UNIVERSITY OF TRENTO

DEPARTMENT OF
INFORMATION ENGINEERING AND COMPUTER SCIENCE

COURSE OF "**INNOVATION AND BUSINESS IN ICT**"
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1. Executive summary

About 1% of the entire world population suffers from celiac disease, a chronic autoimmune disease that causes the body's immune reaction to the intake of gluten: a protein complex present in many cereals, such as barley, wheat and rye.
In celiac patients, eating gluten triggers an immune response that affects the small intestine which, in the long run, produces inflammation that damages its fundamental structures[1].

They must therefore pay close attention to the foods they eat to avoid running into these risks. Among the many problems they have to face, they have to waste a lot of time when shopping to check the absence of gluten in foods. Reading the labels of all the ingredients is a long but necessary procedure they repeat every time they go shopping, as the ingredients can change without notice from the manufacturer[2].

By interviewing people with celiac disease and analyzing their problems, we thought of a solution that could help them in everyday life, allowing them to immediately understand whether a given product can be eaten or not, saving much time compared to manual research.

Furthermore, the absence of well-structured services on the market that offered a solution to the problem similar to ours and the satisfactory response from potential customers, pushed us to delve into our proposal in more detail.

In the following document we will define our solution and will illustrate the **validation** of the **customer**, the **problem** and the **solution** itself.
We will continue with the **business model**, the **analysis** of our relevant **market** and the existing **competitors** and the **financial plan**, which certifies the sustainability of our solution.

2. Problem, validation and target segments

When creating a successful business idea, one should start thinking about the problem to solve and its related customers, not the solution itself. Following this approach, the first section of our report details our efforts to define the problem and customers and validate them before progressing to the solution.

2.1 Initial CP Hypothesis

Nowadays, we have too many things to do and not enough time for them, and we often take away time destined to ourselves in order to complete the things that *need* to be done. Workers from different parts of the world all lament a general lack of time[3] and the same can be said about students that "often manage their time poorly and study very little"[4]. Such lack of time is translated into less and less time spent cooking, which results in lower cooking skills[5], and an increased use of convenience foods instead of preparing everything from scratch[6].

Our business idea has been inspired by the aforementioned problems, leading us to further explore them. In particular, we wanted to focus on the following problems:

- The lack of time for cooking;
- The lack of experience, which leads to the inability to prepare complex and more balanced meals and to the lack of recipe ideas.

Starting from these problems, we drafted two ideal groups of customers:

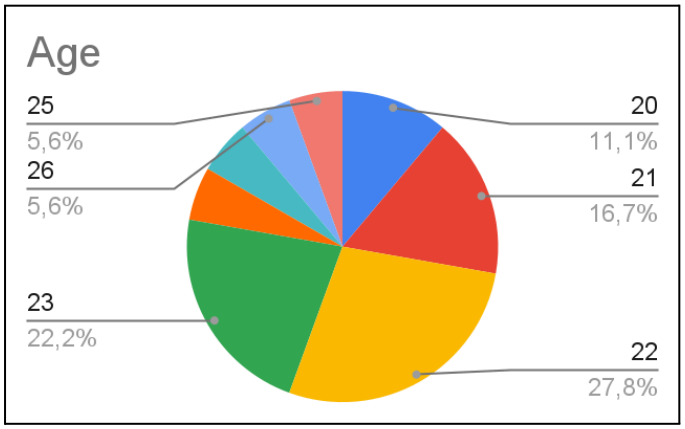
- Sports people that want to monitor their nutritional values;
- Students or workers who live alone and lack cooking experience, recipe ideas and knowledge on how to use the available ingredients.

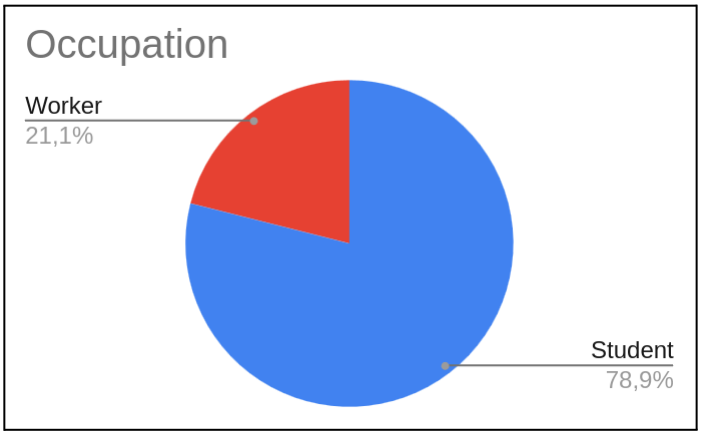
2.2 First round of Validation

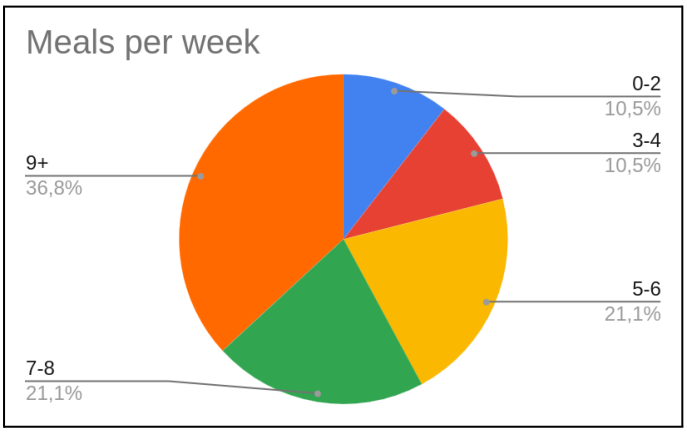
After having defined the problem and its potential customers, we made **35** interviews of students and workers in order to understand whether they actually faced these problems and as such validate or refute our hypothesis. The interview has the following structure:

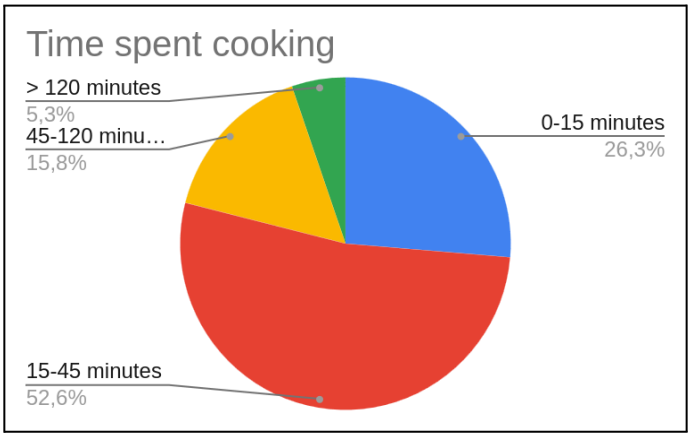
1. How old are you and what do you do for a living?
2. During the workdays, how many meals do you cook yourself?
3. How much time do you spend cooking each of these meals?
4. Do you cook simple or advanced meals?
5. Do you enjoy preparing your meals?
6. Are you satisfied with the results?
7. Do you have problems finding new recipes to prepare?
8. Would you be happy if you had more variety in your meals?
9. Are you able to take advantage of the ingredients you find in your fridge?
10. Do you try to keep a healthy diet?
11. What are the main problems you face regarding your cooking habits?
12. How do you think that a product might help you with cooking?

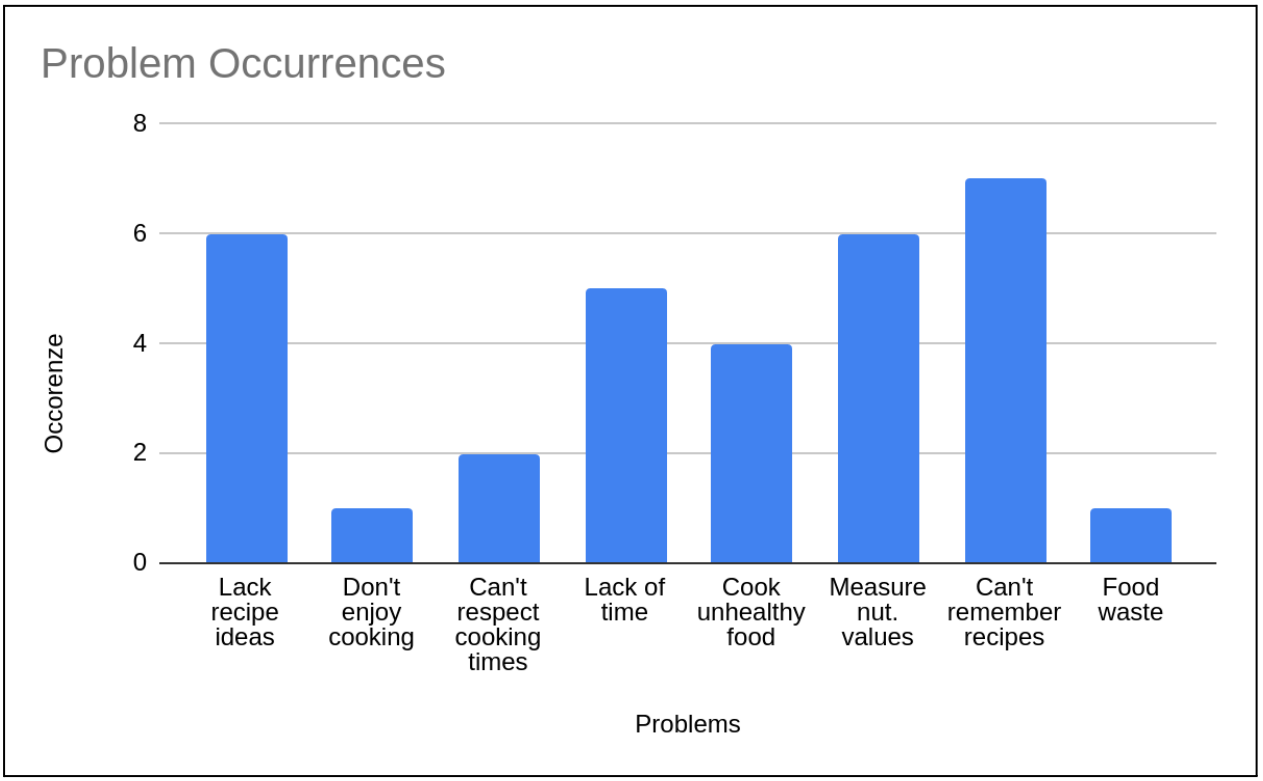
The transcriptions of the interviews can be found in the corresponding file in our Drive Folder. Any deviation from the script is due to them being done face-to-face.
What follows are the analytics of the interviews:

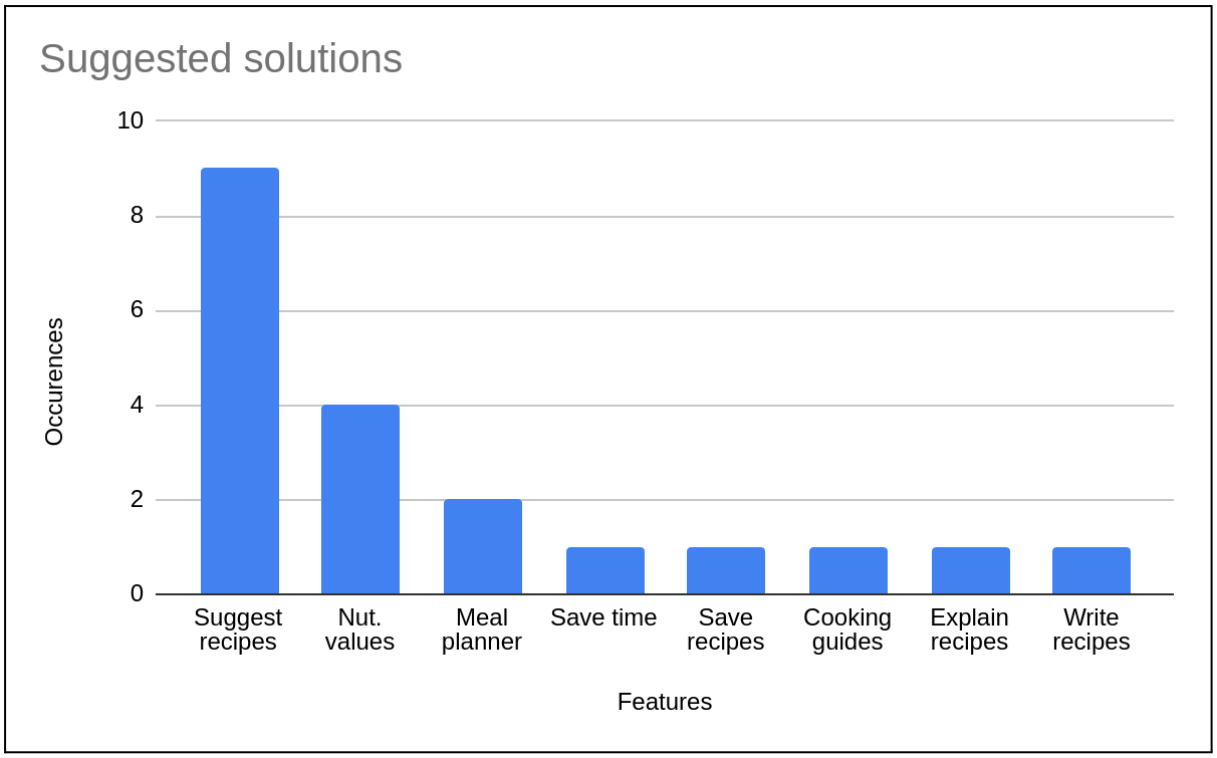












From the data collected in the interviews, we realized that our target customers (workers and students) cook themselves almost all of their meals, and although some find it relaxing and others a chore, all of them agree practically universally with these problems:

- They lack recipe ideas;
- They have limited time;
- Those who don't follow any diet struggle to balance their meals.

On the other hand, we also realized that:

- Many respondents mainly prepare simple meals and actually are not interested in preparing complex ones;
- There are a lot of people that enjoy the process of cooking, even when preparing simple meals in a short time;
- A general preference for recipe guidance over automated tools.

From all these data, we understood that most interest was towards recipe suggestion, meal planning and measurement of nutritional values.

Once we had these results, we proceeded with a meeting with Giovanni Gaglione and we understood that our targets were too broad and vague, and he suggested us to focus on something more specific, like the customer-problem of an athlete that struggles to track the nutritional values of the meals he consumes.

2.3 Revised CP Hypothesis

After the meeting, we started thinking about some more narrow problems and we decided to move towards a more "niche" and overlooked customer segment: celiac people.

Products specifically labeled as gluten-free are much less available compared to other products (e.g. they are only sold in 44% of the stores taken into consideration in this Gorgitano and Sodano's paper[7]) and they also are 2.5 times more expensive as an average.
On the other hand, there are many products that are naturally without gluten, but aren't labeled as such[8] [9]. These products also are cheaper, as they aren't labeled. Although some governments do subsidize a part of the expenses, the situation is still problematic as:

1. Not all governments do this.
2. Some only subsidize celiac people and not those sensitive to gluten, who still have to buy gluten-free products[10] [11].

From these information, we assessed the following problems:

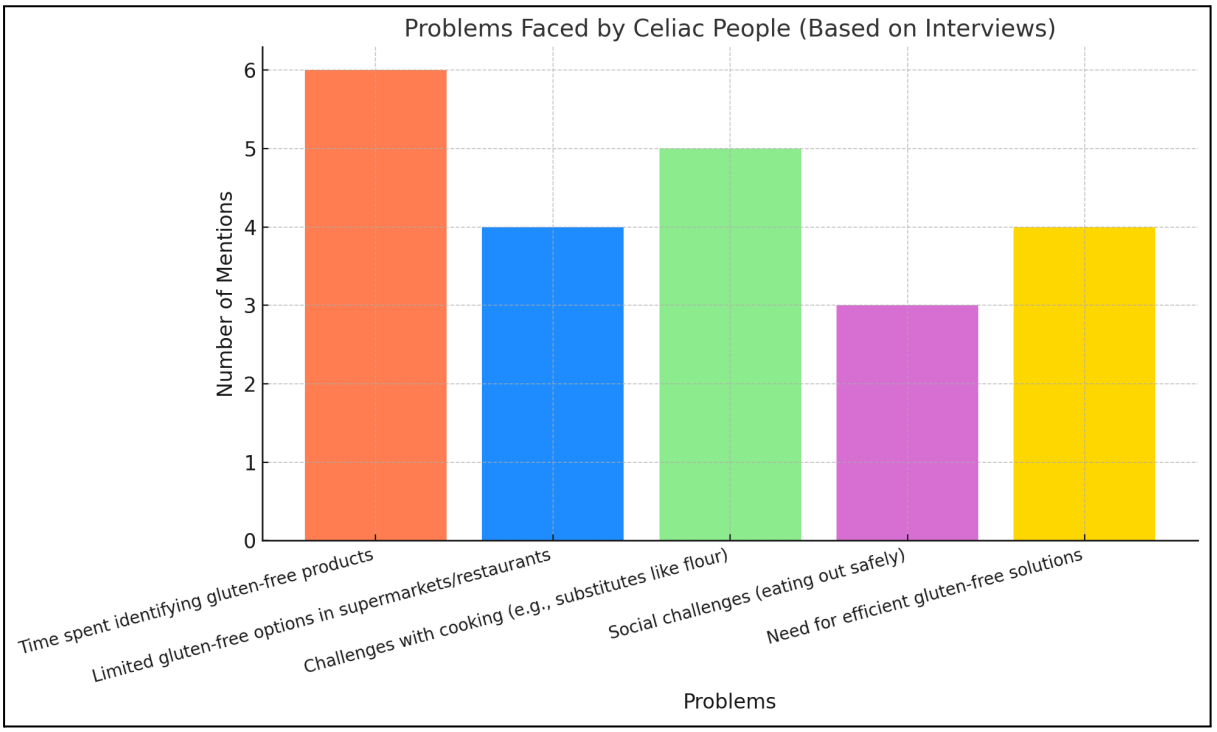
- The difficulty of reading all the ingredients to check whether it contains gluten or not;
- The lack of time to think about specifically gluten-free recipe ideas.

2.4 Second round of Validation

Just like the first round, after having defined the customer and the problem, we proceeded with some interviews. The interview followed this structure:

1. When preparing gluten-free meals, do you think yourself about the recipes or do you look for them?
2. When you go shopping, when you are not sure whether a product has or doesn't have gluten, what do you do?
3. What do you think isn't done enough to help celiac people save time?
4. Would you pay for an app that could solve these problems?

What follows is the data we extracted from the interviews, which can be found transcribed in the corresponding file on Google Drive:



The celiac people we interviewed suffered from:

- The long time needed to identify unlabeled products as gluten-free or not;
- The difficulties of adapting recipes with gluten to gluten-free recipes;
- The limited availability of labeled gluten-free products.

Even though these interviews were based on a smaller data sample (**6** people), this allowed us to notice how all or almost all the people we interviewed suffered some difficulties due to their celiac disease.

2.5 Formalization of Customer and Problem

The *target* of our business can be defined as the ***people with celiac disease that need to avoid some specific allergens in their diet***.

We can additionally classify our customers into three categories:

- **End users**: the daily users of our solution all are celiac people;
- **Recommenders** and **influencers**: they can be some famous celiac people or people managing a social media account about celiac disease; they can be useful to acquire new customers, like we did in **Solution Validation**;
- **Early adopters**: the users who are most enthusiastic about trying our app or who feel the problem is more *urgent*. In our case, those who filled our form (see **Solution Validation**).

Their *problems* we try to solve are:

- ***spending too much time reading food labels in order to identify if a specific product contains gluten or not***;
- ***not being able to follow a balanced diet due to their gluten intolerance***.

The problems we are solving can be classified as **passive** problems, since our customers know they have a problem (as seen in the interviews), but are not motivated to solve it, since the solutions available are not very complete and easy to use and also because they feel it as a minor inconvenience.

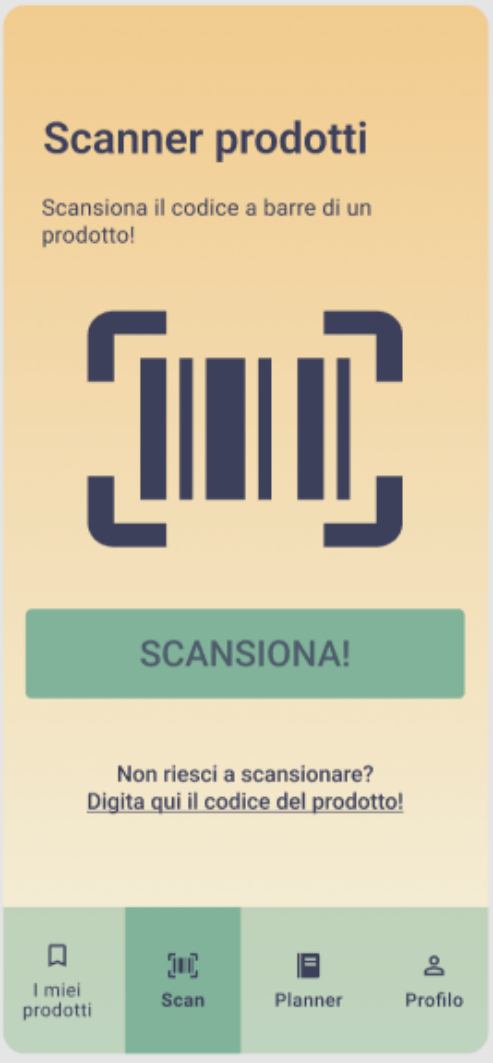
3. The solution proposed

To solve the problem we have validated, we thought about an **application** which can be used to ***scan*** *the barcode* of a product to immediately obtain the list of ingredients and the information on whether it contains gluten or not. This is possible as each product is associated with a unique barcode, so by scanning it we can easily access a database with all the information related to that product.
Additionally, the application suggests products without gluten with similar characteristics to the scanned one.

An additional functionality is the ***meal planner***, used by our customers to plan their weekly meals in order to have a balanced diet, while also considering the impossibility of eating food with gluten. By interviewing some possible customers, we observed that they have few ideas about what to cook and how to make the most out of gluten-free products.
By taking advantage of our database of products, we can identify the products with the characteristics established by the users (nutritional values, personal tastes, limitations and aspects of the diet). Then, thanks to our planning consultants who define the planning algorithm, we recommend products they can buy and dishes they can prepare to maintain a balanced diet.

Below we show the most significant parts of our application, with a link to the complete mockup we have created.

MOCKUP



I miei prodotti

Qui potrai vedere i prodotti scansionati di recente.


Riso Basmati Gallo SICURO


Penne Barilla NON SICURO


Loacker NON SICURO


Cereali grano sarac... SICURO


Biscotti al cacao NON SICURO


Zuppa di lenticchie SICURO

Carica di più

I miei prodotti | Scan | Planner | Profilo

Torna alla lista dei prodotti

Loacker

Scansionato il 02/12/2024 alle 15:59 presso Poli Lavis.

Attenzione! il prodotto è NON SICURO, perché contiene *glutine*!

LISTA INGREDIENTI

- Olio di cocco.
- Farina di frumento.
- Zucchero.
- Nocciole.
- Farina di soia.
- Siero di latte in polvere.

Mostra di più...

- Presenza di addittivi.
- Presenza di conservanti.
- ZERO coloranti.
- Presenza di alimenti pericolosi per te. Scopri di più.

PRODOTTI ALTERNATIVI

Alternativamente, ti consigliamo i seguenti prodotti, che rispettano i vincoli da te inseriti e hanno caratteristiche simili a ciò che hai scansionato:

Wafer con crema di vaniglia.

Si può trovare presso:
- IperPoli Trento
- Vedi altri vicino a te

4. Solution validation

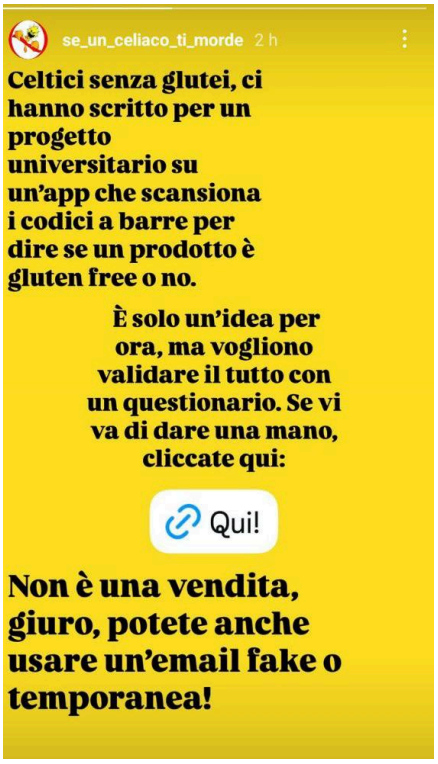
In order to validate the described solution, we set up a very simple landing page so that customers could know the main features of our application. Additionally, we put the possibility of leaving us an email so we can determine if customers were actually interested in our solution.
Finally, we created a very simple questionnaire with few questions in order to have a deeper understanding of what the customers think about the application. This allowed us to identify the more interested people and the possible *early adopters* between our customers.

WEBSITE

To do a proper validation, we could not simply spread our landing page everywhere: by doing so, even people who are not part of our target would see our application and this would have misrepresented the analytics of our survey. For this reason we have contacted nearly 10 Instagram pages that focused on food intolerances. So we were sure that the followers of these pages were people who had to deal daily with such problems.

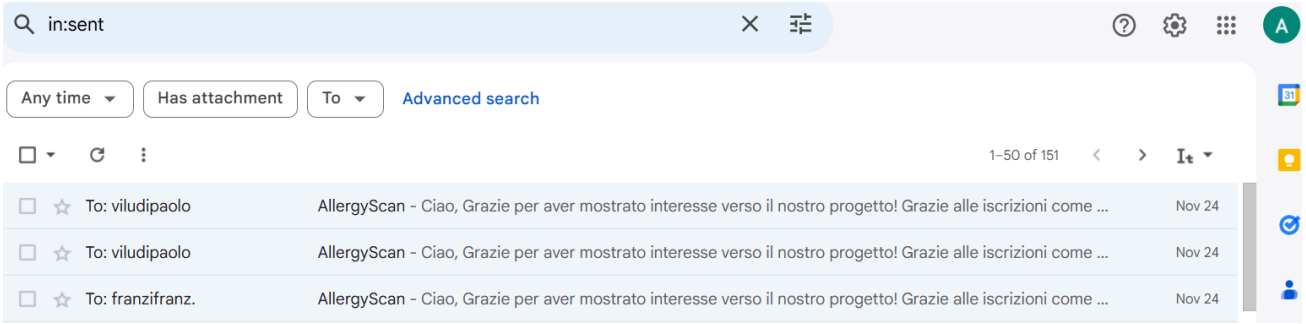
We came into contact with pages regarding both lactose intolerance and gluten intolerance, but only one page of the latter turned out to be interested in our proposal. We interpreted this fact as a signal that people intolerant to lactose are not particularly interested in our idea (or did not feel the problem). After this step, we were definitely sure our target was just people with celiac diseases.

We have contacted only one ironic page about gluten, but the results were enough to consider the solution validated. The page posted an Instagram story with the link of our landing page:

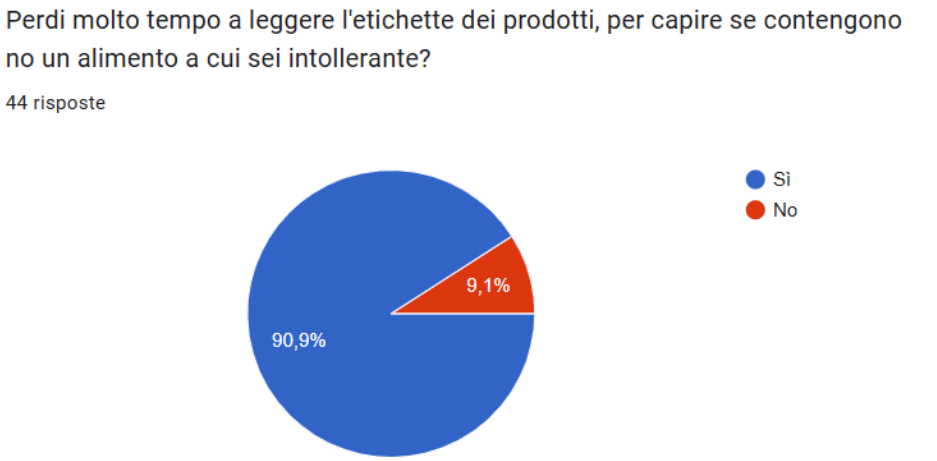


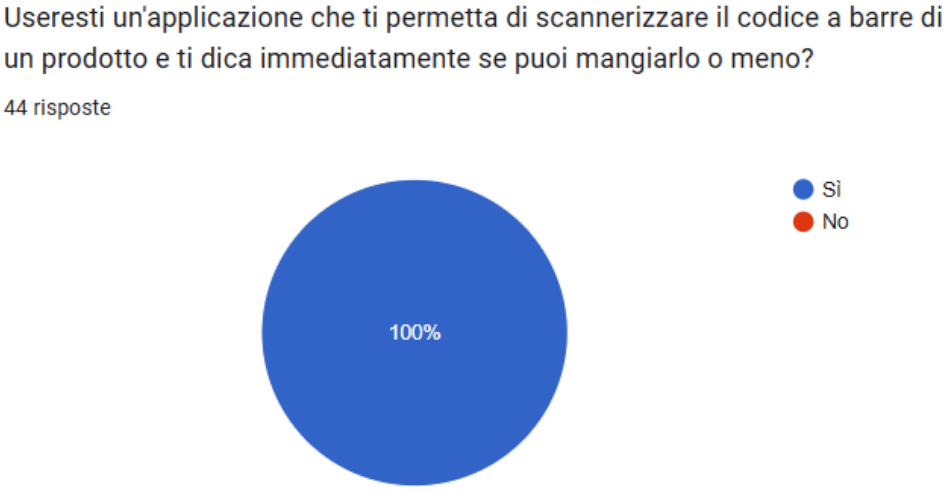
In 24 hours it has been seen by more than four thousand people. By doing some research[12], we found that the number of clicks per link on an Instagram story is around 6,15%, so we can think that more or less 250 people have seen our landing page.

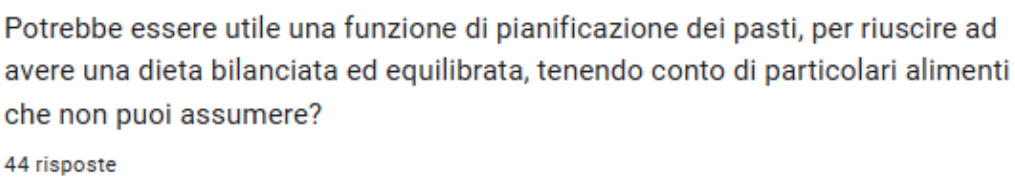
Between all people visiting the website, 102 unique users left their email address.



Out of the 102 people leaving their email addresses, 44 also answered the survey we sent them on the email. In the following pictures, the analytics of the questionnaire:



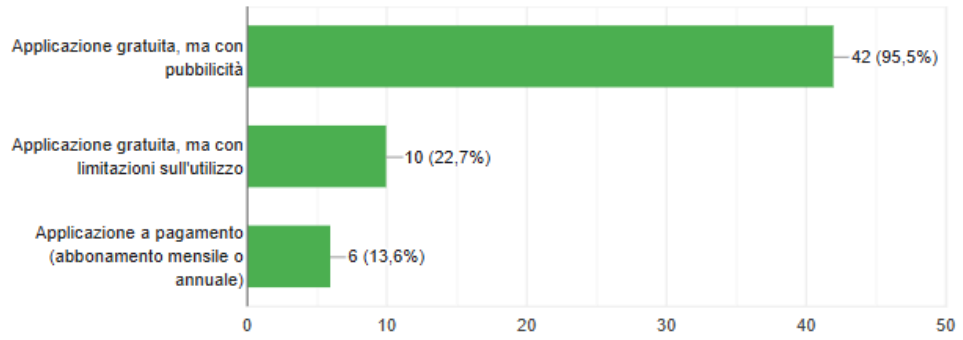




Indica tramite quale servizio usufruiresti l'applicazione. **Puoi selezionare più risposte**.

Copia grafico

44 risposte



Se vuoi, dacci altri feedback su come migliorare la nostra proposta!

6 risposte

Ottima idea!! Complimenti!!

Da celiaco intollerante al lattosio perdo tanto tempo per cui sarebbe utile un app però la preferirei gratis con le pubblicità (magari quelle da 25sec.) per garantire a tutti di usare tutte le funzionalità

Meno pubblicità all'interno dell'app, magari limitare le funzioni diverse (scan codice a barre, Pianificazione settimanale dei pasti, analisi dei nutrienti, conteggio calorico ecc..), non tutte fruibili gratuitamente (comprendo che chi sviluppa lo faccia per lavoro e quindi per un guadagno) però terrei gratuita e senza limiti di utilizzo la funzione dello scanner per i codici a barre per capire al volo se l'alimento è per celiaci, le restanti funzioni le metterei a pagamento mensile e/o annuale

Bellissima idea, grande progetto! Grazie ragazzi ❤️

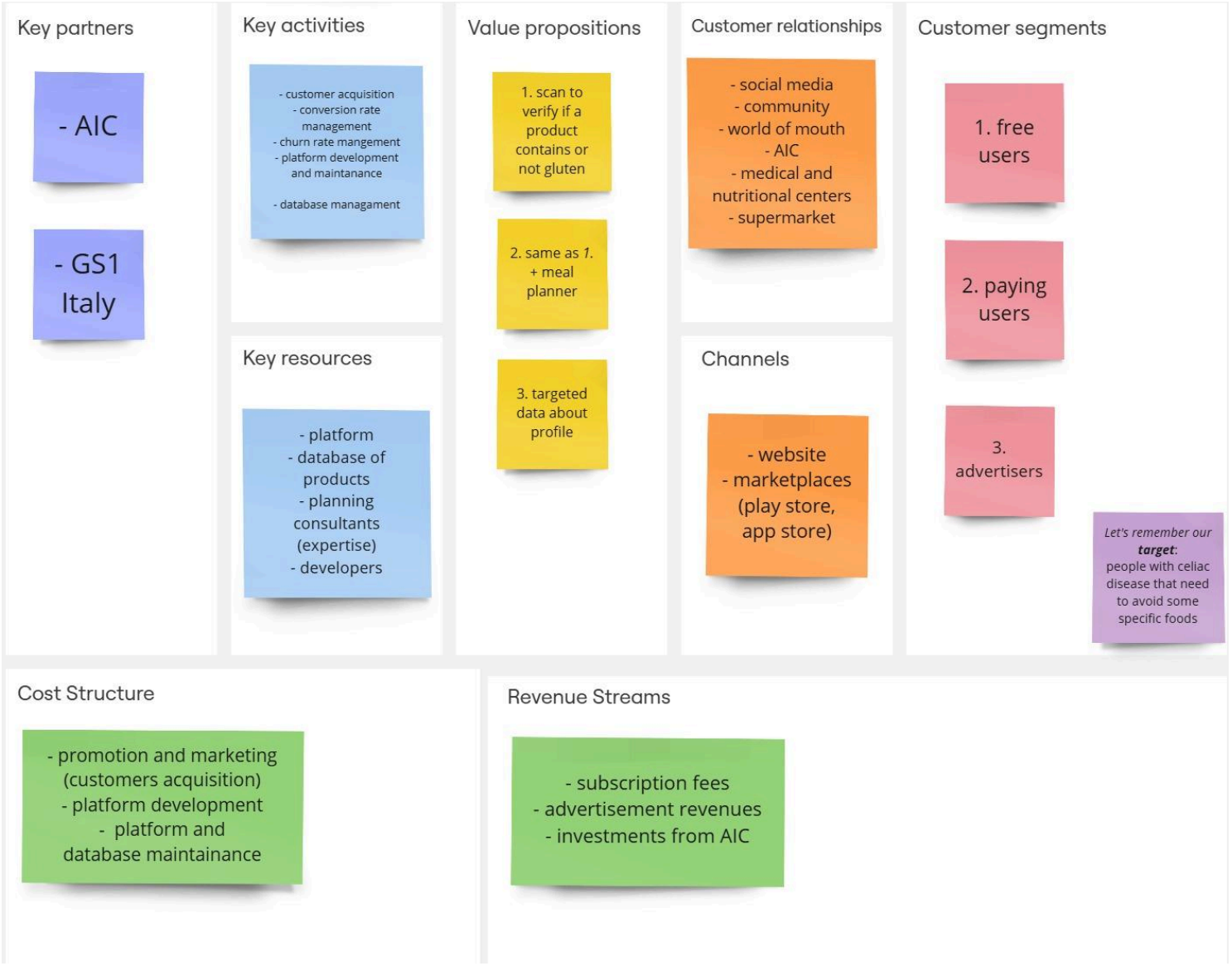
Sarebbe bello quando si scansiona un codice a barre, sapere di tutti gli ingredienti quali allergeni contengono

Inserire anche una lista di locali dover poter cenare tranquillamente e in sicurezza

After these extraordinarily positive results, we decided to mark this phase as a success and proceed with the next one: the business model.

5. Business model

Our business model is a **freemium business model** (with **free advertisement**). Initially, we developed a business model with a **3 years** timeframe, the same as our financial plan.



The business model is quite self-explaining by itself, but let's briefly precise some of the key ingredients.

Customer segment and value proposition

As formalized in chapter **2.5**, our target is represented by people with celiac disease that need to avoid some specific foods.

We decided to have three different types of users:

1. **free users**: the larger portion of our users, whose value proposition will be the possibility to instantly detect gluten in the products (thanks to the scan of the

barcode);

2. **paid users**: estimated as the 15% of our total users (as we can see by the results of the validation of our solution, since 8 out of 44 answering our survey expressed interest in the meal planner), will be the users paying a subscription fee that will have also the access to the meal planner;
3. **advertisers**: they will be a crucial part for our revenues starting from the second year of our business, when we will have a larger user base that will attract advertisers.
    a. We think that advertisers can be very interested in our application, since we have very targeted users, with specific characteristics. For this reason, it could be possible to publish advertisements about gluten-free products or gluten-free restaurants which are absolutely consistent with the type of user of the platform.

Customer relationship

In order to acquire new customers, we decided to put in practice a strategy similar to what we already did in the validation phase: by contacting forum and social media pages related to the community of our users, we aim to reach new customers interested in our platform.

Furthermore, we also want to set up a more structured strategy with targeted advertising in supermarkets or medical and nutritional centers, typically frequented by celiacs.

Channels

About how to distribute our application, we have no doubts: we will publish it in *Play Store* and *App Store* in order to reach both *Android* and *iOS* customers.

Key activities

As for a standard freemium business model, some of our key activities will be:

- focusing on how to acquire new customers
- improve the conversion rate and the churn rate
- develop the application and maintain the infrastructure, in order to deliver all our services as soon as possible.

Last but not least, the management of our most important resource: the database of our products. One person will be focused on constantly monitoring and managing it.

Key resources

The most important resources are clearly the platform, the developers of the application, the planning consultants we rely on to develop the meal planning algorithm and the **database of products**. This is definitely the core resource of our business. It is a collection of information (ingredient list, additive presence, nutritional value, …) about aliments in Italian supermarkets.
It will be used both for determining if a product contains gluten or not and also for planning a diet balance and without elements our customers are intolerant of.

Key partners

We rely a lot on the AIC (*Associazione Italiana Celiachia*) to obtain some investment in the go-to-market phase and advertise our application. We think they might be interested because this would help them in their mission, which is to help people with celiac disease in

Italy.

To build our database of products, we rely on **GS1**[13] [14], an organization managing the database containing the barcode-product correspondence of almost a million of products directly supplied by the producers. From these data, we can understand whether a product contains gluten or not. We can consider them as our direct suppliers so in order to establish a strong partnership we have thought about sharing 10% of our annual revenue.

Cost structure

In the first years of our business, the main costs will be related with the development and the maintenance of the platform (and our database) and on how to acquire customers, to increase our customer base.

Details about all costs we have to deal with will be provided in the financial plan.

Revenue streams

Qualitatively, our revenue model is based on **subscription fees** and **advertising revenues**, which will cover the cost of providing the service for free customers.

6. Market analysis

Analysing the market helped us understand the characteristics of our market type. To estimate the market size, we have followed a **top down approach** since we rely on reports and data available online about competitors or industrial research on the markets.

In the following paragraphs, we are going to understand the market size by analyzing the *Total Addressable Market* (**TAM**), the *Served Addressable Market* (**SAM**) and the *Target Market* or *Served Obtainable Market* (**SOM**). Before that, we are going to formalize our market type. Finally, we will analyse our principal competitors and specify why we are unique with respect to them, stating our *unique selling proposition*.

6.1 Market type

Since we are developing an application helping celiac people in their everyday life, our market type is the market of ***health and fitness applications***: this market includes all those applications that help people monitor their health (for instance to keep a disease under control), but also applications to track the diet and support the workout activities.

Our business idea provides a solution to help people with celiac disease manage their allergies in everyday life and therefore falls exactly into this market. Furthermore, applications of this market are part of a very wide spectrum of applications that ranges from meal and nutrient trackers to fitness apps.

We can state that it is an **existing** market, since the problems of the customers are well defined and the user base is quite large, meaning that there are also lots of competitors to deal with.

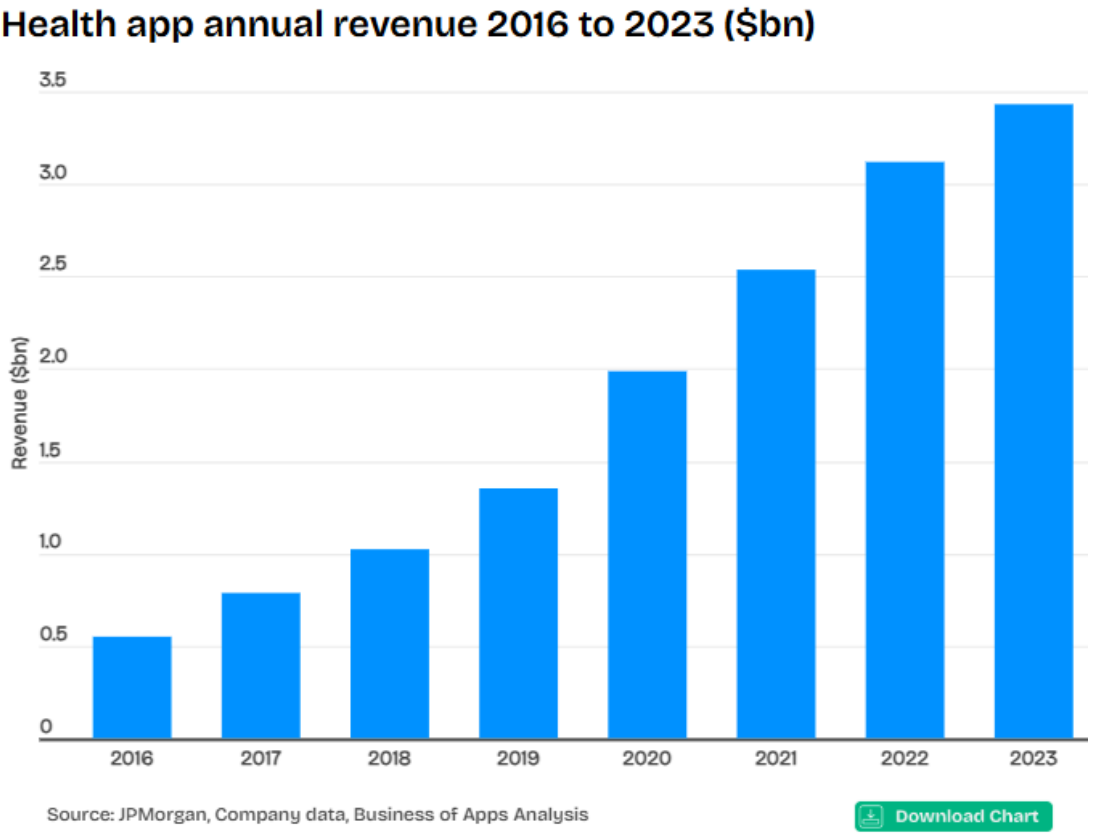
6.2 TAM estimation

Our **Total Addressable Market** is the *worldwide* market of *health* applications: the whole Apple and Google marketplaces of the applications that are inside this category[15].

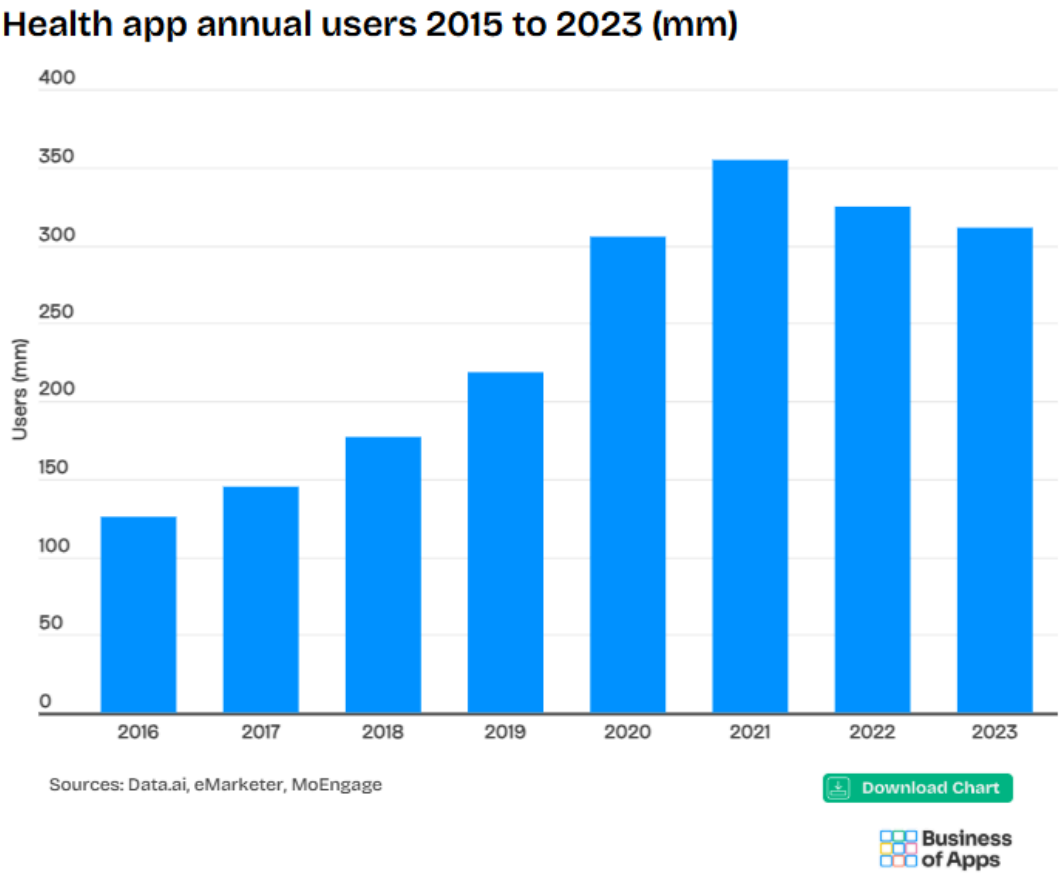
- In 2023, the market generated worldwide **3,43 USD billion**.
- In terms of users, in 2023 there were **311 million health app users**.
- Health applications were downloaded a total of 379 million times in 2023.

The revenue trend is rapidly increasing:

- compared to 2022 there was an increase of 9.9%;
- in less than 10 years, we went from a revenue of 0.5 USD billion in 2016 to almost 7 times as much in 2023;
- forecasts for the following years show that revenue is expected to have an annual growth rate (from 2024 to 2029) of **8,91%**, resulting in a projected market volume of 5,26 USD billion by 2029.



What's interesting to note from it is that in the years following the COVID-19 pandemic, the user base has slightly decreased, returning to pre-covid levels of 2019.
This suggests that recent data may have been "inflated" by the pandemic and that the real consumer base of this market settles between 250 and 300 million users worldwide.

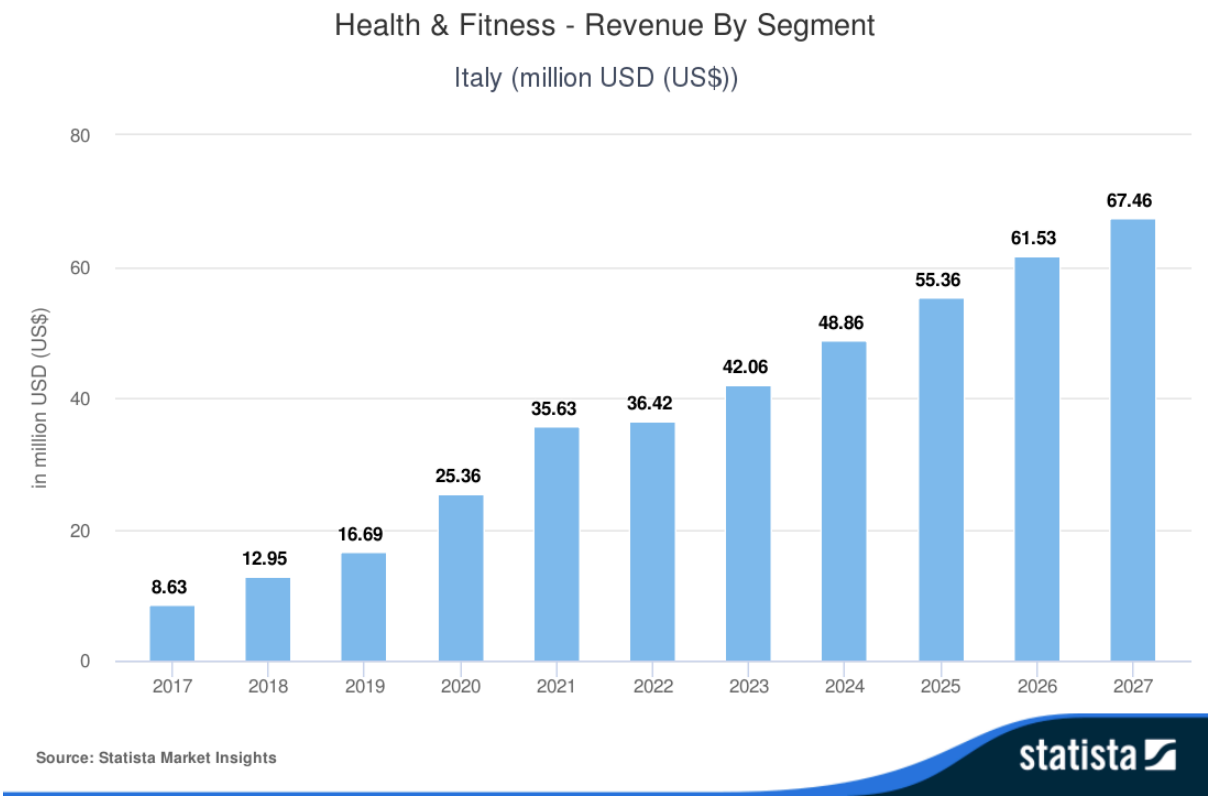


6.3 SAM estimation

The **Served Addressable Market** is a sub market of the TAM, representing the portion of the market we are potentially able to capture considering our business model and the distribution channels adopted.

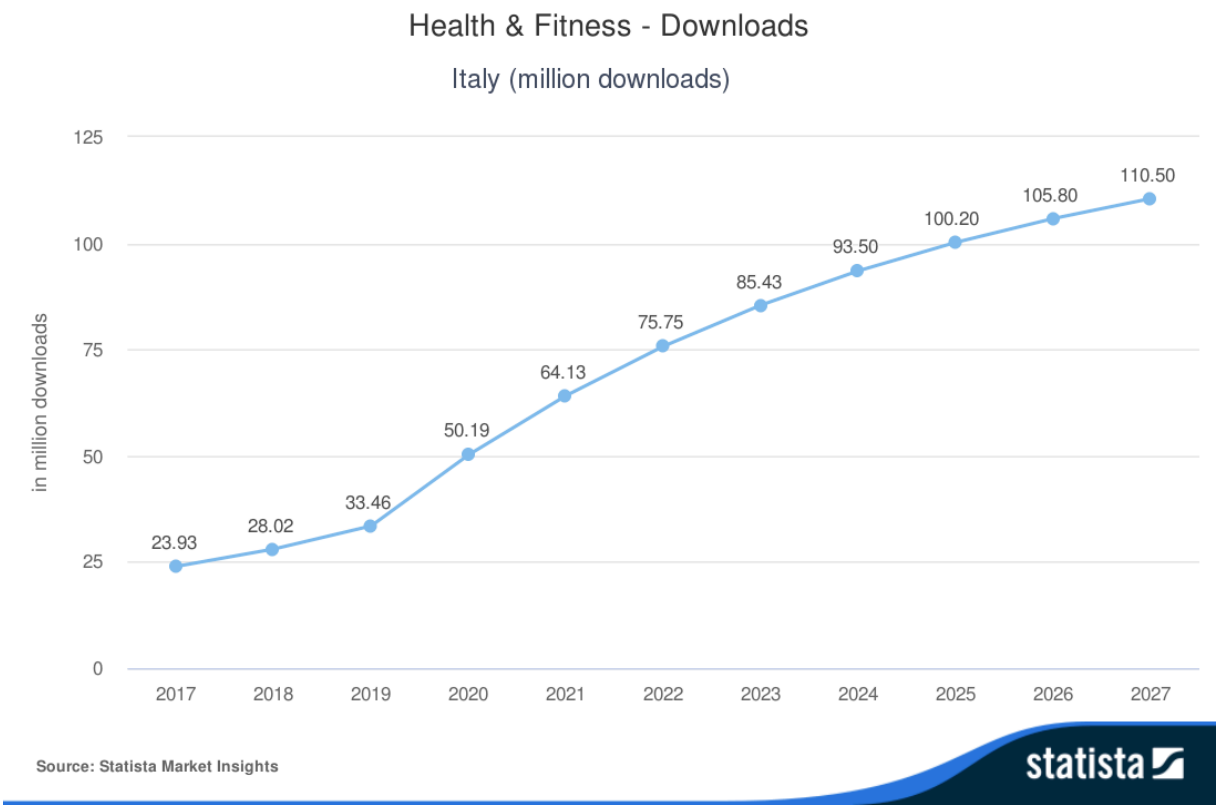
Our plan is to first distribute the application in Italy. As such, we have identified our SAM with the market of *health and fitness applications* in *Italy*. The size of our SAM corresponds to the revenues made by health applications on the Italian app stores[16]:

- Italy's health applications market has generated a total revenue of **48,86 millions USD** in 2024;
- The number of downloads of this kind of application was about **93,50 millions in 2024**.



The trend for the Italian market is similar of the TAM:

- CAGR from 2017 to 2024 was about 28,10%
- the forecast about the market size is slightly more positive than TAM: the CAGR from 2024 to 2027 is estimated at **11,35%**, unlike the 8,91% of TAM.



To conclude the estimation of the size of our market, we did a brief analysis on the spread of celiac disease in Italy, since they will be our potential customers.
Nearly ***1%*** of Italian citizens suffer from celiac disease, so considering the italian population, our potential customer segment is composed of circa **600 thousands** people.

6.4 SOM estimation

The **Served Obtainable Market** represents our target market. It is the actual portion of the possible market that we obtain. Its size is up to us: it depends on our strategy of promotion and customer acquisition.

To estimate the size of the SOM, we tried to re-proportion the data obtained during the validation phase: on 4000 people who have seen the instagram story with our landing page 102 left us the email (2,5%). We applied this rate to the current Italian celiac population (around 500 thousand individuals). As a result, we obtained a SOM size of **12750** users, information on which we also based the financial plan for revenues estimates.

Obviously, we don't expect to have all these users in the first few years of the application's release, but we can use this number to estimate our potential users over the three years.

In the financial plan, we estimate more precisely the size of our target market by taking into consideration also the investments we have made in marketing.
We have estimated a **Customer Acquisition Cost** of almost 10 euros, that we have considered the average for the mobile application market.

7. Competitor analysis

We are entering an established market with many customers and competitors. Customer needs and problems are well-known, but the main risk lies in competing with startups and companies offering similar services.
This section identifies similar applications and focuses on defining our *Unique Selling Proposition* to determine what will allow us to stand out from competitors.

Most of our competitor applications in the market can be grouped into three different categories:

- Apps that have a barcode scanner to analyze if there are traces of gluten but also other characteristics (**YUKA**, **EDO**, **Food intolerances app**).
- Apps that have a barcode scanner to determine only if a certain product is gluten free (**Gluten free scanner**, **The gluten free Scanner app**).
- Apps that have a meal planner with the possibility to exclude certain specific food (**Mealime**, **ShopWell**).

We will briefly analyze one for each category.

7.1 Yuka

Yuka[22] is an application that implements a barcode scanner for food and cosmetic products to understand their qualities. From the barcode, the user can get a product analysis based on the description already present on its label. For all food products, the analysis returns a score based on nutritional characteristics, presence of additives and biological sources.

Yuka uses an independent database managed and periodically updated by a dedicated staff. A correspondence can be thanks to multiple collaborations (a producer may add information about their products directly) or thanks to all users (can send photos of a product to the staff who may add the correspondence in the database).

The app offers two different plans:

- Free: only barcode scanner with advertisements and limited functionalities.
- Premium: 10€ per year that offers other functionalities including the presence of gluten and lactose.

Pros:

- The application tells about the composition of the product and a well defined quality check;
- A product can be searched using a barcode scanner;
- The database is large and constantly updated by a specialized team;
- The user can give suggestions to enlarge the products' database.

Cons:

- To understand if a product is gluten-free the user must buy the premium plan.

7.2 Gluten free scanner

Gluten free scanner[23] is an application that, using a barcode scanner, tells about the presence of gluten in products without returning other characteristics like nutritional values. To access the barcode scanner the user can download the application without the need of a registration but should pay 2,09€ per month or 20,99€ per year to remove advertisements.

All correspondences in the database are based on the description of the product's label. The developers also check if there is a risk of cross contamination (when a food is gluten free but is produced in the same structure that produces normal products).

Pros:

- Application checks also cross contamination risk.
- A user can use the function for free without the need of an account.

Cons:

- The application has just a barcode scanner.
- Advertisements are disturbing the user experience.

7.3 Mealime

Mealime[24] is a meal planner application that suggests recipes to the user based on personal tastes and needs (like type of diet or allergies and intolerances) and creates a weekly plan for groceries. In particular, from a list of recipes the user can choose what he wants to prepare and the application tells about instructions and requirements. The user can choose between the free plan or the premium plan. With the latter (2,99€ per month), the user can get more specific recipes, nutritional values of all meals and do more accurate research with the possibility to have more filters.

Pros:

- The application creates meal plans based on diet preferences and intolerances.
- The application suggests new recipes to the user.
- The application tells about food and instruments requirements and gives all instructions to prepare meals.
- The user can get nutritional information from meals.

Cons:

- The free version is very limited and contains advertisements.

7.4 Recap

	Yuka	EDO	GF Scanner	Mealime	Food Intolerance App
Type	Product scanner	Product scanner	Gluten scanner	Meal planner	Product scanner and diet tracker
MVP	Rates products in base their features	Creates an index of compatibility for the user	Tells if a product contains gluten or not	Suggest recipes based in user's preferences	Return product's informations and tracks daily nutrients.
Database	Managed by developers and productos	Independent	Independent	Independent	Independent
Revenue methods	Adv fees and subscription fees	Adv fees and subscription fees	Adv fees and subscription fees	Subscription fees	Fixed download cost
Business type	Freemium	Freemium	Freemium	Freemium	Paid product
Fetures corresponding to our MVP	Product scanner	Product scanner	Product scanner	Meal planner, grocery planner	Product scanner

7.5 Unique Selling Proposition

The examples highlight existing applications related to our project:

- *First set of applications*: they evaluate products based on their composition, considering potential allergens or intolerances.
    - They are not specifically designed for gluten intolerance, but also provide gluten information via barcode scanning requiring a premium subscription.
- *Second set of applications*: they are direct competitors, since they are specifically designed to identify gluten traces.
    - They lack additional functionalities outside the barcode scanning.
- *Third set of applications*: they provide meal planner based on user preferences, intolerances and allergies.
    - So they are direct competitors for our meal planning functionality.

Our Unique selling proposition is based on the fact that in the market there does not exist an application that combines all functionalities in these three sets.
In facts, *GlutenOut* is an application that:

1. has a barcode scanner to inform about the presence of gluten;
2. has a meal planner designed to suggest gluten-free recipes, also based on the customer preferences;
3. has the capability to tell about the composition of products (nutrients, additives, etc…).

So, ***why may a new customer choose our application?***

a. GlutenOut provides different functionalities all in one.
    i. Customers can get access to more functionalities at a lower cost instead of paying for multiple other applications' plans.
b. The application is primarily designed for offering service to customers with gluten intolerance.
    i. The most useful functionalities (the gluten-free barcode scanner) can be accessed free.
c. The user can also get information not strictly related to the presence of gluten in a certain product like macronutrients, micronutrients and presence of additives.

8. Financial plan

Here we have stated in a *quantitative* way the hypothesis we made in our business model, to prove the sustainability of our solution.

Our **revenue model** combines both **subscription fees** and **advertising**, providing a mixed income stream[17].

Google ADS revenues

$$\text{Revenue} = u \cdot a \cdot s \cdot 52 \cdot \frac{e}{1000}$$

Symbol	Description	Value
e	*eCPM* for video ADS	7
s	# customer go shopping per *week* (# opening the app, called sessions)	3
a	# video ads showed while using the app in a single session	2
u	# customers, considering a **CAC** of 8 euros	variable

Supermarkets and producers ADS estimated revenues

For producers and supermarkets, we charge them a fee of € **250** per month. In exchange, their products would be promoted as **banner ads** when the scanner recommends alternative products or when the meal planner suggests specific foods.

Estimation of the possible revenues:

$$\text{Revenue per month} = u \cdot s \cdot 4 \cdot p \cdot a \cdot d \cdot \frac{e}{1000}$$

Symbol	Description	Value
e	*eCPM* for BANNER ADS	3
s	# times customers go shopping per *week* (# opening the app, called sessions)	3
p	# products scanned while shopping	5
a	# alternative similar products suggested for a single product	4
d	percentage of suggested products that are provided by one of our adv partner	60%
u	# customers, considering a **CAC** of 8 euros	variable

This shows that the € **250** monthly fee is justified and delivers a strong ROI.

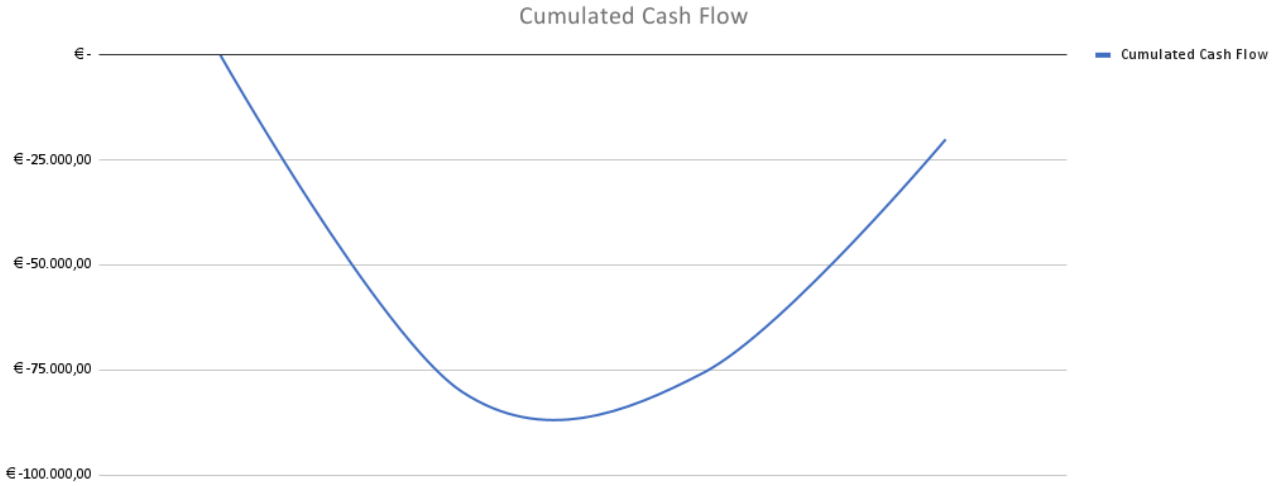
	2026	2027
Estimated NET INCOME for producers and supermarkets (monthly)	2.116,8 €	3.326,4 €
Investment made (monthly)	1.000 €	2.500 €
Estimated ROI (monthly)	111,68 %	33,1 %
Thousands of impressions	705,6	1.108,8
Estimated eCPM	3	3
Estimated CPM	1,42 €	2,25 €

Our **cost model** is composed of a few *variable costs* (the more relevant is the fee to the supplier of the database of product) and many *fixed costs*.

The most important fixed costs are related to critical roles managing our key resources and performing our key activities.

1. A **nutritional consultant**: to design the planning algorithm used in the meal planner.
2. A **developer**: only needed in the first year to develop the application, as two of us can handle platform's maintenance afterward.
3. A **project manager**: only needed part time because this role can be covered by the other two of us.
4. A **database manager**: a crucial figure to manage our database of products, but it is enough to have part time since we do not need to do too many integrations to the database.

Our cash flow analysis, excluding initial investments, indicates that we do not achieve **break-even point** in the first three years, but we project reaching it by the fourth year, as our revenues are set to align with our costs.



	2025	2026	2027
Total Cash IN	28.792 €	82.943 €	136.768 €
Total Cash OUT	109.219 €	78.634 €	81.517 €
Cash Flow of the period	- 80.427 €	4.309 €	55.251 €
Cumulated Cash Flow	- 80.427 €	- 76.118 €	- 20.867 €

Some KPIs of our financial plan (that we considered on average according to some researches[18] [19]):

	2025	2026	2027
Customers	2200	4900	7700
New customers (%)	+2200	+2700 (+122,7 %)	+2800 (+57,1 %)
Paying users (%)	308 (14%)	735 (15%)	1155 (15%)
New paying users (%)	+308	+427 (+138,6 %)	+420 (+57,1 %)
Marketing costs	19.000 €	23.000 €	23.000 €
CAC	8,64 €	8,52 €	8,21 €
ARPU (Revenue per user)	13,09 €	16,93 €	17,76 €
Revenue per user FROM ADV	2,18 €	5,25 €	6,08 €
Ratio ARPU:CAC	1,52	1,99	2,16

Finally, to fund the initial costs (around 80.000 €) of the business we plan to seek investments from **AIC**, a key partner that offers support to projects aimed at improving the lives of people with celiac disease[20] [21].

9. References and web links

[1]https://www.humanitas.it/malattie/celiachia/

[2]https://www.medicitalia.it/minforma/allergologia-e-immunologia/279-convivere-con-l-allergia-alimentare-nella-vita-di-tutti-i-giorni.html

[3]https://docs.iza.org/dp1815.pdf

[4]https://www.aeaweb.org/conference/2019/preliminary/paper/4aNaEzZ3

[5]https://www.sciencedirect.com/science/article/pii/S0195666313000457

[6]https://www.sciencedirect.com/science/article/pii/S0195666315301070

[7]https://www.mdpi.com/2072-6643/11/9/1997

[8]https://nationalceliac.org/celiac-disease-questions/can-i-eat-a-product-that-does-not-contain-any-ingredients-with-gluten/?srsltid=AfmBOoqzFmjuVDTFvyJyUnTyOVZ61ibSLUakOql8crbzwGZdUywpLJ7n

[9]https://canyonglutenfree.com/blogs/how-to-guides/beyond-the-claim-how-to-really-read-gluten-free-food-labels

[10]https://www.apss.tn.it/Servizi-e-Prestazioni/Celiachia-benefici-economici#

[11]https://www.gvmnet.it/press-news/news-dalle-strutture/celiachia-e-sensibilita-al-glutine-non-celiaca-som

[12]https://cxl.com/guides/click-through-rate/benchmarks/

[13]https://gs1it.org/

[14]https://gs1it.org/chi-siamo/annual-report/

[15]https://www.businessofapps.com/data/health-app-market/

[16]https://www.statista.com/outlook/dmo/app/health-fitness/italy?currency=USD

[17]https://www.businessofapps.com/ads/research/mobile-app-advertising-cpm-rates/

[18]https://www.statista.com/outlook/hmo/digital-health/digital-fitness-well-being/health-wellness-coaching/fitness-apps/worldwide

[19]https://www.calqulate.io/blog/ideal-ltv-to-cac-ratio

[20]https://www.celiachia.it/ricerca/bandi-aic-di-ricerca/bandi-investigator-grant/

[21]https://www.celiachia.it/ricerca/aic-call/

[22]https://yuka.io/it/app/

[23]https://www.scanglutenfree.com/

[24]https://www.mealime.com/

10. Personal reflections

At the beginning of this course, I was kind of skeptical about its utility in a Computer Science master. During this semester, I worked on a couple of other projects other than the one for “Innovation and Business in ICT” and noticed how much I started thinking from the solution and not the problem I wanted to solve. Sometimes this was acceptable and led to good ideas, but some other times I realised how much I was creating problems just for the sake of finding a solution. At the end of this course I feel like I can approach the creation phase of a project much more conscientiously and avoid falling into the trap of “fighting the windmills”.

The course itself was interesting to follow, with the topics explained both clearly and with passion, resulting in interest from my side. At the same time, the project seemed vague and unexciting. Yet, with the course progressing and my group figuring out how to proceed with the project, we achieved a better understanding of the development process of our business idea. At the end the project resulted in a complex but satisfying work of which I can call myself proud which, even though it might not be a successful idea, with time became quite good considering what we started from. Moreover, the meetings with Giovanni Gaglione and Professor Pasquini proved invaluable during this process. They helped us a lot to understand if we were proceeding in the correct way and also gave us a lot of great suggestions. Without this help, the final result would have been much more different.

In conclusion, although I do not plan in the near future to create a startup or be directly involved with business, I do believe that this course has given me some necessary understanding of this world and of how to approach project ideation. All of this will be of great importance for me in the future, independently of what I will be doing because, after all, “the devil you know is better than the devil you don't know”.

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