Business Challenge

In collaboration with:

Analysis of a Real Case:

Fleder

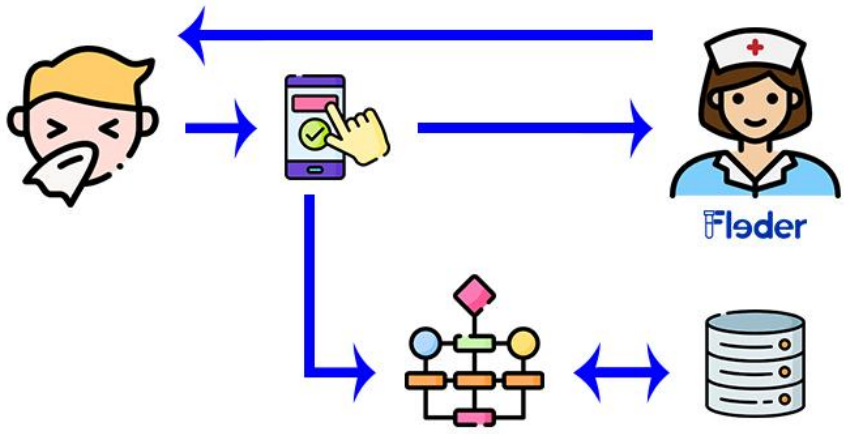
Table of content

Introduction

As the subject for this project, we chose to analyze a start-up in Milan with whom we had contact. The choice was driven by the desire to get involved with a real case study. In this way, we analyzed the real issues a start-up may face and created a report useful beyond the Business Challenge.

The Startup

The company we are talking about is called **Fleder**. Fleder deals with home care services. They differ from their competitors in that, based on their booking system, an algorithm that allows them to optimize the nurses' route to maximize daily services and afford competitive prices. The core of the start-up is their application, which allows users to book the visit themselves, choosing the services, day, and time slot. In addition, via a back-office section, admins can manage bookings, create new ones, check routes and much more. Since the released of the app was not too much time ago, the scope of the service is limited to Milan, although, given the strong scalable component of the infrastructure, it will not be difficult to extend to new areas and cities.



Fleder's operation mode.

Actual State

Although the project has been running for about a year, the application was released about three months ago, receiving discrete results, especially following an advertising campaign by a well-known influencer. This youthfulness on the one hand allowed us to work with a large margin for changes, but on the other hand provided us with little data on the actual performance of the company, and with a lot of uncertainty regarding estimates for the future.

Project Phases

1- Choice of roles, group name and project topic

In the first meeting we chose which of the five business cases we wanted to work on, and eventually we opted for integrated planning; once this was done, we also decided the name of our working group (PLASM from the initials of the participants - Paolo, Lorenzo, Andrea, Steffania and Michele) and the logo. Finally, we divided the roles based on the strength points of the various members of the group.

As a result, our team has the following characteristics:

Name: **PLASM**.

Business case: **integrated planning**.

Roles:

- **Team Leader**: Andrea Napolitano
- **Mockup Designer**: Michele Velardita
- **Solution Developer**: Paolo Andriani
- **Business Process Analyst**: Lorenzo Parra
- **Marketing Manager**: Steffania Sierra Galvis

2- Collaboration with Fleder and the meetings with the start-up's member

As proposed by the leader, who had contact with the start-up, we decided to collaborate with them, by including their current problems as the fulcrum of the project. In this regard, we held a couple of virtual meetings with Fleder's representative, to understand his opinion regarding the company's performance, their objectives, and the main problems the company is facing.

After, we discussed about how we wanted to divide the tasks, such that all members had to do more or less the same amount of work, but at the same time everyone could work in the field in which they have the highest expertise, based on previously chosen roles.

3- Project development

After the definition of the roles and the assignation of the tasks, each member started his/her own part of writing the report. This was the only part of the project where the work was individual, but we continue giving feedback for each section of the report.

For each problem identified by our group, Lorenzo made the analysis as a first step, then Paolo described the solutions found and Michele proceeded to create the mockups for them. Steffania conducted the entire development of the marketing problem independently, as she is the marketing manager of the team. Despite the marketing problem was done independently, Steffania used as guide the drafts of the other problems created by her colleagues. Finally, Andrea tied all together by creating the report, writing the introduction and conclusion so that the work was as homogeneous as possible.

4- Final Preparations and presentation

When the main work was finally finished, in the last available days, the members of the group further divided the remaining tasks between them in order to make everything presentable in the form of a project: Andrea and Steffania took care of creating the powerpoint presentation, Lorenzo described the various phases of the project , Michele chose and described the KPIs, and with Paolo's help they finished implementing the solution and the mockup for the automated management problem, which was by far the one that required most work.

Problems Found

Marketing Management

Marketing and promotion of the offered services play a key role in the success of a company. That is why a good marketing strategy and planning must be implemented. Although start-ups usually have limited resources at the beginning of their operations, the marketing strategy cannot be neglected, so it is necessary to think of an inexpensive way to promote their services.

The organizational chart and the business model of Fleder indicate that the company's marketing campaign will be done in two ways: offline and online, however there is not a detailed marketing strategy and plan to follow. Therefore, in this section the marketing manager of the team seeks to further conduct a deep analysis of the problem and try to propose several feasible solutions according to the mission and budget's company.

Successful marketing management requires a strategy and a plan. Since both phases are linked, to develop each one is necessary to look internally and externally of the company, this means that the marketing manager should understand the mission and vision of the company, the value proposition, and the market where the company pretends to entry.

Marketing strategy

The marketing strategy is an extension of the business strategy and informs future marketing decisions. It outlines the promotional objectives, and details how these can be achieved through marketing efforts. As mentioned above, Fleder is a start-up that offers home healthcare services through an app that allows the type of service required to be booked at the most convenient time for the user.
The marketing strategy has four components: the company's vision and goals, a market analysis, the branding and messaging, and the marketing channels study.

A marketing strategy is aligned to the company's vision; therefore, it should be clear to the marketing manager since the beginning. The second step is to conduct a market analysis that answers which is the size of the market in terms of the number of potential users, how many businesses are in this market, how much revenue does the industry generate, what external factors can modify the way in which the industry operates, which are the entry barriers the business can face, the market gaps, which is the target market, between others. Branding and messaging correspond to the visual attraction and coherence of the logo of the company with its product. Finally, the marketing channels study provides information about the possible channels that can be used during the campaign.

Company's vision*/ goals*

Fleder's vision is to bring health support in short time and accessible price to many Italian citizens.

Market analysis

Fleder's services belong to the industry of sanitary services, in the subcategory of digital health care. This analysis starts understanding the Italian health care system, its structure and its efficiency.

To begin with, the Italian national health system (SSN) is the system that guarantees the sanitary support and the base assistance to each citizen. It is a decentralized organism divided in three levels: *livello centrale* assigned to the State, the *livello regionale*, formed by each region, and the *livello locale* corresponding to the health institutions. The government allocates part of the general tax revenue to healthcare, defines the healthcare package, and exercises a stewardship role. Each region is responsible for the organization of the health service through the public and the accredited private hospitals. In 2020, hospital care made use of 1,004 care institutions, of which 51.4 percent were public and 48.6 percent private accredited. Facilities providing residential territorial care are mostly private (83.2%), as are those providing semi-residential territorial care (71.7%) and rehabilitation care (78.2%). In contrast, facilities providing other territorial care are public (86.9 percent)[1].

[1] https://www.ansa.it/canale_saluteebenessere/notizie/sanita/2022/07/26/in-italia-1.004-ospedali-il-486-e-privato-accreditato_58aa93a3-71eb-476b-bcc0-390bfa1698ed.html

Home care is a service provided by the *Livelli Essenziali di Assistenza* (LEA) with the aim of responding to the health needs of frail people in general, thus non-self-sufficient individuals, the elderly, the disabled, and minors who require care at home on a temporary or protracted basis, for the purpose of managing chronicity, preventing disability, and improving quality of life. This service includes medical, rehabilitative, and nursing treatments necessary to stabilize the clinical picture, limit functional decline, and improve the patient's quality of life[2].

The last report provided by the European Union about the State of Health in the EU in 2021[3] mentions that Italy is the fifth country with the highest expectative of live, and the first country with the highest quantity of elderly population between 65 and 85 years old, with 188 people of at least 65 years for 100 young people of less than 15 years. From these statistics and other factors, some public and private hospital institutions started to offer a similar service to home care that aims to help at the patient's home by health professionals, from nurses to staff in charge of taking blood tests.

In the last two years the health industry experienced a big challenge because of the pandemic. Covid-19 changed in some way how the sanitary industry worked. Sanitary services were not available in place and only fragile people were prioritized, while the others had to take care of themselves in their houses. Furthermore, Italy witnessed from the beginning of the pandemic one of the highest rates of affectation and mortality due to the high percentage of elderly people. This strengthened the home delivery of different health services, and this is where the idea to create Fleder was born.

There are already several companies offering the same service. Some of the competitors are the SSN and private medical centers such as SantaTecla. Also, private companies such as Infermierajay, delivery care srl, infirmieristica, prelievo a domicilio, and privatassistenza. Most of these companies have integrated the service on their website. And this is where Fleder starts to make a difference, as it provides this service through an app, free to download and without third party contacts or phone calls to book.

The category of digital health services in Italy has been little studied, and it is possible to find only a few digital caring services' statistics about the size of the market and the revenue of this one. One of these reports was released by Confindustria[4], and it says that in January 2022, there were 34 start-ups and 28 innovative small and medium-sized companies in the home & digital care sector.

From this market report we can conclude that our target users are elderly, and the digital health services market is our target market.

---

[2] https://www.vidas.it/storie-e-news/cose-da-sapere-assistenza-domiciliare/

[3] https://health.ec.europa.eu/system/files/2021-12/2021_chp_it_italy.pdf

[4] https://www.confindustriadm.it/il-settore-in-numeri/

Branding and messaging

Fleder currently has the following logo and color palette which is closely related to the type of service offered.

Relevant marketing channels

Influencer Marketing, Word of Mouth Marketing, SEO, radio, TV, journals, fliers, and posters.

With the marketing strategy in place, we can differentiate between two types of marketing to be carried out. One to attract more clients, which we will call demand marketing, and the second to attract more medical personnel, which we will call supply marketing.

Demand Marketing Plan

It is the guide that specifies how to put the marketing strategy into practice. It is an action plan that details how the company will implement the promotional activities, thus answering questions such as how, where, when, and how much. The sections it includes are:

Segmentation, Marketing & Positioning

Demographics: person with age above 60 years old, of any sex, education, profession, and living in Milano.

Psychographics: his/her priorities are to care of himself/herself in the most autonomous way possible, avoid frequenting hospitals and laboratories where the risk of contracting a virus is higher.

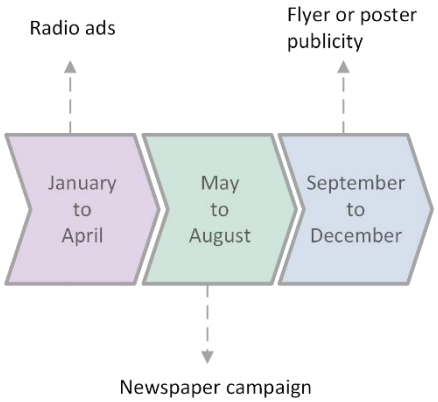
Lifestyle traits: it's a person that because of her/his health conditions cannot move freely and therefore has a sedentary life. With no specific entertainment preferences, and non-work activities.

Behavior: no specific behavior.

Marketing Mix

Fleder's Technology Marketing Mix	
Product Fleder's Technology app	**Price** The price depends on the service. Our services range between --- in price to the consumer
Place The app is available on the app store to download for free.	**Promotion** Fleder Technology relies on the following promotional channels: Radio segment Journal ads: depending on the budget, consider the publicity in a daily or periodic newspaper. Posters close to places usually frequented as supermarkets, pharmacies, laboratories, hospitals, and doctor offices.

Timeline for delivery



Budget

MARKETING ACTIVITY	STRATEGY	BUDGET
Radio ads	Paid publicity of 30" in a local radio of Milano.	From 150€ to 300€.
Newspaper Campaign	Posts on the two types of newspapers: - Quotidiano - Periodico	480€ to 1000€.
Flyer publicity	Delivery of 5000 fliers in different places of the city.	Fliers: from 50€ to 100€. Delivery: from 50€ to 100€.
Poster Campaign	Fix posters on places as: - Supermarkets, - Pharmacies, - Hospitals.	Up to 2000€.

Offer Marketing Plan

We listened to the opinions of those who work at the start-up and have a more specific knowledge of the problems that afflict it, according to what was reported, the biggest problem encountered was the lack of healthcare personnel willing to collaborate with the team.

For now, the app's operating area is extremely limited (a fraction of Milan), despite this, it is difficult to find enough staff to satisfy the requests received, especially if they are services requested for the same day or the next one; this phenomenon

has been attributed to the lack of popularity of the app itself, as a valid alternative to the normal service provided in the hospital.

This turns out to be a crucial point for the team because it represents a big problem for the economic part (missed profit opportunities), but also for the reputation of the app itself which can be seen as unreliable by customers.

The solution identified is to increase the popularity of the app through the distribution of flyers within healthcare facilities, carrying out a marketing campaign both from the point of view of demand, by distributing flyers to waiting people, and from the offer, by advertising employment opportunities for healthcare personnel. Fleder's job offer is aimed at young nurses looking to increase their monthly income, so a targeted marketing campaign is vital in encouraging them to work for the start-up.

Segmentation, Marketing & Positioning

The professional to who is directed this marketing campaign has the following characteristics:

Demographic: people of more than 25 years old to approximately 50 years old. It is a sanitary professional, a nurse or doctor living in Milano. Depending on the service that wants to provide, specific educational requirements are asked.

Psychographics: considers that treatments should be easily accessible to elderly people, persons with reduced mobility or any person with difficulties to move. He/ she does not care about having a physical office and wants to obtain a better salary for his/her job.

Lifestyle traits: none specific.

Behavior: none in specific

Marketing Mix

Fleder's Technology Marketing Mix	
Product Fleder's Technology	Price It has no subscription fee for medical workers
Place The app is available on the app store to download for free.	Promotion Fleder's Technology relies on the following promotional channels: Flyers closed to universities, hospitals and Social media ads

Flyer Mockup

The study conducted by a research team of the university of Aarhus [1] reveals that decliners compared to receivers are less price conscious and that they perceive flyers as more inconvenient and less useful. Although decliners use other media less for deal searching than receivers, they are more inclined to search on the Internet.

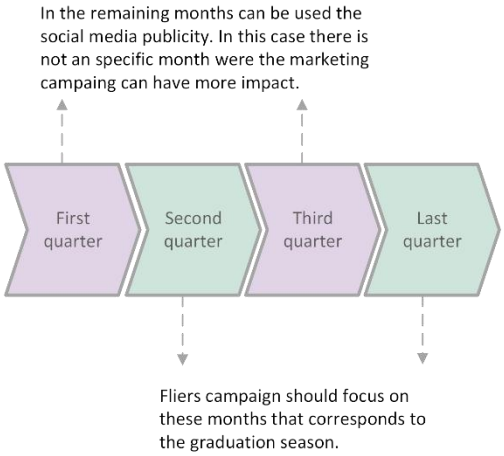
Another study conducted by the university of Parma in collaboration with the university of Almeria and the university of Bologna [2] show that flyer distribution and flyer readership do not seem to change purchase behavior. However, they confirm that flyer proneness, loyalty to the retailer, subscription to its newsletter, and household size all positively contribute to the likelihood of flyer readership. Their findings thus call upon retailers to significantly revise their flyer distribution strategy and reconsider the role of store flyers within their communication and marketing strategies.

After reviewing the studies conducted, it was decided to focus on the quality (rather than quantity) of the interactions, in order to increase the possibility of attracting more health workers and improve sustainability.

Flyer mock-up

Regarding environmental sustainability, it was decided to rely on a social enterprise called "Out of the Blueprint"[3]. Their specialty is sustainable, eco-friendly and affordable print (they use rice ink, recycled paper and 100% organic cotton). They support young artists to fulfil their creative potential as a side project.

Timeline for delivery



Budget

MARKETING ACTIVITY	STRATEGY	BUDGET
Social media ads	- Paid stories - Paid posts on IG.	Up to 500€ per a bunch of stories in one day.
Flyer publicity	Posts on the following places: - Universities, - Hospitals.	Price 5000 fliers: from 50€ to 100€ Delivery: from 50€ to 100€.

Lack of automatic management of corporate resources

Another problem encountered was related to the management of the healthcare personnel working for the app. At the time of the interview with the start-up representative, each request made by the customers was managed manually by a member of the team. This solution may be acceptable in the testing phase of the app, as long as the volumes remain limited, but if an increase in these volumes is expected in the future, it is impossible not to implement an automatic mechanism to manage healthcare personnel and service requests.

Even if this is not currently the most crucial problem according to the startup members, it is still a big one that needs to be solved, before even thinking to enlarge the range of the app to the entire city of Milan, because managing personnel and request become exponentially more difficult as the number of people that are using the app increase, and it is already a problematic aspect with the current volumes.

Furthermore, it is currently the most time exhausting aspect to make the app work, so, with this solution implemented, all the time spent by the team members on this aspect could be used to solve the other problems; these are the reasons why we decide that solving this problem should be our focus for this project.

Solution Found

The identified solution is an IT system that automatically manages the entire organization of the company to carry out the analysis activities at home.

The first step is to receive customer reservations through the app, the information requested will be the day, time of the visit and the type of analysis to be performed. To ensure that the staff is used in the best viable way, at each worker is assigned a certain number of analyses to do and a path to follow to optimize the travel time between one house and another, all this will be done automatically by the system considering the distance between the client's homes and the traffic at that time of day. In the app used by the staff there will be a list of the analyses they will have to perform that day with a map indicating the fastest route to reach the patients' homes.

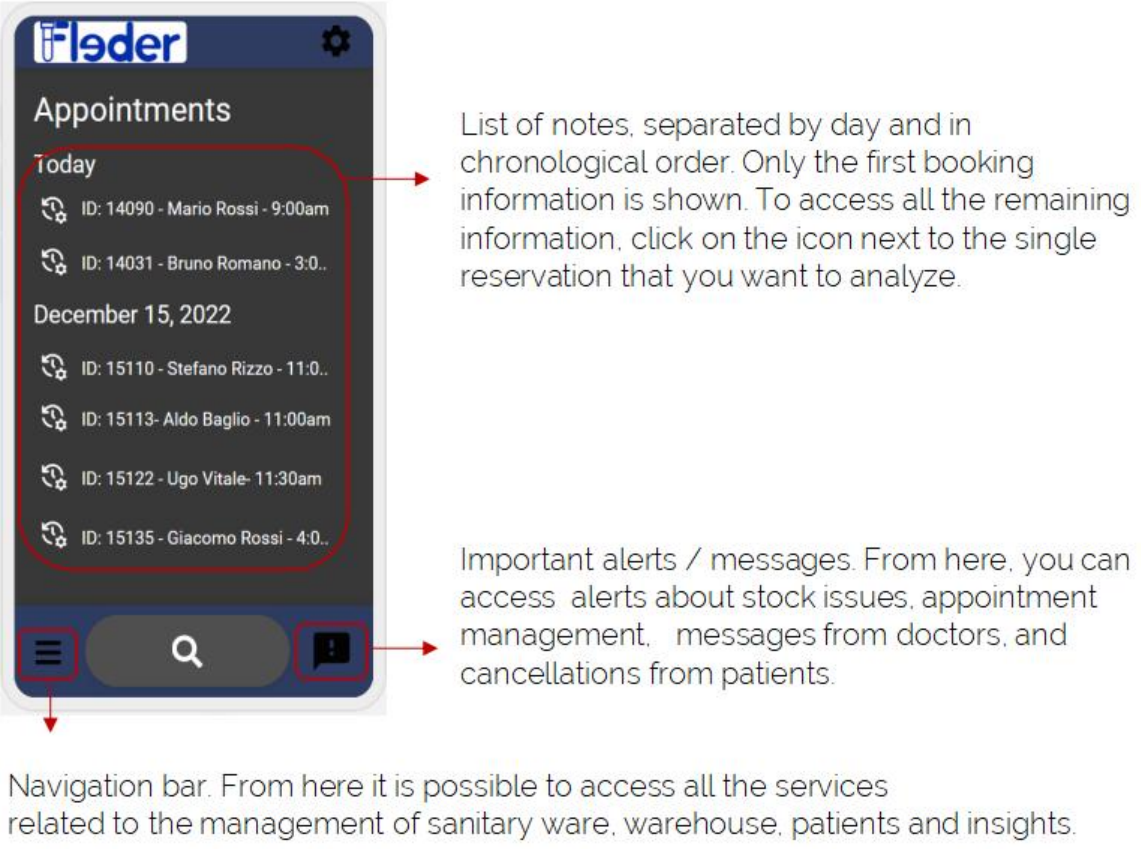
Healthcare personnel need a kit containing the material suitable for the type of analysis that must be performed during the day; each kit is different and must be prepared knowing the type of analysis to be performed. In the warehouse's system, there will be a list containing all the kits to be prepared for that day and the name of the staff member to be supplied to. This list is created using the performance scheduling explained above. Once arrived at the warehouse, the

member of healthcare staff will have to use a QR code present in the app to identify himself and collect the kit.

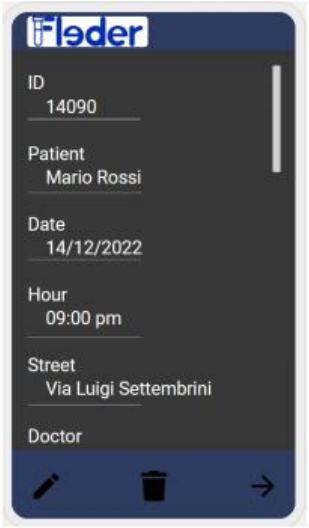
The integration of such a system also allows automatic management of the warehouse, replenishing it according to needs and the number of bookings. (a future application could be a predictive algorithm which, based on data recorded in the past, reveals patterns in bookings and consequently adapts to them for warehouse management).

Mockup

The mockup of our solution is presented below for illustrative and explanatory purposes.

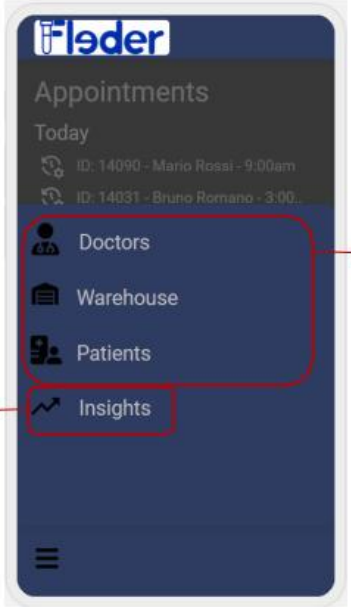


Icon to be able to access all the details relating to the reservation



List of all information relating to a single reservation. Each is associated with a unique ID number, patient details, date and time of the service requested, the street and the doctor who will carry out the visit. From here you can edit individual information or manually delete the appointment.

All the insights useful for management. Here you will also find the operation KPIs to keep track of the startup's progress and monitor the effectiveness and quality of the algorithm.



List of doctors, necessary examination kits and other inventory materials, patient lists. it is possible to manage and edit the information relating to each field.

Implementation

To implement a computer system of this type, it is first necessary to have an infrastructure used for hosting the service. A server is needed with a database hosted on it, where the reservations made by customers and all the information necessary for the functioning of the activity will be saved, such as the doctors you have available and the supplies in the warehouse.

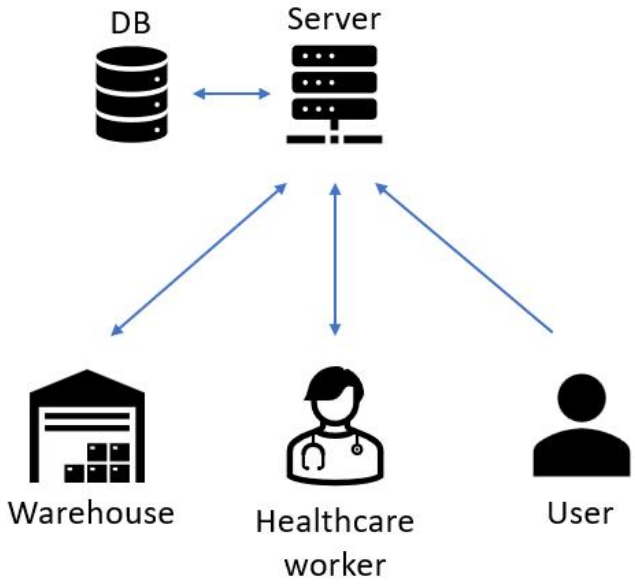
There are many possibilities for infrastructure implementation, for example we could use a cloud base server, like Amazon EC2, for outsourcing all the hardware for the server. This offers high reliability and cuts down the price of maintenance, with cloud server is the provider who takes care of the server and ensures a minimum functioning threshold of it. The starting price is reduced because it's cheaper to "rent" the infrastructure instead of buying it all.

The automatic doctor management system will be installed on the server which, working with the data contained in the database, will divide the work to be performed by the various healthcare personnel. For warehouse management it will be necessary to use the QR codes applied to the products, to keep track of the supplies used in the kit preparation operations. To scan the QR codes, a phone with the warehouse inventory management app installed will be used.

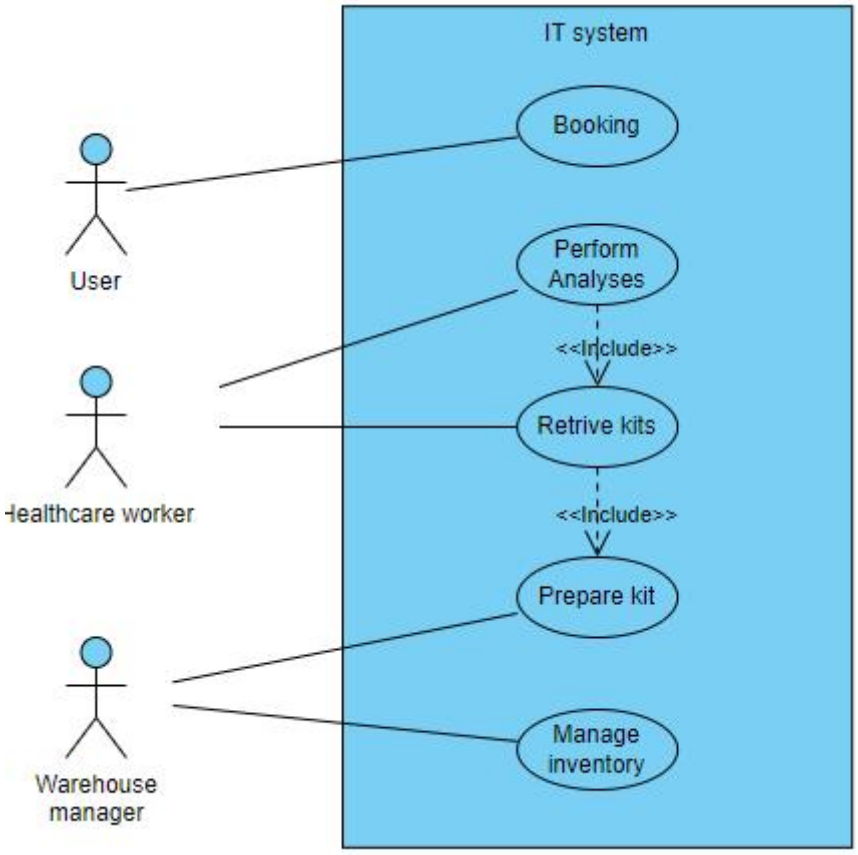
The software part comprehends an application that will be used by customers to make reservations and by healthcare personnel to see the analyses they have to do during the day; for the warehouse management part, it is necessary to develop an app that presents the operator with the kits to be prepared for the day and to keep the inventory of the supplies. The last thing that is needed to implement is the automatic management system and all the structure necessary to make the various parts of the system communicate and function.

In this case we can take several approaches to the development of apps. For cutting down cost we could use a hybrid approach where we build a single web app for users, instead of doing one for IOs and one for Android, that is easier and faster to develop with the disadvantage of having reduced app performance. For the management apps it is better to stick with a native approach given that we can chose what hardware to use and, since warehouse management requires more hardware resources, we can develop an app that performs better than a hybrid one.

To estimate the total cost of the implementation, many variables must be taken into consideration. Without an analysis of the existing infrastructures in the field and a precise direction on the complexity and with what technologies it is to be developed, it is impossible to give a precise cost estimate, a plausible price range for the development is around 5,000 to 50,000 euros.



Infrastructure diagram



Use case diagram

Collecting feedbacks

A problem that most new apps have in common is the collection of customer feedbacks, a mechanism that serves both as an insurance for future customers of the validity of the app, and as a means for developers to understand the strength points of the app (very useful during marketing processes) and the weak points that need to be reviewed.

In our specific case, most people don't leave any reviews, but those who do always leave very positive ratings (almost all reviews are 5 out of 5 stars), which is another reason why we should try to collect as many as possible.

Solution Found

One simple but efficient solution that we found to this problem is to incentivize the customer to leave a review by offering them a discount for their next booking. An approach of this type is much more effective and allows you to "retain" the customer who will be much more inclined to use the service again.

KPIs

KPIs are especially useful to get an idea of how implemented solutions are impacting the company. Below are those that are thought to be the most useful for monitoring company performance.

Fleder KPI	Description
MRR	Monthly Recurring Revenue
ARR	Annual Recurring Revenue
ARA	Average Revenue per Account
MAU	Monthly Active Users
CRR	Customer Retention Rate
NPS	Net Promoter Score
NFS	Net Flyer Score
PCR	Patient Coverage Rate
RCR	Reservation Coverage Rate
PCA	Path Calculation Accuracy
MPV	Monthly Performance Variance

Financial KPI

MRR - Monthly Recurring Revenue
They are revenues that a company can count on every single month (in other words, a predictable income). It can be used to track all recurring revenue over time in monthly steps.

ARR - Annual Recurring Revenue
It is the same as the MRR but on an annual basis. in this way it is possible to make a comparison between the various monthly and annual revenues, to understand in which period the activity was more profitable and which decisions could influence the economic trend.

ARA - Average Revenue per Account
Provides a measure of average monthly revenue per (active) customer. Together with the other financial KPIs it is very useful for making decisions concerning price management. It is calculated with a simple arithmetic mean.

Client KPI

MAU - Monthly Active Users
Provides the number of monthly active users, i.e., the number of subscribers who have made at least one booking during the month.

CRR – Customer Retention Rate

It measures customer retention and, consequently, can be an indicator of the quality of the service offered and customer satisfaction. It is calculated as follows:

$$\frac{MAU}{N}$$

Where *MAU* is the Monthly Active Users KPI, and *N* is the total number of subscribers.

Marketing KPI

When registering on the platform, the customer will be asked how he managed to reach Fleder (via flyers, word of mouth or otherwise).

NPS - Net Promoter Score
It measures the number of new Fleder monthly subscribers based on word of mouth considering the total number of new monthly subscribers.

NFS - Net Flyer Score
It measures the number of new Fleder monthly subscribers based on flyers advertising considering the total number of new monthly subscribers

Operating KPI

PCR - Patient Coverage Rate
It measures the ratio between the number of (active) patients subscribed to Fleder and the number of doctors available. It is very useful for predicting in the following months any problems related to the impossibility of satisfying all the patients' requests on time. It is calculated as follows:

$$\alpha - \frac{N_p}{N_d}$$

Where α is the pre-established and desirable number of patients for each doctor, N_p is the number of patients and N_d is the number of doctors.

RCR - Reservation Coverage Rate
It measures the ratio between the average number of bookings in a month and the number of doctors available. It is useful for monitoring the coverage of requests in relation to the number of healthcare workers. Like PCR, it's the difference between the desirable number of reservations for each doctor and the real number of reservations for each doctor.

PCA - Path Calculation Accuracy
It measures how accurate the algorithm is in calculating travel times. It is calculated as follows:

$$|\mu_t - \mu_p|$$

It is the absolute value of the difference between the arithmetic mean of the real travel times and the arithmetic mean of the travel times predicted by the algorithm. A value close to 0 indicates an excellent prediction by the algorithm.

MPV - Monthly Performance Variance
It measures how the number of health services are distributed among doctors. It can give a measure of how well the algorithm works, that is, if the users requests are well distributed among the available doctors. It is calculated as follows:

$$\sqrt{\frac{\sum_{i=1}^{N} (x_i - \mu)^2}{N}}$$

Where N is the number of doctors available during the month, x_i is the number of health service performed by the i-th doctor and μ is the arithmetic mean between the number of services performed by each doctor.

If MPV assumes too large values then the values of the distribution are dispersed, i.e., the requests are not equally distributed among the doctors. A value close to 0 indicates an excellent distribution of requests.

A Green Approach

Fleder already has an eye on the environment, in fact, to pollute less, they have decided that the only means they use to reach their patients is by moped. Although one might think that this choice does not have a major impact on the environment if one considers the use of this service in busy areas such as Milan, one can see how a car stuck in traffic would pollute much more than a more minute vehicle such as a moped.

In addition to this, the use of an algorithm that optimizes the route allows the vehicles to travel as little as possible and thus minimizes consumption and, consequently, pollution.

From our side, we also have thought about the environment during the ideation of the solutions, in fact, as we already said previously, for the only solution that can have a negative impact on it, the flyers, we decided to use eco-friendly and affordable print based on rice ink, recycled paper and 100% organic cotton.

Conclusion

The work carried out in the group was difficult but stimulating, studying the problem and understanding its various facets was a difficult job but, thanks to the different technical skills of the members, it was possible to complete it. It was an activity of analysis, deepening and study of the problem which purpose was to find an innovative solution. A great opportunity was to learn new techniques in the managerial and economic fields and to approach a modern working environment. Furthermore, the opportunity to participate in a university project such as the Business Challenge was undoubtedly a further added value of the work.

The work carried out laid the foundations for being able to integrate an innovative and data-driven model of integrated planning within the start-up Fleder that aims to increase the size of the start-up by projecting it into a larger corporate view. The solution proposed allows the start-up to scale quickly in a larger perspective allowing to increase both the quality and the reachability of the service.

However, more checks and field tests of the proposed solutions will be necessary to integrate them within the Fleder business model.

References:

[1] https://www.sciencedirect.com/science/article/pii/S096969891300088X

[2] https://www.sciencedirect.com/science/article/pii/S0969698921002915

[3] https://outoftheblueprint.org/