Human-Computer Interaction

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Tesina

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1 Introduction

SetOn is an event platform that aims at minimizing the time that a user needs to search for an event.

It was born from the difficulties that users experience while gathering information about events. Mainly,

1. **fragmentation**: too many platforms to compare. Personalization from one platform does not carry to the others.
2. **fear of missing out**: many users in the past missed an event that they would have liked to attend. This is caused by the focus that other platforms put on long term planning, while short term planning allows users to be more aware of events that surround them.

The goal of our project is to bring people together to explore real-life events and join meaningful communities.

To achieve this, we built an application that lets users navigate a catalog events in three ways:

1. Consulting a personalized **feed**. Users can easily discover events divided by criteria like popularity, affinity, proximity and others.
2. Using the **search** functionality based on keywords. Users that already know what to look for can use the search functionality, may it be for a particular event or events that share a specific theme (like "yoga", "beer"…).
3. Exploring a **map**. To give the opportunity to the users to feel surrounded by events and to let them browse events geographically.

Also, to better keep track of events, the application provides access to the user's **favourite** events. This way users can save events to compare them or to find them without hassle at any moment.

Technically, SetOn is an aggregator (like *trivago*, but for events): it scrapes popular sites and collects events. It can be used to gather information on events from many platforms using a single tool. Tickets and reservations are still managed by external platforms, to which SetOn links from within the app.

2 Requirement Analysis

2.1 Competitor Analysis

There are two main competitors to SetOn, and none of them is an aggregator. As such, they both have a narrower catalog of events. They focus on standalone features like ticketing and event organization and management.

	Selection across multiple platforms	Personalized content	Diverse event categories	Map exploration	Focus on short term planning
SetOn	Yes	Yes	Yes	Yes	Yes
Eventbrite	No	Yes	Yes	No	No
Dice.fm	No	Yes	No	No	No

2.2 Questionnaire and Conclusions

We used a questionnaire to gather information about the kind of users to target, their experience and behavior. The questionnaire included questions specific to event attendees and organizers, but for this phase of the project only the attendees' answers were considered relevant. 60 people answered the questionnaire. Since the questionnaire was targeted towards Italian speakers, it was written in italian.

The following charts show some of the most relevant data obtained by the questionnaire.
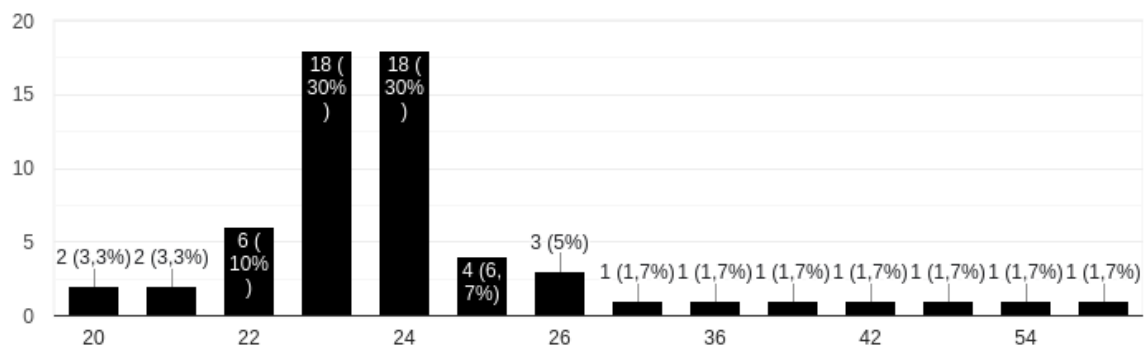
Most of the people answering are between 20 and 27 years old.
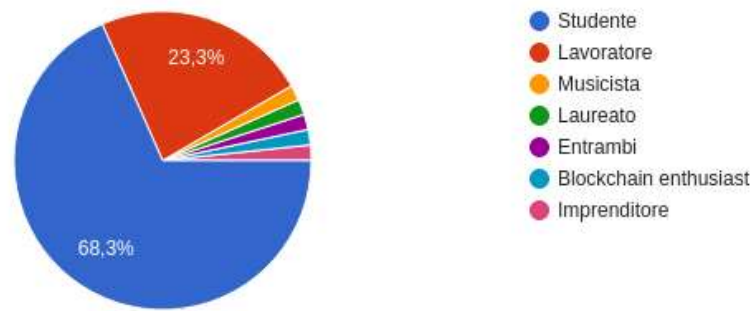
Most of the people answering are students, while the rest have some other occupation.
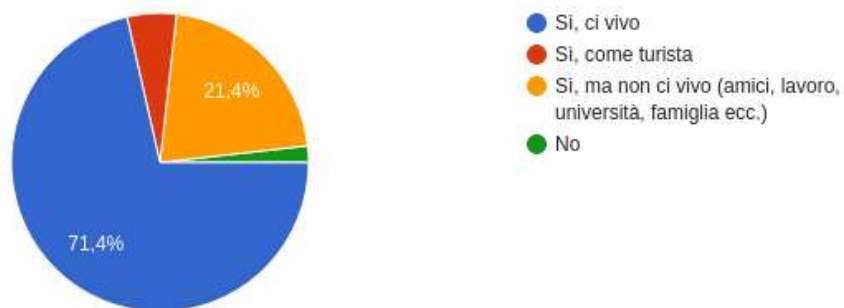
When asked if they spend time in a big city, most of the people answered this.

People use these methods to gather information about events.
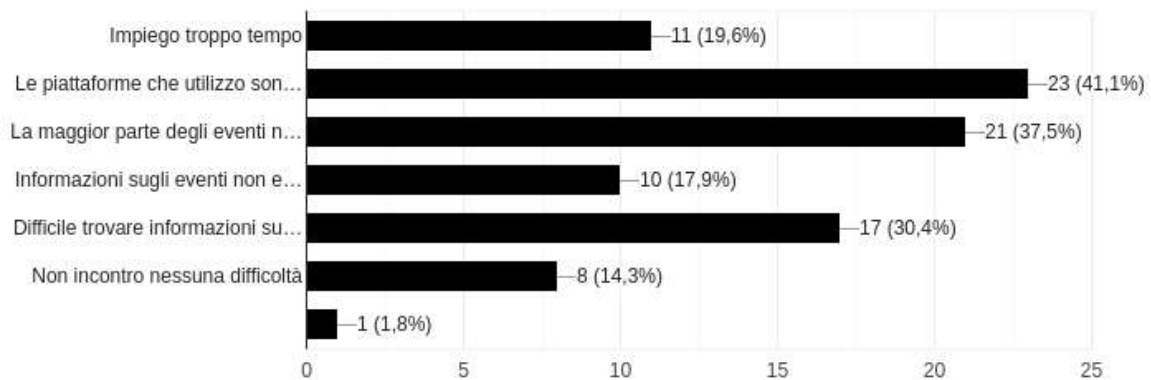
These are the main difficulties people find when gathering information about events. (Truncated text reads: "Le piattaforme che utilizzo sono troppe e/o dispersive", "La maggior parte degli eventi non rispondono ai miei interessi o sono troppo lontani da raggiungere", "Informazioni sugli eventi non esaustive", "Difficile trovare informazioni su eventi che si svolgeranno fra più di una settimana").
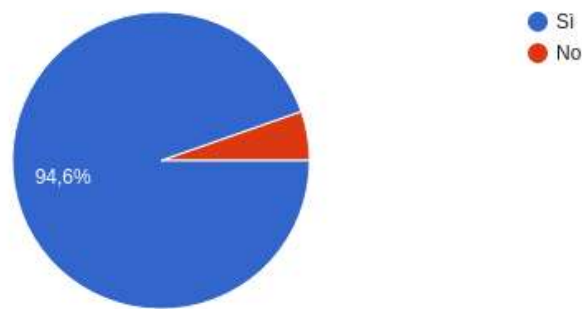
Most of the people answered "yes" when asked if they have ever missed an interesting event because of aforementioned difficulties.

These results show that most of the people that attend events suffer from the fragmentation of the information between different platforms. They are inclined towards the use of digital tools to overcome those difficulties and achieve their goals.

From this questionnaire we derived our target users and found what their needs are in order to address them in this project.

2.3 Interviews

We conducted interviews with various users to understand their experiences and challenges when finding and booking events. The main issues they reported were:

1. **Difficulty in Finding Events**: Users find it hard to locate events that match their interests due to the need to check multiple platforms.
2. **Missing Events**: Many users have missed events because they didn't find out about them in time.
3. **Detailed Information**: Users often struggle to find complete and clear details about events.
4. **Unified Platform Desire**: Users expressed a strong need for a single platform to find all event details and booking options.
5. **Favorites List**: Users want a feature to save and easily access their favorite events. This helps them keep track of events they're interested in, compare them later, and quickly find details without having to search again.

These insights inspired us to design SetOn with features that aggregate event listings, provide personalized recommendations, ensure detailed information, and unify the platform experience.

2.4 Focus Group

We held a focus group with 6 participants to further explore their experiences and preferences related to finding and booking events. The key findings were:

1. **Finding Events**: Participants use multiple platforms, which is time-consuming and frustrating. They often miss events due to fragmented information.
2. **Comparing Events**: Inconsistent information across different platforms makes event comparison difficult.
3. **Event Information**: Complete and accurate event details are often hard to find. Participants emphasized the importance of detailed descriptions.
4. **Booking Tickets**: The current booking process is cumbersome with technical issues and limited payment options. Participants desire a streamlined and reliable booking process.
5. **Unified Platform**: All participants agreed that a single platform for finding, comparing, and booking events would greatly enhance their experience. They highlighted the need for a comprehensive search function, a map view, and a favorites list.
6. **Follow Event Organizers (New Idea)**:

   User Proposal: Participants suggested a feature that allows users to follow their favorite event organizers. This way, they can receive updates and notifications about new events produced by those organizers.

   Benefits: This feature would help users stay informed about events from organizers they trust and enjoy, ensuring they don't miss out on any events from their preferred sources.

The focus group provided valuable insights from the interviews and the innovative idea to enhance SetOn. Participants emphasized the need for a comprehensive, user-friendly platform that simplifies the process of finding, comparing, and booking events. The new idea of allowing users to follow event organizers was particularly well-received and is seen as a way to keep users engaged and informed about their favorite events.

Overall the focus group and interviews confirmed the results that we saw in the questionnaire, but people involved showed particular interest in the idea of a platform dedicated to event aggregation.

2.5 User Analysis

SetOn is oriented towards a large category of people. Every person that is interested in making better use of their spare time, or that perceives the difficulties that we discussed in the introduction, is a potential user of SetOn. As such, we want the application to look familiar and to be accessible.

Using the questionnaire results, we were able to establish that SetOn refers to users that meet this description:

- Gender: Any, equally distributed
- Age: 18-54, mostly between 20-27
- Job/Level of study: Any
- Technology: Smartphone familiarity
- Location: Living in a big city or in proximity of it

2.5.1 Persona 1 - Alessandra

Alessandra : the Social Butterfly
- Female
- 22 years old
- Aspiring social media influencer
- Bachelor degree
- Digital native
- Lives in a residential area in Rome

Alessandra is extroverted and energetic. She is passionate about social events and nightlife. She loves connecting with people and values spontaneity and unforgettable experiences. Believes in living life to the fullest and making the most of every moment. Enjoys pushing boundaries and exploring new experiences. Driven by a desire for genuine connections and meaningful relationships. She feels overwhelmed by the monotony of everyday life. Worries about finding meaningful connections in a digital age. Experiences FOMO (fear of missing out) and likes to be in the center of the action. Her goal is to establish herself as a prominent influencer in the local nightlife scene, to leave a lasting impression on every social gathering he attends. Seeks out events that offer unique experiences and opportunities for socializing. Uses social media to discover upcoming events and connect with friends. Willing to pay for premium events and experiences. Values the power of events to connect people and create lasting memories.

Scenario: always up to date
Due to her efforts in becoming a popular social media influencer, Alessandra needs a reliable tool to always find the best events in Rome to express herself. She is mostly interested in nightlife but she thinks she could insert herself in the niche of enogastronomy.
She spends a lot of her time gathering information about events from many different platforms.

2.5.2 Persona 2 - Stefano

Stefano: the Bookworm
- Male
- 42 years old
- Librarian
- Bachelor degree
- Accustomed to technology
- Lives in Palermo

Stefano is a passionate librarian with a boundless love for books and literature. He delights in sharing his love for books with others, weaving tales of faraway lands and forgotten heroes with his words. He has an uncanny ability to connect with people on a personal level, drawing them into the stories he loves. He loves discussing Sicilian literature and folklore and often misses literary events and exhibitions because he can't keep up with them. He finds it difficult to explore new writing talents from Sicily and he is an advocate for promoting local literature.
He also likes cooking traditional Sicilian dishes.

Scenario: birthday itinerary
Stefano wants to celebrate his birthday in a unique way. He invites three of his friends to join him in a day out in Palermo, engaging in activities, improvising and planning along. He wants to have many different choices to choose from at any time of the day. He would like to see a contemporary art show and maybe even spend some time looking for old books in the vintage market.

3 Task Analysis

3.1 HTA

Hierarchical Task Analysis (HTA) is a task description methodology used to produce a detailed description of tasks through a structured hierarchy of goals, sub-goals, operations and plan. This technique dissects tasks into progressively finer components, providing a comprehensive framework essential for subsequent analysis.

3.1.1 Book an event using the map HTA

3.1.2 Manage account HTA

```
                        ┌─────────────────────┐
                        │  0. Manage Account  │
                        └─────────────────────┘
                                   │
                        Plan 0
                        If needed do 1, 2, 3, 4 in any order
                        Do 5
```
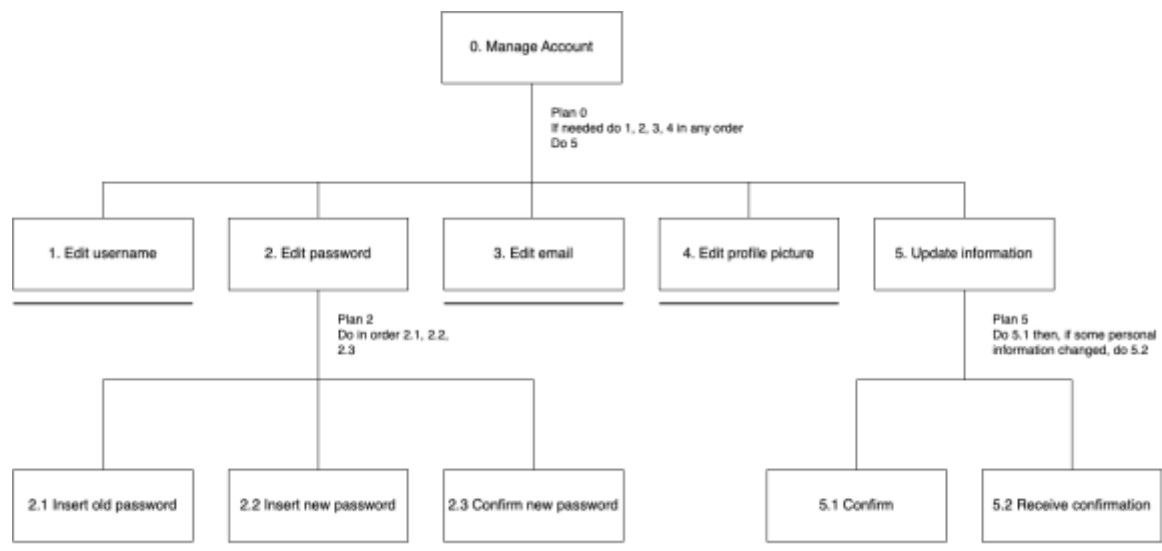
| 1. Edit username | 2. Edit password | 3. Edit email | 4. Edit profile picture | 5. Update information |

Plan 2
Do in order 2.1, 2.2, 2.3

Plan 5
Do 5.1 then, if some personal information changed, do 5.2

| 2.1 Insert old password | 2.2 Insert new password | 2.3 Confirm new password | | 5.1 Confirm | 5.2 Receive confirmation |
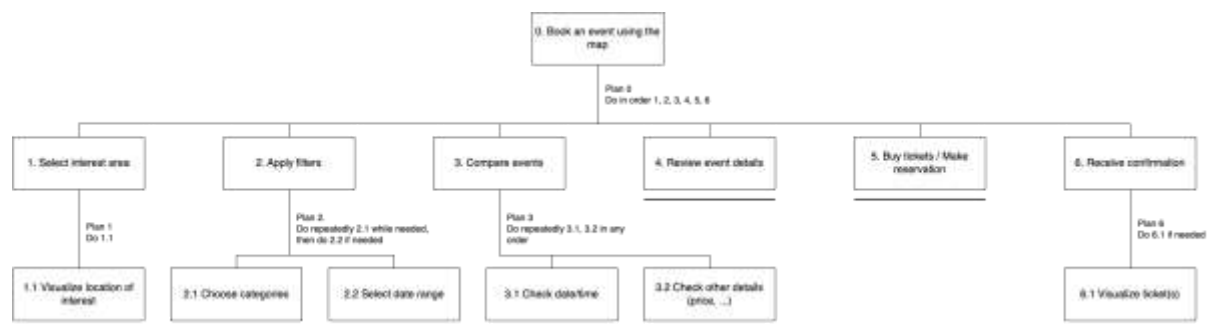
3.1.3 Search an event by keyword HTA

```
                        ┌─────────────────────┐
                        │ 0. Search an event by│
                        │      keyword         │
                        └─────────────────────┘
                                   │
                        Plan 0
                        Do in order 1, 2, 3, 4, 5
```

| 1. Find an interesting event from outside the platform | 2. Write keyword(s) | 3 Start search | 4. Review results | 5. Find corresponding event(s) |
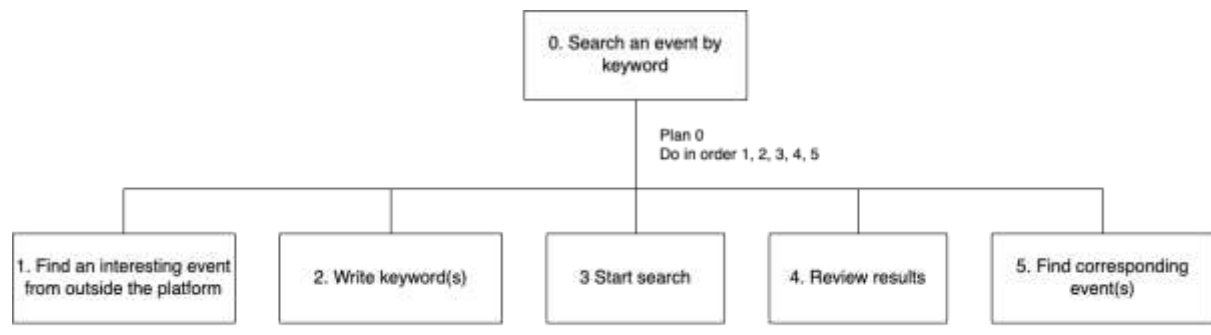
3.2 STN

The most prominent feature of our project is the possibility to browse a map to explore events. This exploration would translate into an STN inefficiently because of concurrency. We decided to split the STN in order to eliminate this concurrency but still preserve the meaning of the interaction.

3.2.1 Gathering event details using the map with satisfying filters already applied

We assume that users have already reached a state in which the map shows events that could satisfy the user.
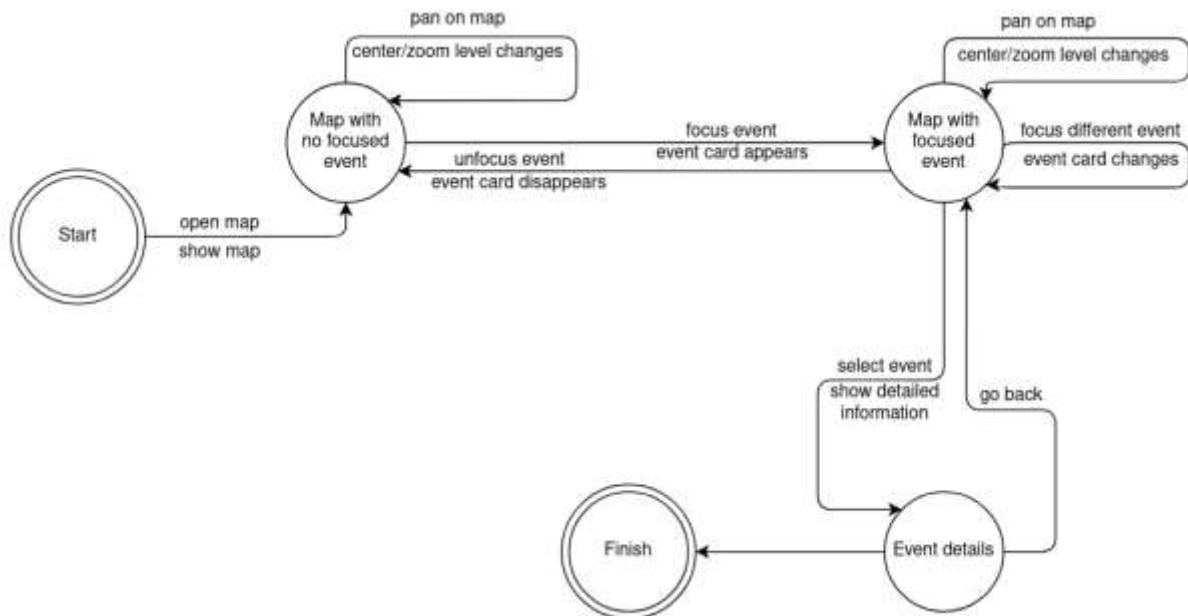

Users can find any event available using the map. To help the user in their search, events can be:

- At first focused: user gathers partial information about the event but is still able to pan on the map.
- Then selected: user gathers detailed information about the event but is unable to pan on the map.

3.2.2 Applying date range filter on the map

Users are able to filter events by date, showing on the map only events that are held during the specified date range.
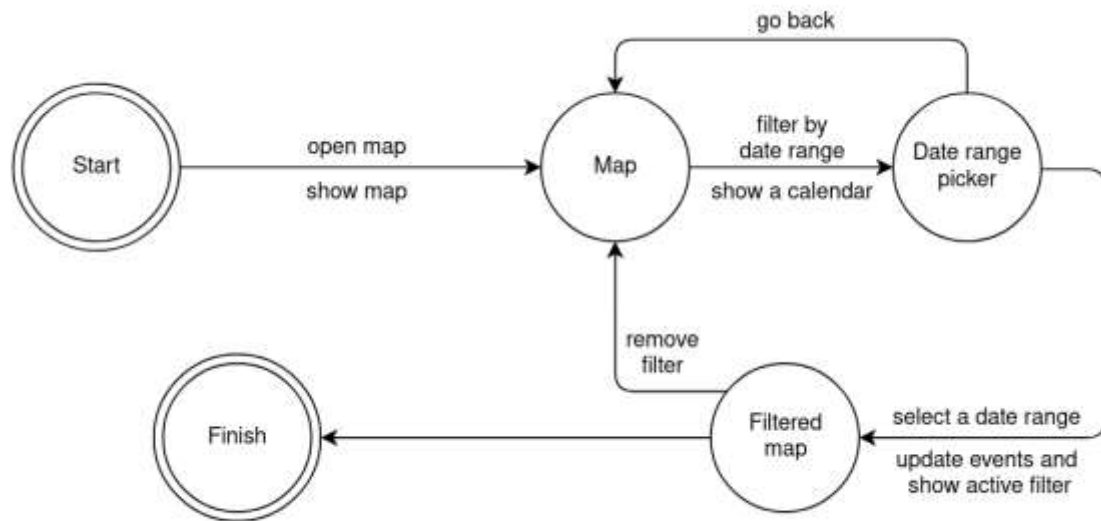
3.2.3 Applying category filters on the map

In order to filter out uninteresting events, users can specify the categories of events they want to see. The user can apply any number of category filters, so the size of the STN grows proportionally with this amount.
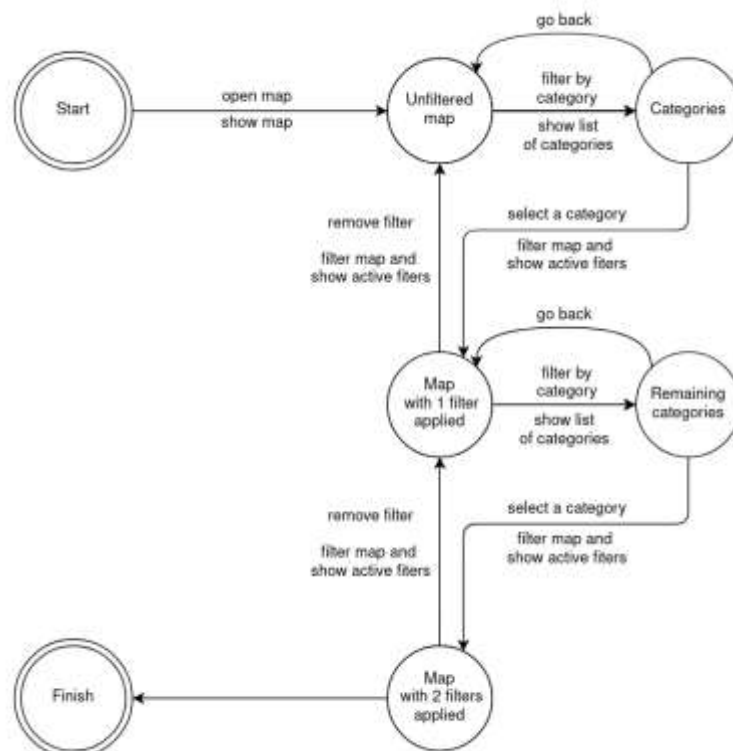
This example shows an STN that corresponds to the application of **2 category** filters.

3.2.4 Gathering favourite event details

To easily find favourite events, users have access to a favourite events list.
They can change from favourite to non-favourite any of the events in the list and by selecting an event they get detailed information about it.
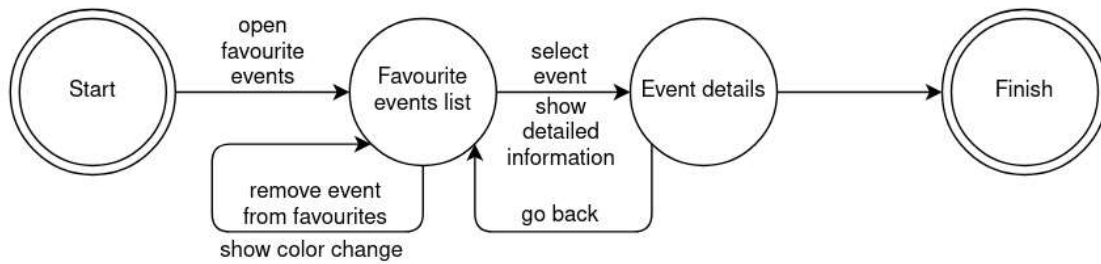
4 Prototype 0

4.1 Personalized Feed
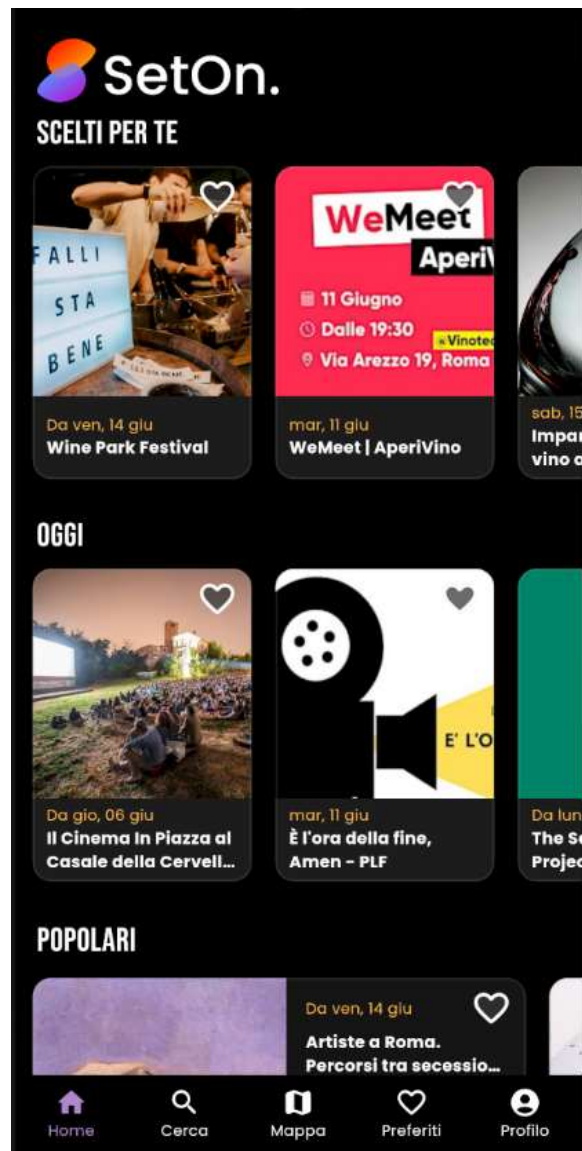
The personalized feed allows users to discover events quickly. Events are divided in rows by different criteria. Some rows are personalized to the users preferences.

4.2 Search Section
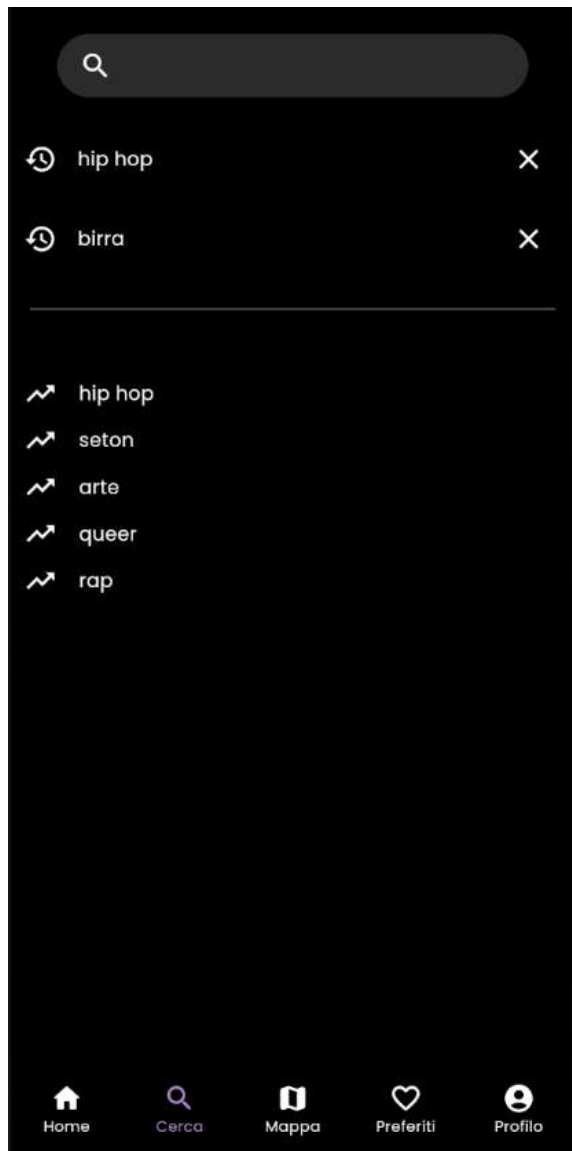
The search section is accessible as a separate page. Users can type in relevant keywords or repeat recent searches. They also have access to predetermined keywords that reflect trending search among other users.
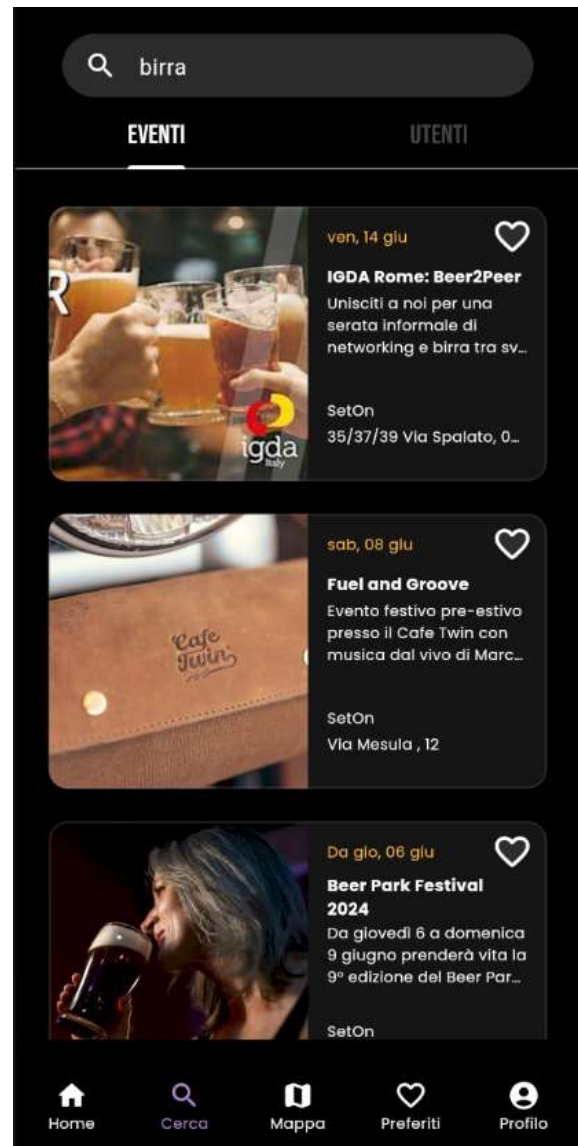
The results are presented as a list of event previews.

4.3 Map
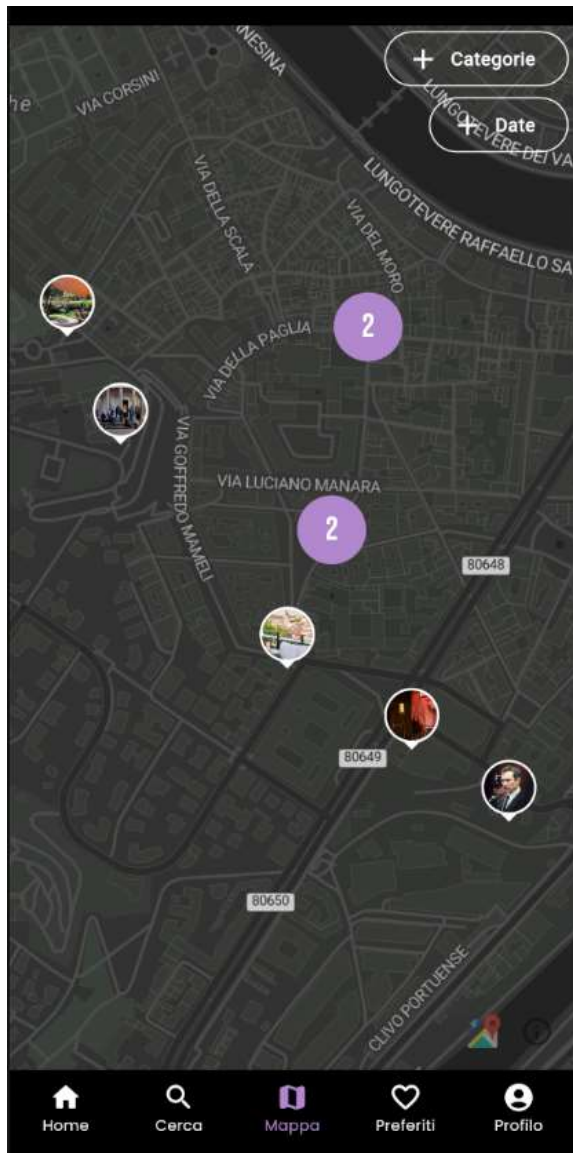
The map displays all the events in their respective venues. If some map markers are too close together, they get clustered. It is possible to recognize events from the image in the marker.
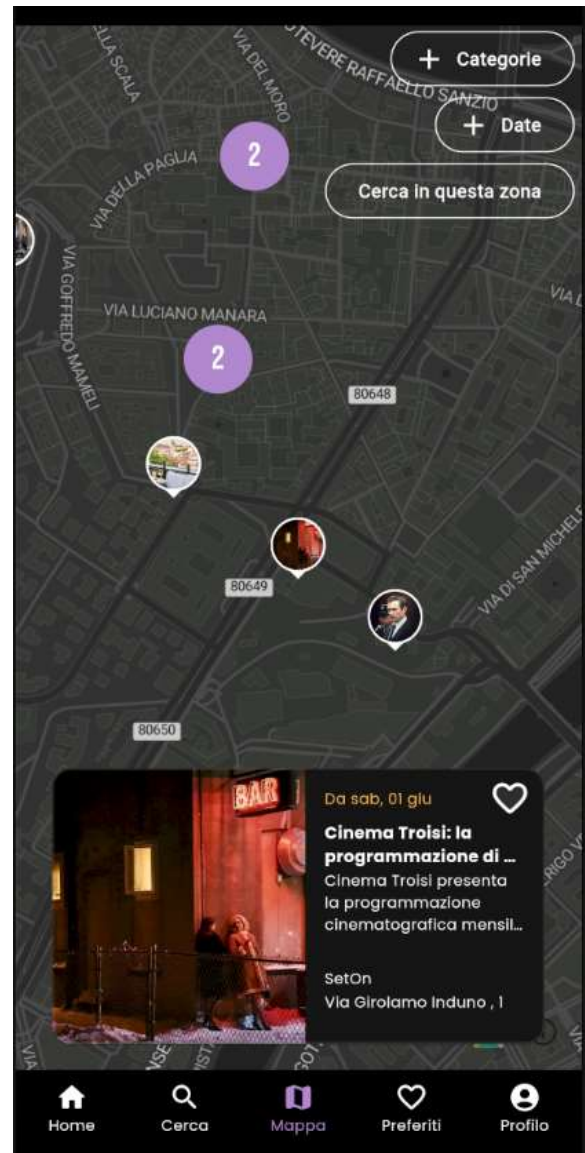
When an event is selected, the map automatically centers on its marker. A card containing some information about the events is displayed, The user is still able to pan on the map. If a different event is selected, the card changes accordingly.

When the user taps on the Categories filter, a list of available categories is presented. Filters already applied to the map do not appear in this list.
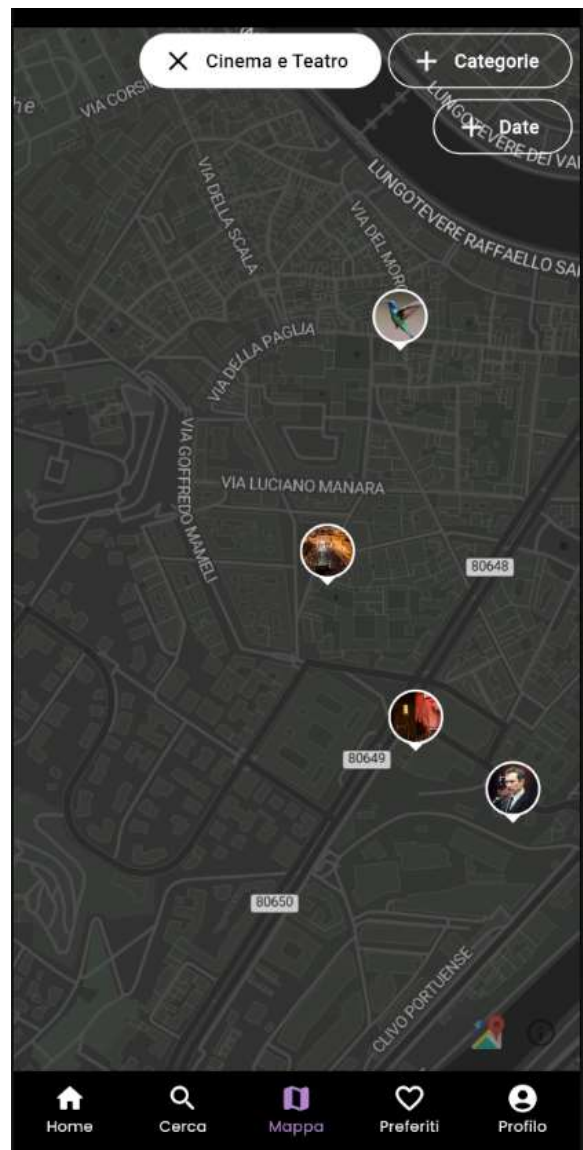
Once a filter is applied, only corresponding events appear on the map. If multiple filters are applied, the set of events appearing is the union of the events corresponding to each filter.

When the user taps on the Date filter, a date range picker is prompted.
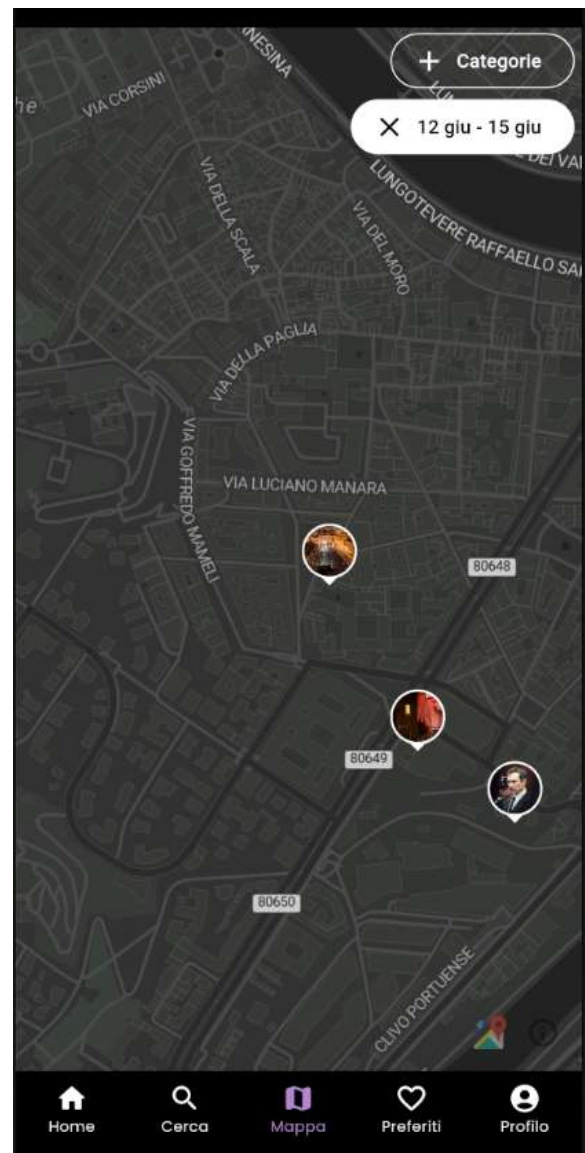
Once applied, only corresponding events will appear. It is not possible to apply more than one Date filter at once.

4.4 Favourite Events
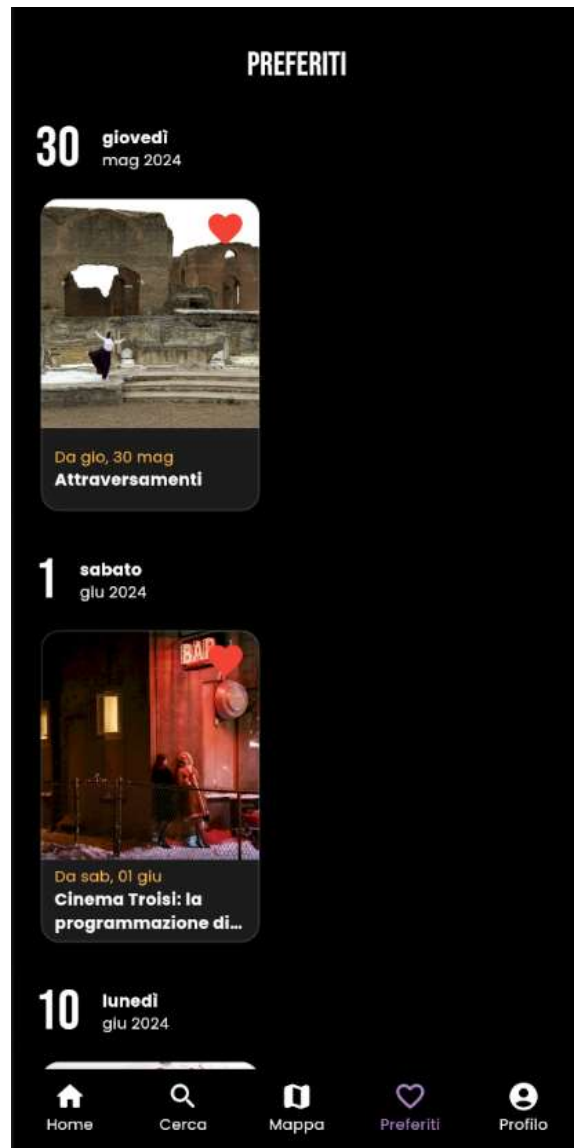
Users can find their favourite events in a separate section. Events are displayed as a list, sorted by date. For every day in the list, there is a row of corresponding events.

4.5 Event Page

When the user taps on one of the event cards in the application, this page is displayed, providing all the details to the user. Here, the user is able to follow a link (the button below) to eventually reach an external page from which is able to complete reservations or buy tickets.

5 Expert Based Evaluation

5.1 Heuristic Evaluation

Heuristic Evaluation is a usability inspection method for identifying user interface design issues by comparing the interface against established usability principles, known as heuristics. This method,

developed by Jakob Nielsen and Rolf Molich, involves expert evaluators examining the interface to generate a list of potential usability problems.

5.2 Molich and Nielsen's Heuristics

Molich and Nielsen developed a heuristic list composed by 10 heuristics principles:
1. **Visibility of system status**: The system should always keep users informed about what is going on, through appropriate feedback within reasonable time.
2. **Match between system and the real world**: The system should speak the user's language, with words, phrases and concepts familiar to the user, rather than system-oriented terms. Follow real-world conventions, making information appear in a natural and logical order.
3. **User control and freedom**: Users often choose system functions by mistake and will need a clearly marked "emergency exit" to leave the unwanted state without having to go through an extended dialogue. Support undo and redo.
4. **Consistency and standards**: Users should not have to wonder whether different words, situations, or actions mean the same thing. Follow platform conventions.
5. **Error prevention**: Even better than good error messages is a careful design which prevents a problem from occurring in the first place. Either eliminate error-prone conditions or check for them and present users with a confirmation option before they commit to the action.
6. **Recognition rather than recall**: Minimize the user's memory load by making objects, actions, and options visible. The user should not have to remember information from one part of the dialogue to another. Instructions for use of the system should be visible or easily retrievable whenever appropriate.
7. **Flexibility and efficiency of use**: Accelerators, unseen by the novice user, may often speed up the interaction for the expert user such that the system can cater to both inexperienced and experienced users. Allow users to tailor frequent actions.
8. **Aesthetic and minimalist design**: Dialogues should not contain information which is irrelevant or rarely needed. Every extra unit of information in a dialogue competes with the relevant units of information and diminishes their relative visibility.
9. **Help users recognize, diagnose and recover from errors**: Error messages should be expressed in plain language (no codes), precisely indicate the problem, and constructively suggest a solution.
10. **Help and documentation**: Even though it is better if the system can be used without documentation, it may be necessary to provide help and documentation. Any such information should be easy to search, focused on the user's task, list concrete steps to be carried out, and not be too large.

5.3 Heuristic Evaluation Report

We submitted Prototype 0 for a Heuristic Evaluation, performed by Professor Alba Bisante. The following violations have been found:

Page	Heuristic(s) violated	Severity	Description / Comment
Map page	Visibility of the system status	3	Consider highlighting which event has been selected on the map
Search page event	User control and freedom	2	You could consider adding

preview	Flexibility and efficiency of use	information about the event location (a preview of the map, a clickable address, …) and event cost in a more prominent way

5.3.1 Severity scale

The severity number identifies:
- 0 = I don't agree that this is a usability problem at all
- 1 = Cosmetic problem only
- 2 = Miron usability problem
- 3 = Major usability problem
- 4 = Usability catastrophe

6 Prototype 1

6.1 Addressing the First Violation
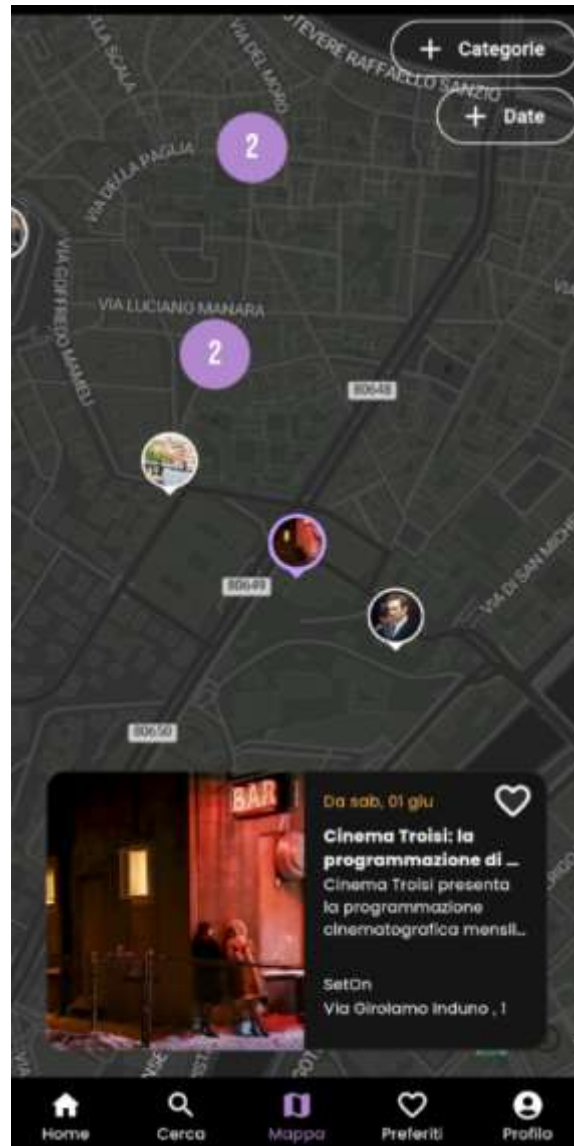
Once a marker is pressed, it changes color to reflect the state of the map.

6.2 Addressing the Second Violation
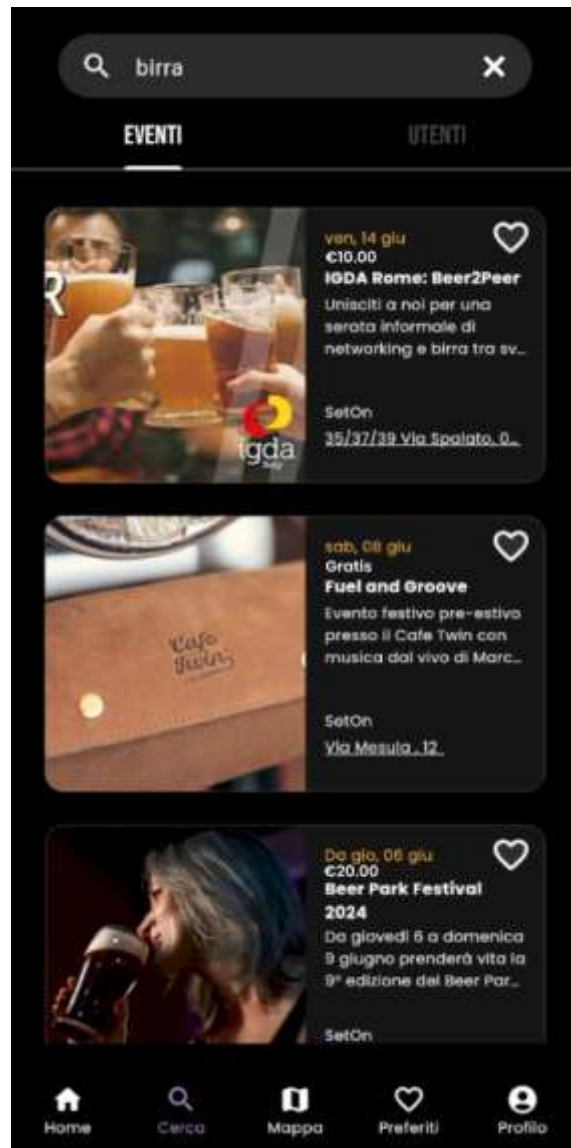
Now the cost of the event is immediately displayed with the rest of the information. The address is now clickable and opens the map at the specified location.

7 Controlled Experiment

A controlled experiment is an experiment in which everything is held constant except for one variable. Usually a set of data is taken for a control group, which is commonly the normal or usual state, and one or more other groups are examined, where all conditions are identical to the control group and each other except this one variable. Sometimes it's necessary to change more than one variable, but all the experimental conditions will be controlled so that only the variables being examined change and the amount or way they change is measured.

Controlled experiments are considered to be the most rigorous of empirical methods capable of providing empirical evidence to support a particular claim or hypothesis.

7.1 Experiments

We wanted to evaluate how the change of one variable in the interface will affect the time spent to perform a task and how much the user would be prone to errors. We considered two tests:
- Test #1: "Find the cheapest event of type *live* using the search function"
  - Interface A: cost information available in the event preview.
  - Interface B: cost information only available in the event detail window.
- Test #2: "Search an event of your interest using the map, add it to favourites, find it in the favourites section"
  - Interface A: bottom navigation section has icons and labels.
  - Interface B: bottom navigation section has only icons.

7.1.1 Reason of the chosen tests

- Test #1: We wanted to test, through controlled experiments, how the heuristic violation regarding the lack of information about the cost in the search page results' preview was impacting the time users spent to compare events using their cost. In addition, we wanted to test which type of error users can make in this scenario.
- Test #2: We wanted to test, through controlled experiments, if the labels were having a positive impact to help users to navigate through pages using the bottom navigation section.

7.1.2 ANOVA Analysis

The controlled experiment has been conducted with ANOVA Analysis.

Participants: 20 people in a range of age between 20-28 years old with smartphone familiarity living in Rome (coherent with user profile).
Groups: we divided the participants into two groups, each one with 10 people. One group has conducted the experiment using Interface A for Test#1 and Test#2, the other group has conducted the experiment using Interface B Test#1 and Test#2.
Null hypothesis:
- Test #1: the presence or absence of the cost information in the event preview in the search section is not relevant.
- Test #2: almost every user that is intended to use this application has a perfect background knowledge about the meaning of every icon in the bottom navigation section.

Our hypothesis:

- Test #1: cost information in the event preview of the search section will help users to compare different events of the same category using the cost.
- Test #2: it is not necessarily true that any user that is intended to use this application will understand the meaning of every icon if not in presence of the corresponding label below it, especially for the map icon which is less common to see.

Assumption: every user is already logged-in and it starts the experiment in the opening home page of the application.

Tools: we used an ANOVA tool in the spreadsheet where we recorded the metrics of the experiment to analyse the values we collected.

7.2 Test #1

7.2.1 Results on the time spent

With cost (s)	Without cost (s)
18	62
10	61
15	40
21	70
14	61
13	42
16	79
14	55
18	72
17	67

Anova: Single Factor - Test #1 (time)

SUMMARY

Groups	Count	Sum	Average	Variance
With prices	10	156	15,6	9,6
Without prices	10	609	60,9	155,6555556

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	10260,45	1	10260,45	124,1767633	0,00000001646	4,413873312
Within Groups	1487,3	18	82,62777778			
Total	11747,7500	19,0000				

7.2.2 Results on the errors

With cost	Without cost
0	1
0	0
0	1
1	1
0	0
0	0
0	2
0	0
1	2
0	1

Anova: Single Factor - Test #1 (error)

SUMMARY

Groups	Count	Sum	Average	Variance
With prices	10	2	0,2	0,1777777778
Without prices	10	8	0,8	0,6222222222

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	1,8	1	1,8	4,5	0,04803752567	4,413873312
Within Groups	7,2	18	0,4			
Total	9	19				

The user is forced to scroll down and open every event, one at a time, to see the price in the Interface B. The effect is that the user must memorize which was the last event name of lowest price seen yet. When the user has seen all the events, he should scroll up until he finds the correct cheapest event. Sometimes, the user forgets the cheapest event and confuses it with another event and he realizes it only after clicking what he thought was the cheapest one, leading to one error every time this process happens.
The error users made in the Interface A was just mis-clicking on the cheapest event.

7.3 Test #2

7.3.1 Results on the time spent

With labels (s)	Without labels (s)
19	23
9	19
18	21
11	16
19	21
16	16
10	20
12	23
16	19
17	17

Anova: Single Factor - Test #2 (time)

SUMMARY

Groups	Count	Sum	Average	Variance
With labels	10	147	14,7	14,67777778
Without labels	10	195	19,5	6,722222222

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	115,2	1	115,2	10,76635514	0,00414982582	4,413873312
Within Groups	192,6	18	10,7			
Total	307,8	19				

7.3.2 Results on the errors

With labels	Without labels
0	0
0	1
1	3
0	1
0	1
0	0
0	1
1	3
0	1
0	0

Anova: Single Factor - Test #2 (error)

SUMMARY

Groups	Count	Sum	Average	Variance
With labels	10	2	0,2	0,1777777778
Without labels	10	11	1,1	1,211111111

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	4,05	1	4,05	5,832	0,02659706165	4,413873312
Within Groups	12,5	18	0,6944444444			
Total	16,55	19				

Users often mis-clicked on the wrong icon in both cases, but these mistakes were much more frequent in the case of Interface B.

7.4 Evaluating ANOVA Results

In both tests, the results showed that $F > F_{crit}$, so we can discard the null hypothesis and our hypothesis is true. Furthermore, the $P_{value} < 0.05$ so the results obtained are significant.

8 Future Improvements

In order to continuously enhance the user experience and expand the capabilities of SetOn, we have identified two key areas for future improvements: the role of event organizers and the integration of a chatbot powered by a large language model (LLM).

8.1 Organizers Role

To further enrich the event ecosystem within SetOn, we plan to introduce a dedicated role for event organizers. By also including organizers in our user base, we can consider some new features that would improve the effectiveness of SetOn.

Organizers will have the ability to **create and manage** their events directly within the app. They will be able to provide detailed information about the event and manage attendee lists. Also, by implementing a **ticketing system**, organizers would be able to also manage their sales through the app. Organizers will be able to **sponsor events** to increase visibility and reach a larger audience. Sponsored events will be prominently featured in users' personalized feeds and search results. Organizers will have access to **analytics and insights** about their events, including attendance rates, user engagement, and feedback. This data will help organizers improve their events and tailor them to better meet the interests and needs of their audience.

Users will have the option to **follow** their favorite organizers. By following an organizer, users will receive notifications about new events, updates, and exclusive offers from those organizers. This will help users stay informed about events from their preferred sources and ensure they never miss out on an opportunity to attend.

8.2 Chatbot Powered by Large Language Model (LLM)

To provide users with a more interactive and efficient way to find and book events, we plan to integrate a chatbot powered by a large language model (LLM). This chatbot will assist users in discovering events based on their preferences, location, and past activity; offer personalized assistance by answering queries about events,providing detailed information and helping with the booking process; enable users to set up notifications and reminders for upcoming events or saved favorites; and facilitate feedback collection after events, allowing users to share their experiences and provide ratings. By implementing these future improvements, SetOn aims to create a more dynamic and user-friendly platform that not only simplifies the process of finding and booking events but also fosters a strong connection between users and event organizers. The introduction of the organizers' role and the LLM-powered chatbot will significantly enhance the app's functionality, making it an essential tool for event enthusiasts.

9 Conclusion

It seems to us that the needs of the users can be satisfied by our application. Using an aggregator we can take care of the fragmentation problem, while by providing a tool that centers around the attendee we can help users achieve their goals efficiently.

There are still some problems that our implementation cannot solve, and the first and most obvious one is that SetOn is "yet another event platform". For this reason we think that SetOn will benefit by remaining in the niche of aggregators instead of being a standalone platform, at least until it develops all the features needed to be fully competitive, such as ticketing services and quality tools for event organization.

The advantages that set apart SetOn by other platforms can be leveraged to grant an income. Mainly, since the catalog is more complete than others and the experience is personalized, SetOn is an excellent way to give visibility to an event by sponsoring it. By targeting organizers, we are producing an interesting product for commercial users that would pay to have access to extra features like analytics and specialist support.