UNIVERSITY OF THESSALY

SCHOOL OF ENGINEERING

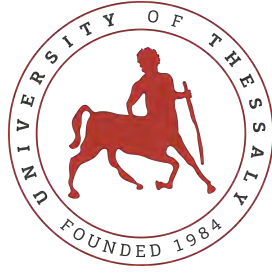## DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

Software Product Management: From inception to delivery with innovation frameworks

Diploma Thesis

Panagiotis Nikitakis

Supervisor: Aspasia Daskalopoulou

Volos 2020

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ΠΑΝΕΠΙΣΤΗΜΙΟ ΘΕΣΣΑΛΙΑΣ

ΠΟΛΥΤΕΧΝΙΚΗ ΣΧΟΛΗ

ΤΜΗΜΑ ΗΛΕΚΤΡΟΛΟΓΩΝ ΜΗΧΑΝΙΚΩΝ ΚΑΙ ΜΗΧΑΝΙΚΩΝ ΥΠΟΛΟΓΙΣΤΩΝ

Διαχείριση προϊόντων λογισμικού: Από την ιδέα εώς την παράδοση σε πλαίσια καινοτομίας

Διπλωματική Εργασία

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Abstract

New technological solutions are continuously being created to solve small and big challenges. Those solutions often come in the form of a software product, like a mobile application or a website. As technology progresses, the tools required to create software become easier and cheaper to use. At that point, in order for a product to stand out, it needs to be clearly defined as a reliable solution for customers. It is merely the technology used, but rather how we can offer a complete experience that serves the user's needs.

In the thesis, we start from a problem and pass through the whole process until the development of the first draft solution. We will frame this process with tools that promote innovation and critical thinking. Those will help us solidify our way of working, so the final software product will be Viable, Desirable and Feasible according to Design Thinking processes. The process includes defining the challenge, producing ideas & prioritizing them, validating possible solutions, supporting the product with a business model and lastly developing the first version of the product.

The final software product created is a mobile application that connects travelers with locals, so the former can get insights, support and connections for the city they are visiting. It is the first prototype for Android and iOS devices. Also, in the end, we have a business model that defines how the product is structured inside the market and the directions needed to establish it. Lastly, we have a website that represents the product and provides credibility to future customers.

Περίληψη

Καινούργιες τεχνολογικές λύσεις αναπτύσσονται συνέχεια με σκοπό να λύσουν μικρά και μεγάλα προβλήματα. Οι οποίες συχνά έχουν τη μορφή ενός προϊόντος λογισμικού, όπως μία εφαρμογή για το κινητό ή μία ιστοσελίδα. Καθώς η τεχνολογία εξελίσσεται, τα εργαλεία για τη δημιουργία λογισμικού γίνονται ευκολότερα και φθηνότερα στη χρήση. Οπότε, για να ξεχωρίσει ένα προϊόν, πρέπει να έχει εγκαθιδρυθεί ως μια αξιόπιστη λύση για τους καταναλωτές. Αυτό βασίζεται εκτός και από τη τεχνολογία που έχει χρησιμοποιηθεί, στο πώς μπορούμε να προσφέρουμε μία ολοκληρωμένη εμπειρία που να εξυπηρετεί τις ανάγκες του χρήστη.

Στη διατριβή, ξεκινάμε από ένα πρόβλημα και περνάμε όλη τη διαδικασία μέχρι την ανάπτυξη της πρώτης μορφής της λύσης. Θα πλαισιώσουμε αυτή τη διαδικασία με εργαλεία που προωθούν την καινοτομία και την κριτική σκέψη. Τα οποία θα μας βοηθήσουν στο τρόπο που δουλεύουμε, προκειμένου το τελικό αποτέλεσμα να είναι βιώσιμο, επιθυμητό και εφικτό σύμφωνα με τις διαδικασίες της Σχεδιαστικής Σκέψης. Η διαδικασία περιλαμβάνει τον καθορισμό του προβλήματος, την παραγωγή ιδεών και την ιεράρχηση αυτών, την επικύρωση πιθανών λύσεων, την υποστήριξη του προϊόντος με ένα επιχειρηματικό μοντέλο και, τέλος, την ανάπτυξη της πρώτης έκδοσης του προϊόντος.

Το τελικό προϊόν που δημιουργήθηκε είναι μια εφαρμογή για κινητά που συνδέει τους ταξιδιώτες με τους ντόπιους, οπότε οι πρώτοι θα μπορούν να λάβουν πληροφορίες, υποστήριξη και επαφές για την πόλη που επισκέπτονται. Είναι το αρχικό πρωτότυπο για συσκευές Android και iOS. Επίσης, στο τέλος, έχουμε ένα επιχειρηματικό μοντέλο που καθορίζει τον τρόπο με τον οποίο το προϊόν είναι δομημένο μέσα στην αγορά και τις κατευθύνσεις που απαιτούνται για την καθιέρωσή του. Τέλος, έχουμε μία ιστοσελίδα που αντιπροσωπεύει το προϊόν και παρέχει αξιοπιστία στους μελλοντικούς πελάτες.

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Abbreviations

B2B   Business to Business

B2C   Business to Customer

JTBD   Job To Be Done

HMW   How Might We

MVP   Minimum Viable Product

CMS   Content Management System

AI   Artificial Intelligence

SWOT   Strengths, Weaknesses, Opportunities, Threats

PESTLE   Political, Economical, Social, Technological & Environmental

Chapter 1

Introduction

The field of Product Management is relatively new compared with other professions. The first form was created in 1931 with a memo written by Neil H. McElroy at Procter & Gamble. It started as a justification to hire more people but became a cornerstone in modern thinking about brand management and ultimately, product management. What he laid out in his 800-word memo was a concise and straightforward description of "Brand Men" and their absolute responsibility for a brand – from tracking sales to managing the product, advertising and promotions. Uniquely he outlined that the way to do this was through thorough field testing and client interaction. They interpreted the Brand Man ethos as putting decision making as close as possible to the customer and making the product manager the voice of the customer internally. In the seminal book "The Hewlett-Packard Way" this way of working is credited with sustaining Hewlett-Packard's 50-year record of unbroken 20% year-on-year growth between 1943 and 1993. [1]

In modern days, Product Management encompasses a wide-ranging area of responsibilities and as a role itself means very different things in different organizations. While product management can be confused with project management, the latter has a different scope. A Project Manager has clear and specific goals and guidelines that are required from stakeholders. Also, they have specific budgeting, so they focus on operational efficiency and reducing costs while keeping quality up to par. In comparison, Product Managers have a holistic responsibility for shipping a product by being in the intersection of technology, business and design. Their efforts rotate around the customer's needs (either B2B or B2C), and they make sure to provide a complete solution. [2]

A subcategory of Product Management is Software Product management, which is the discipline of building, implementing and managing software or digital products, taking into account life-cycle considerations and an audience. Where software program managers focus on the project deliveries of engineering processes, design, documentation, planning, execution, operations and feedback. [3] There are numerous types of software products:

- Shipped software, like a mobile application.

- Online software, like a website.

- Consumer Product, like an online social network.

- B2B product, like productivity software.

In the last decade, we have seen software products evolving and expanding to every aspect of everyday life. That is because of the rapid technological advancement, but also because with the same software we can build easy-to-use tools for software development. By having new evolving tools, a new era of accessibility is opening up. That means that compared to the past, there are fewer resources and less knowledge needed to get started with software product management. It is thus allowing us to focus on two core topics. Firstly on what to build. Is not a question if a product can be made, but rather if it is needed and what is the purpose of it. The point is to have a solution to a problem that will be used and capitalized in a productive way. The second core topic is the methodology used rather than the tools themselves. Since tools have evolved enough, engineers and scientists have focused on different methodologies and frameworks that can speed up and optimize the production of software. Therefore shifting the focus on how innovative those frameworks are, and which are best suited for each process.

1.1   Thesis Purpose

The purpose of the thesis is to explore the complete management of a specific software product. Starting not from an idea, but from a challenge that needs to be solved. On each step of the software product development, there will be used modern innovation frameworks that will support the process. Those frameworks are widely used in the startup ecosystem, but also from large software businesses. Most of the frameworks are not just tools, but rather

a way of thinking and reasoning. While the rest of them are clearly software tools that save time and resources when developing the software. The case study is a software product that is a mobile application to support travellers and residents in a foreign city.

1.2   Structure

Starting from the second chapter we attempt to understand and define the problem that we are trying to solve. It includes who the customers are, what they are trying to do and they need help, and what are the current solutions in the market. A case study is used from my personal experience, which it's developed throughout the thesis. In the third chapter we will focus on generating ideas for a possible solution. We will be based on the work done in the first chapter, in order to create a complete and solid answer to the problem. It includes generating ideas and bulletproofing them. Then we converge into features prioritization and finally make a draft wireframing. Moving to the fourth chapter, we seek to validate the solution from the previous chapter and discover the value it can provide to the market. Thus creating a business business model that can support and make the solution viable. In the fifth chapter, we dive in the implementation of our solution. It includes the development of the website, the application prototype and the first MVP. In the final chapter we have the conclusion of the work done and the future recommended ways forward.

Chapter 2

Problem

Every product & service created in history started because people had a specific challenge that they couldn't solve. That's why the solution's quality is as good as the definition and exploration of the challenge. As Albert Einstein said: "If I had an hour to solve a problem, I'd spend 55 minutes thinking about the problem and 5 minutes thinking about solutions."

The problem that we will analyze is one I ran into while I was traveling. While exploring a new city, I couldn't find places that I was looking for. I used online websites like TripAdvisor, but they had reviews from various people and were mainly targeting tourists. Which obscured me from finding personalized activities and places in the short time of vacations, thus experiencing the city superficially as a tourist.

2.1   Understand the Challenge

To understand the problem, we have to pass through the first step of the Design Thinking process: **empathy**. Empathy is defined as "the action of understanding, being aware of, being sensitive to, and vicariously experiencing the feelings, thoughts, and experience of another without having the feelings, thoughts, and experience communicated in an objectively explicit manner." It describes the ability to put yourself in another person's shoes; to truly see the world through their eyes in a given context or situation.

In our case I had to empathize with other travellers, friends, students and strangers that could run into the same challenge as I did. To understand whether it is a common phenomenon

and how other people experience their vacations abroad. I started with user research, where I interviewed 15 people with various demographics to get insights. The difference of user research from market research is that the former is used to create perspective and gain a deeper understanding of the challenge. The latter is usually used when we want to extract a general truth or conclusion based on a specific question. [4]
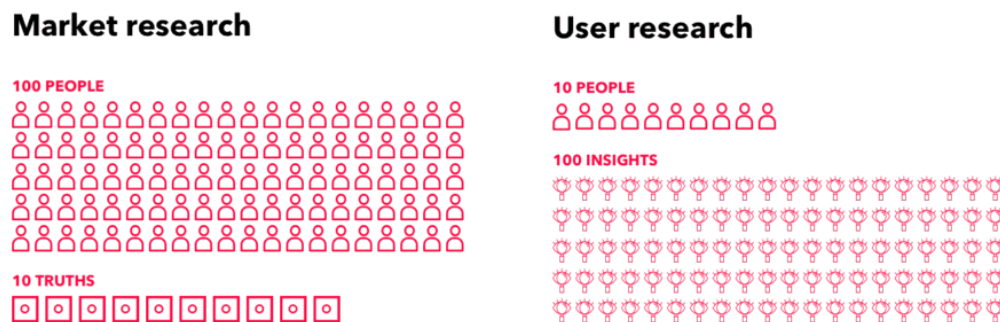
Figure 2.1: Market research & User research difference

From the first insights I was able to express the problem at a high level with the Customer Problem Statement. [5]
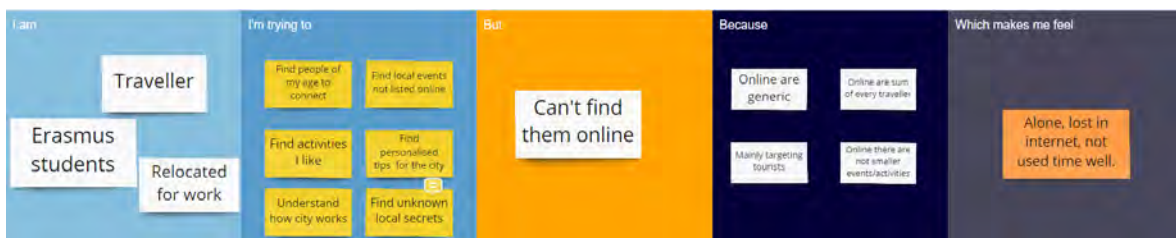
Figure 2.2: Customer Problem Statement

I am:

- Traveller

- Erasmus student

- Relocated for work

I'm trying to:

- Find people of my age to connect

- Find local events not listed online

- Find activities I like

- Find personalised tips for the city

- Understand how city works

- Find unknown local secrets

But:

- Can't find them online

Because:

- Online are generic

- Online are sum of every traveller

- Mainly targeting tourists

- Online there are not smaller events/activities

Which makes me feel:

- Alone, lost on the internet, not used time well.

2.2   Define aspects of the Challenge

The next step is to better frame each and every aspect of the challenge, so we have a clear view of what we are trying to solve. To do so, we will be based on User Research done before and will extend it so we can specify in details who has the specific challenge. And which are the parameters we need to keep in mind while building a solution.

2.2.1   Customer Persona

In user-centered design, a persona is a fictional character created to represent a user type that might use a site, brand, or product in a similar way. [6] From the User Research above we saw that there are probably 3 Personas for people that have almost the same challenge. For each of the 3, I did more user interviews, based on 4 aspects of their lives when they are abroad. Those are:

1. **Pains**: This aspect is about everything that challenges the customer inside a context. Our context is while they are abroad on vacations, or for Erasmus or for working/studying. It includes fears, frustration and anxieties they might have. We need to know what pains and problems people are going through because that's what we want to focus on and relieve them.

2. **Gains**: It's all about what those people want, needs, hope and dream. We need this information so we can reinforce and amplify gains with our solution.

3. **Jobs to be done**: What are they trying to do and why is it important for them? What are their goals and why are they abroad? If we know what they want to achieve, we can provide support through our solution.

4. **Reality**: How do they achieve those goals today? What are the barriers in their way? Reality provides us context and opportunities to see how we can affect customers based on their context and reality.

Also we want to write down their **demographics & characteristics**, because they can affect how they experience the problem differently from other personas or people.

The first Persona is an Erasmus student. Let's name him Lefteris. For the past six months, Lefteris was in Lisbon studying at the University as an Erasmus student. He is 22 yo and in the 3rd year of University. Also, he had a budget of 350 euros given by the University for his Erasmus.

The main pains for Lefteris are:

- The budget because he needs to rent a house and make a living with the money given by the university and his own budget
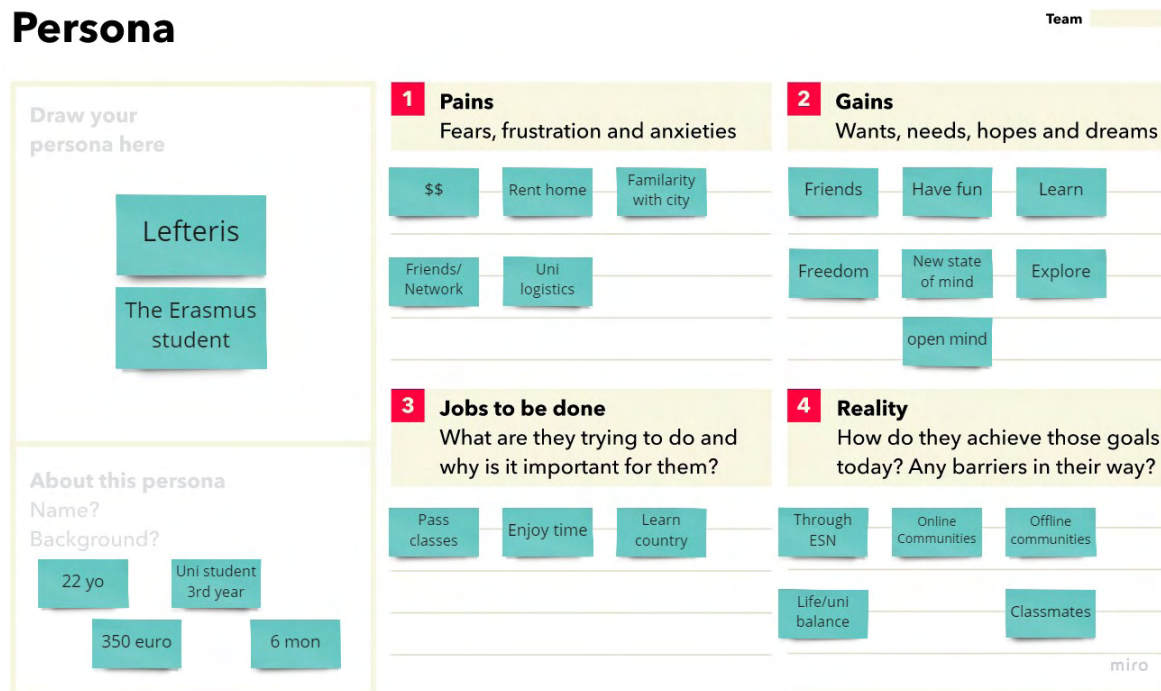
Persona

Figure 2.3: Persona no1: The Erasmus student

- Renting a house because he doesn't know how renting works in this foreign city.

- Also, he needs to handle logistics with the university regarding classes, professors, and the course matching.

- Familiarity with the city. Where are the supermarkets, and what time they open & close. What is considered expensive or cheap. Where to eat or drink. What are the unsaid rules of the city. Which are the dangerous areas of the city.

- Lack of friends and network to socialize with. He needs to start from scratch and make new friends.

The main gains are:

- Friends. Through his time in Erasmus, he wants to make new friendships.

- Have fun. Enjoy the time that he spends in the city in whatever activities he prefers.

- Learn about the culture & the way of living in that country's citizens

- Freedom. He can do whatever he wants, without limits to his imagination. It's up to him to decide how he wants to spend his time.

- New state of mind. By detaching from everyday life in his own country, he can now discover himself and change his way of thinking.

- Explore the city, and it has to offer from museums and art to local bars and places.

The Jobs to be done are:

- Pass classes. He attends university in order to pass all or most of the classes and gain knowledge in his field.

- Enjoy time. It's not exactly a job, but Erasmus students want to go not just for classes but to live and enjoy that city.

- Learn country & city. It's complementary to the previous point. That he wants to enjoy the time in that country and experience it at the fullest. To discover the culture and the peculiarities of that city. Something that he wouldn't experience back home.

The reality of Lefteris is:

- Through ESN, he can find locals and participate in multiple events that they are organizing. Also, they have a buddy from ESN that can support you during your stay.

- Online communities. There are social media, unofficial groups, and sites that are bringing together people from the same country or in general students.

- Offline communities. They are also in actual campus communities of expatriates.

- Life/University balance. He is trying to experience everything, without sacrificing the classes nor the bars & parties.

- Classmates. Through them, he can take a lot of information about the city, the university, and the life there.

The second Persona is a traveler for vacations. Let's name her Luna. She traveled with her two friends for about one week to a country abroad that she has never been to before. Her age is 25-30 y.o. And she is studying for her Bachelor's or Master's degree. Her budget is calculated beforehand, and it's not big, but it's also good enough to support what she wants to do.

The main pains for Luna are:

Persona

Figure 2.4: Persona no2: The traveller

- Security. She wants to be safe during the vacations and know which places are to be avoided. That's why she needs to research the areas and understand how the city works.

- Get around easily. It's not that easy for Luna to understand how public transportation works in that city. And then to decide what is best to use from a safety & budget perspective.

- Communication & language. It's a common problem mainly when dealing with logistics like buying train tickets or while dealing with accommodation.

- See everything. In a span of a few days, she wants to see the more she can. Which can be stressful and needs a lot of research before the travel.

- Limited time. Because of that, the vacations bring anxiety for when to wake up, where to go and what to visit. And it becomes a problem of prioritization of the time she has.

- Travel logistics. Everything that needs to be done before traveling like visa, flight tickets, transportation when they arrive, etc.

- Accommodation, as it is a major concern.

- Budget for what you get. This means that it is a prioritization problem again about the money Luna has and the attractions/activities she wants to experience abroad.

The main gains are:

- Explore the city, as the previous persona does.

- Learn about culture and how the city works.

- Enjoy the time with her friends.

- Party.

- Eat & drink.

- Unique activities that she can live that are special and she doesn't have them in her country.

- Live like local, meaning that she can understand and experience the habits of that city.

The Jobs to be done are:

- Live vacations at maximum. Take advantage of that time being abroad.

- Sightseeing around the city. Museums, art, history, etc.

- Tasting the foreign cuisine.

- Enjoy company and find new. Have fun and create memories.

The reality of Luna is:

- Known friends told her about cities that she should visit.

- She also asked around and found friends of friends that helped her.

- Sites like TripAdvisor. Where she can find information.

- Plan ahead because she wants to live vacations at maximum.

- Read online reviews to understand where to go and what to do.

Persona
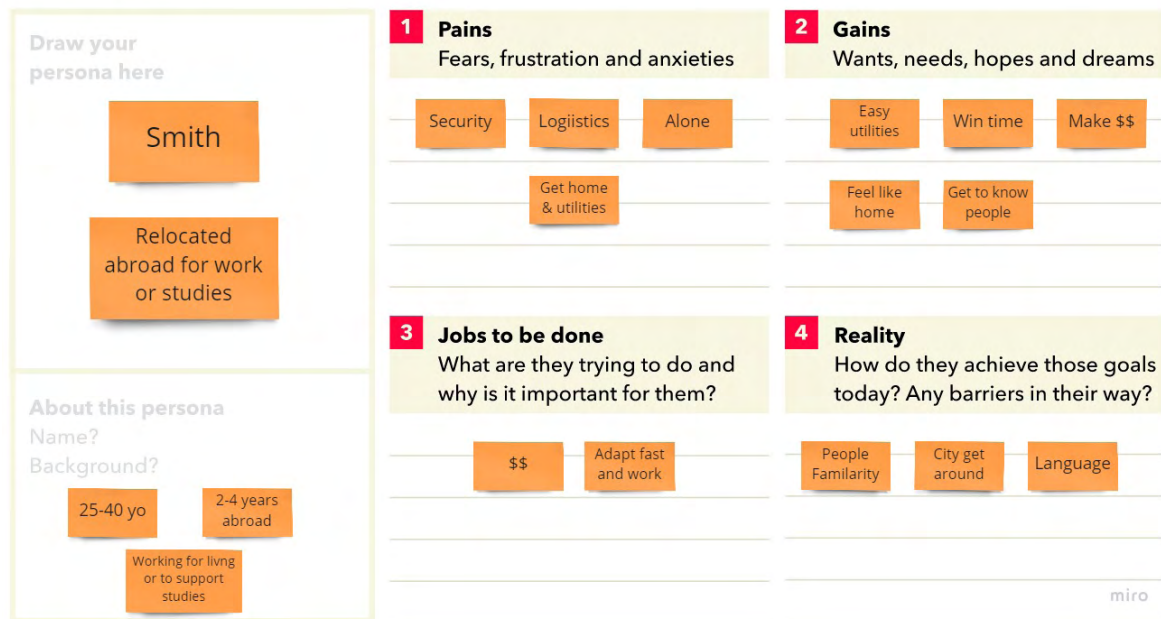
Figure 2.5: Persona no3: The relocated employee or student

The third Persona is someone that reallocated for studies or work abroad. Let's name him Smith. He can be two categories of people. An employee that the company needed him to relocate to another country for some months, up to 1-2 years. Or a student that started university abroad for his Bachelor's or Master's degree. He is relatively young, and the first period abroad he needs to do a lot of logistics to settle in.

The main pains for Smith are:

- Security. He wants to live in a safe neighborhood, and be able to feel safe at all times.

- Logistics about the home, the government, the studies or the work.

- Being alone. When he arrives and for the first period of time, he doesn't know anyone.

- Get home and utilities. Actually renting a home or dormitory, buying furniture and paying bills in a foreign country can be challenging at first.

The main gains are:

- Easy utilities. Once Smiths is settled down he can invest in his home and create a routine like it was his country.

- Win time. He wants to save time and be efficient since he spends many hours in work/studying.

- Make money. Even as a student Smith could use extra money to support his leaving.

- Feel like home in that city. Embrace it and integrate with it.

- Get to know people and create friendships.

The Jobs to be done are:

- Make money. Either for work or support studies.

- Adapt fast and work/study.

The reality of Smith is:

- People familiarity. He needs to start from zero and slowly make friends as time passes by.

- Get around the city. Understand how it works and discover it.

- Language. Be able to communicate with people that do not speak English that well.

2.2.2   Customer Journey

Now that we have the first version of the people that need a solution, we will set up their customer journey. That is all the phases that a customer passes through inside a context, which in our case is going & living abroad. In each phase, we want to write down every action that they are taking, what they are feeling at the specific phase, and what channels/tools they are using. Completing a customer journey map will help us identify unknowns, opportunity areas, and potentially map out possible solutions.

Through the customer interviews, I realized that the 3 personas are passing through very similar customer journeys. That's why I composed one holistic mapping that can serve all of them.

Phase: Desire that they want to travel
Actions: Browsing random blogs/sites and watching photos of places. Casually looking for possible destinations.
Feelings: Tired or want a change. That's why his feelings start from discomfort, and they

Customer journey mapping

1 Phases - Identify different phases in your customers journey

| Desire that they want to travel | Search where & when to travel | Decide where & when | Travel logistics | Country/city preperation | Travel | First day(s) abroad | Normality | Leaving |

2 Actions - Define which actions your customer take during the phases above

| Browsing and watching random blogs/sites/ photos of places Tired or want a change | Ask friends for recommendations or that have been Search internet for nice places Check calendar | Find basic info for country (e.g. tourist season, holidays, etc) Prepare job/family/responsib ilities for that dates | Airplane/train tickets Visa Accommodation Budget How to move around | Search places to: Eat Drink Museums Activities Parties Friends | Preparation Id, $$, running anxiety | Tired Be lost Want to settle in hotel and eat Trying to get familiar with transportation Anxiety to arrive safe & whole to hotel | Explore city Enjoy activities Going out Get to know people | Gather all things again before leaving Enjoy best places Saying goodbye Anxiety to be on time |

3 Feelings - Draw a line of emotions with each action to visualise their feelings

4 Channels - Which channels does your customer use during the defined phases

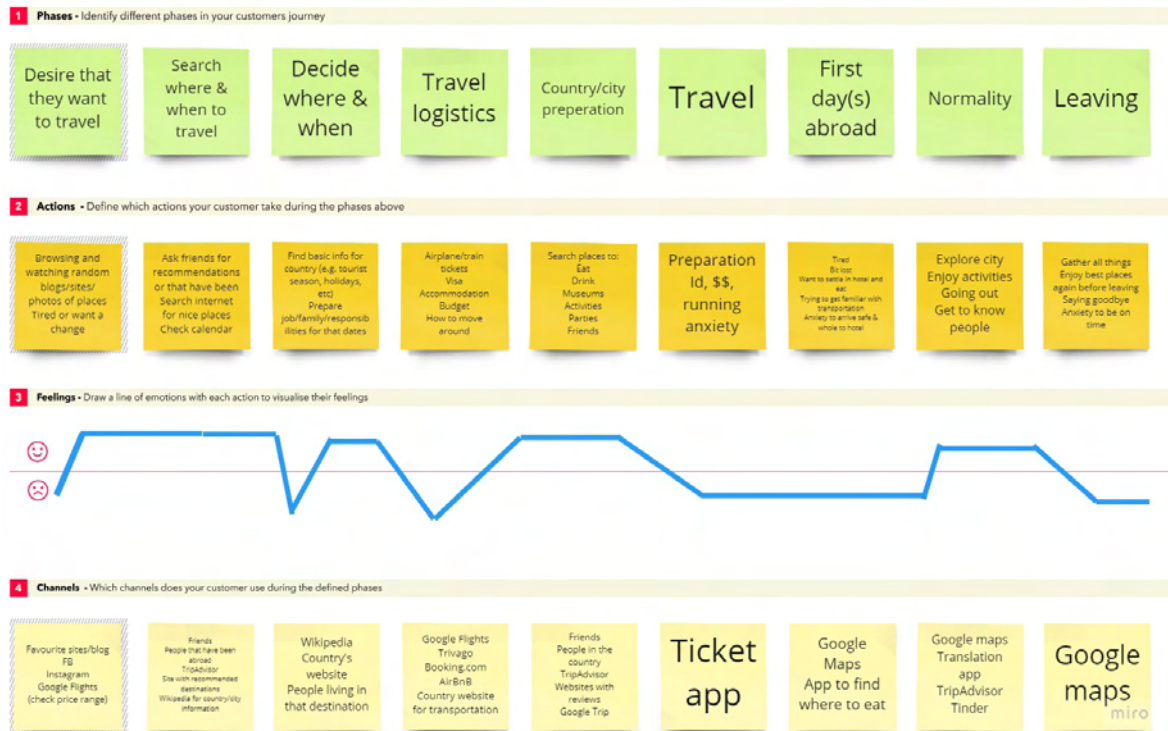| Favourite sites/blog FB Instagram Google Flights (check price range) | Friends People that have been abroad TripAdvisor Site with recommended destinations Wikipedia for country/city information | Wikipedia Country's website People living in that destination | Google Flights Trivago Booking.com AirBnB Country website for transportation | Friends People in the country TripAdvisor Websites with reviews Google Trip | Ticket app | Google Maps App to find where to eat | Google maps Translation app TripAdvisor Tinder | Google maps |

Figure 2.6: Customer Journey

become hope and happiness when he starts searching for places to go.

Channels: Social media like Facebook and Instagram. Favorite travel blogs. Google flights and SkyScanner to check approximate prices for flight tickets.

Phase: Search where & when to travel.

Actions: He is actually looking for a destination. Asking friends for recommendations or places that have been before. Searching the internet for the best locations. Checking the calendar for dates that can be free.

Feelings: Excited to go abroad. Curious for different destinations.

Channels: Friends. Friends of friends that have been abroad. Reviews on TripAdvisor and travel sites. Wikipedia for country/city information.

Phase: Decide where & when.

Actions: He is searching for basic info for the country (e.g., tourist season, holidays, etc.). He is doing preparations needed for job, family & any responsibilities for that date.

Feelings: It's time-consuming to arrange the dates and the destination, so the energy and ex-

citement are starting to fade a bit. But then when those are done, he is calmer to start planning for what he will do there.

Channels: Wikipedia and country's website for formal information. He is asking people living in that destination if he knows any.

Phase: Travel logistics

Actions: He needs to buy airplane/train tickets. Make sure he has a visa or ID, depending on the country. Find and buy accommodation. Set a budget that he will use. Find information about how to move around.

Feelings: It's an anxious phase because he wants to find reasonable prices for transportation and accommodation. Also, because he needs to compare hotels/homes and find the appropriate area he wants. Then it's the logistics of visa or special travel restrictions (e.g., COVID19) that might need to be taken under consideration.

Channels: Google Flights. Skyscanner. Trivago. Booking.com. Airbnb. Country website for transportation.

Phase: Country/city preparation.

Actions: When finished with logistics, it's time to search for places like restaurants, bars, and museums. Also for activities, events, parties, and anything that seems interesting.

Feelings: He is full of anticipation and enthusiasm about the experience he will live.

Channels: He is asking friends that have been there for recommendation. Also asking people living in the country if he knows anyone. TripAdvisor for best places and multiple websites with reviews. Google Trip and similar mobile applications that help you organize your trip.

Phase: Travel.

Actions: He is doing the preparation regarding clothes, luggage, and travel logistics. Finishing up pending issues. Running to catch up on the flight.

Feelings: Anxiety. Rush. He is trying not to forget anything.

Channels: Nothing. Except if he is using a mobile application for his ticket.

Phase: First day(s) abroad.

Actions: He is tired, and a bit lost when he arrives at his destination. He just wants to settle

in the hotel and eat. Then to get familiar with transportation.

Feelings: Anxiety to arrive safe & whole to hotel. Tiredness from the trip.

Channels: Google Maps to find accommodation. Mobile application for finding where to eat.

Phase: Normality.

Actions: He is exploring the city and enjoying activities. Going out and trying to get to know people.

Feelings: He is excited, thrilled, curious & energetic about the experience he is living.

Channels: Google maps to get around. Translation app to communicate when it's difficult. TripAdvisor for places to visit. Tinder and other apps to find people.

Phase: Leaving.

Actions: Gather everything. Enjoy the best places one last time before leaving. Saying goodbye to people. Running to catch up on the flight.

Feelings: Sad that he is leaving. Anxious to get everything and arrive well in his country. Tired from the experience, but fulfilled.

Channels: Google maps to get to the airport or train station.

2.2.3 JTBD (Job To Be Done)

We have our possible customers, their first personas, and the journey they are passing through. This is enough information to frame the problem we want to solve. For that, we will use JTBD or Job To Be Done. A Job to be Done is the process a consumer goes through whenever she aims to change her existing life-situation into a preferred one, but cannot because there are constraints that stop her. Users don't randomly use products. Instead, they use them because they help them achieve a particular outcome, a specified change in the current state. The desire to change the current state is what we call the 'job'. Because this is only of temporary nature, we tend to "hire" a solution -a product or service- to get it done. [7]

In figure 2.7 and 2.8 we can see an example of how Achilles Design likes to express user or stakeholder needs. We can break this into two parts: the job and the outcome statement.
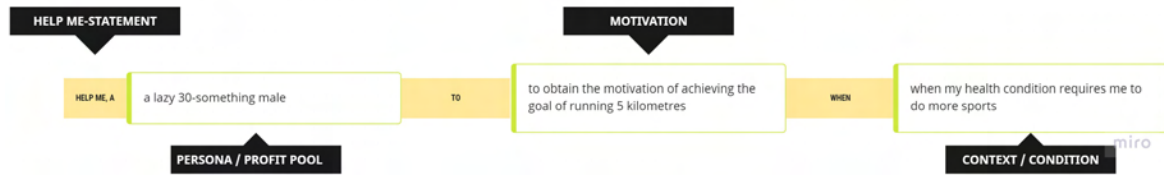
Figure 2.7: JTBD: Job Statement

Figure 2.8: JTBD: Outcome Statement

Step 1: "HELP ME, A ..."

We start with framing things from the perspective of the user/stakeholder, by stating that they want to be 'helped' with something. That way, the thinking is significantly more user-centric, as opposed to business-centric reasoning. Then we have to state the user. For us, we have three personas, and if we see their demographic are **20 to 30 years old, traveling & staying abroad**.

Step 2: "TO .."

We need to describe what is the motivation of the customer. This is extracted from the previous sections, where the biggest and repeatable problem is that users want to **experience a foreign city like locals** and not as tourists. To easily find places, events & activities abroad that match their interests. To avoid tourist attractions. To explore the city and its culture. Find people of their same age and passions. And finally, use their time and budget as well as they can.

Step 3: "WHEN ..."

The context is when travelers **have no knowledge about the city, no known people, and they can't find online what they are looking for**. The last point is valid when online reviews and blogs are generic and made for tourists.

Step 4: "FOR ME, A …"

In our case, it will be a **software product** that can provide a solution.

Step 5: "IT'S SUCCESSFUL WHEN IT..."

The improvement that we want are 2:

- Maximize the personalization of recommendations & support for the city.

- Minimize the time searching for personalized recommendations & support.

So the final JBTD is:

Help me, a 20 to 30 years old, traveling & living abroad, **to** experience the foreign city like a local **when** I have no knowledge about the city, no known people, and they can't find online what I am looking for. **For me, a** software product **it's successful** when it maximizes the personalization of recommendations & support for the city and minimizes the time searching for that.

2.3 Target Customers

We need to make sure that there is an actual market that is worthy of a solution. By understanding the market proportion, we can make decisions early about our solution and it's targeting.

Travelers:

In 2019 there were 4.7B. [8, 9]

In 2018 there were 1.4B. [10]

Erasmus students:

In 2015 there were 300.000. [11]

In 2018 there were 853.000. [12, 13]

Rellocations:

Students: In 2017 there were 1.7M moving to EU. [14]

Workers: In 2018 there were 258M. [15]

COVID19 consequences:

The pandemic can affect our product in multiple ways. Firstly it has and continues impacting the global economy. According to recent McKinsey research [16], discretionary consumer spending may decline by 40 to 50 percent, translating into a roughly 10 percent reduction in GDP and numerous second- and third-order effects. That means that people will tend to save money and not spend it on vacations. The second effect is mobility because people will be more cautious, even afraid of shared traveling because of a possible infection. According to Deloitte & Salesforce [17], there are many different scenarios of how it could evolve.

In conclusion, the impact on our product might be significant, but it can also provide us opportunities.

2.4   Current products in the market

The last step before going to the solution chapter is to do a wide search about products that are already in the market. This will benefit us in many ways. Firstly it will help us understand what problems have already been covered and in what way. For example, what problems AirBnB is trying to solve in travelers and how. In which way and how big market penetration they have. Then this analysis will also provide inspiration for our own solution. It could be some futures, some ideas, or a combination of different apps that can be combined and used for our product.

Apps for travelling abroad

InterNations
Connect with other internationals abroad. [18]

BeWelcome
Bewelcome lets you share a place to stay, connect with travellers, meet up and find accommodation on your journey. [19]

Show Around
Local tour guide that but with payment. [20]

Tours by locals

Local tour guide that but with payment. [21]

MyTriplan

Organize your personalized trip thanks to locals. You need to pay. [22]

Trotter

Travel tips from friends. [23]

Viahero

Locals plan the trip for you. You need to pay. [24]

Apps for meeting people

Meetup

Meetup is a service used to organize online groups that host in-person events for people with similar interests. [25]

Foursquare City Guide

Find places to go based on your friends. [26]

Skout

Is location-based social networking and dating application. The app provides personalized recommendations of places to go near a user's current location based on users' previous browsing history and check-in history. [27]

Friender

Tinder for friends where you put your interests. You need to match to talk. [28]

Tinder, Bumble, MeetMe, Grindr, etc

Dating apps that you can also meet just friends.

Chapter 3

Solution

In this chapter we will move forward with each aspect of the problem that we found earlier and aim to find a complete and well defined solution. We will address those firstly through ideation that we will generate many ideas. Then we will test them with the opposite Thinking. Afterwards we will define what to prioritize and finally we will create a wireframing that will depict our solution.

3.1 Ideation

Ideation is part of the Design Thinking process and it is the creative process of generating, developing, and communicating new ideas, where an idea is understood as a basic element of thought that can be either visual, concrete, or abstract. We want to produce many ideas with an open mind that can possibly address our problem statement.

3.1.1 HMW (How Might We)

Starting with the questions of How Might We [29], we want to gain scope and alternate thinking in the brainstorming. It's a continuation from the challenge definition, where we described the Job To Be Done. Now we want to rephrase the JTBD, so it can help us see the challenge from a different perspective. The goal is to find opportunities for design and kick off the brainstorming.

Figure 3.1: How Might We Statement

Action:

- Minimize time: We want our users to save time and not search the internet for many days without results.

- Improve: We want to simplify and optimize the process that customers are passing through. So they can get rid of stress, anxiety and uncertainty.

- Personalize: Because of the vast information online, we want to save users from confusion and useless information: So they can focus on precisely what they want and need.

- Support. To be present and assist customers when in need. So they can have someone they can rely on.

Subject:

- Young travellers: People without experience and connection in a foreign city.

- Relocated workers: They have just moved to a new city, and they need to continue working at the same time

- Erasmus students: They are going abroad from 6 to 12 months, and they want to adapt to their new reality.

- Students relocated abroad: People that need to establish an everyday life for 2-4 years abroad.

Outcome:

- What they can experience based on their interests: Since every persona has limited time abroad, we want them to discover and live what they truly desire.

- Search for places: How to find bars, restaurants, museums and other locations that they like.

- Find similar people: To connect and create new friendships with similar interests.

- Get insights about the city: Understand how the city works, unspoken rules and insights that can make their life better.

- Find useful information: From local transportation to emergencies and general information about the city.

- Live as locals: To feel and experience a new culture and norms that they are not aware of.

So the HMW statements that can be extracted are:

- HMW minimize the time a traveller needs to find similar people abroad?

- HMW improve the search of Erasmus students to live experiences that are based on their interests?

- HMW personalise the insights about the city for relocated workers & students?

- HMW minimize time that travellers need to search for places and find information they want?

- HMW support Erasmus students to live as locals?

3.1.2   Brainstorm Cards

Brainstorm cards [30] are a collection of 52 questions that can trigger inspiration and ideas. Each of the 52 questions encapsulates an example answer from existing companies & startups. And they are divided into four categories that represent trends in the market. According to the Board of Innovation description, those are:

1. **Regulation**: Regulation needn't be a burden. Get around the restrictions of red tape by creating innovative loopholes and finding crafty solutions to top-down directives. These cards will help you make bureaucracy work for you, not against you. Adaptation is key to rising above what others might see as oppressive rules. We like to think of it as innovation anarchy.

2. **Market**: We all know that marketing is no longer about rampant consumerism or pushing products no one wants. Bring your customer to the negotiating table. Apply the customer-knows-best principle to the extreme. The customer-centric approach has never been stronger. Use these cards to improve on existing methods and devise your own ideas of how to shape the market beyond the current innovation trends.

3. **Technology**: Welcome to the technological revolution: augmented reality, virtual assistants, biometrics, machine learning. Contrary to science fiction predictions of yore, there is no need to fear robots. Rather, they give your company a bionic leg-up. Use the examples on these cards to envision the different technological solutions available, and position yourselves ahead of the curve.

4. **Customers**: Customer trends are quickly shifting. Having your finger on the pulse of innovation puts you ahead of the pack. These cards will help you come up with creative strategies to meet your customers' evolving needs. Learn from these cutting-edge ideas and use design thinking to predict what's next. Use them in conjunction with our customer empathy and customer journey map.

After consulting all examples, the main cards that brought me ideas are depicted in figure 3.2.

You could predict customer behavior?
What if based on the previous interaction of the user, the software product can understand what kind of bars, restaurants, activities, etc the user likes. So then artificial intelligence (AI)

amazon

WHAT IF

You could predict customer behavior?

Think of ways to quickly answer customers' needs by predicting them. Amazon patented a system for predictive logistics: based on buying trends, your searches, and regional data, they send products to warehouses close to you, even before you buy them.

STITCH FIX
Your partner in personal style

WHAT IF

Your products "learned" each time a service or product got used?

Imagine each time you use your service or product, it gets better and more aligned with your needs as the user. Stich Fix provides hand-selected outfits by a personal stylist. Keep what you like, send back what you don't. They learn from your behaviour to send you different proposals the next time.

WHAT IF

Your company had only 5 employees?

Imagine ways to offer your products and services with a small team. Consider automation, outsourcing, and other solutions. Instagram had 13 employees when Facebook acquired it for $1 billion.

waze

WHAT IF

You used gamification?

Think of ways to make using your product or service fun for customers. You can add levels, social rankings, perks, awards, missions, and scores. Waze, a "sat-nav" traffic measurement system, for example, awards points for every km driven or every report added. These reports are so accurate, many car manufacturers such as Honda are leaving TomTom for Waze.

slack

WHAT IF

You allowed external providers into your service?

Imagine ways to let other companies integrate their services into your service. Slack allows hundreds of third-party extensions into its communication platform.

TESLA

WHAT IF

You could help your competitors?

Think of ways to leverage cooperation: share know-how, create alliances, or show some generosity. In 2014, Tesla made all their patents public, and in 2018 they published the full blueprint of all their cars. This way, even if their technology becomes the standard, they will always be ahead of the pack.

Figure 3.2: Brainstorm Cards example

can learn with the time and provide him better suggestions.

You used gamification?

What if having reward & scoring systems can help the retention of the users and make the product exciting even if they have used it a million times. So they would never be bored, but rather willing to open it again.

Your products "learned" each time a service or product got used?

What if the users can give small feedback each time they are given a suggestion, so with AI, we can adapt the algorithm. It could be extensive feedback or many aspects or just a simple More/Less button so that it can be easily done from users.

You allowed external providers into your service?

What if the product will be able to connect through social media or travel applications like TripAdvisor. So I can integrate what already exists in the market and has too much data already.

Your company had only 5 employees?

What if I can support the product myself without other people. User feedback can be implemented directly with the application's algorithm. Everything is clear with a dedicated page for questions, so there is no need for customer support. And for any bugs, they can submit through a form that I will look into it.

You could help your competitors?

What if the software product can be integrated into current apps like TripAdvisor and Airbnb. In that way, they will not strive to compete, but rather use it to boost their own products.

An extra question that I have is:

What if they only need to use the app for 5 seconds and get results?

So everything can be extremely clear and easy for everyone to use. The application's menu and user interface to be intuitive and self-explanatory.

3.1.3 Analogy Thinking

Analogy thinking It's the process of getting inspiration from current solutions and their features. By analyzing what a product/service offers, one from inside our domain (travel abroad) and one from outside. The one from the same domain will help us understand what the best points of attention and features that we can implement are. The one example from outside our domain will assist us in diversifying our thoughts and adapt a seemingly unrelated product to ours. That's because we don't want to focus just on the feature/solution but also on the methodology and how this affects users in a positive way.

The first example taken from our domain is Viahero. [24]
It's a service where a local person will create a vacation plan for you. It's a paid service per day, and the local will assist you with tips, recommendations, and getting around the city.
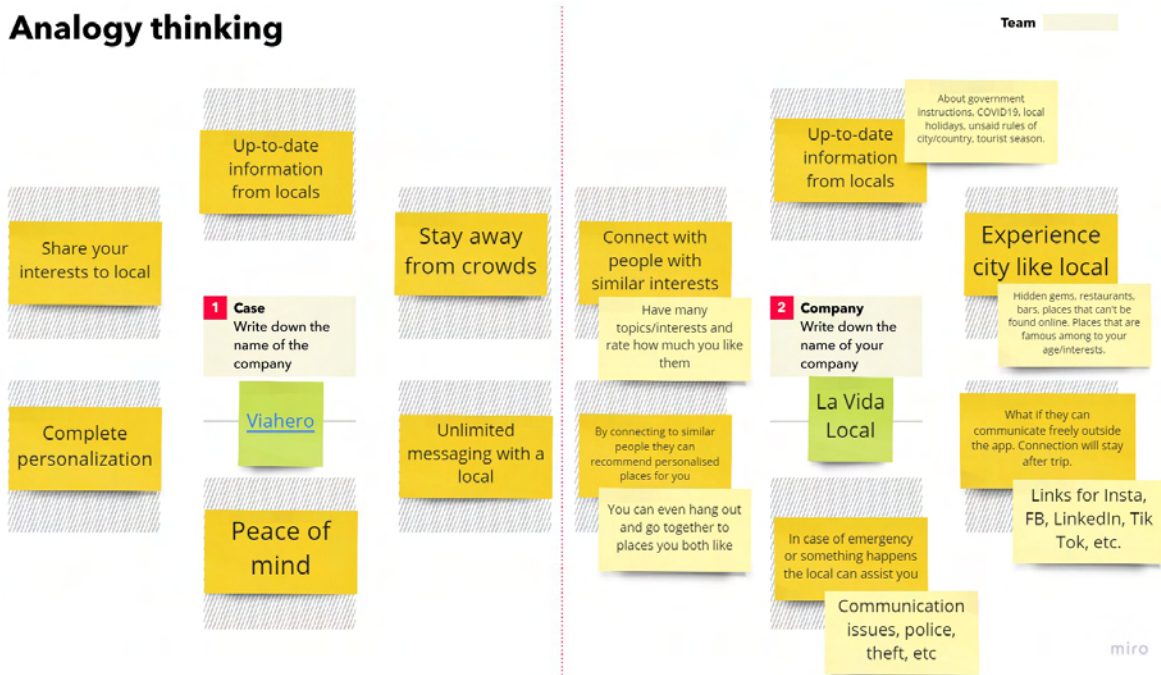

Figure 3.3: Analogy Thinking from the same domain

Some features are:

Up-to-date information from locals
In Viahero, you can have the most recent information about anything because you communicate with a local. What if we can also have exactly the same feature in our software product? That way, the user can learn about government instructions, COVID19 updates, unsaid rules

of the city, and every bit of information that is not easily accessible for foreigners.

Stay away from crowds

The locals will know what a tourist attraction is and what's not. So they can redirect the customer to places & experiences that only the citizens know. In that way, travelers can find hidden gems, restaurants, bars & parties, and people that have people of their same age & interests instead of tourists.

Unlimited messaging with a local

Through Viahero, you can communicate free from the app with the local that will create your trip. What if users in our product can also do the same? But on the other hand, they need to use an extra communication channel. So what if we can provide users the links to social media of the other people so they can text and chat through media that they are already using. For example, Messenger, WhatsApp, Instagram, Tik Tok, etc.

Peace of mind

In Viahero, it makes sense that since a local is creating the trip for you and they are in constant communication with you, they can support you in emergencies. What if we can also capitalize on this feature and provide users with a local person that can support them if something happens, from serious things like COVID19 or theft to just a local reservation.

Complete personalization

Since a local makes your plan, you can talk to him and customize it with your interests and his knowledge of the city. What if for our product we can match people with similar interests, so they can suggest to users where to go out in their city. And that can be expanded into a friendship and company, so they can go together to events or concerts together.

Share your interests to local

In order to be personalized, you share your interests. What if we can also have a variety of criteria that can be used to match the user with a local. For example, it can be how much the user likes something from 0 to 10. Things like travel, food, bar, museums, art, parties, culture, etc.

The second example is taken from a different domain, and it's the Facebook Ads. I choose the specific one because they have extremely complicated algorithms that understand the user's interactions & interests and then provide him with similar advertisements.
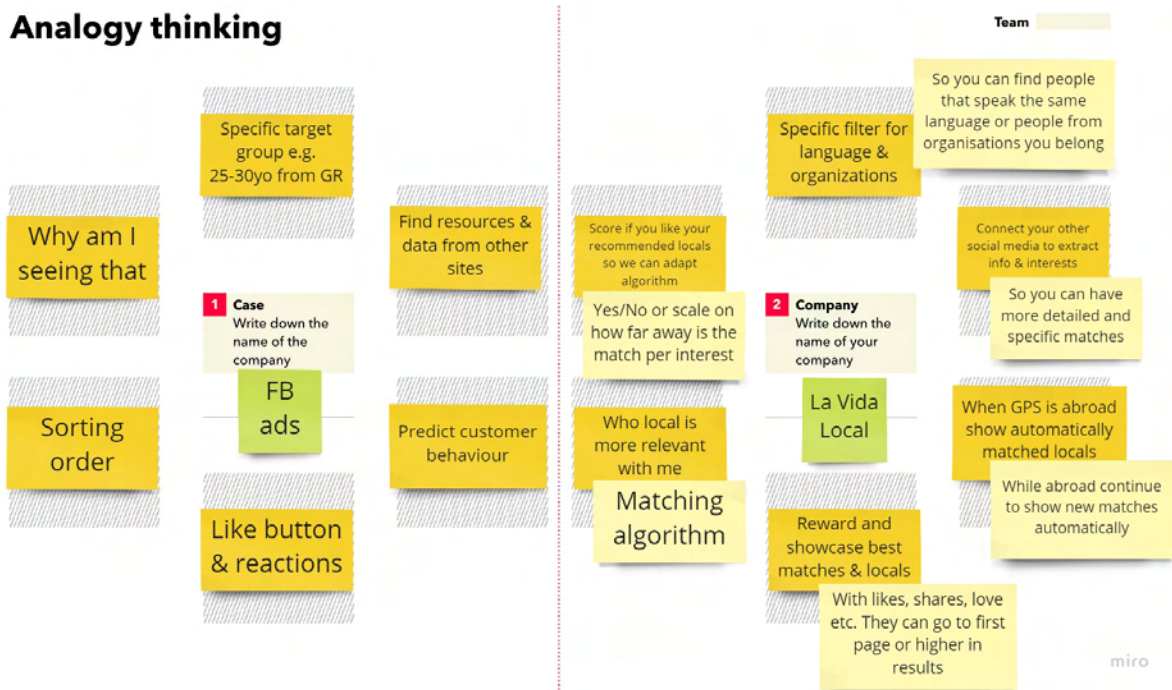

Figure 3.4: Analogy Thinking from different domain

Specific Target group

When a company creates an advertisement through Facebook Ads, they can specify the target group they want the ad to be displayed. For example, to be shown only to 25-30 years old females from Greece that like volunteerism. What if we can translate that feature to filters in our app that can specify the search for locals that are speaking the same language or are part of the same organization.

Find data and resources from other sites

In order to create a complete customer profile, Facebook is using not only users' Facebook profiles but also information taken from Instagram, WhatsApp, and Google. In the same way, we can provide the option to users to connect their social media to our software product, so we can create a more detailed profile for them. Which can help them have better matches with locals.

Predict customer behavior

Is also something that we saw from the Brainstorm Cards. Facebook can predict which posts will be more similar to the interests of the user, so they provide more of those kinds of posts. What if we can also predict customer behavior by having the app to automatically match you with a local when you are abroad. That way, there is not even the need to open the app when you remember it, but rather the app is serving you before you need it.

Like button & reactions

Similar to Facebook, we can have a reward system that can showcase the best travelers or locals. And display them on the first page, so they can be recognized and followed by more users.

Sorting order

Like Facebook provides you with posts, profiles & searches from the more relevant to less, we can have the same feature for matching profiles. The more common interests you share, the higher this person will appear when you search.

Why am I seeing that

When an advertisement appears on Facebook, you can click on it and see why this is displayed to you. Similarly, we can have a like button or Yes/No button, where users can provide immediate feedback on their match, and if the profile that they found is what they were looking at. That way, our algorithm can adapt to users' preferences and improve itself.

3.2   Opposite Thinking

So far, we have created a draft idea with some possible features. That is an app where our three personas can be matched with similar local people based on their interests. So they can communicate and find personalized insights about the city. Moreover, even create new friendships along the way.

The next step is to bulletproof the idea through Opposite Thinking. It is a mindset of seeing things in a different way that can provide us with insights and unique solutions. Opposite Thinking will challenge our assumptions about the problem and the possible solutions. [31]
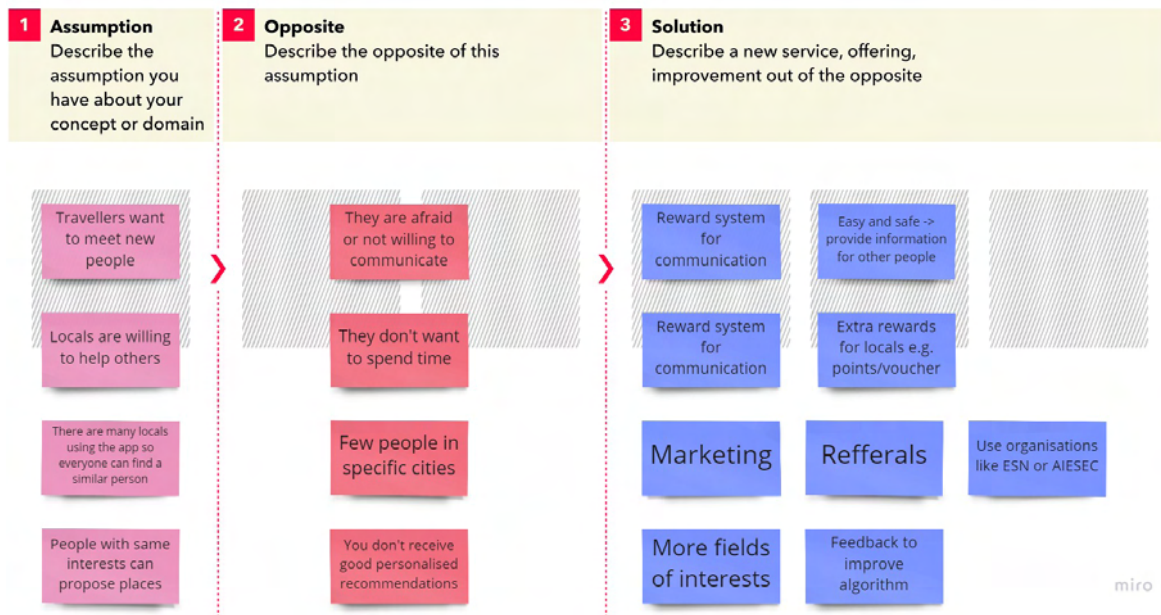
Figure 3.5: Opposite Thinking

Assumption: Travellers want to meet new people. They have no problem talking with strangers in order to get help and insights.

Opposite: They are afraid or not willing to communicate. Because they do not know the other person, and they think that strangers might have malicious intentions.

Solution: Reward system for communication, so trustworthy profiles can be highlighted. Easy and safe app to use, by not having any people data or conversions inside the app. Instead, users will use their social media that can show their trustworthiness. Provide information to other people, like age, small biography and studies/work.

Assumption: Locals are willing to help others. They are open-minded and see the value of communicating with travelers.

Opposite: Locals don't want to spend time. They are bored or not happy to support anyone without some profit.

Solution: Reward system for communication. So they can rank higher the more the help travelers. Extra rewards for locals like vouchers for restaurants or points inside the app that they can spend on their favorites places. Focus on the friendship that they can create.

Assumption: There are many locals using the app so that everyone can find a similar person. There will be a variety of different people that can match with each other.

Opposite: There are few people in each city or very limited personas. In that way, when travelers search, they will be matched with totally different persons. That might discourage them from using the application.

Solution: Marketing to have enormous reach. Referrals from current users. For example, if they refer three people, then they gain a reward/coupon. Use of organizations like ESN and AIESEC to cooperate and promote the application inside their members.

Assumption: People with the same interests can propose places.

Opposite: Travellers do not receive good personalized suggestions. That may lead to disappointment and reduction of the product's credibility.

Solution: More fields of interests, so there is higher matching accuracy. Feedback from users to improve the algorithm by using AI.

3.3   Innovation Battlefield

So far, we have seen some possible solutions in Opposite Thinking that we can incorporate in our product. We also have the features and ideas from Analogy Thinking. Up to this point, we were creating choices, or as it is called in the Design Thinking theory, we were diverging. The next step is to make choices or, as it is called to converge in our solution. It can be illustrated in the figure 3.6.

Converging is an important step in the innovation process. The Innovation Battlefield [32] will help us make the right decision regarding which concepts or features to take forward.
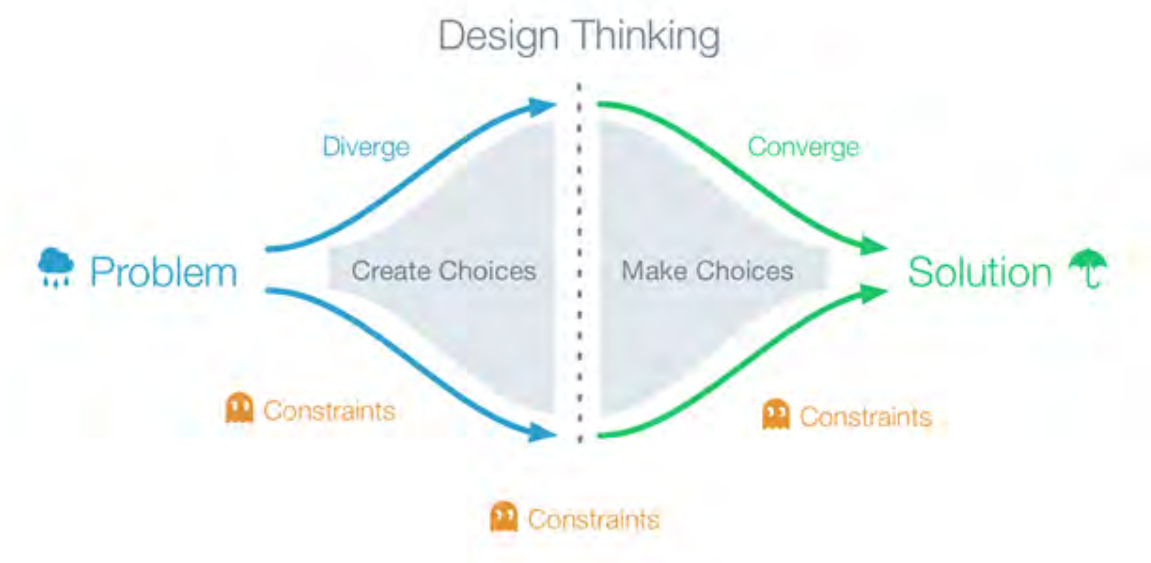
Figure 3.6: Design Thinking divergent and convergent

In the X-axis, we have the level of the indispensability of the feature. This means how much it will be missed from users if we exclude it from the product.

In the Y-axis, we have the level of novelty or newness, representing the impact of the specific feature on user experience.

The Bottom Left quadrant is about all the users' features, and we don't really care about it because they do not impact the app or are attractive to users.

The Top Left quadrant includes the extra features that users did not know about, but they are a delight to see. So they are unexpected awesomeness.

The Bottom Right quadrant is about features that users need and, at the same time, do not have that much extra impact on our product. They are the expected essentials.

The Top Right quadrant includes features that are impacting the app a lot and are needed from users. They are the way of making the app harder, better, faster, stronger.

Bottom Left quadrant:

Connect other social media for more information:

It is not something that users could miss if we exclude it. Also, the impact would be to enrich people's profiles, so it provides value but not that much.
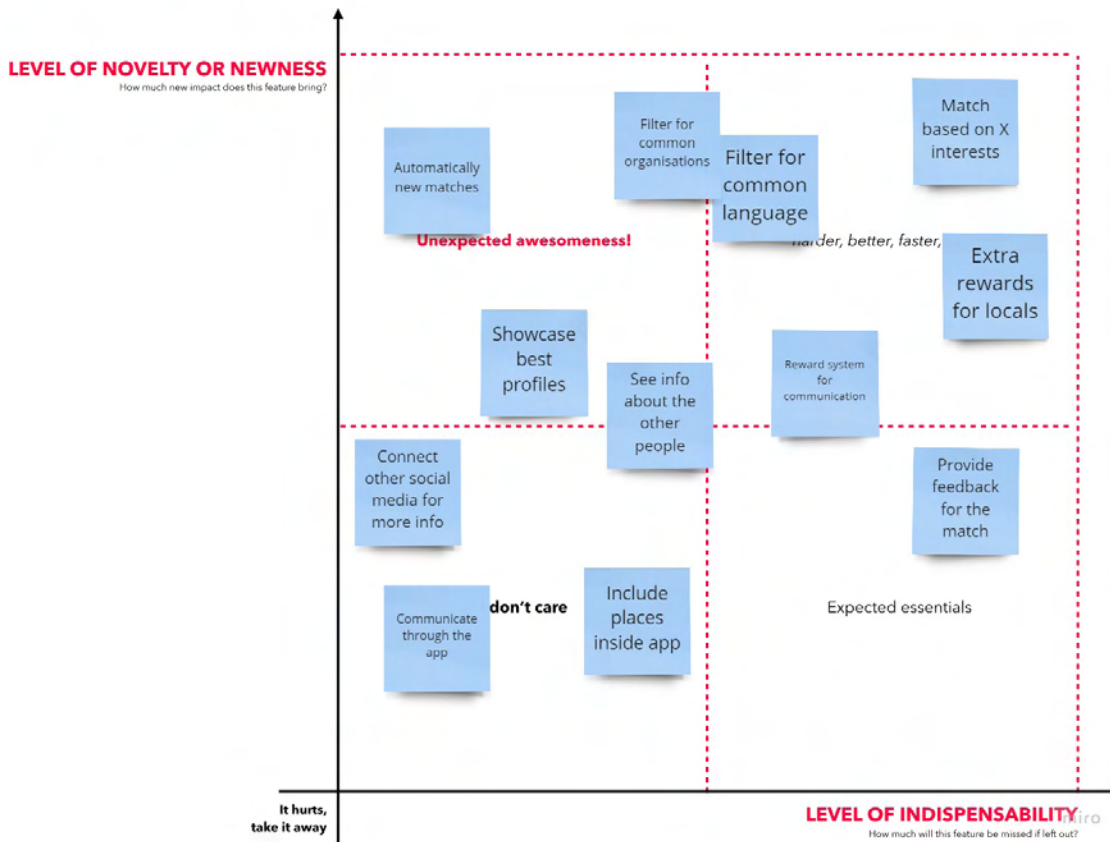
Innovation battlefield

Figure 3.7: Innovation Battlefield

Communicate through the app:

This is dispensable and even unwanted from the users. It just provides more complexity. While it is not impacting the user experience.

Include places inside app:

Like restaurants, bars, and activities. That could be missed somehow from users. Because they can also have that information more easily for them. However, it's not providing that much impact since hundreds of apps are already used to find places.

Top Left quadrant:

Automatically new matches:

To be able to use the GPS of the phone to alert users when a new match happens. The impact can be too high because we predict customer behavior and serve users before they need it.

Making it extremely easy for them to find matches. At the same time, it is not that crucial for users to have this feature. Which makes it belong to unexpected awesomeness.

Filter for common organizations & language:

That could have much impact on how customers find people with high similarity. Moreover, it could be missed by users if we did not include it. That is why it is in the center of the X-axis.

Showcase best profiles:

That can create engagement and drive more traffic to the app. So it has a bit of an impact, without being that necessary for end-users.

See info about other people:

Useful for users that want to see the profile they matched before they send a message. However, they can also see the profile in their social media, so it is in the middle of indispensability.

Bottom Right quadrant:

Provide feedback for the match:

This is something that for sure needs to be implemented so that we can adapt the matching algorithm. If it does not exist, then users will be disappointed and delete our product after some false matches.

Top Right quadrant:

Match with people based on different features:

That is a core feature that users need so they can match with similar people instead of random. Moreover, the impact is the highest since the whole product is based on that.

Reward system for communication:

It can have a medium impact on how much time users spend on the app and the retention rate. At the same time, it could be missed from users but not that much. That is why it is in

the middle between the two quadrants.

Extra rewards for locals:

The indispensability is high because locals can leave the app after some time if they do not gain anything. The impact will be high if we can retain the locals and make the highly active and engaged.

3.4   Wireframing

In User-Centric Design [33], the wireframing [34], also known as a page schematic or screen blueprint, is a visual guide representing the skeletal framework of a website or app. It depicts the app layout or arrangement of the website's content, including interface elements and navigational systems, and how they work together. The wireframe usually lacks typographic style, color, or graphics, since the main focus lies in functionality, behavior, and priority of content. In other words, it focuses on what a screen does, not what it looks like. The purpose is to establish the basic structure of our app before visual design and content is added.

The menu has three main pillars:

1. **Matches**: Users can find everyone that they have been matched before and access their profile. Also, they can provide feedback for each of them.

2. **Find** local: Users search for the city or country and then can filter the results. For each profile shown, they can click and view more information and their social media links.

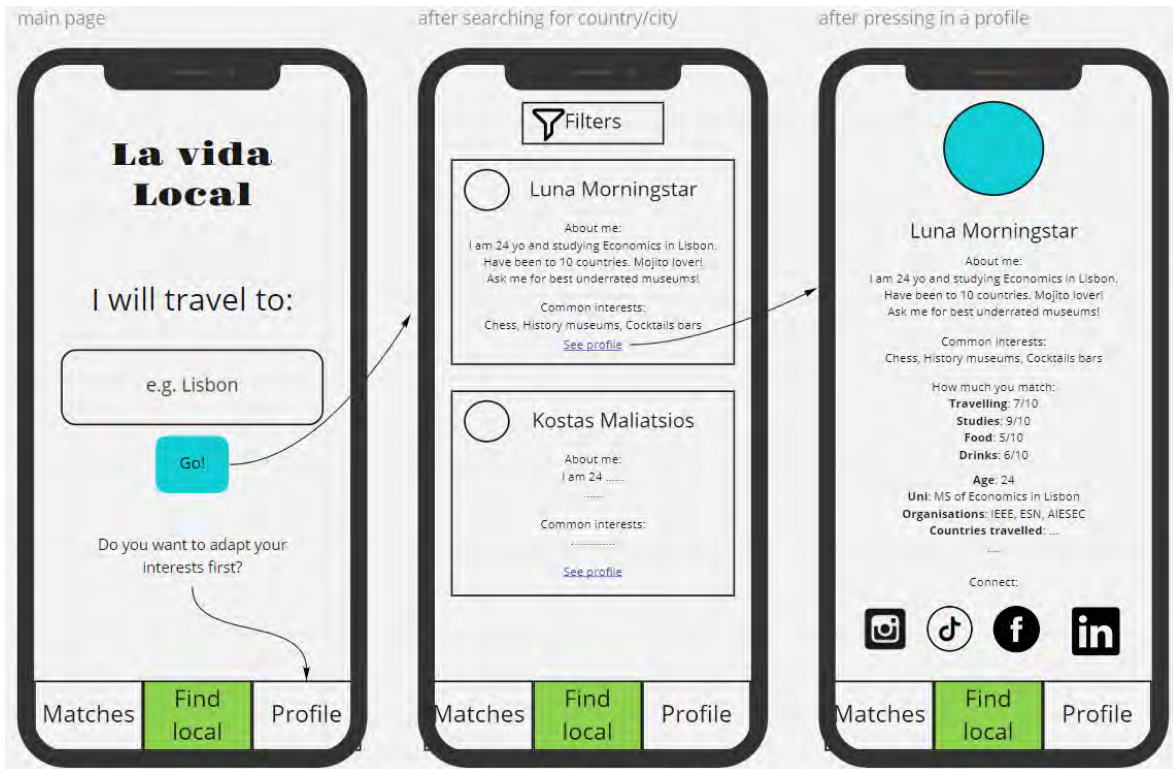3. **Profile**: Users can update their information and change settings.
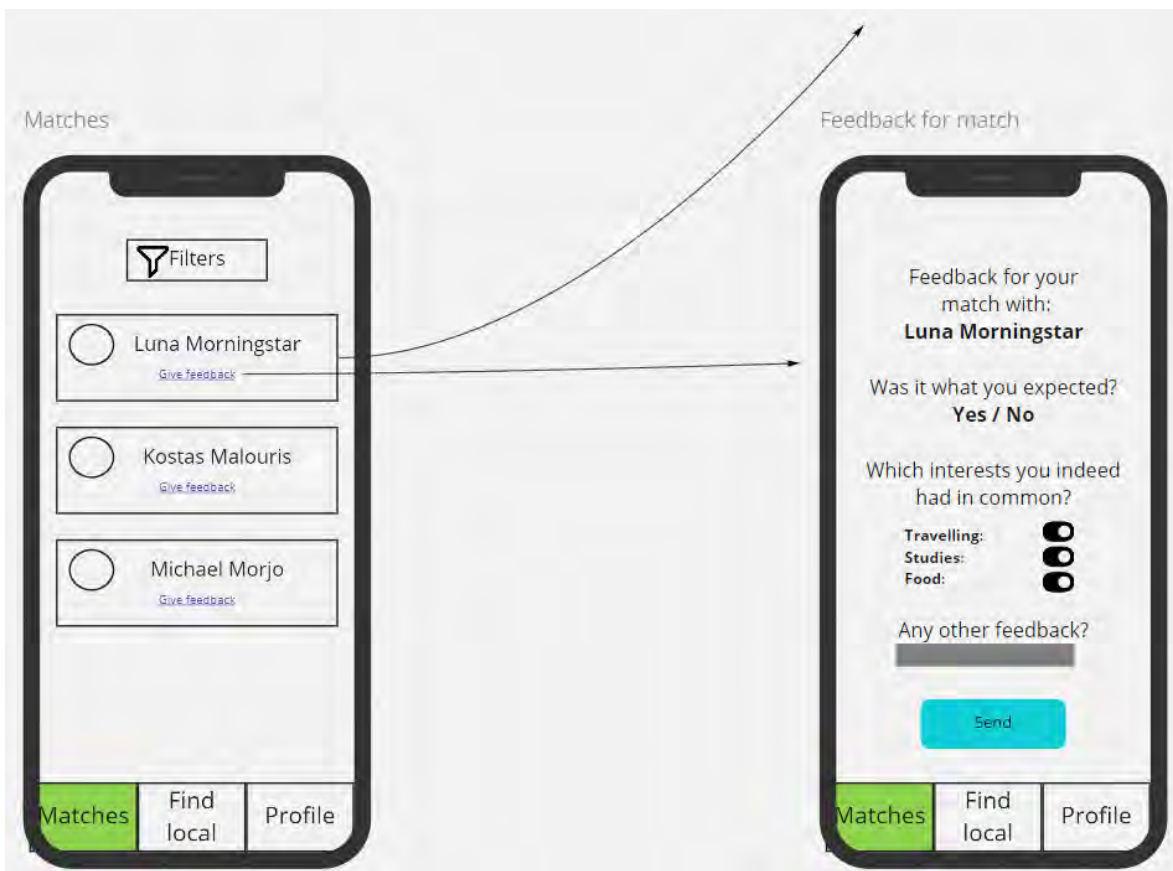
Figure 3.8: Page: Find local
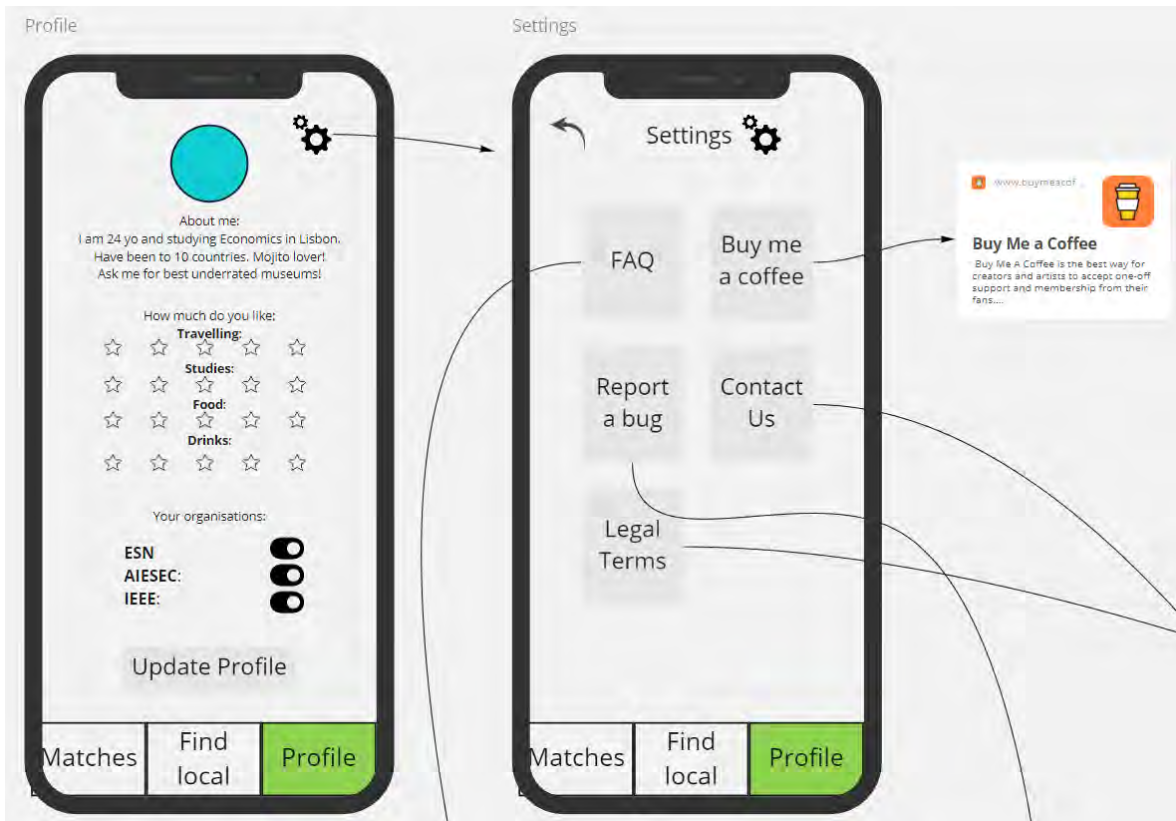

Figure 3.9: Page: Matches
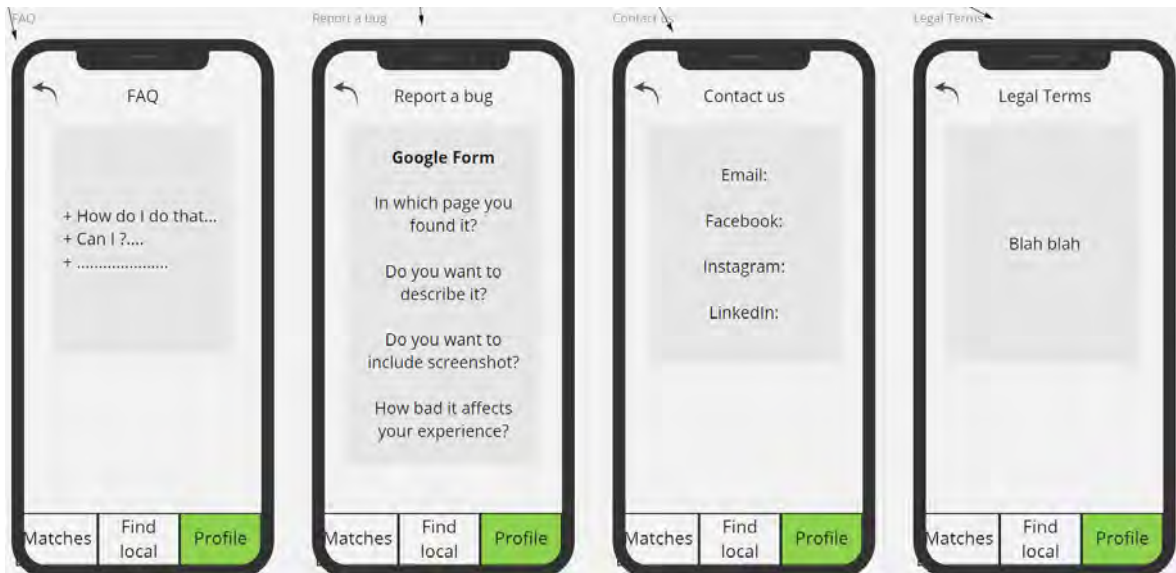
Figure 3.10: Page: Profile

Figure 3.11: Page: Settings

Chapter 4

Market

What comes next is the establishment of the value for the users. We need to make sure that the solution is viable and sustainable, as well. That is why we will validate it first, and then after market research, we will create a business model where the solution is well supported.

4.1   Validation of solution

What needs to happen next is to validate if the solution can work with actual people and customers. In the Waterfall methodology [35], everything is sequential, which means that first, we implement the solution into an application, and then we validate and test it. However, that encapsulates the risk of spending too many resources that can be wasted if users do not want the product. That's why in Agile software development [36], we want to iterate soon and fast every step while creating the solution. For that reason, we want to validate now how our draft solution is viewed from the market.

In order to do so, we require a diverse pool of customers, with different demographics. That's why a Google Form was used and shared to different Facebook groups, not only Greece but also other countries' groups with young people. Those were University groups, Erasmus groups, and opportunities for youth exchanges.

The questions were:

1. How old are you?

2. Have you ever travelled alone?

3. Let's say that you will take a trip to another city/country.Before your arrival in the foreign city/country, how well do you think you know which places(bars/pubs/parks/shops) to visit?

4. How do you gain information about the city/country you are going to visit?

5. How time-consuming is it for you to find this information?

6. How knowledgeable do you feel about the place you are planning to visit?

7. Do you prefer discovering the city all by yourself or would you like someone to guide you around and discover it together?

8. How useful is it for you to have/meet someone familiar in the city you want to visit?

9. You are new in town! How easy is it for you to find local people with similar personality/hobbies/activities?

10. As a traveler, would you use a web-app that would get you in touch with local people that have similar interests with you?

11. Let's say you are a local in a town and you know around the places. Imagine that a traveler with the same hobbies is a newcomer to your town. The above mentioned traveler is someone around your age that you share the same interests with! So.. as a local, how worthy would it be for you to show a traveler around your city without any (direct) monetary profit?

The inquiries that we extracted from the survey are:

• Two out of three people have traveled alone, which means that they could appreciate connecting with local people to make new friendships abroad.

• Before traveling, the knowledge for local places is below average. Users could use a solution to provide them with more knowledge, like a local, for example.

• The main channels that users get information are through the internet and friends. The former includes the problem that we want to solve about online tourist places. While the latter shows that customers trust and seek information from other people that have experience.
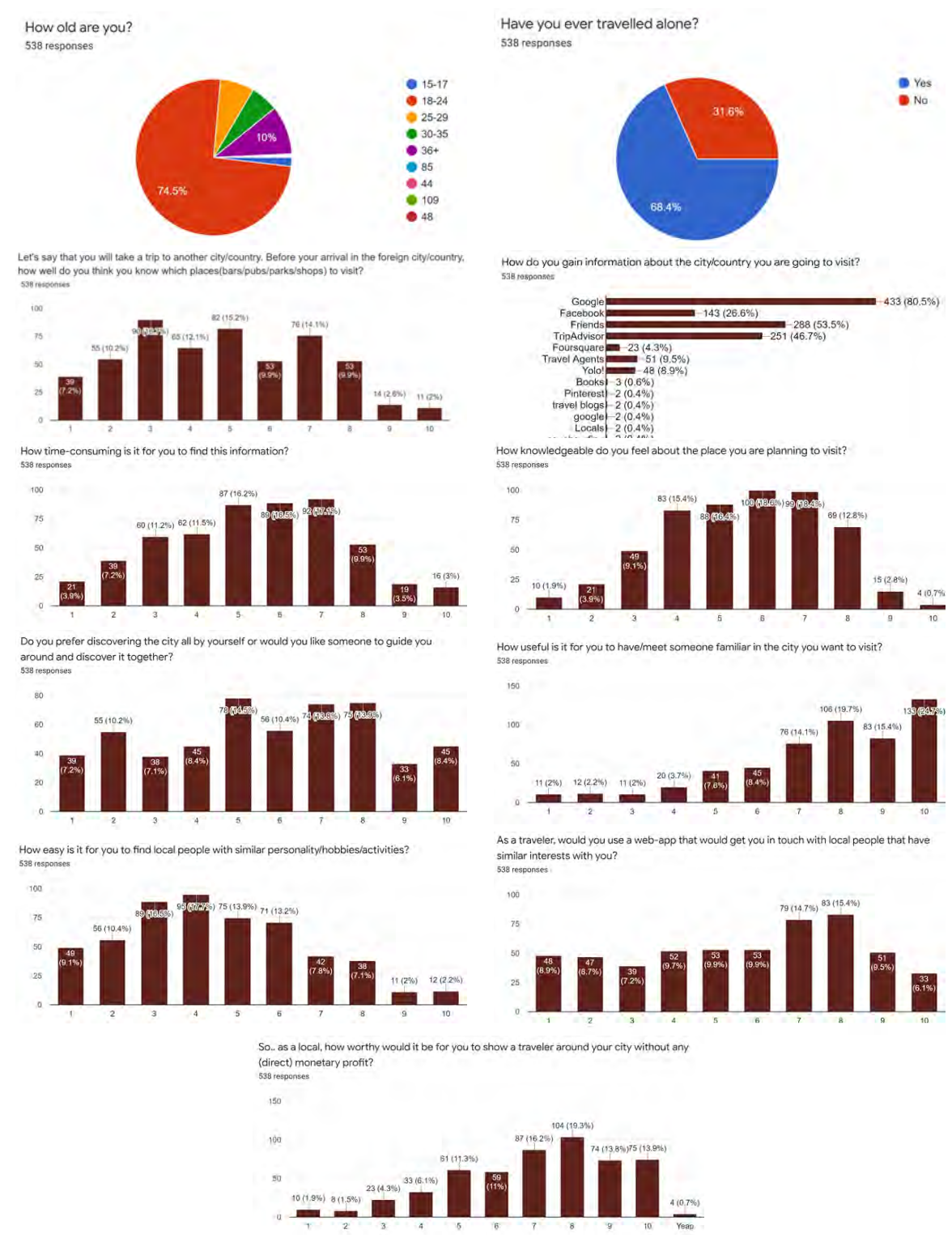
Figure 4.1: Responses for validation of solution

- The search for information is above average time-consuming for users.

- Regarding how people want to discover the city, we observe various opinions on whether they prefer alone or with someone to show them, where 60% of users would tend to the latter way.

- Approximately 80% of the answers show that people find it useful to know someone beforehand in that city.

- Around 65% of users find it challenging to connect with people with similar interests.

- If users would use an app to connect with similar people, 62% percent would probably use it. That is derived from answers that scored 7 and above. If we include all answers of 5 and 6, which are the skeptical users, then the percentage is 84%.

- Lastly, 64% (from 7 to 10 score) and 86% (from 5 to 10 score) of users said it would be worthy as a local to show around his/her city without direct monetary money.

In conclusion, we can observe that the solution is firmly validated.

4.2 PESTLE Analysis

PESTLE is an external analysis when conducting market research, and gives an overview of the different macro-environmental factors to be taken into consideration. [36] The acronym stands for Political, Economic, Social, Technological, Legal, and Environmental factors. With PESTLE analysis, we will understand what external elements can affect our product positively and negatively. By completing it, we will have a better direction and business position in the market. We are thus eliminating the threats found from the analysis and focusing on the opportunities.

Political

Aspects that can have a negative impact:

- Complex logistics for having a company in Greece. Public sector bureaucracy is an obstacle for new funding a company because the legal requirements are enormous.

- Regulations for revenues. Government's taxes are extraordinarily high and obscure the early profitability of small and medium size companies.
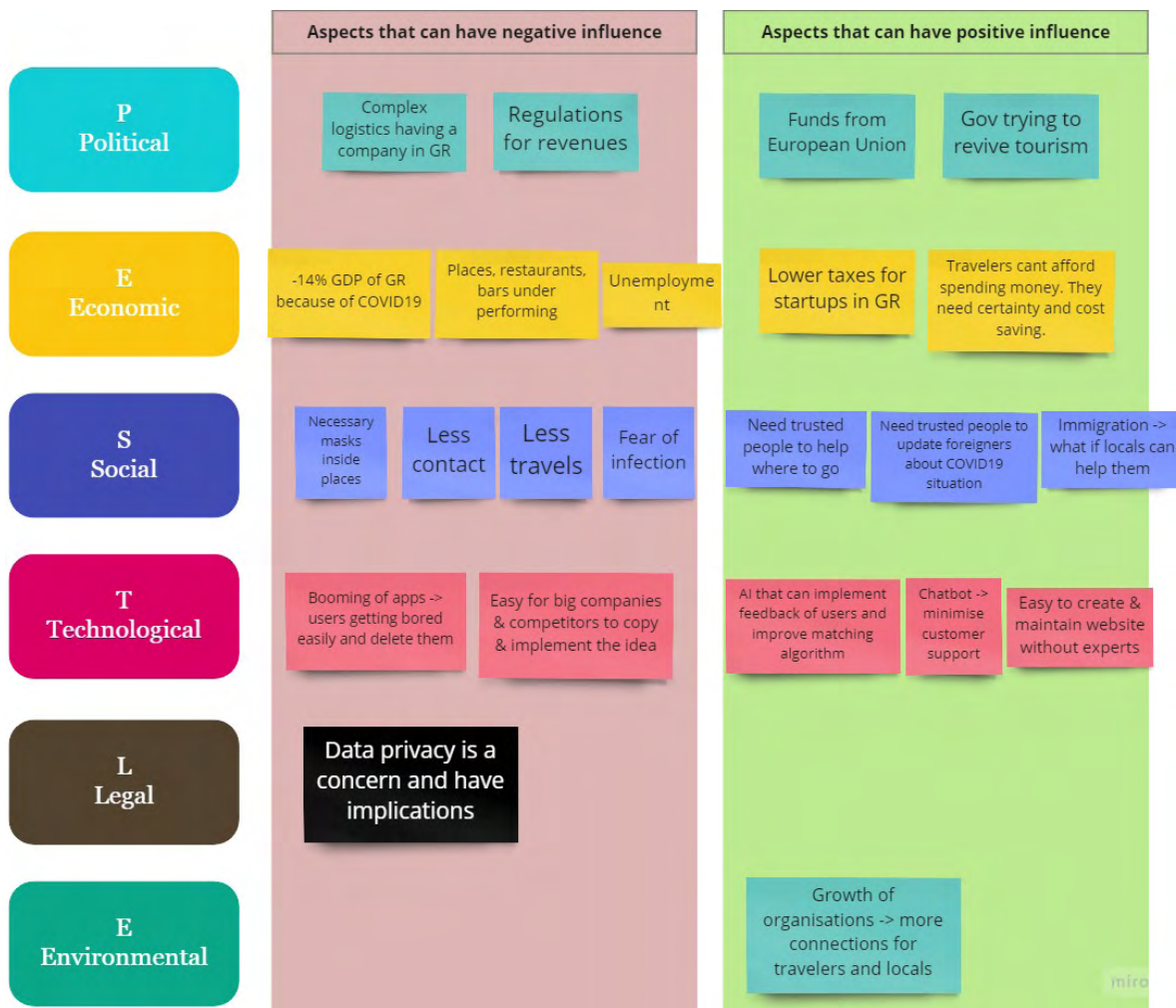
Figure 4.2: PESTLE Analysis

Aspects that can have a positive impact:

- Funds from the European Union. Those are money packages that are injected in the economy to boost it because of the past year drop.

- Government trying to revive tourism which is the main revenue stream for Greece and in 2020 it dropped around 70% because of COVID19.

Economical

Aspects that can have a negative impact:

- The GDP of Greece has dropped -14% because of COVID19.

- Places, restaurants, bars underperforming because of COVID19 regulations and citizen's fear of infection.

- Unemployment because of the places' underperformance.

Aspects that can have a positive impact:

- Lower taxes for early startups in Greece. The first 2-3 years the taxes are relatively low until the startup becomes a small company.

- Travelers cannot afford to spend money. They need certainty and cost-saving.

Social

Aspects that can have a negative impact:

- Necessary masks inside places. That increases the discomfort of society and the way of interacting.

- Less contact because of COVID19.

- Less travels for the same reason as before.

- Fear of infection.

Aspects that can have a positive impact:

- People need trusted people to help them where to go.

- People need trusted people to update foreigners about COVID19 situation.

- Immigration. What if locals can help immigrants to either settle down or support them with by any means.

Technological

Aspects that can have a negative impact:

- Booming of apps. Users are getting bored quickly and delete unnecessary applications.

- Easy for big companies and competitors to copy and implement the idea.

Aspects that can have a positive impact:

- AI that can implement feedback of users and improve matching algorithm accuracy.

- Chatbot that can minimise customer support.

- Easy to create & maintain a website without experts.

Legal

Aspects that can have a negative impact:

- Data privacy is a concern and has implications on users and applications handling personal data.

Aspects that can have a positive impact:

- -

Environmental

Aspects that can have a negative impact:

- -

Aspects that can have a positive impact:

- Growth of organisations. So more connections can be made for travelers and locals, and everyone can find people that belong to the same organisation.

4.3   Business Model

A business model describes how we create, deliver and capture value in a context. That includes revenues, strategies, stakeholders, market segment, infrastructure, and every other process that is needed for the product. Firstly we will discover our revenue model, and then with all the previous information, we will create the Business Model Canvas.

4.3.1   Revenue Model

With the Revenue model flowchart B2C we explore different potential revenue streams and discover models we can use to monetize our product. The flowchart can be found here in high quality. [37] In the end, we want to have 5-10 companies that are relevant to our solution, so we can take ideas and construct our own revenue streams. [38]
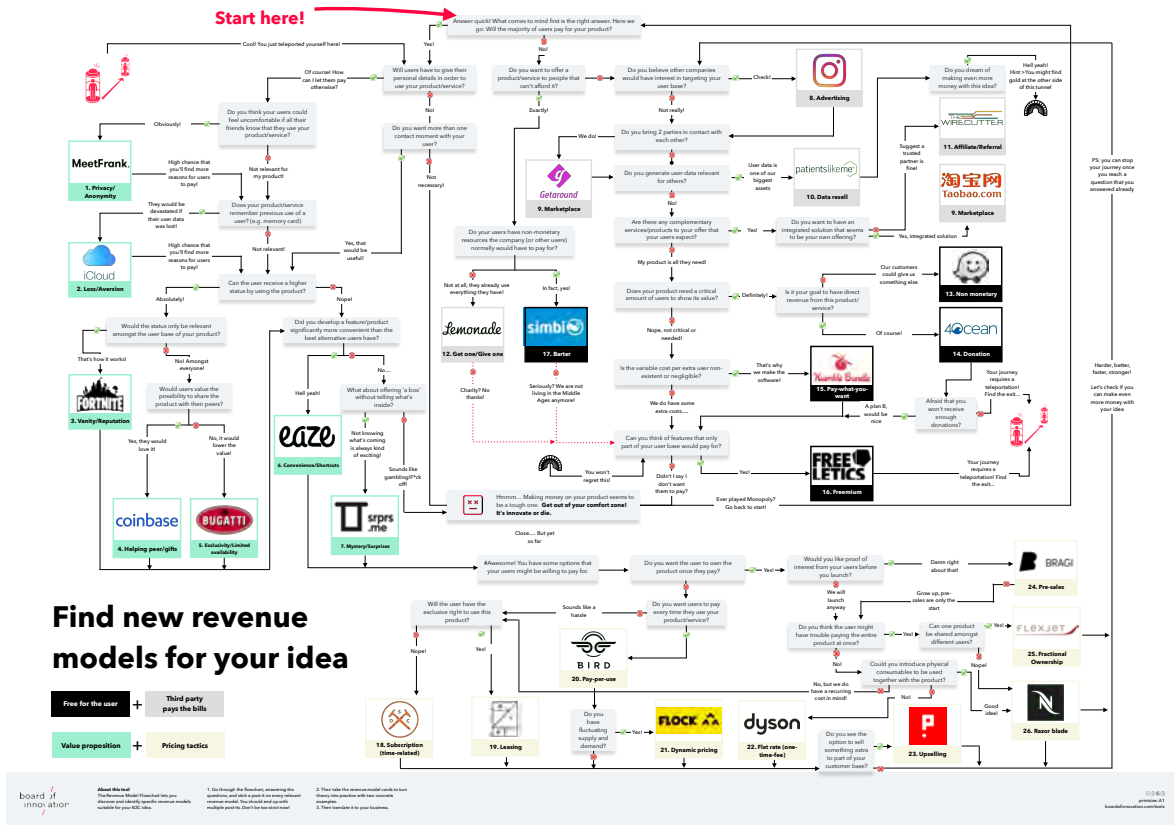
Figure 4.3: Different revenue models based on context

Here is the flow that I followed:

Will the majority of users pay for your product?

No

Do you want to offer a product/service to people that can't afford it?

Exactly

Do your users have non-monetary resources the company (or other users) normally would have to pay for?

Not at all, they already use everything they have!

Lemonade company: Flat fees, and extra money are going to charities. [39]

My idea: What if users have the option to pay any amount of money for charities in the country they are visiting through our product. And we keep 10% of what they pay.

Can you think of features that only part of your user base would pay for?

Yes

Freemium and Freelectics: gym free, pay for nutrition. [40]

My idea: Everything is free up to 20 matches per country and you pay to have more filters while searching and also have unlimited matches.

Will users have to give their personal details in order to use your product/service?

Of course! How can I let them pay otherwise?

Do you think your users could feel uncomfortable if all their friends know that they use your product/service?

Not relevant for my product!

Does your product/service remember previous use of a user? (e.g. memory card)

They would be devastated if their user data was lost!

iCloud Loss/Aversion, they pay so there is a backup of data or biggest storage. [41] My idea: What if the monthly subscription includes backup of their profile.

Can the user receive a higher status by using the product?

Nope!

Did you develop a feature/product significantly more convenient than the best alternative users have?

Yes!

Eaze: Convenience/Shortcuts. [42]

Now I am going to: Do you believe other companies would have interest in targeting your user base?

Check!

Instagram, Advertising

My idea: I can use the app to have advertisements for bars, restaurants, etc.

Does your product need a critical amount of users to show its value?

Definitely!

Is it your goal to have direct revenue from this product/service?

Of course!

Donation, 4ocean.

My idea: Have a link to Buy Me a Coffee, where users can donate whatever they want.

Now that we have generated some ideas and got inspired by other revenue models, we will continue to Business Model to see how revenues can be implemented.

4.3.2   Business Model Canvas

We will use the Business Model Canvas, a famous strategic management and lean startup template for developing new or documenting existing business models. [43] It is a visual chart with elements describing a firm's or product's value proposition, infrastructure, customers, and finances.

Some of the advantages [44] of Business Model Canvas are:

- **Risk-identifying**: The canvas provides us input data to identify risks at an early stage. We can measure most of the bottlenecks to build a high-performance growth strategy.

- **Value-centered**: Of all the business model canvas elements, Value Propositions are pivotal. It tells us why our business exists and what value it delivers. We can say that the entire business model canvas is built around this section. As a result, we get a broad scope of jobs to be done and versatile supporting inputs.

Customer Segments

For whom we create value?

Who are the most important customers?

- Travellers for some days.

- Erasmus students for 6 - 12 months.

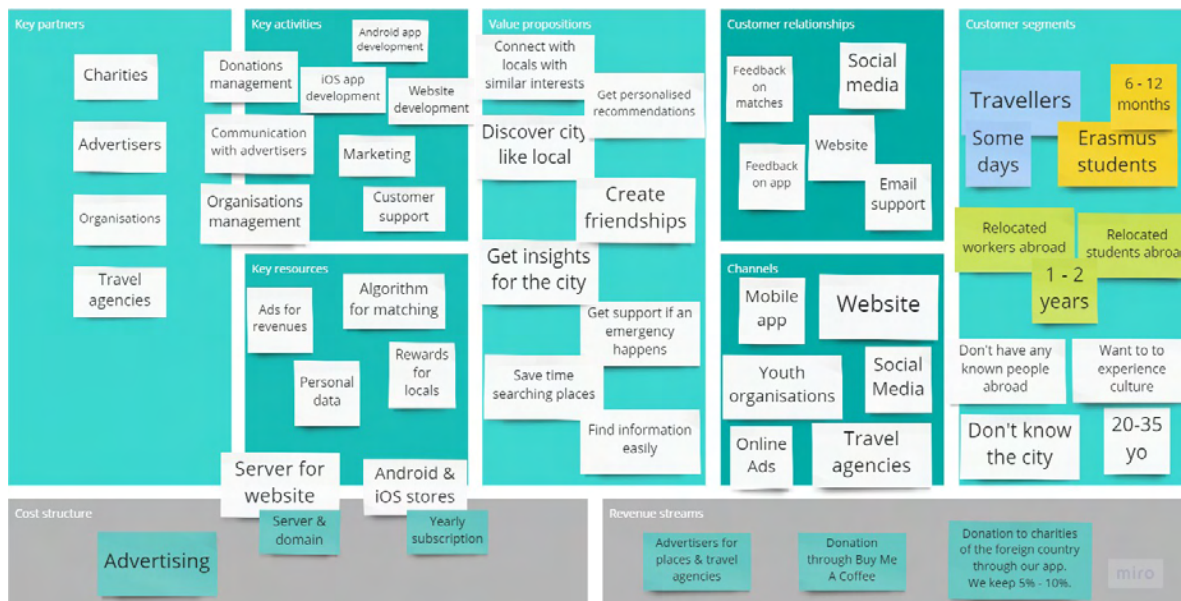- Relocated workers abroad for 1-2 years.

Figure 4.4: Business model canvas

- Relocated students abroad for 1-2 years.

- People around 20 - 35 yo that have no previous experience of the city.

- Don't have any known people abroad.

- Want to discover and experience the local culture.

- Don't know the city and are not aware of how it works.

Value Propositions

What value do we deliver to the customer?

Which customer needs are we satisfying?

- Connect with locals with similar interests. Find people that can provide insights, help and connection in a foreign city.

- Get personalised recommendations. Locals with the same interests can assist travelers easily.

- Discover the city like a local from the tips of real locals.

- Create new friendships and make connections for life.

- Get insights for the city and get around easily and without getting lost.

- Get support if an emergency happens. Locals can assist in translating or providing foreign documents.

- Save time searching for places to go. Locals are here to provide recommendations.

- Find information easily if it is not in English.

Channels

Through which Channels do our Customer Segments want to be reached?

- Mobile app for android and iOS.

- Website that displays our value proposition and the links for downloading the application.

- Youth organisations that we cooperate with and promote our product.

- Social Media like Facebook, Instagram, and LinkedIn.

- Online Advertisements that can boost our market reach to the audience we want.

- Travel agencies that we cooperate with.

Customer Relationships

What type of relationship does each of our Customer Segments expect us to establish and maintain with them?

- Feedback on matches. That way, customers can help us improve, and we make them feel important.

- Social media & website. Where we can display our brand, values and insights about our product.

- Feedback on the app. So the customer's voice can be heard and used well to improve our application.

- Email support for bugs and issues that need to be solved.

Revenues

For what value are our customers really willing to pay?

- Advertisers for places & travel agencies inside the matches. It will not be spam or irrelevant advertisements but ads of restaurants and places in the city that travelers visit.

- Donation through Buy Me A Coffee. Which is an external company that allows users to donate any amount of money with an easy and secure way.

- Donation to charities of the foreign country through our app. From which we keep 5% - 10%.

Key Activities

What Key Activities do our Value Propositions require?

- Android and iOS app development.

- Website development.

- Marketing for better reach.

- Customer support.

- Donations management. How to include local charities in the application.

- Communication with advertisers and management of cooperation.

- Communication with organisations and management of cooperation.

Key Resources

What Key Resources do our Value Propositions require?

- Algorithm for matching and feedback implementation using AI.

- Advertisements for reach that can provide us more revenues in the end.

- Rewards for locals that boost their willingness for connecting with travelers.

- User's personal data management.

- Server for the website.

- Android & iOS stores subscription. Each needs payment and logistics to maintain.

Key Partners

Who are our Key Partners?

Who are our key suppliers?

- Charities.

- Advertisers.

- Organisations.

- Travel agencies.

Cost Structure

What are the most important costs inherent in our business model?

- Advertising.

- Server for website and domain.

- Android & iOS stores. Yearly subscription.

4.4   Vision statement

This is the vision of the software product in a one-pager. [45] It displays in a clear and simplified way the core characteristics. That provides clarity and direction for the business and the product itself. "Vision without action is merely a dream. Action without vision just passes the time. Vision with action can change the world." - Joel A. Barker

So the final vision statement is:

Our vision is to build a solution that is targeting travelers, Erasmus students and relocated workers & students. Those people have the problem of not finding personalised activities and places, living the city superficially like tourists and not connecting with foreigners easily. In order to solve their problems, we offer them a mobile application that can automatically match them with locals that share the same interests. The first ideas on how to make money are (a) To advertise local restaurants, bars and places, (b) Enable users to donate to local charities through our product, and we take a small commission, (c) Enable users to donate our team money at will. Our idea will rock because we empower travelers to truly experience a city

Figure 4.5: Vision statement

and to connect with a version of themselves abroad. Our idea will fail because if there are a small pool of locals that cannot match with foreigners. The next steps are to create a website for positioning and credibility and develop the application prototype. The four top feature of our app are: (a) Filter for language and organisations, (b) Automatically provide new matches while abroad, (c) Use feedback on matches and (d) Provide extra rewards for locals. Finally, our value proposition is for foreigners to explore cities through locals with the same interests.

Chapter 5

Feasibility

We have validated that there is value for the customer and that it is also viable. Now the product is ready to enter the feasibility phase. All the previous phases have de-risked the chance of failure of investments in the agile development phase. Firstly we will look at what agile development is and the procedures of this innovative set of methodologies. Then we will move to the actual development of the website, the prototype, and the MVP of our solution.

5.1   Agile development

Agile is a set of software development methodologies based on iterative development. [46, 47] It advocates adaptive planning, evolutionary development, early delivery, and continual improvement, and it encourages flexible responses to change. Agile processes generally promote a disciplined product management process that encourages frequent inspection and adaptation. A set of engineering best practices intended to allow for rapid delivery of high-quality software, and a business approach that aligns development with customer needs and company goals.

Scrum

Scrum is one of the more popular Agile methodologies – its rigid yet straightforward structure allows it to be readily applied. [48] Japanese experts first introduced it in 1986 (New Product Development Game) as "a flexible, holistic product development strategy where a development team works as a unit to reach a common goal" as opposed to a "traditional, sequential approach."
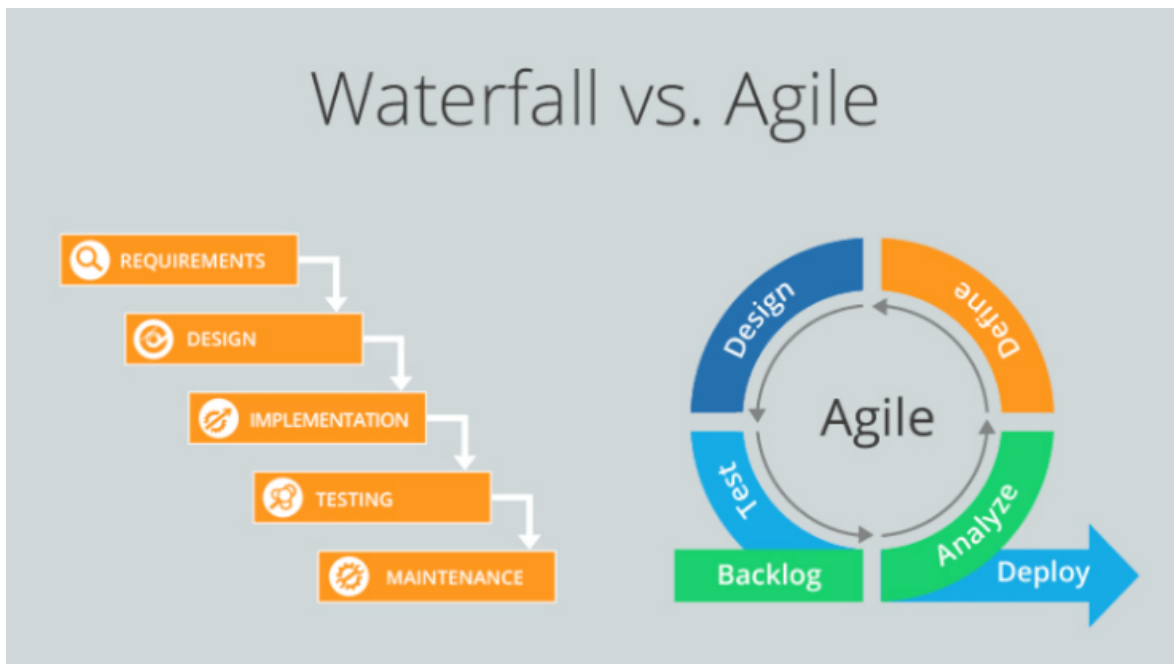
Figure 5.1: Agile and Waterfall differences

It is designed for teams of ten or fewer members who break their work into goals that can be completed within timeboxed iterations, called sprints, no longer than one month, and most commonly two weeks. The Scrum Team tracks progress in 15-minute timeboxed daily meetings, called daily scrums. At the end of the sprint, the team holds a sprint review to demonstrate the work done, and sprint retrospective to continuously improve. [49]

Kanban

Kanban is another Agile method, developed by Toyota in 1953 to manage their manufacturing logistics chain. It focuses on teamwork, leadership, customer orientation, and efficiency. [50] Kanban is an excellent tool for startups (where priorities regularly change, even faster than a sprint) or at the start of a nebulous project and where the team must maximize flexibility, discovery, and learning. In each case, it avoids the overhead of Scrum for an even more lightweight and flexible process. Kanban tends to break down at scale.

Kanban is all about visualizing the work, limiting work in progress, and maximizing efficiency(or flow). [51] Kanban teams focus on reducing the time it takes to take a project from start to finish. They do this by using a kanban board and continuously improving their flow of work.

Frameworks Integration

During the development of the website, prototype, and MVP, I integrated different aspects of the above methodologies.

From Scrum, I used the four ceremonies:

Sprint planning: I establish the goal for a 1-week sprint and choose the right priorities to focus on.

Daily Scrum: Where at the beginning of each working day, I was reflecting on those questions:

1. What did I work on/accomplish yesterday?

2. What will I work on/accomplish today?

3. What impediments are in my way?

Sprint review: At the end of each sprint, I reviewed what I achieved during that sprint. Moreover, gather feedback from people on what I had developed that week.

Sprint retrospective: Where based on the sprint review, I adapt and improve the process of development. Based on what went and ill, and possible issues that came up from the feedback.

From Kanban, I used:

Kanban board: It's where I manage my workflow in a visual way. That helps me have continuous delivery and maximize my efficiency.

In figure 5.2 there is an example screenshot from my Kanban board when I was working on the website.

We can see that I have 4 columns (Backlog, In Progress, Review, Done). I added the "Review" column to validate and check one last time things that I have finished for mistakes. Also, some tags help me understand which area this work belongs (e.g., to the Main page). Then there are also visual deadlines that I set to myself on Kanban.

Backlog:

- Update text on "Our story". With label: About page.

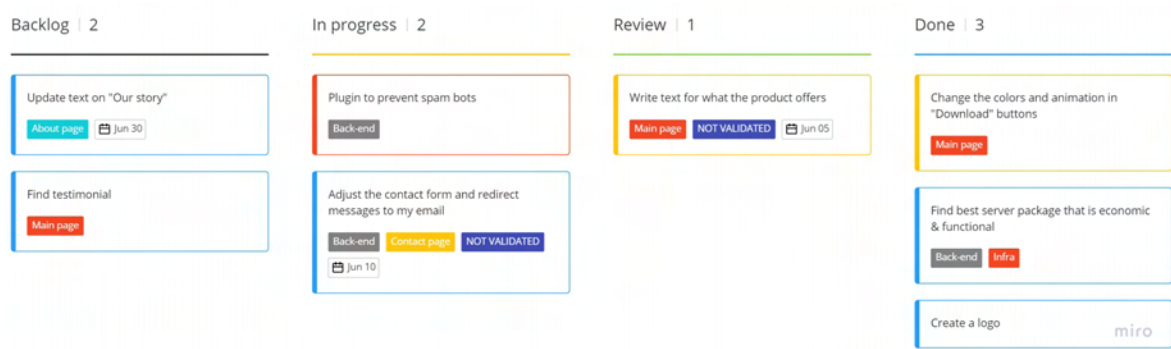- Find testimonial. With label: Main page.

Figure 5.2: Example of Kanban board

In progress:

- Plugin to prevent spam bots. With label: Back-end.

- Adjust the contact form and redirect messages to my email. With labels: Back-end, Contact page, Not Validated.

Review:

- Write text for what the product offers. With labels: Main page, Not Validated.

Done:

- Change the colors and animations in "Download" buttons. With label: Main page.

- Find the best server package that is economic and functional. With label: Back-end, infra.

- Create a logo. Without a label.

5.2   Website

Before we create a prototype of our application, we need to build a website to represent our product and business. That will add credibility, and we can use it immediately to benchmark how customers see the product from an external point of view. Through that, we get feedback on how we have set up the Market from the previous chapter.

Link: www.lavidalocal.app

Server

I bought from pointer.gr a monthly server subscription, which includes unlimited disk space, emails & MySQL databases.

Domain name

I bought the domain lavidalocal.app from pointer.gr, and it is a yearly subscription. [52]

CMS (Content Management System)

CMS is computer software used to manage the creation and modification of digital content. For our case, it is a website, and for that reason, I used WordPress, which is the most popular and well established CMS. [53]

Theme

On top of the CMS, we used a pre-built theme that we can modify afterward. That will allow us to have ready the site's core functionality, which we will extend later on. The theme I used is called Phlox. [54]

Page Builder

In order to be efficient and minimize the code needed to write, I used an innovative page builder called Elementor. Elementor provides a high-level view of the website that can change by dragging & dropping elements on the page. That way, we can create a big draft proportion of the site that we later use programming to adjust. [55]

Plugins

Plugins are useful 3rd party code that extends the functionality of the website. I used:

- Akismet Anti-Spam: For protecting the website from spambots.

- Autoptimize: It automatically optimizes CSS, JS, Images, and fonts.

- Contact Form 7: Simple form so customers can contact me through the website into my email.

- Loginizer: It blocks IPs of people trying to breach the website admin panel

• Smush: It reduces image file sizes and improves performance.

HTML, CSS, JS

I used those to program and further customize the website.

Layout

While creating the website, I was directed by the Agile methodologies, as seen in the previous sector. I separated each block of the website and used small iteration and feedback to optimize it.

5.3 Prototype

A mobile app prototype is a preliminary visual mock-up that looks like a real app, demonstrating an app's fundamental design and function, but does not contain working code. [56] An app prototype can be as basic as sketches on paper or as high-fidelity as a clickable digital model that works on the phone. Prototypes convey the look and feel of the app, but they are usually not working software. They set the stage for the first functioning version of the app, often referred to as the minimum viable product, which we will in the next chapter.

For now, we will create our prototype in InVision, a prototyping tool that allows us to create a high fidelity clickable prototype. [57] That will be done by building on the wireframing created in section 3.4.

Link: here

This prototype demonstrates each page and its interactions. It does not have any data or algorithm for matching, instead just the visual representation of our final application. We will use that prototype for our next chapter when creating the MVP (Minimum Viable Product). We will use it by reading all the dimensions, colors, and interactions from the prototype and then recreate them with real code.

5.4 MVP (Minimum Viable Product)

A minimum viable product (MVP) is a product version with just enough features to satisfy early customers and provide feedback for future product development. [58] A minimum viable product has just enough core features to deploy the product effectively, and no more. Developers typically deploy the product to a subset of possible customers—such as early adopters thought to be more forgiving, more likely to give feedback, and able to grasp a product vision from an early prototype or marketing information. This strategy targets avoiding building products that customers do not want and seek to maximize the customer's information with the least money spent.

For development, I am using Flutter. Flutter is Google's UI toolkit for building beautiful, natively compiled mobile, web, and desktop applications from a single codebase. [59] That means that the code I am writing can be translated for Android and iOS devices, without me writing in different programming languages.

The programming language that is used for Flutter is called Dart. [60] Dart is a client-optimized programming language for apps on multiple platforms. It is developed by Google and is used to build mobile, desktop, server, and web applications. Dart is an object-oriented, class-based, garbage-collected language with C-style syntax. Dart can compile to either native code or JavaScript. It supports interfaces, mixins, abstract classes, reified generics, and type inference.

As an IDE (Integrated Development Environment), I am using Android Studio. [61]

Android app: here
iOS app: here

Chapter 6

Conclusion

6.1   Overview

Starting from the problem at hand, we analyzed it in detail, and we were able to break it down. We understood the target group and created their personas accordingly and where the challenge is on their customer journey. Also, we mapped products that already exist in the market that possibly solve the same or similar problems. Then with all the information, we moved to the brainstorming, where we used multiple techniques to diverge in ideas. After that, we converged to a few possible solutions and prioritized what should be built. And then we created the first draft wireframing that showcase how the solution might look like. Next step was to validate our idea with the market and make an analysis to solidify what we created. After having done that, we came up with the first ideas for revenues and later we created the business model which supports our solution. Lastly created a one-page vision to drive future decisions and directions. Moving to the last chapter, we jumped into the implementation where we developed the website, the prototype and the first MVP of our application.

6.2   Future work

The future work is splitted in two different categories. The first is the feasibility or development of our solution in order to be a complete application. It includes next steps regarding core or extra features that need to be built. That required further resources and people, so the end product can be concrete. The second category is the Market, which includes all actions that need to be taken so our solution can be relevant to end-users and be able to adapt based

on their needs. Those are next steps that will reinforce our solution and make sure it will continue to be viable throughout each product's life cycle stage.

6.2.1   Feasibility

The features that are needed to build in the future are:

- Advertisements for revenues.

- Reward System for locals.

- Donations to us or to organizations.

- Log in with email or 3rd party.

- Option to delete personal data.

6.2.2   Market

Focus group

In order to validate the MVP and find out how it's perceived we can use a focus group. [62] That is bringing people from various backgrounds in one place and letting them use our product. While they do, we observe all their actions on the application and their reactions. At the end we make multiple questions to understand how they used the app and what were their behaviors & feelings. Based on all this information, after the focus group we can adapt and improve our MVP based on our findings.

SWOT

After having our product in market for a while, we can do a SWOT analysis to understand our position in the market. [63] By identifying our strengths, weaknesses, opportunities and threats, we can evaluate our strategic directions and adapt the course of our product.

Customer k-means clustering

Customer Segmentation is the subdivision of a market into discrete customer groups that share similar characteristics.. [64] Customer Segmentation can be a powerful means to identify unsatisfied customer needs. Using the above data companies can then outperform the

competition by developing uniquely appealing products and services.

Cost-benefit analysis

It is a systematic approach to estimating the strengths and weaknesses of alternatives used to determine options which provide the best approach to achieving benefits while preserving savings. [65] We can use it to compare completed or potential courses of actions, or to evaluate the value against the cost of a decision, project, or policy.

Bibliography

[1] The history and evolution of product management. `https://www.`
`mindtheproduct.com/history-evolution-product-management`.

[2] Gayle Laakmann McDowell and Jackie Bavaro. *Cracking the PM interview*. Career-Cup, 2013.

[3] Software product management. `https://en.wikipedia.org/wiki/`
`Software_product_management`.

[4] Customer insights. `https://www.boardofinnovation.com/business-`
`design/customer-insights/`.

[5] Customer problem statements online template. `https://upboard.io/`
`customer-problem-statements-online-tools-templates/`.

[6] Persona. `https://en.wikipedia.org/wiki/Persona_(user_`
`experience)`.

[7] Achilles. `https://www.achilles.be/`.

[8] Passengers. `https://www.statista.com/statistics/564717/`
`airline-industry-passenger-traffic-globally/`.

[9] Uniting aviation. `https://www.icao.int/annual-report-2018/`
`Pages/the-world-of-air-transport-in-2018.aspx`.

[10] International arrivals by world region. `https://ourworldindata.`
`org/tourism#:~:text=International%20arrivals%20by%`
`20world%20region,-Arrivals%20by%20world&text=The%`
`20United%20Nations%20World%20Tourism,is%20a%2056%2Dfold%`
`20increase`.

[11] Erasmus. `https://ec.europa.eu/assets/eac/education/library/statistics/erasmus-plus-facts-figures_en.pdf`.

[12] Erasmus+. `https://ec.europa.eu/programmes/erasmus-plus/about/statistics_en`.

[13] International student. `https://en.wikipedia.org/wiki/International_student#cite_ref-17`.

[14] Learning mobility statistics. `https://ec.europa.eu/eurostat/statistics-explained/index.php/Learning_mobility_statistics`.

[15] Global education monitoring report. `https://www.un-ilibrary.org/children-and-youth/global-education-monitoring-report-2019_22b0ce76-en`.

[16] Mckinsey & company. `https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/safeguarding-our-lives-and-our-livelihoods-the-imperative-of-our-time`.

[17] Future of mobility after covid-19 transportation scenarios. `https://www2.deloitte.com/us/en/insights/economy/covid-19/future-of-mobility-after-covid-19-transportation-scenarios.html`.

[18] Internations. `https://www.internations.org/about-internations/`.

[19] Bewelcome. `https://www.bewelcome.org/`.

[20] Show around. `https://www.showaround.com/`.

[21] Tours by locals. `https://www.toursbylocals.com/How-It-Works`.

[22] Mytriplan. `https://www.toursbylocals.com/How-It-Works`.

[23] Trotter. `https://www.trotter.app/`.

[24] Viahero. `https://www.viahero.com/#how_it_works`.

[25] Meetup. `https://www.meetup.com/`.

[26] Foursquare city guide. `https://foursquare.com/city-guide`.

[27] Skout. `https://www.skout.com/`.

[28] Friender. `https://frienderapp.com/?pid=Website`.

[29] How might we. `https://www.designkit.org/methods/3`.

[30] Brainstorm cards. `https://www.boardofinnovation.com/tools/brainstorm-cards/`.

[31] Thinking the opposite is an extraordinary way to get creative. `https://medium.com/productivity-revolution/thinking-the-opposite-is-an-extraordinary-way-to-get-creative-692009120a24`.

[32] Divergent thinking and design. `https://divergentthinking.design/why-divergent-thinking`.

[33] User-centric design. `https://en.wikipedia.org/wiki/User-centered_design`.

[34] Website wireframe. `https://en.wikipedia.org/wiki/Website_wireframe`.

[35] Waterfall model. `https://en.wikipedia.org/wiki/Waterfall_model#:~:text=The%20waterfall%20model%20is%20a,certain%20areas%20of%20engineering%20design`.

[36] Agile software development. `https://en.wikipedia.org/wiki/Agile_software_development`.

[37] Revenue model flowchart b2c. `https://www.boardofinnovation.com/tools/revenue-model-flowchart-b2c/`.

[38] Pestle analysis. `https://en.wikipedia.org/wiki/PEST_analysis`.

[39] The lemonade giveback. `https://www.lemonade.com/giveback`.

[40] Freelectics. `https://www.freeletics.com/en/`.

[41] icloud. `https://support.apple.com/en-us/HT201238`.

[42] Eaze. `https://www.eaze.com/`.

[43] Business model canvas. `https://en.wikipedia.org/wiki/Business_Model_Canvas`.

[44] Business model canvas – a one-page business plan. `https://railsware.com/blog/business-model-canvas/`.

[45] Vision card. `https://www.boardofinnovation.com/tools/vision-card/`.

[46] Agile software development. `https://en.wikipedia.org/wiki/Agile_software_development`.

[47] What is agile? what is scrum? `https://www.cprime.com/resources/what-is-agile-what-is-scrum`.

[48] Scrum (software development). `https://en.wikipedia.org/wiki/Scrum_(software_development)`.

[49] Overview of agile development methodologies. `https://drive.google.com/file/d/1EAPZumrEmVAQ6hQfTWP3-yc7ma-YYpW9/view`.

[50] Kanban (development). `https://en.wikipedia.org/wiki/Kanban_(development)`.

[51] Kanban vs. scrum. `https://www.atlassian.com/agile/kanban/kanban-vs-scrum`.

[52] Pointer. `https://www.pointer.gr/web-hosting`.

[53] Wordpress. `https://wordpress.com/`.

[54] Phlox. `https://phlox.pro/`.

[55] Elementor. `https://elementor.com/`.

[56] Mobile app prototype. `https://discoverbigfish.com/blog/what-is-a-mobile-app-prototype.html#:~:text=A%20mobile%20app%20prototype%20is,that%20works%20on%20your%20phone.`

[57] Invision. `https://www.invisionapp.com/.`

[58] Minimum viable product. `https://www.pointer.gr/web-hosting.`

[59] Flutter. `https://flutter.dev/.`

[60] Dart. `https://dart.dev/.`

[61] Android studio. `https://developer.android.com/studio.`

[62] Focus group. `https://en.wikipedia.org/wiki/Focus_group.`

[63] Swot analysis. `https://en.wikipedia.org/wiki/SWOT_analysis.`

[64] Customer segmentation. `https://towardsdatascience.com/customer-segmentation-using-k-means-clustering-d33964f238c3?gi=7b740b9eaeac.`

[65] Cost–benefit analysis. `https://en.wikipedia.org/wiki/Cost%E2%80%93benefit_analysis.`

[66] Miro. `https://miro.com/.`

Appendix

Software for innovation frameworks

For every framework that I capitalized, I used an online whiteboard from Miro. [66] Miro provides almost infinite whiteboard that can be used with online post-its, symbols, designs, templates and other utilities.

The whiteboard in which I have everything regarding the thesis can be found <u>here</u>.