SAPIENZA
UNIVERSITÀ DI ROMA

FACOLTÀ DI INGEGNERIA INFORMATICA: MASTER OF SCIENCE IN ENGINEERING IN COMPUTER SCIENCE

Tesina - Human Computer Interaction

yourBestLive

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Academic Year 2019/2020

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Chapter 1

Introduction

The idea behind yourBestLive

yourBestLive is a mobile app whose purpose is to create a network based on love for music with the aim of promoting musical events and sharing the experiences gained by various musicians. This application wants to act as an intermediary between clubs and new emerging artists allowing all the users to increase their visibility, to expand their range of action finding new places to play and to be always updated on events and opportunities that surround them. It is also usable by standard end users to see which events are available in specific nearby clubs.

Chapter 2

Requirement analysis

2.1 Competitors Analysis

The following applications can be considered as yourBestLive competitors:

- SongKick Concerts
- BandsInTown Concert
- ILive Music

SongKick Concerts allows to buy tickets for concerts and to save concerts calendar, so it is a good app with respect to the standard user, but lacks a lot of features that are indeed useful for musicians and club owners.

BandsInTown Concerts allows to find nearby events and also gives users the possibility to add them into the app, but it does not allow to find clubs near you in order to know them more (read the music genre played, see which types of band they accept,...).

ILiveMusic is more oriented to musicians and club owners with respect to the previous ones because club owners can share their music events and musicians can apply for them, but it does not allow to write reviews, add favorite clubs and contact clubs directly through social media accounts, phone, email and so on.

Now we examine pros and cons of each competitor and of yourBestLive too:

- SongKick Concerts
  - Advantages
    * Buy concert tickets
    * Save concert dates (calendar)
    * Several search filters
  - Disadvantages
    * No informations with respect to a specific club or place
    * Needs Spotify installed for a good UX
    * No features for club owners at all
- BandsInTown Concerts
  - Advantages
    * Find nearby concerts and music events
    * Notifications about favorite artists followed
    * Several payment methods
  - Disadvantages
    * No club-related features
    * No sponsorization for events
    * No Gmail login
- ILiveMusic
  - Advantages
    * Event creation by organizers
    * Search events as a music band
    * Very easy to use
  - Disadvantages
    * Too event organizer - centered
    * Not so used
    * No sponsorization features

- yourBestLive
  - Advantages
    * For musicians, standard users and club owners
    * Search by geo-location and for specific clubs
    * Reviews and sponsorization system for clubs
  - Disadvantages
    * For Italy only
    * No Gmail login feature
    * No iOS version

2.2 Questionnaire Analysis

In this section we present the results of the questionnaire which helped us in modelling our application with respect to the information obtained.

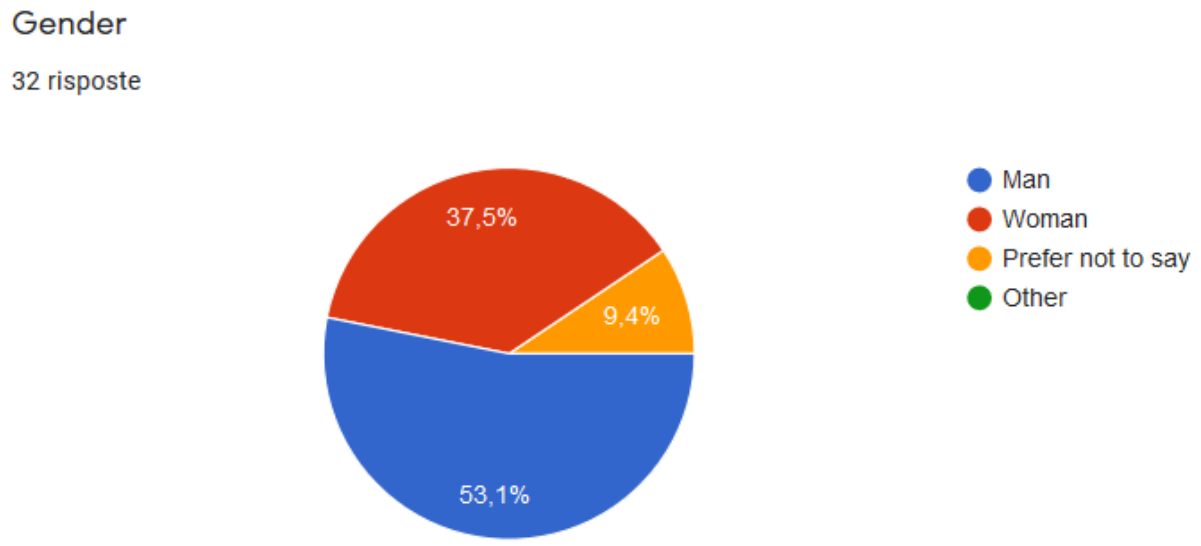

Figure 2.1: User gender.

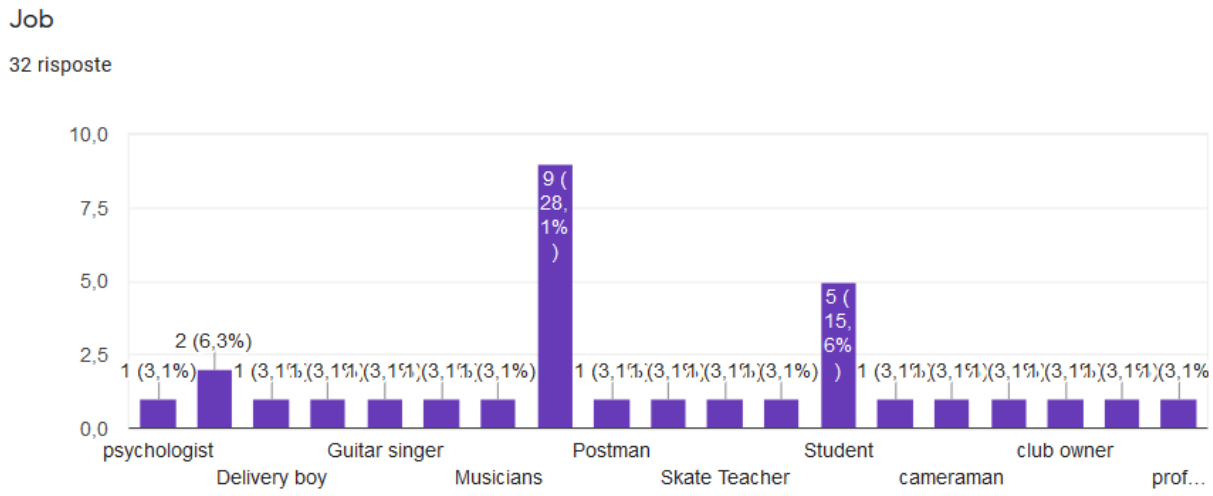

Figure 2.2: User job.

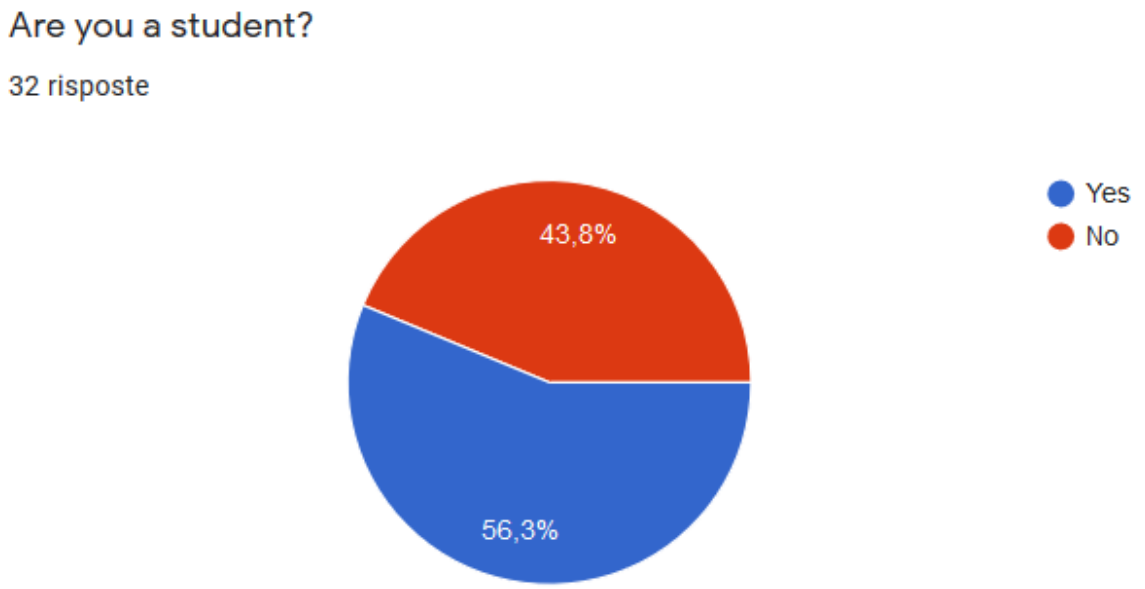

Figure 2.3: User student status info.

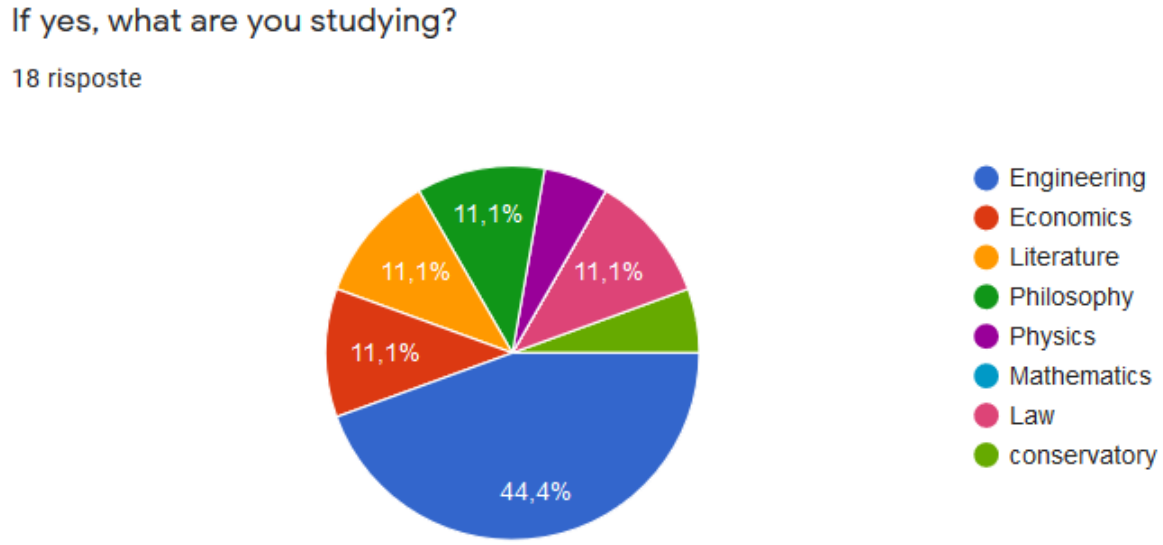

Figure 2.4: User student subject info.

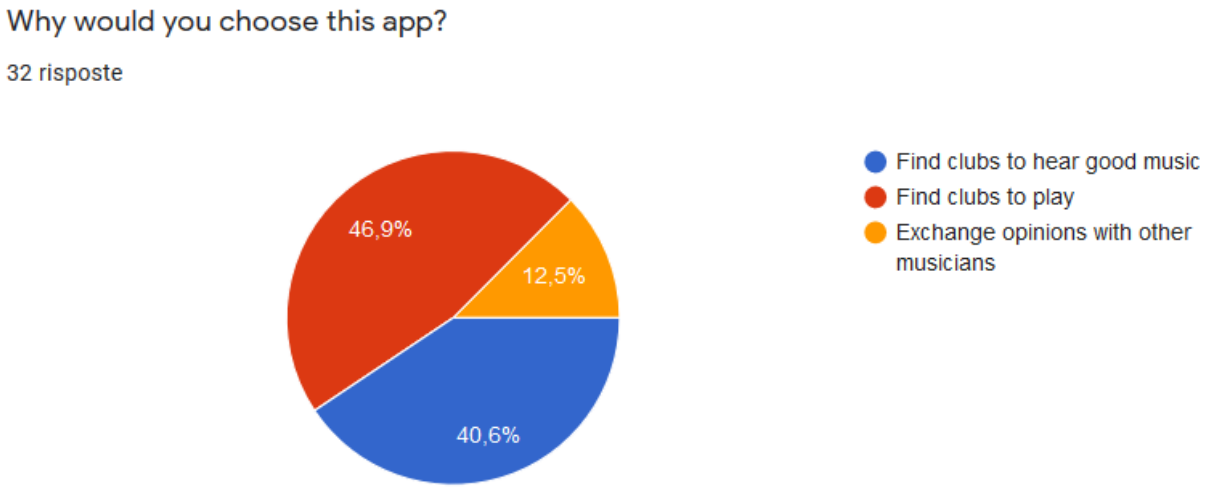

Figure 2.5: User motivations for app use.

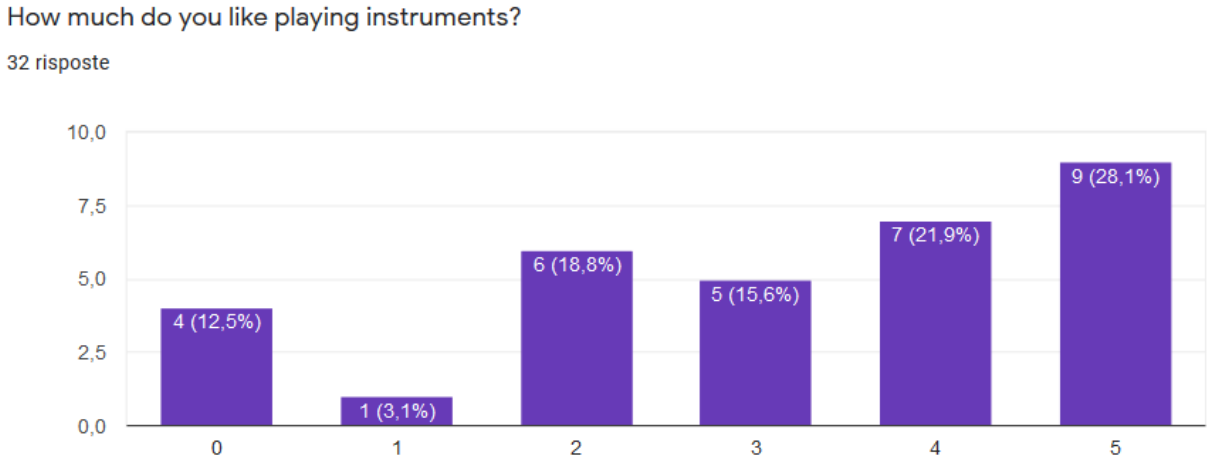

Figure 2.6: User instruments playing info, range 0-5.

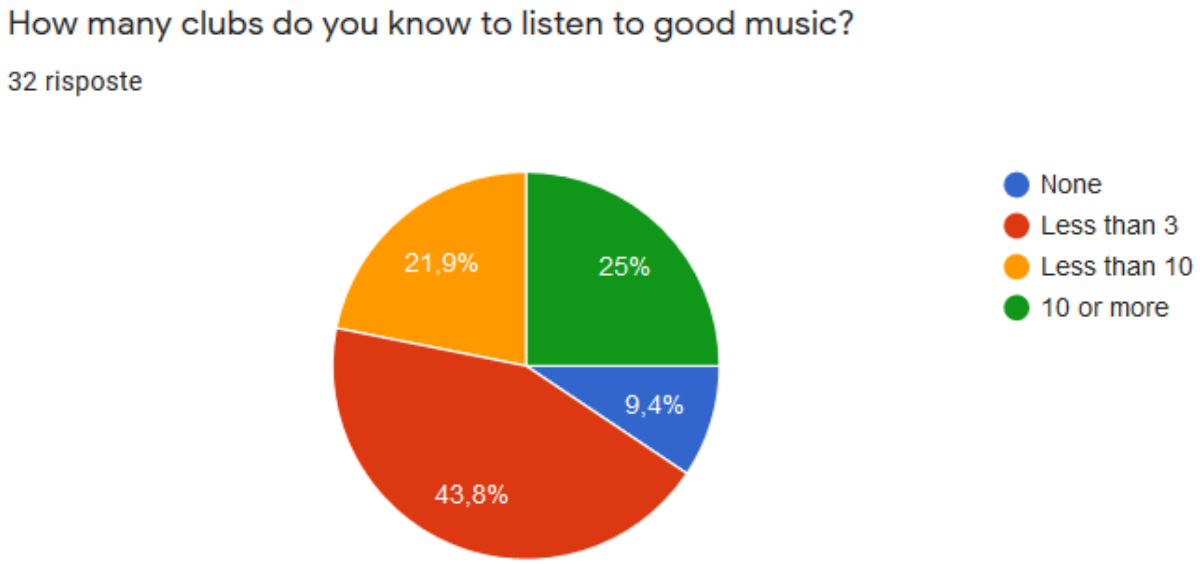

Figure 2.7: User known clubs info.

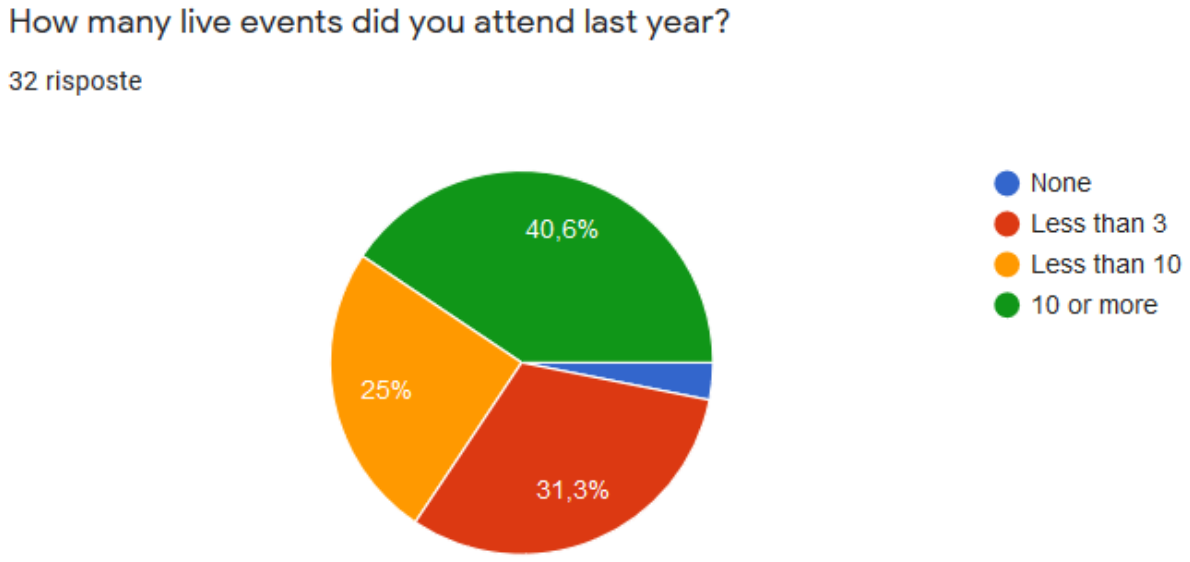

Figure 2.8: User events number attended info.

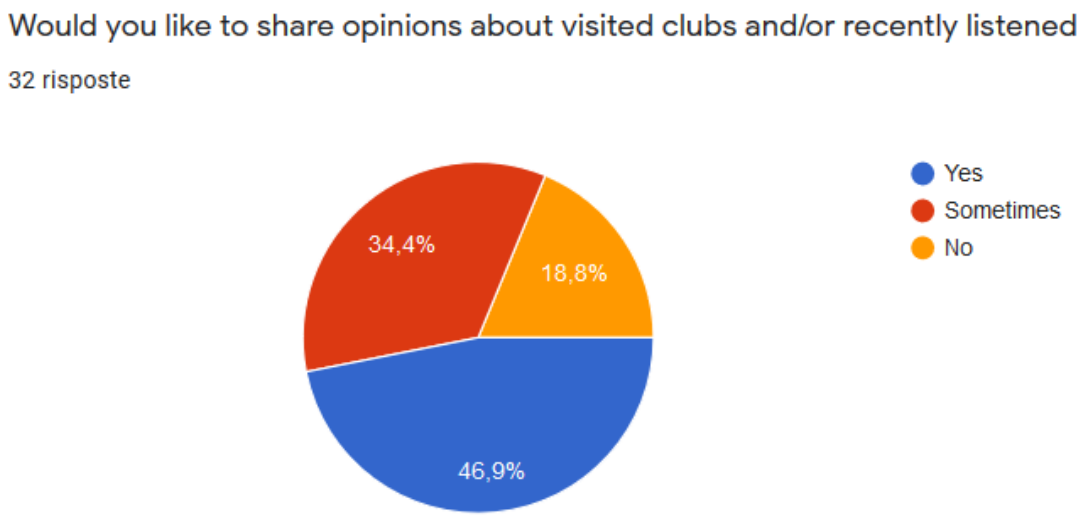

Figure 2.9: User opinions sharing info.

2.2.1 Conclusions

After collecting these results, we understood some information that we will now list here:

- Users has an age which ranges from 18yo to beyond 50 and, thus, their occupation can vary from student positions to several jobs, related and not related to music, so the application has a good level of audience;
- Users more prone in using the app are the ones who can play instruments, as we expected;
- The app received a good feedback from standard users too, who want to attend several music events with friends and share opinions about such events.

The questionnaire also contained an open question about app features wanted by users. We do not present it here as it contains the actions we implemented in the app so it is quite straightforward: we will analyze each task in the next chapter.

2.3 User Analysis

In this section, we present a detailed analysis of yourBestLive users through some examples, also with Scenarios which help us in understanding how the application would be used.

2.3.1 User Profile

Here we present all the information about the user:

- **Age**: 18-60
- **Gender**: equally distributed
- **Location**: Italy
- **Technology**: a smartphone with GPS and Internet connection
- **Work hours**: it depends on the user
- **Family**: anyone
- **Passion**: love for music and for sharing opinions about it
- **Qualification**: any, from secondary school to PhD

2.3.2 Persona 1

User profile

Name:	Fabio
Age:	23
Gender:	Male
Occupation:	Student
Location:	Rome (Italy)

Persona

Fabio is a 23yo student of engineering in computer science, who loves music and has a small band with his friends. He often uses 4G connection for connecting to the internet, from his mobile phone. His dream is to become a famous guitarist and singer to play and sing, one day, in front of thousands of people. He would like to transform his passion into a real job. He has only vintage outfits because he loves 80s rock scene.

Scenario

Fabio has just finished his summer exam session and wants to play with his band in city clubs to have fun and earn some money. He has to ask for each club to play in it (along with payment methods, cachet,...) but this requires a lot of time. His band needs an easy-and-fast solution. He usually uses phone calls to get in contact with clubs, but always struggles to find the correct numbers, losing time.

2.3.3 Persona 2

User profile

Name:	Ciro
Age:	44
Gender:	Male
Occupation:	Club owner
Location:	Naples (Italy)

Persona

Ciro is a 44yo man from Naples whose favorite music is metal. During his youth, he worked for several years as a waiter in bars, pubs and restaurants, saving money for opening, one day, his own club, having the possibility to personalize it with respect to his tastes. Now, he wants his club to be the most popular in the city so he needs a way to do it properly, without wasting money.

Scenario

Ciro is a rock music lover and recently opened a new club in the city center. However, he needs it to be more famous as the number of customers is still quite low. A sponsor method would be the best for him, possibly in a place where rock musicians see his club. However, Ciro is not a good mobile phone user so he needs an easy way to reach his goals, possibly through a user-friendly interface. Musicians often contact his club by phone as he does not update the Facebook page since some time.

2.3.4 Persona 3

User profile

Name:	Tullia
Age:	25
Gender:	Female
Occupation:	Student
Location:	Rome (Italy)

Persona

Tullia is a 25yo Political Sciences offsite student at Sapienza University of Rome. She loves indie pop music that is gaining popularity in the capital of Italy and her favorite artist is Gazzelle. She has a lot of friends with whom she likes to go out for assisting to concerts and to share opinions about artists. She usually go out on weekends only, because she is busy during the week to study for exams. She uses the mobile phone a lot because she follows artists' pages on social media, especially Instagram to be updated on their last videos.

Scenario

Tullia wants to organize her weekend with friends but has no idea on where to go. She would like to hear some live music but she is tired of going always to the same clubs. She needs a way to easily search for new ones which respect her music tastes and that are not excessively far from where she lives. In order to see which artists play in nearby clubs, she follows Facebook pages but often they are not updated properly.

Chapter 3

Task Analysis - HTA and STN

In this chapter we present the HTA and STN related to yourBestLive tasks:

- Add a club to the app;
- Promote a club;
- Add a club to Favorites;
- Review a club.

3.1 Add a club to the app

In order to perform this task, the user needs to be logged in. After doing it, he/she has to go to the dedicated page for adding a new club and perform the task.

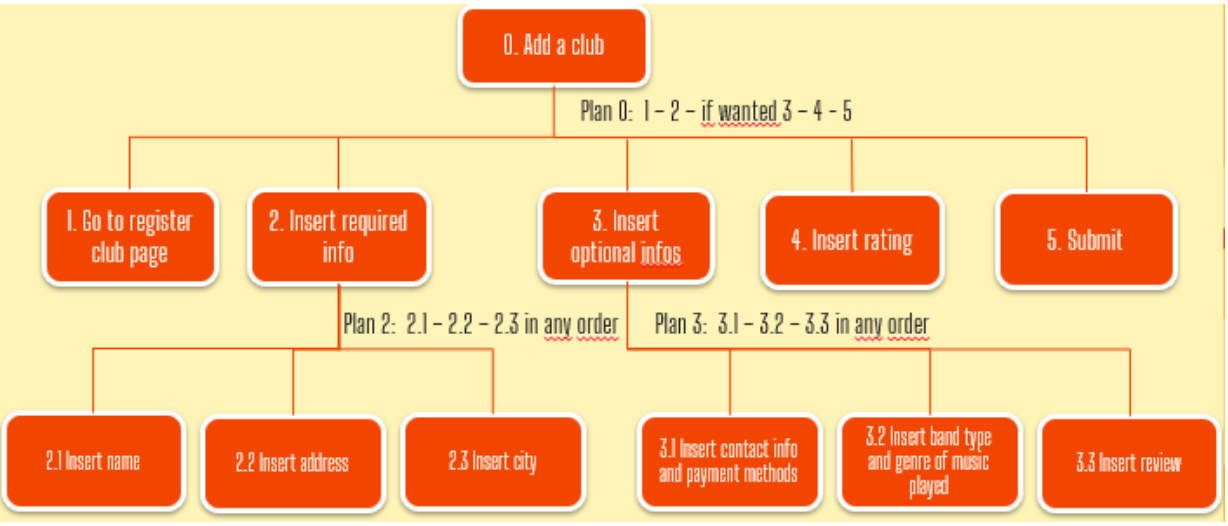

Figure 3.1: HTA: Add a club to the app.

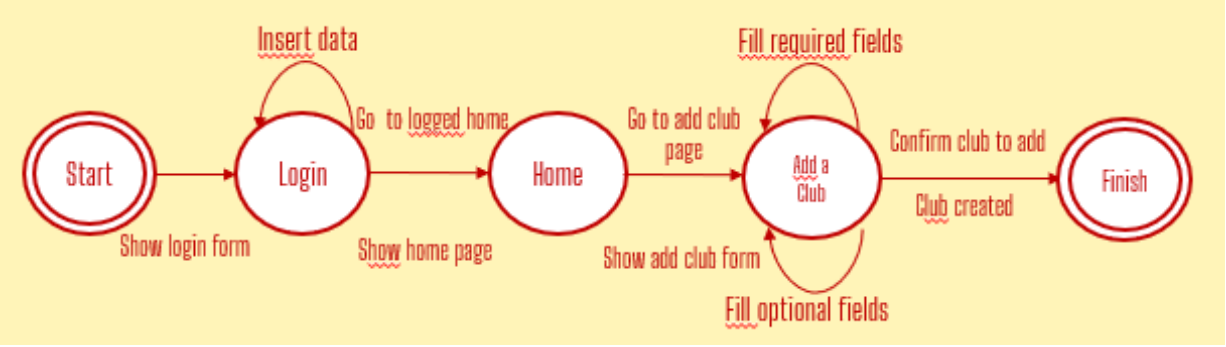

Figure 3.2: STN: Add a club to the app.

3.2 Promote a club

Also for this task we need a signed in account: the club sponsorization is done thanks to some payment methods, so it's a paid feature.

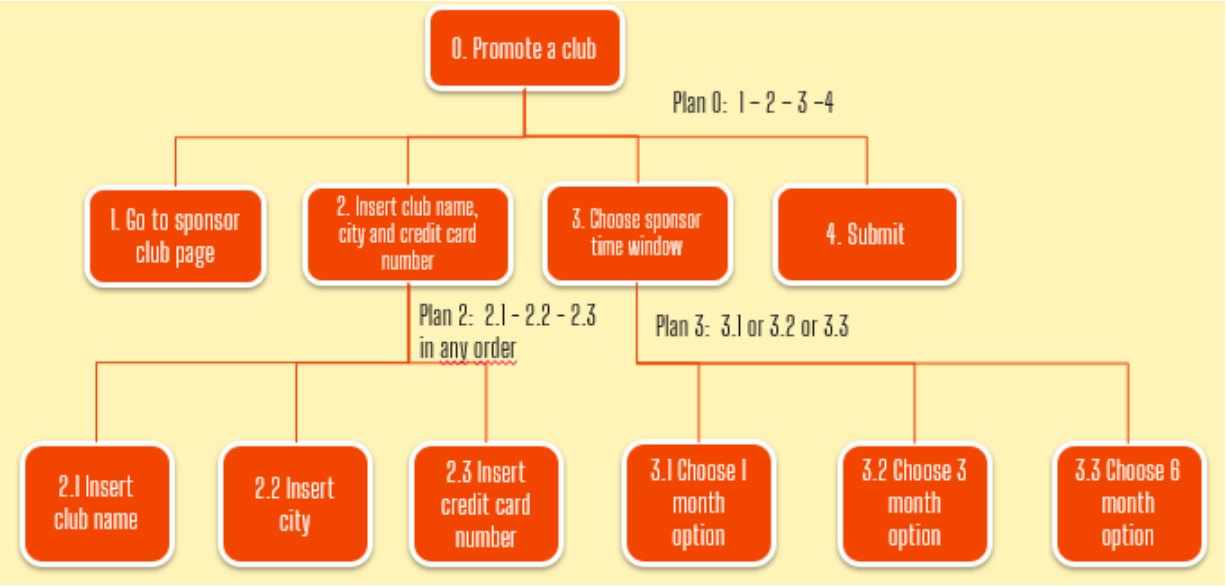

Figure 3.3: HTA: Sponsor a club of the app.

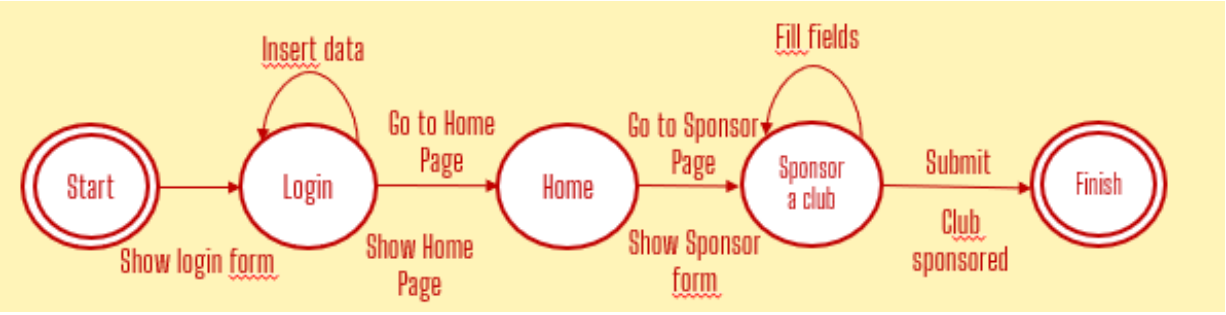

Figure 3.4: STN: Sponsor a club of the app.

3.3 Add a club to Favorites

This feature is useful for logged in users who want to save their best clubs and access them in a faster way with respect to all the other ones.

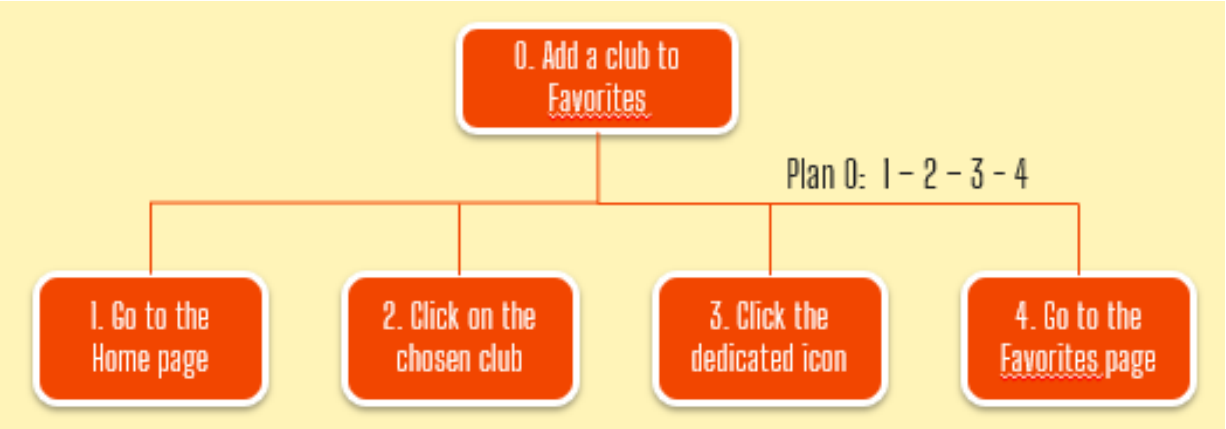

Figure 3.5: HTA: Add a club to Favorites section.

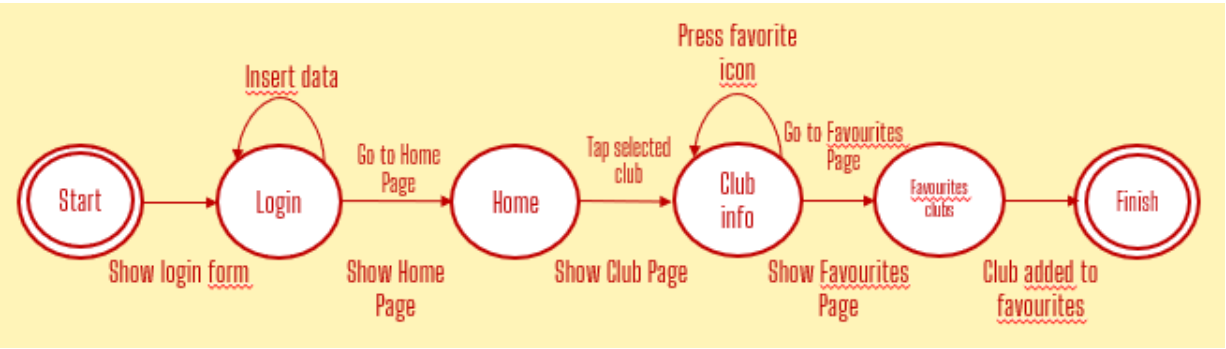

Figure 3.6: STN: Add a club to Favorites section.

3.4 Review a club

This is a relevant feature of our application: thanks to it, users can express their opinion about clubs helping other musicians or normal users in their choice.

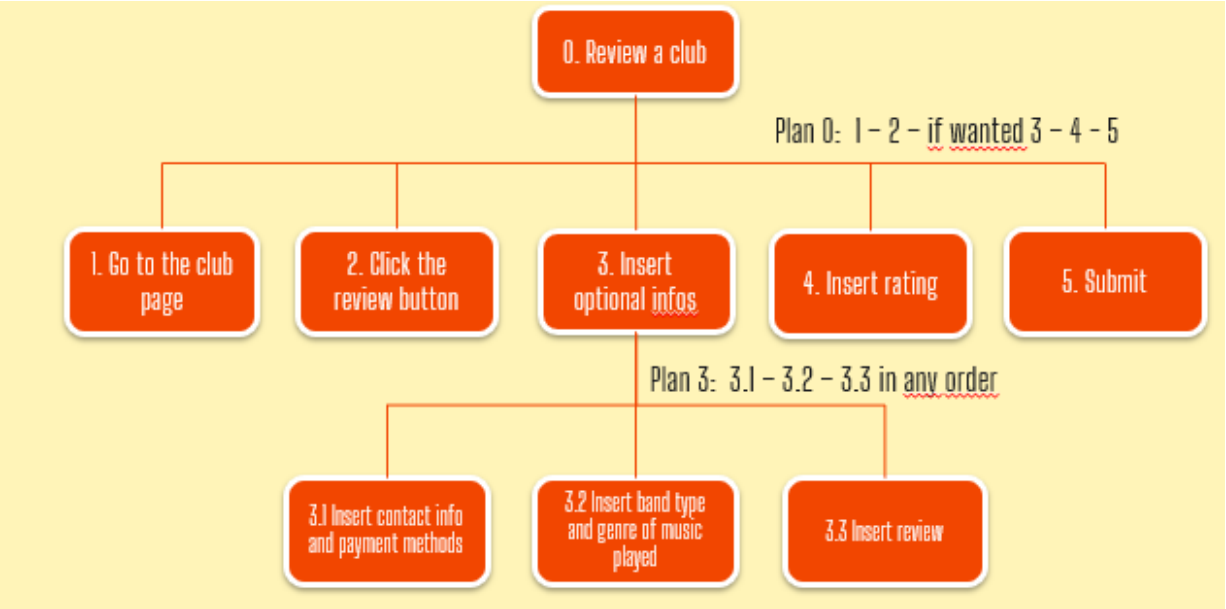

Figure 3.7: HTA: Write a review for a club.

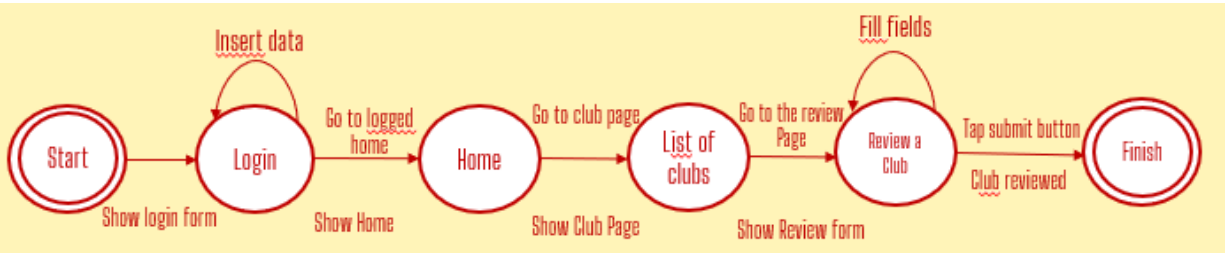

Figure 3.8: STN: Write a review for a club.

Chapter 4

Mockups and Prototype 1

4.1 Main functionalities

In this chapter we are going to present the mockups of our first prototype; analyzing the results we got from the questionnaires, we decided which functions and features to put in this section.
The HTA and STN section describes the behaviour of the application in a more accurate way.
The mobile application is designed to help musicians in finding the best club to play in and to help club owners to make their clubs more in evidence in the music scene.
The actions presented in this section are:

1. **Add a club to the app** which was not there before;
2. **Review a club** using the appropriate button when accessing a club in the app;
3. **Add a club to favorites** in order to access it easily;
4. **Sponsor a club** to advertise it;

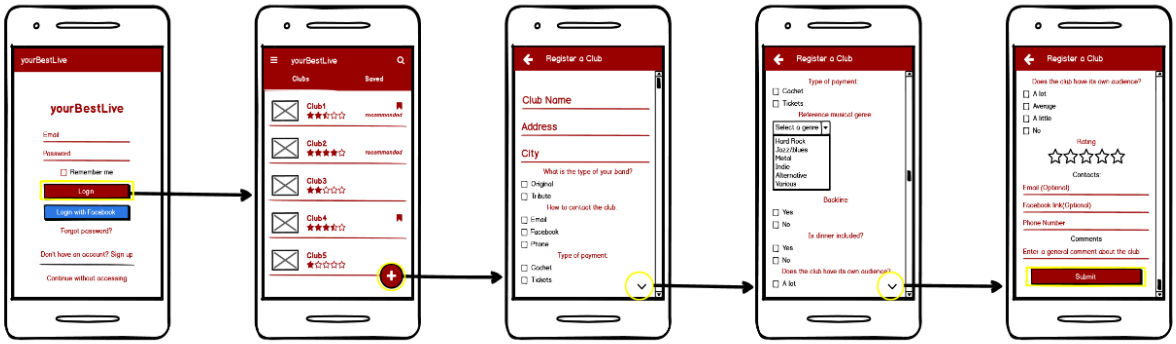

Figure 4.1: Task 1: Add a club to the app

Figure 4.2: Task 2: Review a club of the app

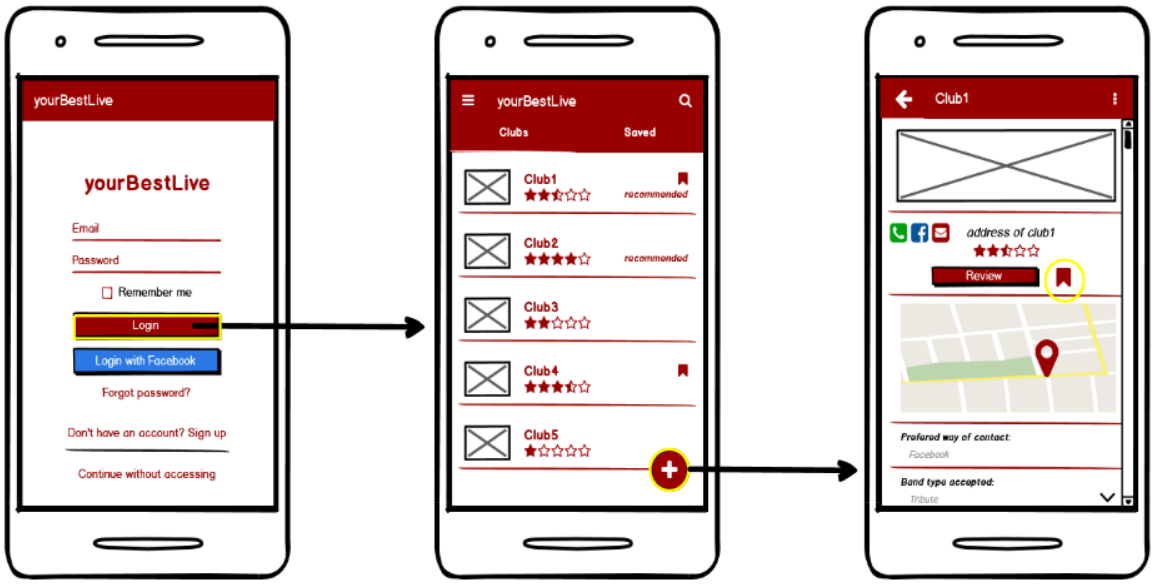

Figure 4.3: Task 3: Add a club to Favorites section

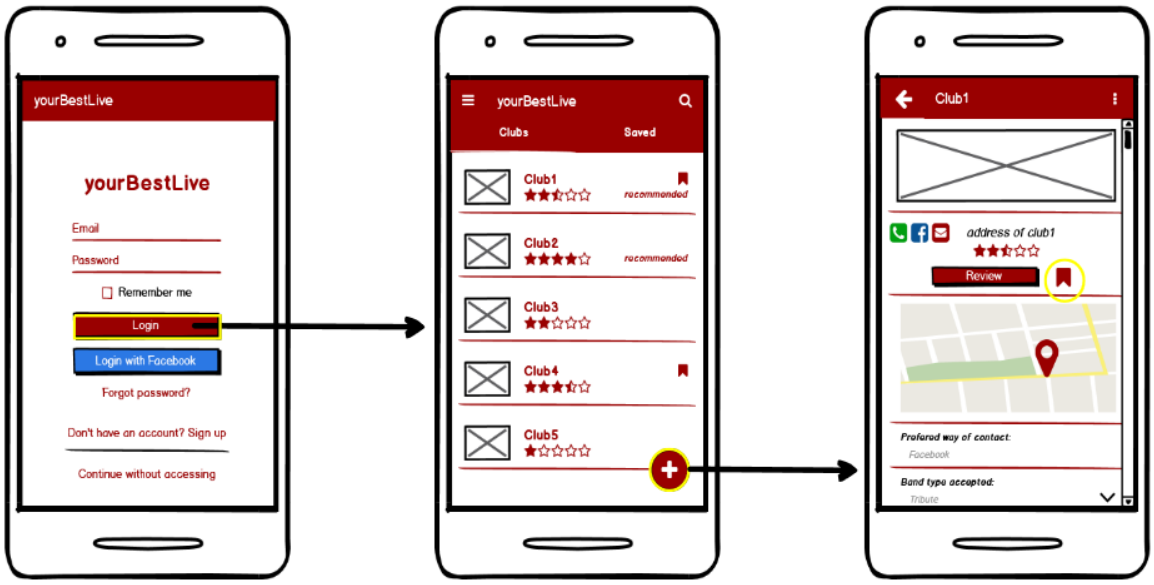

Figure 4.4: Task 4: Sponsor a club of the app

4.2 Prototype 1

The first prototype was developed following both the mockups presented above and the steps described in HTA and STN diagrams.
Moreover, some secondary features were implemented, like donating to app developers and remove ads function (paid).
These functions can be accessed from the main page's navigation drawer, where appropriate buttons are shown to the user in order to perform these actions.
The GUI has been designed with the following criteria:

- Google Material Design guidelines;
- Fancy drawables created from scratch using graphics tools;
- Usage of same fonts and colors in all the activities.

Chapter 5

Expert Based Evaluation

Evaluation occurs in laboratory or field, especially when in collaboration with the user, to make tests of the functionality and usability of the current system. It is useful to evaluate both design and implementation and ideally, the evaluation process should be considered at all stages in the design life cycle.

Evaluation techniques have multiple goals to achieve: the evaluation of a possible extent of system functionality, like for example the task that users are interested in; the evaluation of the effect of the interface on the user, like for example the user's experience of interaction or how it is easy to learn and to use or the satisfaction of the user; the identification of specific problems, like for example errors, confusion and unexpected results. Heuristic Evaluation and Cognitive Walkthrough are examples of the expert analysis methods.

5.1 Heuristic Evaluation

A heuristic evaluation is a usability inspection method for software, developed by Nielsen and Molich, that helps to identify usability problems in the user interface design. This method is based on the comparison between your own interface and the usability principles. Given that usability criteria, called "the heuristics", the interface and its compliance will be examined, and the analysis result in a list of potential usability issues. The analysis is obviously useful to improve such software.

5.2 Molich and Nielsen's Heuristics

Molich and Nielsen developed a heuristics list which is composed by 10 "heuristics":

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, following real-world conventions, using words, phrases and concepts familiar to the user and making information appear in a natural and logic order, rather than using system-oriented terms.

3. **User control and freedom**: Given that users often make mistakes, choosing the wrong system function, they need a clearly "emergency" exit to leave the unwanted state. Because of that, the system should support undo and redo.

4. **Consistency and standards**: Follow platform conventions so that users don't have to understand if different words, situations or actions mean the same thing

5. **Error prevention**: Having a careful design which prevents a problem from occurring in the first place is better than a good error message, so 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**: Allow users to personalize frequent actions with accelerators. Accelerators, unseen by the novice user, may often speed up the interaction for the expert user such that the system can provide for both inexperienced and experienced users.

8. **Aesthetic and minimalist design**: Dialogues should not contain information which is irrelevant or rarely needed, because every extra unit of information in a dialogue, competes with the relevant units of information reducing their visibility.

9. **Help users recognize, diagnose and recover from errors**: Error should not be expressed in codes, but in plain language, precisely indicating the problem and constructively suggesting a solution.

10. **Help and documentation**: It may be necessary to provide help and documentation, even though if it is better if the system can be used without documentation. Any information should be easy to search, focused on the user's task, so make a list of concrete steps to be carried out, and not be too large.

5.3 Expert report

In this case the evaluation was done by our professor Valeria Mirabella. After the expert based evaluation, it has been reported that the following heuristics have been violated:

Frame/Page	**Heuristic violated**	**Severity**	**Description / Comment**
Change password	Match between the system and the real world	2	Undo label is not appropriate for buttons
Report	Consistency and standards	3	Don't use different words for the same action (cancel/undo)
Sponsor a club	Recognition rather than recall	3	Supply information on the overall sponsored club. It seems that the user must access all clubs to check the overall situation
Sponsor a club	Flexibility and efficiency of use	3	Consider an accelerator from sponsor a club in the main menu to club details
Add/remove ads	Consistency and standards	3	Same functions can be activated alternatively in different way starting from different part of the application

Figure 5.1: Expert report HE

where the "severity" number identifies:

- 0 - I don't agree that this is a usability problem at all
- 1 - Cosmetic problem only
- 2 - Minor usability problem
- 3 - Major usability problem
- 4 - Usability catastrophe

Chapter 6

Prototype 2

After received the expert-based evaluation with the heuristics violated in Prototype 1 we made some changes to solve these issues:

- **Problem 1, Frame: "Change password", Heuristic violated: "Match between system and real world", Severity: 2**: the expert found that the use of "undo" as a term for cancelling the change password action was not correct, so we simply substituted it with "cancel" that is way better.

- **Problem 2, Frame: "Report", Heuristic violated: "Consistency and standards", Severity: 3**: here we had the same probem as before, so we replaced "undo" again with "cancel".

- **Problem 3, Frame: "Sponsor a club", Heuristic violated: "Recognition rather than recall", Severity: 3**: as written by the expert, we should have supplied information on the overall sponsored club, as it seems that the user must access all clubs to check the overall situation. To solve this problem we set all the sponsored clubs to be at the beginning of the list.

- **Problem 4, Frame: "Sponsor a club", Heuristic violated: "Flexibility and efficiency of use", Severity: 3**: as written by the expert, when user wanted to sponsor a club he should have known the exact name and city of such club. Hence, we changed the EditText with a drop-down list, both for city and club, such that the user do not have to remember all the details.

- **Problem 5, Frame: "Add/remove ads", Heuristic violated: "Consistency and standards", Severity: 3**: as suggested by expert, this function was applicable from different ways, starting from different parts of the app. We decided to keep the function application possibility only in Settings.

In these screenshots we can look at the changes we made to the application:

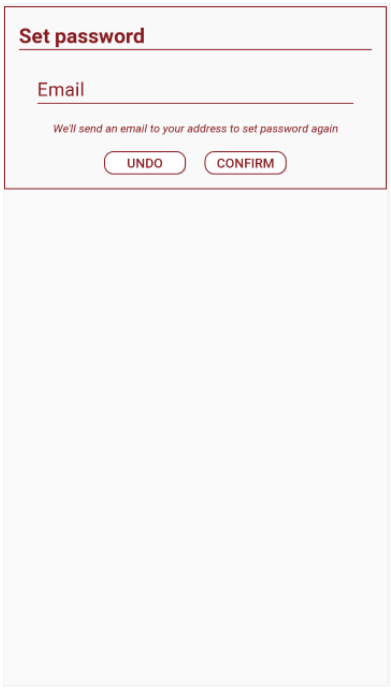

Figure 6.1: Prototype 1 "Change password" frame (before expert evaluation)

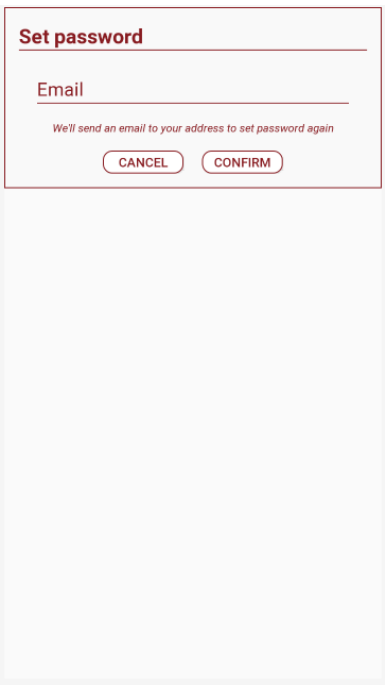

Figure 6.2: Prototype 2 "Change password" frame (after expert evaluation)

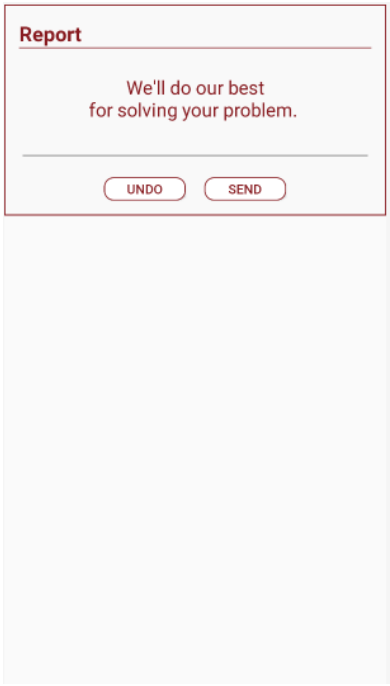

Figure 6.3: Prototype 1 "Report" frame (before expert evaluation)

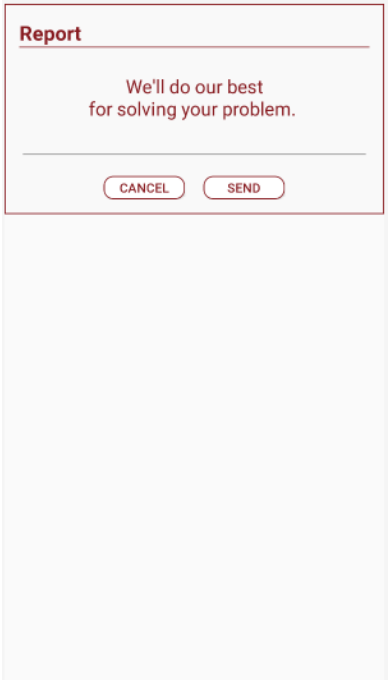

Figure 6.4: Prototype 2 "Report" frame (after expert evaluation)

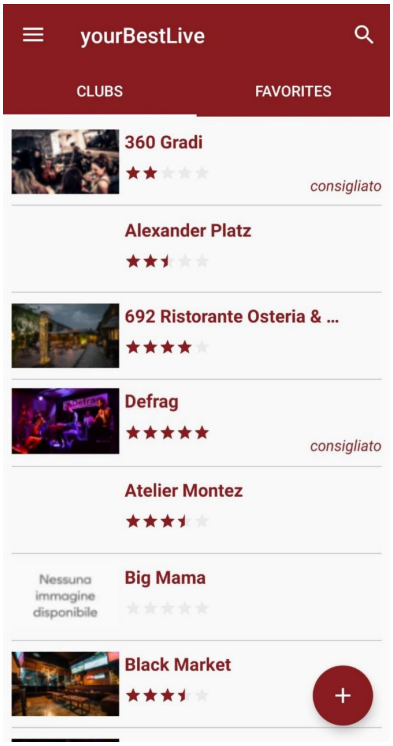

Figure 6.5: Prototype 1 "Sponsor a club 1" frame (before expert evaluation)

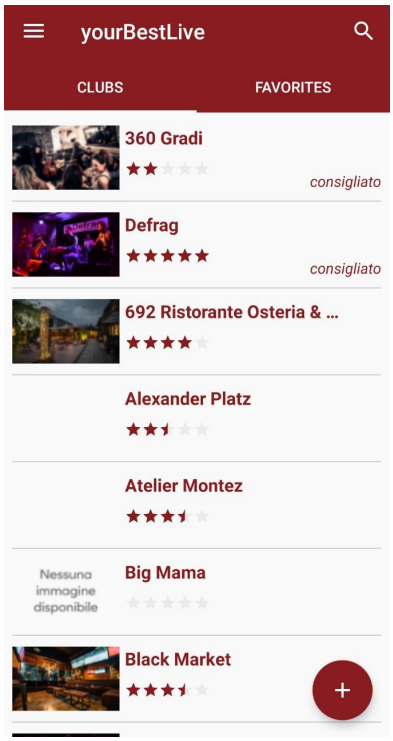

Figure 6.6: Prototype 2 "Sponsor a club 1" frame (after expert evaluation)

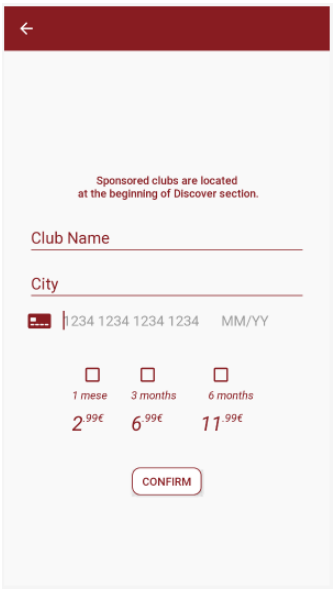

Figure 6.7: Prototype 1 "Sponsor a club 2" frame (before expert evaluation)

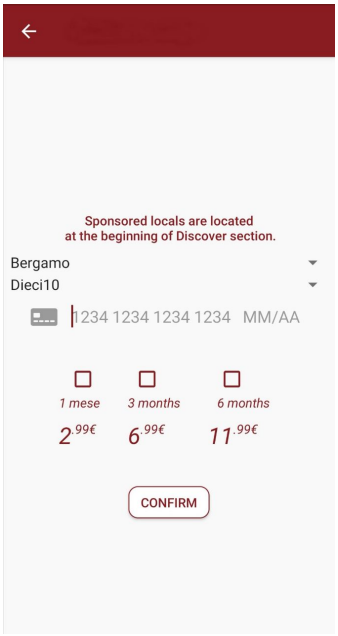

Figure 6.8: Prototype 2 "Sponsor a club 2" frame (after expert evaluation)

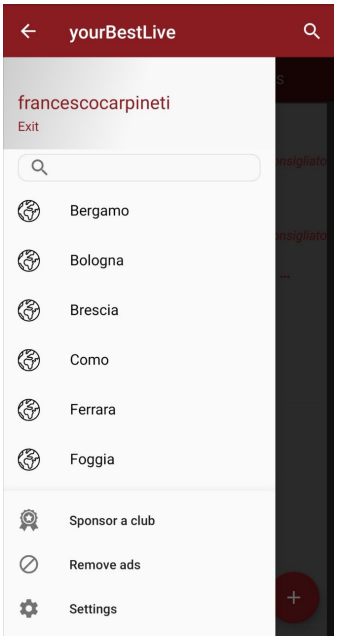

Figure 6.9: Prototype 1 "Add/remove ads" frame (before expert evaluation)

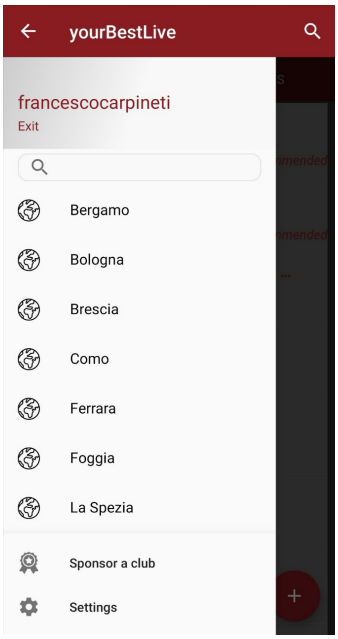

Figure 6.10: Prototype 2 "Add/remove ads" frame (after expert evaluation)

Chapter 7

Think Aloud

The Think Aloud is a kind of evaluation based on a real-life evaluation of the app. Think Aloud is simple and does not require particular expertise to be performed. We took 16 people of different ages (all of the ages contained in our questionnaire). These people are our families' components, which are completely different in user profile characteristics. In fact, they do different jobs with different hours (student, teacher, employee, material planner, secretary, construction company owner or no job at all) and have different qualifications (high school diploma or bachelor's degree). We performed the experiment using the following criteria:

- We explained to people who we are and what we are doing;
- We said to everyone to do the same task, i.e. **adding a new club to the app**, individually;
- The experiments has been done saying to the users that they should have said aloud what they were doing, what they thought and so on;
- We took note of what they said during the previous step.

7.1 Think Aloud Session

We decided to choose that task for Think Aloud because it is the main and most powerful action a user can do with yourBestLive, so we wanted to focus our study on it.

7.2 Conclusions of the session

The test has been done with people with age ranging from 19 years to 50, hence we perfectly reflected the ages that appeared during the first stages of the project development. No one had specific issues in using the application, although older people were slower because less familiar with technology in general. The task was simple to accomplish thanks to the FloatingActionButton present in the app's main activity. We are satisfied by the results even if there was no label onto the floating button saying that it would have led to that task.
A minor problem we encountered is that club information cannot be modified after club creation, so if they are wrong there is a problem. We decided to implement a button which removes the club (clickable only by the club owner/responsible) so the creator can recreate it from scratch, correcting the errors:

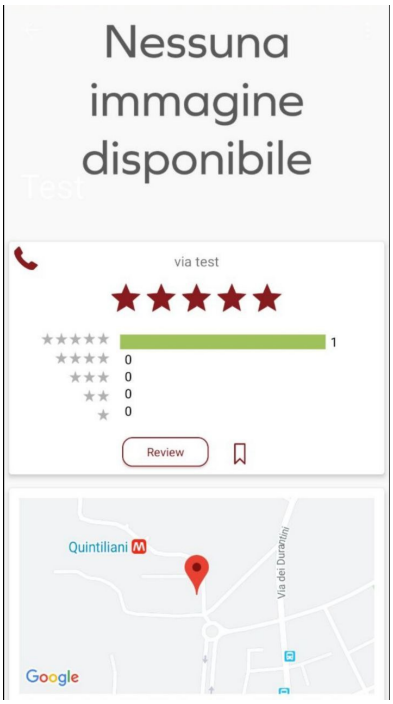

Figure 7.1: Before modification

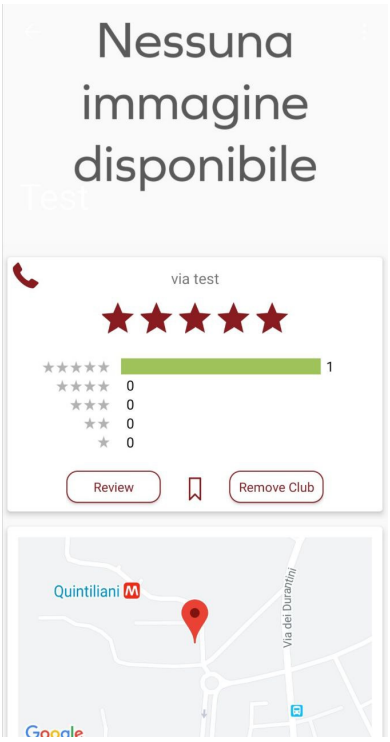

Figure 7.2: After modification

Chapter 8

Controlled Experiment

8.1 Problem

We have implemented two distinct interfaces for the "Add a new club to the app" task. The first one, showed in Figure 8.1 and 8.2, uses a FloatingActionButton which is on the clubs list (i.e. main page of yourBestLive) and which corresponds to the most common way of adding something new to an app in most cases.

Then, we made another interface (Figure 8.3 and 8.4) in which we removed the floating button and instead we added a menu item to the Navigation left menu, accessible from the three-lines button at top left. This is usually done for app actions that are not often performed.

Our assumption is that the first alternative is faster and more intuitive than the second. We did a controlled experiment to verify our thoughts.

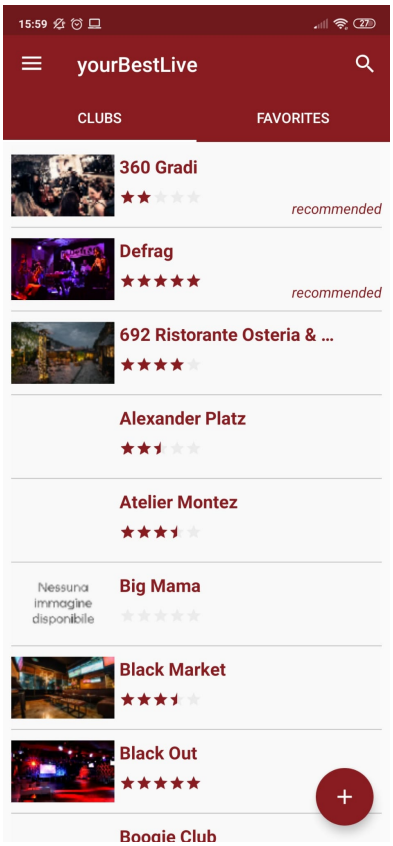

Figure 8.1: Interface style 1: "Add a new club to the app"

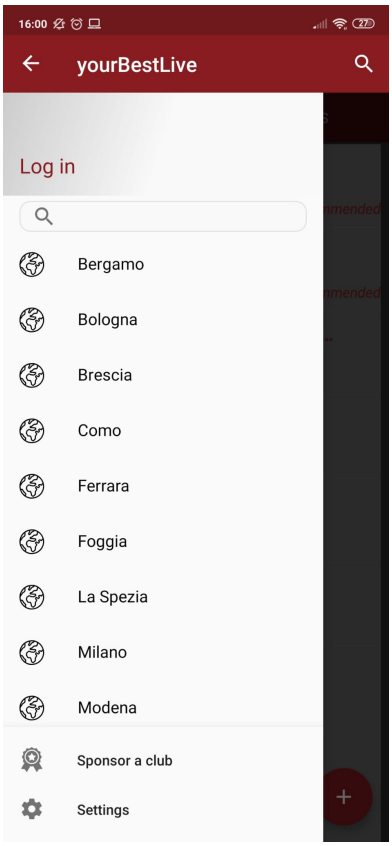

Figure 8.2: Interface style 1: "Add a new club to the app"

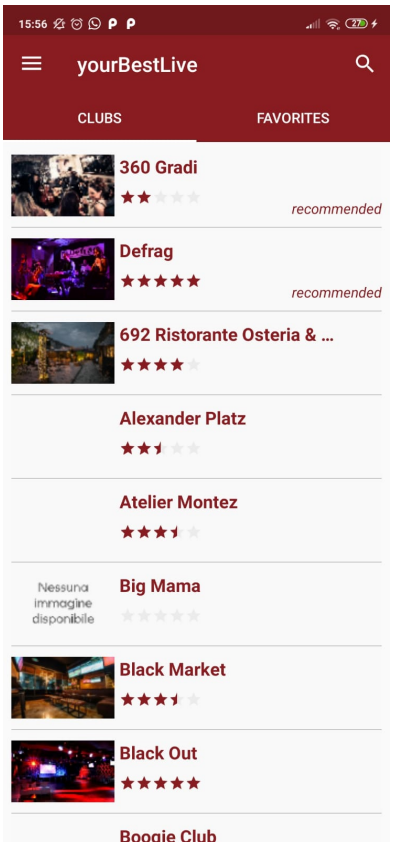

Figure 8.3: Interface style 2: "Add a new club to the app"

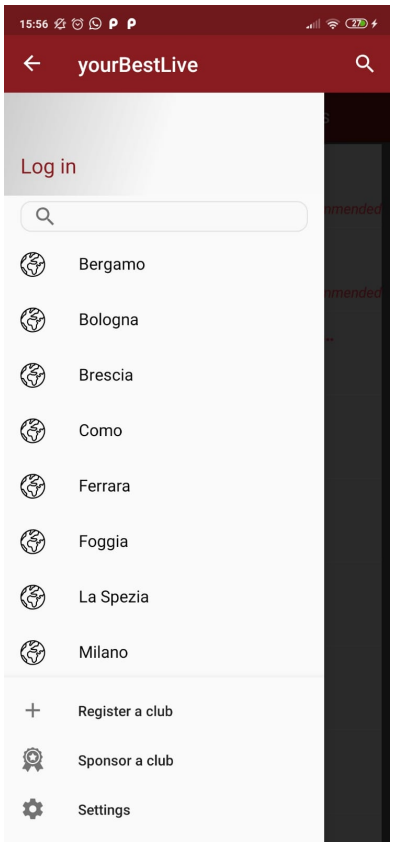

Figure 8.4: Interface style 2: "Add a new club to the app"

8.2 ANOVA One-Way Analysis

To solve this, we used ANOVA One-Way analysis. About the datas:

- **Who?** (participants): 20 people (in a range of age between 18-55 years)

- **Variables**

  - *independent*: the two interfaces
  - *dependent*: the time in seconds to execute a task

- **Hypothesis**

  - *null*: there are no differences between the two interfaces
  - *our*: users will take less time to perform the task using the floating action button

- **Experiment**

  - *task*": "add a new club to the app"
  - *assumptions*: user is already logged in and is in the app's main activity

- **How to apply ANOVA**? We used a simple chronometer to measure the time needed to perform the task in each alternative. Values were collected in order to do the analysis.

Interf. 1	Interf.2
7.2	6.9
9.5	8.1
5.7	11.7
8.5	9.7
6.6	7.7
7.6	10.1
8.4	12.3
5.1	10.4
6.1	7.3
4.3	9.2

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Column 1	10	69	6.9	2.702222
Column 2	10	93.4	9.34	3.391556

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	29.768	1	29.768	9.769966	0.005841	4.413873
Within Groups	54.844	18	3.046889			
Total	84.612	19				

Figure 8.5: ANOVA One-Way Analysis Results

As we can see from the first table, we did a *within group* controlled experiment, i.e. we told the same group of people to use both the interface styles. We chose this alternative because we thought it is the more powerful in our study case and because it allows us to compare data directly on the same person.

8.3 ANOVA results

The data collected were putted in the Excel and using the specific plugin we computed the ANOVA analysis. Since $\mathbf{F} > \mathbf{F\ crit}$, our hypothesis is confirmed and we can reject the null hypothesis, meaning that the two interfaces are not the same and there are differences between them. In particular, in the second interface (no floating button), users needed more time to find the option on the NavSide menu.

Chapter 9

Conclusion

During this experience we learned how to follow several design principles and criteria, both for development (production of the design itself) and evaluation. It was also the first time we directly interacted with end users for tests.

Furthermore, we learned how to use XML language properly for Android apps, also with all the Android UI components that are specific of such domain.

9.1 Future works

This project can be expanded, for example with native design elements instead of the Android default ones, and innovative additional functions. For example:

- **more payment methods**, allowing users to use also the newest bank cards, like the ones of mobile banking, etc.;
- **improve login methods**, adding Google Sign-In and other famous social network-related methods like Twitter;
- **country extension** which should allow the user to choose a country before continuing to the app, in such a way as to filter presented clubs properly.