



UNIVERSITÀ DI PISA

PROJECT DESIGN & MANAGEMENT FOR DATA
SCIENCE

FINAL REPORT:

A solution for FAI- Fondo Ambiente Italiano

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1. Introduction

This document is a detailed account of our commitment and activities within the project centered around the FAI (Fondo Ambiente Italiano). The elaboration of this report is structured into three distinctive macro areas. The first one delves into the methods employed for identifying users, their needs, and the respective need hypothesis. Once passing through this stage, we present the results derived from our research and analytical work.

In the second part, the feasibility phase, we focus on the solutions identification for our chosen user and need and after the assessing step, only one of them will be proposed.

Finally, after setting our threshold, we test the chosen solution through the prototyping technique that allowed us to collect some data to compare with our expectations in order to have an overview of the implemented solution.

2. Methods for users and needs identification

In this initial phase, following a group brainstorming session, we collectively decided to work individually, focusing on researching different methods suitable for identifying users and needs. This approach allowed us to maximize results, leveraging the diverse backgrounds of team members. In particular, once various ideas were proposed, a phase of discussion followed, during which their evaluation (testing) took place. This phase helped us understand which among them were feasible or not, considering the time at our disposal and the opinions of the group members. At this point, the selection of methods ensued: some were discarded while others contributed, each with a different weight (as we will see later), to the formulation of the list of users and needs (output).

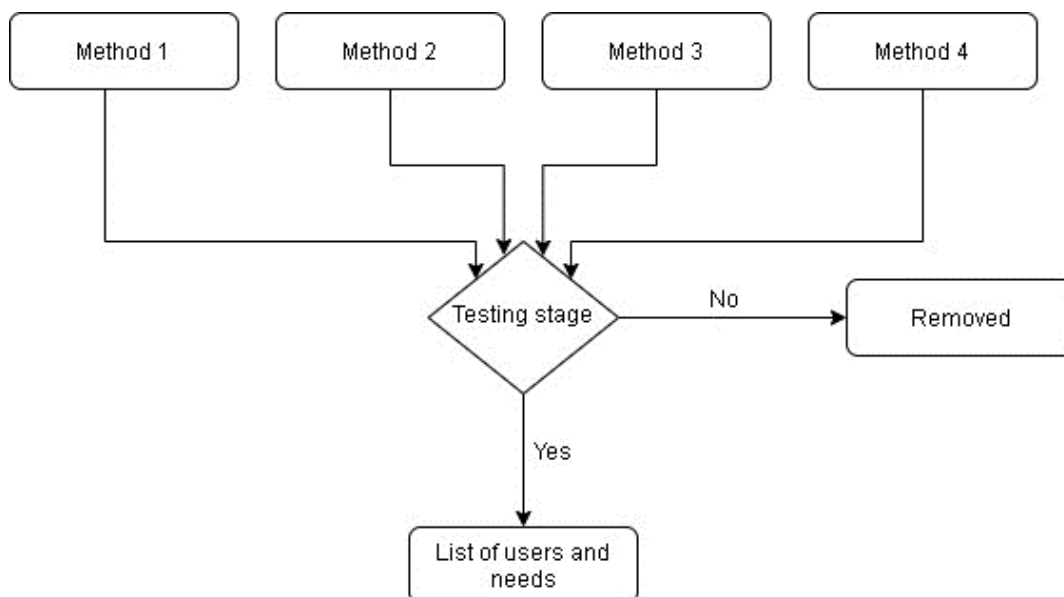


Figure 1: Methods research flowchart

2.1 User and needs

Our initial focus was to gather as much information as possible about Fondo Ambiente Italiano, aiming for an accurate and detailed understanding of it.

The result was multiple, and we identified different methods:

- **Resources from the official website:** We extracted the economic and social balance sheet (FAI) that FAI publishes annually and makes accessible to everyone. Specifically, we referred to the one prepared for the 2022 fiscal year. From the analysis of the latter, we obtained the list of stakeholders of the organization—individuals, groups, or organizations directly involved and actively contributing to the success of the enterprise. Below is displayed the map from which we derived a list of macro categories of users, which will be defined in the next phases by seeking the most appropriate level of abstraction.

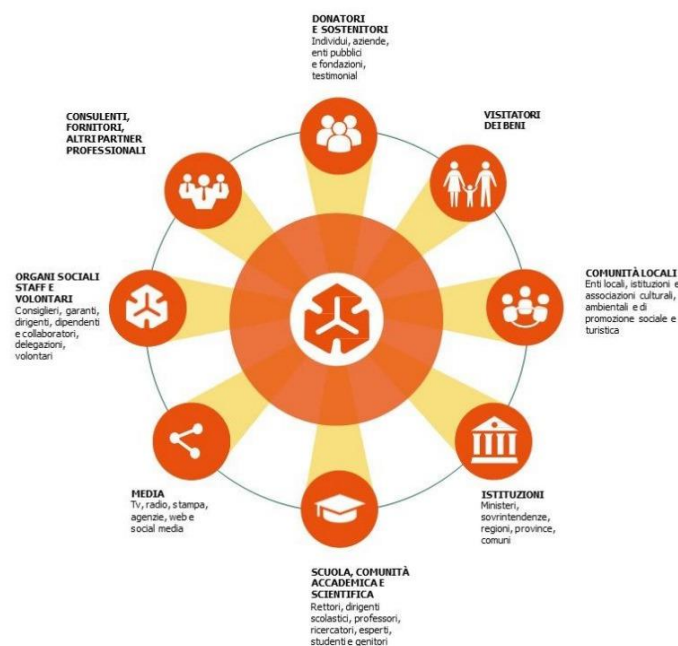


Figure 2: Stakeholders list

- **Sentiment Analysis:** We conducted a search for feedback from visitors to FAI's assets through social networks such as Facebook and Google reviews. The research revealed discontent among FAI visitors regarding the methods used for collecting voluntary contributions.
During our information-gathering process, we explored various social networks. Through Twitter, we managed to collect 1300 tweets that outlined two major topics:
 - **Visitor Feedback:** In these tweets, users shared their experiences with the organization. Primarily, users spoke about positive experiences. The only significant discontent was related to the methods used for collecting voluntary contributions.

- **Volunteer/Worker Opinions:** The majority of these users expressed predominantly negative opinions, focusing primarily on criticizing the volunteer system and the limited opportunities for career growth. In addition to Twitter, we also utilized other platforms such as Facebook, Google reviews, and job search websites. Although we found a significantly smaller quantity on these platforms, they confirmed the information gathered from Twitter.



Figure 3: Some reviews (retrieved from Facebook)

- **Data search:** Conducting a Google search, we found a dataset from FAI named "beni-fai" in CSV format. The dataset comprises 58 observations, corresponding to 58 assets, and 23 variables describing the characteristics of each asset (figure 4). The following list of dataset's variables was obtained using the RStudio statistical software.

The most interesting and useful features for our research are:

- **"Geolocalizzazione":** to understand the geographical location of FAI assets across the entire Italian territory.
- **"Modalità di acquisizione":** to verify the mode of acquisition. From figure 5, we can infer that the donor is a significant user to the acquisition of goods, as the frequency is considerably higher than in other categories.
- **"Visite Guidate":** a boolean variable indicating the possibility of guided tours at the asset. Most of the assets offer guided tours, although not all, as also indicated in Figure 5. This could be crucial for those who want to fully experience FAI, as well as for foreign tourists who require a guide due to language barriers.
- **"Accessibilità per disabili":** a binary variable expressing the presence of facilities suitable for enabling access to the asset by people with disabilities. Observing Figure 5, the percentage of missing values (NaN) is substantial, accounting for 41% of the data. Consequently, it is not possible to confidently ascertain whether the majority of FAI assets indeed provide adequate accessibility for individuals with disabilities. Excluding these missing data, structures with some form of access, even if only partial, make up 52%.

```
"i..Denominazione.bene"
"Comune"
"Provincia"
"Regione"
"Indirizzo"
"Tipologia"
"Descrizione"
"Anno.di.acquisizione"
"Modalità..di.acquisizione"
"Telefono"
"Mail"
"Pagina.Facebook"
"Orari.di.apertura"
"Visitabile"
"Ingresso"
"Visite.guidate"
"Parcheggio"
"Accessibilità..per.disabili"
"Punti.di.ristoro"
"Disponibilità..per.eventi.privati"
"Geolocalizzazione"
"Immagine"
"Autore.Foto"
```

Figure 4: Variables list

- **“Disponibilità per eventi privati”**: a boolean variable providing information on the possibility of organizing private events. From figure 5, it is possible that for the majority of Fai's assets, events can be organized, but there is also a significant number of NaN (missing values).
- **“Regioni”**: variable that represent the regions where is situate the assets. Analyzing Figure 5, it reveals that Lombardy has the highest frequency of FAI assets, precisely 17. Following closely are Liguria and Veneto. The predominant concentration of FAI assets in Northern Italy suggests an opportunity to expand the portfolio to Central and Southern regions. For instance, Lazio, with its capital, could represent a significant need, aligning with the objectives outlined in the FAI's financial statement.

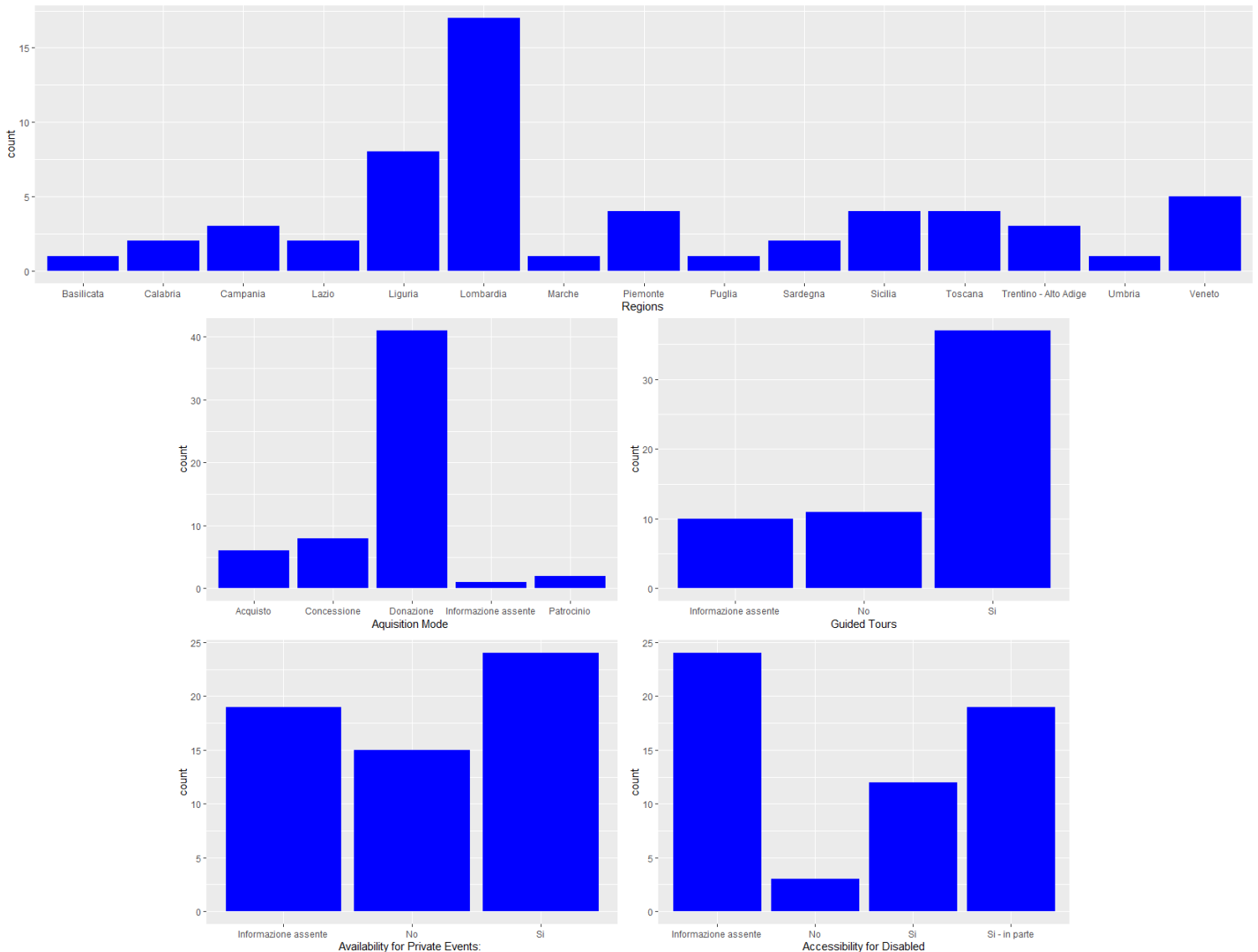


Figure 5: Datasets statistics

- **ChatGPT:**

In the context of our research, we embraced a qualitative approach to thoroughly identify user needs. During the entire project we incorporated ChatGPT as a team member, leveraging its ability to conduct personalized conversations. For instance, we used specific prompts like "List the various needs a foreign tourist might have in Italy" to delve into the diverse aspects of user needs.

Initially, we identified a broad range of potential users, drawing inspiration from the FAI's stakeholder list. In the divergent phase, we pinpointed around 30 different user categories.

- **Voting time:**

We introduced a convergence phase through a group survey. ChatGPT actively participated in this survey, contributing to the assessment of user alignment. Only users who took part in the survey and received at least 3 out of 4 consents were included in the final list of identified users. This qualitative approach allowed us to gather detailed and contextually relevant information about each user's specific needs, significantly enhancing the user needs identification process (figure 6).

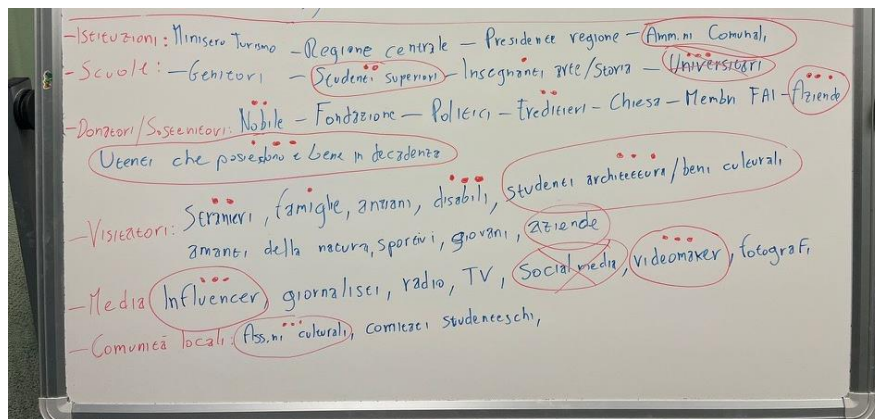


Figure 6: Process of User Converge

After compiling a list of our users, we delved into a preliminary analysis of their potential interests and needs based on our assumptions and ideas. As we discussed, we realized that many individuals exhibited similar needs or shared relevant characteristics. Consequently, we initiated a categorization process aimed at grouping and reorganizing individuals based on these similarities, such as those with different hobbies (figure 7). Simultaneously, we worked to bring users to a common level of abstraction, maintaining a general classification for the main categories and aiming not to delve too deeply into specifics when outlining subcategories.

Step1:	
a Long List of users	
Istituzioni	Ministero Turismo-Regioni Centrali-Presidente Regione- Amministrazioni Comunali
Scuole	Genitori-Studenti Superiore-Insegnanti arte/storia-Universitari
Donatori/Sostenitori	Nobile-Fondazione-Politici-Ereditari-Chiesa-Aziende- Utenti che possiedono i beni in decadenza
Visitatori	Stranieri, famiglie, anziani, disabili, studenti di architettura/Beni culturali, amanti della natura, sportivi, giovani, aziende.
Media:	Influencer, giornalisti, Radio, TV, videomaker, fotografi
Comunità Locali:	Associazioni culturali, comitati studenteschi.
FAI:	Dipendenti, Volontari, Membri Associati, Partner Istituzionali.

Figure 7: Preliminary users list

2.2 Need hypotheses

After compiling a detailed list of users and their needs, we focused on effectively testing these requirements. We carefully examined each identified need, working on targeted strategies to gather valuable feedback from users. This approach led us to develop various experimental methodologies, directly engaging with the individuals involved. To ensure the reliability and objectivity of the gathered information, we paid particular attention to formulating questions aimed at obtaining both direct responses and more subtle, implicit information. We adopted a balanced approach, presenting both general questions addressed to the entire user group and specific inquiries directed at each individual. This methodology allowed us to collect a wide range of data, both qualitative and quantitative, providing us with a comprehensive and detailed understanding of user needs.

In addition to experiments involving direct interaction with users, we have also delved into experiments centered around information analysis, supported by data sourced from online platforms. The inception of these experiments stemmed from a thorough analysis of data collected in earlier phases. This analysis was also conducted using specific tools (such as Excel, Google Maps, Google Trends and Almalaurea) that will be better explained in the following chapter. At that point, leveraging individual insights, we collectively developed the idea and discussed potential implementations of the anticipated results, assessing their significance until finalizing the experiments. Our approach involved a collaborative process that merged diverse perspectives, pooling individual insights and expertise to refine the proposed experiments. This iterative process encompassed meticulous planning, iterations, and refinements, ensuring that the chosen experiments were robust, well-structured and aligned with our goals.

2.3 Need statements and assessment

The purpose of this section is to classify the needs of the user class that have been validated in the preceding paragraph. The structure used to describe this process is divided into three parts, as well as the number of variables to assess: Number of users, Importance, and Confidence.

In particular, each of these will detail the methods that have allowed us to compile the table where we will observe the measurement of the aforementioned variables. In the concluding part of this paragraph, following a brief analysis of the results obtained, focus will converge on the specific need that will receive total attention in the feasibility chapter.

2.3.1 Number of users

The number of users refers to the quantity of individuals associated with that need who would benefit from its solution. To understand the number of users, we naturally utilized the web with its vast and infinite amount of data. However, we also took into account the source from which such information was extracted (further details in [paragraph 2.3.3](#)). Firstly, we started from the most strong and reliable sources searching for official statistics (ISTAT), statistical surveys (Banca d'Italia), scientific articles, and other types of sources that allowed us to arrive at a more or less well-defined number. If no direct and concise data can be found using these sources, then we would use minor websites in order to get an estimate.

2.3.2 Importance

The second phase involves the importance, the variable measuring how strong the need is for the user class it refers to.

At this point, we opted to employ Maslow's hierarchy of needs. However, as happened in some of the previous phases, we once again decided to 'divide.' This approach allowed us not to influence one another and maximized the diversity of study backgrounds and cultural experiences of each team member. The criterion for assigning scores to the different levels of the pyramid was as follows: a bottom-up approach where the highest priority (5) was assigned to the lowest level (Physiological needs), while the score associated with the highest level (Self-actualization) was 1. If the need didn't fit precisely into a step, we considered the existence of an intermediate level.

Upon completing the individual phase, a discussion and rationale phase followed to determine the scores attributed to each need. Subsequently, the result was obtained by averaging team members scores.

2.3.3 Confidence

The level of confidence represents the extent to which we are certain regarding the data discovered during the analysis. We have chosen two different criteria to assess the confidence:

- Reliability of information: After a comprehensive collective discussion, we assigned a value between 1 and 5 to each need based on how valid and secure we considered the sources from which we gathered the data and information.
- Degree of abstraction: Similarly, we rated the level of abstraction of the users. Scores ranged from 1 to 5, where 5 represents a low and highly detailed level, and 1 represents a high and more generalized level. To assess the level of abstraction, we determined the measurement unit as the number of words needed to describe the users' class.

After assigning values to both characteristics, we calculated the average between the two to obtain the final result of the confidence.

3. Results for users and need identification

In this chapter, we will list the solutions obtained from the methods described in the previous sections.

3.1 Users and needs

Regarding the users, this is the final list obtained:

Young:

1. Middle school student
2. High school student

Institutions:

3. Ministry of Tourism
4. Municipal Administrations
5. Cultural Associations

Hobbyists:

6. Influencer
7. Videomaker
8. Architecture/cultural heritage students
9. Nature lovers

Visitors:

10. Disable
11. Foreign Tourist
12. Elderly
13. Families
14. Sportsmen

FAl's environment:

15. Voluntaries
16. Members

Companies:

17. Small and medium- sized enterprises.

And here there is the final list of needs:

- User: **Young People:** High School Students
 - Need: Career Guidance: Need support in choosing a career, seeking detailed information on university courses, job opportunities, and sectors of interest.
 - Need: Socialization: Need to socialize by participating in events that offer a social environment where people can interact and build relationships with others.
- User: **Enthusiasts:** University Students in fields like Architecture/Cultural Heritage
 - Need: Opportunities to intern or train (at FAI sites), allowing them to gain practical experience in the field of conservation and management of cultural heritage.
 - Need: Collaborations with academic institutions to organize workshops, seminars, or research projects (related to FAI sites), involving them in interactive academic activities.
- User: **Enthusiasts:** Influencers
 - Need: Engaging content to attract more users.
- User: **Enthusiasts:** Photographers/Videomakers
 - Need: Inspiration
 - Need: Specialized equipment
- User: **Enthusiasts:** Nature Lovers
 - Need: Find a way to connect people with similar interests.
 - Need: Learn about the characteristic flora and fauna of the area.
- User: **Visitors:** Disabled
 - Need: Improve the excursion experience.
 - Need: Build dedicated infrastructures.
- User: **Visitors:** Foreigners
 - Need: Understanding the content of the guide.
 - Need: Learn about the local culture.
 - Need: Improve transportation
- User: **Visitors:** Elderly
 - Need: Find a way to connect people with similar interests.
 - Need: Build dedicated infrastructures.
- User: **Visitors:** Families
 - Need: A way to let families rest and eat.
 - Need: Better activities to include children in the excursion.
- User: **Visitors:** Sports Enthusiasts
 - Need: Lack of tracks, paths, and sports facilities, such as hiking trails, bike paths, or climbing areas.
 - Need: Lack of sports events.
- User: **Institutions**
 - Need: Enhance/preserve heritage.
 - Need: Lack of good way to promote tourism/regional tourism.
 - Need: Lack of services.
 - Need: Raise awareness among citizens about environmental issues.
- User: **FAI Members**
 - Need: Improve inclusion in organizational activities.
 - Employees: Need for recognition.

- Volunteers: Need for independence, recognition, and suitable tools to perform their tasks.
- User: **Microenterprises and small businesses**
 - Need: Increase profits.
 - Need: Visibility of their products.
 - Need: Exclusive locations for events.
 - Need: Branding.

3.2 Needs hypothesis

Thanks to the methods explained in [section 2.2](#), the following findings have emerged, which we have chosen to present using the formula: "*We believe that...*", "*So, if we...*", "*Then we will see...*". In the first sentence we can see the need statement, in the second one we show the experiment and in the third one we set the expectations.

In this stage, each of us has selected one need, and together we have chosen another one, for a total of 5 needs. From this moment onward, our attention will be focused on the latter.

We believe that foreign tourists have the *need* to benefit from an efficient and well-organized public transportation system *in order to* have an experience without wasting time and with the maximum optimization of routes.

So, if we aim to fully understand how to reach a "Bene FAI" (Fondo Ambiente Italiano), we immerse ourselves in the perspective of tourists and hypothesize the use of Google Maps to verify the feasibility of reaching the point of interest, the duration of the journey and the distance to be covered using available means of transportation. We have created a dataset called "dataTrasporti" by retrieving data from Google Maps following the procedure below:

1. Extract the geolocation of the selected "Bene FAI" and its province from the "beni.fai" dataset.
2. Use the geolocation as the destination on Google Maps, while the main station of the province of the asset serves as the starting point. This choice is based on the fact that main stations are often central starting points for various public transportation modes and are commonly used by tourists.
3. After Google Maps calculates the route, select the "public transport" mode to examine the presence of public transportation services, distance, approximate travel duration and the number of necessary transfers.
4. Once this information is gathered, integrate it into the "dataTrasporti" dataset for further analysis. We have calculated the average speed of public transportation for each route and conducted a benchmark analysis of the obtained data. The benchmark was achieved by estimating the average speed of a car to cover the same route, taking into account both urban and extra-urban segments.

Then we will see that public transportations are not well-suited to reach FAI sites easily.

We believe that Small and Medium Enterprises (SMEs) *need* to implement marketing and branding strategies *in order to* increase their corporate value.

So if we do an online research to confirm this need in SMEs.

Then we will see that branding not only increases brand awareness among end-users but also facilitates customer acquisition and improves overall sales. Moreover, it contributes to audience engagement and enhances the likelihood of being preferred in purchases by loyal customers. These

data underscore the significance of branding for companies, as it brings numerous tangible benefits.

We believe that university students in fields like Architecture/Cultural Heritage *need* opportunities to intern or train, *to* gain practical experience.

So if we go to Almalaurea website and search for some data regarding graduates in Art History, Cultural Heritage, or Archaeology.

Then we will see that less than 50% of the students completed an internship during their path.

We believe that small and medium enterprises *need* exclusive locations for events to consolidate branding or celebrate milestones.

So if we check on Google Trends how many people search for “locations per eventi aziendali” and we find how many private events are organized in FAI’s sites.

Then we will see that there is a consistent interest throughout the year.



Figure 8: Google Trends: "Location per eventi aziendali"

We believe that disables *need* dedicated infrastructures *to* allow them to fully experience life and avoid difficulties.

So, if we directly ask people with disabilities and analyze the dataset 'beni-fai.csv,' specifically the boolean variable 'Accessibility for disabled' with a value of 'Yes'.

Then we will see that not all facilities have dedicated structures for people with disabilities.

After presenting the need experiments and establishing the need hypotheses, in Table 1, we documented the process that allowed us to validate the chosen needs.

NEED	VALIDATE OR NOT	MOTIVATION
Better transportations to reach Bene-Fai	VALIDATED	From the analysis conducted, we discovered that the totality of the public transportations is not well-suited to reach FAI sites.
Implement marketing and branding strategies.	VALIDATED	Online researches highlighted the actual importance of these

		factors for the company's operations ¹
opportunities to intern or train, to gain practical experience.	NOT VALIDATED	From the data that we collected, we discovered that 70.5% of the students completed an internship during their path.
Small and medium enterprises need exclusive locations for events.	NOT VALIDATED	That there is a consistent and evenly distributed interest throughout the year but FAI gives the opportunity to organize such events. ²
Build dedicated infrastructures for disabled person.	VALIDATED	From the research carried out, both on the dataset and from the website, it is possible to observe that not all sites provide access for disabled people. ³

Table 1: Validation Table

3.3 Needs assessment

Through the methods explained in [paragraph 2.3](#), we managed to assign a numerical value to our validated needs and inserted them into Table 2.

Need	N. of users	Importance	Confidence	Tot
Better transportations to reach "bene-fai".	2,5 million Italian and non-Italian tourists that use public transportation.	Votes: 3, 3, 3, 3.5 ↓ Total: 3,125	Reliability of information: 4 Degree of abstraction: 5	1,406,250

¹ The importance of branding for businesses is highlighted in various sources. An article from Digimind emphasizes its role in building strong customer connections, influencing overall company performance, and aiding in market success (Pirozzini, 2023). Shopify underlines branding as a strategic activity for differentiation among competitors (Cazziol, 2022). A KPMG study indicates that a significant portion of consumers (59%) forms a strong, loyal bond with a brand due to personal connections (KPMG, 2020). Additionally, a Glassdoor survey reveals that 50% of candidates consider a company's reputation crucial, even more than a salary increase (Team, 2021).

² Our need hasn't been validated since FAI already provides this service, and furthermore, we lack sufficient data to understand if this service poses any issues, is in sufficient demand, and is well-organized. In light of this, we have decided not to proceed with this need.

³ We have encountered issues with the survey conducted on just 3 people with disabilities, so we've decided to reinforce the experiment with data obtained from the internet and datasets. From the dataset, we observe that accessibility is often partial, with many cases lacking specific information. Exploring the FAI (Italian Environment Fund) website, we noticed that during the 'Autumn Days' event, only 50% of the publicly open properties are accessible to people with disabilities. Other data from online research demonstrate that Italy is unable to offer accessible holidays to the 3,150,000 potential Italian tourists living with some form of disability. Only 45 out of 7,904 municipalities (0.57%) are accessible, and they have obtained the 'Bandiera Lilla' (Purple Flag) certification. (Grazi, 2022)

			Total confidence: 4.5	
Implementation of marketing and branding strategies.	148,531 small and medium-sized companies.	Votes: 1.8, 2.5, 2, 2 ↓ Total: 2.075	Reliability of information: 2.5 Degree of abstraction: 3 Total confidence: 2.75	33,902
Build dedicated infrastructures for disabled person.	3,1 million disabled in Italy.	Votes: 4.5, 3.5, 4, 3.5 ↓ Total: 3.875	Reliability of information: 4 Degree of abstraction: 1.5 Total confidence: 2.75	1,321,375

Table 2: Assessment Table

To determine the number of users for "Improving transportation to reach the 'bene-fai'," we gathered data from various sources, considering only the relevant percentages.

In Italy, there were **55 million** Italian tourists

- Motivations:
 - 9.7 % for cultural activities
 - 11.1 % for natural beauties of the place
 - = 20.8 %**
- Means of transportation used by Italians in Italy:
 - 9,5 % trains
 - 2,7% buses
 - 0,7% unspecified means
 - = 12,9 %**
- **Total 1,5 million**

There were also **55.98 million** foreign tourists in Italy (data from SKY TG24, 2022):

- Means of transportation:
 - 44.5% not by car
- Motivations:
 - 45% for cultural activities and natural beauties
- **Total 1 million**

4. Final decision for users and need identification

To calculate the final total value, we decided to use the following formula:

$$ToT(user) = NumberUsers \times \frac{Importance}{5} \times \frac{Confidence}{5}$$

To standardize these values, we divided both the importance and confidence by 5, aiming to stabilize and create a consistent evaluation scale.

To choose the need, we decided to pick the one with the highest total value. However, in the end, we had two needs with very similar values. Therefore, we discussed which one to choose, as the difference wasn't significant enough to make a definitive decision. Ultimately, we opted to consider the transportation need, engaging in internal discussions and conducting an approximate cost-benefit analysis.

5. Solution methods

The goal of this section of the report is to identify a list of solutions for the following need:

"Tourists who are passionate about cultural experiences and fascinated by the natural beauty of the place, who are looking for better quality transportation solutions to reach FAI sites."

5.1 Solution identification

Now that the need is clear, it is possible to begin the solution identification. In this section we will explain the methods and their application to discover possible solutions.

The methods used for the identification of solutions are the following ones:

- **Creativity Caucus:**
It is a structured and collaborative method for generating creative ideas. Basically it's a brainstorming tool which name was made up by our group. It leverages the collective intelligence of a diversified group, in our case the different background, encourages an open exchange of ideas, and often includes structured activities to stimulate creativity. This method is particularly useful when seeking innovative solutions to challenges or when aiming to generate new ideas for projects. To apply these methods, the steps that must be followed are:
 - 1) Establishing a Collaborative Environment
 - 2) Encouraging Diverse Perspectives
 - 3) Utilizing Structured Creativity
 - 4) Promoting Open Exchange of Ideas
 - 5) Problem Resolution and Brainstorming
 - 6) Collective Decision-Making Process
 - 7) Planning Tangible Actions

The steps have been utilized in the general method, or in other words, more methods have been implemented from this approach. Specifically, during the brainstorming in the fifth step, another method emerged:

- **ChatGPT:**

It was used to explore the possibility of generating solutions using AI-driven solutions. To obtain this type of solution, we decided to consult a conversational AI. The prompt, crucial for the optimal application of these methods, is illustrated in the following figure:

What would be the solutions by applying the use of AI to the following need:
 "Tourists who are passionate about cultural experiences and fascinated by the natural beauty of the place, who are looking for better quality transportation solutions to reach FAI sites."

Figure 9: ChatGPT Prompt Example

were obtained diverse solutions that are written in the [section 6.1](#).

Furthermore, during the Creativity Caucus session, we used the '5 Whys' method with various steps to better understand the problem and draw inspiration for formulating solutions from the different steps.

o 5 Whys:

The "5 Whys" technique is a problem-solving method that aims to identify the root cause of an issue through a series of "why" questions. This approach involves analyzing the deep-seated causes of a problem, going beyond surface manifestations, and determining whether certain solutions converge into one of the "five whys." Additionally, it enables a realistic assessment of what can be feasibly accomplished.

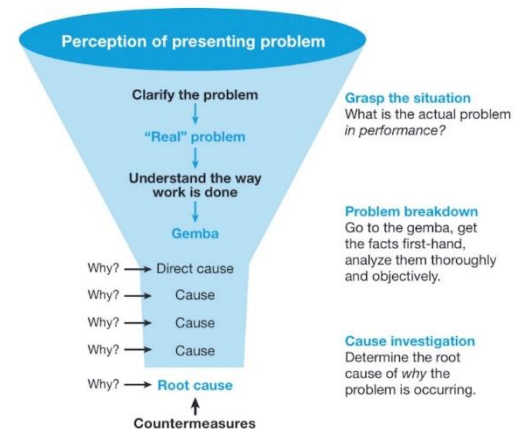


Figure 10: 5 Whys Process

5.2 Solution assessment

In the context of evaluating solutions to improve FAI transportation, the combined use of SWOT Analysis and Consequence Scanning emerges as an essential strategic approach. These analytical methodologies provide a profound understanding of internal and external factors that can influence the project's success, enabling a holistic assessment of proposed solutions.

5.2.1 SWOT analysis:

The SWOT Analysis reveals the Strengths, Weaknesses, Opportunities, and Threats associated with various mobility proposals. The FAI App, organized tours, shuttles, BLA BLA car, electric shuttles, car sharing, and collaborations with public transport entities are scrutinized through the lens of SWOT, highlighting critical aspects such as accessibility, sustainability, and potential technological dependencies.

5.2.2 Consequence scanning:

Consequence Scanning outlines the potential positive and negative outcomes resulting from the implementation of each solution. From the benefits of guided experiences to potential exclusions for non-app users, each proposal is thoroughly evaluated.

These analyses aid in evaluating options in terms of advantages and disadvantages, enabling an informed decision-making process.

5.2.3 Import-Effort matrix

Following this initial phase of analysis and a period dedicated to idea generation, we committed ourselves to converting our assessments into tangible and measurable data. Consequently, we chose to evaluate both weaknesses and strengths, analyzing them in terms of impact and effort. To delve deeper into our solutions, we decided to subdivide both effort and impact into specific subcategories.

EFFORT:

- **Operational Complexity:**
Requirement of human and logistical resources needed for project execution.
- **Economic Cost:**
Budget allocation for operational expenses, equipment, and potential specialized technologies.
- **Technologies and Infrastructures:**
Adoption of new technologies or the need to build new infrastructures.
- **Time and Planning:**
The project necessitates detailed planning, and adhering to the established timelines is crucial.

IMPACT:

- **Accessibility and Mobility:**
Access to a wide part of the population.
- **Environmental Sustainability:**
If it reduces pollution and has a positive impact on the environment.
- **Social and Economic Benefits:**
If it generates economic opportunities or enhances the community's quality of life.

	Organized Tours in FAI Assets with Conventions:	FAI Shuttle	FAI-Organized BLA BLA Car	Electric Shuttles	Car/Scooter Rent	Collaborations with Trenitalia/Busitalia/Local Authorities, Organizing Events:
Impact	Guided experience	Traffic reduction	Potential environmental impact reduction	Environmental sustainability	Increased visitor autonomy.	Access to established transportation networks
	Direct engagement.	Convenience for visitors.	Traffic reduction.	Positive image.	Reduction of private vehicles	Potential discounts.

	Ability to collaborate with local guides.		Shared transportation. Collaborations with carpooling platforms.		Resource sharing. Collaborations with existing car-sharing services.	Increased visibility through partnerships.
Effort	Additional costs. Dependence on guide availability Potential time limitations. Potential restrictions on access to FAI sites.	Operating costs Planning issues. Potential access restrictions to serviced areas.	Dependence on the availability of volunteer drivers. Geographic limitations, low participation.	Potential higher initial costs. Leveraging government incentives for eco-friendly vehicles. Limited charging infrastructure.	High initial costs Maintenance costs. Dependency on community adoption. Low participation in certain areas.	Dependency on third parties Potential bureaucratic complications. Possible resistance from local authorities.

Table 3: Characteristics of Solutions Obtained from SWOT Analysis and Consequence Scanning, Divided by Impact and Effort.

Arrived at this point, we initiated the pivotal phase of numerical assessment. Our journey began with an in-depth group analysis to evaluate the impact. For each solution, we collectively determined a score based on how well the information gleaned from consequence scanning and the SWOT analysis aligned with the highlighted subcategories, using a scale ranging from 10 to -2.

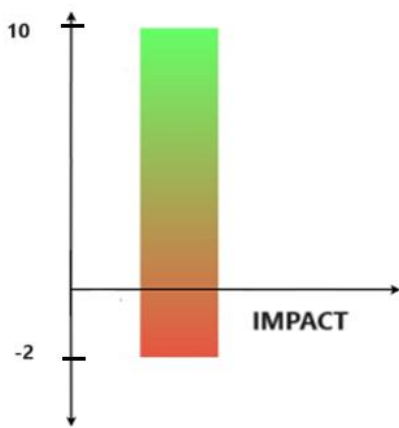


Figure 11: Impact Valutation

Regarding the effort required, we collectively decided to allocate a score between 0 and 2.5 to each of the four subcategories into which the effort is divided. Then we add each score. This evaluation

consistently referenced the specific aspects of the solution highlighted by the consequence scanning and SWOT analysis.

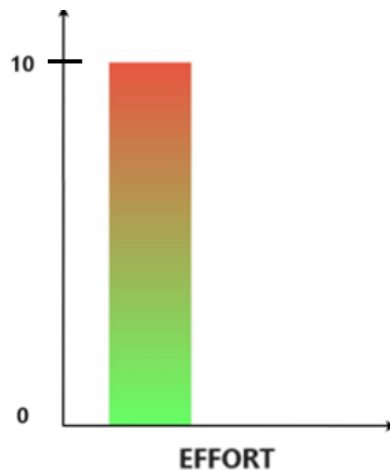


Figure 12: Effort Valuation

The zones are:

1. **Easy Wins:** Solutions in this category offer high impact with relatively low effort. They represent the most advantageous options in terms of outcomes compared to the required work.
2. **Big Bets:** These solutions demand significant effort but have the potential for significant impacts. They require more resources and involve higher risks, yet they may yield highly relevant results.
3. **Incremental:** Solutions in this zone provide modest impacts while requiring limited effort. They signify gradual improvements that consistently contribute to progress, though not revolutionary.
4. **Money Pit:** Solutions here demand substantial effort but result in limited or less significant impacts. These investments might not offer proportional value concerning the resources invested.
5. **Loss Generators:** These solutions, despite requiring low effort, lead to negative impacts or resource loss. They either do not contribute positively or harm the overall project.

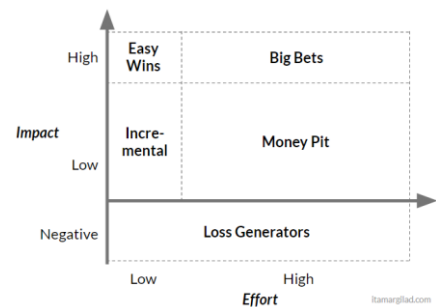


Figure 13: Impact-Effort Matrix

6. Solution results

6.1 Solution identification

After the application of the different methods all the possible solutions are:

1. FAI-organized tours: that include transportation to multiple nearby FAI sites or experiences (such as food and wine tours, excursions, etc.).

2. FAI- FAI car: The idea is to recreate a situation similar to BLABLA CAR, allowing the sharing of specific routes with others through the implementation of carpooling (AI solution by ChatGPT).
3. Electric shuttles: Electric bus organized by FAI to reach one of their sites.
4. Car/scooter rent: The possibility to rent a car or scooter for a short period, up to a maximum of 24 hours, available near FAI locations.
5. FAI shuttles: Bus organized by FAI to reach one of their sites.
6. Collaborations with transport companies: Exploring potential collaborations with transport companies (like Trenitalia or Busitalia) to add new stops or offer ticket promotions for both transportation and FAI entry.

6.2 Solution assesment

6.2.1 SWOT analysis:

1. **Organized Tours in FAI Assets with Conventions:**
 - *Strengths: Guided experience, direct engagement.*
 - *Weaknesses: Dependence on guide availability, potential time limitations.*
 - *Opportunities: Ability to collaborate with local guides.*
 - *Threats: Potential restrictions on access to FAI sites.*
2. **FAI Shuttle:**
 - *Strengths: Traffic reduction, convenience for visitors.*
 - *Weaknesses: Operating costs, planning issues.*
 - *Opportunities: Collaborations with local businesses.*
 - *Threats: Potential access restrictions to serviced areas.*
3. **FAI-Organized BLA BLA Car:**
 - *Strengths: Shared transportation, potentially sustainable.*
 - *Weaknesses: Dependence on the availability of volunteer drivers.*
 - *Opportunities: Collaborations with carpooling platforms.*
 - *Threats: Geographic limitations, low participation.*
4. **Electric Shuttles:**
 - *Strengths: Environmental sustainability, positive image.*
 - *Weaknesses: Potential higher initial costs.*
 - *Opportunities: Leveraging government incentives for eco-friendly vehicles.*
 - *Threats: Limited charging infrastructure.*
5. **Car/Scooter Rent:**
 - *Strengths: Reduction of private vehicles, resource sharing.*
 - *Weaknesses: Dependency on community adoption.*
 - *Opportunities: Collaborations with existing car-sharing services.*
 - *Threats: Low participation in certain areas.*
6. **Collaborations with Trenitalia/Busitalia/Local Authorities, Organizing Events:**
 - *Strengths: Access to established transportation networks, potential discounts.*
 - *Weaknesses: Dependency on third parties, potential bureaucratic complications.*
 - *Opportunities: Increased visibility through partnerships.*
 - *Threats: Possible resistance from local authorities.*

6.2.2 Consequence scanning:

1. **Organized Tours in FAI Assets with Conventions:**
 - *Positive Consequences:* Guided experiences, increased engagement.
 - *Negative Consequences:* Potential time limitations, additional costs.
2. **FAI Shuttle:**
 - *Positive Consequences:* Traffic reduction, increased convenience.
 - *Negative Consequences:* Operational costs, planning issues.
3. **FAI-Organized BLA BLA Car:**
 - *Positive Consequences:* Shared transportation, potential environmental impact reduction, traffic reduction.
 - *Negative Consequences:* Dependency on volunteer drivers, geographical limitations.
4. **Electric Shuttles:**
 - *Positive Consequences:* Environmental sustainability, positive image.
 - *Negative Consequences:* Potential higher initial costs.
5. **Car/Scooter Rent:**
 - *Positive Consequences:* Increased visitor autonomy.
 - *Negative Consequences:* High initial costs, maintenance costs.
6. **Collaborations with Trenitalia/Busitalia/Local Authorities, Organizing Events:**
 - *Positive Consequences:* Access to consolidated networks, potential discounts.
 - *Negative Consequences:* Dependency on third parties, potential bureaucratic complications.
 -

6.2.3 Impact-Effort matrix:

Finally, we collected and combined all these values, representing them through an Impact-Effort Prioritization Matrix.

	Organized Tours in FAI Assets with Conventions:	FAI Shuttle	FAI-Organized BLA BLA Car	Electric Shuttles	Car/Scooter Rent	Collaborations with Trenitalia/Busitalia/Local Authorities, Organizing Events:
Impact	7.5	5	2	7.5	-2	5
Effort	3	2	4	8	6	5
(Operational Complexity, Economic Cost, Technologies and Infrastructures, Time and Planning)	(1.5,0,0,1.5)	(1,0,0,1)	(0,0,2,2)	(1,2.5,2.5,2)	(0,2.5,2.5,1)	(2.5,0,0,2.5)

Table 4: Impact- Effort Prioritization Matrix

This allowed us to position each solution within one of the five zones of the matrix.

1	Organized Tours in FAI Assets with Conventions	Easy Wins
2	FAI Shuttle	Incremental
3	FAI-Organized BLA BLA Car	Money Pit
4	Electric Shuttles	Big Bets
5	Car/Scooter Rent	Loss Generators
6	Collaborations with Trenitalia/Busitalia/Local Authorities, Organizing Events	Money pit

Table 5: Solution and Their Positioning Evaluation

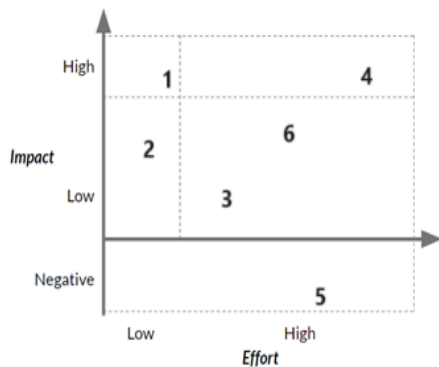


Figure 15: Solution Positioning

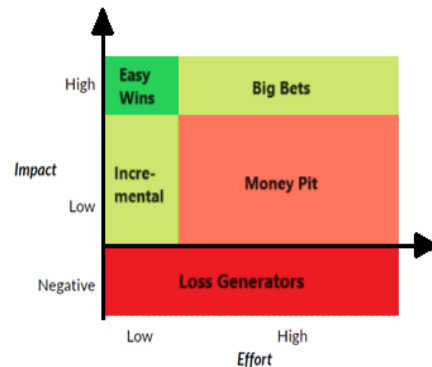


Figure 14: Positioning Evaluation

7. Solution final decision

After thorough consideration, our ultimate choices were confined to solutions situated within the 'Easy Wins' zone, exemplified solely by the concept of 'Organized Tours in FAI Assets with Conventions'. In instances of multiple viable solutions, our paramount criteria leaned towards selecting options characterized by lower effort coupled with a higher impact. Additionally, we accounted for solutions categorized under 'Incremental' and 'Big Bets'. These were not dismissed outright, as their potential to transition into the 'Easy Wins' zone was plausible with expert insights or slight modifications, despite their initial divergence from the optimal criteria.

8. PrEtotype

8.1 Typology and functioning

Fake Door Testing involves rapidly validating an idea: we present users with an option that doesn't actually exist. After the user takes action (clicks, registers, etc.), the system notifies the user that this feature or product/service is not yet available. By measuring how many potential users have shown interest, we can understand if the transportation solution for FAI will work or not.

For the implementation, we envisioned a smartphone application serving two primary functions: firstly, aiding in organizing guided tours for FAI, and secondly, acting as a versatile tool to meet various needs within FAI.

More specifically, we created an application interface that allows users to navigate through menus without offering any actual functionality, giving the illusion to those interacting with the interface that they are using the application and collecting their reactions to its usage.

For the interface creation, we utilized FIGMA, a collaborative design tool enabling the creation, prototyping, and development of interfaces for digital products. We developed the app interface in various aspects, including registration/login, homepage, FAI assets, and directions on how to get there.

Regarding the FAI assets section, we generated a screen containing a list of FAI assets. Once a specific asset is selected, a new page opens containing detailed information about the selected asset: photos, a description, and two buttons:

- Purchase Ticket: Allows the user to buy a ticket through the app.
- Directions: Shows a screen with coordinates and different options for reaching the asset: by car, train, or organized tour. Clicking on the organized tour option displays a calendar showing dates available for FAI organized tours. Additionally, users are given the opportunity to purchase a tour ticket.

Using the services provided by the "QR Code Generator" website, we generated a QR code linked to the FIGMA pretotype. The site also allows us to monitor how many times the code has been scanned. To gather user feedback, we visited crowded tourist locations, allowed users to experience the fake app, and explained the FAI organized tour service. At the end, we distributed a flyer containing the QR code. Users who scan the code after our interaction will validate the success of the experiment.



Figure 16: Flyer of the app

8.2 Conclusion

With the use of the pre-prototype we designed, we set expectations for results, which are represented in figure 17 through the use of pie charts. In figure 18, the actual results obtained are illustrated using the same type of chart.

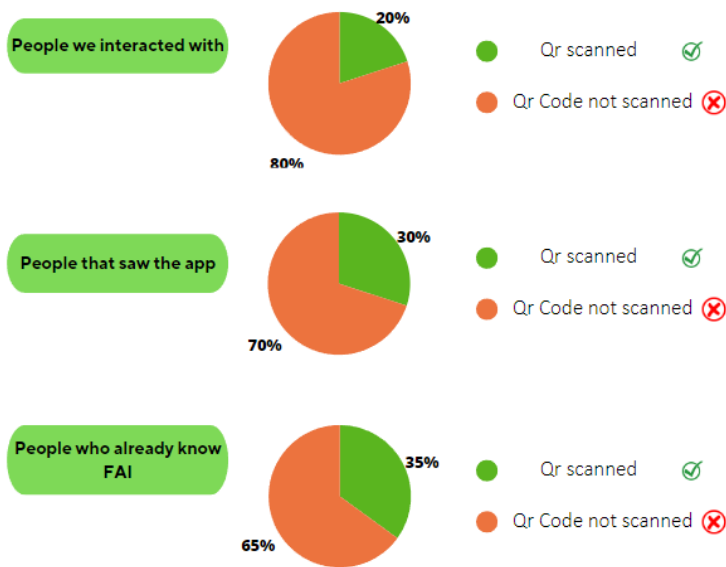


Figure 17: Threshold

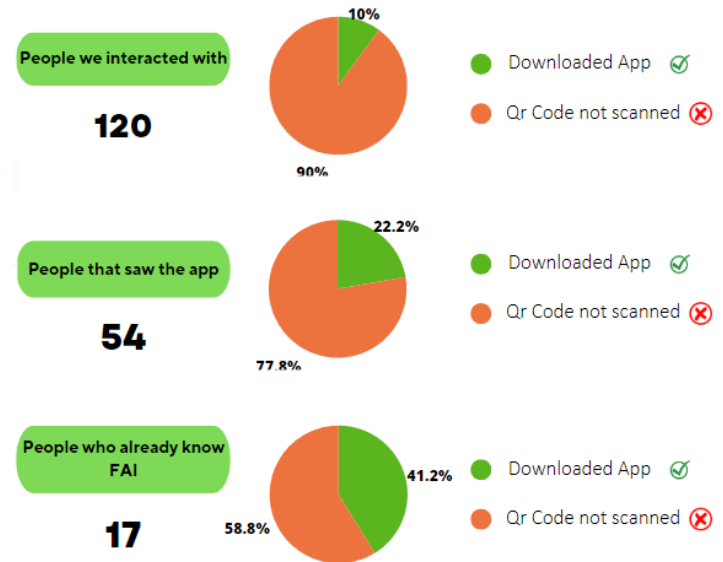


Figure 18: Effective Data

Observing the obtained results, we can state that, concerning the first two pie charts, specifically, the one related to "People we interacted with" and the second to "People that saw the app," our thresholds are higher than the actual data obtained. Meanwhile, for the pie chart related to "People who already know FAI," the percentage exceeds our predefined threshold.

In conclusion, from the testing of our pre-prototype, we gathered data that appeared theoretically negative as we anticipated a higher interest from individuals towards our pre-prototype. However, despite this, we found a favorable reception towards our organized tour initiative among the interviewed individuals who had previous experience with FAI. Therefore, even though our pre-prototype turned out to be a negative experiment, the fundamental concept is not entirely dismissible.

9. Final conclusion

In conclusion, our project has not only identified the needs of tourists seeking efficient transportation solutions to reach FAI sites but has also underscored the importance of integrating innovative services to enhance FAI's accessibility and usability. The proposal of organized tours, despite facing some initial obstacles, has demonstrated interesting potential, particularly among those already familiar with and appreciative of FAI.

Looking ahead, the synergy between technology, sustainability, and culture could play a crucial role in promoting FAI's heritage. Our experience has emphasized the significance of tailoring innovative solutions to the specific needs of the audience, considering the cultural and historical context of FAI

sites. In this way, we hope that our findings can contribute to a broader discussion on enhancing cultural heritage and improving tourist experiences at FAI-managed sites.

9.1 External Validation

After completing our project, we had the report reviewed by two external individuals: one entirely unfamiliar with the context and one of our colleagues. We did this to obtain a review of our work, identify potential errors, and gather feedback. Additionally, this allowed us to test both the comprehensibility of our methods and processes by non-experts and the potential reproducibility and accuracy of the project by a knowledgeable individual.

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- Almalaurea <https://www2.almalaurea.it/cgi-asp/classi/Scheda.aspx?codiceAggr=11095&tipoCorso=LS&lang=it>

ANNEXES

Quanti anni hai? *

- ☐ 0-18
- ☐ 18-27
- ☐ 27-55
- ☐ 55-100

Hai mai partecipato a un evento FAI (Fondo Ambiente Italiano) ?

- ☐ Si
- ☐ No

Nazionalità

- ☐ Italiana
- ☐ Altro

Se "Si" hai riscontrato qualche problematica?

Testo risposta lunga

Se hai risposto "Altro" alla domanda precedente scrivi la tua nazionalità

Testo risposta breve

Se "No" perchè ?

- 1. Mancanza di Tempo
- 2. Difficoltà negli spostamenti
- 3. Non lo conosco
- 4. Non mi interessa

Occupazione

- ☐ Studente
- ☐ Lavoratore
- ☐ Disoccupato
- ☐ Pensionato

Quali sono le cose che controlli quando organizzi un viaggio (tipo escursioni, spostamenti, visite)?

Testo risposta lunga

Quanto è facile reperire informazioni sulle accessibilità e i servizi per i disabili?

- | | | | | |
|-----------------------|----------------------------------|-----------------------|-----------------------|-----------------------|
| 1 | 2 | 3 | 4 | 5 |
| <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Preferiresti partecipare agli eventi FAI con un gruppo/accompagnatore?

Testo risposta breve

Hai incontrato delle difficoltà nelle tue esperienze precedenti? Se sì, quali?

Testo risposta lunga

Attached you will find the Excel document containing the analyses conducted for the experiment concerning public transportation to reach FAI properties. Below, you can see a brief preview.

Bene FAI	Regione	Provincia	Mezzi_Pubblici	N_Cambi	Durata_Viaggio	Geolocalizzazione	Distanza_Stazione_Centrale
Maso Fratton Valaja	Trentino Alto Adige	Trento	Si	1	1.11.00	46.216900, 11.047473	26
Saline Conti Vecchi	Sardegna	Cagliari	Si	1	1.40.00	39.224060, 9.024623	8,8
Alpe Pedroria e Alpe Madrer	Lombardia	Sondrio	Si	0	0.43.00	46.136517, 9.611203	23
Cappella del Sinomio	Trentino Alto Adige	Sondrio	Si	0	0.09.00	46.069127, 11.123778	0,65
Villa Fogazzaro Roi	Lombardia	Como	Si	1	2.44.00	46.021473, 9.033164	42
Torre del Soccorso detta di	Lombardia	Como	Si	0	1.00.00	45.969658, 9.171422	29
Velarca	Lombardia	Como	Si	0	0.54.00	45.967969, 9.173227	27,8
Villa del Balbianello	Lombardia	Como	Si	0	1.07.00	45.965379, 9.202457	30,1
Mulino "maurizio Gervasoni"	Lombardia	Varese	Si	5	4.41.00	45.952192, 9.732398	139
Monte Fontana Secca	Veneto	Belluno	Si	1	1.30.00	45.924064, 11.934239	41
Villa della porta bozzolo	Lombardia	Varese	Si	2	1.26.00	45.907728, 8.712233	26,2
Antica Pensilina del Tram	Lombardia	Varese	Si	0	0.20.00	45.846443, 8.797065	6,3

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