 3.2. Secondly, not every information module has to be curated or even included right from the start. For example, there are plenty of existing weather API's that are easy to implement. Usage data gathered after release specifies which modules are most popular, indicating these should be optimised first. The design is easily scalable in that sense, as modules can be added, changed or deleted while keeping the recommendation feature intact.

7.1.2. Viability

The goal of this project was never directly aimed at a financial benefit. This thesis and a released version of Tracy contribute mostly in the field of gathering knowledge about Generation Z and unveiling more of the potential virtual assistants have for Transavia. If Tracy would be marketed effectively through channels relevant to Generation Z, a small percentage of users will end up booking one of the trips suggested by Tracy. However, its viability might be more directed towards brand awareness, customer engagement and learning about a new medium. These intangible effects are not easily measured, but could be adopted by Transavia's current marketing teams. In the end it is up to the company if a fully featured assistant is worth the investment to engage with Generation Z, or that other, less precious means should be considered first.

7.1.3. Desirability

The overall positive feedback gained from the user studies and -tests showed that Generation Z likes interacting with Tracy and the concept of recommending trips (instead of destinations), while providing information. There is enough indication for desire to proceed with a virtual assistant in this context and for this user group. A true validation with multiple users in a real life scenario is still required to be able to determine Tracy's desirability within the complete customer journey. From a design and technical perspective there are still some to-do's left to make Tracy live up to the user's expectations.

A way to navigate more freely in the conversation, especially being able to do steps back in the flow was a highly requested feature. Even though assistants from other brands lack this option too, it seems that the absence of such basic navigation is almost a showstopper.

Most customer groups, and ever more so Generation Z, are not per se devoted to flying with Transavia, but choose whichever airline offers the best price. That means if any meta-search releases a similar service like Tracy it is a direct threat to Transavia's assistant. A single airline can not realistically compete with that, apart from offering unique features or a better user experience to attract users.

7.2. General recommendations on virtual assistants for Transavia

Tracy uncovered only a small portion of the of the potential of virtual assistants, as it focussed on Generation Z, Google Assistant and pre-booking. Based on the findings of my explorations, the following recommendations can be used by Transavia to shape its overall strategy regarding assistants. It is much easier to predict the near future and to give advice on how to adapt to coming changes, but a few long term recommendations are proposed as well. Note that these are drafted upon the positive scenario that the popularity trend of virtual assistants carries on.

7.2.1. Short term (0-2 years)

Push the boundaries of currently available platforms

As mentioned before, the future of virtual assistants is very unpredictable. I expect that the coming years most companies will still be using the big assistant platforms from Google, Amazon, Apple or any other tech giant. This means they dictate both the capabilities and limitations while they are continuously in development. They will provide better sounding voices, higher intelligence, easier design tools and more customisation options. Transavia should stay on top of these changes and keep iterating using the expanded boundaries these updates deliver. Google Assistant is for now the best starting point because of its market share and development tools, but this can change quickly. As for every technology, there are plenty of smaller startups and initiatives that might offer simpler or more open-source based implementation.

Find unique use cases that are relevant for the Transavia customer

When building a new assistant it is important to consider if it adds any value at all. The technology has specific advantages and disadvantages and is not naturally always a good problem solver. In this thesis, the combination of Generation Z and pre-booking was carefully chosen as a topic, based on the company goals and popularity of virtuals assistants among younger ages. A similar approach could work for other touch points of the customer journey, or for other user groups. For example, blind, illiterate or elderly people could really benefit from conversational interactions. There lies a strength in such a non-generic approach as generic conversational services are already covered by the default Google Assistant itself. For example, users do not have to talk to Transavia to learn information about a destination, but can ask Google directly.

Focus on content, not on perfecting the voice

During this thesis the Google voices have been updated frequently, each time with significant improvements. Ideally Transavia has its own, unique voice, but creating one along the same quality standards is currently a very precious asset. Instead, focus on creating the right content to establish a tone-of-voice that matches the brand. Choose one of the available voices and add

some minor adjustments to get closer to the desired persona as discussed in this thesis. Perfecting the sound of every phrase is very time-consuming and the result is irrelevant to users who use the assistant on their smartphone in silent mode. Also, having the same voice on Google Assistant and Amazon Alexa, or any other platform is currently impossible anyway. Hopefully a high quality Dutch voice will be released soon to cater more to the customers in The Netherlands.

Focus on both mobile and smart speakers

The future of virtual assistants is already unclear, the adoption in the Dutch market even more so. When it comes to preferred device: it is very dependent on the use case. Assistants that are designed using Dialogflow are automatically available on every platform that it supports, meaning there is not much to gain from focussing on a specific device. It is important however to optimise the assistant for different device types. Voice-only experiences require clearer and shorter dialogs than smart screen experiences, for example.

7.2.2. Long term (+2 years)

Work towards a brand-wide audio identity

Looking at the pace in which Google Assistant's voices and customisability is being enhanced, it is very likely that it will get easier for brands to have their own unique voice. Startups like Lyrebird already showed how you can make your own voice with less resources. Whenever assistants become a substantial expression of a brand, it gets more crucial to think about how a brand should sound. Transavia may not yet be using sound as much as brands with a recognisable earcon, audio logo, jingle or voice actor, the need can change in the future. The voice and sounds used for Transavia's assistant should then become an integral part of the brand identity. A specific challenge for Transavia, as its services a wide variety of customers, is to find out whether a single voice can appeal to everyone. Alternatively the company can choose for multiple voices or personas that address specific customer segments, at the risk of blurring its own clear vocal identity.

Embed a personalised assistant in the full customer journey

Tracy made some first steps towards personalisation, but stayed on a relatively basic level. She is active during the pre-booking phase, but afterwards the relationship with the customer is broken and the user will not interact with her again. To sustain this relationship Transavia should explore how it can provide its customers with a personalised experience that stays relevant during the full customer journey.

Tracy offers a personalised experience only to Generation Z as a whole, but this can be expanded to the individual. A first step could be to further research relevant segmentation based

on age, gender, location or even personal taste and interests. The possibilities and feasibility are highly dependent on which user data can be collected under the user's consent in the future.

Take a stance in ethics and privacy

Already a relevant topic today, ethics and privacy are becoming increasingly relevant in artificial intelligence driven technology. Virtual assistants might seem to be mostly a fun and new way of interacting with a machine, they can have a more sociable impact. Brands should consciously think about how they want the relationship between their assistant and customers to be when a new level of intelligence is reached. The impact of a more intelligent, humane or emotional virtual assistant on relationships, loneliness or underaged users might still be far away, brands and designers will have to make deliberate ethical decisions. Subsequently, customers may not be on guard when sharing personal information in a conversational interaction that feels more intimate.

7.3. Personal reflection

This project started from a strong interest in novel technologies, its impact on humans and the new challenges the bring for (industrial) designers. Although I am used to working on different topics, each every project is different is some way, this one was probably the furthest out of my comfort zone. The learning curve to bring Tracy to life turned out to be even steeper than I expected, mostly due to the need to learn new tools and methods. Still, I really liked exploring these, but I just took far too much time in the end. There are a number of learnings I like to highlight in this final, personal reflection.

I did the majority of this project alone, which I should not have done. Often times I was not sure where to get the expertise from that I needed, caused mainly by the topic. Still, there were moments I got stuck in my own head where I should have asked for advice. That is not to say I never did, because I regularly had discussions with either friends, fellow students, Transavia employees or my supervisors. Still I felt the knowledge of technical limitations of virtual assistants were decisive for next steps. This made me lose the connection even more with the principles of my master's specialisation. If I knew this beforehand, I would have made this into quite a different project I think. Apart from collaborating for the expertise or fresh views, working with a team I much more enjoyable.

Half way during the project I found that virtual assistants operate much more linear than I hoped for. This made me choose between designing a working prototype using currently available technology, or pursue a more visionary long term approach. I chose the former as I always love

building something that works, but also because I felt that the future of assistants was too impossible to grasp to confidently ground this vision on.

Another thing that I've learned is that I should have started testing concepts much earlier. I am used to make three concepts after a research phase, but this time I kept the feeling that I was missing grounded proof why I made a certain concept to start testing with. As a result I kept exploring in the hope to learn more, without having a clear goal.

However, I am still excited about how it all turned out as I definitely learned a lot of new things. I still found it easy to stay positive, especially when the prototype improved after testing with users. Again, I did expect a bit more from Google Assistant's intelligence, as I recall many *"Why is this not possible?"*- moments, but I accepted that within its boundaries I should try to get the most out of it.

A graduation project is the perfect moment to apply the skills you have developed over the years. However, many things I have done I did for the first time. I am happy I took the risk, but I am not convinced it showed my capabilities to the fullest.

On a final note, I am very thankful to Transavia for giving me this opportunity and all of the supervisory team for their support (and patience) all this time.

8. References

Alderighi, M., Cento, A., Nijkamp, P., & Rietveld, P. (2012). Competition in the European aviation market: the entry of low-cost airlines. *Journal of Transport Geography*, *24*, 223–233. https://doi.org/10.1016/J.JTRANGEO.2012.02.008

Allianz Partners. (2017). Air France launches Louis, the virtual assistant luggage expert Read more at https://allianzpartners-bi.com/news/air-france-launches-louis-the-virtual-assistant-luggage-expert-1cdd-333d4.html#fcukhuvzK2IJCmtc.99. Retrieved May 10, 2018, from https://allianzpartners-bi.com/news/air-france-launches-louis-the-virtual-assistant-luggage-expert-1cdd-333d4.html

Bhardwaj, P., & Gal, S. (2018). Siri owns 46% of the mobile voice assistant market — one and half times Google Assistant's share of the market. Retrieved July 2, 2018, from https://www.businessinsider.nl/siri-google-assistant-voice-market-share-charts-2018-6/

Boogert, E. (2018). Helft interacties Google Assistant zijn 'multimediaal.' Retrieved September 9, 2018, from https://www.emerce.nl/nieuws/helft-interacties-google-assistant-multimediaal

CTV News. (2017). New travel trends report shows how fliers search and book flights. Retrieved December 20, 2017, from https://www.ctvnews.ca/lifestyle/new-travel-trends-report-shows-how-fliers-search-and-book-flights-1.3345246

Dialogflow. (2019). Intents overview. Retrieved February 2, 2019, from https://dialogflow.com/docs/intents

Emerce. (2017). Infographic: de opmars van spraakhulpjes. Retrieved December 7, 2017, from https://www.emerce.nl/nieuws/infographic-opmars-spraakhulpjes

Fingas, J. (2017). Samsung's virtual assistant might live in your fridge. Retrieved December 28, 2017, from https://www.engadget.com/2017/05/15/samsung-bixby-on-refrigerators/

Google. (2016). *It's Lit*.

IATA. (2017). 2036 Forecast Reveals Air Passengers Will Nearly Double to 7.8 Billion. Retrieved May 5, 2018, from https://www.iata.org/pressroom/pr/Pages/2017-10-24-01.aspx

Kinsella, B. (2018). Google Assistant Has 51% Virtual Assistant Market Share on Smartphones According to Strategy Analytics. Retrieved August 10, 2018, from https://voicebot.ai/2018/07/22/google-assistant-has-51-percent-virtual-assistant-market-share-on-smartphones-according-to-strategy-analytics/

Kleber, S. (2018). *Finding the right voice for AI*. Amsterdam: Open Voice Conference.

KLM. (2018). Meet BB. Retrieved May 13, 2018, from https://bb.klm.com/en

Koetsier, J. (2018). AI Assistants Ranked: Google's Smartest, Alexa's Catching Up, Cortana Surprises, Siri Falls Behind. Retrieved June 10, 2018, from https://www.forbes.com/sites/johnkoetsier/2018/04/24/ai-assistants-ranked-googles-smartest-alexas-catching-up-cortana-surprises-siri-falls-behind/#4feeffbb492a

Manthorpe, R. (2017). The human (and Pixar characters) inside Google's Assistant. Retrieved December 1, 2017, from https://www.wired.co.uk/article/the-human-in-google-assistant

Premack, R. (2018). Millennials love their brands, Gen Zs are terrified of college debt, and 6 other ways Gen Zs and millennials are totally different. Retrieved July 28, 2018, from https://www.businessinsider.nl/gen-zs-habits-different-from-millennials-2018-6/

PWC. (2018). Prepare for the voice revolution. Retrieved January 12, 2019, from https://www.pwc.com/us/en/services/consulting/library/consumer-intelligence-series/voice-assistants.html

Statista. (2019). Worldwide intelligent/digital assistant market share in 2017 and 2020, by product. Retrieved January 5, 2019, from virtual assistant market share

Törőcsik, M., Szűcs, K., & Kehl, D. (2014). How Generations Think: Research on Generation Z. *ActA UniversitAtis SApientiAe, CommUnicAtio*, (1), 23–24.

Transavia. (2018). About Transavia. Retrieved January 4, 2018, from https://corporate.transavia.com/en-NL/home/

Turner, A. (2015). Generation Z: Technology and Social Interest. *The Journal of Individual Psychology*, *71*, *Number 2*, 103–113.

Van Boeijen, A., & Daalhuizen, J. (2010). *Delft Design Guide*. Delft: Faculteit Industrieel Ontwerpen.

Virji, P. (2018). *Purna Virji (Microsoft) On the 4 C's of designing conversational AI | TNW Conference 2018*. Retrieved from https://www.youtube.com/watch?v=nCH8b1pUyG4

Welch, C. (2018). Google just gave a stunning demo of Assistant making an actual phone call. Retrieved May 9, 2018, from https://www.theverge.com/2018/5/8/17332070/google-assistant-makes-phone-call-demo-duplex-io-2018

Wilkinson, J. (2018). Air New Zealand leads the way with Google Assistant. Retrieved November 2, 2018, from https://wayfarer.travel/air-new-zealand-leads-way-google-assistant/

9. Appendix

Appendix A
Sensitising booklet

Sensitizing booklet

TU Delft transavia

Hi! 😊

Wat leuk dat je mee wilt doen met dit onderzoek!

Voor mijn afstudeerproject aan de TU Delft probeer ik in kaart te brengen hoe jongeren **vliegtickets boeken** en hoe ze **spraakhulpjes** gebruiken. De resultaten zullen worden gebruikt om te experimenteren naar manieren om vliegtickets te boeken via een spraakrobot!

In dit boekje staan een aantal korte opdrachten die te maken hebben met deze onderwerpen. Het kost je een paar minuten per dag. Probeer zo precies mogelijk antwoord te geven, en weet: geen enkel antwoord is fout!

Als je alle 4 de dagen hebt ingevuld kun je het boekje weer teruggeven aan mij, of aan diegene van wie je het boekje hebt ontvangen. Een aantal deelnemers wil ik vervolgens graag uitnodigen voor een vervolgonderzoek. Hier is een financiele vergoeding aan verbonden.

Vragen? Je mag me altijd appen of bellen op **06-51264781**.

Veel succes!

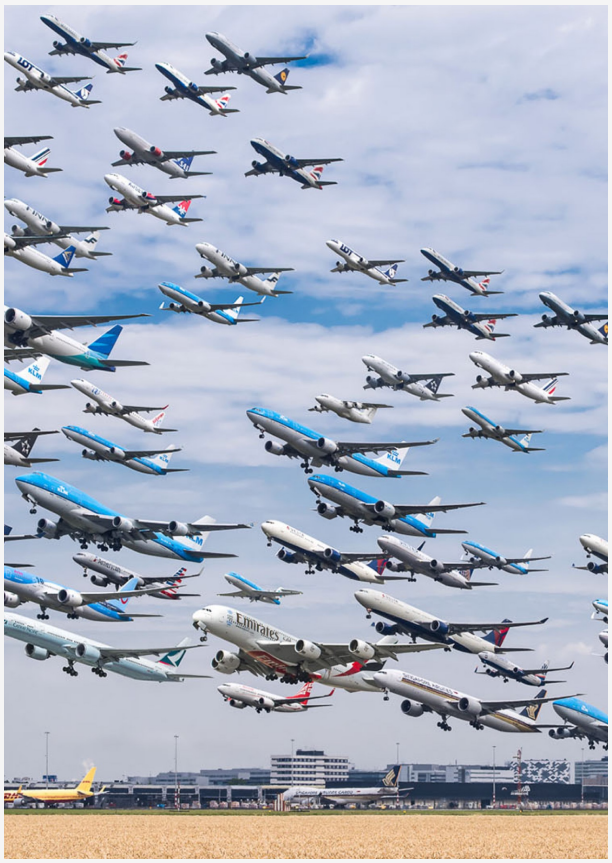
Hekon van Duijvendijk
Masterstudent Design for Interaction, TU Delft

Introduceer jezelf!

Hoe heet je?
(Je mag ook een naam verzinnen als je dat liever wilt!)

Hoe oud ben je?

Wat zijn je favoriete apps op je telefoon?



Dag 1: Mijn laatst geboekte vlucht

Hoi! De opdracht van vandaag gaat over de laatste vlucht die je hebt geboekt. Dit kan voor een vakantie zijn, of misschien ging je op bezoek bij iemand in het buitenland? Het is hierbij belangrijk dat je je een vliucht herinnert die jij zelf hebt geboekt! Wil je de onderstaande vragen invullen?

Waar ging je laatste vlucht naartoe die jij hebt geboekt?
(bijvoorbeeld: Rome, Parijs, Indonesië, etc...)

Waarom heb je deze bestemming gekozen? (bijvoorbeeld: prijs, nooit eerder geweest, mooie stranden, niet te ver weg, etc...)

Hoeveel tickets had je geboekt? En voor wie? (bijvoorbeeld: goede vriend, beste vriendinnen, mijn ouders, etc...)

Waarom boekte je alleen voor jezelf of juist ook voor anderen?

Waar heb je de tickets geboekt? (bijvoorbeeld: via de website van KLM, vergelijkingssite, boekingskantoor, etc...)

Waarom heb je ze hier geboekt?

Waar was je precies tijdens het boeken?
(bijvoorbeeld: in de stad, woonkamer, op school, buiten, etc...)

Waarom was je op die plek?

Met wie was je tijdens het boeken? (bijvoorbeeld: alleen, samen met een vriend, mijn beste vriendinnen, ouders, etc...)

Waarom was je met anderen of juist alleen?

Thanks! Dat was de laatste vraag van vandaag!
Tot morgen :D

Dag 2: Mijn ideale boeking

Gisteren heb je verteld over je laatst geboekte vlucht. Vandaag ben ik benieuwd wat je leuk vind aan boeken, en wat juist niet. Op de volgende pagina mag je omschrijven hoe je ideale boeking er uit zou zien. Succes!

Wat vind je het leukst aan het boeken van een vlucht?

En wat het minst leuk?

Hoe zou je ideale boeking er uit zien? (denk aan locatie, met wie je bent, tijdstip, hoe de boeking er uit ziet, etc...)

Dank je wel! Morgen gaan we weer verder.

Dag 3: Mijn spraakhulpje

De komende 3 dagen gaan over spraakassistenten, ofwel spraakhulpjes. Je kunt ze nu vooral vinden op je telefoon, maar steeds vaker ook op andere producten. Bij allemaal kun je je stem gebruiken om ze te besturen. Vandaag wil ik graag weten in hoeverre je deze technologie gebruikt.

Kun je de producten op de foto hiernaast benoemen?

1.
2.
3.
4.
5.
6.

Welke producten die spraak ondersteunen gebruik je zelf wel eens?

Hoe vaak gebruik je een spraakhulpje ongeveer?

Waarvoor gebruik je dan vooral?

Waarom doe je dit het liefst via een spraakhulpje?

Dank je!

Dag 4: Mijn spraakhulpje (2)

De opdracht van vandaag gaat over hoe je je huidige spraakhulpje zou omschrijven. Op de komende pagina's zie je 20 eigenschappen staan. Per eigenschap kun je aangeven in hoeverre je het daar mee eens bent.

1. Vrolijk
Blij, opgewekt

2. Open
Sluit zich niet af, toegankelijk

3. Relaxed
Niet overhaastig, ontspannen

4. Leuk
Aardig, aantrekkelijk, charmant

5. Vlot
Los, ongedwongen

6. Schattig
Erg lief, snoezig

7. Eigenzinnig
Afwijkend, eigenaardig

8. Uitdagend
Provocerend

9. Interessant
Prikkelt de nieuwsgierigheid

10. Pittig
Krachtig, energiek

	Helemaal oneens :(			Neutraal			Helemaal mee eens!
1	☐	☐	☐	☐	☐	☐	☐
2	☐	☐	☐	☐	☐	☐	☐
3	☐	☐	☐	☐	☐	☐	☐
4	☐	☐	☐	☐	☐	☐	☐
5	☐	☐	☐	☐	☐	☐	☐
6	☐	☐	☐	☐	☐	☐	☐
7	☐	☐	☐	☐	☐	☐	☐
8	☐	☐	☐	☐	☐	☐	☐
9	☐	☐	☐	☐	☐	☐	☐
10	☐	☐	☐	☐	☐	☐	☐

11. Opdringerig
Vraagt negatief om aandacht

12. Dominant
Overheersend

13. Slordig
Rommelig, onverzorgd

14. Kinderachtig
Kinderlijk, onvolwassen

15. Dom
Onnozel, stom

16. Saai
Eentonig

17. Afstandelijk
Terughoudend, koel

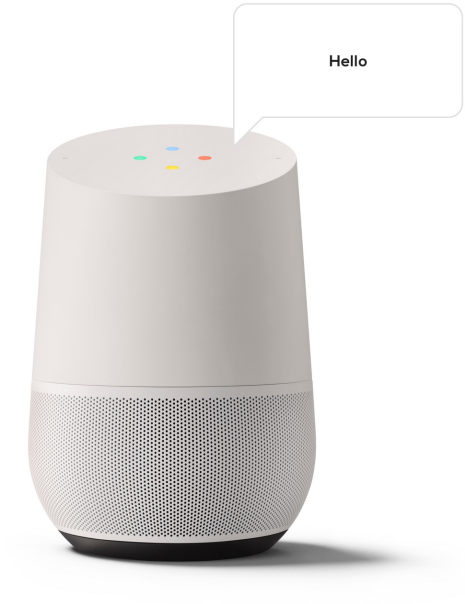
18. Serieus
Verstandig, volwassen

19. Bescheiden
Niet op voorgrond, ingetogen

20. Eerlijk
Te vertrouwen, oprecht

	Helemaal oneens :(			Neutraal			Helemaal mee eens!
11	☐	☐	☐	☐	☐	☐	☐
12	☐	☐	☐	☐	☐	☐	☐
13	☐	☐	☐	☐	☐	☐	☐
14	☐	☐	☐	☐	☐	☐	☐
15	☐	☐	☐	☐	☐	☐	☐
16	☐	☐	☐	☐	☐	☐	☐
17	☐	☐	☐	☐	☐	☐	☐
18	☐	☐	☐	☐	☐	☐	☐
19	☐	☐	☐	☐	☐	☐	☐
20	☐	☐	☐	☐	☐	☐	☐

Top, je bent al weer klaar!
Morgen is al de laatste dag :)



Dag 5: Boeken via spraakhulpjes

Hoi! De opdracht van vandaag gaat over de laatste vlucht die je hebt geboekt. Dit kan voor een vakantie zijn, of misschien ging je op bezoek bij iemand in het buitenland? Het is hierbij belangrijk dat je je een vliucht herinnert die jij zelf hebt geboekt! Wil je de onderstaande vragen invullen?

1. Vrolijk
Blij, opgewekt

2. Open
Sluit zich niet af, toegankelijk

3. Relaxed
Niet overhaastig, ontspannen

4. Leuk
Aardig, aantrekkelijk, charmant

5. Vlot
Los, ongedwongen

6. Schattig
Erg lief, snoezig

7. Eigenzinnig
Afwijkend, eigenaardig

8. Uitdagend
Provocerend

9. Interessant
Prikkelt de nieuwsgierigheid

10. Pittig
Krachtig, energiek

	Helemaal oneens :(			Neutraal			Helemaal mee eens!
1	☐	☐	☐	☐	☐	☐	☐
2	☐	☐	☐	☐	☐	☐	☐
3	☐	☐	☐	☐	☐	☐	☐
4	☐	☐	☐	☐	☐	☐	☐
5	☐	☐	☐	☐	☐	☐	☐
6	☐	☐	☐	☐	☐	☐	☐
7	☐	☐	☐	☐	☐	☐	☐
8	☐	☐	☐	☐	☐	☐	☐
9	☐	☐	☐	☐	☐	☐	☐
10	☐	☐	☐	☐	☐	☐	☐

11. Opdringerig
Vraagt negatief om aandacht

12. Dominant
Overheersend

13. Slordig
Rommelig, onverzorgd

14. Kinderachtig
Kinderlijk, onvolwassen

15. Dom
Onnozel, stom

16. Saai
Eentonig

17. Afstandelijk
Terughoudend, koel

18. Serieus
Verstandig, volwassen

19. Bescheiden
Niet op voorgrond, ingetogen

20. Eerlijk
Te vertrouwen, oprecht

	Helemaal oneens :(			Neutraal			Helemaal mee eens!
11	☐	☐	☐	☐	☐	☐	☐
12	☐	☐	☐	☐	☐	☐	☐
13	☐	☐	☐	☐	☐	☐	☐
14	☐	☐	☐	☐	☐	☐	☐
15	☐	☐	☐	☐	☐	☐	☐
16	☐	☐	☐	☐	☐	☐	☐
17	☐	☐	☐	☐	☐	☐	☐
18	☐	☐	☐	☐	☐	☐	☐
19	☐	☐	☐	☐	☐	☐	☐
20	☐	☐	☐	☐	☐	☐	☐

Appendix C
Study on (pre-)booking interactions through dialogue

Goal

One could say that (pre-)booking through a virtual assistant exhibits similarities with booking at a travel agency or call centre: both are conversational. In human-to-human interactions information is exchanged in a loop of question and response. Customer and employee can both steer the conversation and ultimately try to reach a mutual goal. This study tries to find out how this process manifests exactly to learn more about the following:

1. How does the conversation kick off?
2. Which tone of voice is used during a conversation?
3. What questions do users ask to get to a completed booking?
4. Do users ask questions related to pre-booking?
5. How is the conversation concluded?

Setup

This study took place at Transavia's customer support office which is located in Prague. Apart from the call centre most of the company's webcare, social media and email support is handled here as well. Initially I preferred to do user observations at physical stores on travel agencies, but unfortunately none were found willing to cooperate.

For about four hours all phone calls between an operator in the 'booking-shift' and her customers were observed, so only relevant incoming phone calls were included. Initially I made notes during calls, writing down recurring questions and responses. Additionally each phone call is recorded which is standard procedure at the call center. In case conversations required deeper analysis these recording could be accessed. Basic personal information about age and gender were noted as well to optionally extract unique aspects on Generation Z.

Operator at BlueLink, Prague

Results

During the four hour observation only three customers called to book a flight. By default these customers are advised to book through the website as Transavia charges ten euros for booking through the call center. This motivated all three customers to wrap up the call and proceed to the website.

During talks with the operator I learned that less than one percent of all incoming calls are related to booking. Pre-booking is not really part of the call center's service. From this one percent almost no one completed the booking on the phone, but went to the website, just like during my observations. In the rare event that bookings are done over the phone, it involves edge cases. For example, it is not possible to book assisted flights for 5-11 year olds online. Additionally, mostly elderly customers prefer to use services directly with an operator over dealing with matters online.

As this study did not yield the intended results relevant for this thesis, no transcriptions or recordings have been appended.

Discussion

It is confirmed again that internet has taken over as the main platform for pre-booking and booking activities. Clearly, Generation Z is very likely to consult the web during both phases. The ten euro booking fee seems to seems to be the final discouragement for callers to go elsewhere for their booking needs. Although study 1 provided qualitative user insights of this generation, not much is known yet about its actual quantitative behaviour on the Transavia website. In study 3 booking data about Generation Z will be analysed to provide another perspective on the user.

Appendix D
Prototype user test scenario and interview

Prototype 1: User test

A. Scenario

You will be participating in a user test for a holiday recommender with a virtual assistant. Imagine you just started thinking of planning your next summer holiday and are looking for inspiration. Decide for yourself if you have specific dates when you want to travel or not. Call the assistant by saying “Talk to Travelling Tracy”.

B. Concluding interview

1. **First impression**

   What do you think of the idea of a conversational destination recommender?

   Would you use something like this, and why (not)?

2. **Design**

   What do you think of the voice?

   What do you think of the language and wording?

   What do you think of the visuals and audio content?

3. **System**

   On which device are you most likely to use a service like this?

4. **Open suggestions**

   What would you change?

   What would you leave out?

   What would you add?

Appendix E
Final design logic in Dialogflow

		Intent	Question	R1	R2	R3	R4	R5	R6	Context in	Context out
	1	Welcome	Hi! I'm Tracy! I can help you find the perfect holiday destination! Shall I help you decide?	Let's do it > 2	Nah, I'm good > 1b					-	location, marrakesh
	1b	Welcome: No	No problem! If you ever need my help, you know where to find me.	-						location	-
	2	Location	Fun! Is it ok if I check your location so I can give better suggestions?	Sure > 3	Hmm, no > 3					location	dates
	3	Dates	Ok! Do you have exact dates in mind for your trip?	Yes / $period > 3b	No > 4					dates	dates2
	3b	Dates: Confirm	I have noted $period. Did I get that right?	Yes > 5	No > 5					dates2	cities
	4	DaysMoHo	Good, thats makes things easier for me! How many days would you like to go?	$numdays / $holiday / $month						dates2	dates3
	4b	DaysMoHo: Confirm	I will look for trips of $number days in $moho. Ok?	Yes > 5	No > 5					dates3	cities
	5	Cities	Good! I will search for trips in that period... Done already! I've found these options for you:	Yes	Marrakesh	Barcelona	Pula			cities	marrakesh
	6	Marrakesh	Enchanting palaces, breathtaking mosques, colourful markets and a square to excite all your senses: welcome to magical Marrakesh! What do you want to know more about?	Events > 6a	Hotspots > 6b	Weather > 6c	Practical > 6d	Book now > 6e	Other destinations > 5	marrakesh	marrakesh, cities
	6a	Marrakesh: Events	Check out these activities and events!	-	Hotspots > 6b	Weather > 6c	Practical > 6d	Book now > 6e	Other destinations > 5	marrakesh	marrakesh, cities
	6b	Marrakesh: Hotspots	Marrakesh has plenty of cool places for you to see!	Events > 6a	-	Weather > 6c	Practical > 6d	Book now > 6e	Other destinations > 5	marrakesh	marrakesh, cities
	6c	Marrakesh: Weather	You are lucky, during your stay the weather in Marrakesh will be quite sunny: around 23 degrees! Only on Saturday you might want to bring an umbrella into town...	Events > 6a	Hotspots > 6b	-	Practical > 6d	Book now > 6e	Other destinations > 5	marrakesh	marrakesh, cities
	6d	Marrakesh: Practical	Here is some info you should check before you go!	Events > 6a	Hotspots > 6b	Weather > 6c	-	Book now > 6e	Other destinations > 5	marrakesh	marrakesh, cities
	6e	Marrakesh: BookNow	I'm happy I got you excited about Marrakesh! Click the link below to proceed with your booking!	Book now!	About Marrakesh > 5	Other destinations > 5				marrakesh	marrakesh, cities