

Flystance: An app that allows air travellers to travel worry free during their journey.

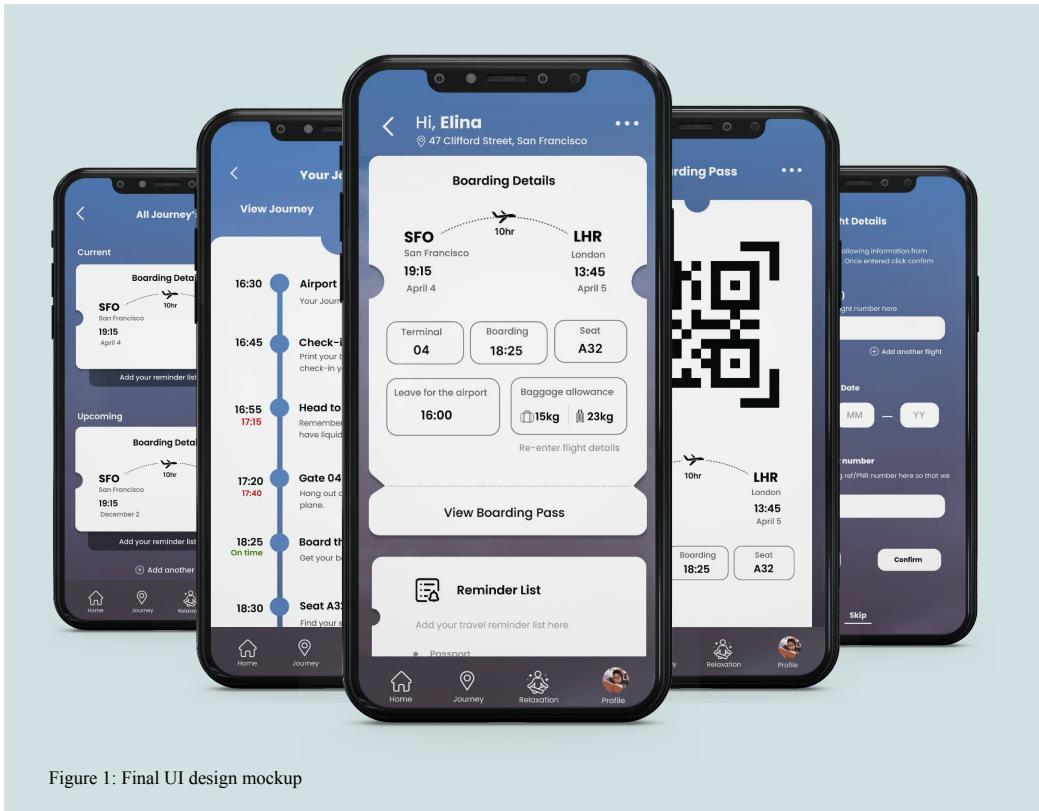


Figure 1: Final UI design mockup

Abstract

In an ever globalising world, air travel is becoming an essential part of people's lives. It connects friends, families and businesses together. Aircrafts, airports and air safety have come a long way since passenger flights were first introduced, however the fear and chaos of air travelling still remains a problem for many. Evidence shows that over the last decade, traveller satisfaction with air travel experience has steadily declined. This project aims to reduce the chaos and fears of travellers flying by air and improve the overall experience. The project app will help users through guided navigation, helpful checklists, regular reminders, and proven de-stressing activities amongst other things. The goal of the app is to improve the overall experience of air travel leaving passengers more satisfied and hopefully boosting the air travel industry.

Introduction

At present, air travel is not as smooth of a process as people may hope. With increased security checks, strict baggage rules, and obnoxious waiting times, air travel is seen as more of a chore than a pleasure by some. Holidaymakers break away from their jobs and homes to have a stress free holiday only to find that the start of their vacation is very straining (Batra, 2021)

DeFrank et al. (2000) defines travel stress as “the perceptual, emotions, behavioural, and physical responses made by an individual to the various problems faced during one or more of the phases of travel”. In this way, air travel is understood as the human reaction to unnerving triggers.

Individual travellers play a pivotal role in sustaining the air travel industry more than businesses or governments. Despite this, not much attention has been provided to improve the experience for the individual traveller, with research showing low level of traveller satisfaction. According to Awori et al. (2012) airlines rank the lowest among all industries when it comes to the number of satisfied customers. This research paper also indicates that business travellers, who pay premiums for perks, are the least satisfied with the air travel experience.

Background research

Duncan Madden (2019) of Forbes surveyed 1,700 Brits to understand what aspects of air travel are the most stressful. An astounding 49% stated that baggage collection is the most stressful part, whereas 47% have said that security and waiting for transfers is stress inducing. Getting stuck on the way to the airport is a worry for 63% of the 1,700 people. This evidences that air travel is a cause of concern for the industry, and something that needs to be addressed.

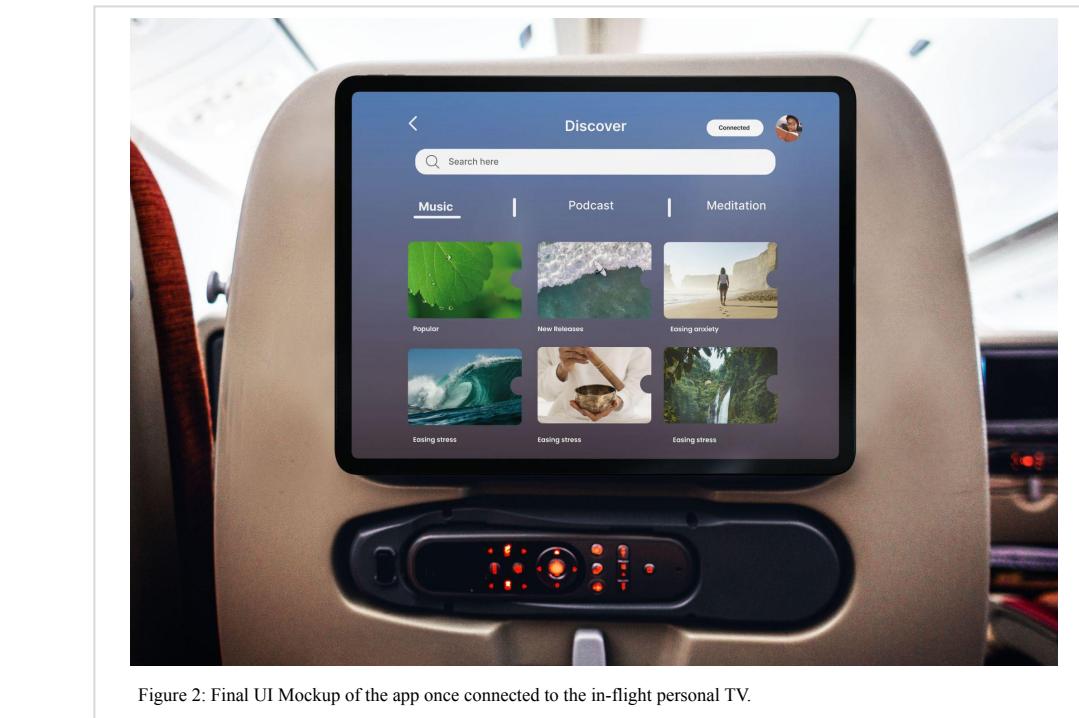


Figure 2: Final UI Mockup of the app once connected to the in-flight personal TV.

A research paper by Zehrer & Crots (2012) divides leisure travel into three stages of stress: pre-trip stress, travel stress (i.e. air travel stress), and at-destination stress. Even though pre-travel and at-destination stresses have been at the centre of many research papers, studies on air travel stress have been stagnant (McIntosh, 2006; Batouei et al. 2019; Zhang et al. 2021).

Bricker (2005) research shows that the factors most commonly leading to air-travel stress are delayed / cancelled flights, missed flights, long waiting periods and health and safety concerns. This is further evidenced by the survey conducted for this research which shows the same factors as being stress inducing during the air travel journey. The research paper further goes on to explain that irritating factors also contribute to the hardship are baggage allowances, loud environments, crying babies, and annoying people.

Awori et al. (2012) explains that navigation and wayfinding in travel continues to be an important area of focus for many researchers. This is particularly true for air travel where many passengers get lost in airports.

McIntosh et al. (1988) mentions that fear and anxiety associated with travelling are a common occurrences and can be a significant portion of the travel experience, particularly for those travelling by air.

The research presented above clearly identifies air travel as stress inducing for travellers. It is the purpose of this research pictorial to find a solution to help people relieve some of that stress.

Coping Strategies

Passengers have found several ways to cope with the air travel worries. McIntosh (2003) explains that some passengers distract themselves by reading, writing, and utilising relaxation techniques such as listening to music. Bernardi et al. (2006) explains that listening to music with a slow or meditative tempo induces relaxation in people by slowing their breathing and normalising their heart rate. Contrary, listening to fast tempo music has the opposite impact on people.

Liu et al. (2015) found that in-flight videos and music systems have been strong factors in improving the comfort level of passengers. However, currently the in-flight music available do not address the stress that passengers feel while flying.

Related work

Flytalk is a social media inspired prototype mobile app designed by Awori et al. (2012). It is an app based on feeds and short messages similar to Twitter. By using Wifi beaconing information, the app identifies the airport that the user is in and where the user is located within the airport. Subsequently, after requesting the user to enter some travel information, the app meaningfully filters the information presented in the feeds as per the pre-set criteria. Through using messages from official sources, such as announcements, the app provides the user with highly relevant information for their airport journey so that nothing is missed. Additionally, the app allows users to post messages, updates and opinions to the space in order to aid other app users. By having this information in a single, easy to access space, airport travellers feel less worried about missing key information which in turn distressed them. Note that Flytalk mostly works on user generated content, with limited information obtained from official sources. As such, it is dependent on people posting useful information for the Flytalk community to benefit.

Current available solutions

Triplt

Triplt is an app that has similar solutions to the problems discussed in the background research. With a clean and user-friendly interface, it makes it easy to organize and manage travel itineraries for the user. It provides relevant information in an easy to read format for the user; such as the flight details, hotel reservations, and transport options. Nonetheless there are some drawbacks to the app. It is noted that the app's search functionality is something to be desired. The search results are not always accurate of up-to-date.

Calm

Another currently available solution to the problem this paper is discuss is the app - Calm. The app focuses on providing personalised content based on the user preferences for meditation techniques and meditation music. The app allows for seamless integration with Apple watch and Google home to create a connected environment. There are some disadvantages to the app. For example, the number of free content available is limited. The subscription costs are quite high, and the variety in meditation practices available is low. Nonetheless, a study by Huberty et al. (2019) showcases that Calm has been an effective tool to reduce stress and improve mindful meditation.

Problem statement

After gaining insights from research, the next stage is to define the problem. With enough evidence showing that air travel, both for business and pleasure, has been found to generate significant stress on passengers. It detracts from the whole travel experience, leading to discomfort for the traveler. As such, it is critical to identify ways to mitigate air-travel related stress and create a more enjoyable journey for the passenger.

Stakeholders

After the defining the problem, subsequent stage is to ascertain the parties concerned, referred to as stakeholders. In the context of this project, it is crucial to recognize and classify the stakeholders (Lyon et al., 2020). The primary stakeholders consist of first-time travellers, avid travellers and airline stuff. The secondary stakeholders encompasses airline companies, family and airports, while the tertiary stakeholders comprise of competitors and the general public.

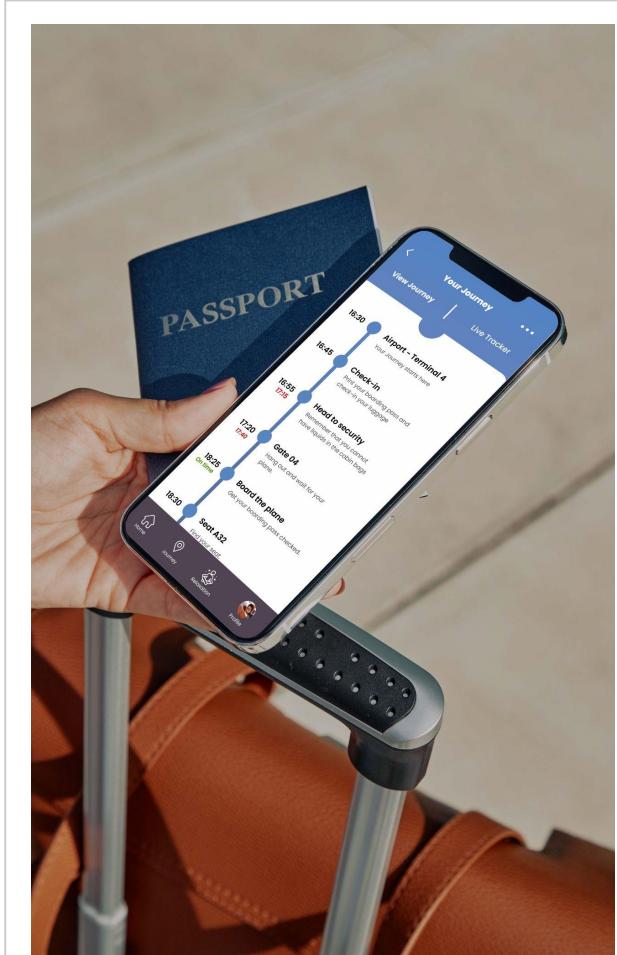


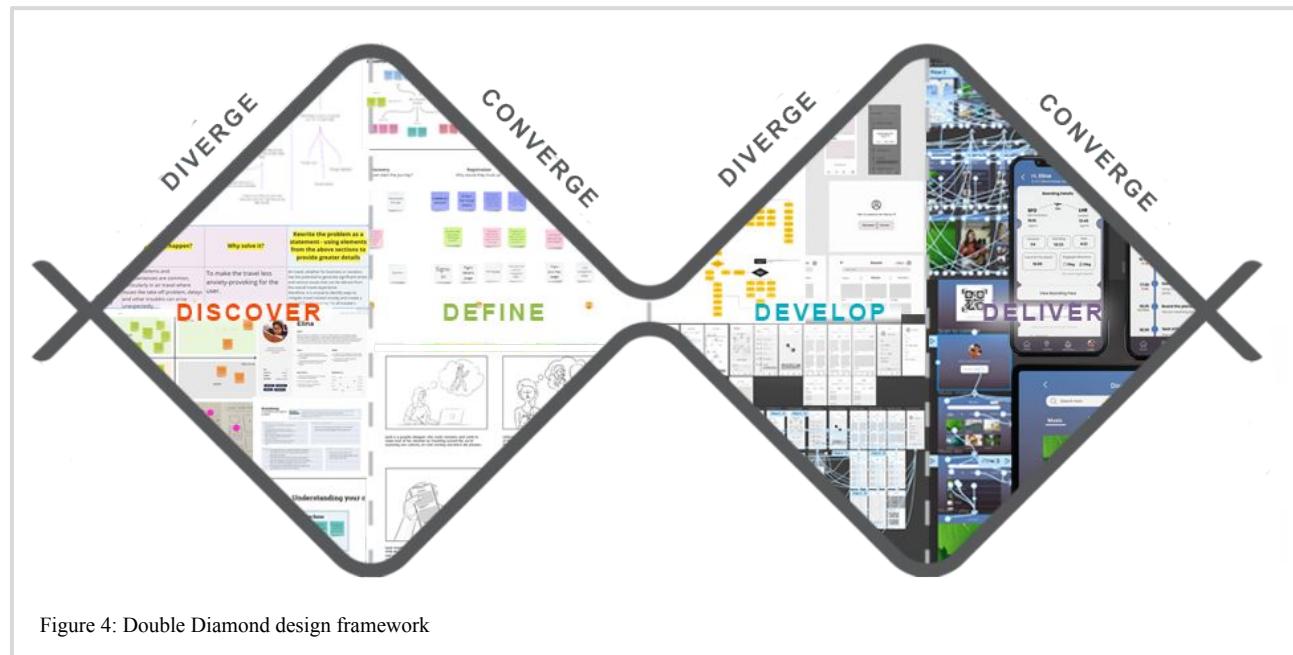
Figure 3: Mockup of a person using the prototype

Approach

After reframing the problem statement, The aim of this research is to design a mobile app that helps travellers overcome the stress and worries associated with passenger air travel. A combination of research and development methods have been used to design the app. Initially, background research was conducted to identify the problem and realise that it is an actual issue in society. Subsequently, a primary survey was conducted to narrow on the stress triggers of air travel which the app will target. Following this, personas were created that would be used as guided target users for the app. These acted as the main target audience. Following this, a low fidelity version of the app was developed through Figma and live user tests were run. By running the live user tests, design and user flaws were identified within that were worked on and incorporated in the second prototype iteration. The previous step was repeated on the second Figma iteration to further identify the pain points of the app. These were incorporated into the third and final version.

The Double Diamond approach was followed for the design and development journey of the app. The Double Diamond approach involves four stages (Design Council, 2019) discover, define, develop, and deliver. It is a framework used in UX design to create an effective solution to meet users' needs.

- Discover - This stage is where the problem is discovered. Background research and surveys aide in this stage.
- Define - At this stage, the issue is defined and initial ideas start floating on how to tackle the problem.
- Develop – During this stage, the product is developed. Prototypes are created and user tests are run to identify the problems.
- Deliver - At the final stage, the product enters its final edits and developments. Final user testings are performed to understand further tweaks to be made before deployment.



Ideation

After conducting background research, on why people face stress at the airport and the coping mechanisms that can be adopted, ideation was conducted. In this phase, questions were asked to better understand the stress factors; why it needs to be addressed; and who benefits from resolving the problems.

How Might We

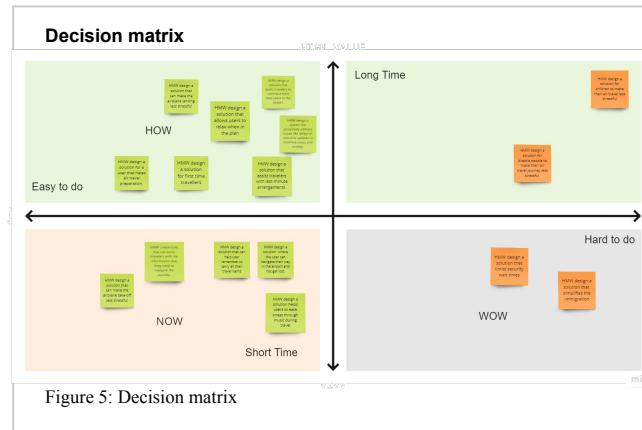
The HMW method utilises creativity to address the problems at hand. The method encourages the designer to ask questions such as “How might we alleviate stress during the journey?”; “How might we help passengers navigate their way seamlessly through the airport?”. Considering these questions help generate some potential solutions, simplify complex problems and make the design solution focused.

Decision Matrix

The decision matrix is a tool utilised to optimally evaluate potential solutions and effectively make design decisions. The HMWs were inputted into the Decision Matrix to understand the tasks that take a short time and are easy to do versus those that take a long time and are hard to do. Arranging the tasks within this grid helped prioritise the actions that need to take priority and those that can be tackled at a later stage.

Tasks identified as those taking a long time and hard to do were “HMW design a solution that simplifies the immigration process”. This is considered a challenge due to the various immigrations process across the world and the complex requirements involved therein.

Contrarily a HMW identified as “NOW” is “HMW create tools that can assist travellers with the information they needs to navigate the journey?” This can be easily resolved by using GPS technology.

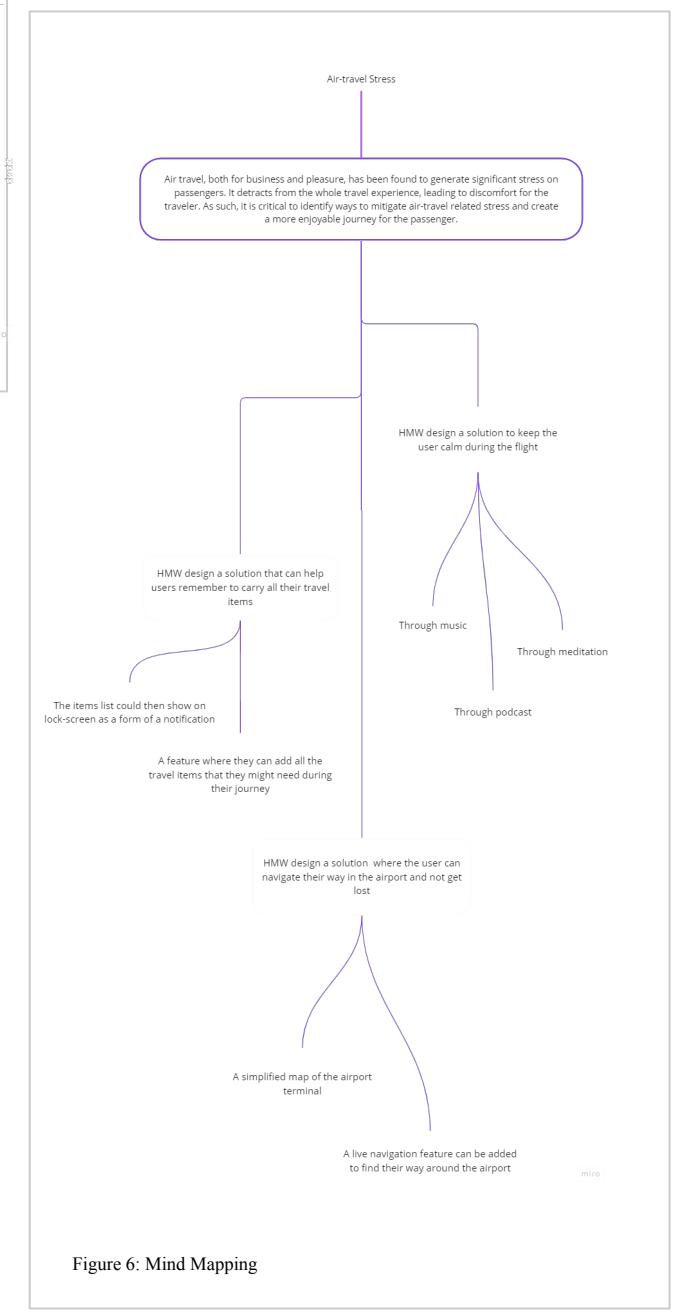


Mind Mapping

With the aid of the Decision Matrix, three HMWs were selected to create mind maps; “HMW design a solution that can help users remember to carry all of their travel items?”, “HMW design a solution where the user can navigate their way through the airport and not get lost?”, “How might we design a

user calm during the flight?”. The mind maps helps to contextualise the solutions based on criteria connections. The mind maps also assists in visualising solutions that overlap between HMWs so that these may address multiple issues at once. It provides a visually stimulating environment so that the brain is able to retain the information easier (Chik et al., 2007).

Several solutions were identified from the mindmap that will be incorporated into the design solution. For example, GPS navigation can be used to help users navigate the airport and reach their gate on time. Meditation music is a solution to calm nerves and destress people during the flight.



Understanding the user

Before creating the personas, we need to understand the user. One way in which this can be done by understanding the user environment and demographic. This information was collected through a survey which then assisted in designing the personas.

Survey results and findings

As part of the research, a survey was conducted with 15 participants who have all travelled by air. With the majority of the participants aged between 21 - 30 years old, the survey found that 53% travelled a few times a year and 40% travelled once a year or less. For the respondents who answered they do not enjoy air travel, a few commented that "it is too tiring and uncomfortable" and "fear of heights... occurrence of turbulence" and "frustrating experience requiring a lot of forward planning". The main factors that contribute to air travel stress are found to be delays/cancellations, check-in and immigration, and baggage handling. To cope with air travel stress, respondents said that lounge access is a method they have previously used. Mobile apps is another form of stress relief used by the respondents of air travel. Finally, when asked if the respondent will use an app that offers stress reducing services, 80% have said that they are somewhat or very likely to use it.

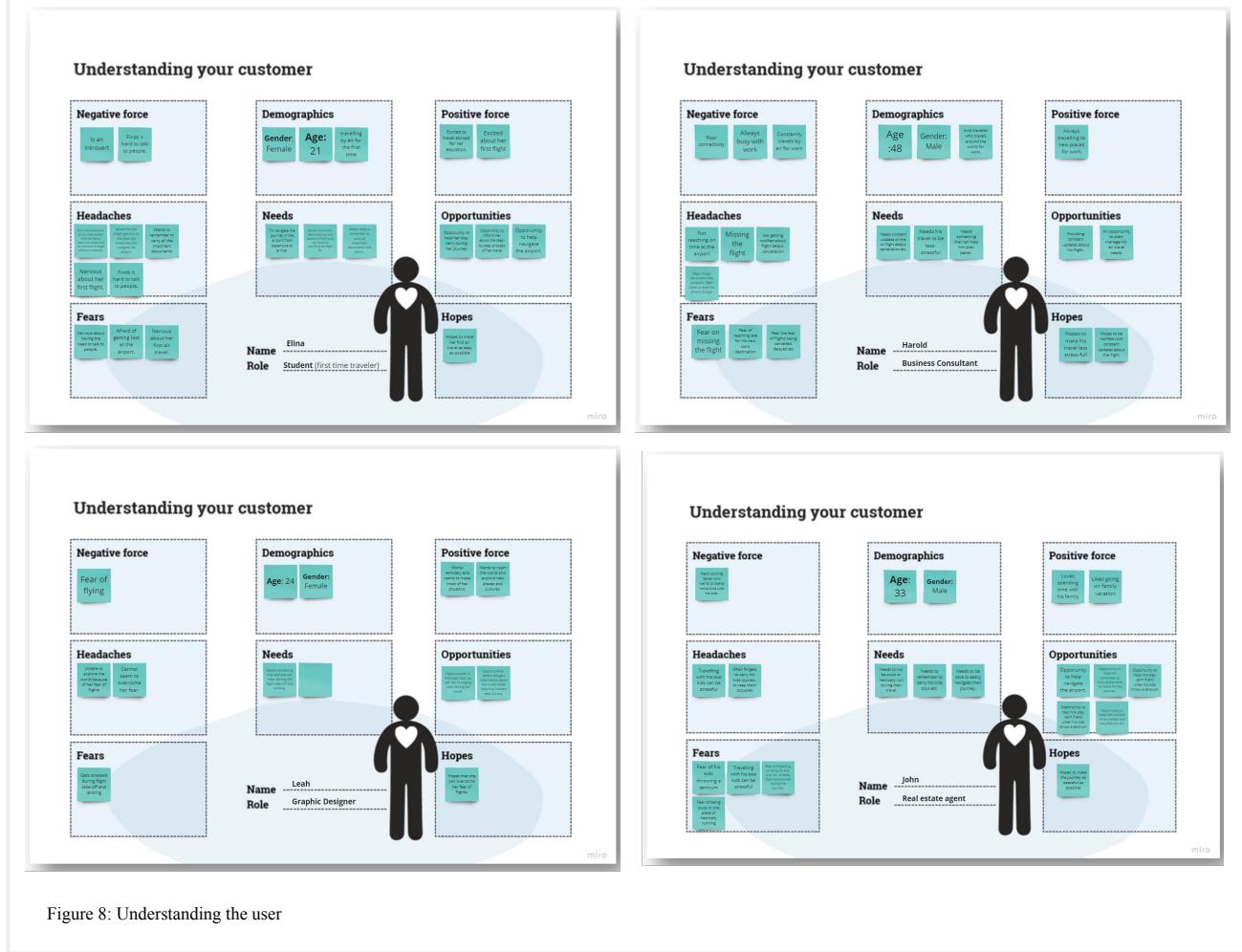


Figure 8: Understanding the user

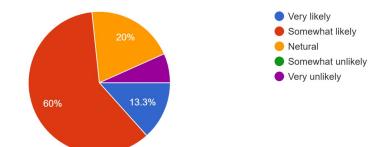
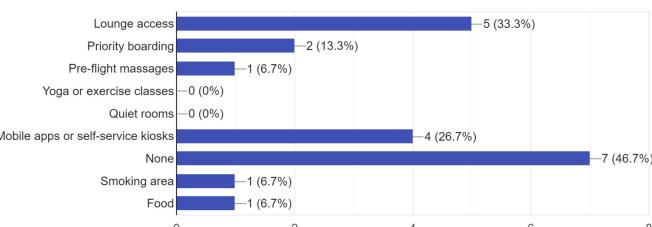
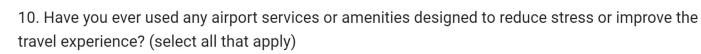
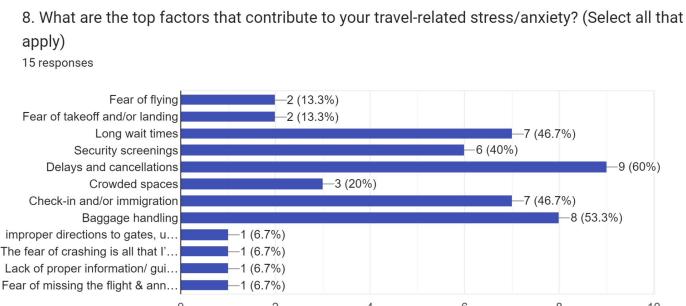


Figure 9: Survey results and findings

Braindump

Braindump is an exercise that consolidates all of the thoughts and ideas into one space so that it is checked and confirmed. By doing this, an easy to access reference point is generated where the development phase can therein begin. No further ideas are brought in at this stage in order to maintain flow and keep on track.

Doing this allowed to finalise all of the features and functions of the product that will benefit the user. Features such as navigation, reminders, and de-stressing media.

Crazy 8's

Crazy 8's utilises the notion of fast thinking in a limited time space to generate creative ideas. By thinking of 8 ideas in 8 minutes, it helps designers think quickly and be as creative as possible, exploring different solutions to the problem. Above is an image (figure 10) of 8 ideas that were voted on by fellow designers.

Doing this exercise allowed me to visualize how the design would look on paper. This allowed me to make further changes and improve on the design during the later stages. An example is including the “list of things” feature into the design as a separate feature.

SCAMPER

Fellow students voted on my Crazy 8's sketches which helped me select the idea that had the most votes. Following this, I used the Scamper ideation technique to refine my idea and improve on it. Scamper uses the basic operations of adapt, combine, modify, substitute, reverse and put to other use (Fiadotau and Sillaots, 2020) I used these operations on my selected idea to improve on it.

For example, with the eliminate operation, I realised that instead of requiring the user to scan a QR code at every step of the journey to ask them how they feel, I could eliminate this as this would be annoying for someone who is in rush.

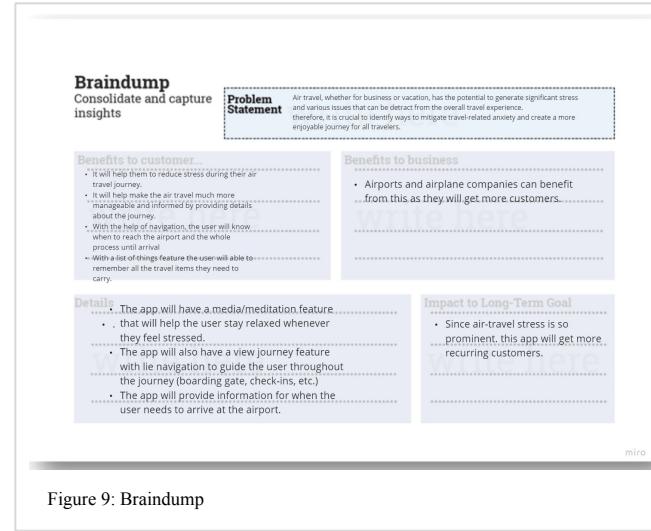


Figure 9: Braindump

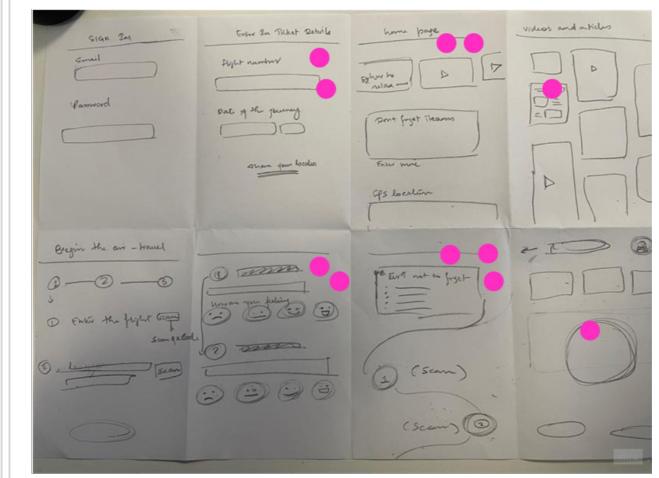


Figure 10: Crazy 8s

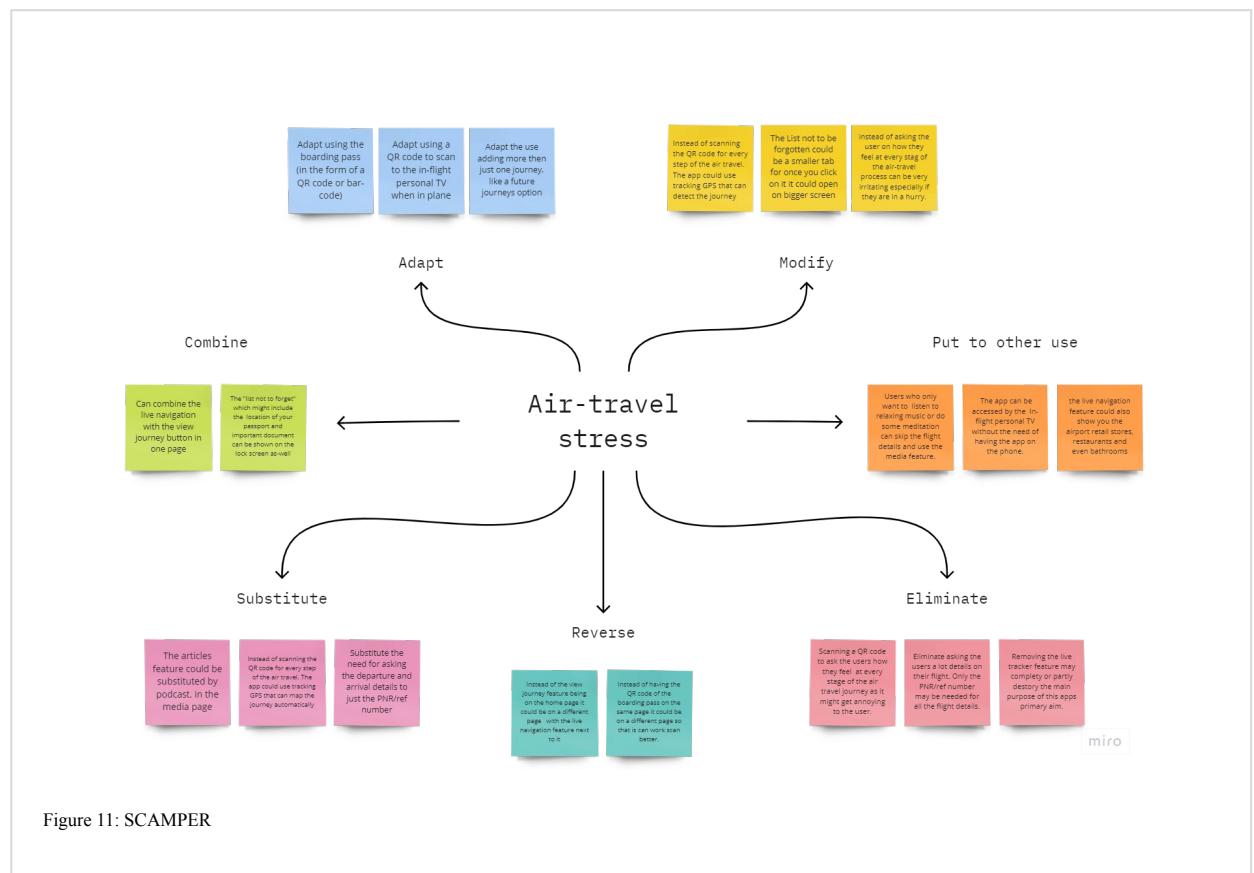


Figure 11: SCAMPER

Personas

According to Matthews et al. (2012) personas facilitates the inclusion of user perspectives during the design process. This approach can help make informed decisions about the user behaviour and can assist in effectively communicating user insights to a range of stakeholders.

Personas are used to generate the ideal target audience for the app that exemplifies the issues the design is trying to resolve. These personas help designers create a user-centred approach for the app while thinking about motivations, preferences, pain points, and needs/expectations of the user.

The four personas created for this design are Elina, John, Leah, and Harold as presented on this page (Figures 12, 13, 14, and 15). They each fit the target audience metrics for the issue to address. The app will aim to satisfy the needs and wants from each of the personas so that it maintains the user-centred criteria.

User Journeys

User journeys are scenarios based steps that the user takes to achieve a certain goal with a product (Experience, 2023). The aim of the user journey is to illustrate the user's experience from the start to finish, highlighting the areas focus. This has been conducted for each of the four personas (Elina, John, Leah and Harold). Creating a user journey identifies how the process can be made seamless for the user and improve overall satisfaction. The result allowed for clarity and understanding of the whole process. It started of me thinking about how each of the persona would use the app, the feature they would use first, and the features they would use the most amongst other things. Having this analysis helped design the layout of the app and the order that features would be available.

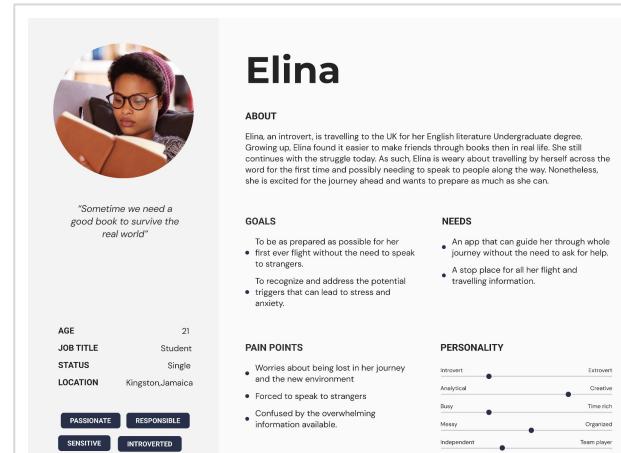


Figure 12: Persona - Elina

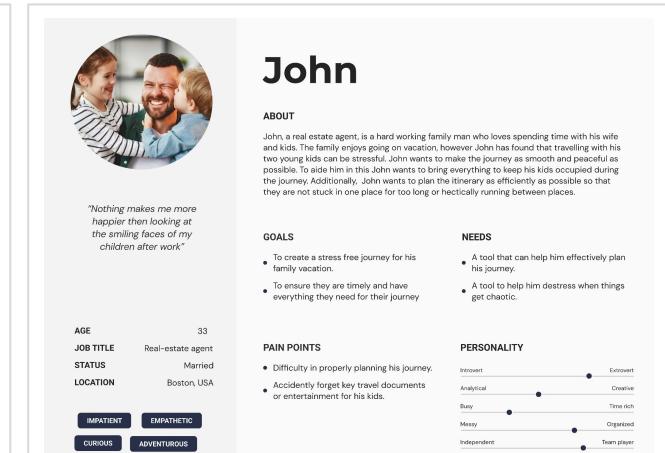


Figure 13: Persona - John

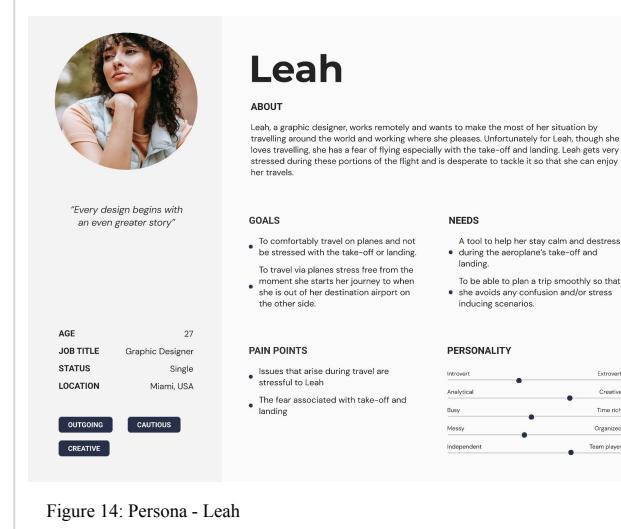


Figure 14: Persona - Leah

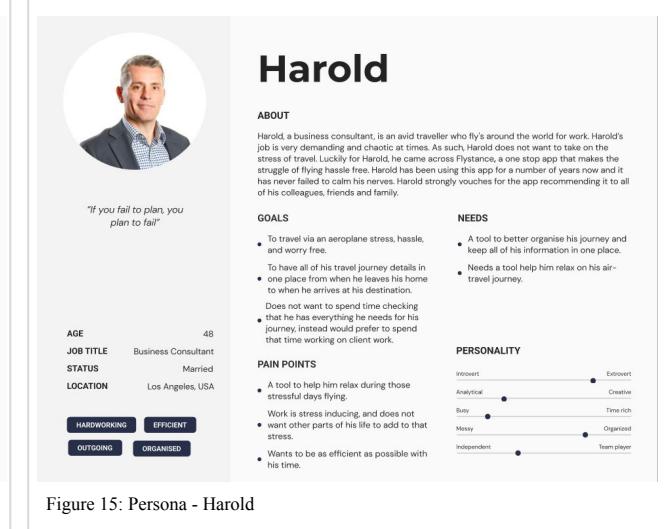


Figure 15: Persona - Harold



Figure 16: Journey map - Elina

Storyboards

Storyboards are brief visual images of a narrative. It helps a designers create new technologies (Truong et al., 2006). Storyboarding takes the user journey one step further by creating visual representations of Elina's, Leah's, John's and Harold's journey. Using illustrations and narratives, it demonstrates how users will interact with the product. The storyboards show the journey of each persona from why they were stressing with air travel, to how they came across the app, to the result that the app provided them. Note that this is an ideal solution and one that this design process is trying to recreate among all of the users of the app. The storyboard resulted in communicating the user journey in a visual way to better understand the user journey.

Elina

Elina is an introvert student who will be travelling for the first time in her life. Understandably, she is very nervous of getting lost along the way and needing to approach strangers for help. With this in mind, Elina decides to download Flystance. After entering her flight details, Elina is able to see her journey and all the information she will need for her flight. On the day of her flight, Elina uses the live navigation feature to ram confidently around the airport and to her gate. She made it to her seat without needing to speak to people, Elina feels very happy and comfortable with that.



Figure 20: Storyboard- Elina



Figure 17: Journey map - John

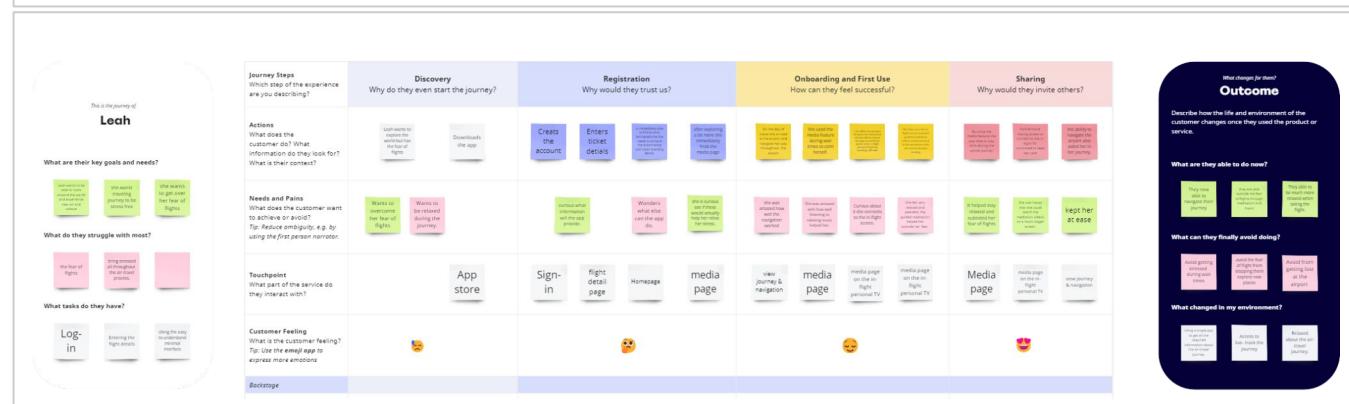


Figure 18: Journey map - Leah

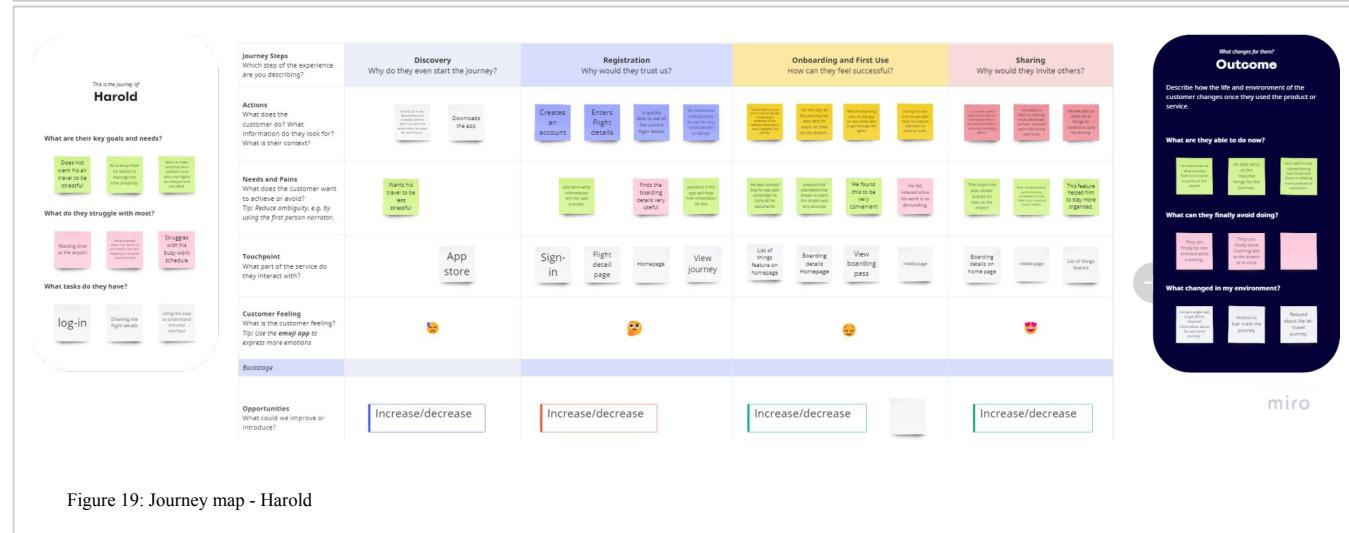


Figure 19: Journey map - Harold

Leah

As a remote working graphic designer, Leah wants to make the most of her situation and travel a lot. She loves experiencing new cultures and art. Unfortunately, Leah has a fear of flying. Thankfully, Leah has come across Flystance which she hopes will help calm her nerves during the flight. When Leah takes her seat on the plane, she navigates to the media feature of the app and starts listening to the recommended music playlist. She connects the app to her private front seat screen and is able to watch meditation videos to calm her nerves. Leah manages to easily de-stress during the journey and has a pleasant flight experience.

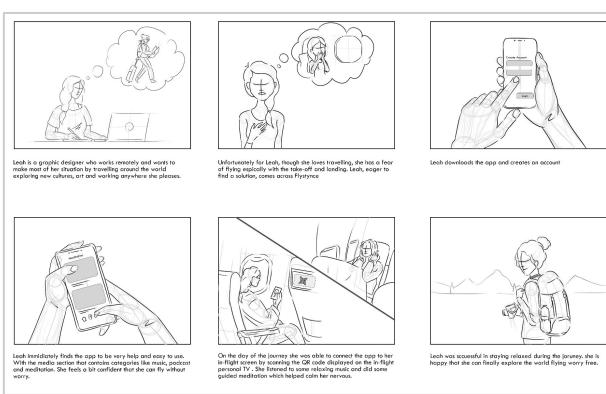


Figure 21: Storyboard- Leah

John

John is a hardworking family man. He enjoys spending time with his partner and two kids. However, John has found that travelling with his children can be very stressful, and as such has sought help from Flystance recommended by his colleague. To help keep his kids calm and distracted during the journey, John needed to remember to bring all of their games and toys. Including plenty of healthy snacks. John made strong use of the “list” feature on Flystance to record everything he needs to take for the flight then checked it off before he left his house. This ensured that John remembered to bring everything his family needs. John also found that having the list of things on his lock screen was convenient as it displayed everything in a quick and accessible format for

John to glance over. This feature has made the air travel journey for John and his partner very comfortable.

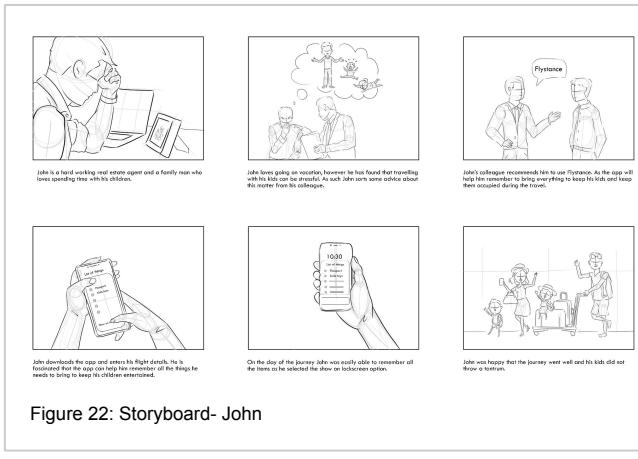


Figure 22: Storyboard- John

Harold

Harold is a business consultant, is an avid traveller who flies around the world for work. Harold's job is very demanding and chaotic at times. As such, Harold does not want to take on the stress to travel. Luckily for Harold, he comes across Flystance, a one stop app that makes the struggle of flying hassle free. Harold starts using the app and to his surprise the app clearly lays out important details of his journey including estimated time to leave for the airport and was successfully able to calm down his nervous. Harold strongly vouches for the app recommending it to all of his colleagues, friends and family.

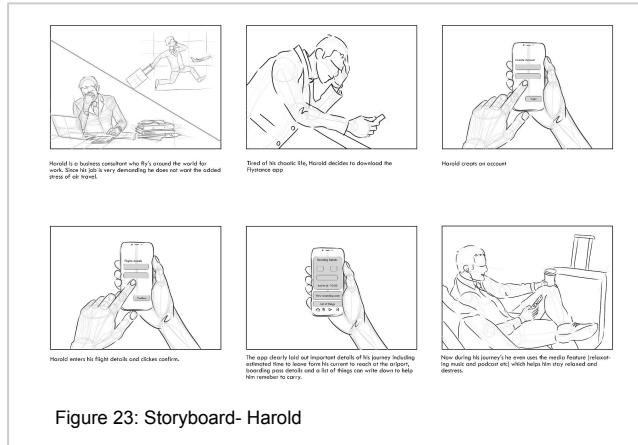


Figure 23: Storyboard- Harold

Key features analysis

From the research conducted, and the creative processes followed, I have shortlisted a few features that will be critical for the app to have. An analysis of these features are described below.

- **Flight details**

Along with providing stress reducing features, the app will also centre at having all of the required flying information for the user in one place. This will include the flight details such as departure time, gate number, flight number etc.

One key aspect within the flight details will be the Passenger name record (PNR) detail of the passenger. This will allow the app to track all of the key information of the passenger by accessing it through the airline website. Each passenger has a unique PNR (Liu et al. 2017), therefore with the user's consent to provide this information, the app will be better at tracking the information that is relevant to the user.

- **Boarding pass**

Having the boarding pass on the app will mean that the user will not need to exit the app during their journey when they need to present the boarding pass at multiple checks. This enables convenience to the user and focuses all key information within the app.

- **Navigation**

One key stress trigger identified during the research phase was navigating the airport. It was noted that airports can be very large buildings that turn into a maze to maneuver, especially when you go to a new airport. For this reason, I felt that it will be beneficial to include an airport navigation feature that works similar to Google live navigation whereby the user will have a map to follow to their gate.

- **Media**

Media will be a key feature of the app as it is a proven tool to reduce stress. The media feature will take the user to music and podcasts that have a proven track record of reducing stress. This will be calming music for example.

- **Meditation**

Finally, meditation will need to make a prominent feature in the app as it will allow a visual guide for the user to understand how to reduce their stress. With guided videos, the user will understand what to do to successfully meditate during the chaos and have a pleasurable flight.

- **Connectivity**

The user will be able to seamlessly connect to their in-flight personal screen using a QR code displayed on the screen and scanned by the phone. They will be able to interact with the in-flight screen to display their personalised media and meditation content.

User Flow

User flow is a set of interactions that details the steps to achieve a task (Experience, 2023). As an important tool in UX design to help designers understand how users will move through the product, I have created a user flow for the air travel stress reducing app. Mapping out the user flow allowed me to identify the pain points of the design including areas for improvements. The user flow allowed for visual understanding of how the app will function from the user logging in to them entering their flight details, and using the many features of the app. Visualising this helped me prioritise some features of the app that are critical to the user. Such as recording flight details, accessing boarding pass, using the navigation feature and finding the meditation section.

Testing and iteration enabled me to find areas of improvements. One such example was that I realised at which point of the journey will the user want to connect to the in-flight personal TV and how to make it accessible to them in this case I added the scan to connect to the in-flight personal TV button in the “view journey” once they find their seat on the plane.

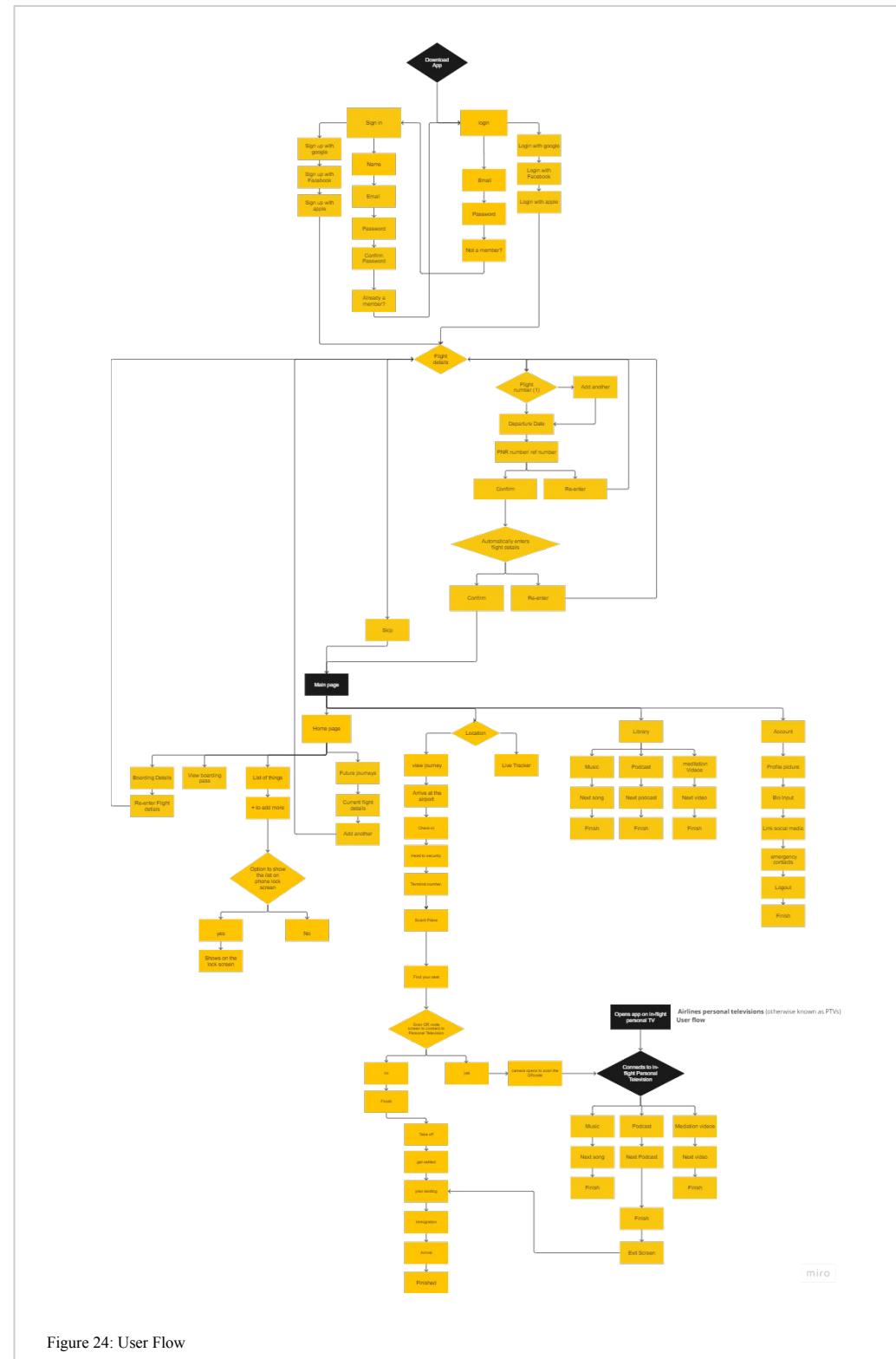


Figure 24: User Flow

Prototyping

Low Fidelity prototyping - study 1

After creating the user flow, I needed to test the various aspects of the design such as interaction and layout through low-fidelity prototyping. Sefelin et al. (2003) explains low fidelity prototyping as the early visualisation stages of the design process. I have focused my low fidelity prototype on Figma as research has shown that paper and computer based prototyping resulted in the same quantity and quality of critical user statements. However, the research further showed that the test subjects preferred computer prototypes (Sefelin et al., 2003).

Prototyping allows the designer to experiment with different design solutions, test assumptions, and gather feedback from the user. Through collecting feedback, I was able to identify and address issues early on in the design process leading to a more successful and user-centred approach.

Wireframes and low-fidelity allowed me to quickly and easily create rough blueprints of the app without getting deep into the details. Doing my low-fidelity prototype on Figma gave me a better understanding of the screens and understanding of the various interlocking functions. Additionally, after gathering the user feedback, I was able to quickly make the changes without having to recreate the whole process.

After exploring the various design ideas and iterations, I was able to refine on my idea and settle on the images as shown on this page (figure 25, 26 and 27).

Low-fidelity helped me focus on the functionality rather than the visual appearance of the app. For example, I was able to understand that the “view journey” and “live navigation” buttons need to be on the same page so that the user can navigate between the two very easily.

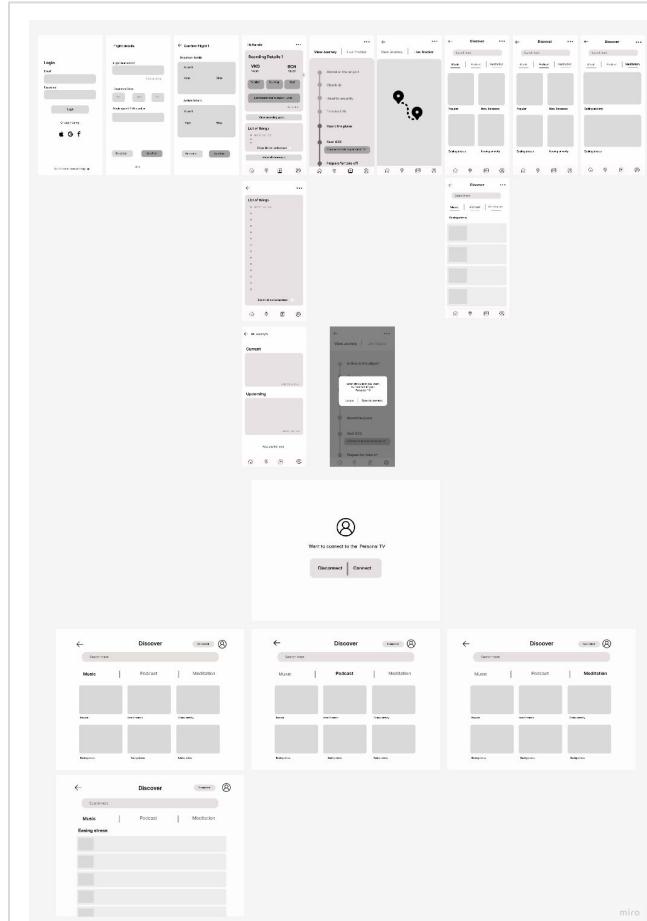


Figure 25: Low-fidelity wireframes created in figma

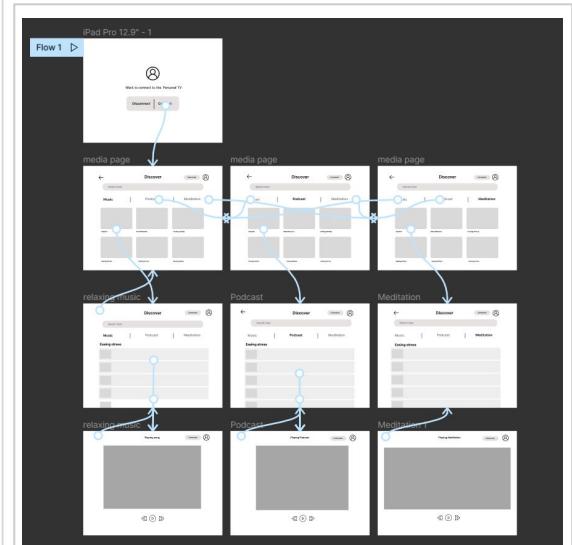


Figure 27: Low-fidelity prototype for in-flight personal TV created in figma

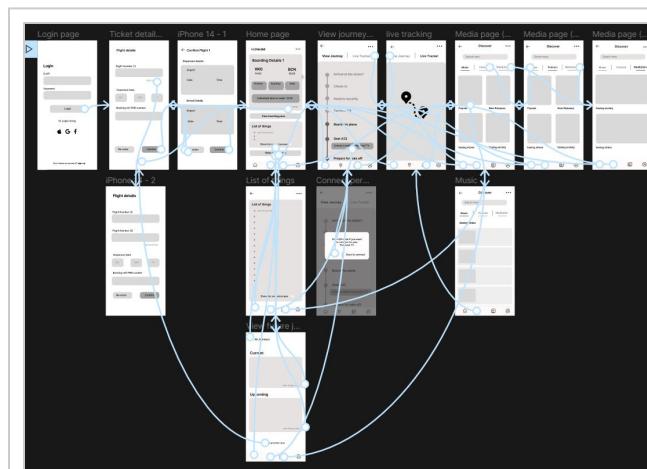


Figure 26: Low-fidelity prototype for mobile phone created in figma

Thematic analysis for usability testing - study 1

Following the usability testing, the think out loud test was performed with five test participants. The participants provided their consent for the usability testing. Nelson (1994) explains that a thinking aloud test is when the user is asked to use the system and encouraged to vocalise their thoughts out loud. This does not need to be in large numbers with research showing that 75% of usability problems were found when conducted by 4-5 subjects (Nelson, 1994).

A thematic analysis a method of analysing, identifying and reporting patterns (Braun and Clarke, 2006) was drawn up from their responses (qualitative data). Key points from the responses were highlighted into multiple different codes (i.e. language, suggestions, design, time etc), then further filtered into 4 key themes: uncertainty, positive, recommendation, and design. The outcomes from these themes are discussed below.

Uncertainty

All of the test participants noted a area of uncertainty when testing the low fidelity prototype. The uncertainty theme describes points when the participant are confused or unsure of areas / features of the app.

Participant 1 - "Estimated time to reach what?"

Participant 3 - "Okay so I need to enter my flight details here right?"

The examples presented above show that some features of the app need to be shown more clearly so that it avoids confusion by the users. These points will be addressed during the later iterations of the app.

Positive

One theme that was prevalent during the usability testing were positive feedbacks given on the app. Positive themes are feedbacks given by the users that show the positive aspects of the app. Such comments include:

Participant 2 - "It's pretty clear that I can add two flights then I click the add flights that's nice"

Participant 3 - "The live tracker sounds good and I bet it will be really helpful".

Positive themes are very useful for the design as it shows features of the app that I will need to maintain in future iterations. It also shows the parts of the app that users like and what I can leverage across other areas.

Multiple participants have said that the live navigation feature is useful, which I will definitely keep and develop further. It will be a highlight of the app as it helps people navigate the maze that is some international airports.

Design

The design theme identified the design features of the app that were both good and bad. These were around the layout of certain pages, or the functionality of some features. Some examples of points to come out of this theme are described below:

Participant 1 - "maybe the media one I would not guess that it is for meditation"

Participant 4 - "oh okay the in-flight personal screen has the same layout that is nice."

These comments are helpful in the production of the app as they clarify the parts that work and those that do not. My undertakings from this theme are that I need to redesign a few of the buttons to make them more explicit. This will be presented in future iterations of the app.

Recommendation

Recommendations are a theme that were provided by a few of the participants who had ideas on where the app could be improved. The codes that make up this theme are "suggestions" and "external links". A recurring idea proposed by the participants was to include external links to spotify, apple music, netflix etc from the app so that users may interact with their own media content. Comments arising from the recommendation theme are outlined below.

Participant 3 - "Then maybe a link to Spotify, Apple and maybe even netflix?"

Participant 4 - "ooh emergency contact would be nice under profile"

Participant 2 - "Having like a flight history would be nice"

Recommendations that arise from the thematic analysis have been very useful in realising what to include in the future iterations. For example, external links will be included in the high fidelity version so that users can access their own media outlets. Additionally, other features recommended by the participants will be considered for the high fidelity version.

Second iteration of the prototype - study 2

After conducting the usability testing on the initial low-fidelity prototype, I took the feedback from the participants and incorporated these into the next iteration where I saw fit. Initially, I took the feedback from the participants and performed thematic analysis to understand the codes and themes that came out of the feedback. The themes that arose were uncertainty, positive, recommendation, and design. The thematic analysis helped me clearly identify the areas of the app that needed to be addressed in a systematic way. I used the output of the analysis to further improve the app. This resulted in an improved version of the app, even though it is still presented as a grey-scale.

The following describes some of the improvements made as a result of the usability testing.

- **Subtext**

To avoid confusion in where to enter personal information or travel list items, subtext was added to provide simpler understanding of what needs to be included .

- **Visually appealing**

Even though low-fidelity prototype was focused on functionality rather than visual appearance, comments were raised on the design and look of the app. As such, the next version had greater focus on the detail where needed.

- **External links**

Participants noted that it would be useful for the app to interact with third party apps such as spotify, apple music and netflix. As such, buttons linking to third party apps were included so that users could interact with their own music or movies / TV series.

- **Language**

One area that caused confusion amongst the participants was the language chose in the prototype. For example, the participants did not understand what was meant by “list of things”. As such, this was this was changed to “Reminders list”. In the next iteration I paid closer attention to the use of language so that these comments would not arise again.

- **Time**

Displaying time aspects was identified as a suggestion to include in the next version of the app. Such aspects include how long delays are expected, time updates on deadlines, and cancellation updates.

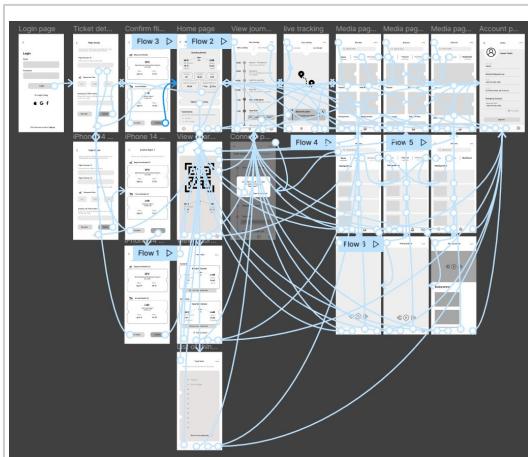


Figure 28: Second prototype iteration (high Fidelity) for mobile phone created in figma

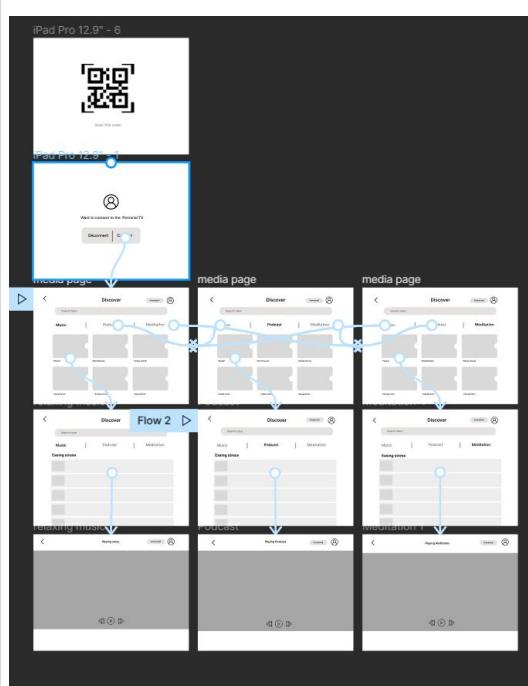


Figure 29: Second prototype iteration (high Fidelity) for in-flight personal TV created in figma

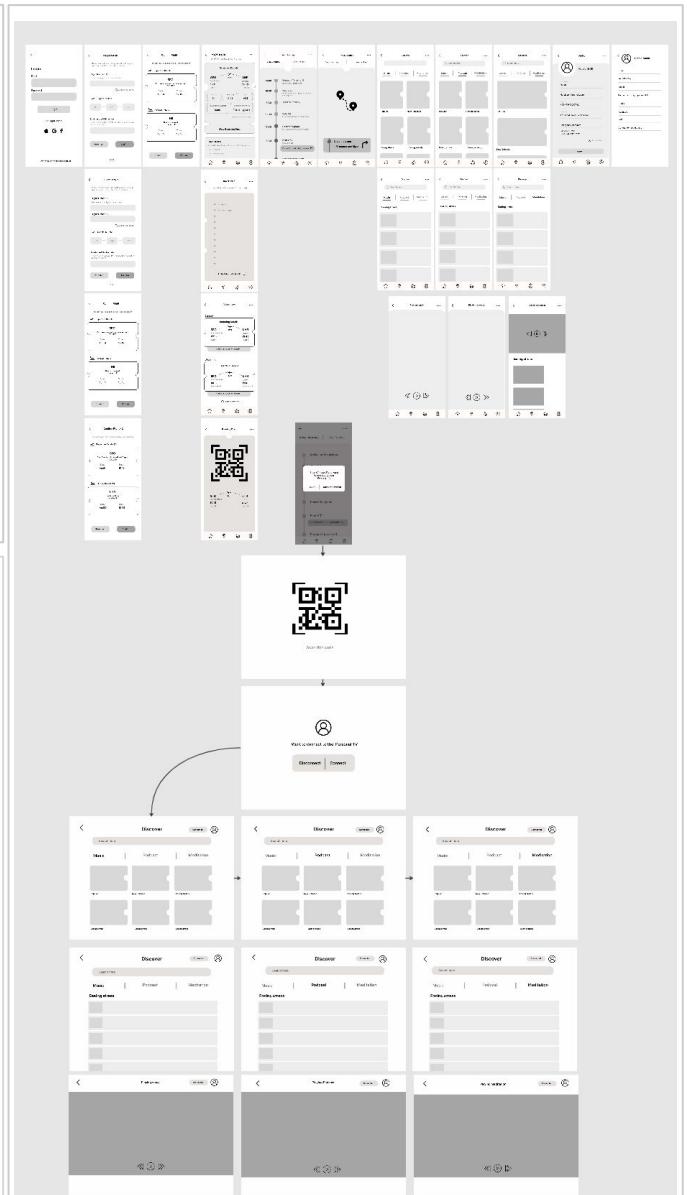


Figure 30: Second prototype iteration High Fidelity wireframes created in figma

Usability testing - study 2 and results

After conducting usability testing 1 and reflecting on the feedback comments in the second iteration of the app, another usability test was conducted. A total of 5 participants were asked to think aloud and their responses were recorded. I note that the result of this usability testing found the participants made little to no comments on the uncertainties of the app. Everything was found to be clear and understandable. A significant portion of the responses were positive covering all of the themes identified during the thematic analysis. The participants were satisfied that the app met most of their comments. Additionally, they expressed that they will use the app in the future if it becomes functioning on the app store. Therefore, thematic analysis on usability test 2 was not performed as it was primarily positive feedback.

Nonetheless, one design improvement was noted from conducting usability testing 2. Two participants pointed out the following when referring to the media buttons on the home page:

Participant 2 - "I feel like you know this part should be in a box, it should be a bit separated".

Participant 4 - "Just take care of the buttons (music, media and mediation on the home page) there are a lot of actions to do. make it differentiate a little".

This will be addressed in the high-fidelity prototype.

I note that feedback over the color scheme was not obtained as the app was in grey scale.

High Fidelity prototyping

Creating the high fidelity prototype was a simpler process after conducting usability testing 2 as there were very few comments on areas for improvement. The high-fidelity prototype provides a realistic representation of the final product, including visual designs, layouts and interactions (Rudd et al., 1996). Through creating the high fidelity prototype, I am able to refine the details of the typography, colour, and imagery giving it a more professional look.

Unfortunately, given the extensive time it takes to create prototypes and conduct two thorough user tests, I was not able to perform user testing research on the high-fidelity prototype.

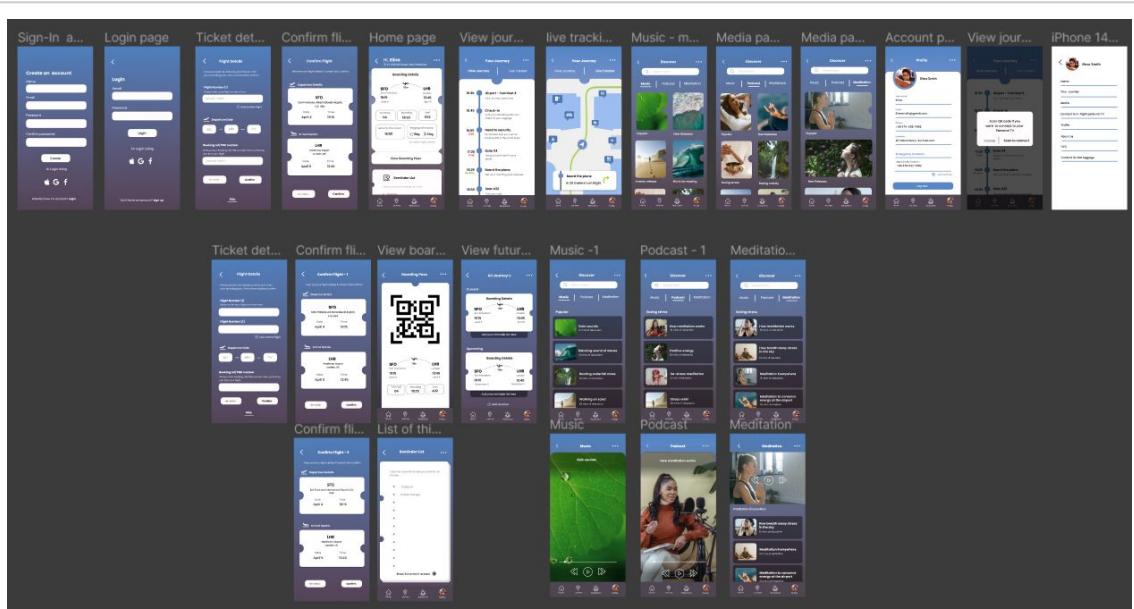


Figure 31: High Fidelity prototype for mobile phone created in figma

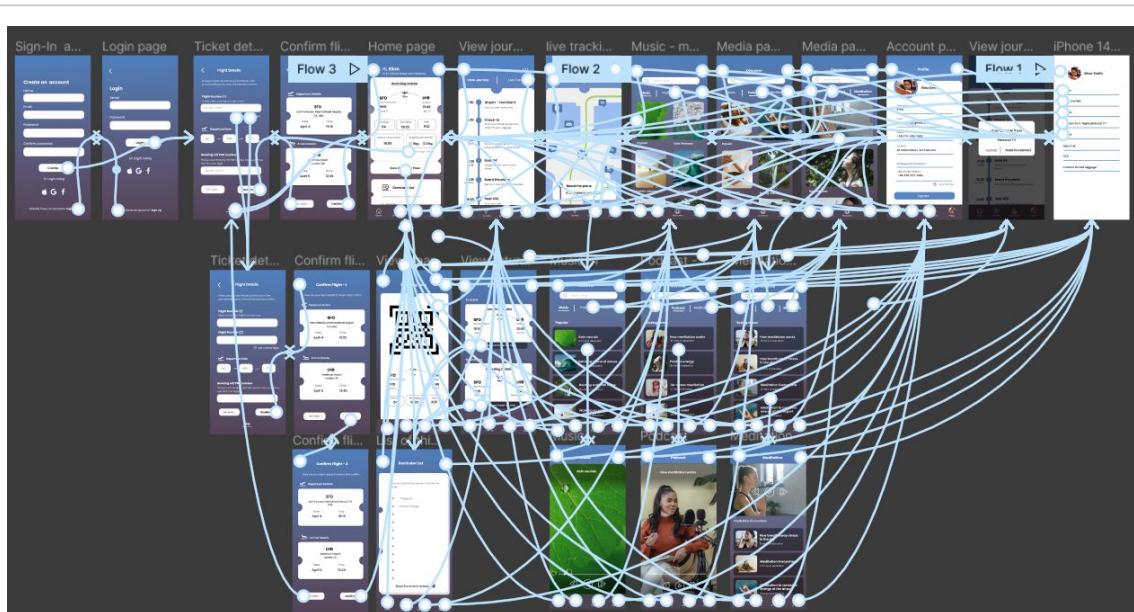


Figure 32: High Fidelity prototype for mobile phone created in figma

Discussion

The background research undertaken and the surveys conducted show that stress as a result from air travel is a growing issue amongst passengers. The most common factors leading to air-travel stress are delays, cancelled flights, missed flights, long waits and health and safety. As such, it will be very useful to have a solution to this problem. After careful consideration, I devised that an app would be an ideal solution for passengers to use and destress by its features. By asking only a few simple questions such as the flight number, PNR reference and other flight details, the user would be able to use the app to navigate the airport, board the flight and fly through check in. They would have all of the information they need in a single space only a few swipes or buttons from each other. The users would also be able to use live navigation features to not worry about getting lost in large airports, or having to run to their gate as they don't know where it is. Additionally, they can make use of the meditation features within the app to destress from the long lines, annoying security clearances and boarding wait times. When flying the users will be able to connect the app to their personal in-flight screen to reflect their app on a bigger screen and enjoy the same benefits. For those that have a worry of take off and landing, the app will provide soothing music to calm nerves. Finally, after strong feedback, the app will include third party interactions with other media apps such as Spotify, Netflix and Apple music so that people may enjoy their own music or podcast choices through Flystance.

The combination of all of the above elements will provide the user with a holistic experience during their journey.

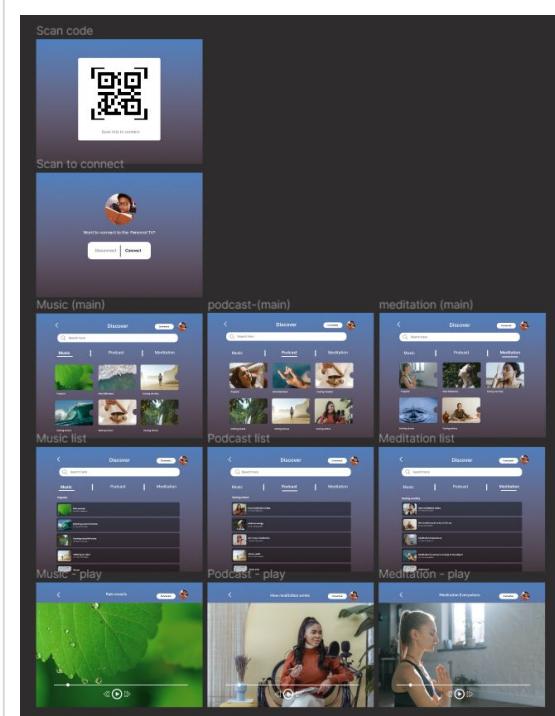


Figure 33: High Fidelity prototype for in-flight personal TV created in figma

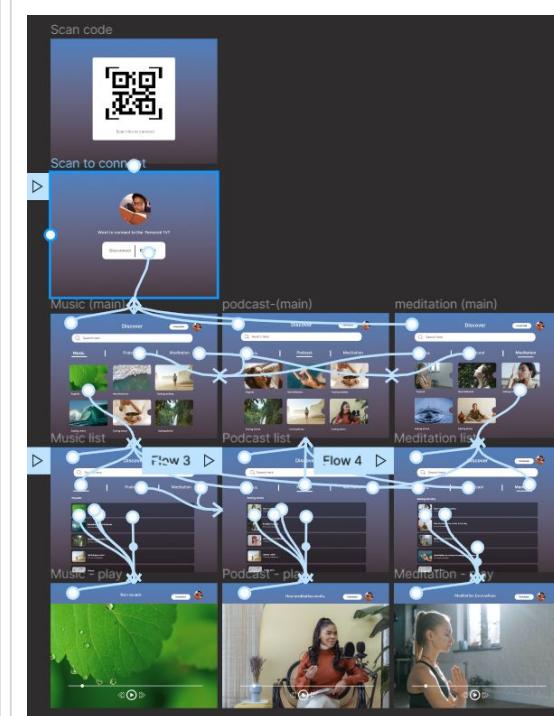


Figure 34: High Fidelity prototype for in-flight personal TV created in figma

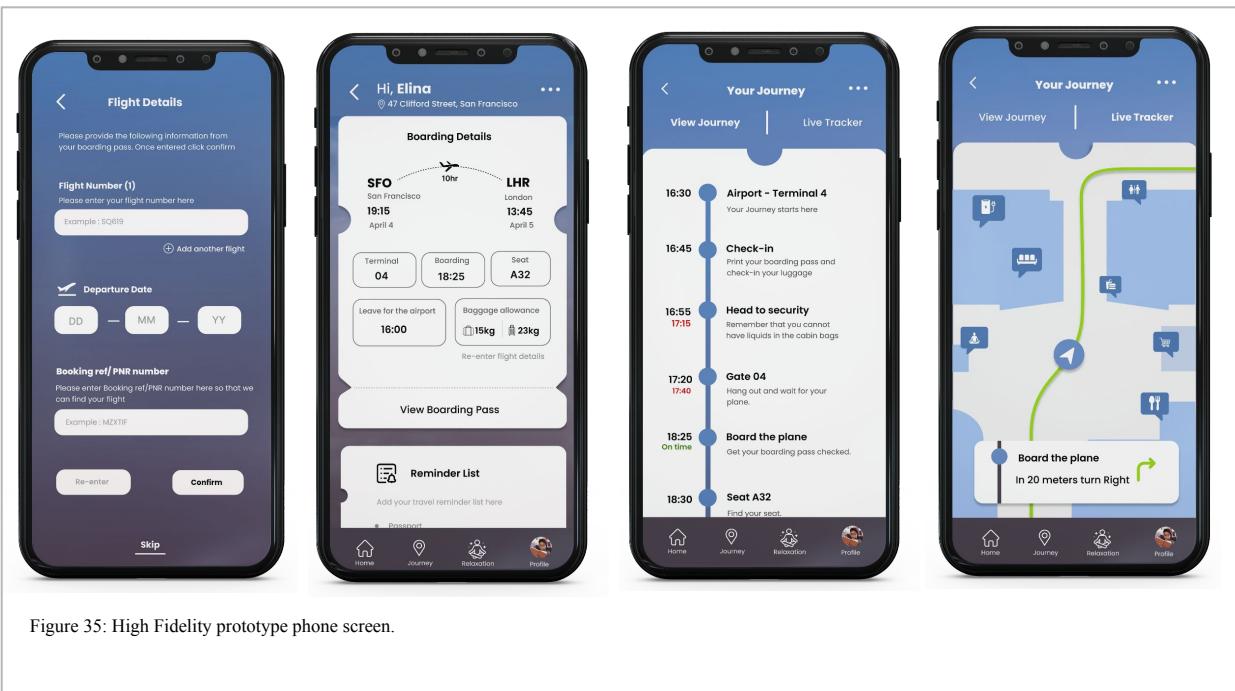


Figure 35: High Fidelity prototype phone screen.

Future Work

Due to the tight time constraints of this assignment, and many possibilities for the app, there are definitely features of Flystance that can be improved or introduced in the future. Firstly, to get accurate feedback from users, the high fidelity prototype of the app will need to be tested by users during an actual flight journey to ensure that the app serves its purpose. Conducting research through this approach will give live feedback of the app in action and highlight where further improvements can be made.

The app needs to be made more accessible to people with disabilities. Unfortunately, as I did not have a lot of time for this project, accessibility for the app was not considered in great detail. This will need to be looked into further and incorporated into the final version of the app.

It may be worthwhile in the future once the app has a strong following to introduce booking flights through the app so that all information is collected instantaneously. Booking through the app will give the user a one stop shop for everything about their flight and they will not need to open other apps or look elsewhere.

Flystance Prototype

Link to High Fidelity prototype on phone:

[https://www.figma.com/proto/sb8viYT0Vlk2XPfRqx1W3TUFlystance-Final-\(mobile\)?page-id=0%3A1&type=design&node-id=1-2&viewport=784%2C773%2C0.52&scaling=scale-down&starting-point-node-id=1%3A879&show Proto-sidebar=1](https://www.figma.com/proto/sb8viYT0Vlk2XPfRqx1W3TUFlystance-Final-(mobile)?page-id=0%3A1&type=design&node-id=1-2&viewport=784%2C773%2C0.52&scaling=scale-down&starting-point-node-id=1%3A879&show Proto-sidebar=1)

Link to High Fidelity prototype on in-flight personal TV (ipad)

<https://www.figma.com/proto/u9HvedlHaq2WhdpCtOIQN2/Flystance-in-flight-personal-TV?page-id=0%3A1&type=design&node-id=1-577&viewport=1042%2C551%2C0.37&scaling=scale-down&starting-point-node-id=1%3A565&show Proto-sidebar=1>

Note: As figma does not allow to easily switch between devices (phone screen and in flight TV screen), you will need to do this manually.

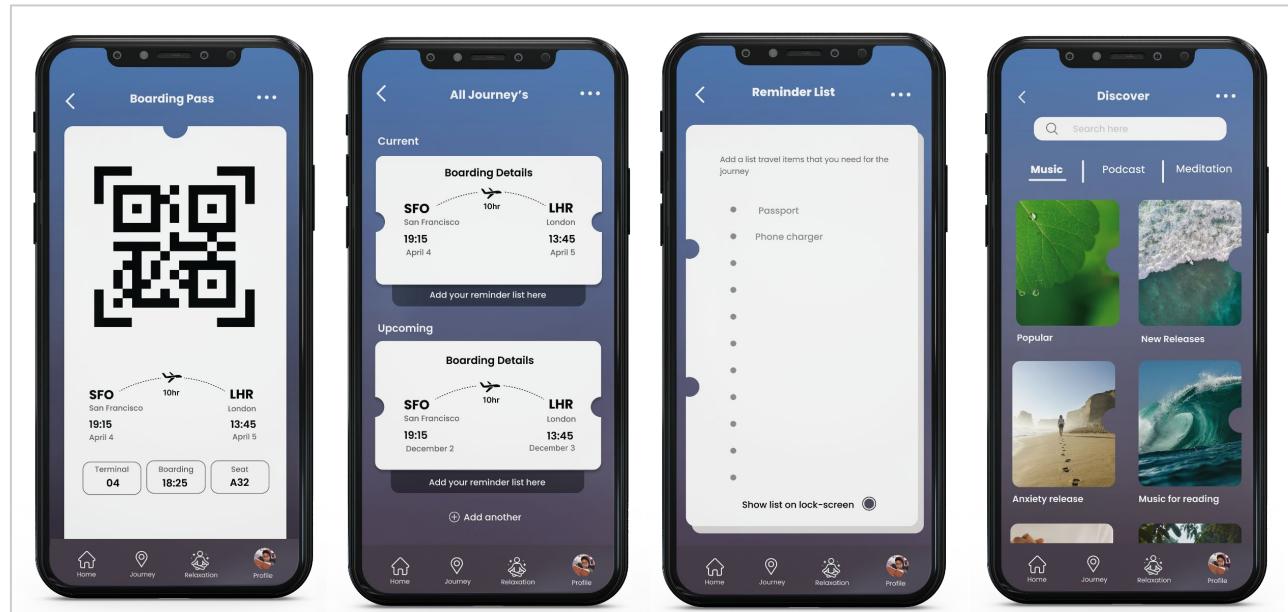


Figure 36: High Fidelity prototype phone screen.

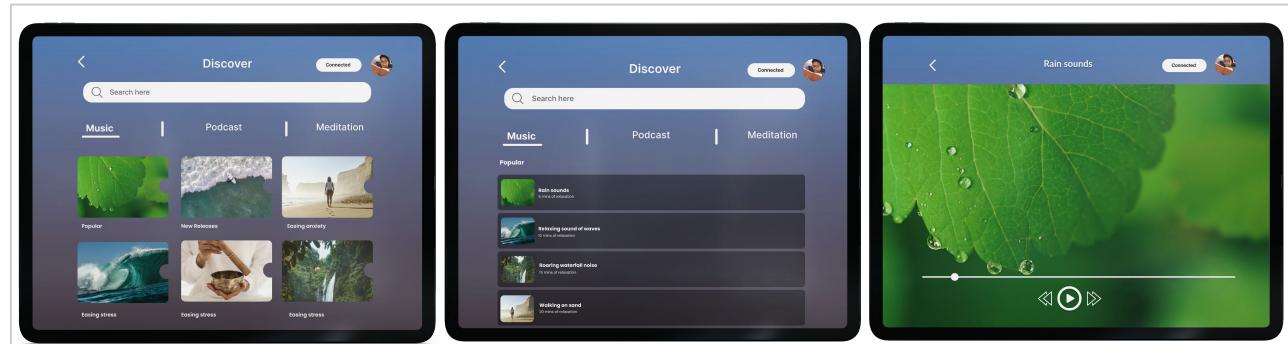


Figure 36: High Fidelity prototype in-flight personal TV screen by using an Ipad mockup.

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Appendices

Project link:

Link to the Miro board :

https://miro.com/welcomeonboard/VFYwOWJHMuVI_NmxvbXp3cTJGbGowTndFek0zOVZGNkOOXdjWT_RXV2ZrQigzVkJelVhc1FcEtPYWMYQ3k2ZnwzND_U4NzY0NTQ3NDYyMjE2MjMzfDI=?share_link_id=36723610211

Prototype links:

First iteration of the prototype (low fidelity)

For phone:

<https://www.figma.com/proto/5ZXMuUCpbPY5x4xTCQDGD1/Air-travel-stress-wire-frames?page-id=0%3A1&type=design&node-id=1-2&viewport=358%2C185%2C0.21&scaling=scale-down&starting-point-node-id=1%3A2>

For in-flight personal TV :

<https://www.figma.com/proto/ryrnDd2sVPNvsjdsP2UgyXy/Air-stress-on-personal-TV?page-id=0%3A1&type=design&node-id=16-250&viewport=604%2C275%2C0.13&scaling=scale-down&starting-point-node-id=16%3A250>

Second iteration of the prototype

For phone:

<https://www.figma.com/proto/6Y1xUGC3PJFtf8974ahzxZ/Wire-frame-2?page-id=0%3A1&node-id=1-3&viewport=1273%2C936%2C0.51&scaling=scale-down&starting-point-node-id=1%3A554&show=proto-sidebar=1>

For in-flight personal TV :

<https://www.figma.com/proto/gJ6k3Fi7UY40A2yPlrQFrK/Untitled?page-id=0%3A1&type=design&node-id=1-856&viewport=575%2C453%2C0.12&scaling=scale-down&starting-point-node-id=1%3A2&show=proto-sidebar=1>

Results of the thematic analysis for the usability testing - study 1

Uncertainty		Positive		Recommendation		Design	
Uncertainty	Language	Acknowledged	Suggestions	external links		Design	Time information
I am already confused about is why you have the flight number (1) over here	so what the list of things suppose to be	so all the details will be filled in by the app after entering my flight number and PNR number that's nice it looks good.	like shops, and different part of the airport.	I think just showing media on the screen is enough maybe movies, or links to like spotify would be nice because i usually watch movies when i am in the plane so yes.		Yes design wise i think it could be a bit more visually appealing.	I think adding the time of departure would be nice, Just so that you are not late so that you can see at what time you have to be. For like boarding and other stuff I think.
what are you suppose to have there	Estimated time to reach what?	Oh okay I think it makes sense that you can show the lock screen info on phone, yes it's nice	Also boarding from the plane, from the front and the back.	like if you could connect to like spotify, netflix that would be nice.		but also like it needs to be visually appealing.	Maybe like what time it would be best for you to arrive at the terminal, head to security check-in know so that you don't miss the flight.
The airport ? it's really not clear . does it mean that you have to reach to the airport like?	okay so what is a list of things ?	I like the meditation section it is pretty good and i mean it is useful. I also like the list of things .	Having like a flight history would be nice	Then maybe a link to Spotify, Apple and maybe even netflix?		I like the layout of the in-flight screen it is very minimalist. It is very very straightforward. like i can see and tell where i need to click	live tracker lets say of the cancelled flights or delayed flights or like you know how at the airport sometimes you can see on the screen you can see you know what time, like where is your plane like it's arriving or has it landed, you know so that you know what is happening to the plane ? is it far? is it here? things like that
Okay so i need to enter by flight details here right?	i get it now but it needs to be more clear	the live tracker is a good thing because you cannot navigate the inside of an airport. so this is good	Incorporating something like traveling to the airport, like you've got your taxi booked out for the day or like a journey where you have to take buses or something like that.	Maybe like you known you could connect it to spotify and other things and maybe then even movies		I the view journey is layed out very clearly.	Also it should be like add reminder here not things
so is this information just for the departure?	add things here what things able change the wording here	View boarding pass. this is nice, so it all in the phone	probably maybe a list of past journey or journeys that I have already completed			So here you will search like relaxation thing. oh nice i like that, I like the layout it is very intuitive.	View journey is nice, i like this, something you could add here is time like arrive at 2 hours before or something like at
will the PNR number also be on the ticket ?	List of things ? What things ?	On nice so the scan to connect takes you to the personal in-flight TV nice.	just a suggestion I feel like you could make like a AI generator list of the basic things and maybe like an option in the bottom to add more something like that			I like this layout very simple and nice, it's what you need'	
wait so do I need to enter all the details		It's pretty clear that I can add two flights then I click the add flights that's nice	ooh emergency contact would be nice under profile			I think the layout is good.	
so like a to do list? like a list that you need to carry with you. like the suitcase, flight,		view boarding pass is that like an E-ticket. on wow that is fun, and very useful	Also I think the view boarding pass should be in the tab as this			I like the layout it's easy, it is what its suppose to be	
I think flight details have a lot of information, and I might not have my flight number with me.		I think telling me which terminal I need to go to is very useful.	connect to inflight personal TV could also be included under the homepage or maybe even on the 3 dots			The skip button in the flight details could definitely be improved like if it was a bit bigger and underlined	
oh okay maybe the name needs to change.		so will this be like a google map ? and tell me your gate is here, oh that's nice	Instead of people typing the same thing over and over again in the list you could perhaps pre-populate it, so that you could just swipe on the ones they want to keep			Show list on lock screen is nice i wish it could be a bit more obvious,	
Is the live navigation going to work only in the airport?		okay so yes this will take me to my personal screen when i'm on the flight nice.	maybe a popup would be nice before i begin exploring the mediation, music and podcast maybe like a tutorial, maybe only like the functional thing gets highlighted like a spotlight			click on it. It opens yes maybe underline it or something I don't how it did not feel that it is clickable, maybe have it as a button.	
so will it show me all the meditation lounge and all that here right?		ooh nice it's just the same layout I like that on a bigger screen. fun.	maybe it could have like an icon for information like a bubble pops up saying that your flight number can be found here XXXX example the flight number and the same for the confirm flight details			maybe the icons could be named for better understanding	
this is a bit strange i want to view it and dont want to scan the QR code ?		okay so if I need to disconnect I click here, it is pretty clear.	This is not good but personally I feel a few of things are more directly to me, but some that don't so including like a subplot would be great because looking at this as of now i feel lost.			so will the re-enter take back to that page okay nice. I like that	
ohh wait I think I get the scan code for when you go through the gate		So yes overall I think a designated app or area where I could plan like holistically the entire journey	but also is it only going to be that size can you make it a bit bigger so it takes up the whole page,			maybe the media one i would not guess that it is for mediation and	
The media icon is not very obvious		okay nice all the details are entered, okay so that will generate all my details nicely.				the disconnect button on in-flight personal screen is a bit confusing	
oh and how do I disconnect ? wait if I click on connect it will show disconnect.		oh wow the list of things looks okay. it's inclusive like on my lock screen I like that.				View boarding pass is pretty good, like it very next level	
The flight details page needs some sort of explanation, because I have not seen on the app what it is? Why is that?		ooh nice I like the meditation part of the app				oh okay the in-flight personal screen has the same layout that is nice.	
Music popular? popular who is popular music		the view journey is nice I like the step-by-step the journey process					
Estimated time to reach where? The destination?		oh nice you can connect to your in-flight screen that's cool, I like that feature.					
I'm assuming that these are different methods of easing stress?		The live tracker sounds good and I bet it will be really helpful					
		I like this discovery feature .					
		woah the entire journey till your out of the airport that's cool					
		I don't know anything more needs to be added other than it might cause stress.					
		Ooh I like that you can connect it to the in-flight personal TV.					
		oh wow the disconnecting on the screen is pretty easy.					
		View all journeys that's nice					
		yes I like the media section					
		I feel like it's a good thing that there is not a lot of stuff, it is simple in a good way.					
		I know what I can do here, its nice scan to connect, oh that is nice					
		oh the view journey, arrival at the airport that is nice					
		View all journeys, oh there are the other journeys that are nice					