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UNIVERSITÀ DI ROMA

U N I K A S S E L
V E R S I T Ä T

Improving the User Experience and User Centeredness in a Confirmation of Documents for The Embassy of Italy

Department of Product Design

Master's degree in Product Design and Service Design

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Abstract

This thesis aimed to study how service design can assist in improving the user experience. For this purpose, the vital objectives were first, observing, interviewing the users, and analyzing for discovering the failure and potentials of current Embassy service for confirmation of documents. Secondly, enhancing the service by the aid of the new technology (smartphone's application), Artificial Intelligence and Blockchain and considering the user centeredness in each step by understanding the challenges and empathizes.

The thesis was conducted in Tehran, Iran, as a part of a thesis for the master of the Sapienza University of Rome and the University of Kassel.

From a symbolic interactionist perspective, this thesis studies the use of symbols in similar services for representing them.

The thesis utilized the manifest function of working with smartphones, for reaching to latent function, being ascertained the correction of documents and the appointment.

The thesis emphasized the fair system for the whole user to book an appointment by considering each case, for reducing the problems in the Conflict Theory.

The various method is applied for obtaining the result. Observation, Focus Group, Diary Study, System Map, Emotional Journey, Empathy Map, Interview, the User Needs, the Journey Map, Personas, and the Service Prototype were utilized. As a result, an app is introduced to allow users to:

- Fully understand of requirement documents;
- Check the correction of their documents in advance;
- Uploading their documents for confirmation;
- Send and receive their docs by post;
- Send their docs to the official offices in Italy remotely and online by requesting in the app.

Keywords: User experience, user centeredness, Artificial Intelligence, Italian Embassy, Mobile App, Blockchain






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Applied Colors Guidance

| | |
|---|-------------------|
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|  | T a b l e |
|  | F i g u r e |
|  | G r a p h |
|  | M a p |

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Abbreviations

| | |
|-------|---|
| DSU | University Study Right (Diritto allo Studio Universitario) |
| HEPs | Human Error Probabilities |
| ISEE | Equivalent Financial Situation Indicator (Indicatore della Situazione Economica Equivalente) |
| ISPE | Equivalent Asset Situation Indicator (Indicatore di Situazione Patrimoniale Equivalente) |
| MAECI | Ministry of Foreign Affairs of Italy (Ministero degli affari esteri e della cooperazione internazionale) |
| MIUR | Ministry of Education, University and Research (Ministero dell'Istruzione, dell'Università e della Ricerca) |
| MOCD | UAE's Ministry of Community Development |
| PSFs | Performance shaping factors |
| PTSD | Posttraumatic stress disorder |
| UCD | User-centered design |
| UI | User Interface |
| UX | User Experience |
| AML | Anti-money laundering |
| KYC | Know your customer |

Chapter 1: Introduction

1.1 The Problem

Immigration has been always difficult due to its multidimensional nature. It challenges the mental and physical of the immigrant. Simultaneously, this person separates from their country of origin, culture, family, language, familiar environment and in some cases religion, and ought to be adopted to a novel situation. Stresses as an indivisible part of this process can cause mental health issues, such as depression, posttraumatic stress disorder (PTSD)¹, substance abuse², anxiety and more (Immigration and Mental Health, 2020).

In 2019, the number of international migrants globally quintuple compared to 2010 (272 million in 2019 and 51 million in 2010) ("The number of international migrants reaches 272 million," 2019). People who breathing among citizens and communicate with them. It transforms the world into one continent and ties people live to each other tighter than ever.

While governments are spending millions of resources for fighting Coronavirus, Italy almost paid out €750 billion (nearly half its GDP) for this target, they should not misremember that the impact of immigrants can last longer and cost impressively (Euronews, 2020).

One of the means for reducing immigration effects is clarifying the embassies' policies and enhancing their services. For this aim, as a first step, changing the process of confirmation can be significant. This part of the embassy has to deal with users directly for collecting their docs. While users ought to collect their docs, translate them from Persian to Italian, and change their currency's money. In the process of confirmation, the embassy deals with:

- Students who want to study in Italy (they ask for DoV documents);
- Students who want to study in Italy and have applied for the DSU scholarship; and
- People who want to work in Italy (they ask for a Criminal Record).

This process is not occurred at a specific time, in fact, the embassy faces them every day. Albeit, it becomes complicated in the peak season, summer, when the embassy has to manage Visa requests and also simultaneously the DSU bando is announced.

In 2020 and 2021, the COVID-19 increases this difficulty by stopping the face-to-face confirmation, which was not a completed success, due to users ask for an appointment via email, but still, they need to hand over manually their docs.

1.2 Proposed Solution

Nowadays, numerous government organizations suggested to their customers to manage their requests and tasks via apps. Luckily, this method is popular among notions, 86.5% of Americans used smartphones for checking their bank balance in 2020 (Spajić, 2021).

¹ A person who suffers from PTSD has been experienced or witnessed a terrifying event (MayoClinic, 2020).

² Substance abuse is overusing alcohol, prescription medicine, and other legal substances uncontrollable or wrongly (WebMD, 2020).

One of these apps could be offered by the Italian for reducing the number of face-to-face visits. This app could be a part of a service for controlling the requests, identifying the urgent cases, booking appointments and connecting the embassy to offices in Italy.

Two actions are required to be inspected to find the solution to the problem: first, the host country's capability and embassies' potentials which can be quantified must be defined. Second, the availability of technology must be deliberated. In other words, it is required to link innovation and technology for solving this problem.

The service design tools were applied as a guideline for fulfilling the objectives. Due to the informed situation is connected to various aspects of the user's need, the thesis was emphasized first on: 'disclose' and 'empathy'. Researching among the analogous services, collecting information by studying personas, customer's journeys and customer's needs, creativity and ideas, and then examined and determined the discoveries and managing them into easy to understand documented comprehensive, design principles and offers to guide the project.

1.3 Thesis Goals

Previously, people interacted with each other directly, which cause lots of errors and conflicts. For slimming down the number of failure cases, authorities need to push organizations to apply technologies in their workplaces.

This thesis tries to nominate some latest and relevant technologies and services in the society for upgrading one of these offices, the embassy.

It is worth considering that each country spends lots of resources and their staff have to live in a foreign country and communicate with strangers, on this account, the comfort of them is necessary. And this is fulfilled when their tasks become lighter and easier.

1.4 Thesis Objectives

As for building a house, it is essential to have foundations, it's pretty obvious that after clarifying the aims, the objectives- the way which this thesis can reach them- have to be explained.

- Understanding of the users need by applying the Design Thinking principles and narrowing down solutions for reaching the answer;
- The cause of users Behaviors will be extracted from the known historical/political record;
- The latest technology and services will be extracted from available ones in the market; and
- Users thought, and their opinion will be extracted from the interview, Focus group and Survey.

1.5 Thesis Outline

For approaching an ideal service, this thesis is chaptered to get closer as much as possible to the problems. Thus, after the introduction which highlights the perspective of the research, the second chapter emphasizes the political decision which affects users lives and behaviors. Additionally, the services that are offered by the Italian Embassy and other Embassies, are catalogued. After fully understanding

and gathering the main issue and its cause, in the third chapter, the suitable method of research and design tools are picked. These tools assist the research process for recognizing users and their needs, which is reported in the fourth chapter. At this level, due to the problems are categorized and the audiences are more known, the fitting technology is presented in the fifth chapter. The whole last chapters information is gathered and applied in the sixth chapter for showing the solution. And finally, the learnt lessons and gained experience for the further works are get together in the final chapter. In the entire process of research, the attention has been centralized on three facts:

- Firstly, gathering information about the embassies' potentials;
- Second, existing cooperation centres; and
- Third, finding the possible technology for enhancing embassies' services.

Chapter 2: Background

2.1 Italy as a residence for foreigners

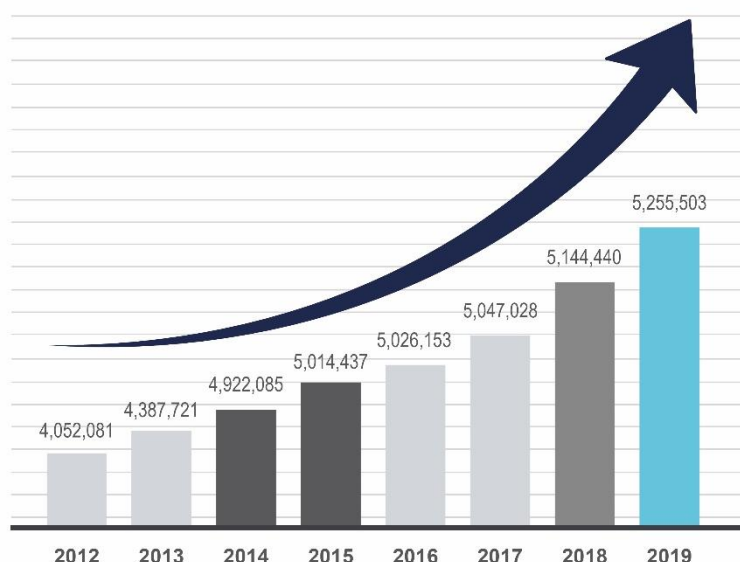
In the 1970s, Germany handed over its role as the first target of immigrants from less-developed countries to Italy. Before this period, immigration was a part of Italians' destiny. With this new designation until 1991, 860,000 newcomers crossed the border of Italy; although clandestine migrants were not estimated in this announcement (King, 1993). By the end of the 1990s, immigrants merely accounted for 2.6% of Italy's population (A. Tragaki, A. Rovolis, 2012) and this country was at the lowest rank in the list of hosts among the EU-15 (OECD, 2003).

In the first decade of the twenty-first century, this country recorded the highest number of outsiders in comparison with the EU average, 6.4% for 2010 (Vasileva, 2010). The rate of foreign residents virtually has tripled during 2003-2010: It rose from 1.5 to 4.2 million (Istat, 2010).

Now, 5 million legal foreign nationals select Italy as their domicile (see Graph 1), according to the national statistics institute Istat. It is 8.3% of the total population (60.5 million) of this country (Immigration to Italy: a look at the numbers, 2018).

Ergo, Italy has two main challenges in dealing with these groups:

- Managing them in its country as it governs Italian citizens; and
- Its embassy facilitates the administrative process.



Graph 1: Total foreign resident population on 1 January (aise, 2019)

2.2 Uni-Italia and its policies

On July 30, 2010, Uni-Italia as a public institution, issued cooperation between MAECI (Ministry of Foreign Affairs of Italy) and MIUR (Ministry of Education, University and Research) for supporting international students and researchers towards Italian Universities by offering various educational degrees and close collaboration between Italy and other co-operator countries (China, India, Indonesia, Iran, and Vietnam) (Gli studenti internazionali in Italia e in UE, 2018).

Thus, they offer English courses in levels I and II and for prospective students, with low price of tuition fees in the high ranked universities which attract the wide range of students to Italy (L'immigrazione degli studenti, 2012) (see Figure 1).



Figure 1: Visas issued by Italy for study reasons: top 10 nationalities (2006-2011)

Albeit, Italy as a member of the European Union goes further in presenting service and grants its pupils. It is called DSU (University Study Right) scholarship and be provided by the Agenzia Regionale Diritto allo Studio Universitario for students who enrolled in a Laurea Magistrale (Master's degree), in a single-cycle Study Programme and in a Doctoral Programme for Research and Specializing Course.

A DSU grant presuppose:

- Free accommodation in dormitories;
- Free meals at the chosen places;
- The monthly payment for sporting activities, books, etc.; and
- Exemption from University tuition fees (DSU scholarship, 2020).

For taking advantage of this financial aid:

- Italian students need to submit the Equivalent Financial Situation Indicator (ISEE) based on the Equivalent Asset Situation Indicator (ISPE) (Diritto allo Studio Universitario (DSU), 2020); and
- For foreign students:
 - i. Document certifying the composition of the family abroad;
 - ii. Income of each member of the family;
 - iii. Buildings owned by the family; and
 - iv. Certification of non-property assets owned (DSU Scholarships (Diritto allo Studio Universitario - DSU), 2017).

Furthermore, these certificates must be confirmed by one of the following authorities:

- Italian diplomatic representatives in the country of origin; or
- Embassy or Consulate of the country of origin in Italy (DSU scholarship, 2020).

2.3 Applicant Registration

The process of verification of documents in the Italian Embassy begins with an announcement from the DSU offices. It explains the grant, requirement documents and deadlines. Often, for some nationalities, the authorities of DSU ought to define a new type of document due to the differing policies.

Then the applicant prepares the asked documents and sends them to the professional translator who had been empowered by the Embassy of Italy.

For the next step, the translated documents are uploaded to the DSU website. Afterwards, these official papers ought to be confirmed by the embassy and the fee is paid in cash. Hence, the user exchanges their currency to the euro for paying it. Finally, these certificates are collected by the applicant for delivering manually or sending by post to the DSU offices.

For students who participate for the first time, after registration, they must send their identity paper and request for a pin code (which is issued by the DSU offices) by post to the DSU workplace.

The process of confirmation occurs each year until the graduation of the student (see [Figure 02](#)).

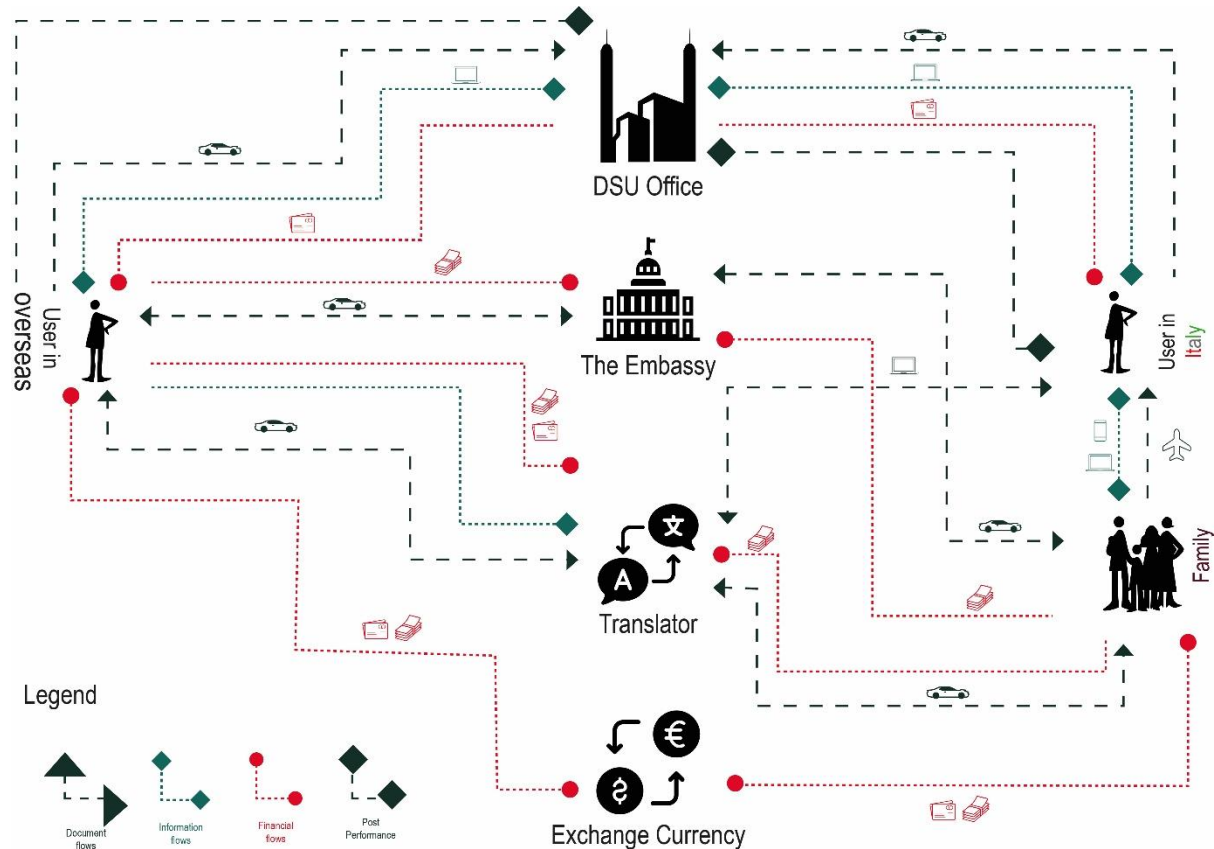


Figure 2: System Map of DSU Scholarship

2.4 Iran as the case study

Iran also called Persia, and officially the Islamic Republic of Iran, is located in the West of Asia between the Caspian Sea and the Persian Gulf (see [Map 1](#)). It is the second-largest country in the Middle East with 83 million populations (2020, [انمار](#)) and Tehran is its political and economic centre ([R. Annamoradnejad, I. Annamoradnejad, T. Safarrad, J. Habibi, 2019](#)).

As it was above-mentioned in sections [1.1.1](#) and [1.1.2](#), one of the nations that inhabit in Italy is Iranians who refer to the Italian Embassy annually.



Map 01: Location of Iran on the globe

2.5 Role of Embassies

"We are made wise not by the recollection of our past, but by the responsibility for our future." —**George Bernard Shaw**

Unsurprisingly, it is expected that the nation that has introduced the system of diplomacy, be more responsible and creative in terms of services.

Initially, the duty of diplomats was a discussion over a specific subject and mostly return after their expedition deduced. As a matter of fact, their royal's or high ranked family's blood legitimizing their missions. Albeit, the connection of the Byzantine Emperor³'s diplomat with the Pope was an exception, he was residing in Constantinople constantly (A Brief History of Diplomacy, 2020).

The arrival of new regions demanded novel ways of communication. Thus, the states of Northern Italy in the early Renaissance instituted the first embassies in the thirteenth century. Milan as a key player, under the order of Francesco Sforza⁴, constituted constant embassies in the city's states of Northern Italy (Polat, 2013). This movement expanse from Italy to the other European authorities and the first destination was a diplomat from Milan to France in 1455 (Mattingly, 1937). In 1460, a diplomat commanded by the Duke of Savoy to the Holy See. In 1496, two Venetian traders as resident ambassadors or subambasciatori were dispatched by Venice in order to live in London and Paris (Ruey, 2017).

The complexity of the new world called for skilful staff for embassies, therefore, the graduates of universities were hired. This propelled a growth in the study of international law, modern languages, and history at universities throughout Europe (A Brief History of Diplomacy, 2020).

Nowadays, Embassies demonstrate their country and chief of state and origin policies to a destination host country. Their main duties are:

- The relationship between the countries by exchanging pieces of information; and
- Offering various types of service for their citizens abroad (Zilberboim, 2018).

³ The Byzantine Emperor or the Eastern Roman Empire ruled from the 4th to 15th century CE. The emperor or empress was commander-in-chief of the army, head of the Church and government, controlled the state finances, and settled or dismissed nobles at will (Cartwright, 2018).

⁴ Francesco Sforza, (born July 23, 1401, San Miniato, Tuscany [Italy]—died March 8, 1466, Milan), condottiere who played a critical role in Italian politics. As a duke of Milan, he founded a dynasty that ruled for almost a century (Britannica, Francesco Sforza, 2021).

With tight-knit cooperation between the embassy and the host country, strength and close relationships are formed between more than two countries. For the reason of each country has its allies, friends, and common interests, these activities have wide and numerous aspects which can be provided by joined action among the private and public organizations. Opening a Language School, associating in business as a second party, a conference for introducing their universities for students seeking knowledge, etc. For example, under the power of the Italian Embassy, two Italian schools are training students in Tehran ([Courses Overview, 2020](#)) and Esfahan ([lingua Italiana, 2020](#)).

Albeit, these links can be disconnected, while misapprehension or nonconformity appears. In 2019, Zambian President Edgar Lungu asked Daniel Foote, The US ambassador, to leave the country, for Gay rights conflict ([Taonga Clifford Mitimigi and Matthew Hill, 2019](#)).

Owing to the high level of interaction and demand, a consulate as a small model of an embassy is located outside the capital and in cities with a high potential for tourism. In Italy, for instance, the U.S. consulates are in Milan, Florence, and Naples ([U.S. Embassy Rome, 2020](#)). The embassy is located in Rome, the capital of Italy. It deals with tiny duties such as:

- Issuing visas;
- Aiding in trade relationships; and
- Taking care of migrants, tourists, and expatriates ([Briney, 2020](#)).

As mentioned in the last section, improving the confirmation service is tightened to understanding the embassy function for modifying. Therefore, it is widely believed that offering a faultless service by the embassy has a significant role in enhancing the quality of the user experience and the country features.

2.6 Background and motivations

"What you wear is how you present yourself to the world, especially today when human contacts are so quick. Fashion is instant language." —**Miuccia Prada**

If we consider embassies as clothing, then they present the dressed-up person, their countries. Thus, the location of the embassy, the building, the uniform of clerks and their behaviours proposal the position of a country in the world. Moreover, from the cynical perspective, they know that any failure can cause a punishment by the society they supposed to offer a service ([Haas, 2020](#)). A critical report in social media can bring a huge misfortune for the whole department.

Consequently, embassies seek new technology for showing up their power, policy, courtliness and customer orienting. Online booking for reissuing passport, changing names in the case of marriage, issuing a passport for new-born children, issuing visas, etc. are the available possibilities which are provided by the embassies' websites for nations.

As a matter of fact, websites and search engines are the first platforms where people look for their needs. Although, when they cannot detect it or the information is irrelevant (the function of the searching algorithm is unknown for most people), disappointing is the last image of the service. Accordingly, this request gets more personal, focused, and specific.

Mobile Apps appear for this aim, especially when the service involves personal data. A personal bank, e-books, a platform for saving and sharing images, video and files and email apps already have shown up. It is about time for introducing an app for embassies.

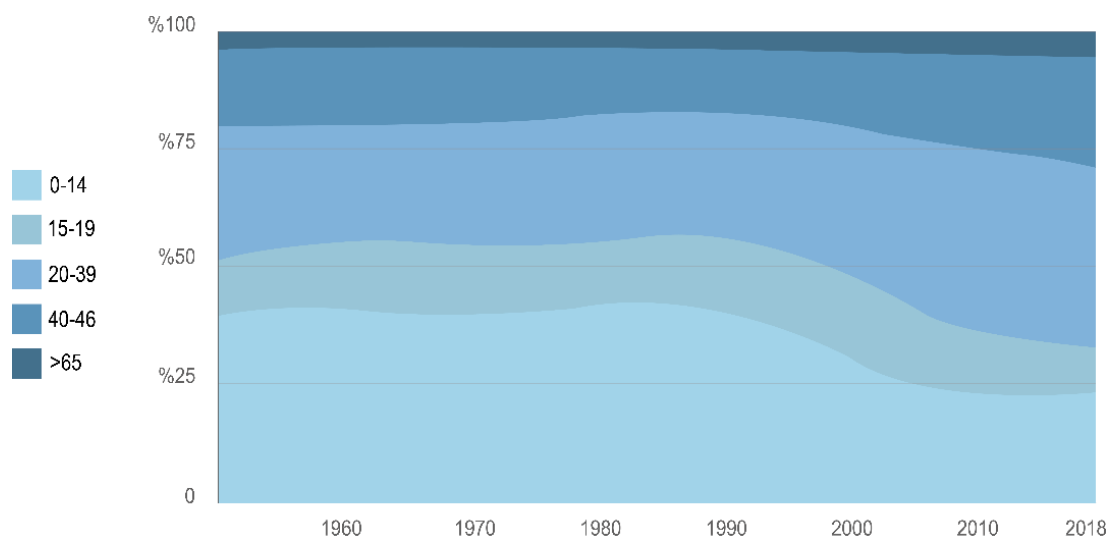
The benefits and possibilities of service design for embassies are preventing from spoiling resources.

While a wide range of visa applications are issued, simultaneously, a remarkable number of visa applications are denied (Visa Denials, 2020). The U.S. government rejected approximately 4 million visa applications a year under the name of, including for practising polygamy, kidnapping children or not being eligible for the visa (Torbati, 2019). The latest eventuates due to the dissimilarity between rules and documents of each nation. For instance, proof of unemployment is almost inconceivable in Iran, owing to paying unemployment insurance taxes are not prevalent or against law (Unemployment insurance in Iran on a global scale, 2017). Thus, when an organization in the United States asked for this document, expects it based on the rules in its country (DeWitt, 2017). Hence, in each step of this process, from collecting documents, translating, booking an appointment, fees and finally, checking documents, enormous resources are concentrated. Therefore, an "Intermediary Company" is authorized by embassies to accumulate documents. Unfortunately, visitors ought to pay for this service to be assured about documents.

2.7 Introducing Iran as a sending country

Iran has a youth population, with roughly 60 per cent under the age of 30 (see Graph 2).

Before "The Iranian Revolution"⁵ in 1979, the population was 36 million and now the census estimated 83 million. In point of fact, at the beginning of the Iran–Iraq War in 1980, the policy of governments encourages nations for Population growth (Baby Boom⁶) for cultural and security reasons. Although, this diplomacy was applied without predicting and planning for the primary needs (feed, clothe, house, educate and eventually employ) of people (Nada, 2014). After 8 years of war, they released that providing the basic needs of people was not possible, and it was repealed.



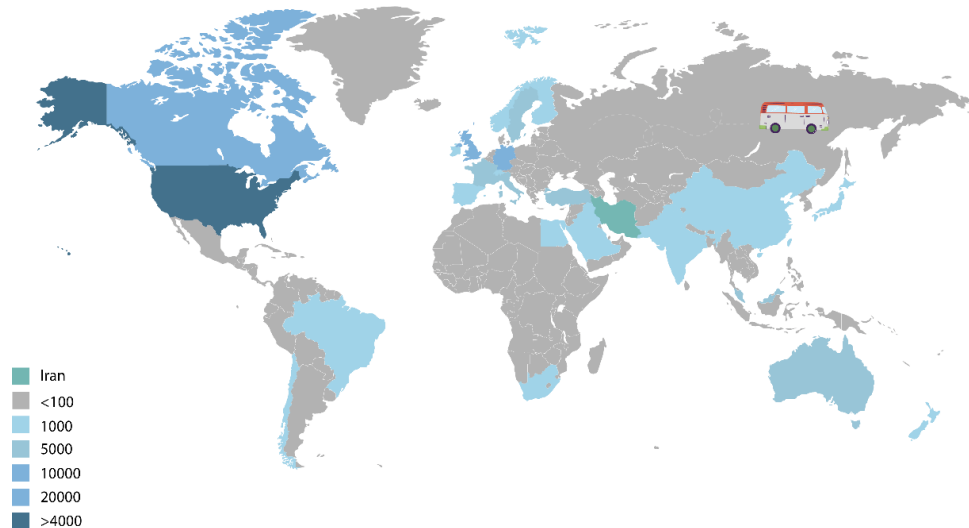
Graph 2: Iran population based on age (Iran before and after the revolution in terms of statistics; What it was, what it is, 2019)

⁵ The Iranian Revolution also called as the Islamic Revolution, or the 1979 Revolution caused the overthrow of the Pahlavi dynasty and the substitution of it with an Islamic republic (Gözl, 2017).

⁶ A baby boom is a period which is evidenced with a significant rise in the birth rate

As regards the above **Graph 1**, the age structure is significant among people who are 20-39. Also, the median age⁷ in Iran is 32.0 (**Worldmeters, 2020**).

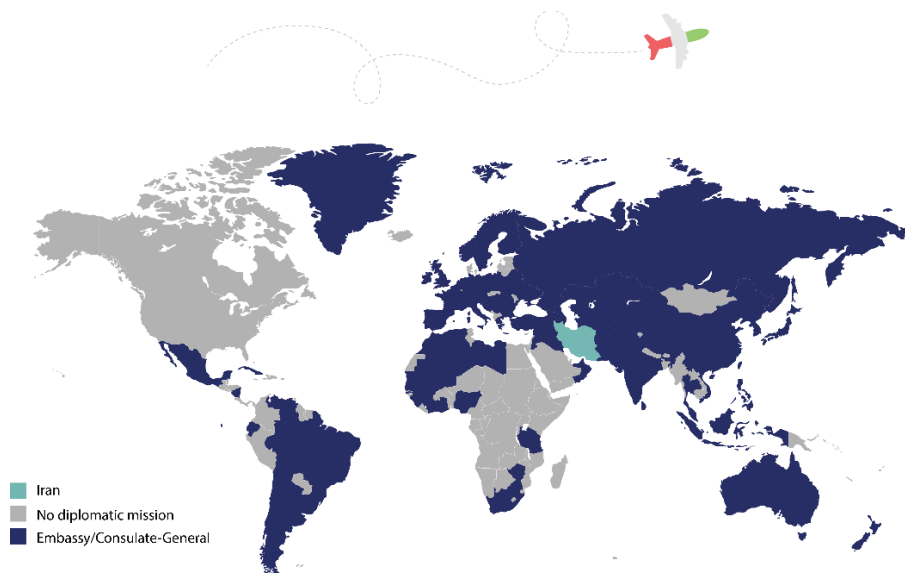
Consequently, while social services are inadequate, the country would face losing its workforce to more developed countries, as now Iran is dynamic emerging market for international students (**Trines, 2017**) (see **Map 2**).



Map 02: The estimated number of scholars of Iranian descent affiliated with universities and research institutions in foreign countries since 1980. Based published data on Scopus (**Pooya Azadi, 2020**)

2.8 Embassies in Iran

Various countries offer their service in Tehran as the capital of Iran as an embassy and consulates in other cities (See **Map 3**).



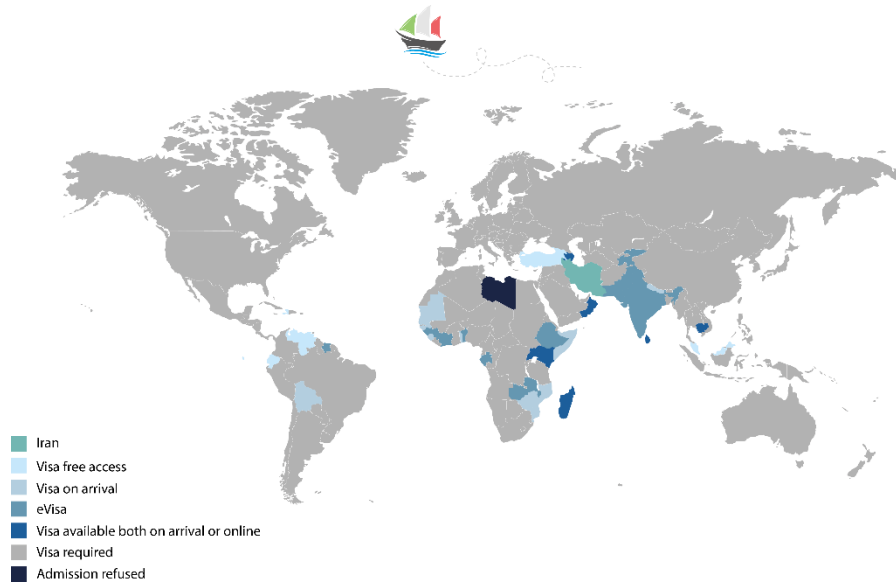
Map 03: Map of diplomatic missions in Iran (**Wikipedia, List of diplomatic missions in Iran, 2020**)

⁷ "The median age divides the population in two parts of equal size: that is, there are as many persons with ages above the median age as there are with ages below the median ages," (**Data, 2020**).

Iran passport power rank is 87 out of 93 ([PassportIndex, 2020](#)):

- 9 countries: visa-free;
- 38 countries: visa on arrival; and
- 151 countries: visa required (see [Map 4](#)).

Studying [Map 2](#) and [Map 4](#), illustrates the substantial role of embassies in Iran.



Map 04: Visa requirements for Iranian citizens ([Wikipedia, Visa requirements for Iranian citizens, 2020](#))

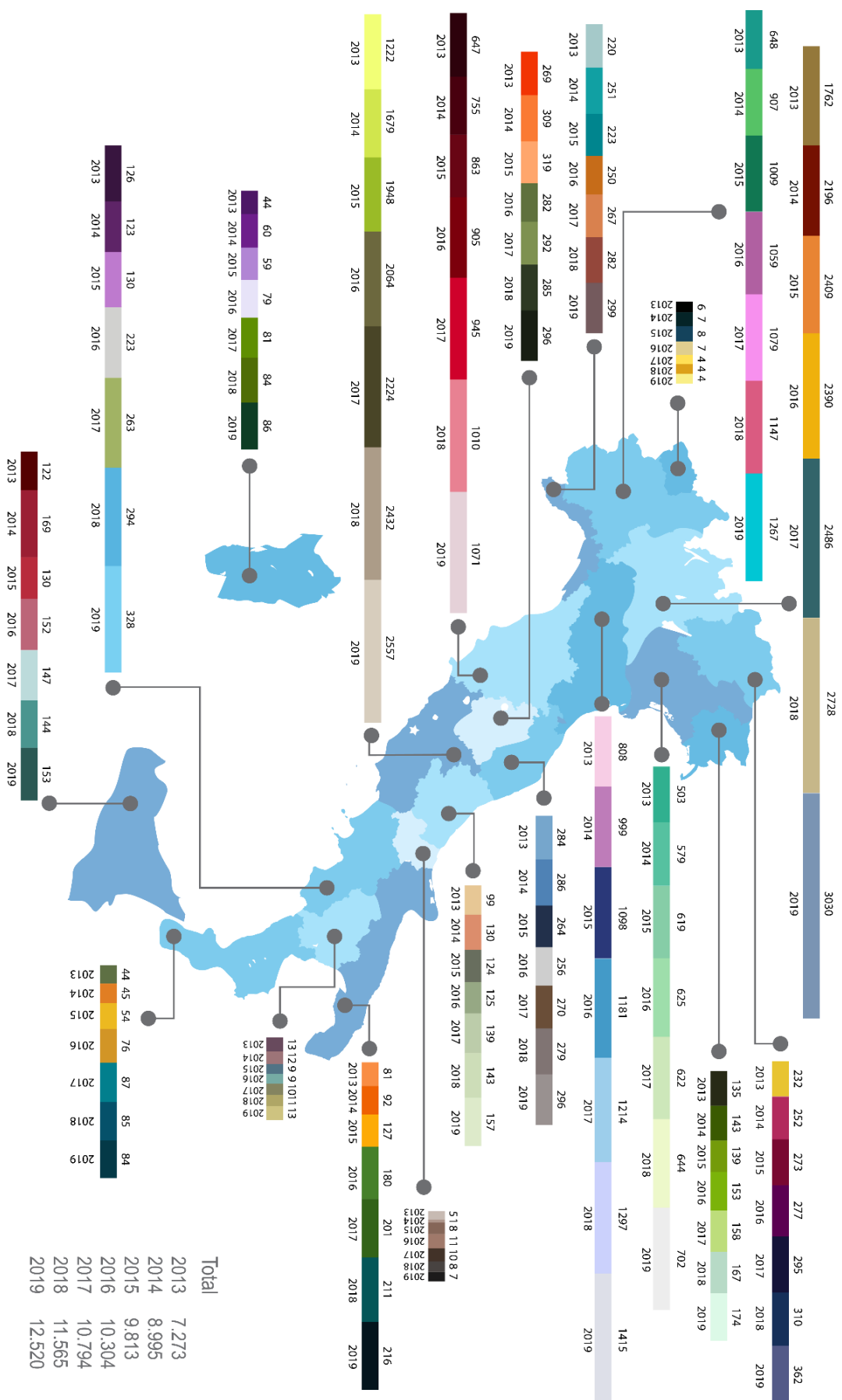
Performance of the embassies in Iran are incompetent, for example:

- For travelling to Germany, it took:
 - i. 6-9 months for a person who requested a study Visa;
 - ii. For marriage or re-joining their family, 8-9 months; and
 - iii. For other types of Visas, 1 year or more to register in the embassy.

Previously, mongers dealt with appointments and the embassy's clerks were aware of them. Although, after this scandal and an increase in demands, this group were omitted ([Chamedan, 2018](#)).

- Austria turned to the impossible destination; its ambassador declared that all the appointments are booked in 2018 ([Chamedan, 2018](#)).
- Italy had a strict rule for study seekers. They only have a few months to book an appointment and the date is published on its website at the last minute ([Chamedan, 2018](#)). In 2018, for nearly one month, the Italian embassy's website blocked its service due to none of the applicants could reserve. In 2019, this task was entrusted to a private company. Although, in the end, under a mistake on the website, a group of candidates lost their chance to travel to Italy.

In other words, while the number of aspirants increased as it is reported in [Map 2](#), embassies overwhelmed with numerous issues and then trial, and error have been occupied. Although it could have been foreseeable, as it is perceptible in Italy (see [Map 5](#)). Peculiarly, when Italy had been targeted to Iranian students.



Map 05: Foreign residents with Iranian citizenship on January 1st of each year (Iraniani in Italia, 2020)

2.9 The future of Confirmation

Two weavers assure an emperor a new outfit that is invisible to those who are foolish, or incompetent – while in reality, they are pretending to sew a cloth. When the emperor presents before commons in his new "clothes", no one has the courage to say that they do not see any suit of clothes on him. Finally, a little boy points out and says: "But he isn't wearing anything at all!"⁸

Could this little boy represent the Coronavirus pandemic? Maybe! Industrial and fearlessness as two tailors dress the world in invisible clothing. Now, this outbreak (Coronavirus) calls out this nakedness and injudicious.

Under the shadow of this pandemic, plenty of responsible departments substitute manually verification of documents to digital authentication of official certificates and other documents. As the UAE's Ministry of Community Development (MOCD) has come into accepting digital documents as an alternative to paper documents (see Figure 3) (UAE's version of customer service centres) (Rodgers, 2020).



Figure 03: Storyboard the UAE Pass app

2.10 Service of Embassies

2.10.1 Online Service

As mentioned, most activities and focus of embassies are administrative duties, offering services for migrants and international travellers. In these services, the bureaucracy is an obvious feature that is managed to vanish step by step. Online forms, appointment booking, and applications were substituted on embassies' websites and apps. The Philippine Embassy in Madrid, for example, launched the eFILIPINAS mobile app for recommending consular services with gradual guidance

⁸ El vestit nou de l'emperador (El traje nuevo del emperador) Tale by Hans Christian Andersen (1837)

on how to attain them (Standard, 2019). Assist students for depicting studying and living in the US, as a part of EducationUSA app (Raman, 2019), re-issuing (renewal) of passports, change of name in case of marriage /divorce, and appointments at the Indian Embassy in Rome (Guidelines and Instructions for online applicants, 2020) are being proceeded online.

2.10.2 Post

As it was mentioned for ceasing the era of waiting in queues, the Post Office in the UK has launched a digital passport renewals service as a part of the "Check and Send" in 725 locations in 2018. This service is almost cost the same as the paper-based application and customers pay an extra fee for in-branch support-checking the correction of application -, the taking of digital photographs, and the assured transfer of the customer's old passport to HMPO (Her Majesty's Passport Office). Director-General HM Passport Office Mark Thomson said: "We want to make sure we have a modern and easy-to-use service for the millions of passport holders and applicants, which is why the Post Office's Check and Send service is valuable," (Post Office launches digital passport service, UK, 2018).

The embassy of Thai in the UK goes further and offers a filling online visa application via travel agencies or individually. Then the required documents and payment of the visa fee ought to be attached. Finally, the process of submission can be completed in person by booking an appointment or by post.

2.11 Confirmation

*Ah, ne'er so dire a Thirst of Glory boast,
Nor in the Critick let the Man be lost!
Good-Nature and Good-Sense must ever join;
To err is Humane; to Forgive, Divine. — Alexander Pope*

Human Error is pointed to as a non-fulfilment of a calculated act. For eliminating it, Performance shaping factors (PSFs) is established for individual, job, and organizations (Human Error, 2020). PSFs defines a base for consideration of possible impacts of human actions and consistently considering them in the quantification of human error probabilities (HEPs). It is categorized as:

- Internal PSFs: Influences that are brought by individuals such as mood, fitness, stress level, etc.;
- External PSFs: Influences that are brought by the situation or environment such as temperature, noise, work practices, etc. (Ronald L. Boring, Candice D. Griffith, Jeffrey C. Joe, 2020).

In fact, by inadequate managing of PSFs, the rate of mistakes increases in workplaces. Thus, by studying human error, responsible authorities and precisely designers can predict and remove them. Usually, it begins before and after some critical decisions and actions. Applying, deleting a file or image from your smartphone or personal computer, closing a web browser, or paying a bill online are some routine activities, which are demanded confirmation.

Furthermore, due to errors, such as disconnection of the internet, missing a part of a task or an unsubmitted commend, after each action, a user would ask about processing. Thus, feedback as confirmation has a role of reassurance.

For the advance verification, as a second chance before a crucial decision (deletion of user documents or spending money), while a user works with their PCs

or smartphones, a box pop-up before the system will apply the user's command. It must explain the performance of the system and clarifies the consequence of the user's choice. For example, in Windows 10 when the user clicks on Empty Recycle Bin, a confirmation dialogue appears and asks whether the user is sure about deleting (Nielsen, 2018).

Besides, an authentication is being accomplished, while a user confirms their identity via email, a fingerprint, face ID, message, eye ID, calling, etc. These days, for registering each website or app, it asks for the user's email address or phone number and immediately a message emerges in their inbox. Types of confirmation emails are:

- **Order Confirmation:** It contains the order information, price, delivery date, contacts, order number and barcode or QR code. Approximately, %64 of buyers "consider transactional confirmation emails to be the most valuable messages in their inboxes," (Roggio, 2016). It diminishes the post-order concern that bothers customers mainly in the case of online shopping ("17 Best Confirmation Email", 2020). Also, the QR code and barcode help a customer to receive their purchase easier than ever. For instance, Amazon Hub Locker is a safe, self-service kiosk that allows a customer to pick up their parcel any convenient time (Everything you need to know about Amazon Hub Locker, 2020). By scanning the QR code or inserting the order code, the customer will be able to collect their items.
- **Booking Confirmation:** It is sent as a thank-you message to the customer for showing thankfulness and the purchase details. Considering that they pick up your business and invest time and resources in it, so they deserve it. Customers who reserve a flight, hotel rooms, restaurant tables, etc. would receive this type of message (17 Best Confirmation Email Examples & How To Set Them Up, 2020).
- **Registration Confirmation:** The central aim of it is to announce an event or affirm an online registration, such as (Mester, 2020):
 - i. To confirm a payment transaction: for example, as a part of the PayPal service, after the payment is approved, the recipient will receive an email in their inbox (How do I send a payment through PayPal?, 2020).
 - ii. To enlarge an enrolment user's engagement with your product or service or encourage maintaining, whether to buy again or to remain as an active user: In this case, triggered messages are developed for users. They are written for users who are inactive for a specific time (it is calculated according to the customer's usage pattern) or a new user who only signs up and does not engage in the offered service. Indeed, it predicts users' needs or problems while they had been working with the service. Thus, the provider advises users to the advantage of their service (Beohar, 2017). Conforming to this, Instagram emails users who are absent for a long time to inform them about the activities that are missed and have been shared by their followed accounts. Moreover, as an encouragement, by offering discounts for their next purchase, the customer's life cycle would be enhanced.
 - iii. To remind your registrant about the event date: While inside the Microsoft Teams and Google Class, online conferences are scheduled to be added to calendars, Skype sends a notification to

each user on the group to remind them the time of the meeting ([How do I schedule a call in Skype?, 2020](#)).

- iv. To remind readers of the registration benefits: Goodreads as a platform for book lovers permits all users who not being interested in registering to benefit from the shared information. Although, a member can have access to a private profile, lists of suggested books based on the user's favourites are sent via email.
- v. To communicate and inform your prospective attendee about the basic event details: During the Coronavirus outbreak, the Glasgow School of Art informs accepted students about the fall semester via email.
- Subscription Confirmation: Subscription Confirmation: It is an allowance that is issued by users to receive newsletters. For instance, the Interaction Design Foundation website asks users to submit their emails to be able to read the updated materials ([Get weekly design tips, 2020](#)).

Albeit, this process is still operated manually in some cases and the documents ought to be verified face-to-face.

2.11.1 Confirmation documents in the Italian Embassy in Iran

As mentioned in section [1.1.3](#), the process of winning the scholarship is complicated and time-consuming. 'Service Blueprint' as a tool is illustrated here to mapping the weakness of the service ([Gibbons, 2017](#)) (see [Figure 9](#)):

- At first glance, although the DSU office approves documents only and only if the verification is validated by the embassy, no connection is arranged. It is predictable that disorganization from any part of these sides can paralyze applicants' lives. In 2019, the embassy did not authorize the self-certification, while the DSU had emphasized it;
- The next distressing is caused by the fact that the embassy and official translators are in the centre; and
- Eventually, the Telegram group which is created by the people who are engaged with this difficulty, even though it never recognized by the embassy's authorities.



Figure 4: People are waiting in the park in front of the Italian Embassy for confirmation

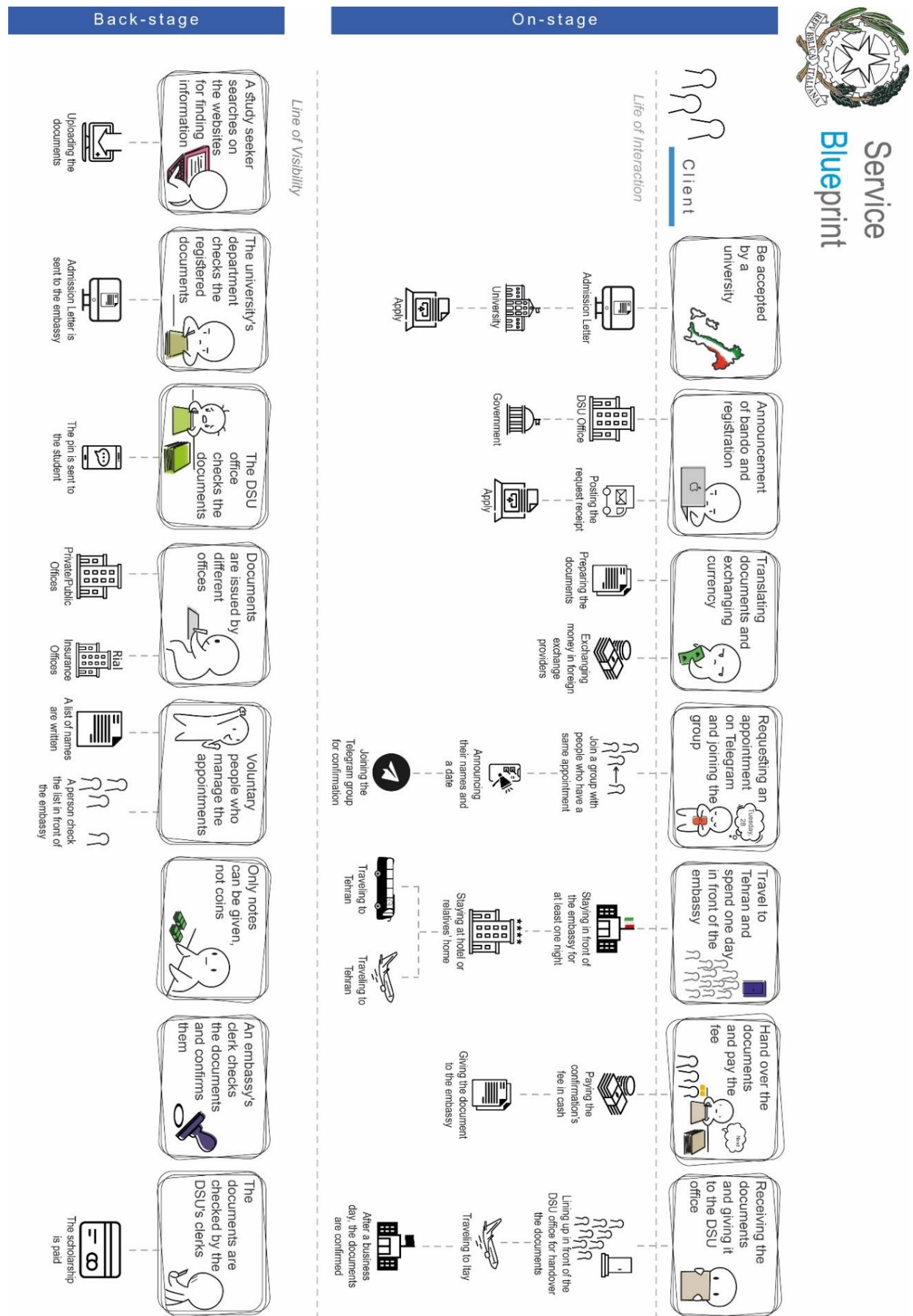


Figure 5: Service Blueprint of the Italian Embassy's confirmation documents (DSU Scholarship)

2.11.2 Criminal Record Document

The CERTIFICATO DEL CASELLARIO GIUDIZIALE (the Italian name for CRIMINAL RECORD CERTIFICATE⁹) is a type of report which demonstrates if there are any crimes, sentences, and/or final convictions in the civil, criminal, and administrative fields. It is required for recruitment, employment, legal purposes, political and voting rights, citizenship, visa. Also, Immigration governs from foreign Countries could request them for immigration intentions (CAESAR, 2020). For Iranian citizens, this paper is certified by the Italian Embassy in Tehran and has an arduous system (see Figure 11).

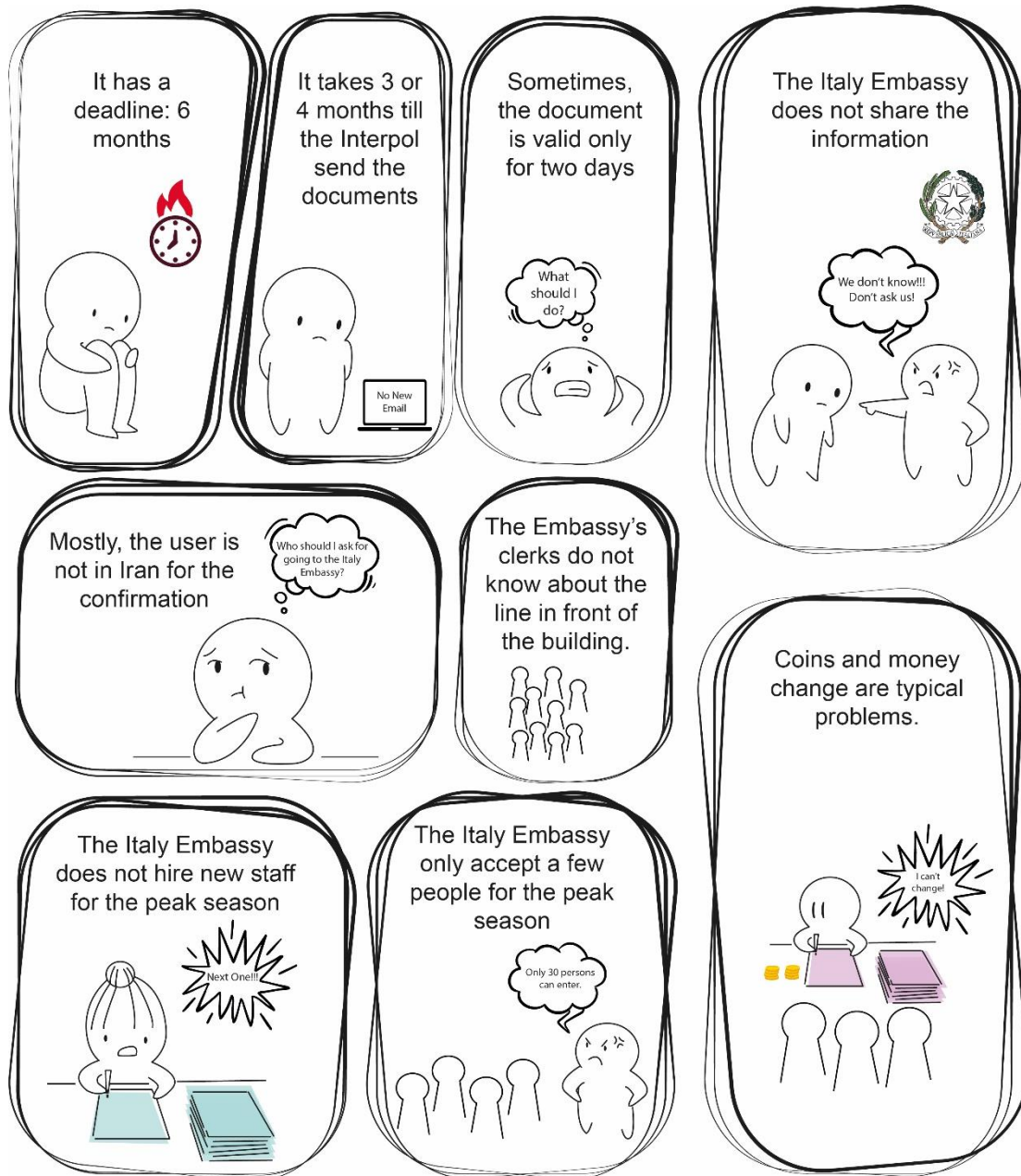


Figure 6: Appointment process for confirmation (Case Study: Criminal Record)

⁹ It is also called a Police Clearance Certificate, Police Certificate, Police Check, PCC, Judicial Records Register, Good Conduct Certificate, or Background Check (CAESAR, 2020).

2.11.3 Telegram Group: a temporary solution

"Necessity is the mother of invention."

Students have been undertaken to manage the appointments for confirmation without permission of the Embassy. In the past, the list of students is written in front of the embassy. It forces requesters to drive hundreds of Kilometres to arrive at the embassy, spend nights and days and frightened for their turn (see Figure 12).

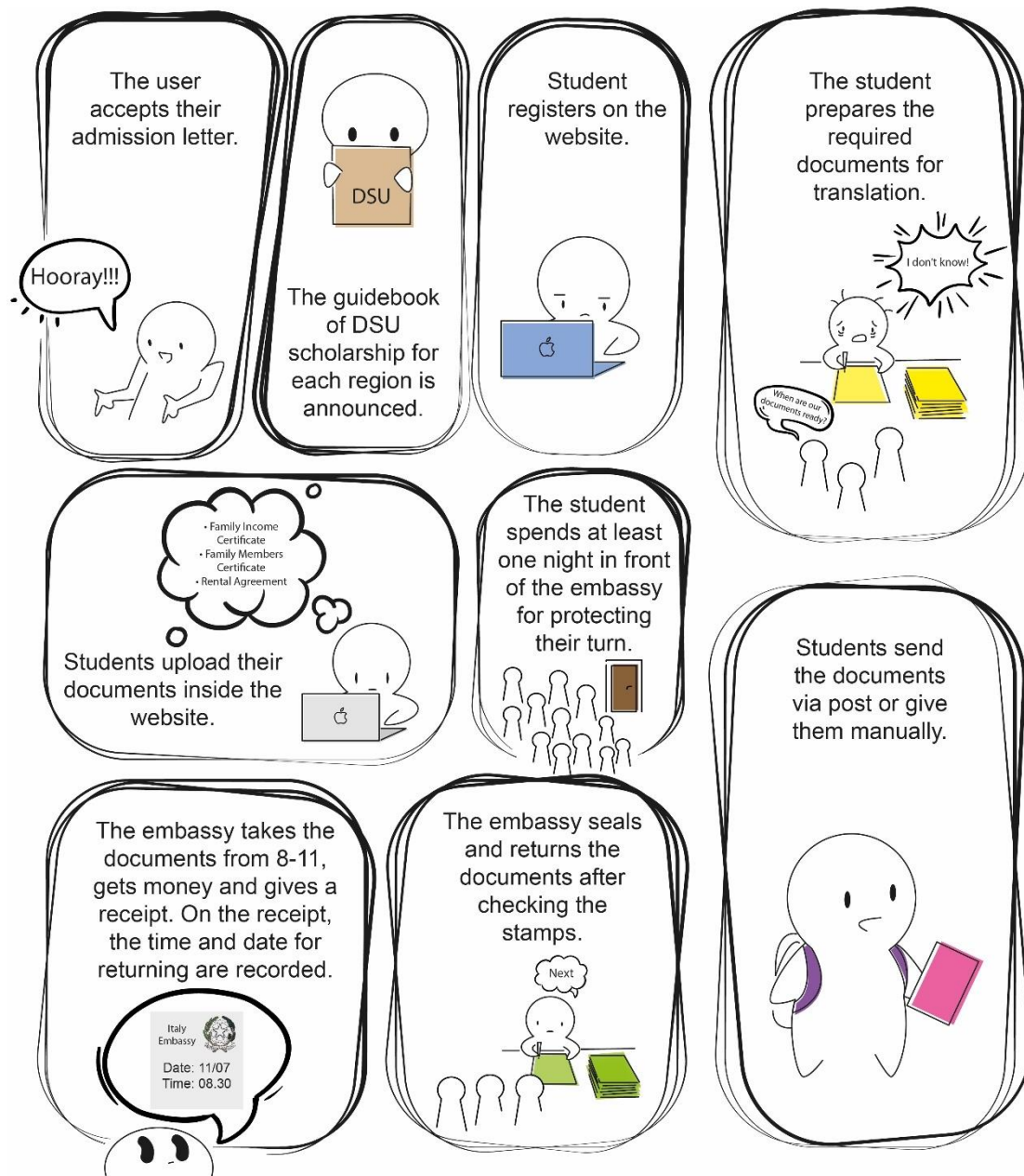


Figure 7: Appointment process for confirmation (case study: confirmation of DSU documents)

The first experiment has appeared on the WhatsApp platform. It was provided by admins who have founded a university group in Telegram for Persian speakers' students independently.

Among various types of social media in Iran, Viber¹⁰, Telegram¹¹ and WhatsApp were more accessible. In 2014, with the filtration of Viber (**Viber was finally filtered, 2014**), it almost vanished among users immediately. Telegram was substituted instantly and grows as 60% of the country's Internet's bandwidth is consumed on using it (**ISNA, 2017**). It was the last shifting for Persians. Despite the filtering of Telegram in 2017 (**Tavakoli, 2015**), the public interests did not distract from it and VPN was shared rapidly for maintaining. This inaccessibility has influenced the new-born service and instead of Telegram, WhatsApp has been preferred (see **Figure 13**).

WhatsApp's facilities were unsatisfactory, because of:

- The limitation in the number of new members, 256 members in each group (**Bolton, 2016**);
- Visibility of phone numbers; and,
- Limitation in offered options for connection and management (searching among messages was impossible and serious note was getting lost among other speeches).

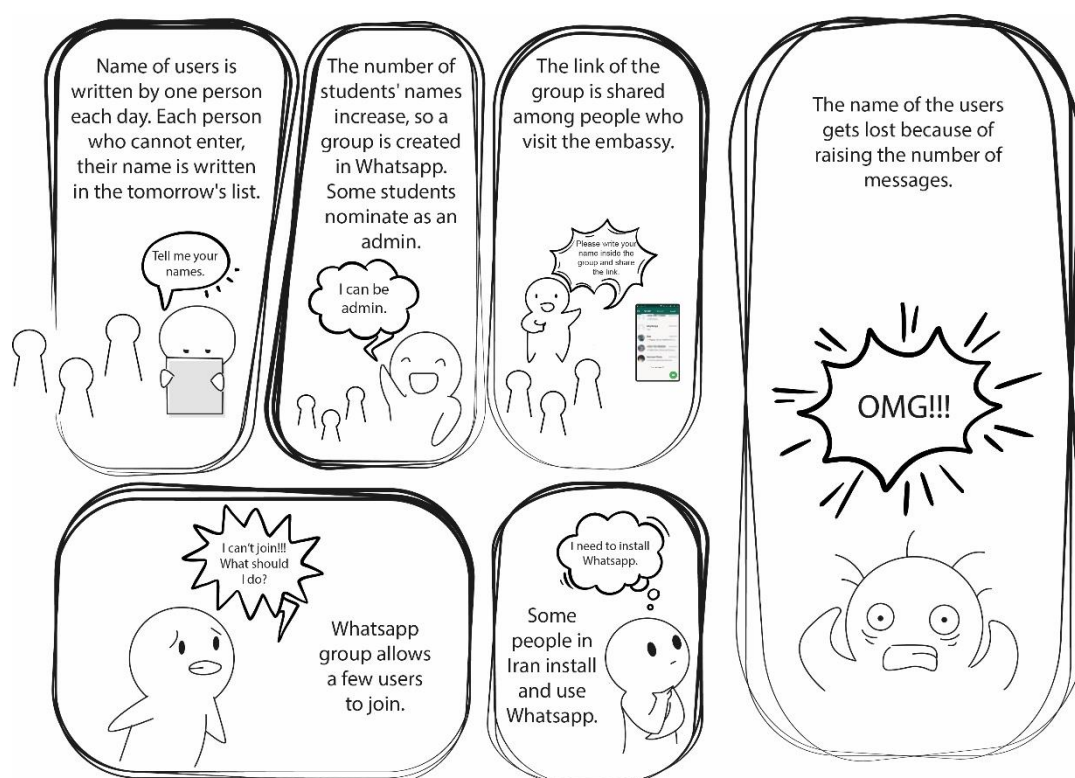


Figure 8: Appointment process for confirmation (platform: WhatsApp)

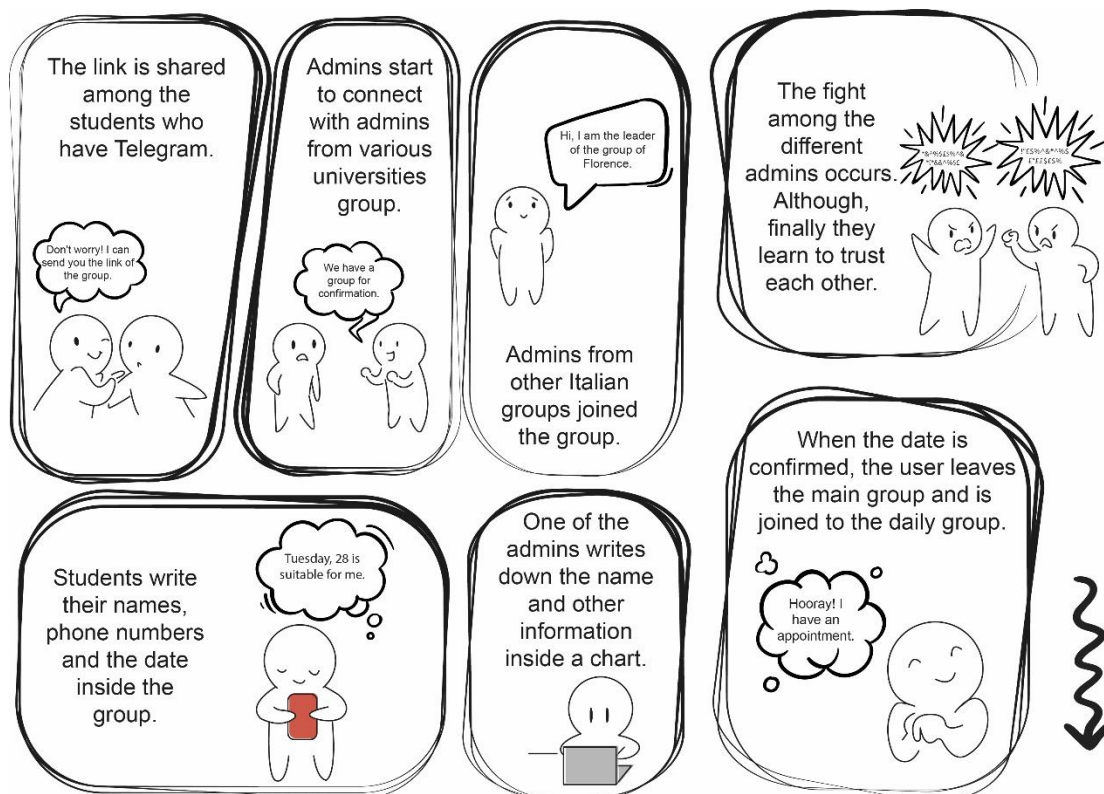
On the next platform (Telegram), the reputation of the group spread among students thanks to the wide range of Telegram groups (see **Figure 9**). It is never permitted by the embassy, which is inevitable.

Various voluntaries as essential gears nominate and work 24/7 for advancing the group. Students join the group and inform their names, contact numbers, the name of their universities and a date which is suitable for them. Then:

¹⁰ Viber is a free app that admits users to make free calls, send texts, pictures and video messages to other Viber users (**webwise, 2020**).

¹¹ Telegram is a free messaging app with a focus on speed and security (**DrKLO, 2020**).

- A person collects names and refers them to the next person;
- A person writes names on the online Excel and shares it with the main admins and responsible daily admin. The proposed date is confirmed and be told to the name collector;
- The collector mentions the student and in private gives them the daily group link;
- The student joins the daily group;
- He rewrites his name in the group, in order to be checked by a daily admin;
- Daily admin is suggested from the daily group members;
- The list is controlled by daily admin for being sure that no one missed the confirmation;
- If a user was missed from the group, the daily admin cautioned the main admins for searching among names for finding them;
- Two days before the appointment, daily admin calls or send a message to the whole members;
- A day before the appointment, the whole members present in front of the embassy (in the park) for affirming their names;
- If the situation in front of the embassy is calm, referrals set a shift for protecting their names;
- At night the whole applicants gather again;
- At 5-6 A.M. people line in front of the door of the embassy for preventing new arrivals to disturb. The link of the group is shared with new arrivals;
- At 8:00-8:15 A.M., first the applicants who had given their documents previously, get their certificated documents. Then, the embassy assembles the documents and give a receipt to each person;
- On the pointed date, the referrals get their document; and
- The given documents are delivered to the subjected office.



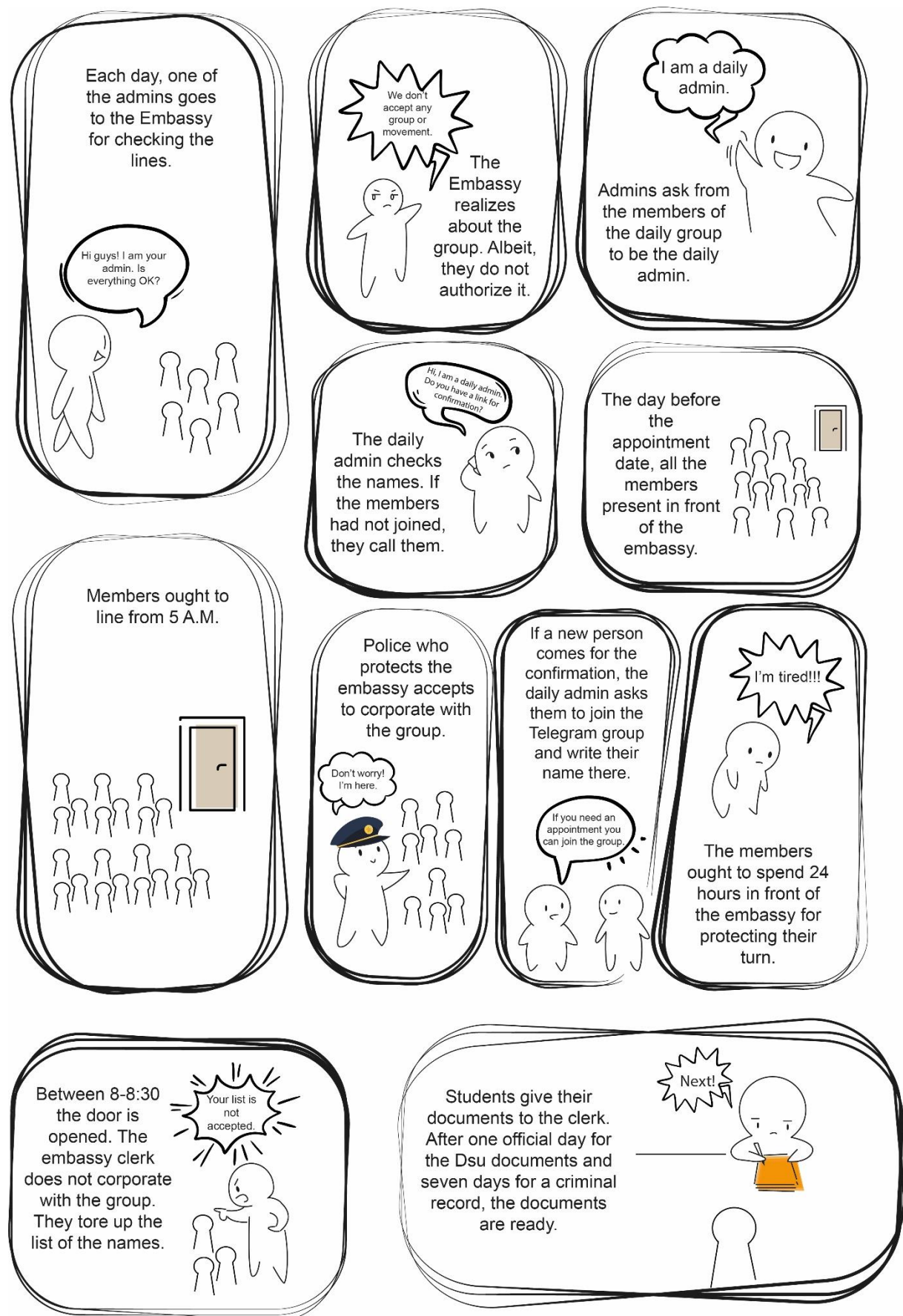
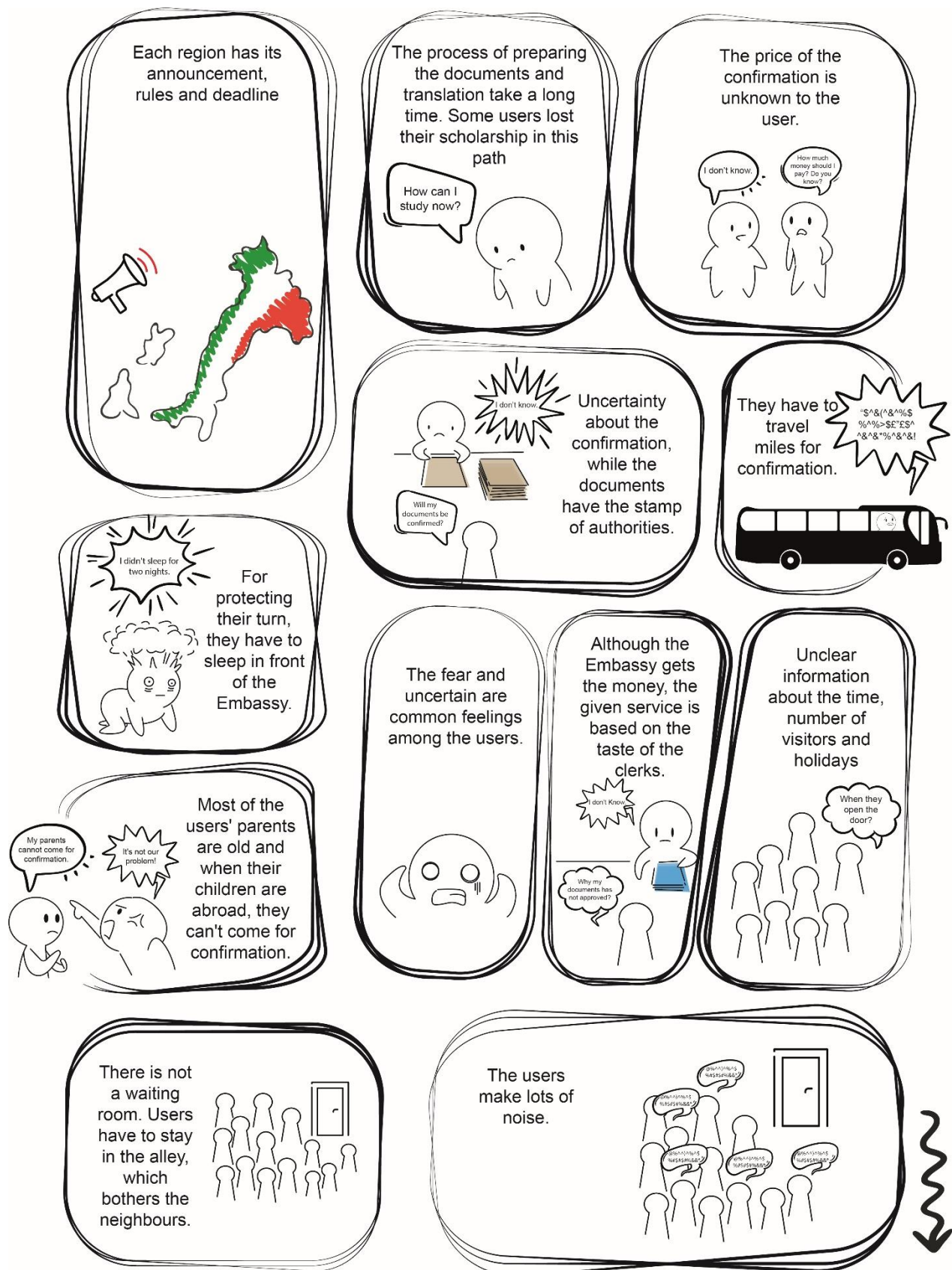


Figure 9: Appointment process for confirmation (platform: Telegram)

Obviously, similar to other services, the current one has disappointed users in the variant aspects (see [Figure15](#)).



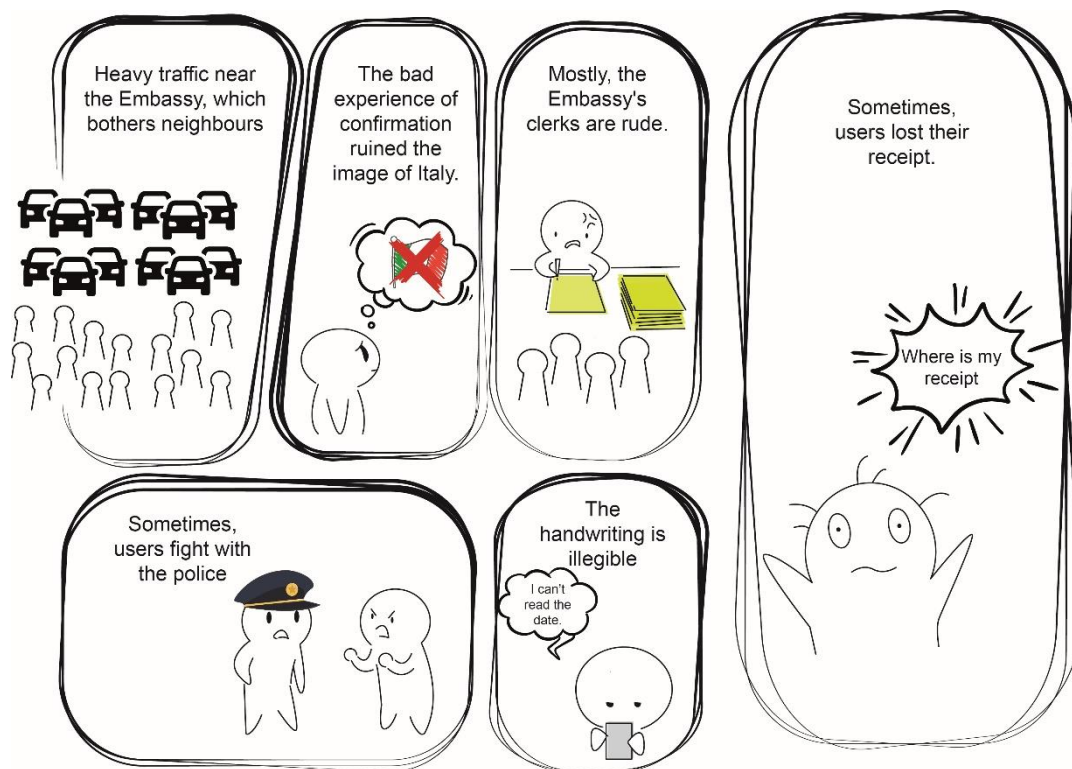


Figure 10: Inability of Telegram group service

Chapter 03: Methods

The main goal of this phase is to understand the context of the experiences, needs, desires and requirements of the different referred and personnel of the embassies, as well as re-designing a service as a solution. Various techniques are utilized in order to gather data and to configure insight, to centralize the users in the process and as well as to analyze and model the discoveries. The applied methods, the gained intuitive understanding and results and how the project proceeded are explained next.

3.1 Methodological Approach

Applied research as a methodology was used in this research to solve and develop new technology to the practical issue of confirmation documents which is affecting the group of requestors ([YourDictionary, 2020](#)). The leading question was:

- i. How the Italian Embassy can develop its services and communications to be more user-inclusive?
- ii. Which effective strategies can be utilized for introducing a distance and online service in the Embassy of Italian?

For gaining in breadth and depth of understanding and corroboration, and neutralizing the weaknesses in the search methods, quantitative and qualitative, the *mixed method* was exercised ([Mixed methods research, 2020](#)). By definition, primarily, the Interviews, Observation and Focus groups methods were selected from the Qualitative method. Then, the hypotheses were extracted from the raw data. Subsequently, the survey from the Quantitative method tested the accuracy of the assumptions ([Streefkerk, 2019](#)). After an adequate amount of both qualitative and quantitative data have been gathered and organized, they have been represented as ideal Personas, Journey maps, Empathy maps, Diary Studies and System mapping for each persona. For understanding the current service, Blueprint¹² tool is utilized. The whole gathered information aids in designing a Conceptual Map to framing what new service needs. In the end, Benchmarking and Business Model show the perspective of service in the real world.

For the sake of this type of research, the reliability and validity of methods and measurements must be judged. The below questions have been answered for this principle:

- i. Does the test compute the idea that it is intended to measure (Construct validity)?
- ii. Does the test fully characterize what it aims to achieve (Content validity)?
- iii. Do the results correlate with a different test of the same thing (Criterion validity) ([Middleton, 2020](#))?

For approaching the actual obstacle, the primary data was selected from plenty of sources. As well as secondary data as the facts and statistics collected was demonstrated.

¹² This method has been presented in the first chapter of the thesis in order to explain the process of confirmation better.

3.2 User-centered design (UCD)

UCD is an iterative forth-steps design process (see Figure 4) in which designers centring the users and their needs in each step. It is possible with involving users throughout the design process by utilizing the various design technics for creating highly usable and accessible products (User Centered Design, 2020).

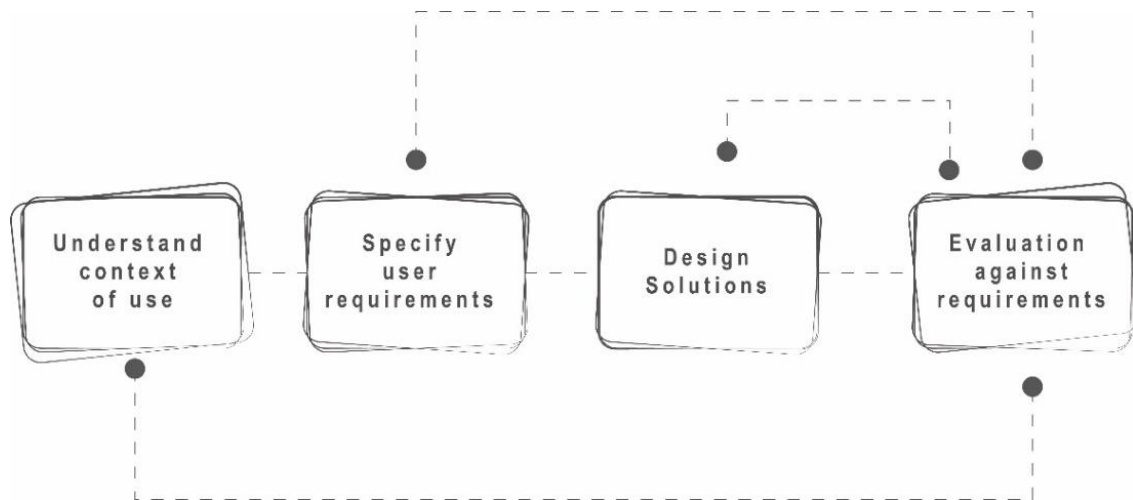


Figure 11: Four distinct phases of UCD

3.3 Design Thinking and its role in service design

“Design thinking is a human-cantered approach to innovation that draws from the designer’s toolkit to integrate the needs of people, the possibilities of technology, and the requirements for business success.” — Tim Brown

A circular Venn-diagram in **Design Thinking** can lead service to its final aim: Desirability, Feasibility and Viability (Ven, 2018) (see Figure 5).

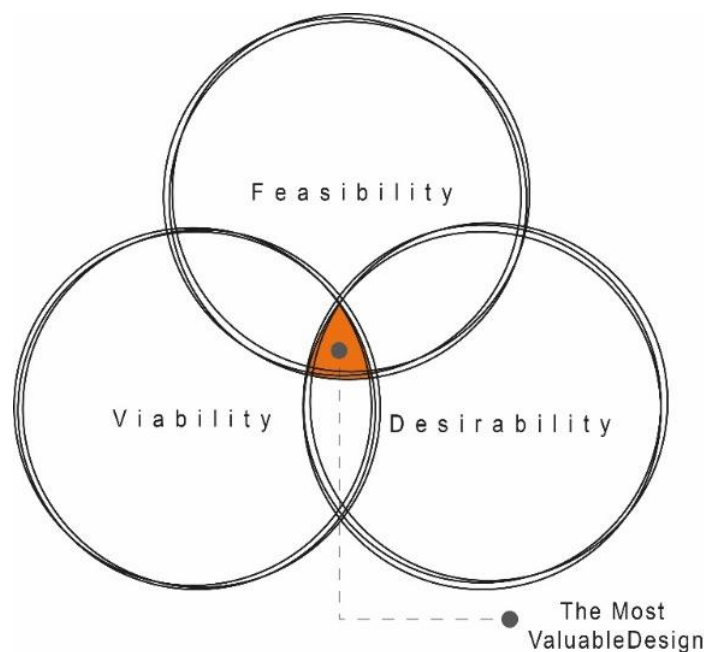


Figure 12: The three-way design thinking model

These three noteworthy keys are seeking for these questions:

- Desirability: what are the actual user needs?;
- Feasibility: can the available knowledge and technology handle the whole process; and
- Viability: how the money would be managed ([The value of balancing desirability, feasibility, and viability, 2014](#)).

Additionally, UX design adopts the Design Thinking tasks for its points (see [Figure 6](#)):

- Empathize: understand users' feelings;
- Define: exploring problems and user's needs;
- Ideate: propose ideas to puzzle out the problems;
- Prototype: making mock-ups and, after some time, the final product; and
- Test: analysing the product by offering it to users ([Teo, 2020](#)).

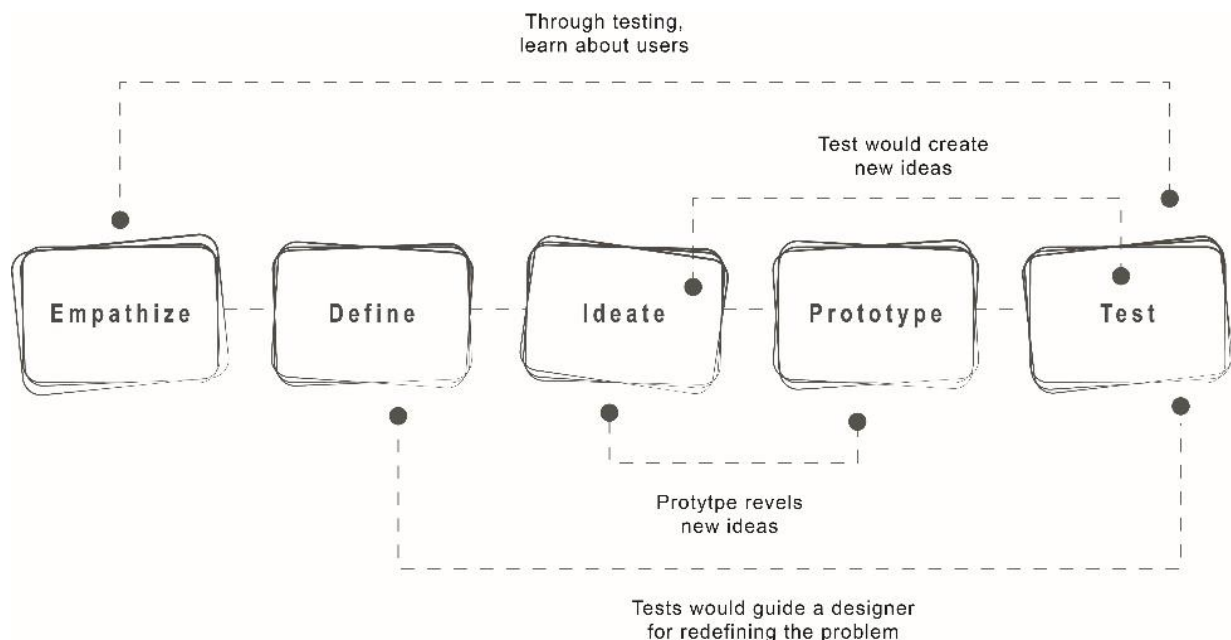


Figure 13: Key UX tasks in the Design Thinking Process

3.4 User Experience (UX)

"If we want users to like our software, we should design it to behave like a likeable person: respectful, generous and helpful." — **Alan Cooper**

UX design is the process design for creating products that represent meaningful and relevant experiences to users ([User Experience \(UX\) Design, 2020](#)). For finalizing a service or a product, the UX established six stages (see [Figure 7](#)):

- Understand: *"If I had an hour to solve a problem and my life depended on the solution, I would spend the first 55 minutes determining the proper question to ask, for once, I know the proper question, I could solve the problem in less than five minutes."* — **Albert Einstein**.

Before beginning any project, the basic information needs to be clarified. That means realizing two crucial elements:

- i. User: What's their problem?
- ii. Brand: Can this brand solve these problems (Tran, 2019)?
- Research: The research phase illuminates the pain points of the audience as well as how your product may interact (Moen, 2019).
- Analyse: All the gathered information in the previous two stages is analysed and distilled for detecting the most major elements. The best ways for analysing the research are:
 - i. User personas; and
 - ii. User journey maps (Tran, 2019).
- Design: Working on final graphics required: mock-ups and wireframes, principles, guidelines, colours, typography, and iconography (Minhas, 2018).
- Launch: Developers make this part possible, albeit the product needs to be tested by the target audiences for observing the interactions and perceiving the errors in advance (The Six Stages Of The UX Design Process, 2019).
- Analyse (again): For another round of analysis, the whole focus would be on the final product (Tran, 2019).

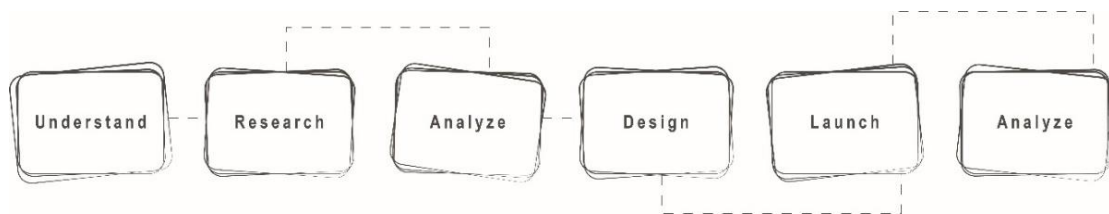


Figure 14: The UX design process in 6 stages

A variety of factors controls a user's experience on a website or an app (see Figure 8):

- Useful: An organization launches the product to meet customer needs (Gomes, 2019).
- Usable: It enables users to effectively and efficiently fulfil their end objective with a product (Userlytics, 2017).
- Findable: A product or service must be easy to find (user experience, 2017). They can be published through:
 - i. Newspapers;
 - ii. Websites; and
 - iii. Social media (Gomes, 2019).
- Credible: *"Fool me once, shame on you. Fool me twice, shame on me."* — **Randall Terry**.
 There would be no second chance in the market for companies who fool people (User Experience Basics, 2020).
- Desirable: Market competition motivates companies to make their product and service more desirable for their users (Netaq, 2017). It could be bold by appreciating:
 - i. Aesthetics;
 - ii. Emotion Design; and
 - iii. Image of brand (Morville, 2017).
- Accessible: User has a wide range of definitions and goes beyond sexism, colour, abilities, nationality, religion, and age. Accessibility is about providing an experience for the whole users with different abilities, such as hearing loss,

impaired vision, motion impaired or learning impairment ([The 7 Factors that Influence User Experience, 2020](#)).

- Valuable: It would guarantee the success of a product by delivering value to its creator and target users ([user experience, 2017](#)).

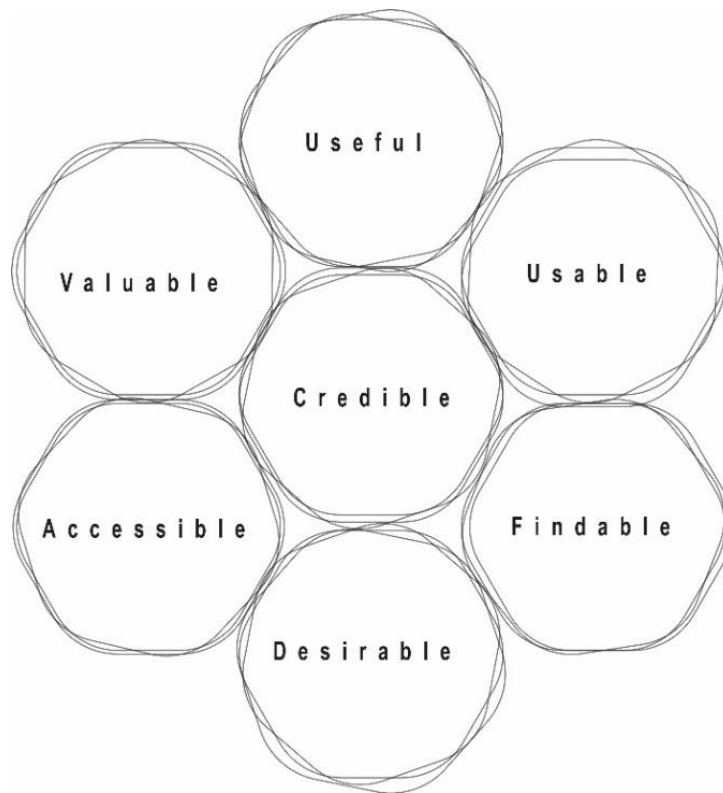


Figure 15: 7 Factors that Influence User Experience: The Iconic Honeycomb Model ([D., 2020](#))

3.5 Sample Method

In research and service that involve a large group of people, it is almost impossible to collect data from every person in that specific group. Instead, a sample is selected. For this thesis, these types of sampling methods were occupied ([McCombes, 2020](#)):

- Probability sampling to select random selection, allowing the research to make statistical inferences about the whole group. For this scheme, a questionnaire was spread among the students in various regions. As well, it was shared in the official channel of confirmation Telegram, to notice the other refers for the collection of data.
- Non-probability sampling demands non-random selection based on easement or other criteria, allowing the thesis to easily collect initial data. For this desire, three students and one regular visitor have been chosen.

3.5.1 Probability sampling

In this sampling, each member of the population has a chance of being elected. It is used as a quantitative research tool to represent the whole population. Among the four types of Probability sampling, Simple random sampling, Systematic

sampling, Stratified sampling, and Cluster sampling (see [Figure 19](#)), the first method has been picked. In a simple random sample, the frame includes the whole population. For conducting this, the questionnaire has been contributed randomly and all the members had a chance for filling it.

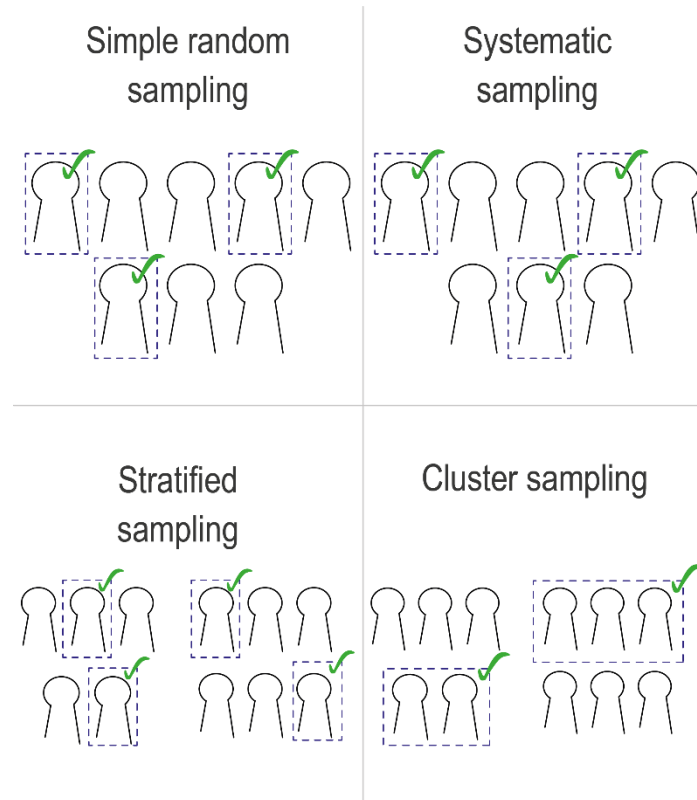


Figure 16: Four main types of probability sample ([McCombes, 2020](#))

3.5.2 Non-probability sampling

In a non-probability sample, individuals are preferred based on methodical point of reference, and some persons would be missed for the study. The non-probability sampling model is convenient for exploratory and qualitative research. Among the four types of Probability sampling, Convenience sampling, Voluntary response sampling, Purposive sampling, and Snowball sampling (see [Figure 20](#)), the two last methods have been assigned for the thesis.

- For a Purposive sampling, the researcher's judgement selected a sample that is most helpful to the intentions of the research. The fundamental object of the researcher was to gain precise knowledge about the process and failure parts.
- The duration of confirmation mostly occurs in the summer and the research for the thesis have initiated in the winter, the researcher has no access to the whole population. Thus, snowball sampling has been used to engage participants via other participants.

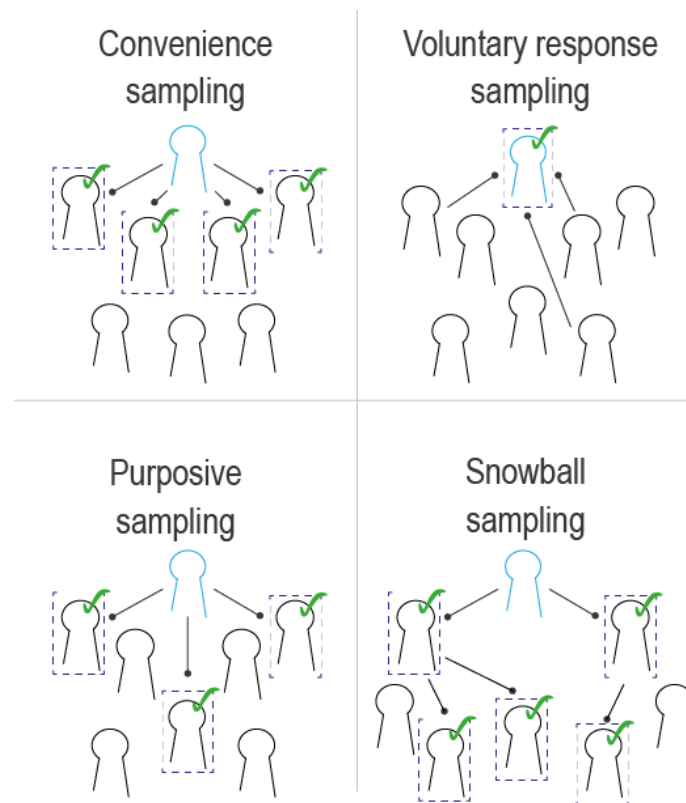


Figure 17: Four main types of non-probability sample (McCombes, 2020)

3.5.3 Sampling bias

The outbreak of COVID-19 almost paralyzed the confirmation part of the Italian Embassy in Iran. Unfortunately, in Iran, phase one and two of the Coronavirus happened immediately, so the Embassy has changed its system. Consequently, the Telegram group for confirmation in 2020, has been eliminated and the Embassy itself gave appointments. It caused Sampling bias (ascertainment bias), due to the study chiefly focused and be shared among the students and other visitors were unaware of it. Among the six types of Sampling bias (see Table 1), Self-selection, under coverage and Pre-screening or advertising were predicted to be intervening in the study.

For avoiding the sample bias, the below tasks have been adopted:

- The researcher explained the right of users for a better service in the Embassy and asked the users to trust her for enhancing the Embassy's function;
- The survey has been filled by the users who had experience in confirmation. The users whose parents go through the whole process, the survey has been filled by their parents; and
- For interviews, the researcher search among people who were not a student and for another purpose has an appointment with the Embassy. It would reduce targeting on the survey (pollfish, 2020).

| Type | Explanation | Example in the Thesis |
|-------------------------------------|--|--|
| Self-selection | People who had participated could have specific characteristics | People who are more companion are likely to take part in the research. Others may believe that the Embassy would not change easily or authorities do not care about their hurts. |
| Non-response | People who do not care about participating or are deleted from a study systematically differ from those who participate. | |
| Undercoverage | Each member of a population has not the chance of participating in the research | The surveys online may miss groups with limited internet access and filterings of Telegram makes it harder. The elderly who ought to go for confirmation instead of their children are supposed to be in these groups. |
| Survivorship | Unsuccessful samples are more likely to be omitted in compare with the Successful ones | |
| Pre-screening or advertising | The way of advertising or pre-screened the study may bias a sample. | The link for interviewing, Dairy Study and the Online survey were mostly shared among the students. |
| Healthy user | Health-boosting behaviours are mostly followed by volunteers for preventative interventions than other members of society. | |

Table 1: Six Types of sampling bias (Bhandari, 2020)

3.6 Hypotheses

This thesis contains the plentiful hypotheses:

H₁: The number of staff works in the embassy in the part of confirmation has a positive effect on the process.

H₂: By recommending the distance confirmation, the action could be sped up.

H₃: A social media platform can reduce the unnecessary visits to the embassy.

H₄: The distance confirmation can protect staff from the COVID-19 attacks.

H₅: The Blockchain provides a safe environment for documents and prevents document forgery.

H₆: Knowing about the reasons for rejection can save the time of clients and the embassy.

H₇: The online stored docs can help clients to send them everywhere and any time.

3.7 Interview

| Motive | Involved | Time factor |
|---|------------------------------------|-------------|
| Ask the questions for figuring out about the process of confirmations, user feeling toward it, finding hypotheses and detecting pros and cons of available service of embassy | Interviewer, interview participant | 15 minutes |

Table 2: Interview's information (Curedale, 2013)

For empathy with users and understanding their needs, thoughts, feelings, behaviours, and motivations, interviewing is a cornerstone (Perales, 2018).

1. Introduce yourself and tell me where you come from.
2. Introduce your project.
3. Tell me about the last time you have visited the Italian embassy (It was asked by the interviewee to ask for an explanation of the manner of the embassy staff).
4. Could you tell me why this visit was important to you?
5. Were you certain that you ought to visit the embassy in order to solve your problem?
6. Were you aware of the required documents?
7. Have you joined any social media groups for understanding the process and documents? How were you convinced that their information is correct (It was asked from the interviewee to also explain if they experience any problem with these groups)?
8. For booking an appointment with the embassy, what have you done?
9. Have you asked any questions when you gave your documents? If yes, could you tell me what it was and was their answer convincing?
10. Do you have any experience with the ckg sir¹³ company? What do you think about their service?
11. How were you confident that your documents were acceptable by the embassy? Has any of your documents been rejected so far?
12. Why do you think the embassy service is inconvenient and nonfunctional?

3.8 Observation

With considering that human is a combination of conscious and unconscious behaviors, the interview can explain about the first part and for the latter, we need to observe to highlight problems and the unusual.

¹³ Cox and Kings Global Services LLC is an official visa application for the Italian Embassy in Tehran, Iran.

| Goal | Preparation | How to/Steps | Additional Info |
|---|-----------------------|---|---|
| <ul style="list-style-type: none"> • Getting insights about a structure of the exist service, its context and the impact of the visitors on the service. • Discovering invisible user needs and noticing key issues for developing a service. | Recorder and personas | Record the behaviour, events and activities, body language of the person. | The direct observation (participant observation) in combination with questioning has been chosen. |

Table 3: Observation's information

3.9 Focus group

*Walk a mile in my shoes,
someday you might feel the blues.
See the world though my eyes,
how it feel to hear all lies.
Go a mile in my shoes,
take your time and have a snooze.
Don't be afraid to get a bruise,
there's not a chance you'll be a fool.
Wear my shoes and have some fun,
walk a mile in the sun.
Walk a mile in my shoes
And I will do the same to you.
-by a fabulous and talented first year — **Academy of the Redwoods***

Although interviewing can depict what had happened, a focus group is a helpful tool for encouraging to talk and reminding participates about the details. It was a small group (4 persons), in a comfortable environment where questions were asked, and the answers were recorded. In the end, the answers were analyzed and reported for further decision-making.

For this focus group, the method of Fantasy/daydream exercises and Role-playing has been proposed to the participants ([Interaction Design Foundation, 2020](#)). They played as staff and authorities of the embassy. It helps them to declare the weakness and failures parts of the current service and find a solution for it. In some cases where the solutions were unclear, the results were clarified by them (e.g., if the embassy can reduce the time of booking an appointment, then the negative attitudes towards it would be omitted).

3.10 Personas

For focusing on what matters most to our users and sympathy with them (what, how and why that drives them), we need personas. There are 3 different ways of creating personas:

- Proto personas: Quickest way for having a persona based on the team's existing presumptions about who their users can be, but not based on (new) research;
- Qualitative personas: According to qualitative research, such as interviews, usability tests, or field studies; and

- Statistical personas: Qualitative research informs a survey instrument for gathering a large sample size, and the personas appear from statistical analysis (Laubheimer, 2020).
For introducing the best personas in this research, both plans, Qualitative and Statistical personas are applied. Thus, the main characters of personas are categorized as below:
- A person with a deadline for confirming their documents; A person who does not aware of the required documents; A person who has no access to the embassy (lives abroad, in other provinces or cannot go to the embassy in the morning);
- A person who does not accept the current service (Telegram group and writing a list in advance);
- A person who has a problem with exchanging the currency;
- A person who is confused by the variation of policies;
- A person who is not aware of the fee of confirmation;
- A person who does not know about the expiration of documents;
- A person who has the missing authorities' stamps on their documents;
- A person who faced rude behavior from the embassy's staff;
- A person who fights with others in the queue;
- A person who stays day and night in the bad weather in order to remain on the list;
- A person who paid to a middleman for confirmation; and
- A person who has a problem with using Telegram.
-

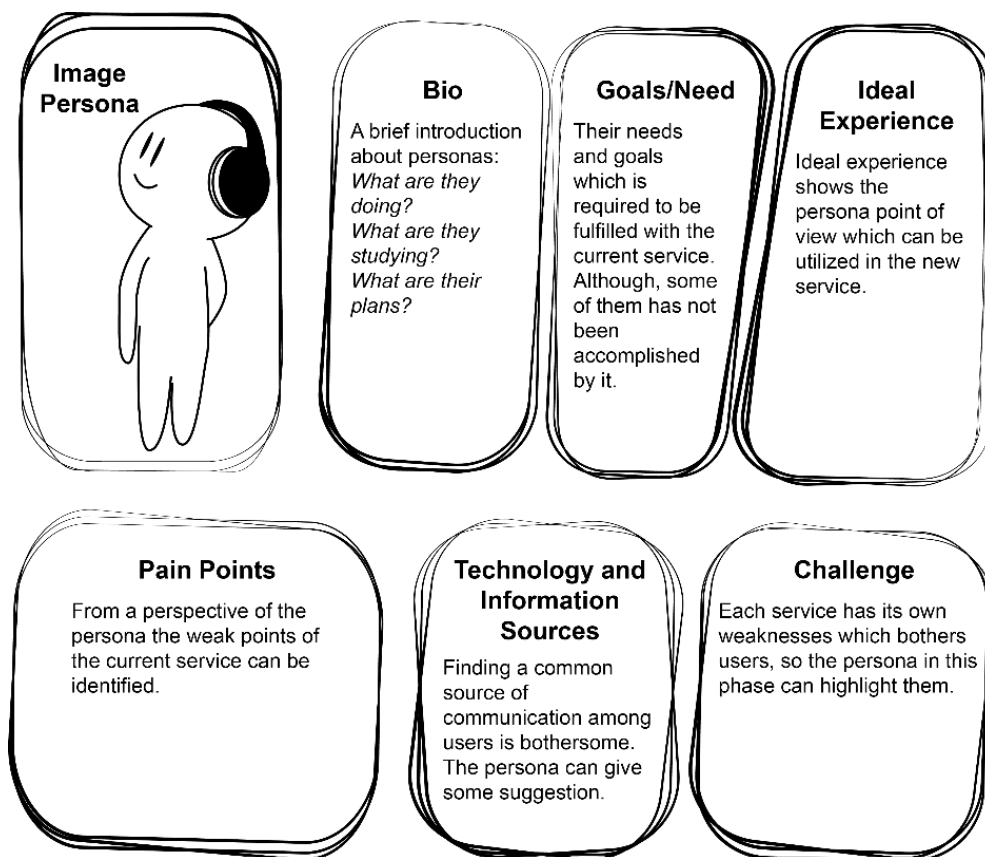


Figure 18: Persona Template

3.11 Journey Map

Visualizing personas with the service over time and through various channels (where the persona interact with the service) is called a User Journey map. It is mostly presented as a timeline with touchpoints between personas and the service (Babich, 2019).

In this journey, the user appears when they need to confirm their documents at the embassy, and it finishes when they hand over them to the related office.

3.12 Empathy Map

An empathy map is an easy-to-understand visualize that is used to capture what we know about a persona. It forms knowledge for:

- Getting closer to user needs, behaviours, and attitudes; and
- Help in decision-making (Gibbons, Empathy Mapping: The First Step in Design Thinking, 2018).

| | |
|---|---|
| <p>Say</p> <p><i>What are they saying to each other and to the interviewer? It may change depending on where she is or who she is with. Others can effect on what a persona say by encouraging they to be brave or hide their thoughts or emotions. In this case, we need to consider both situations.</i></p> | <p>Thinks</p> <p><i>What are they thinking about? We need to consider positive and negative sides of thoughts. What solutions and possibilities are they considering for this problem?</i></p> |
| <p>Does</p> <p><i>What are their behaviours? How do they conduct themselves? How they show their emotions? Individually or in a group how they behave?</i></p> | <p>Feels</p> <p><i>What can affect their feelings directly? What makes them anxious and paralyse their life? How do they feel? What makes them excited? How do they feel about the experience and the process?</i></p> |

Table 4: Empathy Map's information (Brown J. L., 2018)

3.13 Diary Study

It is a research method used for studying user behaviors, activities, and experiences which is reported by the user over time. Diary studies are used for understanding long-term behaviors such as:

- Habits: What time of year do users engage with a service?;
- Usage scenarios: In what capacity do users engage with the service? In the first step, what are they doing? How do they solve the problems that they have faced?;

- Attitudes and motivations: What are their motives for doing a specific task? How are their feelings, and what are they thinking?;
- Changes in behaviors and perceptions: How learnable is the process?;
- Service: Understanding all interactions with the service over one month;
- Behavior: Collecting general information about user behavior; and
- Completing activity: Understanding how people complete each step (Salazar, 2016).

3.14 System Mapping

A system map is a plan that shows all the different dynamics and interconnectedness involved in service with its mutual links. The system map clears how the different service parts and roles are connected to each other and exchangers among them (servicedesigntools, 2021).

3.15 Service Blueprint

A service blueprint is a diagram that emphasizes touchpoints in a user journey and shows several services that play a role from the beginning to the end (Gibbons, 2017).

| Customer actions | Frontstage actions | Backstage actions | Processes |
|--|---|---|--|
| Illustrating steps, choices, actions, and interactions which can be collected from research or a customer-journey map. | Actions that happen directly in view of the customer: <ul style="list-style-type: none"> • Human-to-human • Human-to-computer | Steps and activities that is not visible to the user and occur behind the scenes. | Internal steps, and interactions that support the employees in delivering the service. |

Table 5: Key elements of Blueprint (Gibbons, 2017)

3.16 Benchmarking

Benchmarking is a process used for comparing the current industry services for gathering ideas in order to generate new ideas (Zuiderveen, 2021). For applying this tool, the various services in the market were picked and studied:

- Distance Confirmation
 1. Tuodi club¹⁴
 2. Booking.com¹⁵
 3. ASUS products (Notebook, Mobile) Warranty¹⁶
- Post Services
 1. E-visa: The Royal Thai Embassy¹⁷

¹⁴ Further Study: <https://www.tuodi.it/card.cfm#/>

¹⁵ Further Study: https://www.mlive.com/business/west-michigan/2014/08/bookingcom_signs_10-year_lease.html

¹⁶ Further Study: <https://www.pcmobitech.com/how-to-register-asus-products-notebook-warranty-online/>

¹⁷ Further Study: <http://www.thaiembassy.org/london/en/services/7742/84397-How-to-apply-visa-by-post.html>

2. Passport Check and Send service¹⁸
- Storing Documents
 1. UAE Pass¹⁹
 2. Dropbox²⁰
 3. IBM Blockchain²¹
 4. Siacoin²²
- Embassy Services
 1. Australian Embassy²³
 2. Duty Officer App (US Embassy)²⁴
 3. Portail France Visas²⁵
 4. e-service portal (Pakistan Embassy)²⁶
 5. SECOLI portal (Italy Embassy)²⁷
 6. Indian Embassy²⁸
 7. Dutabash²⁹
 8. EducationUSA³⁰
 9. Mobile Passport³¹
 10. eFILIPINAS (Philippine Embassy)³²
- Queue Services
 1. McDonald's kiosk ordering system³³
 2. VirtuaQ³⁴
 3. Disneyland³⁵
 4. Wavetec³⁶
 5. Amazon Go³⁷

¹⁸ Further Study: <http://www.mynewsdesk.com/uk/post-office/pressreleases/post-office-launches-digitalpassport-service-at-more-than-700-branches-across-the-uk-2791535>

¹⁹ Further Study: <https://www.khaleejtimes.com/news/general/Access-govt-services-make-transactions-with-UAE-Pass>

²⁰ Further Study: <https://www.apkmirror.com/apk/dropbox-inc/dropbox/>

²¹ Further Study: <https://www-03.ibm.com/press/us/en/presskit/50610.wss>

²² Further Study: <https://coincentral.com/siacoin-beginner-guide/>

²³ Further Study: <https://jordan.embassy.gov.au/>

²⁴ Further Study: <http://www.squarefresco.com/portfolio/squarefresco-mobile-apps-portfolio-dutyofficer.html>

²⁵ Further Study: https://france-visas.gouv.fr/en_US/web/france-visas/visa-application-guidelines

²⁶ Further Study: <https://onlinemrp.dgip.gov.pk/>

²⁷ Further Study: https://www.esteri.it/mae/en/sala_stampa/archivionotizie/approfondimenti/2012/11/20121116_secoli.html

²⁸ Further Study: <http://www.indianembassyrome.gov.in/eoi.php?id=Passport>

²⁹ Further Study: <https://play.google.com/store/apps/details?id=com.parallaxlogic.dutabash&hl=en>

³⁰ Further Study: <https://timesofindia.indiatimes.com/home/education/news/us-embassy-launches-mobile-app-to-help-indian-students/articleshow/69759220.cms>

³¹ Further Study: <https://www.cnn.com/2019/08/29/mobile-passport-app-speeds-travelers-through-immigration-customs.html>

³² Further Study: <https://manilastandard.net/mobile/article/312533>

³³ Further Study: <https://business.financialpost.com/news/retail-marketing/mcdonalds-discovers-major-flaw-in-ordering-kiosks-making-them-unusable-for-large-number-of-customers>

³⁴ Further Study: <https://virtuaq.com/healthcare#target>

³⁵ Further Study: <https://disney.parks.disney.go.com/blog/2017/08/five-things-you-might-not-know-about-disney-maxpass/>

³⁶ Further Study: <https://www.wavetec.com/solutions/queue-management/>

³⁷ Further Study: <https://www.justaskgemalto.com/en/amazon-go-checkout-free-store-work/>

6. Qmatic Intro³⁸
7. Qminder³⁹
8. Skiplino⁴⁰

3.17 Questionnaire

Questionnaire is a tool for finding how people explicitly think, feel, and act. Based on the previous research, the questions are:

- The convenience of the embassy hours for confirmation (N/A, Poor, Fair, Good, Very Good, Excellent);
- The availability of an appointment to suit you (N/A, Poor, Fair, Good, Very Good, Excellent);
- How many times have you visited the embassy each year for confirmation? (Once, Twice, Other);
- Was a single referral sufficient to confirm the document? (Yes, No, Maybe);
- Ease of making your appointment (N/A, Poor, Fair, Good, Very Good, Excellent);
- Ease of paying (N/A, Poor, Fair, Good, Very Good, Excellent);
- Staff's friendless and courtesy (N/A, Poor, Fair, Good, Very Good, Excellent);
- How professional and knowledgeable was the person you spoke to? (N/A, Poor, Fair, Good, Very Good, Excellent);
- How quickly were the documents you have requested provided by the embassy? (Very quickly, Quite quickly, Okay, Quite Slowly, Very slowly);
- How long did you have to wait?
- Was everything explained clearly? (Yes, No, Maybe);
- Was the waiting comfortable? (Yes, No, Maybe);
- Was it easy to find the Telegram Group (Document Confirmation)? (Yes, No, Maybe);
- Were all your questions about the confirmation answered to your satisfaction? (Yes, No, Maybe); and
- Overall, what was your level of satisfaction with the embassy performance? (Very Satisfied, Satisfied, Not Satisfied).

3.18 Conceptual Map

A concept map is a visual tool used to depict what should a picked service have to have, include and provide.

3.19 Business Model Canvas

The Business Model Canvas is a depiction for presenting how an enterprise creates, delivers, and captures value (Compean, 2016).

³⁸ Further Study: <https://www.qmatic.com/products/self-service-kiosks/>

³⁹ Further Study: <https://www.qminder.com/>

⁴⁰ Further Study: <https://skiplino.com/>

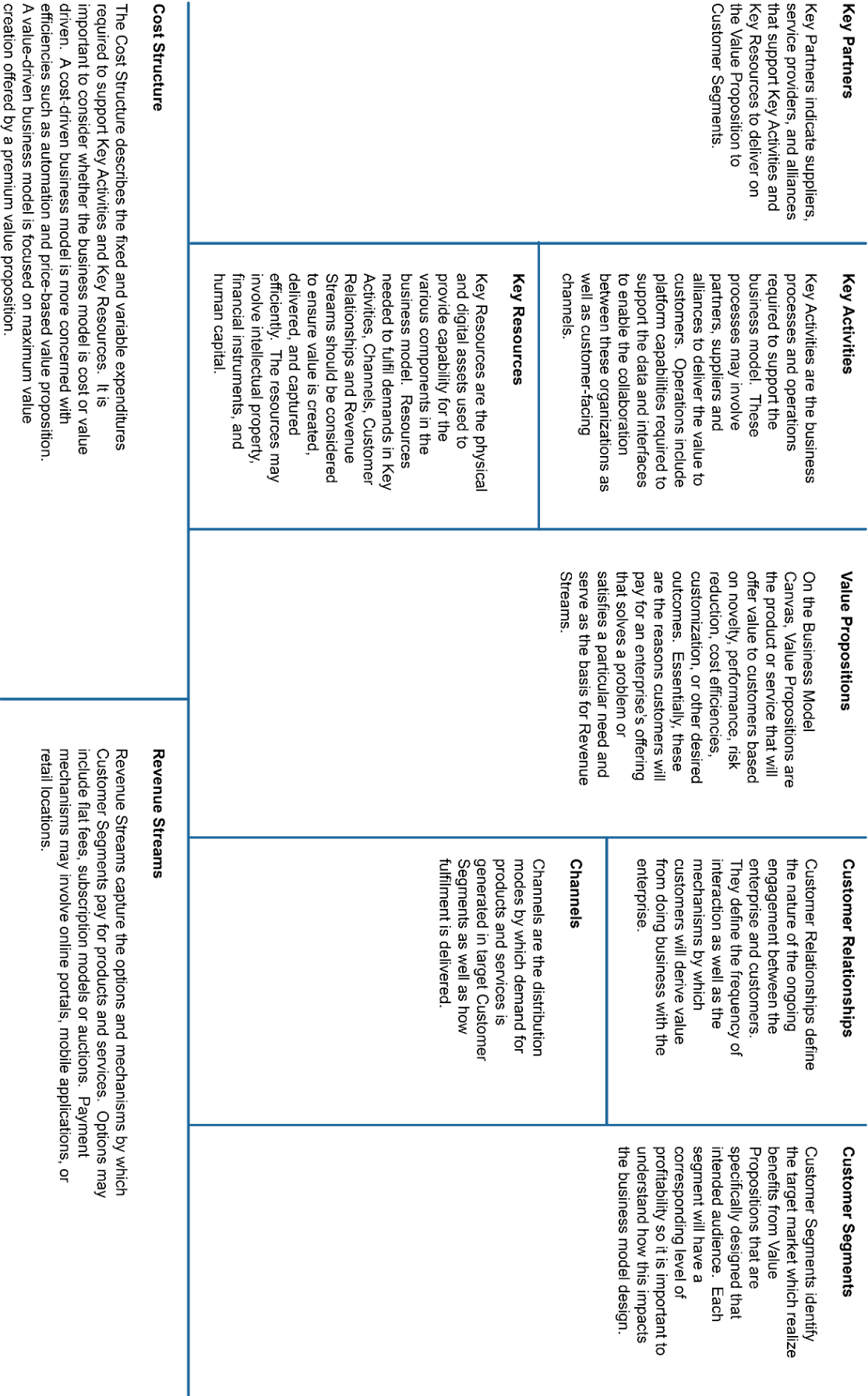


Figure 19: Business Model Canvas (Compean, 2016)

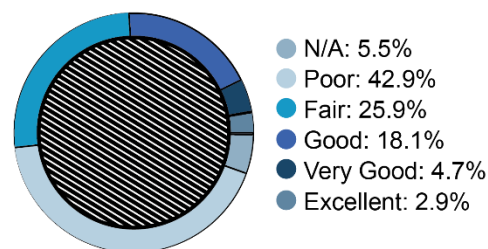
Chapter 04: Results

In this section, the result of the previous chapter is presented. The research is mostly focused on explaining better the user needs.

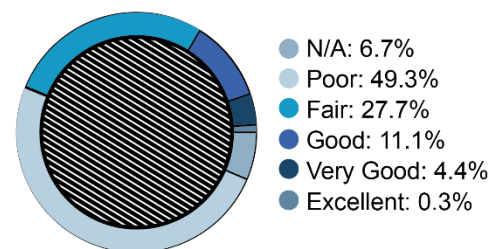
4.1 Questionnaire Result

Based on our survey goals and the high confidence we need in our results for narrowing the expected errors (Margin of Error: $\pm 5\%$), 345 respondents were asked to fill the questionnaire ([Calculating the Number of Respondents You Need, 2021](#)).

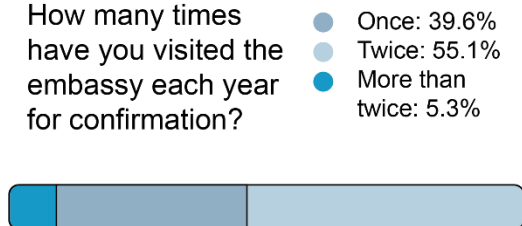
The convenience of the embassy hours for confirmation



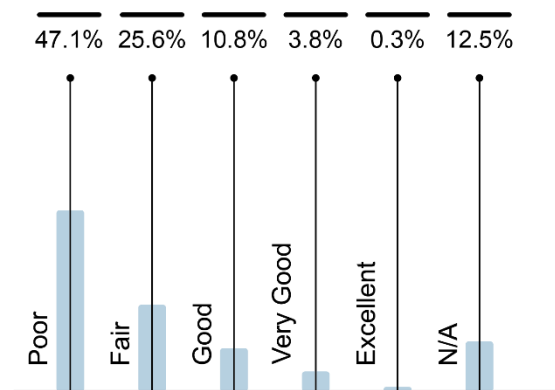
The availability of an appointment to suit you



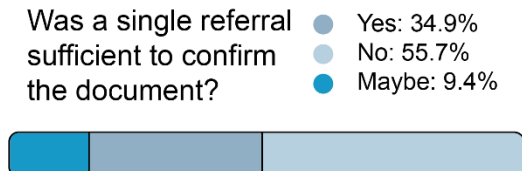
How many times have you visited the embassy each year for confirmation?



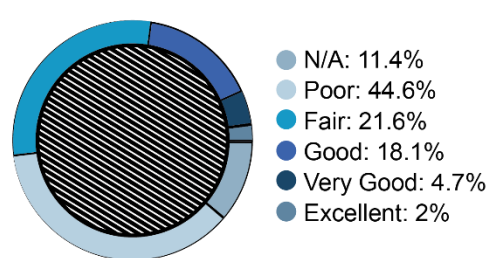
Ease of making your appointment



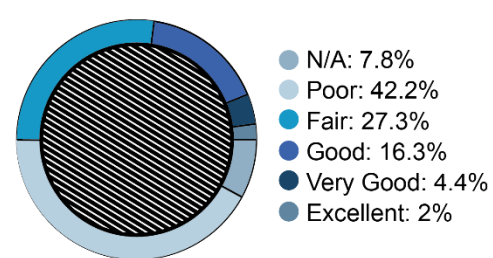
Was a single referral sufficient to confirm the document?



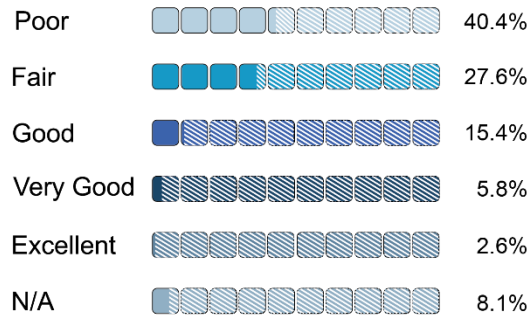
Ease of paying



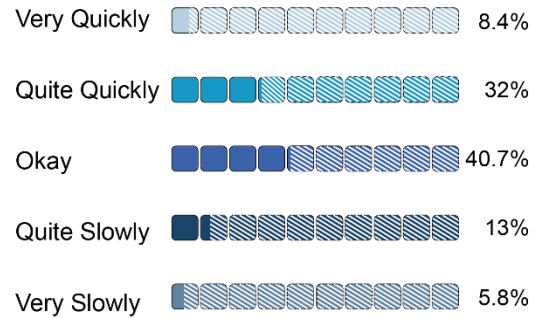
Staff's friendless and courtesy



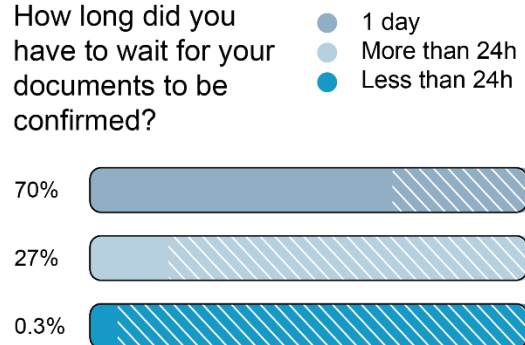
How professional and knowledgeable was the person you spoke to?



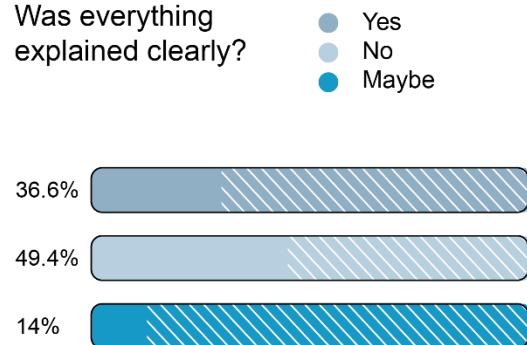
How professional and knowledgeable was the person you spoke to?



How long did you have to wait for your documents to be confirmed?



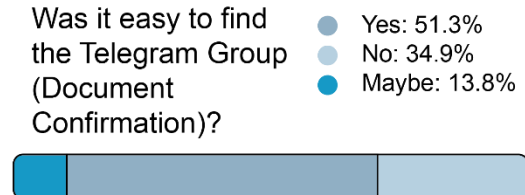
Was everything explained clearly?



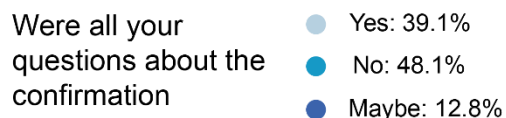
Was the waiting comfortable?



Was it easy to find the Telegram Group (Document Confirmation)?



Were all your questions about the confirmation



Overall what was your level of satisfaction with

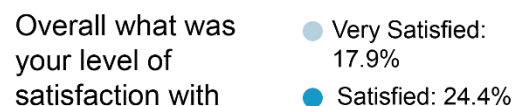
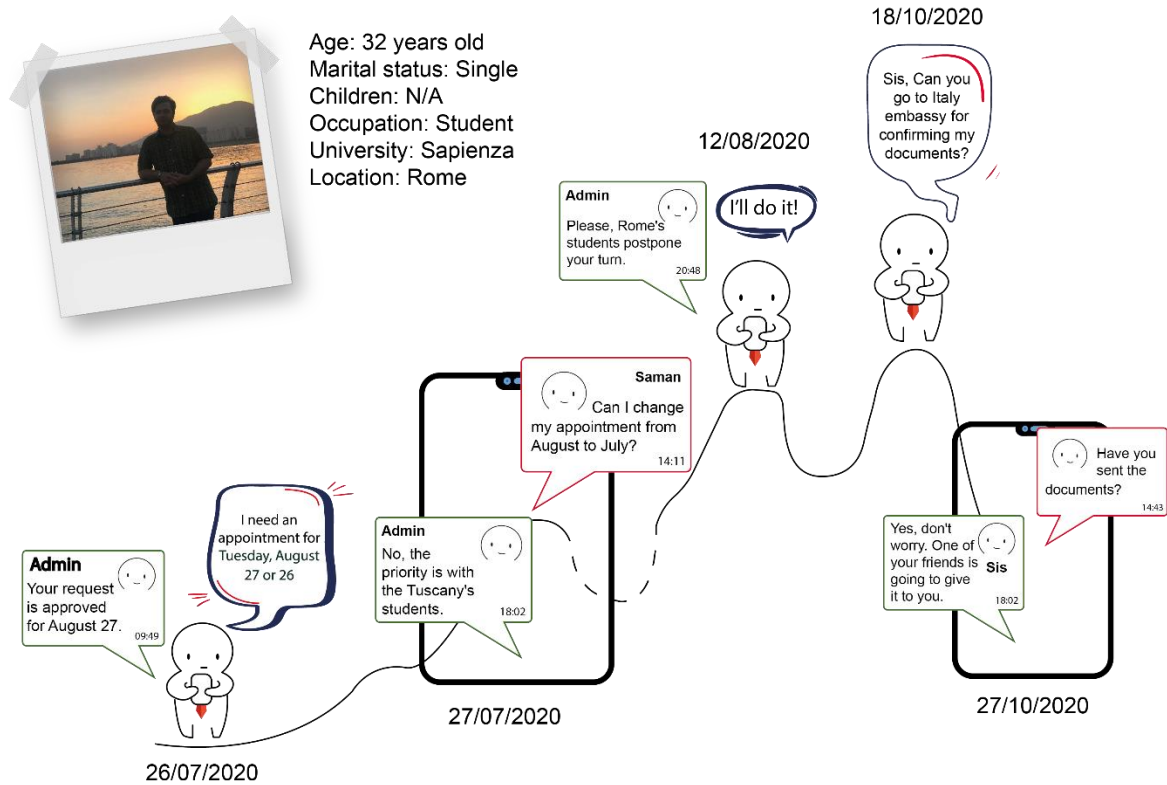


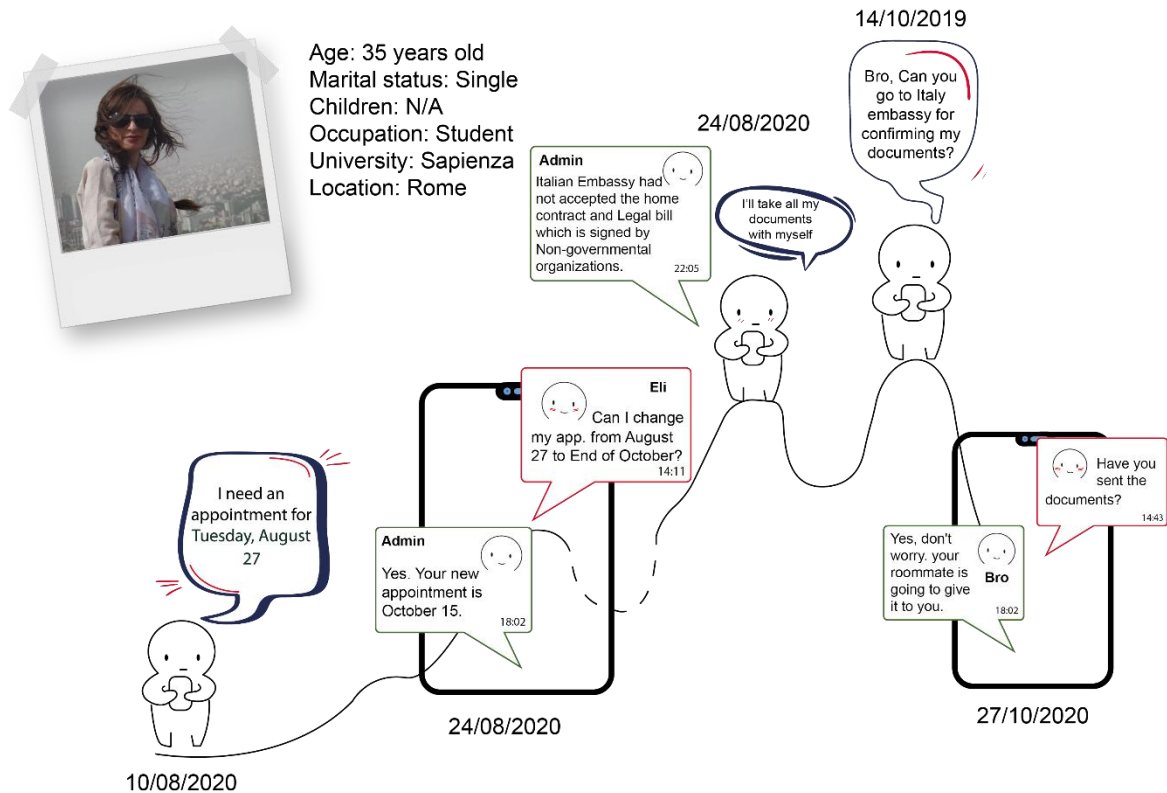
Figure 20: Questionnaire Result

4.2 Diary Study

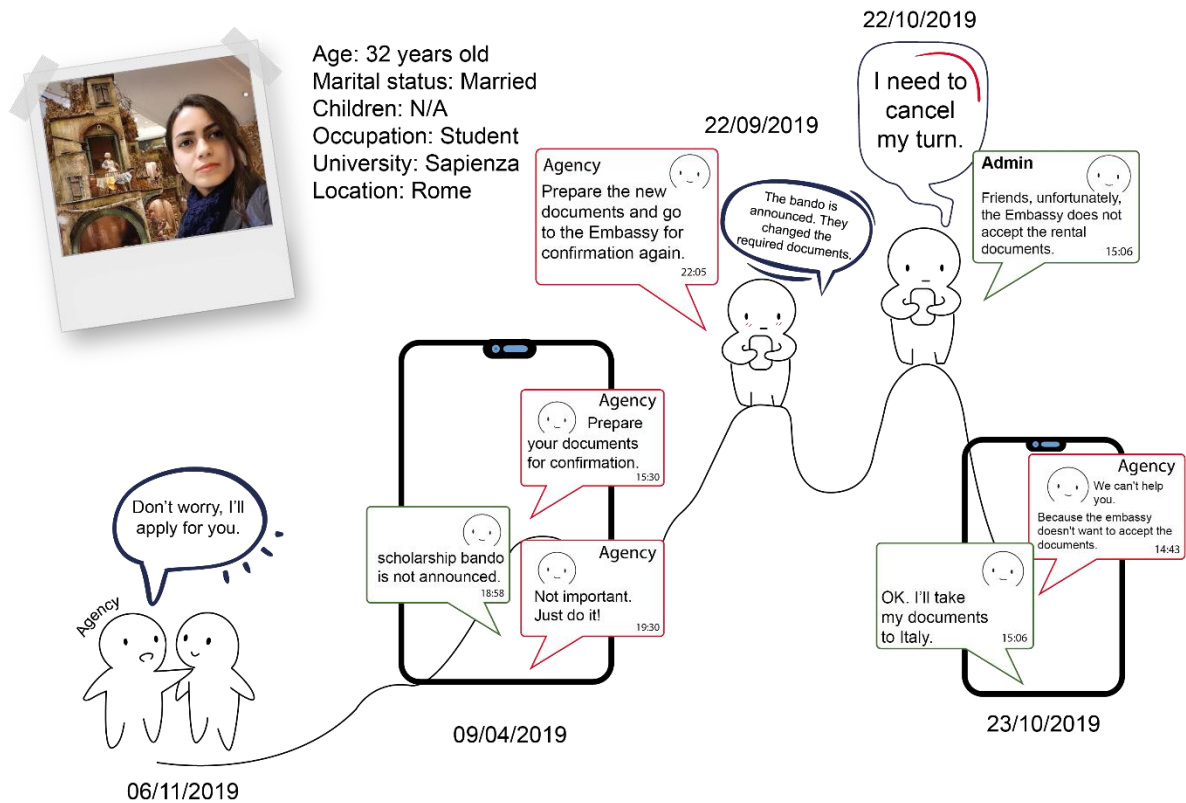
First Case Study: Saman



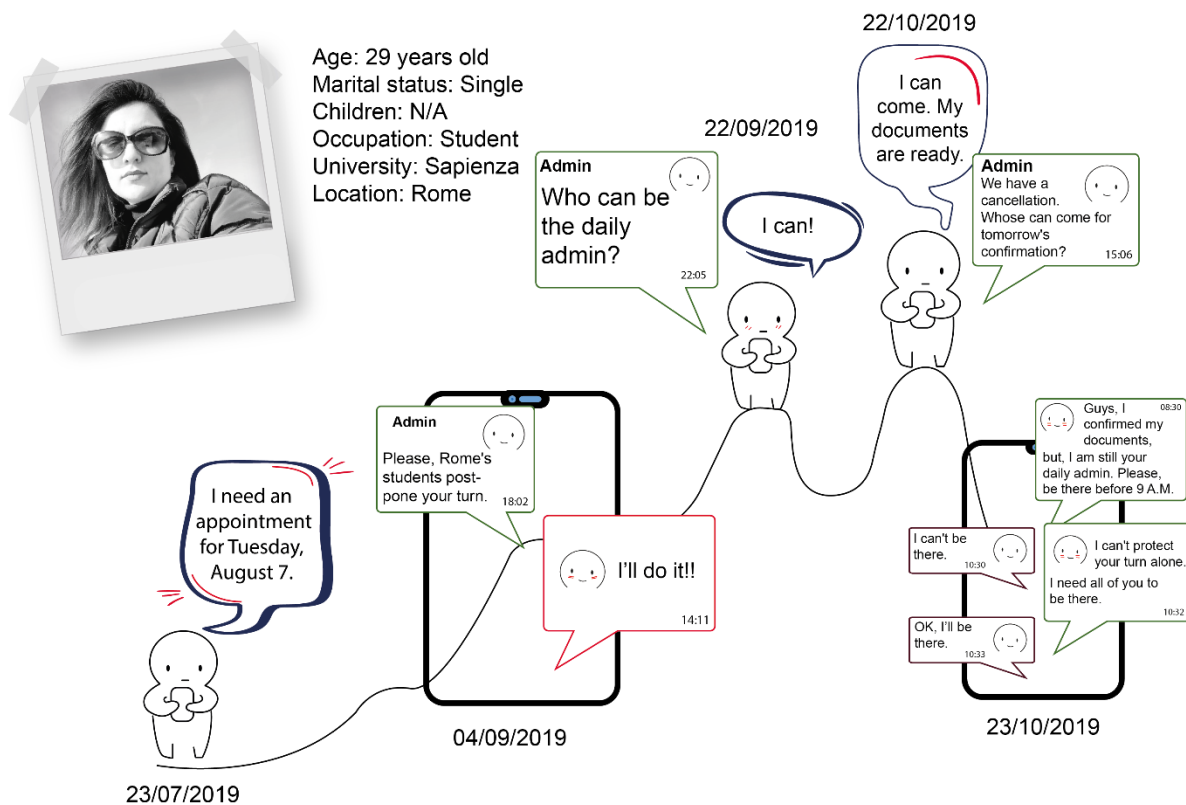
Second Case Study: Eli



Third Case Study: Mozghan



Forth Case Study: Parvaneh




4.3 Personas, Storyboard, Empathy Map, Journey Map and System Mapping

Based on the interview, focus group and questionnaire, 4 personas are selected.

First Case Study: Pegah Pedramfar

Persona



Pegah
Looking for opportunities in Europe

Bio
I am studying Product Design at the Sapienza University of Rome. I majored mechanic as my bachelor. I planned to apply for the German visa, although because of the new policy of the embassy of Germany in Iran, I lost this chance.

Goals/Needs
Graduating and immigrating to Germany. Albeit, I work as an online teacher, I need to be supported for finishing it in two years.

Pain points
The documents have to be confirmed personally, while I do not have the facility to stay in Tehran. I live in one of the cities far from the capital. Further, my mother is sick and I cannot leave her alone for confirmation.

Ideal Experience
In Iran mostly because of the weak relationship between the embassies and governments, we faced with the poor services.

Challenges

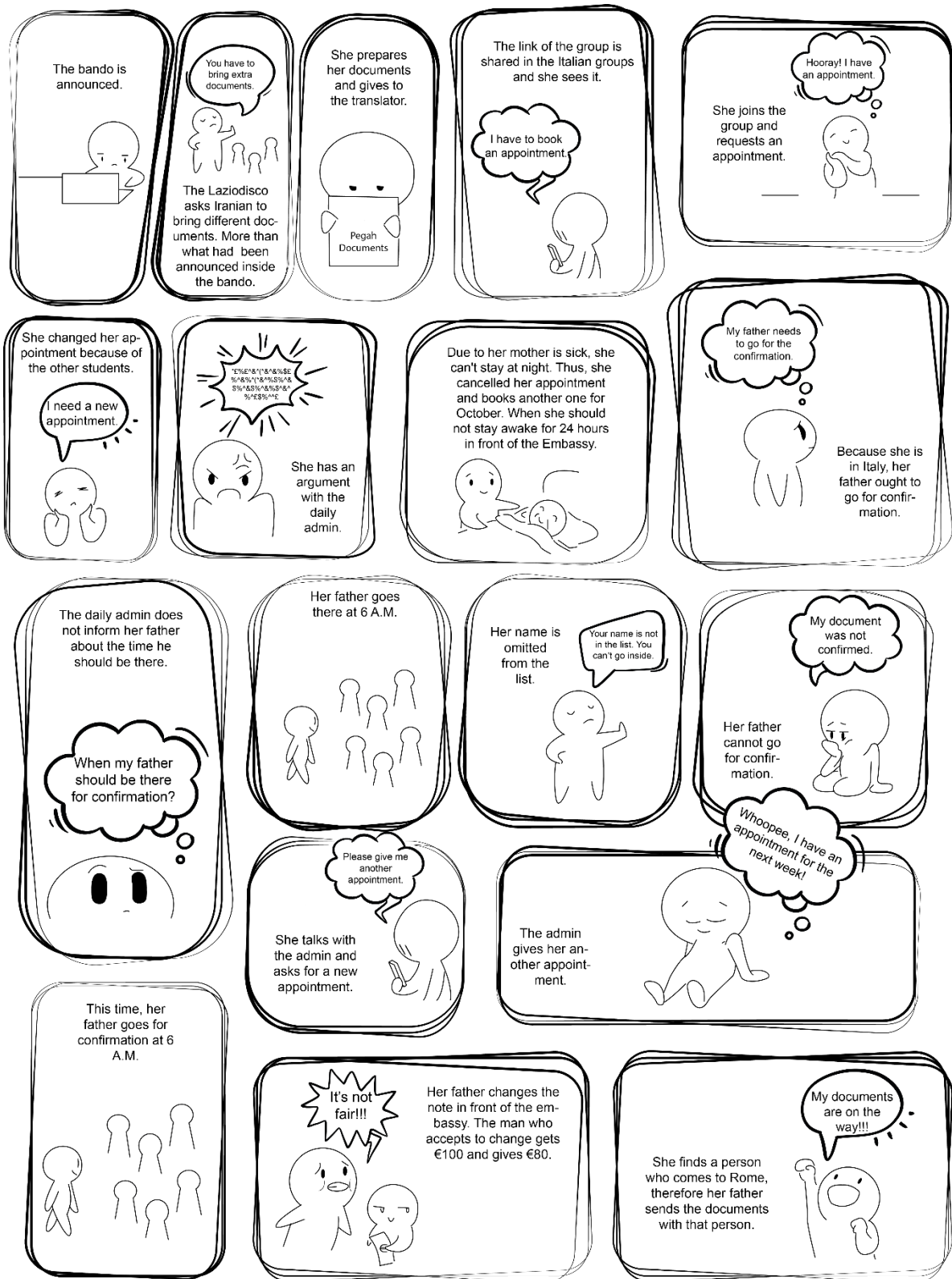
- They ignored me for two times that I went there
- The prices are too high
- The information was not up-to-date

Technology & Information Sources

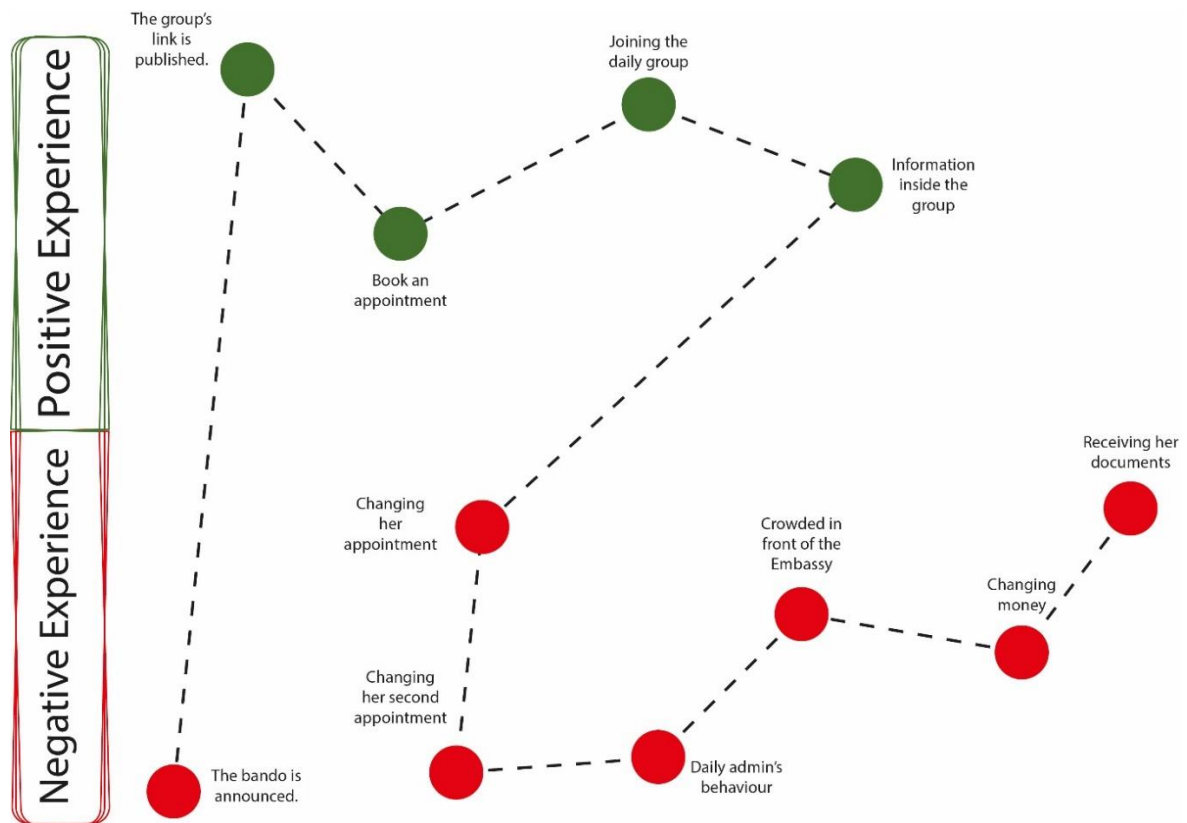
1. Apple devices
2. Using laptop at home
3. Heavy user of social media
4. Browsing on Internet

Age: 29 years old
Marital status: Single
Children: N/A
Occupation: Student
University: Sapienza
Location: Rome

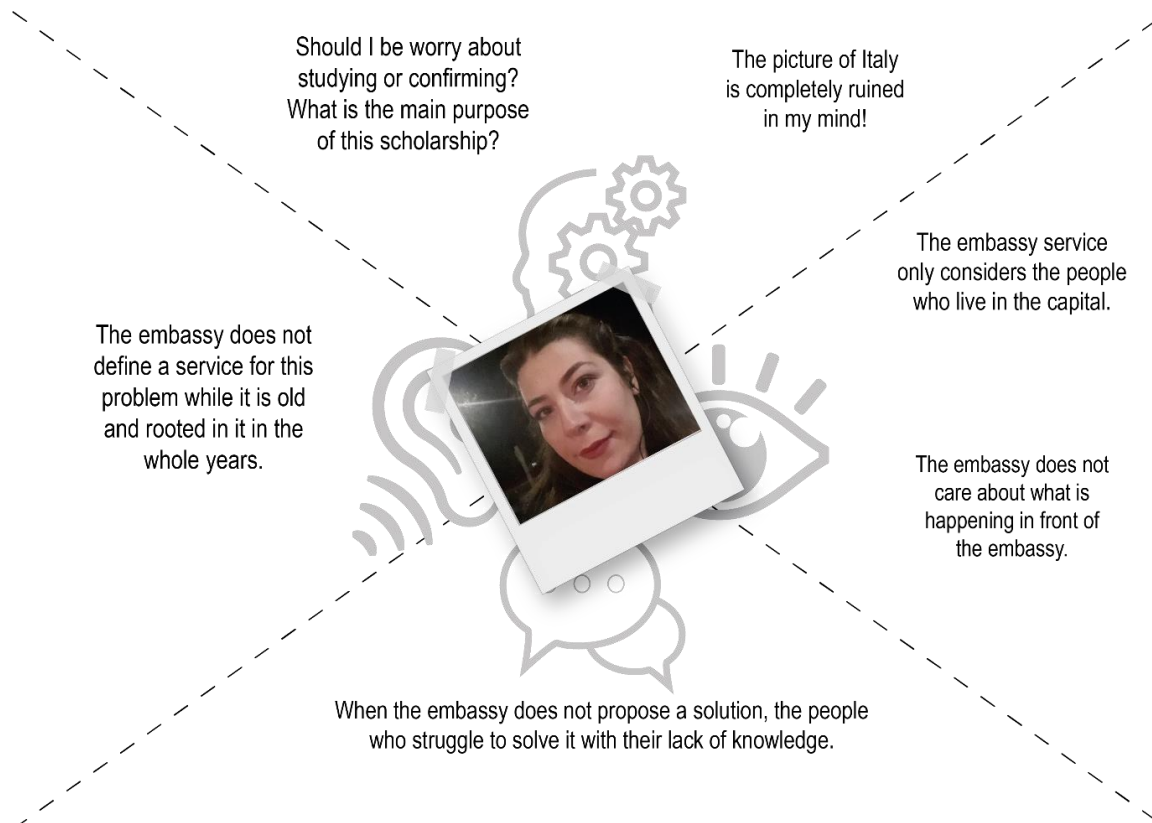
Storyboard



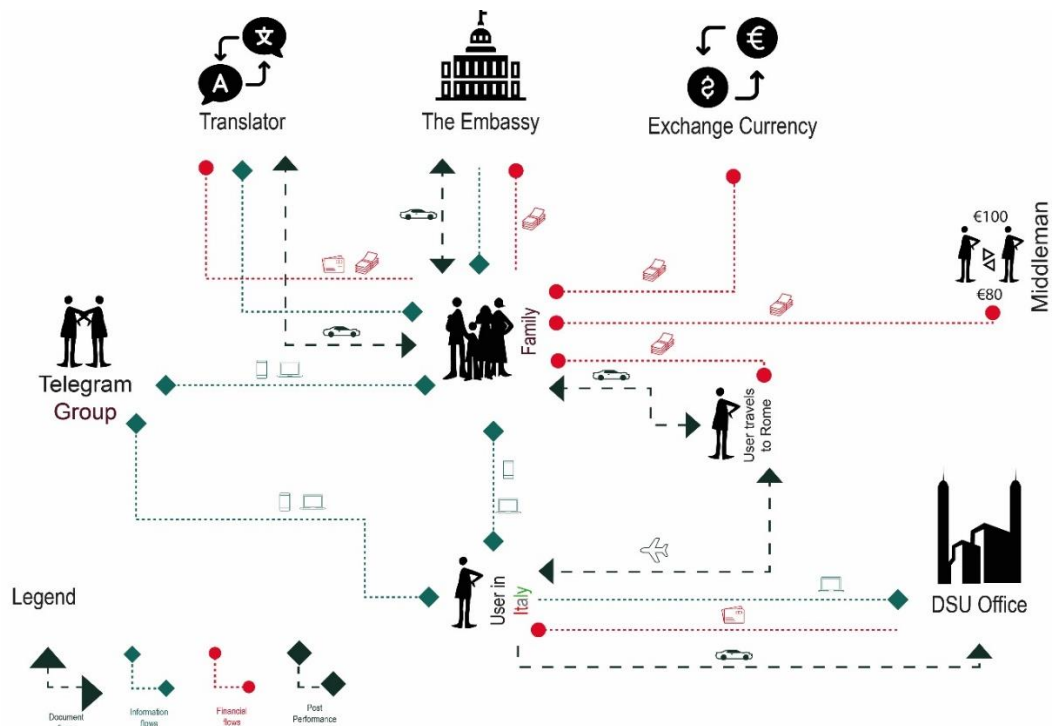
Journey Map



Empathy Map



System Mapping



Second Case Study: Ketabdar

Persona



Age: 37 years old
Marital status: Married
Children: 1
Occupation: Housewife
University: N/A
Location: Verona

Bio

I've always been interested in sculpture. My husband, my little boy and I are living in Verona for many years. I am a housewife.

Goals/Needs

Enjoying Everyday of Life!
Yearly, I travel to Iran for spending with my family. It is a short time for us since my husband only has two weeks off. I don't want to be too much engaged in the process of translation and confirmation.

Ideal Experience

Nowadays, various embassies utilize online booking for different tasks, like visas. It is simple and easy. Additionally, you know the date and the time you have to be there.

Technology & Information Sources

1. Social Media:
Telegram, Instagram
2. Websites

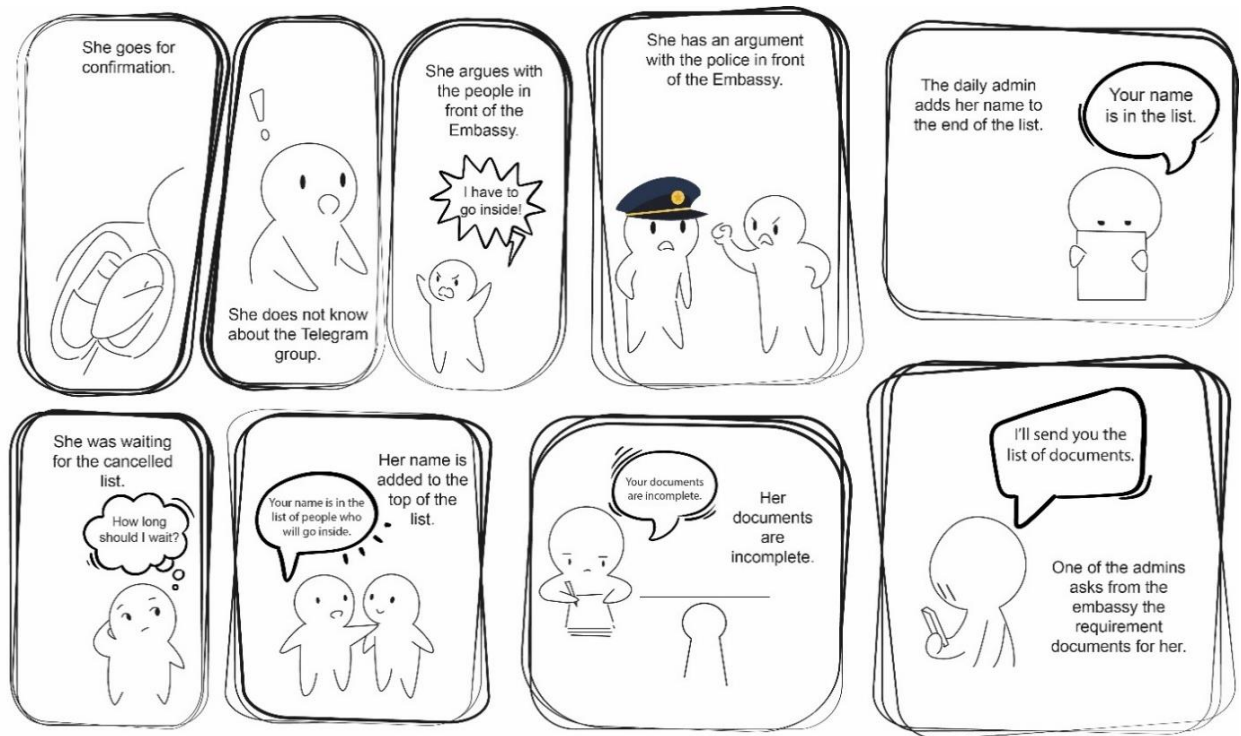
Pain points

Once a year, my documents ought to be confirmed by the Italian Embassy. Unfortunately, due to me and my husband are occupied, this confirmation mostly happens during the summer. Thus, it is ordinary that I have to argue with the other people in front of the embassy for a turn. Chiefly, the list is written by the students, which we are not aware of it.

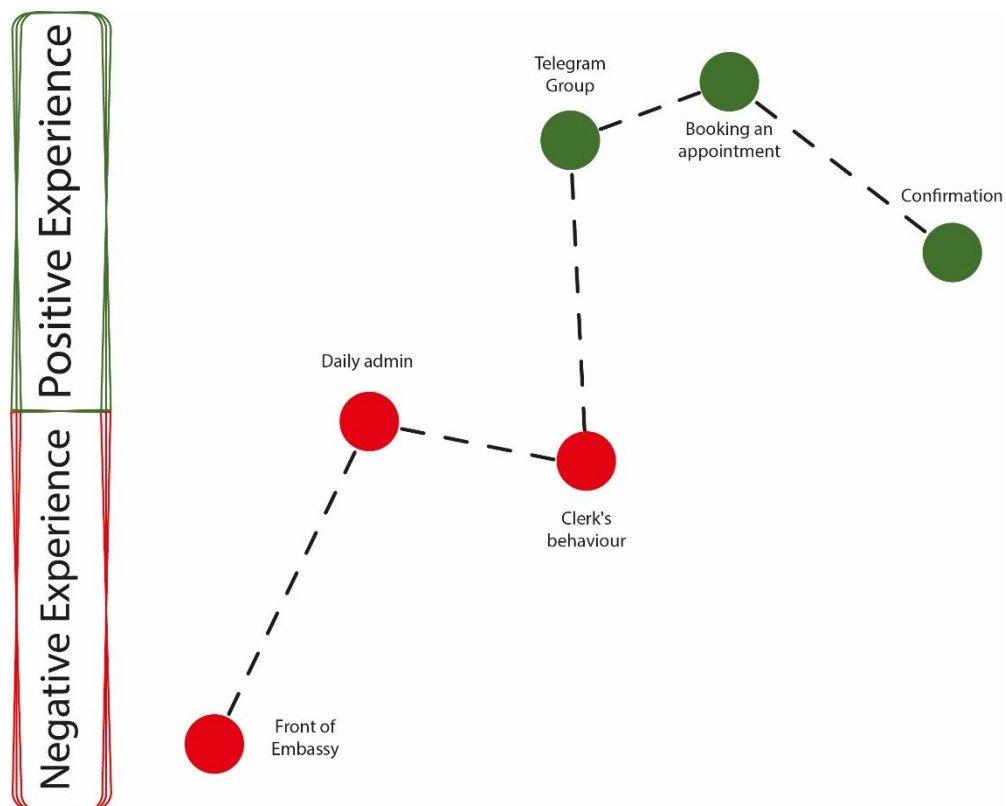
Challenges

- Be aware of the required documents
- Do not be concerned about the expiration of the documents
- Do not waste time in front of the embassy
- Confirmed the documents with a one-time referral

Storyboard



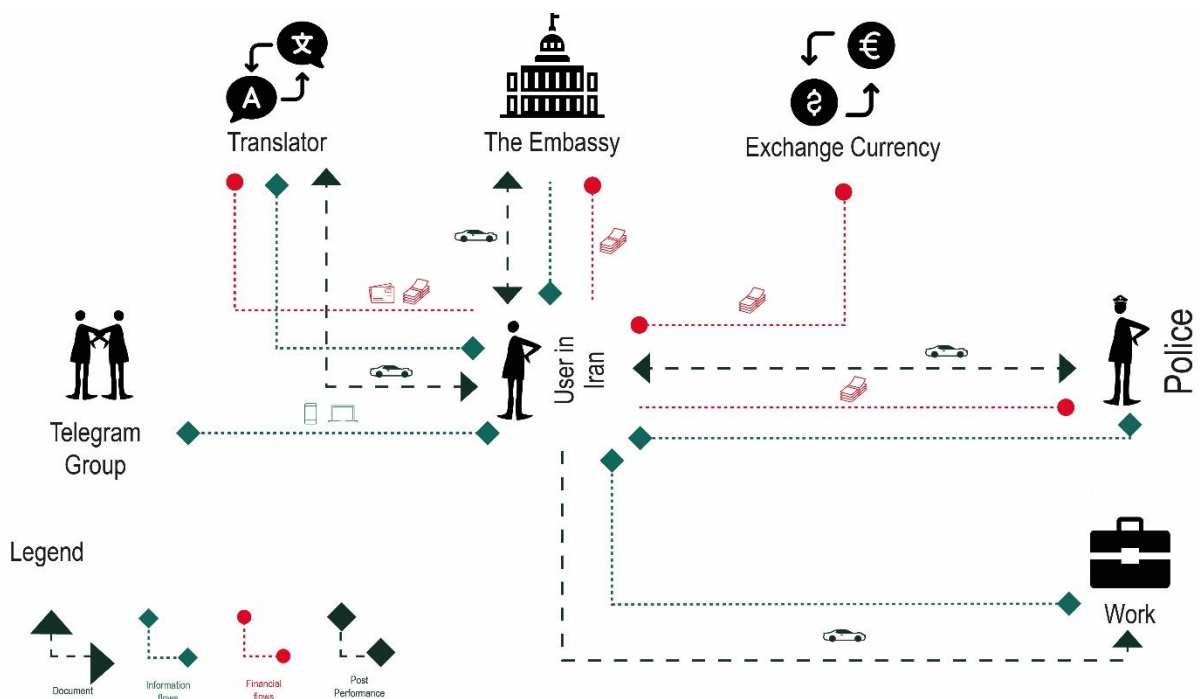
Journey Map



Empathy Map




System Mapping



Third Case Study: Adeleh

Persona



Adeleh
Living in different countries

Bio
I used to live in Dubai, Spain and Germany before I have moved to Italy. I am studying American and Anglo Saxon Literature at the Sapienza University of Rome. I taught English when I was in Iran.

Goals/Needs
Challengeable life! My goal is to come out of my comfort zone. For this style of living, I need to be aware of the rules. Additionally, these principles ought to be stable. The uncertainty wastes my time and energy.

Pain points
I need to go for confirmation anytime which I want to. The Telegram group is against the right of the people who live outside the capital. I have to wait for them to finish their work and then pay someone to go for my confirmation.

Ideal Experience
Three years ago, I visited the German Embassy for requesting the studying visa. Immediately, after they had realized my admitted course has been started, they accepted my application for less than 24 hours.

Challenges


- The embassy accepts the sent documents by post
- The embassy accepts the declared documents by the Laziodisco
- The embassy confirms the documents and sends them by post
- The embassy manages the appointment instead of students

Technology & Information Sources


1. Social Media: Telegram, Instagram, Twitter, Facebook
2. Websites

Age: 35 years old
Marital status: Single
Children: N/A
Occupation: Student
University: N/A
Location: Sapienza

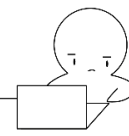
Storyboard



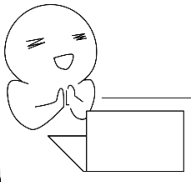
She was in Germany.




She realizes about the Laziodisco Scholarship.




Online, she sends her documents for translation.



She pays online for the translation.




Her family does not live in the capital.




Could you please give me the documents of Adeleh? I am her friend.

Thus, her friend gets her documents.




I couldn't go inside.

Her friend goes in front of the embassy and cannot go inside for confirmation.



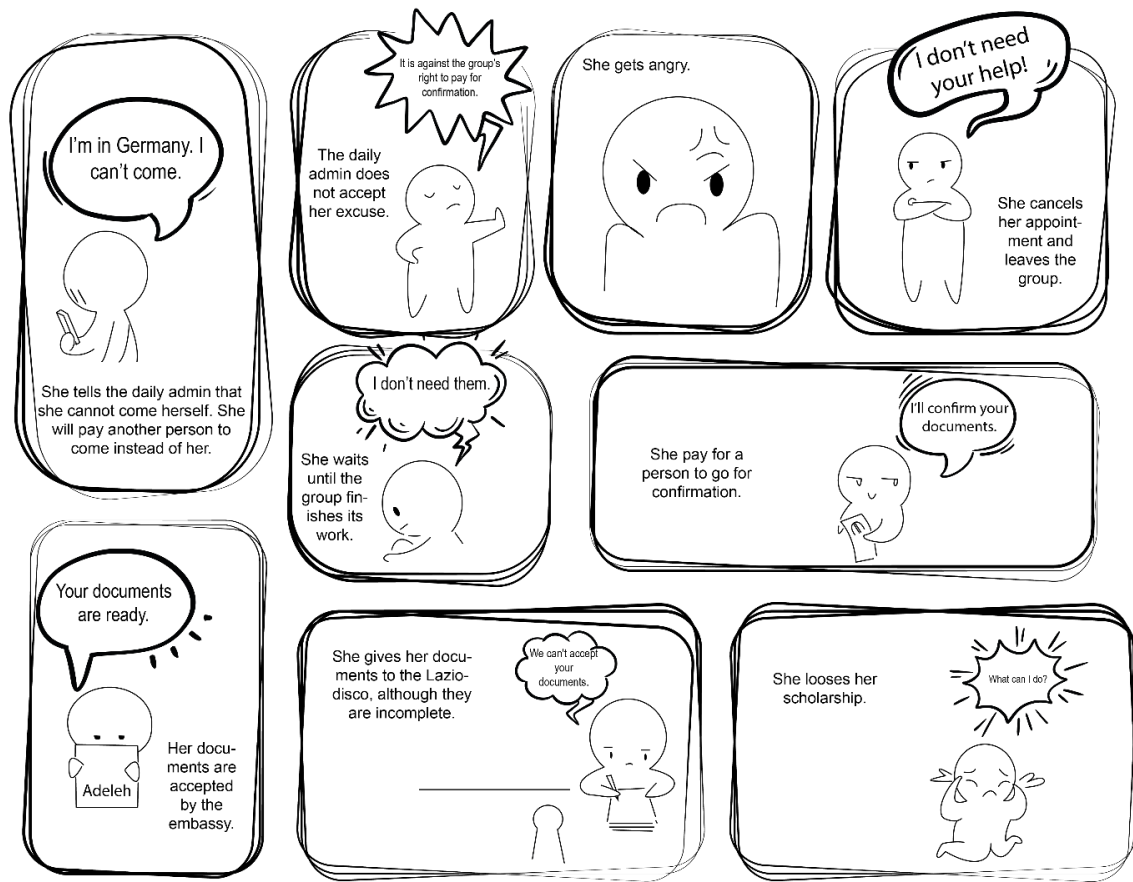
For confirmation join the group.

The link of the group is given to him.

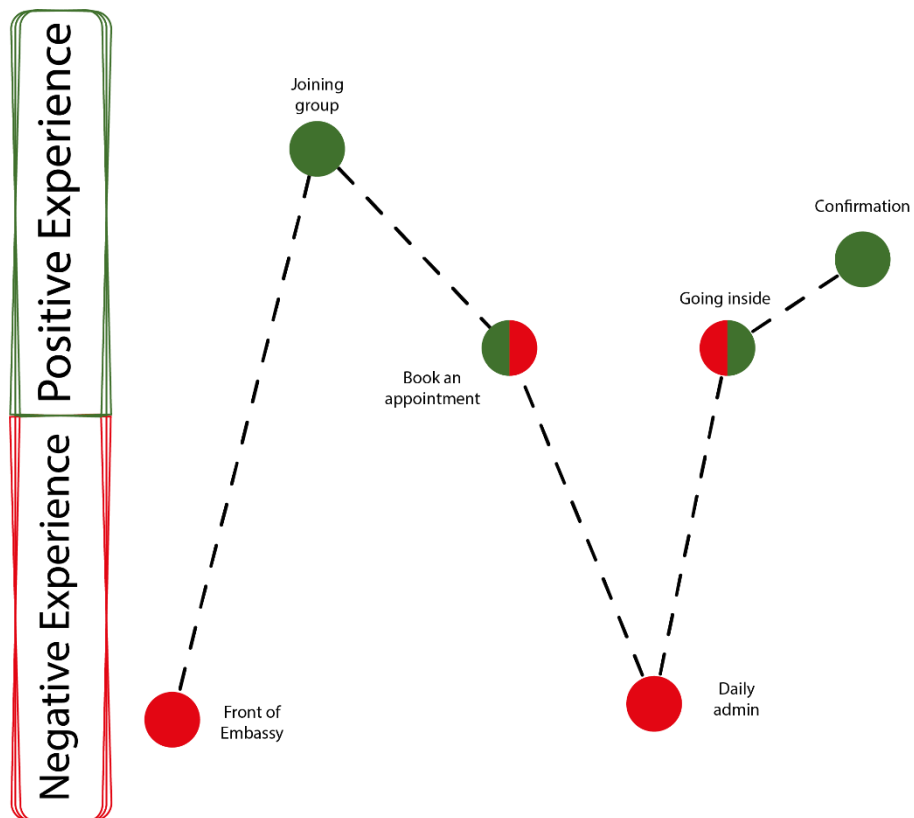


I need an appointment.

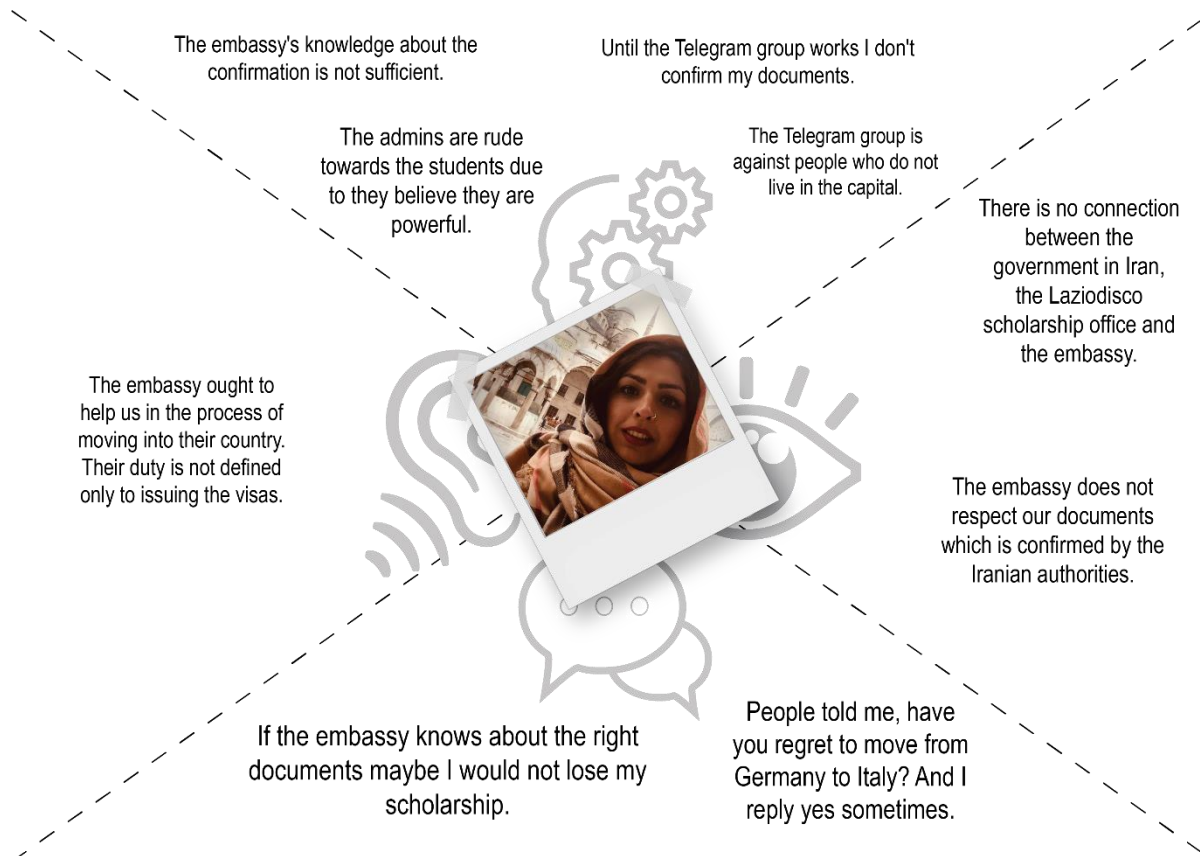
She joins the group and books an appointment.



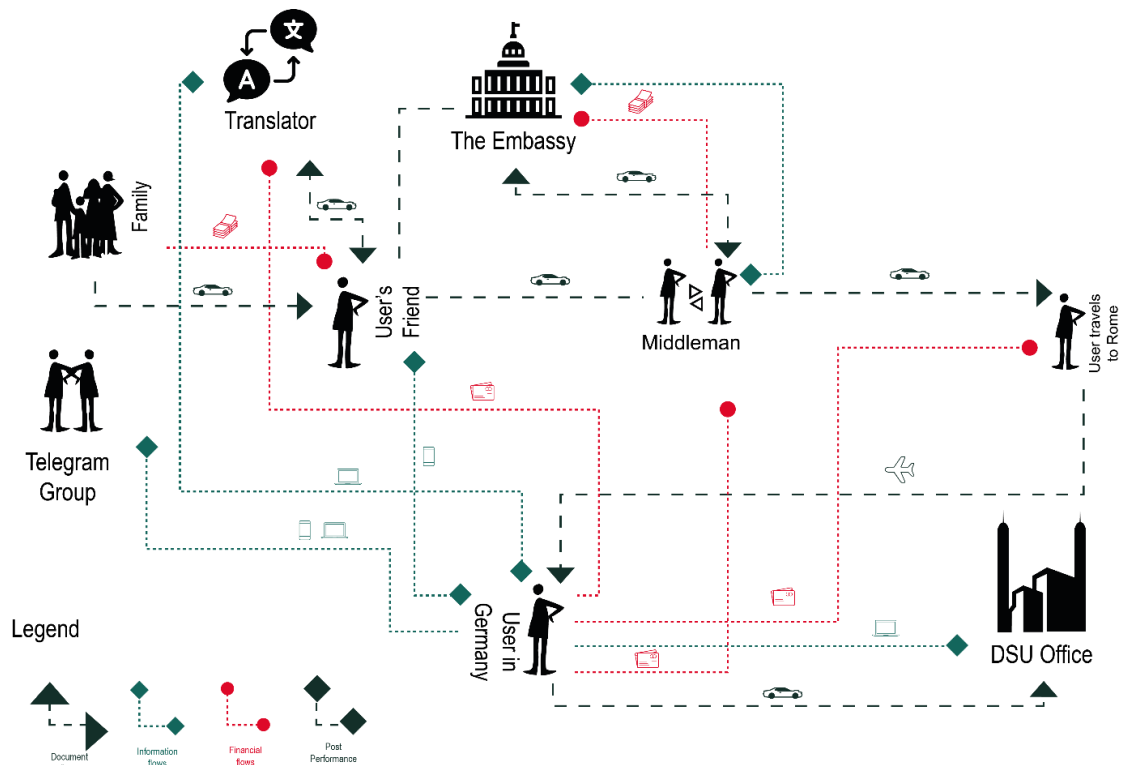
Journey Map



Empathy Map




System Mapping



Third Case Study: Mohsen

Persona



Mohsen
Working and living in the nature

Bio

I am studying engineering at the University of Ca Foscari. For emigration and studying at this university, I have lived separated from my family. I used to work 7 days of the week for collecting the required money.

Goals/Needs

Graduation from university as soon as possible. For this purpose, I need a Laziodisco scholarship. Without this assistance, I have to work hard for my expenses. It can damage my education.

Pain points

A few people are allowed to go for confirmation each day, which make the process too complicated and bothersome. Moreover, staying awake for the whole night, being worried about your turn and being torture with the thought of confirmation can be unbearable.

Ideal Experience

I don't have an ideal experience during this process.

Challenges

- Buying the Euros
- Finding the coins for change
- Asking the other students to be aware of the unacceptable documents
- Staying outside in the hot days of summer
- Staying awake the whole night

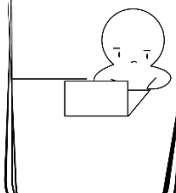
Technology & Information Sources

1. Social Media: Telegram, Instagram
2. Facebook

Age: 26 years old
Marital status: Single
Children: N/A
Occupation: Student
University: N/A
Location: Venice


Storyboard

The bando is announced.




I am ready for confirmation!

He joins the Telegram group.




The list of July is filled, thus he ought to wait for the August list.

For how long should I wait?




I have to set an alarm for it!

In the group, the date is announced for writing the list of August.




I have an appointment! Thank God!!!

At 9 o'clock he books an appointment.



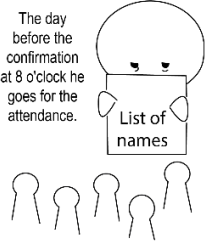
I don't know, how much money should spend for confirmation.

He does not know how much money he should take with himself for confirmation.

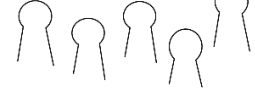


The day before the confirmation at 8 o'clock he goes for the attendance.

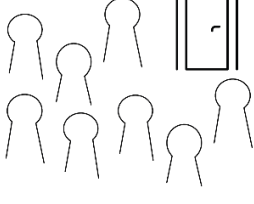
List of names

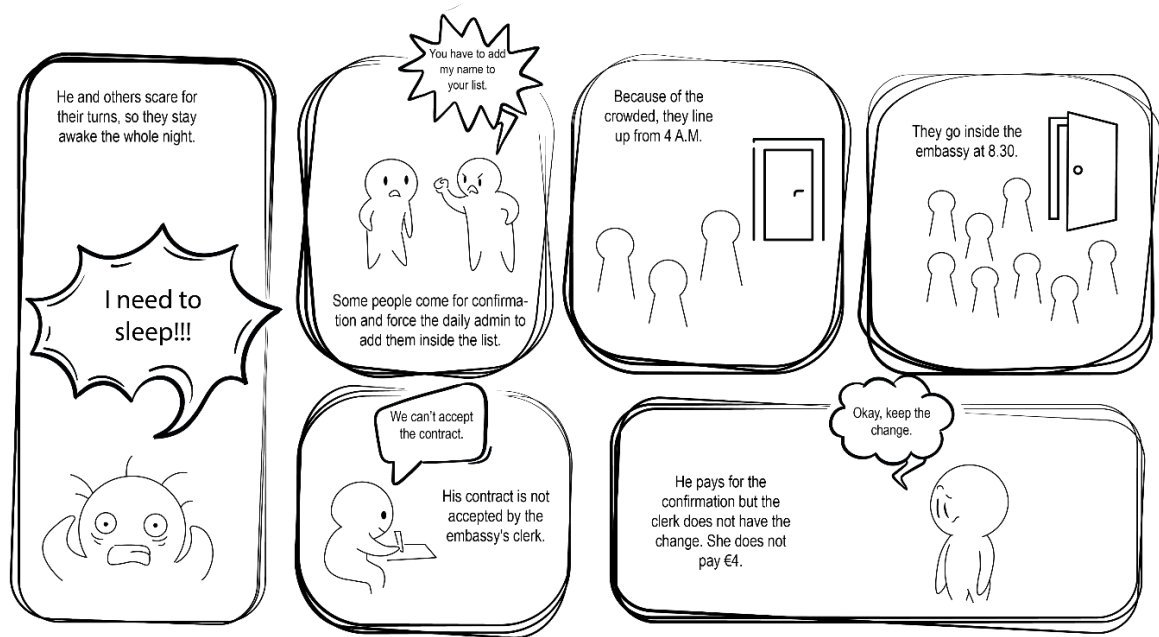


He chooses to stay in front of the embassy in the morning and goes for rest at noon.

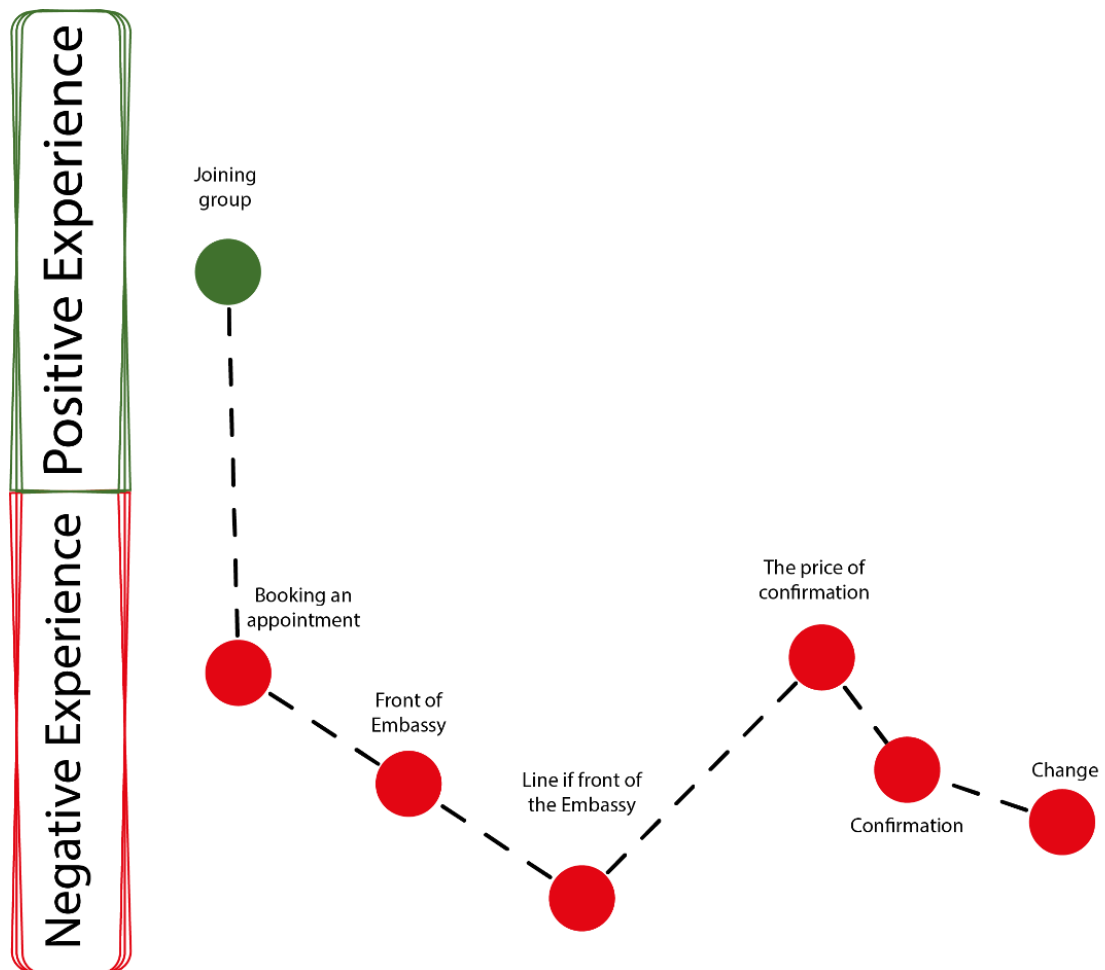


At 10 P.M. all the visitors gather in front of the embassy.

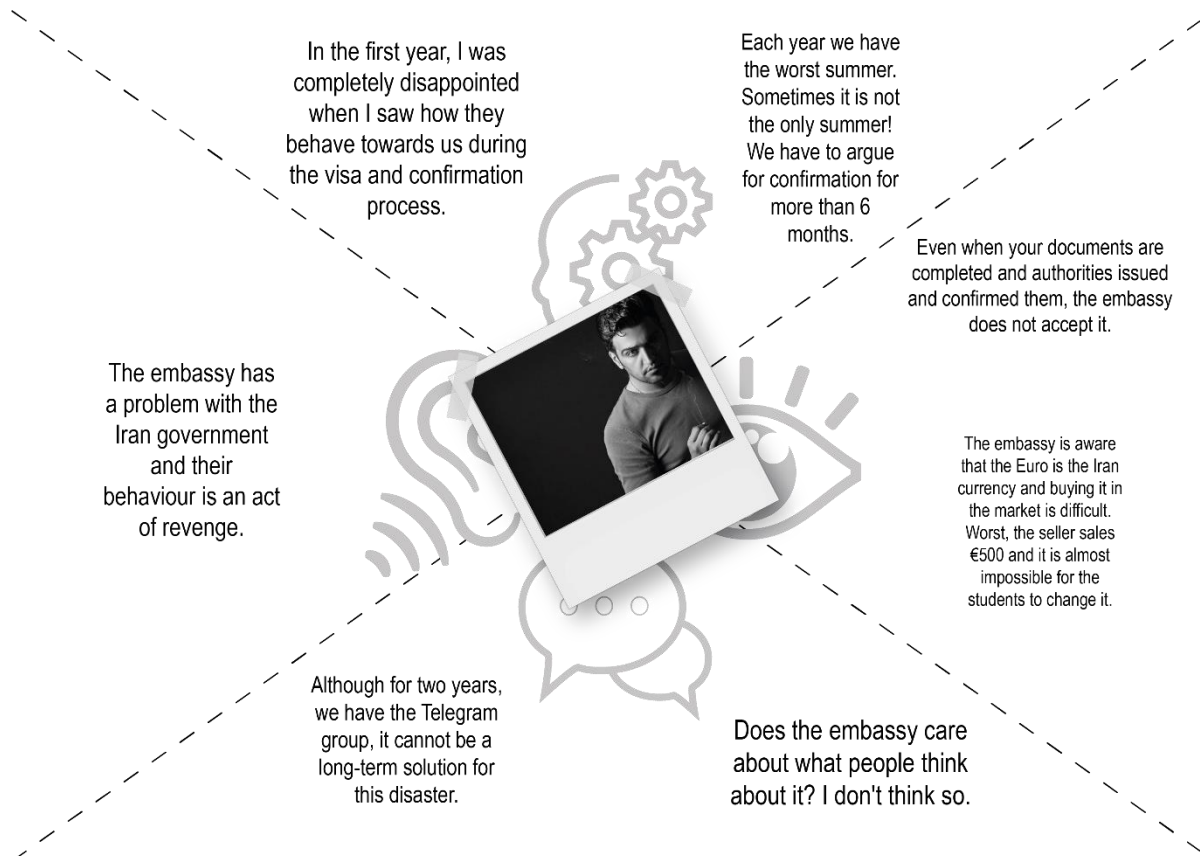




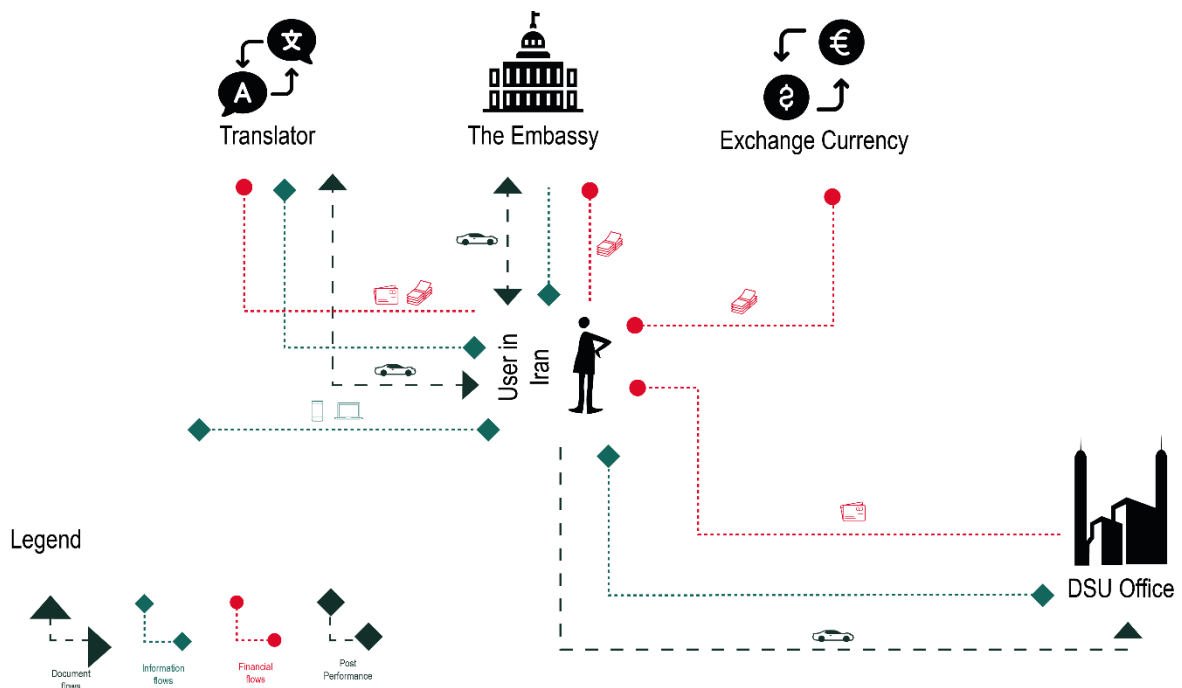
Journey Map



Empathy Map



System Mapping



4.4 User Needs Based on Collected Data

4.4.1 Interview, Observation and Focus Group, Diary Study

According to the recorded interviews, Observation, Diary Study and Focus Group, the needs are listed as below:

- The embassy identifies the documents with the nearest expiry date and gives them a sooner appointment;
- Online platform for sharing the information;
- Remote confirmation;
- The embassy controls the whole process of confirmation;
- Increase the number of staff when it is a peak season;
- Online payment;
- Flexible payment currency;
- Connection between the embassy and the DSU offices;
- The embassy has the list of the requirements documents;
- Identifying the universities with the shortest confirmation date;
- Clarifying the confirmation's fee;
- The embassy respects the confirmed documents in Iran by Iranian authorities;
- Sending and receiving documents by post;
- A unique policy in the whole embassy sections;
- Warning users about the latest changed policies;
- The embassy needs to hire polite staff and be more respectful about their users;
- An online receipt;
- Omitting the middlemen;
- The embassy needs to have a social media that is popular and accessible in Iran;
- User wants to be sure about the requirements of their documents; and
- Avoiding the repeatable translation and confirmation for the same documents.

4.4.2 Personas, Empathy Map, Journey Map, Storyboard and System

Mapping

Studying the character of chosen personas and going deeper in their needs by illustrating Storyboard, Journey Map, Empathy Map and System Mapping, narrow down the below needs (see [Figure 28](#)):

| | |
|--|---|
| <p>Pegah</p> <ol style="list-style-type: none"> 1. Specific documents for confirmation 2. Booking an appointment before the deadline 3. Posting the document for the embassy 4. Quick confirmation 5. The embassy posts the documents 6. Finishing the process before leaving Iran 7. Knowledgeable clerk 8. Online payment 9. Changing money 10. A page on Facebook with the latest News | <p>Ketabdar</p> <ol style="list-style-type: none"> 1. Be aware of the required documents 2. Do not be concerned about the expiration of the documents 3. Do not waste time in front of the embassy 4. Confirmed the documents with a one-time referral 5. The embassy manages the turns 6. The service is announced widely 7. The information is published clearly 8. Quick confirmation |
| <p>Adeleh</p> <ol style="list-style-type: none"> 1. The embassy accepts to send documents by post 2. The embassy accepts the declared documents by the Laziodisco 3. The embassy confirms the documents and sends them by post 4. The embassy manages the appointment instead of students 5. Information on the platform of the Embassy | <p>Mohsen</p> <ol style="list-style-type: none"> 1. Buying the Euros 2. Finding the coins for change 3. Online payment 4. Changing money 5. Asking the other students to be aware of the unacceptable documents 6. Calculating the price in advance 7. Quick confirmation |

Table 06: Personas needs based on their information, Journey Map and Empathy Map

4.4.3 Questionnaire

The online Questionnaire was held in the Google Form and was shared among the users who engaged in the confirmation process. For this purpose, the link of it was pasted and pinned in the whole Italian groups in Telegram. In the end, the below needs were gathered:

- More appointment for confirmation;
- An equal chance for everyone to book an appointment;
- Easy methods for paying fees;
- Receiving the documents with the one visit;
- More polite and friendly staff;
- Easy methods for booking an appointment;
- Educating the staff based on the users' questions and needs;
- Fast confirmation;
- Accessing reliable resources; and
- A suitable place for waiting.

4.4.4 Business Model

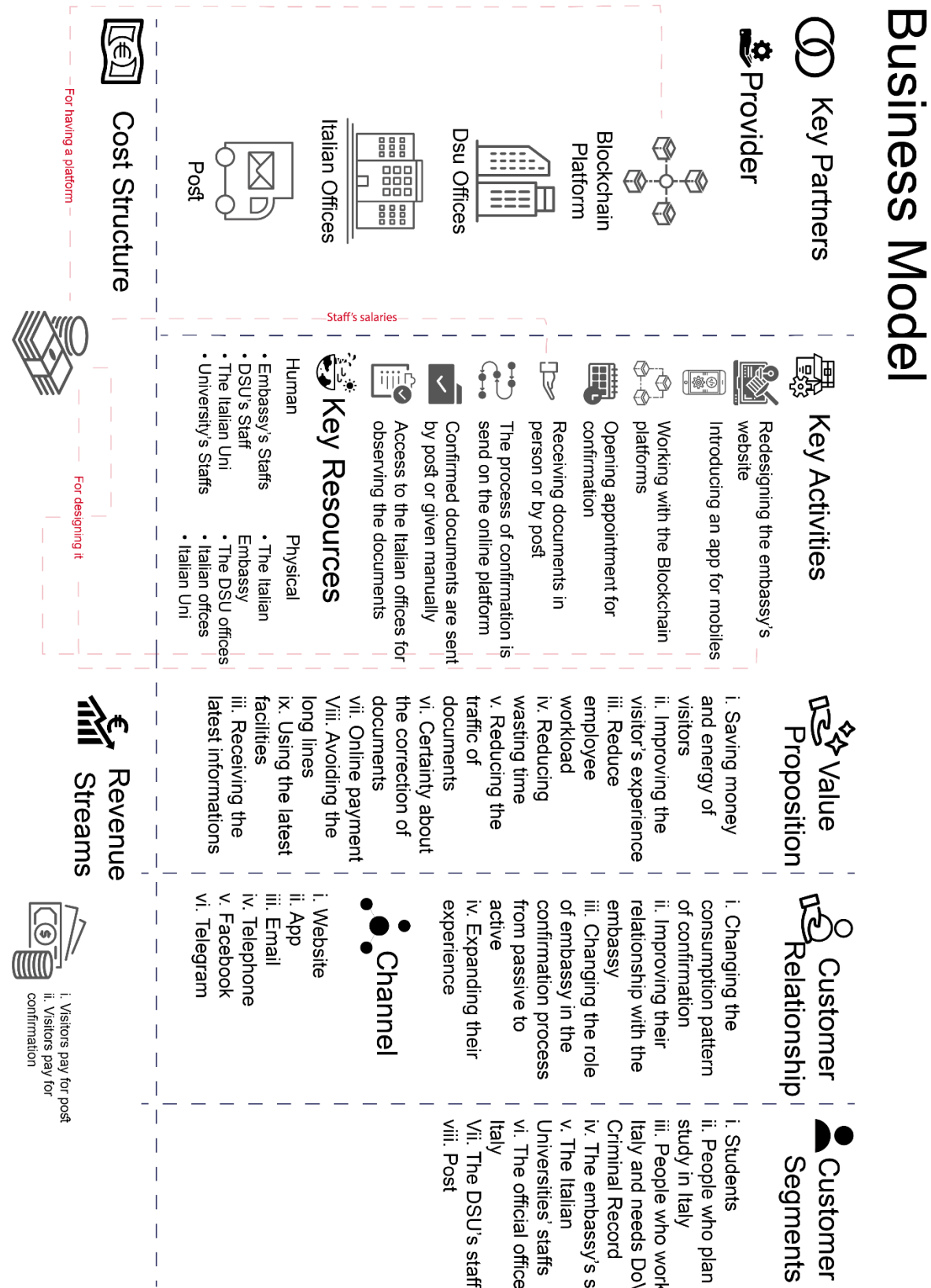


Figure 21: Business Model

4.5 Conceptual Map

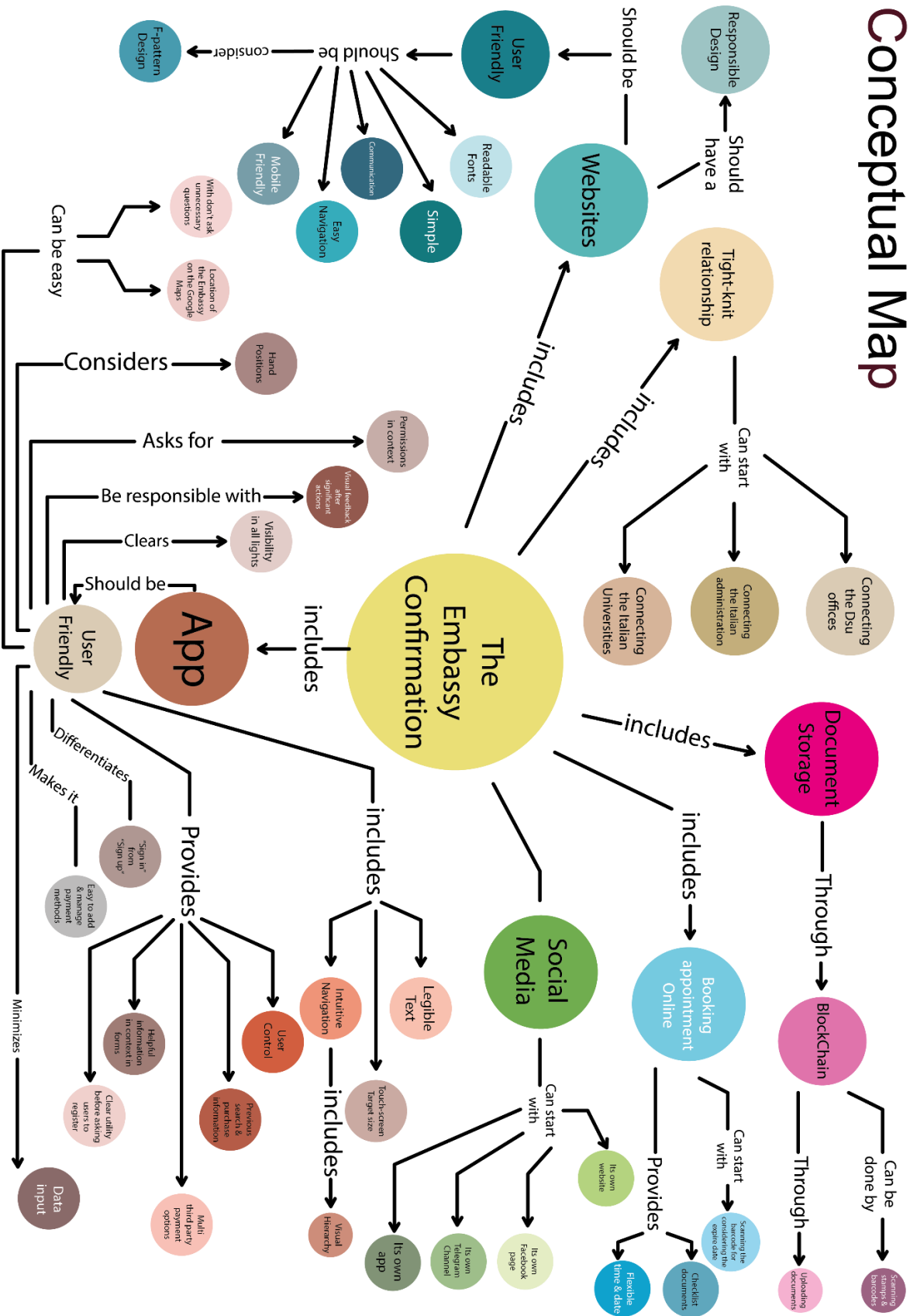


Figure 22: Conceptual Map

Bench-marketing Diagram

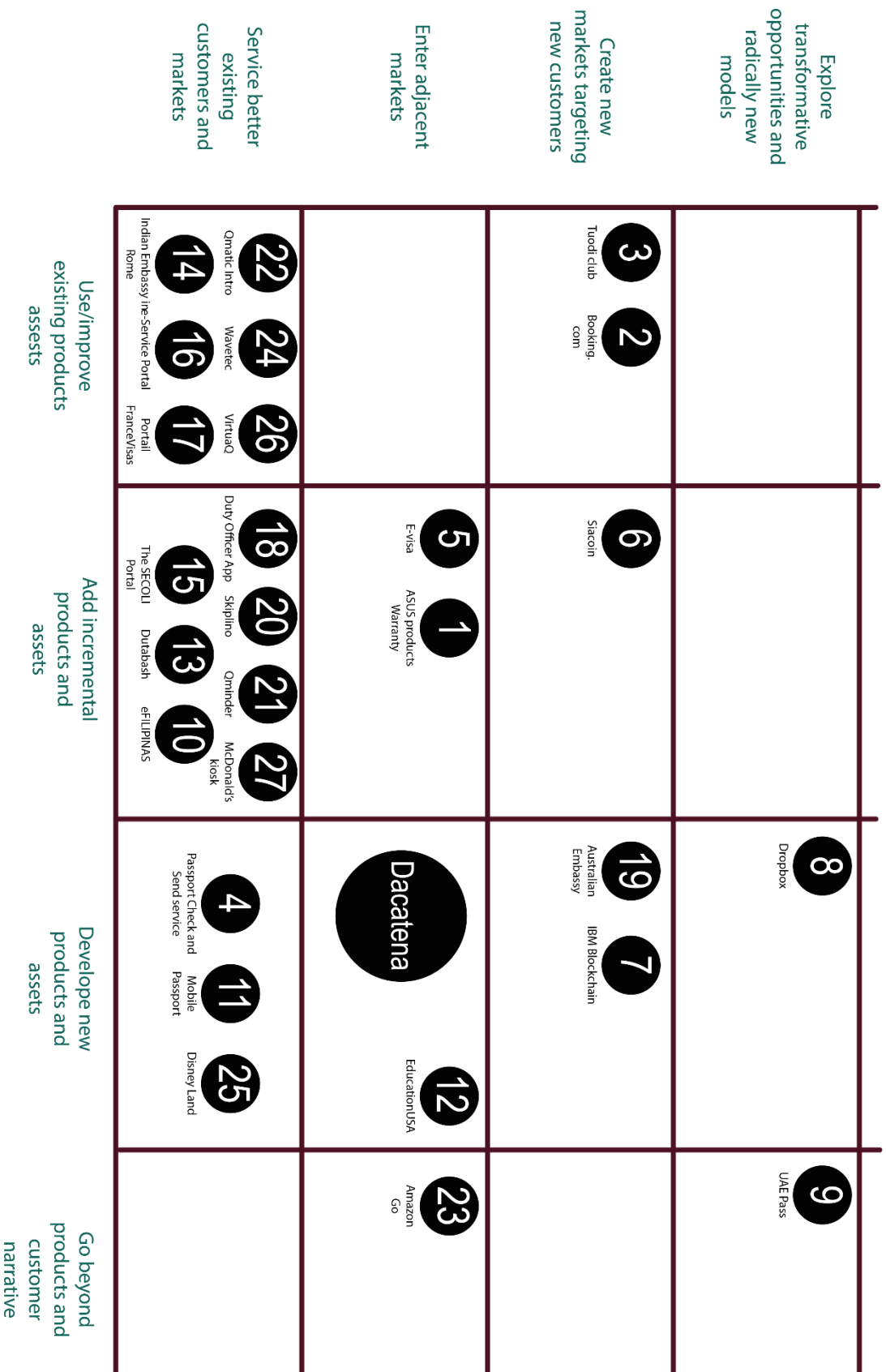


Figure 23: Benchmarking

4.7 Proof of Hypothesis

In the section of [4.1.2](#) some hypothesis has been selected and the design tools, especially Questionnaire tests them for finding the failure part of the current service.

4.7.1 Hypothesis 1

H₁: The number of staffs works in the embassy in the part of confirmation has a positive effect on the process.

One of the problems which were emphasized by users was that the embassy does not consider the increase in confirmation requests in Summer. The service tools proved that the satisfaction of users is tighten to the number of staff.

4.7.2 Hypothesis 2

H₂: By recommending the distance confirmation, the action could be sped up.

Numerous users who visit the embassy live outside of Teheran, and the process of going to the embassy can be bothersome for them. The experience of ckgisir company shows that not the whole process of visiting the embassy needs to be face-to-face. Especially, receiving the documents.

4.7.3 Hypothesis 3

H₃: A social media platform can reduce the unnecessary visits to the embassy.

The Telegram group turns to a place where users share their experiences. Although, these experiences are old mostly, because they are for the last year, and it takes lots of time until users reach the latest changes at the embassy. Thus, the embassy can manage this social media itself.

4.7.4 Hypothesis 4

H₄: The distance confirmation can protect staff from the COVID-19 attacks.

Many countries choose to lockdown during the pandemic. It shows that less contact can reduce the danger of COVID-19.

4.7.5 Hypothesis 5

H₅: The Blockchain provides a safe environment for documents and prevents document forgery.

Researching among services in the real world and Bitcoin emphasized that Blockchain can be a safe place for storing the docs.

4.7.6 Hypothesis 6

H₆: Knowing about the reasons of rejection can save the time for clients and the embassy.

Lots of users book more than once because they were not aware of the problem with their documents. This awareness helps them to prepare the correct documents and do not waste staff's time and energy.

4.7.7 Hypothesis 7

H₇: The online stored docs can help clients to send them everywhere and any time.

During the pandemic, plenty of documents are shared among people through online storage platforms and emails. These documents can be lost among other data. So, it is necessary to have an online platform which not only stores docs but also be clean and have an ability to be sent. Albeit, privacy is vital, thus the Italian Government, the embassy, in this case, ought to decide about the validity of offices. And users only can select and ask for giving the access to their documents among the valid offices.

Chapter 05: Technology

5.1 Industrial Revolution: Definition and Inventions

"If England became a world power, it was because of the industrial revolution." — **N. R. Narayana Murthy**

English economic historian Arnold Toynbee (1852–83) in describing the progress of Britain's economy from 1760 to 1840 used the term of Industrial Revolution for the first time. It was combined with technology, socioeconomic, and culture. Moreover, it was dealt with tangible sources, such as materials (iron and steel), fuels and motive power (coal, the steam engine, electricity, petroleum, and the internal-combustion engine) and palpable technologies, such as machines, factories, the steam locomotive, steamship, automobile, aeroplane, telegraph, and radio (Britannica, 2020).

In the late 19th and 20th centuries, lighter materials, plastics, new energy sources, and computers for automatic operation in factories declared the second Industrial Revolution (Britannica, 2020).

The start of the Third Industrial Revolution in 1969 opened digital electronics, space expeditions, research, biotechnology, the automation of production (Pouspourika, 2019), consumer electronics, information and communications technology and the internet (Meet the Three Industrial Revolutions, 2020).

The Fourth Industrial Revolution or what is mostly known, Industry 4.0, is promising incessantly enhancement in data and all-consuming automation. Business and manufacturing sectors overload with modern IT, such as Big Data, IoT (Internet of Things), cloud capacities, AI-based solutions, as well as the focus on environmentally sustainable production. The primary target of this movement is pushing the world toward progressive explanations and cost/time/eco-efficient techniques (Hackernoon, 2020).

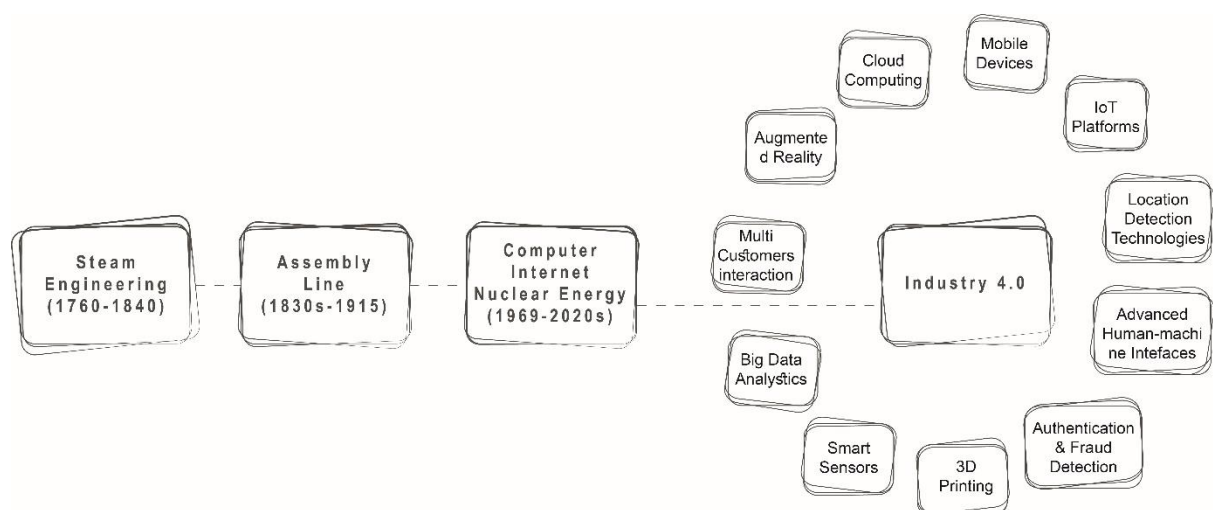


Figure 24: A presentation of the various stage of industrial production and where we are in 2020 (Brown, 2019)

5.2 Possible technologies for proposing a solution

5.2.1 Blockchain

“A blockchain is essentially a distributed database of records or public ledger of all transactions or digital events that have been executed and shared among participating parties,” (M.Crosby et al., 2016). For any transaction in the public, the whole participants in the system need to verify it. The inserted information can never be deleted. It is good for:

- Smart contracts;
- The sharing economy;
- Crowdfunding;
- Governance;
- Supply chain auditing;
- File storage;
- Prediction markets;
- Protection of intellectual property;
- Internet of Things (IoT);
- Neighbourhood Microgrids;
- Identity management;
- Anti-money laundering (AML) and know your customer (KYC);
- Data management;
- Land title registration;
- Stock trading (M.Crosby et al., 2016).

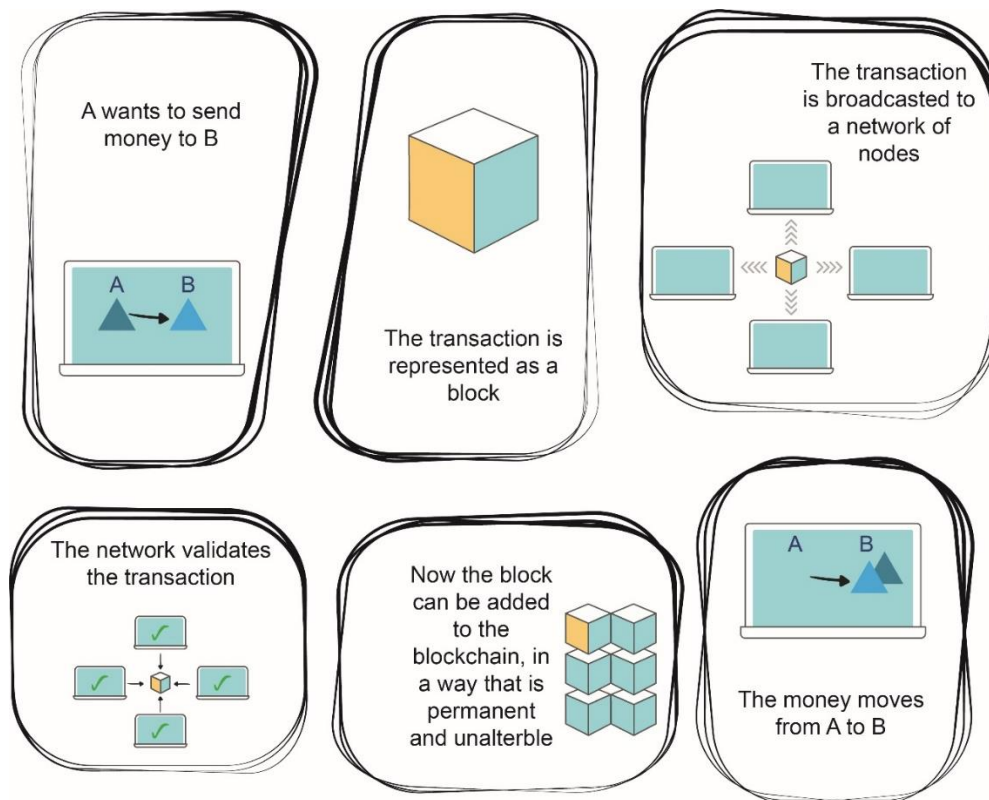


Figure 25: How It Works (Rosic, 2016)

5.2.2 Signature verification

It is examined whether a questioned signature matches a known given signature (H. SrinivasanSargur et al., 2006). This automation software can play an urgently important role in fraud prevention and ensuring the customer about the accuracy of documents (Gallagher, 2020).

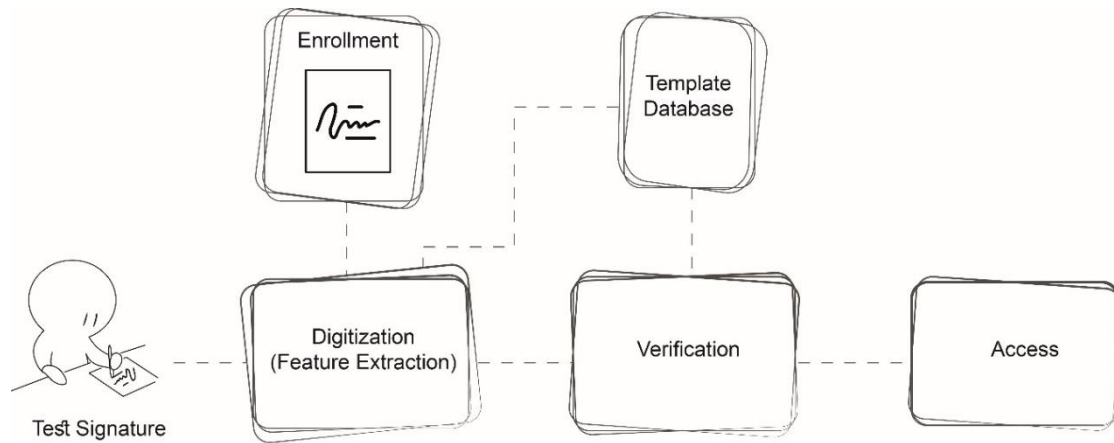


Figure 26: Typical Signature Verification System (Sanda, 2017)

5.2.3 Image recognition

Image recognition is a type of machine vision that identify objects, places, people, writing and actions in images. With a camera and Artificial Intelligence software, the technology of image recognition is achieved (Rouse, 2017). The modeling process for image recognition is:

- Take out pixel features from an image;
- Prepare labelled images to instruct the model;
- Train the model to be able to classify images;
- Identify (or predict) a new image to be one of the classifications (Dataman, 2018).

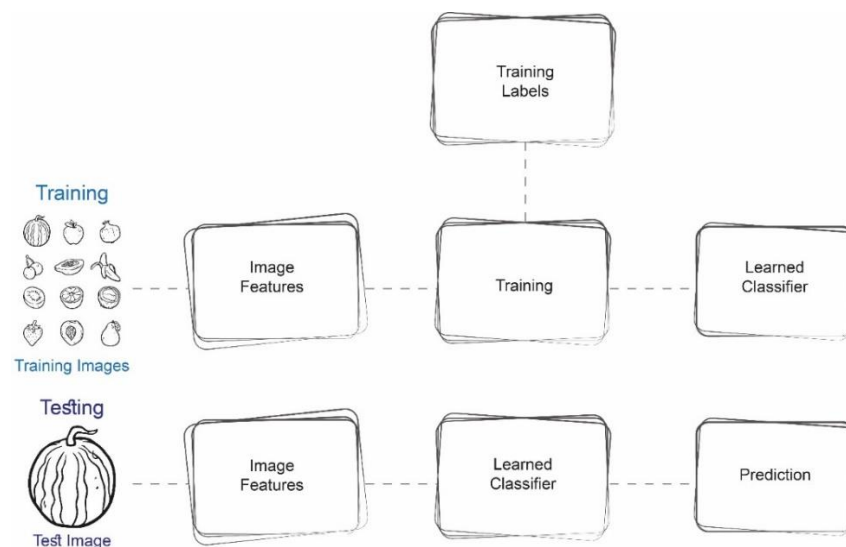


Figure 27: The process of object recognition (Object Recognition Review, 2017)

5.2.4 Methods of online payment

In the modern world, having one way to accept payments is an essential and fundamental requirement, but having multiple can be called an advantage. It allows for fast and automated flows among merchants and customers. For this purpose:

- A customer specifies a service and the amount of payment is calculated;
- She/He selects how they want to pay online. For this step, credit/debit cards or other options such as digital payment and mobile payment methods are required;
- Once the way is elected, and the asked information is provided, the ratification process is begun by the card-issuing bank of the customer.

This operation involves a business owner account, a payment gateway⁴¹, a payment provider and a payment processor (Kragie, 2021).

The list of some online payment services:

- PayPal;
- Amazon Pay;
- eBay Managed Payments;
- Google Pay;
- Apple Pay;
- Direct debit payments;
- Bank transfers;
- Prepaid cards;
- Gift cards;
- Digital currencies;
- 'Buy now pay later' instant financing; and,
- Cash on delivery (COD) (Linnworks, 2021).

Examples of popular online payment methods for Europe:

- Pay with bank cards: Mastercard, Visa, American Express, UnionPay, JCB, Maestro;
- Pay using an eWallet: PayPal, Amazon Pay, Google Pay, Apple Pay, Yandex, Qiwi, Skrill;
- Pay with money transfer: Sofort, iDEAL;
- Pay by direct debit;
- Pay with cryptocurrency: Bitcoin;
- Pay with prepaid cards: SNAP, Paysafecard; and,
- Buy now pay later: Klarna (Linnworks, 2021).

Examples of popular online payment methods for Iran:

- Asan shaparak;
- Melat Bank;
- Parsian Bank;
- Parsian Electronic Tejarat;
- Saman;
- Pasargard;
- Arian;
- Sadad;
- Iran Kish;

⁴¹ Online payment gateway is a service supplied by the e-commerce to process payment information for websites (Hicks, 2019).

- Fanava;
- Mabna;
- Damavand; and,
- Sayan (بهترین درگاه پرداخت اینترنتی و بهترین درگاه واسطه برتر سال ۹۹, 2020).

Because of Sanctions, the process of payment directly by Mastercard or Visa card is impossible. Therefore, currency exchange is needed in the middle of it for exchanging the Rial to Euro. Consequently, for proposing a service, an Iranian and an International/Italian payment gateway is vital (Islami, 2021).

5.2.5 Methods of login/creating an account

The functionality of the app emphasizes the security and user convenience of the logging part. For balancing between these two, a study about the various methods and their pros and cons has been taken. Below, the most common login options are listed:

- Password login: The simplicity, familiarity and convenience make this method one of the most common used logins. Users use their email or username — or both — and a password for accessing their data (Firefox, 2021). Mostly, users must insert a valid email in order to click on the confirmation link or receive a code. This method has two main problems. The password needs to be secure, so it should contain numbers, randomly capitalized letters and perhaps symbols. It means that the user has to remember it, which makes the password hard to memorize. Thus, firstly, another bothersome button has to be added as a "forget password". Secondly, some users could use a repeated password and makes the app as an insecure place for their data (Swoop, 2020);
- Social and third-party login: This method provides the most convenient way of logging in for users and developers by using the credentials contained on a user's social media account. This eliminates steps such as filling in forms, log in to emails for confirming and memorizing a password or a username.
- Additionally, users are grateful for having one less password to memorize. The most popular application programming interfaces (API) are Facebook, Google, Apple, or LinkedIn which are mainly free (Sifter, 2017);
 - i. INPS PIN⁴² and Fiscal Code⁴³;
 - ii. SPID⁴⁴; and
- Mobile number login: One of the easiest, simplest, and unique ways of logins for avoiding a form and keeping a password and usernames in the minds. Although, this method can make trouble for immigrants due to mostly they have at least two SIM cards and sometimes one of them does not have a signal;

⁴² The PIN (Personal Identification Number) is the personal identification code for accessing the INPS online services. It helps citizens of EU and non-EU countries with no identity document issued in Italy to have a secure login (Sociale, 2021).

⁴³ The Fiscal Code (Codice Fiscale) is a code that is used by the Public Administration for identifying people who live in Italy. It is made up of letters and numbers based on the first name, family name, date and place of birth (Politecnico di Torino, 2021).

⁴⁴ SPID is the Public Digital Identity System that allows users to have access to the online services of the Public Administrations and participating companies (Poste Italiane, 2021).

- Multi-factor authentication: The two-factor authentication (2FA) is designed to protect user information against weak or compromised passwords by asking a user to go through an additional step to log in. If one of the steps depends on phones, we would face the same problem as the above one (Russell, 2020).

As the above definitions, advantages, and disadvantages, for the embassy service considering the location of a user, availability of devices, SIM cards and Emails are important.

Chapter 06: Solution

The main information about the users' needs in the last chapter and the newest technology and facilities are combined for introducing a service as an app.

6.1 UX/UI Design for App

6.1.1 Name of App and its Logo

For considering a name for the app, its functionality and its origin are discussed. The vital aim of the app is for collecting documents and utilizing Blockchain technology for storing them.

Therefore, the short form of a document, Doc is selected and from the Blockchain the part of the chain is picked. By translating the chain to its Italian form, Catena and combining it with Doc, we have Docatena. This name also can present the docs that connected by a chain.

For its logo, also the shape of the box is considered. Due to, in the Blockchain, the data is collected inside the small cubes.



Figure 28: Logo App

6.1.2 The Menu of the App

For designing the menu, the concept of the chain as it was used in the name of the app and Blockchain is regarded. So, each part of the menu is connected by the chain.



Figure 29: Menu

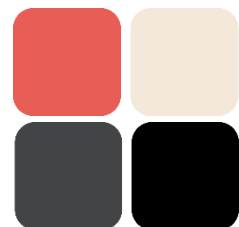
6.1.3 Colour Theme and Fonts

| | |
|---------|-----------------------------|
| Thin | <i>Thin Italic</i> |
| Light | <i>Light Italic</i> |
| Regular | <i>Italic</i> |
| Medium | <i>Medium Italic</i> |
| Bold | <i>Bold Italic</i> |
| Black | <i>Black Italic</i> |

Figure 30: Fonts

Due to, it was discussed that user needs to be able to use the app in the various environment, night and day, the white background is covered with the light cream colour. Consequently, two other colours which have harmony with cream is chosen.

Roboto as a font for a wide range of devices, sizes, and resolutions with 12 different weights is selected (Bautista, 2019).



6.1.4 Illustrations

In the last couple of years, illustrations as popular and solid design trends are presented in designing apps and websites. As much as simplicity is a key factor, illustrations give a sense of creativity to the app that stands out your app in the world of competition (Yalanska, 2021).

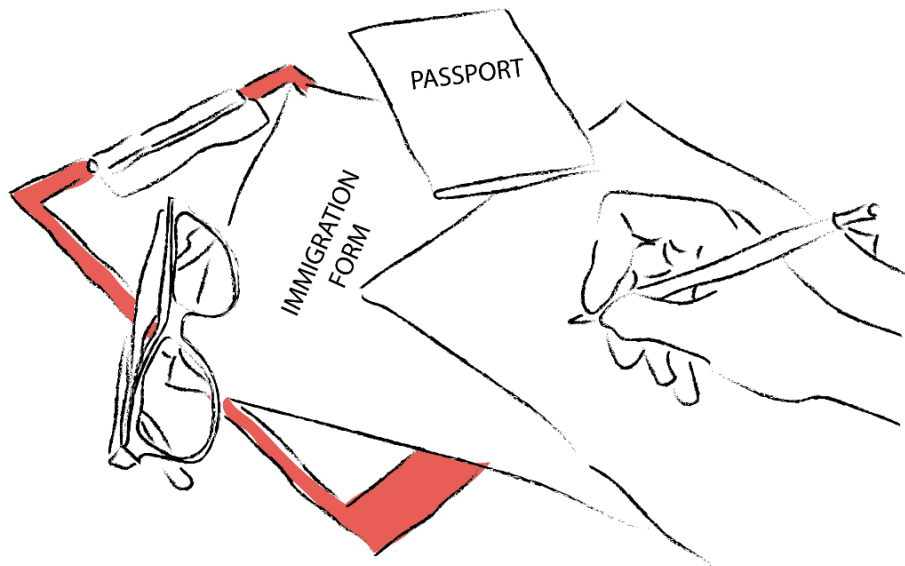


Figure 31: Sample of illustration

6.2 Introduction: A Special App for the Embassy

The focus of the beginning of the app was presenting the offered services and the connection ways. Also, the user can choose the section that they want. In contrast with most apps, users do not need to log in/register in order to go inside the app.



Figure 32: Introducing the app, its offered services and ways of connection

6.3 Picking up the Service

As it was mentioned, each region and in some cases each university has its own rules for confirmation and its own particular type of documents, and therefore a user after choosing the type of service that they want, needs to pick up their university.

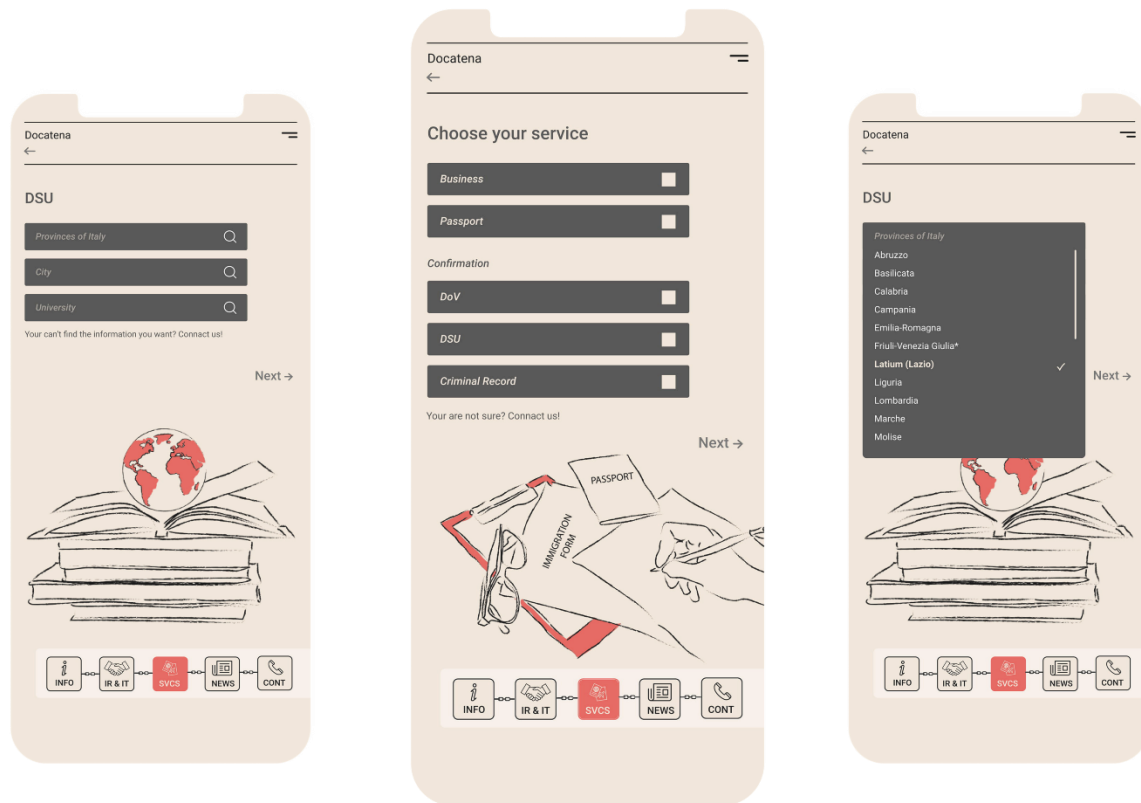


Figure 33: Choosing a desire service, region, city and the university

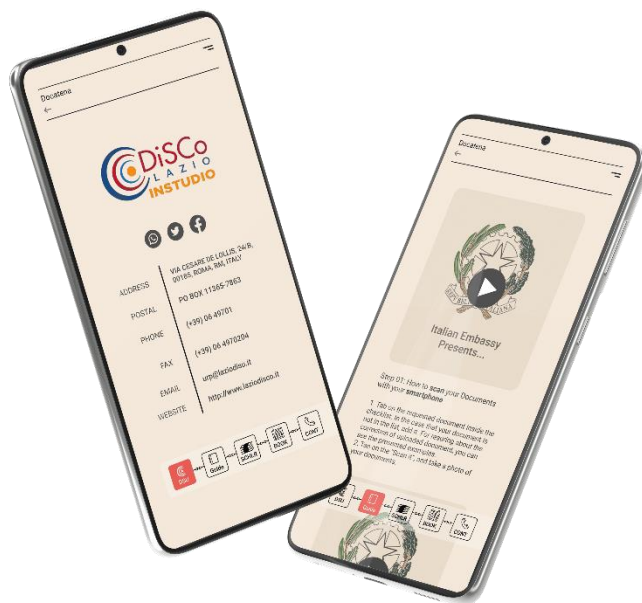


Figure 34: Laziodisco page and the tutorials

6.4 DSU office Information and Guidance to App

After the user selects their university, they automatically will be transferred to the page of DSU scholarship. The new menu was designed to guide the user through the process step by step. In the first step, the user can watch the video and read the structure of the app. For reaching to this aim, we need to record a video and upload them to the app.

6.5 Login/Registration

In this section, the user needs to register/login in order to upload their docs and asks for an appointment. Fast ways of going through the app, SPID, CielD and Apple account is designed.

In the registration part, for speeding up the process, it is asked the user to take a photo of their ID card or passport. After that, the information of user will be appeared automatically on the blank boxes. The user only needs to add a phone number and password.

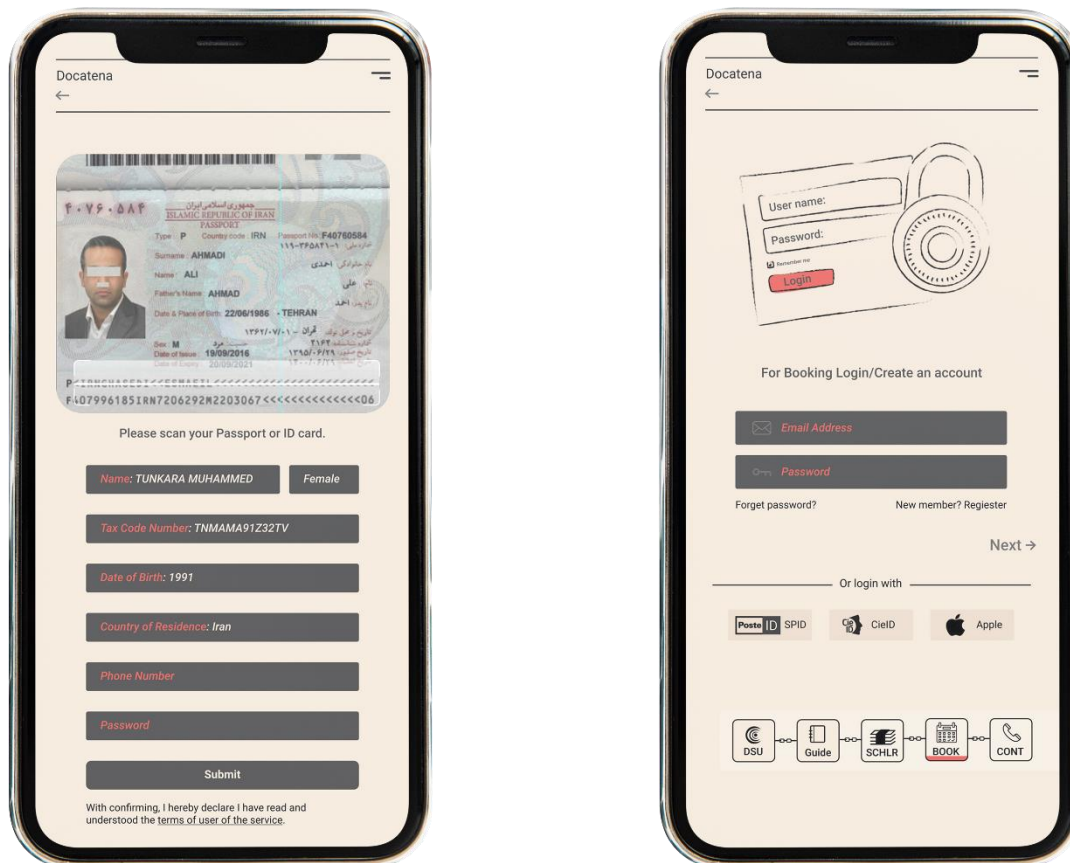


Figure 35: Login/Registration

6.6 Uploading Documents

As the user has chosen their university, the requirement docs are shown on the uploading page. The user can take a photo or upload a scan of their docs. Artificial intelligence gives the opportunity to check the demands stamps, signatures, and expiration dates. After that, the user can ask for an appointment.

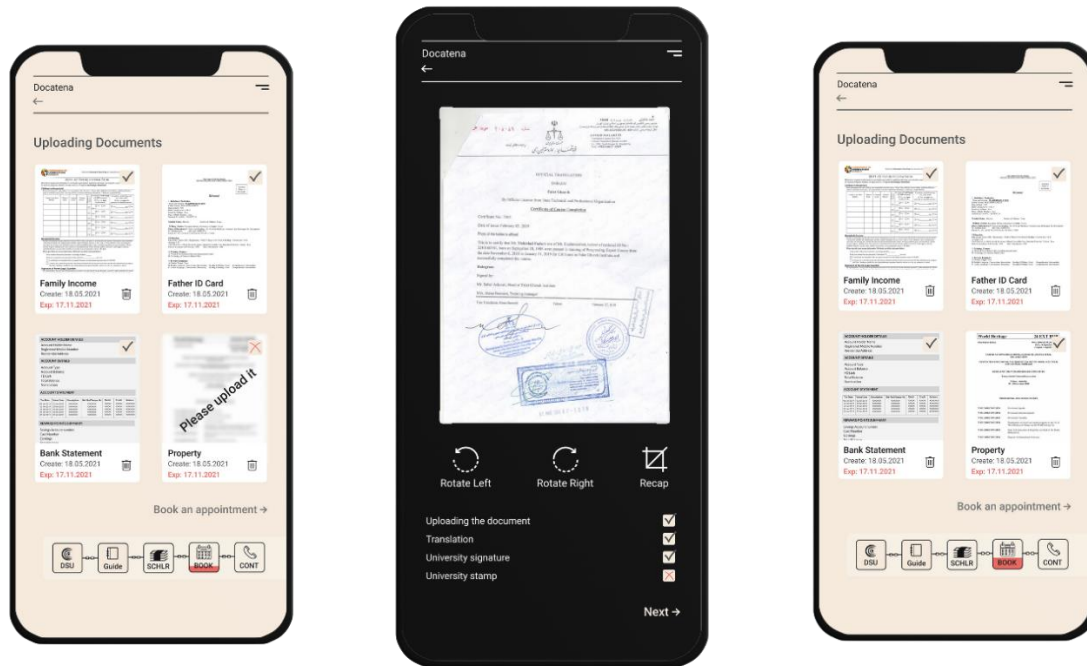


Figure 36: Uploading documents and checking the requirements

6.7 Booking an Appointment and Paying the Fee

In this part, the user can book an appointment. The availability of appointments is based on the region, university, and document expiry. Then the user can pay the fee by choosing their favourite currency and way of payment.



Figure 37: Booking and payment

6.8 Docs Statue and the Burger Menu

After the user sends the docs or gives them manually, they can follow the status of their documents and see whether one of them is rejected and why. Additionally, the user can change their appointment and download their appointment receipt by touching the burger menu at the top.

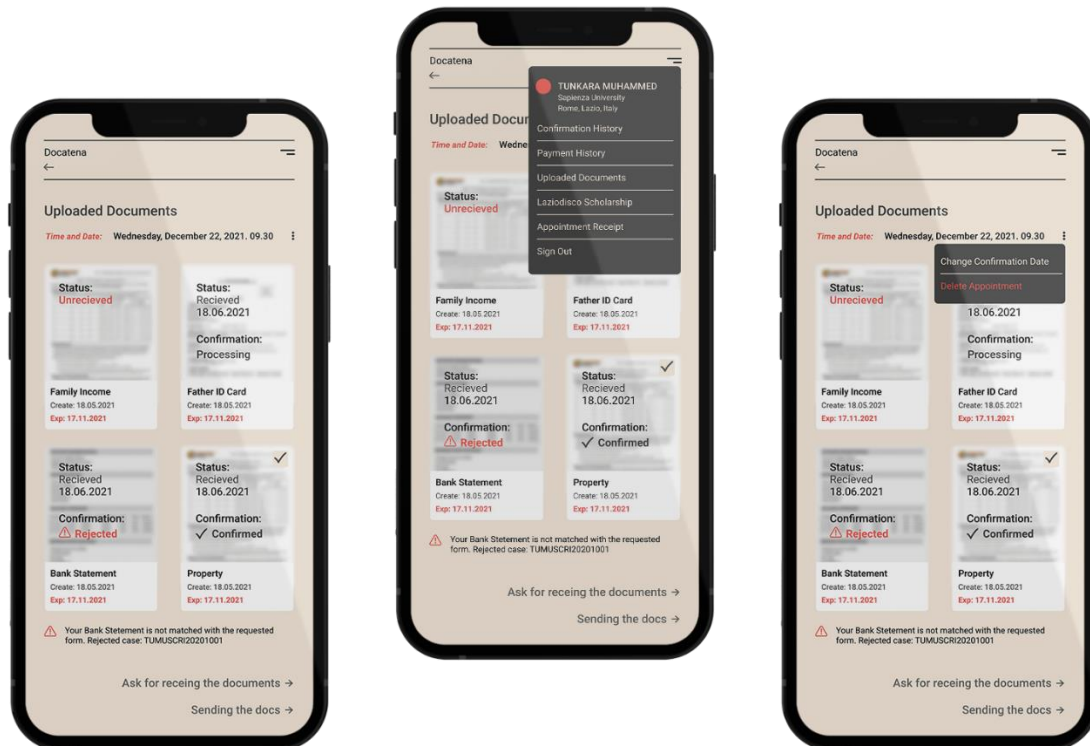


Figure 38: Document Statues

6.9 Receiving the Docs and Sending them Online

After confirmation, the user can request for receiving their documents by post or personally. Also, they can request the embassy to send online their confirmed documents to the offices in Italy.

In the end, the documents are always in the app and anytime the user needs them, they can send them online and directly.

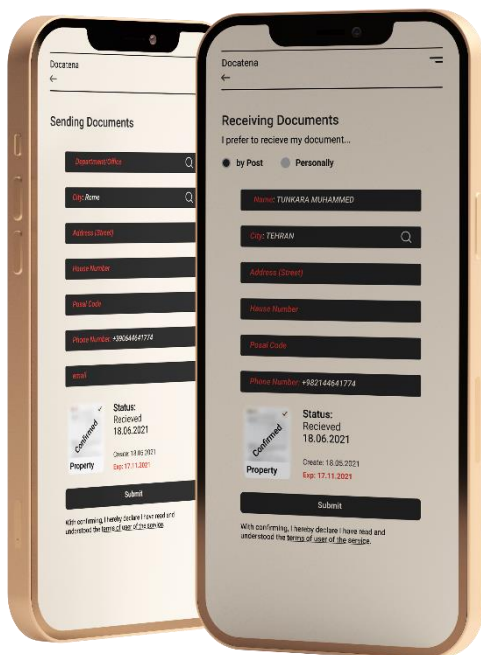


Figure 39: Receiving and Sending docs

6.10 Final Storyboard

The app gives the user the chance to confirmed remote and online, as it is presented below (see [Figure 39](#)):

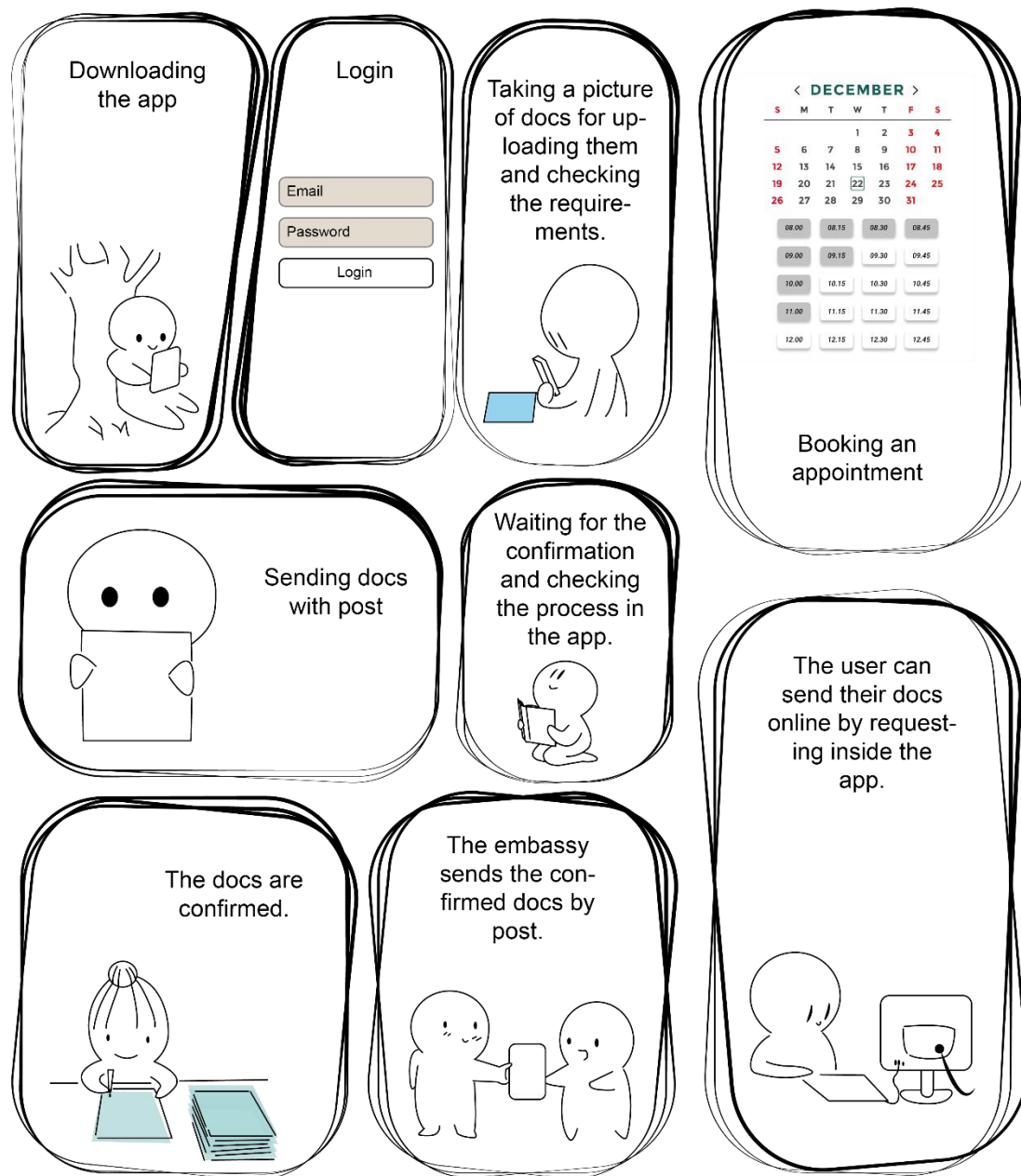


Figure 40: Confirmation Docs after introducing the service

Chapter 07: Conclusion

Although technology helps office tasks and face-to-face tasks to be remote and online, COVID-19 pushed this action to happen sooner. Unfortunately, these technologies, such as Blockchain, online storage and Artificial Intelligence are expensive, but it is worth reminding that Italy has top universities that can help to program them.

This thesis tries to introduce technology to one of the oldest sections in each country to make them modern and more functional. It is obvious that sooner or later, embassies need to change their old-fashioned structure and make peace with new technologies.

Also, it shows that in any transaction that trust, accountability, and transparency is essential, Blockchain can be one of the solutions. It prevents cybercrimes by providing a safe place for documents.

Moreover, post in Iran is reliable and functional as what we can find in EU but mostly be neglected by users and organizations. In 2017, Iranian authorities have changed the ID card and sent new cards to their clients by post. It underlines the safety of this service. Consequently, it was recalled being a part of the introduced service.

In the end, have the proposed solution will be solved the problem? Probably not! It was only a better solution for approaching this problem because in the real world we do not have a perfect solution.

7.1 Impact of Design Tools

During the research, emphasizing (observing and engaging) for understanding ill-defined/unknown problems (Wicked Problems, the problems that seem impossible to solve) was contemplated, which helps in forming the human-centric design. Due to this concept, most of the thesis is focalized on the understanding of the problem.

One of the characters of the Wicked problem is the difficulty of its beginning. For this step, by the aid of System Mapping and Blueprint, the information is broken down into nodes (parts of information such as objects, people, or concepts) and links (the connections and relationships between the nodes). This makes the research to the small parts for studying each of them separately. In the beginning, users have to deal with at least 5 different offices: official departments in Iran for collecting their docs, translation offices, exchange money offices, the embassy and finally the Italian offices. The defined service finally shorts down these offices to 3 by combining half of the process in the app.

7.2 Shaping the Idea

Businesses always looking for a big hit idea while connecting them with a winning idea is tough. As a result of this, it is necessary to examine the idea in each step and from the beginning for ensuring that it is on the right path. There are 4 ways that shape the idea:

- Simple idea: In this project, it is reckoned that the idea should not be complicated and needs to be simple so each person with a different level of education is able to communicate with it. The best way in this thesis was

improving and changing the existing services to create new uses and new markets for them.

- Clearly identified customers: From the beginning, defining the target users was the fundamentals column of this research. It lit the path for characterizing users' needs.
- The idea has a market: A service is acceptable in society if on the outside there is a big gap. For realizing this gap, we have talked to as many people as possible, especially those who were engaged with it.
- Benefits the customers: The basic principle of a successful service is something that users want. A user turns to a service or accepts to find an alternative when service truly solves a problem or that issue paralyse their lives. In this case, users need to confirm their documents to be able to work in Italy or receive scholarships. If they lost this chance, they would work in the black market for covering their expenses. Thus, in the end, this service can benefit users.

7.3 Examining the Success of Proposed Service

In the world of design and innovation, any project can be successful if it delivers: superior solutions, lower risks and costs of change, and employee buy-in (Liedtka, 2018).

- Superior solutions: For this project, centralizing users in the middle of every step and question leads to obvious, conventional solutions. Of course, it was considered that after some in-depth study of the problem, the next phase begins, unless it could cause the failure of the thesis. Also, to be sure that users would accept the app and communicate with it for fulfilling their needs, the selected technologies are picked up from the known and current ones.
- Lower risks and costs: The embassy spends plenty of resources for managing requests and reducing errors while their staff confirming documents. The proposed app deletes the requirement for new employees in the peak season. Additionally, docs are examined by the power of AI for their accuracy, so it decreases errors.
- Employees buy-in⁴⁵: A successful innovation idea has the company's employees behind it. In fact, the asked task from employees ought to be clear. In the case of confirmation, in lots of time staffs who have to communicate with users for receiving documents have to deal with questions, which their answers are unknown for them. For omitting this problem, the whole information is submitted inside the app, so the staff does not need to handle various issues.

7.4 Further Research

This article is focused on one of the small tasks that the Italian embassy is doing every day. Great deals of tasks are in the embassies that need to be considered and changed for reducing resources and energies. Also, because most

⁴⁵ 'Employees buy-in is when employees are committed to the mission and/or goals of the company, and/or also find the day-to-day work personally resonant. ... Buy-in promotes engagement and a willingness to go the extra mile on the job' (Employee Buy-In: Definition & Explanation, 2021)

of these tasks are repeatable, they make staff exhausted, and their functionalities are reduced. Therefore, it is essential that embassies move more and more toward online and remote working.

The app which was designed for the embassy can be expanded to other parts as well, for example, different types of visas.

7.5 Vision

A great idea needs to be sustainable. For this aim, they have to have a vision. It shows that in five years how would the service be. It believed that in the next five years, the Italian embassy would have enough information about people who immigrate to Italy, can protect this information and finally immigrants would not need to travel between their home country and Italy. Additionally, Italy can manage the documents based on their rules.

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