Tesina
Human Computer Interaction

CiakTime

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Contents

1 Introduction

The idea behind CiakTime comes from the fact that nowadays there are a lot of movies out both in theatres and in streaming platforms, so that cinema lovers can satisfy their needs to stay updated with the latest movies and keep track of them. Also they may want to know on which streaming platforms they can found the movies. Finally they could have the necessity to interact with other cinema lovers about their favourite movies or share their opinion about the movie with the community through reviews.

For these reasons, our app offers a lot of functionalities. The user has the possibility to keep track of already watched movies, movies to watch and favourite movies; moreover he can search for movies by title, also filtering results, search for actors and movie directors, look for upcoming movies and popular movies and actors. Regarding the movies, he can read information about plot, cast, year of release, duration, genre, movie director and streaming platform on which the movie is available; in addition, he can review and rate movies, comment and like reviews made by other users. Finally, regarding movie directors and actors, the user can read their biography and take a look to their filmography.

In order to involve as much users as possible, we decided to make our app available for both iOS and Android devices.

2 Requirement analysis

To realize our application, we followed the *User Centered Design* (UCD) approach, which intends to ensure that the user is at the center during the design process in order to realize products that meet usability requirements.
Since humans become the center of our interest, the system is created according to their perspective. So we need to involve user throughout the creating process in order to learn as much things as possible about our type of product and the final customers. To do that, we start collecting some information through competitors analysis, user analysis and questionnaires analysis.

2.1 Competitor analysis

Since a system needs to compare itself with what's already on the market, both in the pros and in the cons, one of the first requirments analysis to be done is *Competitor analysis*. In this way, we can add something that is new, innovative and valuable to the user.

We found two main competitors for our application: **IMDb** and **Cinemaniac**.

IMDb

IMDb is the world's most popular and authoritative source for movie, TV, and celebrity information. This app has a huge fanbase and a limitless cinema database. On this app the user can watch trailers, get showtimes, and buy tickets for upcoming films. He can rate and review shows he has seen and track what he wants to watch using his Watchlist, and he can also get suggestions regarding movies based on it.
However, we have identified few weaknesses, such as the impossibility to exchange opinions between users, to keep track of already watched movies and to save favourite movies in a list; it is also not very intuitive to retrieve movies specific information due to the high number of functionality offered by the application.

Cinemaniac

Cinemaniac is an app on which the user can search for a movie and add it to the "Movies to watch", "Watched movies" or favourite list. He can see all the relevant details for any movie and he can leave his own personal grade. The user can find suggestions on the most popular and top rated movies. Moreover, he can find a specific list relative to currently projected movies and upcoming titles.
Also here we have identified some weaknesses, like the fact that the interface is not so user friendly, there is no user interaction, there are no information about streaming platforms; moreover the search about movies is not so intuitive and there are in-app purchases required to remove advertisements and unlock some functionalities.

In the following table we summarize the comparison between our app and the competitors:

	CiakTime	IMDb	Cinemaniac
User profile	✓	✓	✗
Search	✓	✓	✓
Movie info	✓	✓	✓
Streaming platform	✓	✓	✗
Upcoming movies	✓	✓	✓
Watch history	✓	✗	✓
Watch list	✓	✓	✓
Favourite movies	✓	✗	✓
Review movies	✓	✓	✓
Rate movies	✓	✓	✓
Comment other reviews	✓	✗	✗
Like other reviews	✓	✓	✗
No ads	✓	✓	✗

2.2 User analysis

In this section we want to analyze the possible users for our application. In particular we describe the User Profile, which is a detailed description of our users' attributes, the Personas, which are fictional individuals created to describe the typical user based on the user profile and the Scenarios, which are stories that describe how a particular persona completes a task or behaves in a given situation.

2.2.1 User Profile

In the following table we show the general description of our target users and their characteristics.

Age	18-50 years
Gender	male/female
Profession	Any
Education	Any
Location	Any
Tecnology	Basic smartphone experience
Passions	Cinema, movies

2.2.2 Persona 1 - Vittoria

Age: 25 years-old
Gender: Female
Profession: Student
Education: University student
Location: Rome, Italy
Tecnology: Mid level
Passions: Watching movies and tv-series on streaming platforms

Persona
Vittoria is 25 years-old and comes from Rome. She is a university student and in the free time her main hobby is watching movies and tv-series on her favourite streaming platforms. During her study breaks she likes to keep in touch with her friends on various social apps.

Scenario
Vittoria has just terminated an intense study session and now she only wants to relax watching a movie. She decides to call her best friend to spend the evening together. Once she arrives, in order to choose which movie to watch, they both open the app to compare their watchlists. After a while they realize that both have "La La Land" in their watchlists and so decide to watch it together. At the end of the evening they both check it as "watched" in their app.

2.2.3 Persona 2 - Emanuele

Age: 33 years-old
Gender: Male
Profession: Programmer
Education: Degree
Location: Torino, Italy
Tecnology: High level
Passions: Action movies, technology

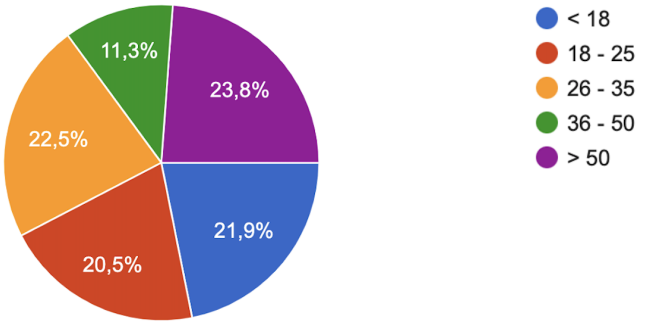
Persona
Emanuele is 33 years-old and comes from Torino. He is a programmer and he likes very much going to the cinema with his girlfriend. As a programmer, he is addicted of technology in general, and more specific of mobile devices; moreover he is a very organized guy, and so he likes to keep under control everything he does in his life using mobile apps.

Scenario
It is an afternoon autumn day. Emanuele and his girlfriend would have liked to go out for a walk, but since it's raining, they don't know what to do. So, Emanuele opens the app in search of new movies available in cinemas. In this list he founds that is just available a new action movie with his favourite actor Vin Diesel; since also his girlfriend likes action movies, they decide to go to the cinema to watch it and spend a good afternoon together.

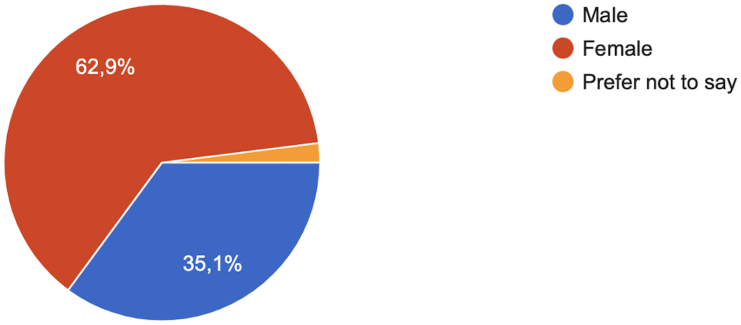
2.3 Questionnaire analysis

Questionnaires are a useful method to investigate user needs, expectations, perspectives, priorities and preferences. They are useful in user requirement but also in evaluation phase to investigate user satisfaction, user attitudes and opinions, relevance of collections and services to user needs, trends. We designed the questionnaire in such a way that each question was clearly written, in order to not lead the user to a specific answer and to always make them feel confortable while answering. Below we present the questionnaire results used to better understand the target of potential users in order to have a better refinement of some aspects of our application. More precisely, we reached 151 people, and so we had a good number of answers, statistically speaking.

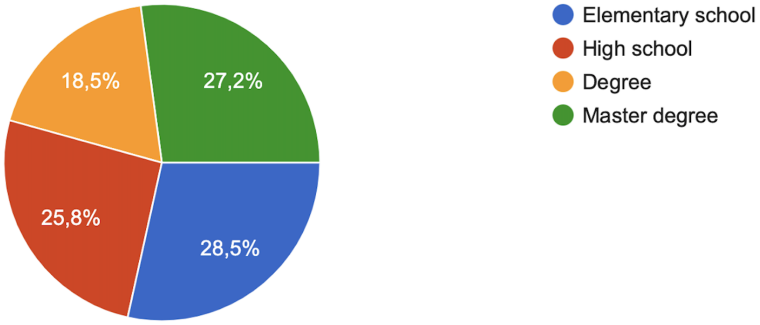
What's your age?



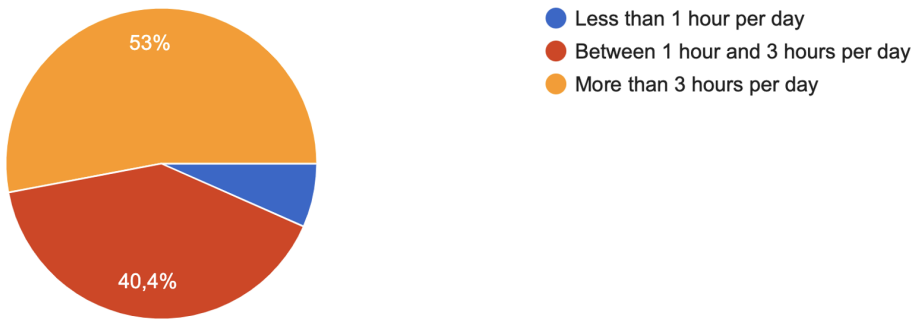
What's your gender?



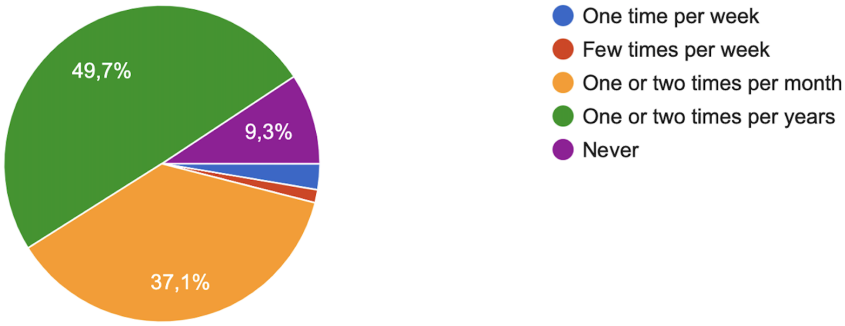
What's your educational level?



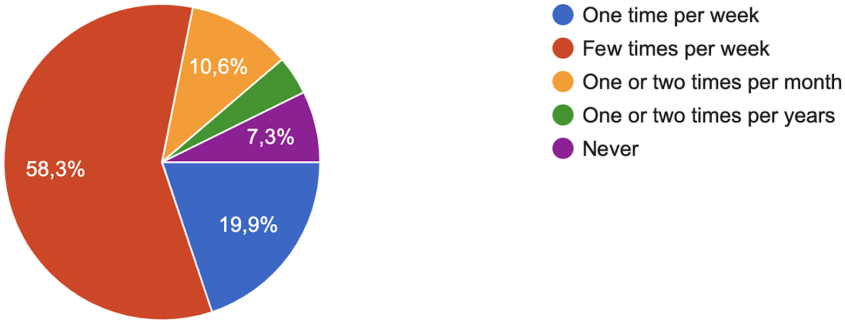
How frequently do you use your smartphone on average?



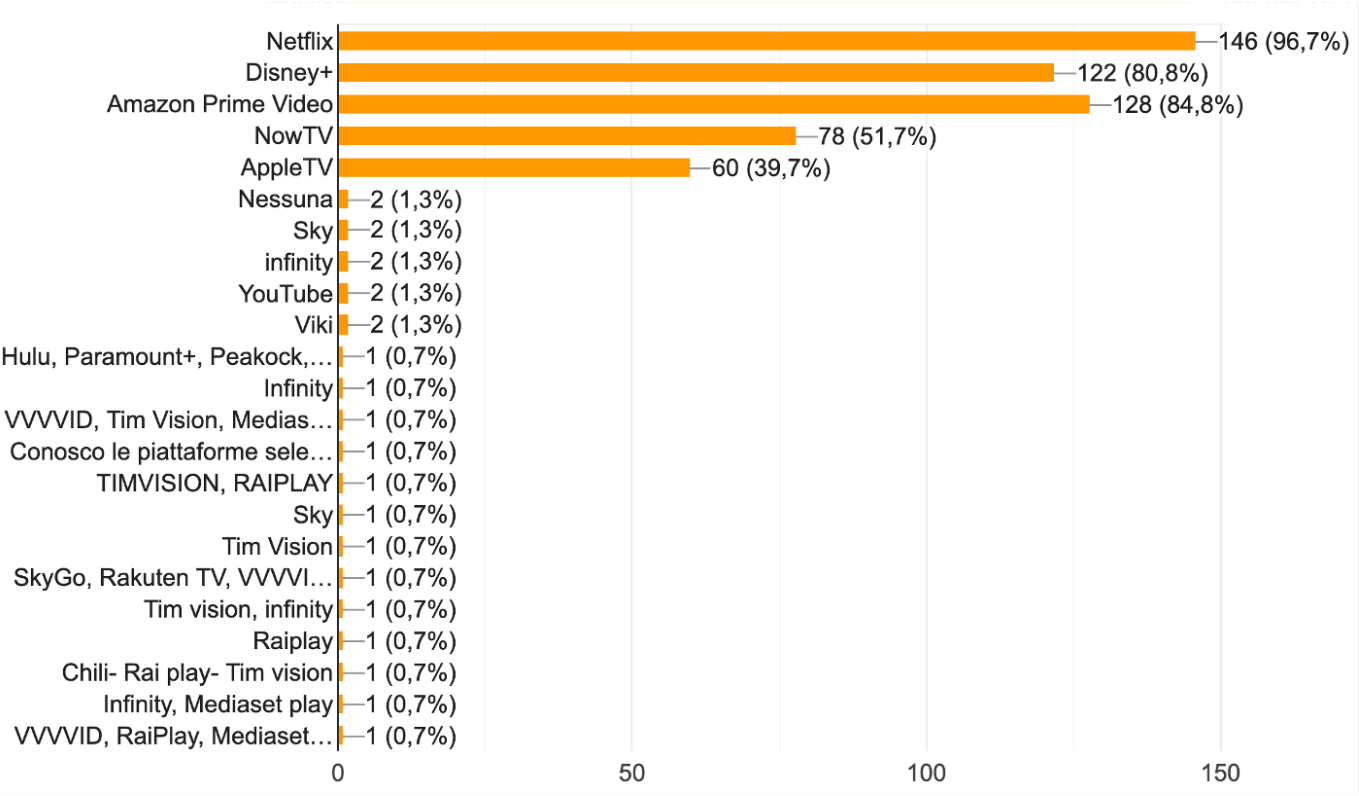
How many times do you go to the cinema on average? (Before pandemic)



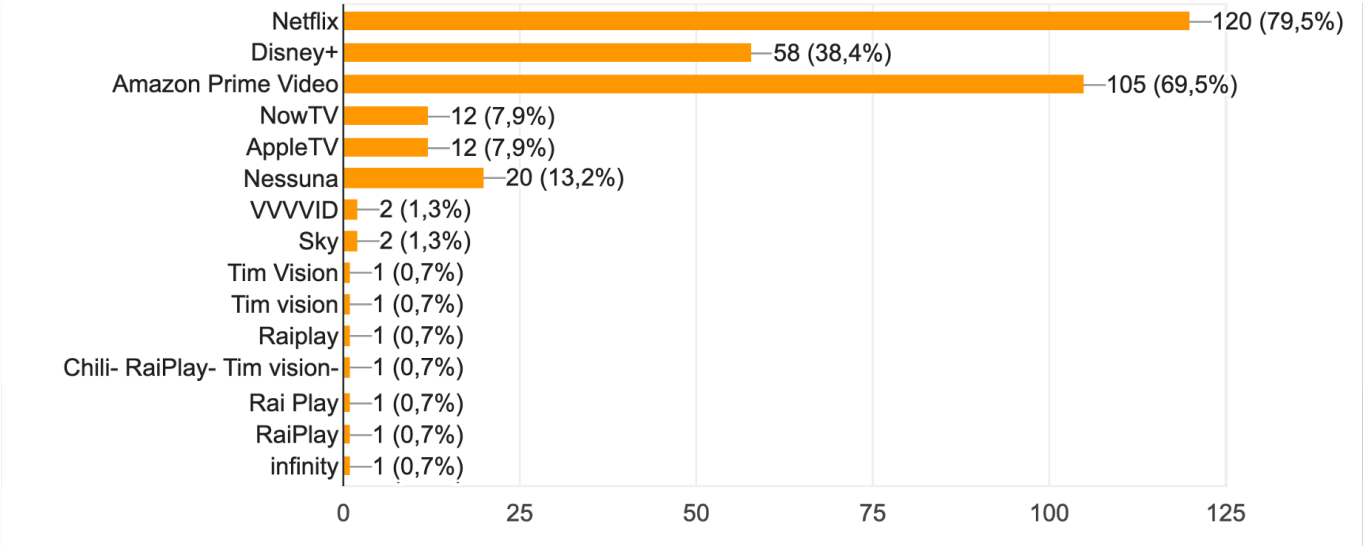
How many times do you watch movies on streaming platforms/tv on average?



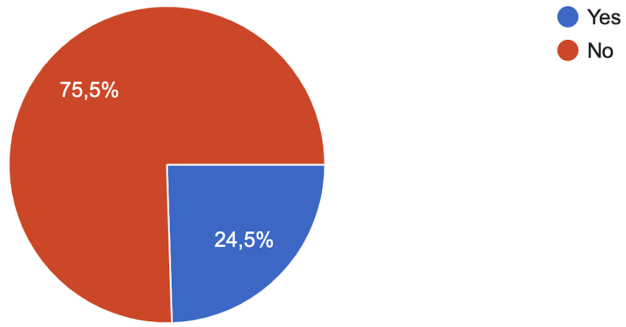
Which streaming platforms do you know?



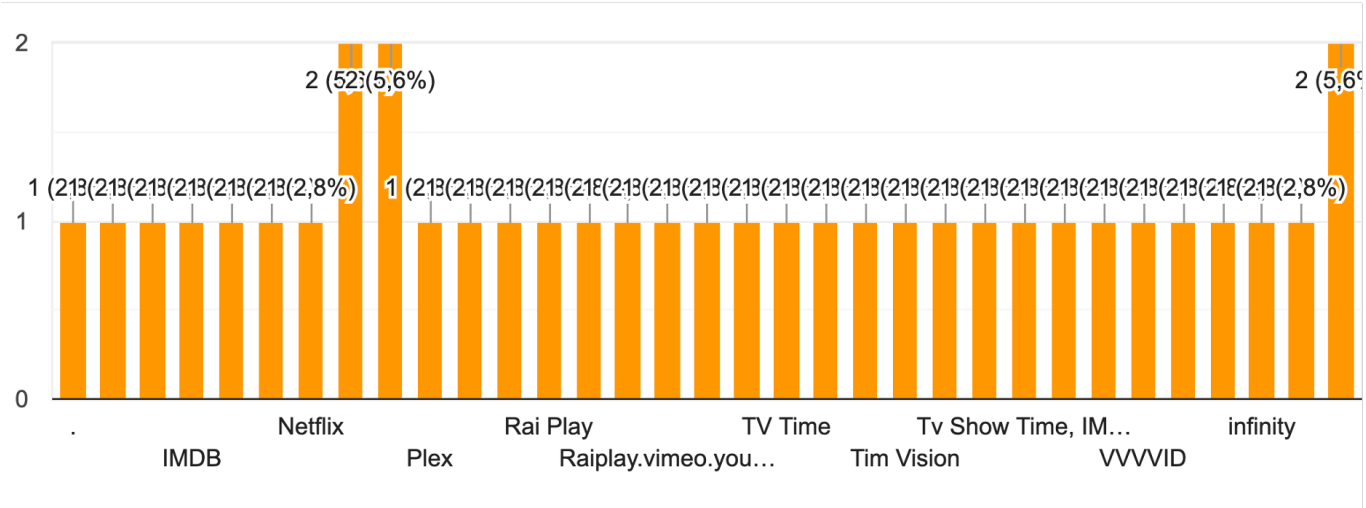
Which streaming platforms do you use?



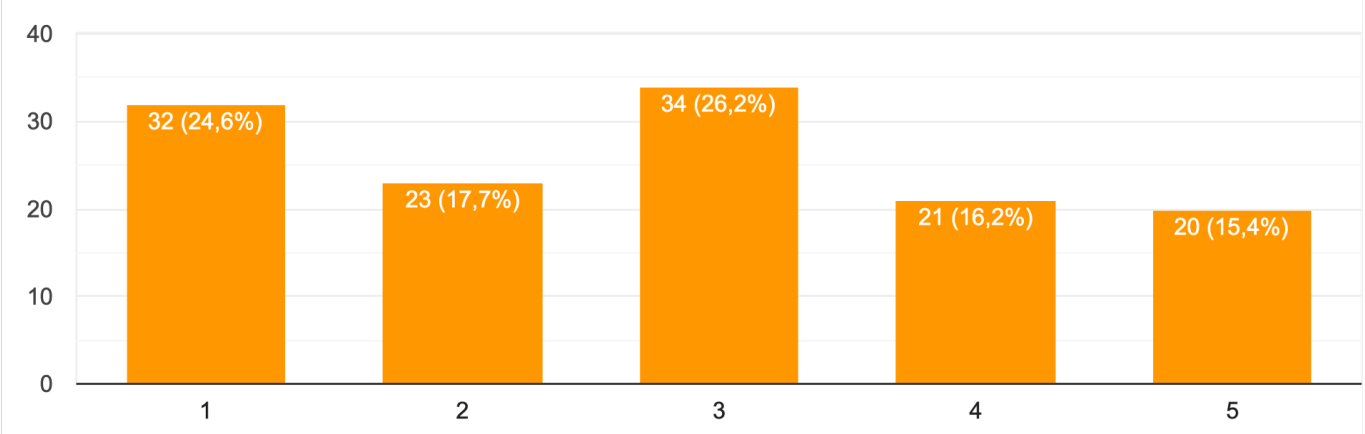
Do you use any movies related app?



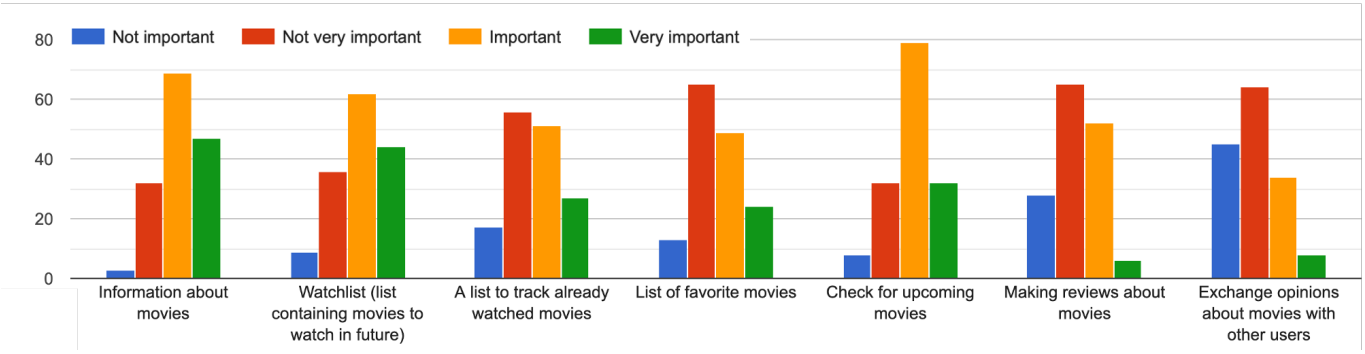
If you use any movies related app, which one?



If you don't use any movies related app, how much would you be interest in using one?



How much do you think the following features are important in such an app?



2.3.1 Conclusions

After having analyzed the results obtained from the questionnaires, we have formalized the following conclusions:

- Regarding ages, we noticed that there is no predominant range, but they are more or less equally distributed between 18 and 50, and the majority of them are women.
- The majority of them uses smartphone more than 3 hours per day.
- Since we noticed that the majority of people rarely goes to cinema and conversely watches very often movies on streaming platform, we decided to focus our app on this feature.
- Moreover, given the fact that a very high number of people does not use a movie related app and that the majority of them would be interested in doing this, we thought that the idea of such an app would be very appreciated.
- Finally, from the last question, emerge the most wanted features such as have informations about movies, have the possibility to add movies to lists and have informations about upcoming movies, and so we decided to focused on them.

3 Task analysis: HTA and STN

In this section we are going to show HTA and STN in order to formalize the main task of our application and to analyze and describe how users can reach their goals.
Hierarchical Task Analysis (HTA) is a task description methodology that is used to produce a complete description of tasks in a hierarchical structure of goals, sub-goals, operations and plans in order to have a complete representation of the action.
Instead, a *State Transition Network* (STN) represents a dialogue between the user and the system, in which the system could support the tasks that the customer has to execute. It describes which are the available actions at a certain point, and the consequent state that the system will reach.

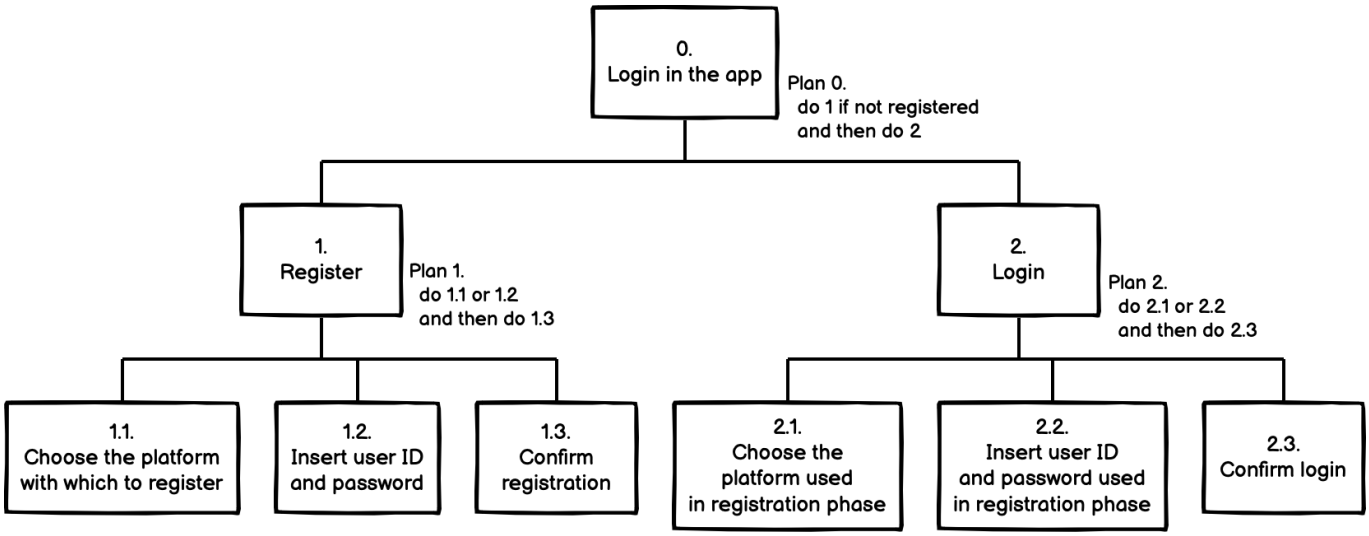
The main tasks that the user can do in our application are:

- Login into the app.
- Search for a movie, an actor or movie director.
- Add a movie into three lists: watchlist, movie already watched list and favourite movie list.
- Make a review regarding a movie.
- Interact with other users by commenting a review written by another user.

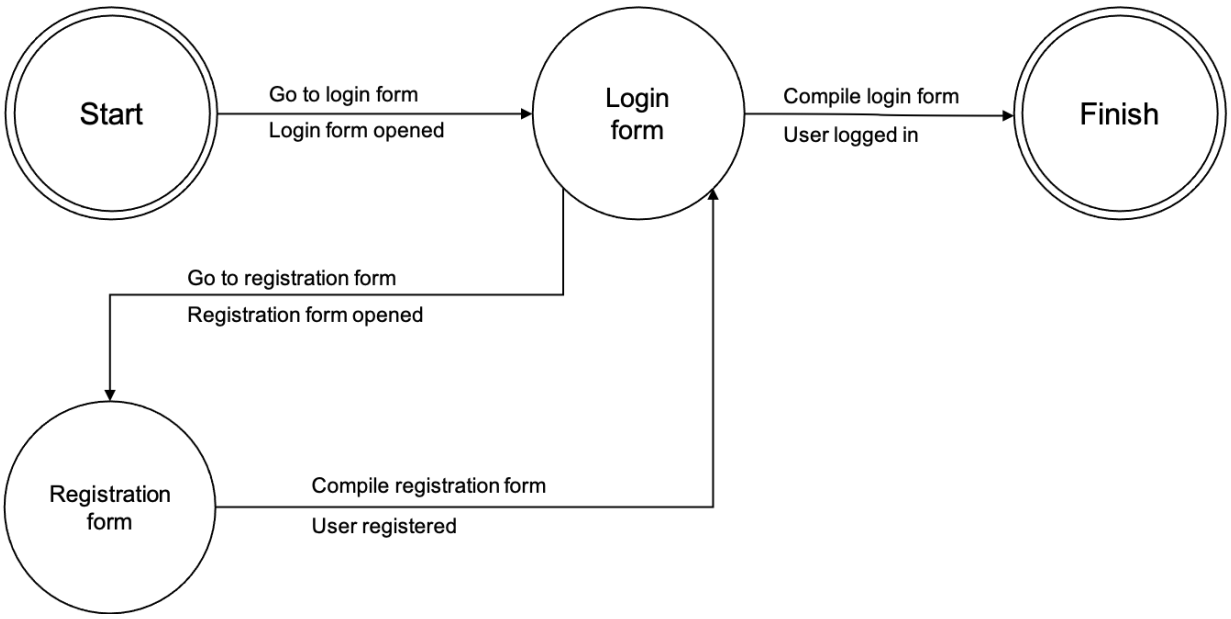
3.1 Login

The user can login into the app if registered, either through online platforms (Google, Facebook) or using his personal email and password, in order to save in the cloud all his data regarding the app. From now on, in the following HTAs, we assume that the user is logged in.

HTA - Login



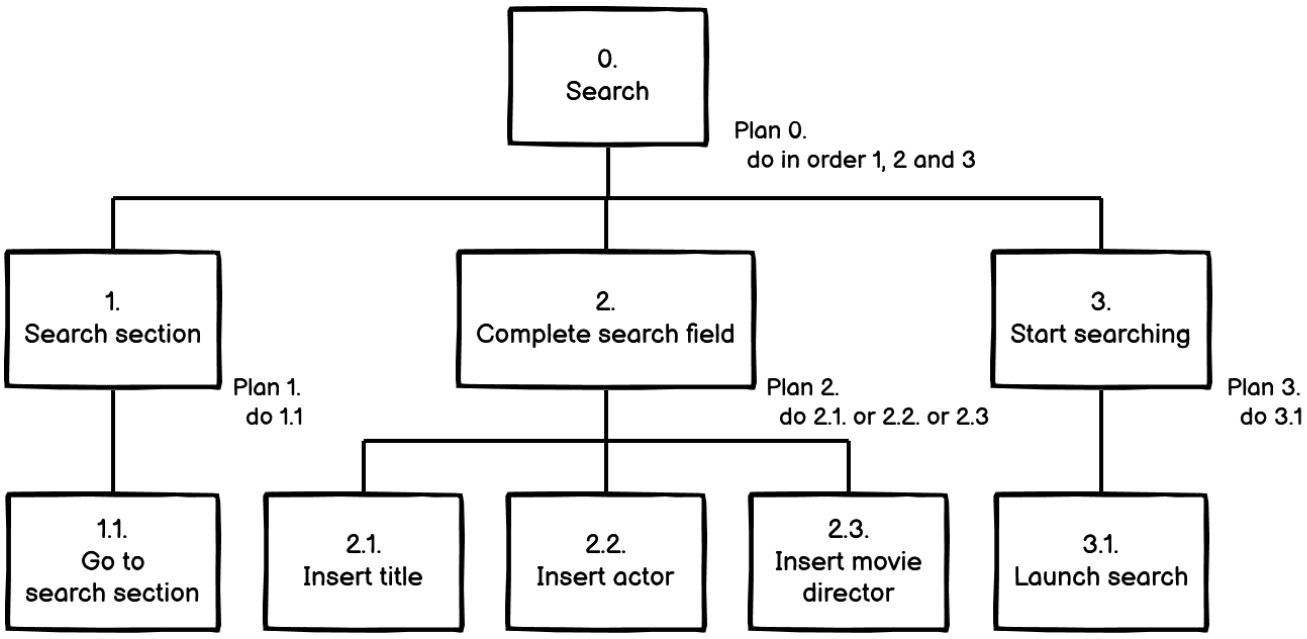
STN - Login



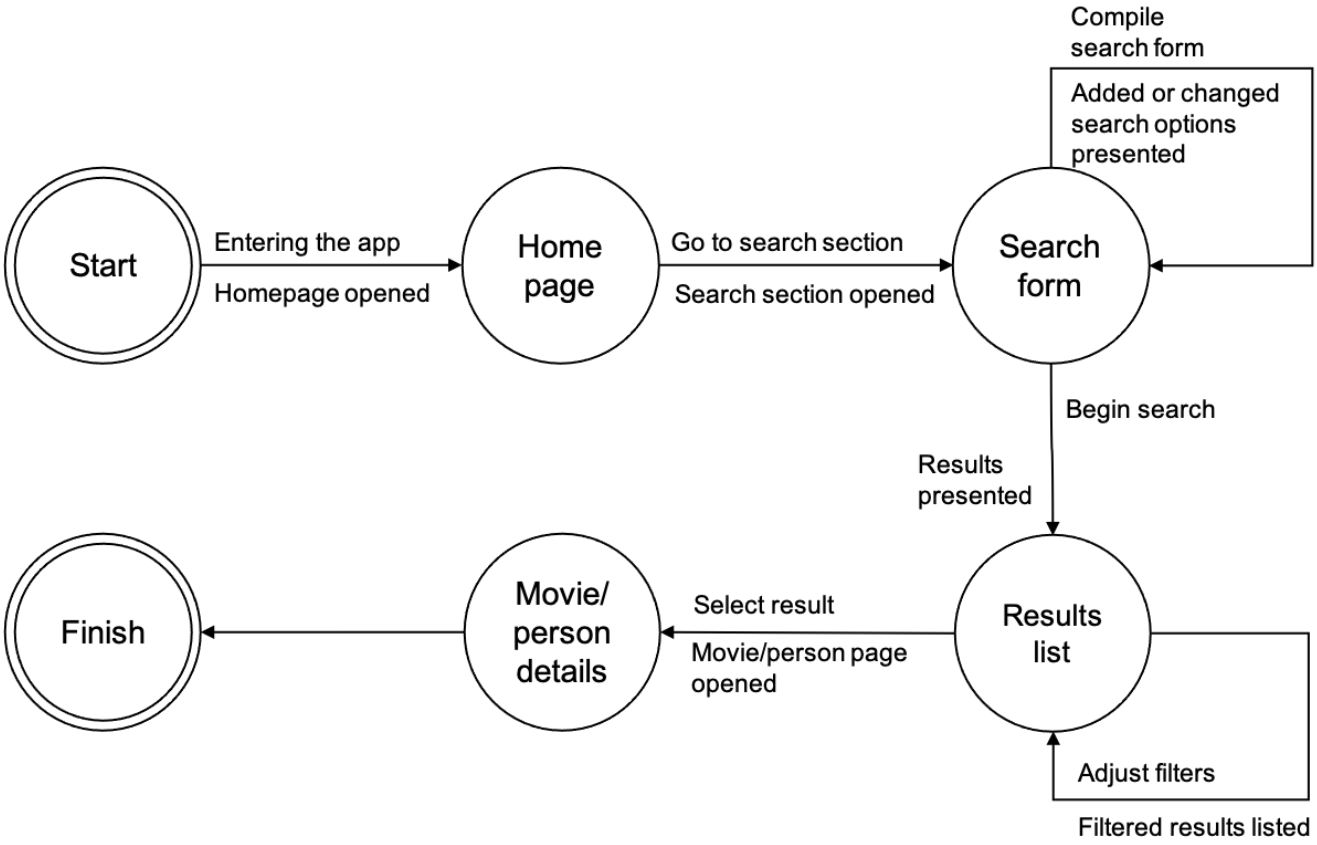
3.2 Search for a movie or a person

The user searches for the movie or the person he wants to know information about. He can do search by title, actor or movie director and, when the results are shown, he selects the result he is interested in.

HTA - Search for a movie or a person



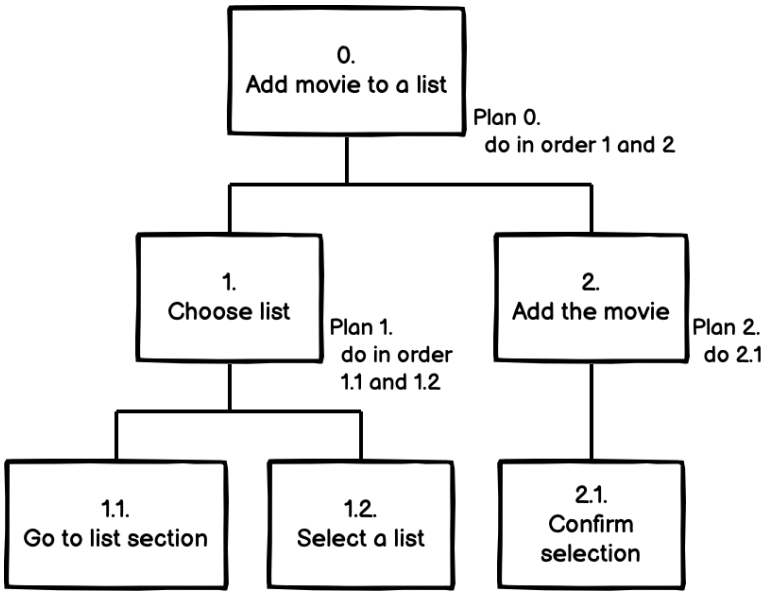
STN - Search for a movie or a person



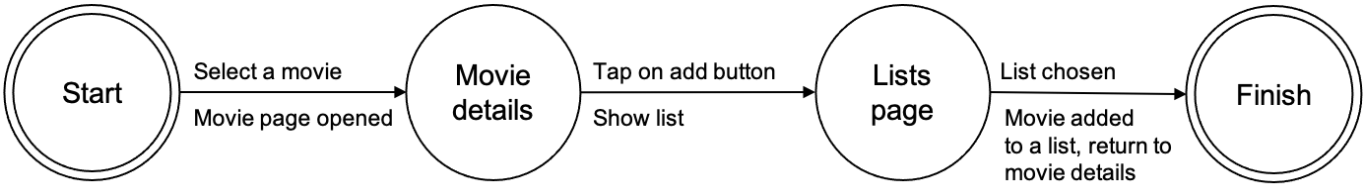
3.3 Add movie to a list

The user can add a movie into a list: he can choose between a watchlist that contains movies to watch in the future, a list containing movies already watched and a list containing favourite movies. We are assuming that the user has already selected a movie.

HTA - Add movie to a list



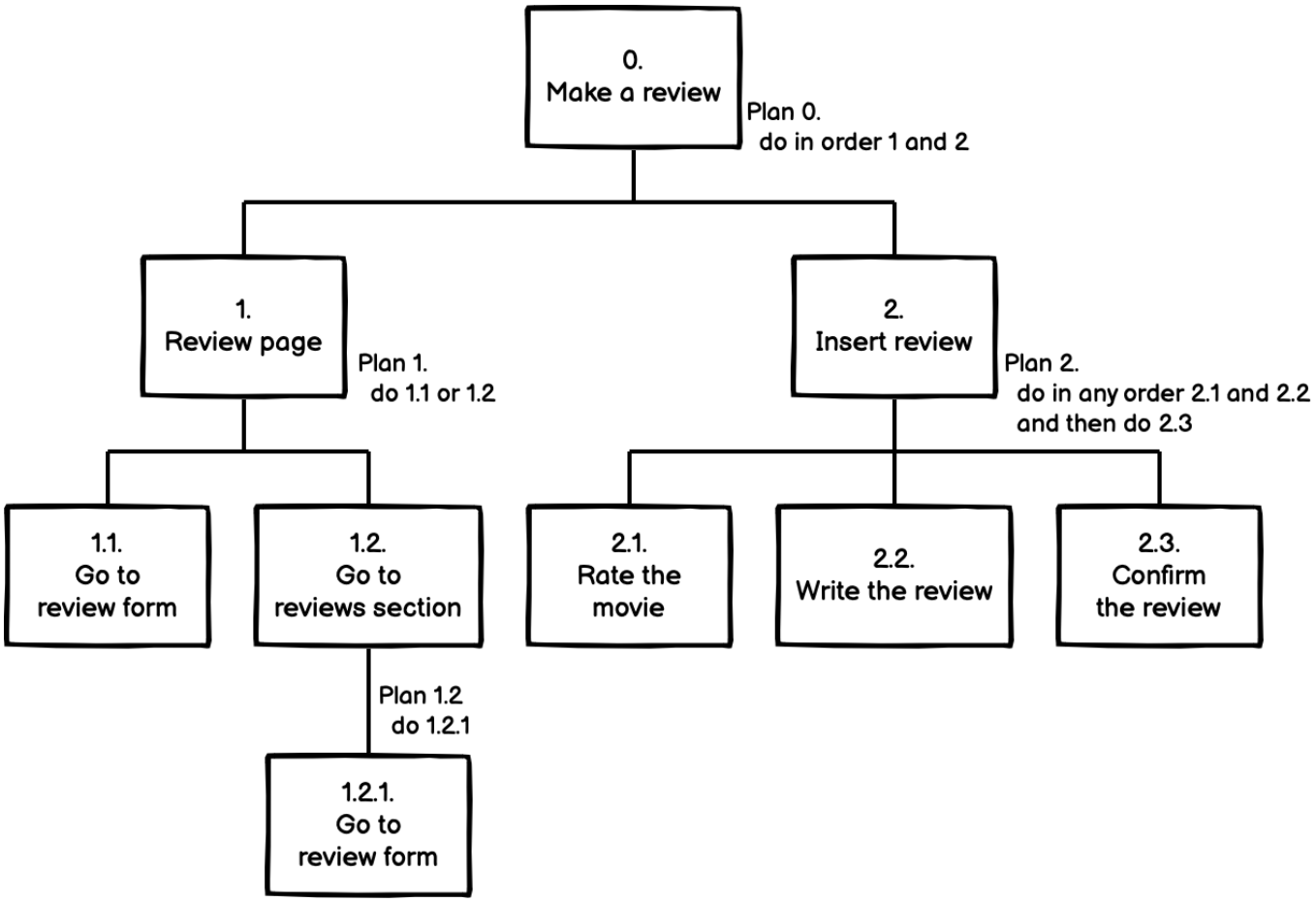
STN - Add movie to a list



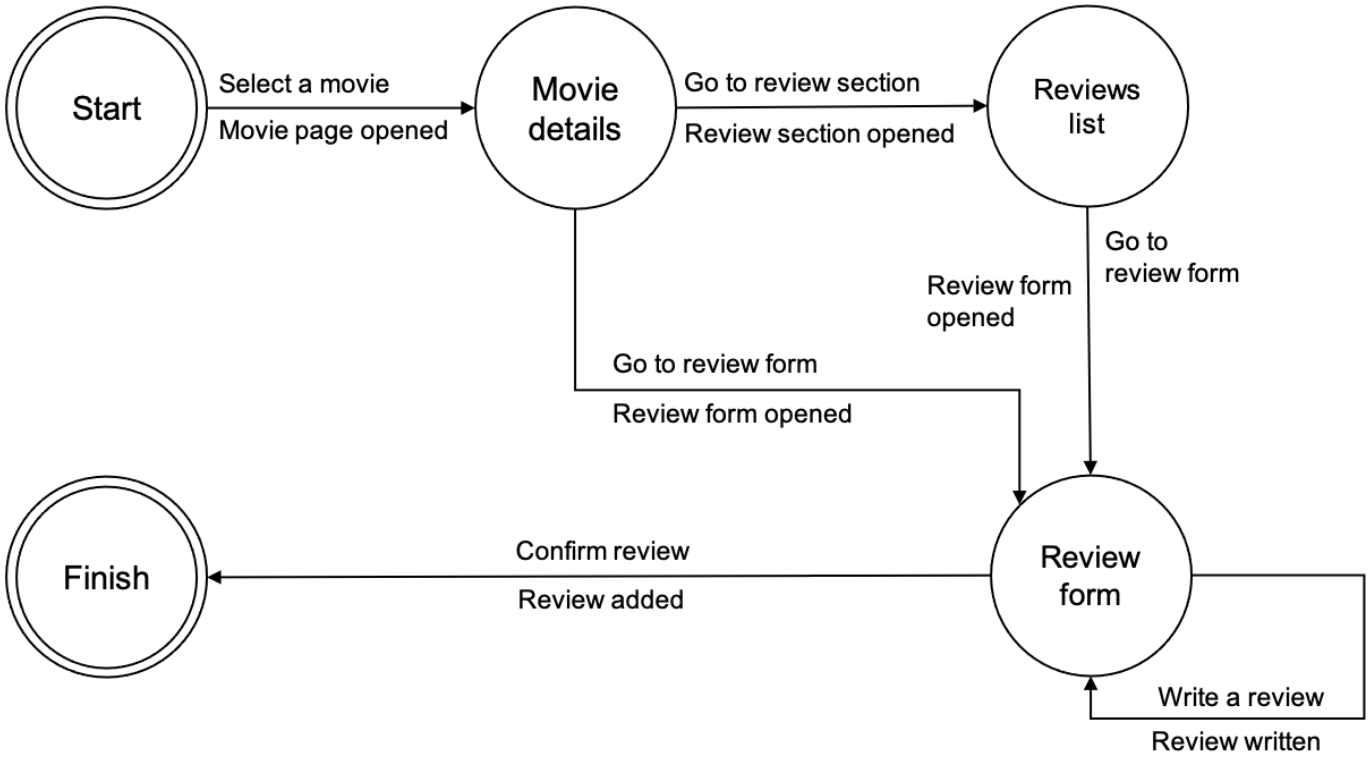
3.4 Make a review

The user can make a review regarding a movie. In particular, once he selected a movie, he can go to the review page either from the movie page or from the page containing all reviews.

HTA - Make a review



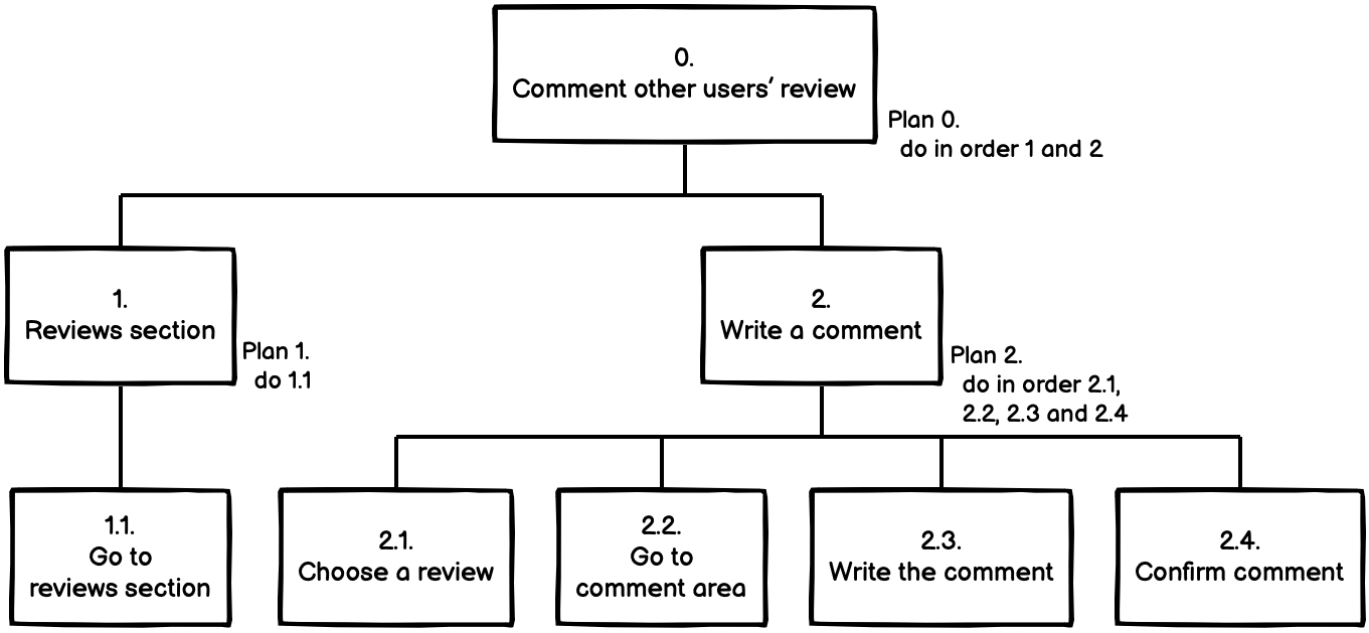
STN - Make a review



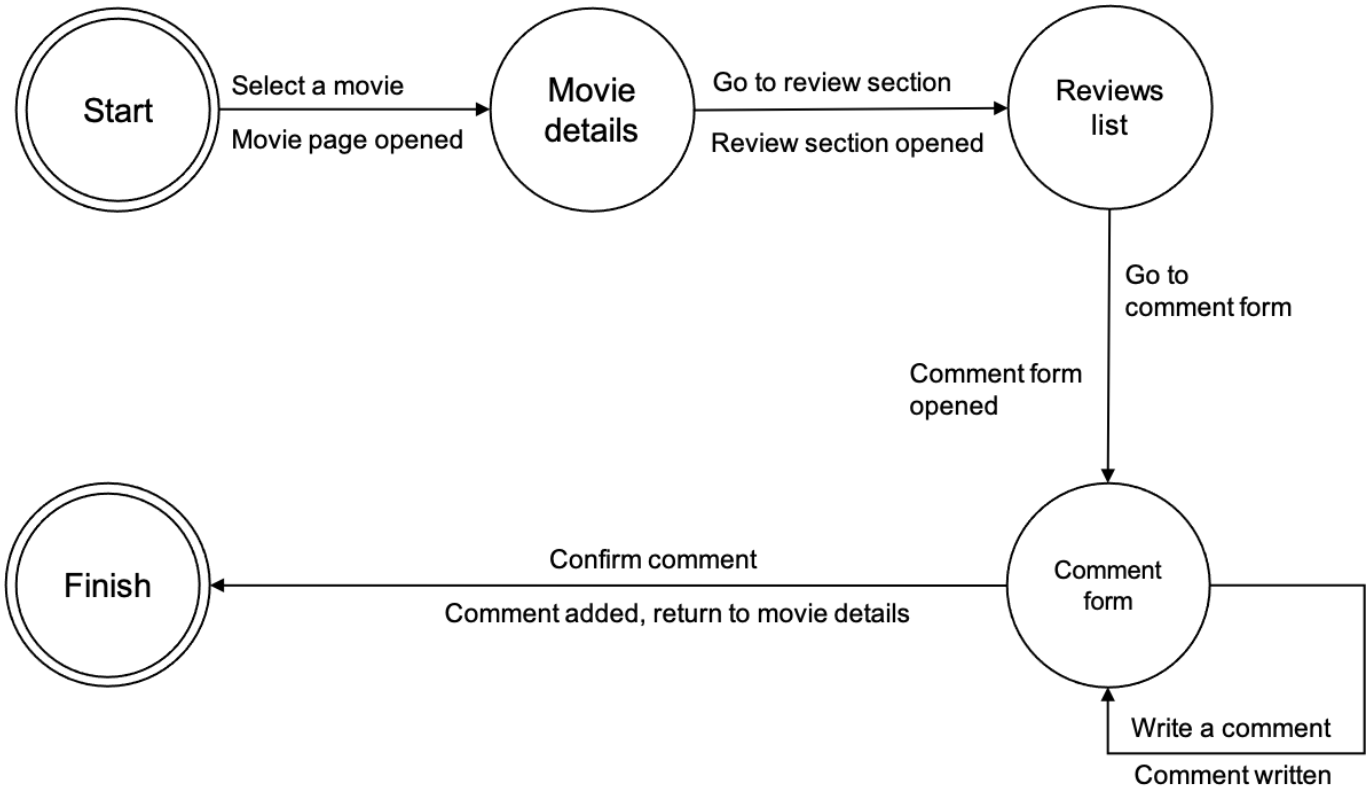
3.5 Comment other users' reviews

The user can comment a review written by another user. In particular he can go to the page containing all the reviews, choose one of them and comment it.

HTA - Comment other users' reviews



STN - Comment other users' reviews



4 Prototype 0: mockups

In this section we are going to present our first prototype realized through mockups in Balsamiq Wireframes. In the first prototype we created the skeleton of the application by modeling the different screens and the interaction between them.

The main functionalities of this prototype are:

- Login and registration of an user.
- Search for a movie or a person.
- Add a movie to a list.
- Review a movie.
- Comment other reviews.

Login and Registration

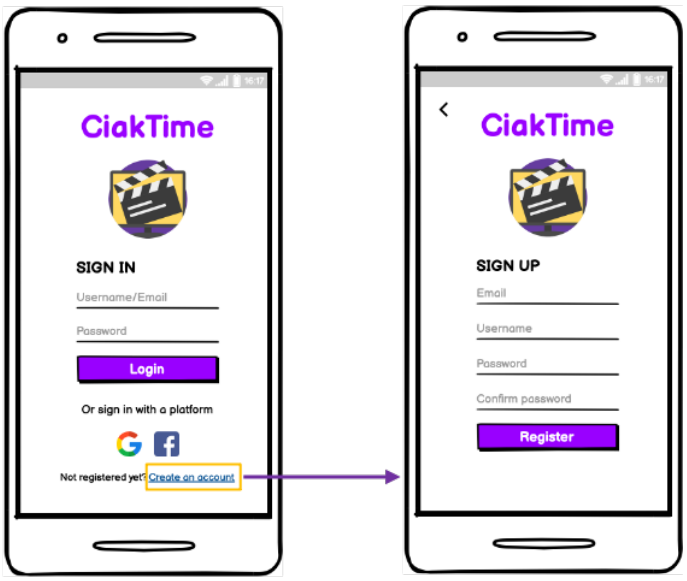


Figure 4.1: Login and Registration pages

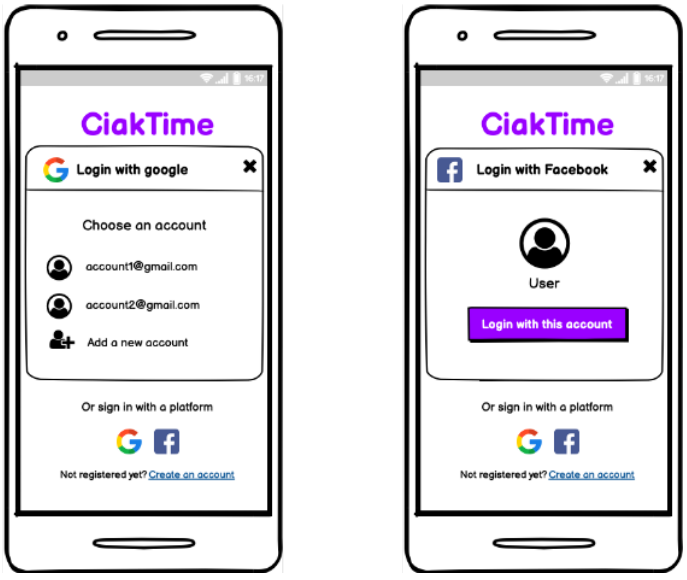


Figure 4.2: Login with Google and Facebook

Search for a movie or a person

The user can do the search by tapping on the search bar and, if he wants, he can apply filters by tapping on the proper icon.

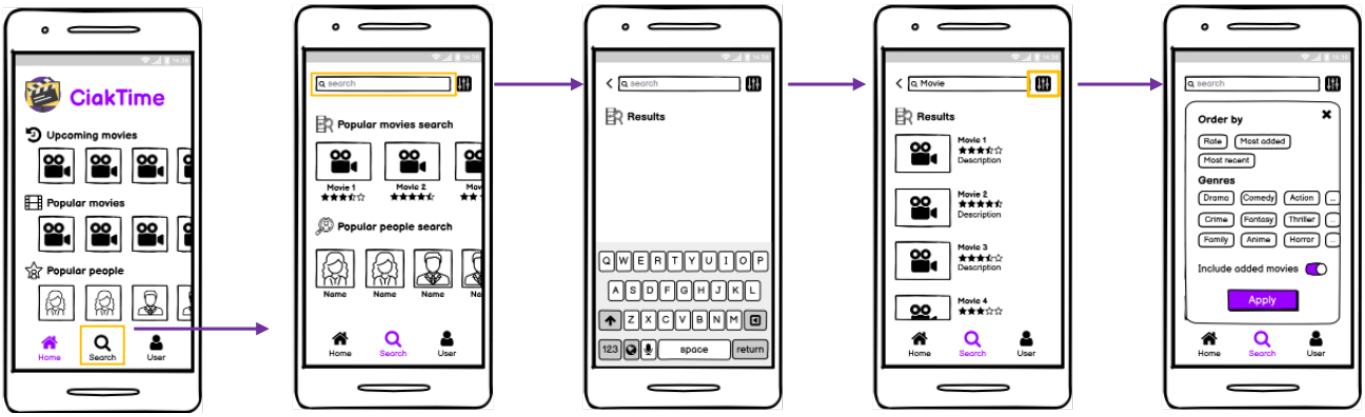


Figure 4.3: Searching process with optional filters

After having searched for a movie or a person, the user can tap on it and the application, according to his choice, will show one of the following screens:

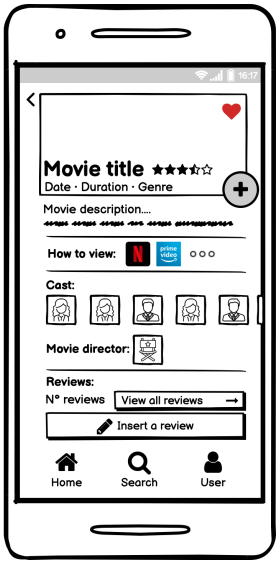


Figure 4.4: Movie page

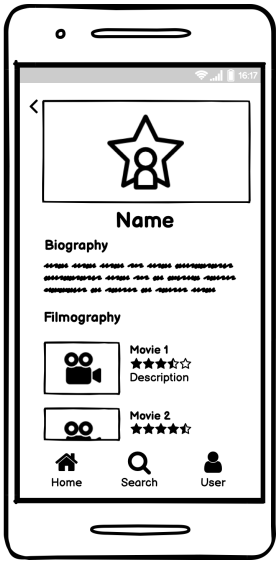


Figure 4.5: Person page

Add a movie to a list

The user can add a movie to a list in the following ways: by tapping on the "+" button to add the movie to "Watchlist" or "Already watched" and by tapping on the heart icon to add the movie to "Favourite movies".

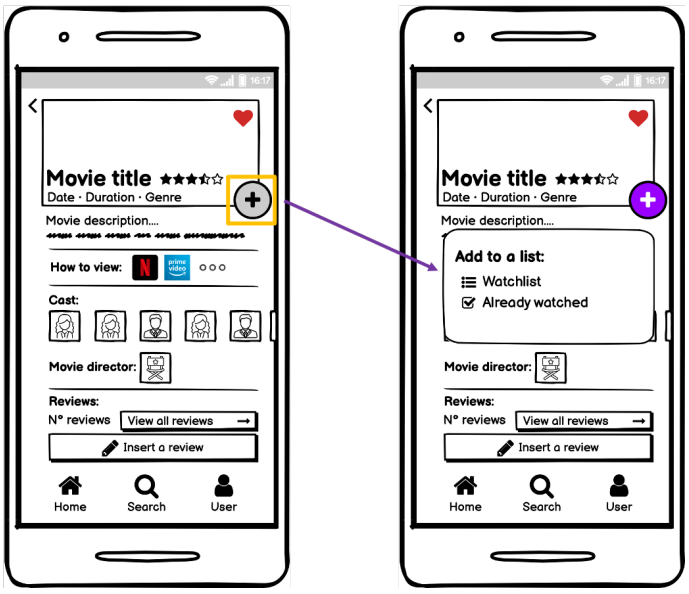


Figure 4.6: Add a movie to a list process

The user can reach the lists where he added the movie from the user profile page, in order to see all the movies added in watchlist, already watched list and favourite movies list.

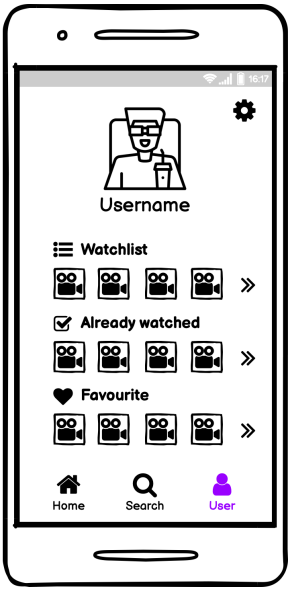


Figure 4.7: User profile page

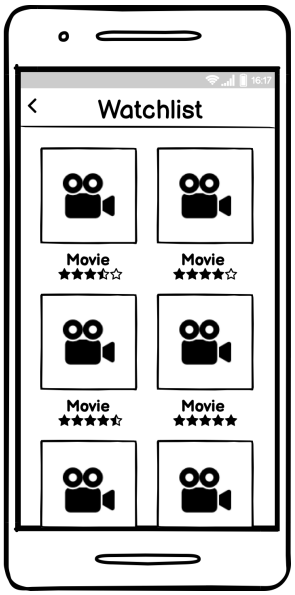


Figure 4.8: Watchlist

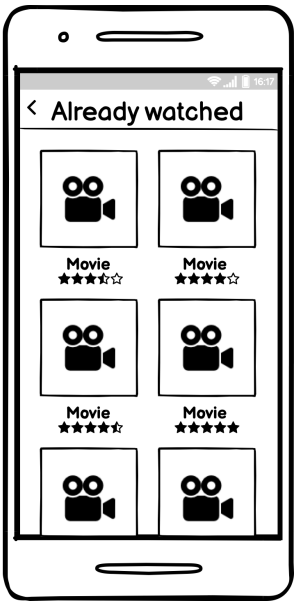


Figure 4.9: Movie already watched

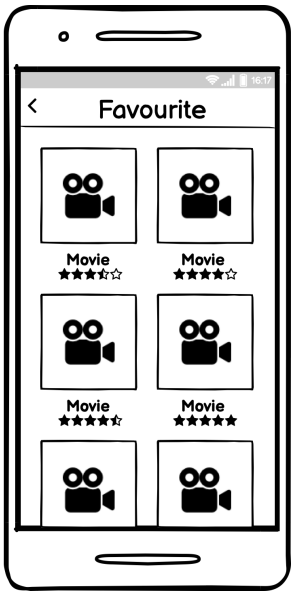


Figure 4.10: Favourite movie

Review a movie

The user can reach the review form in two ways:

- from the movie page;
- from the reviews page.

As we can see in the following figure:

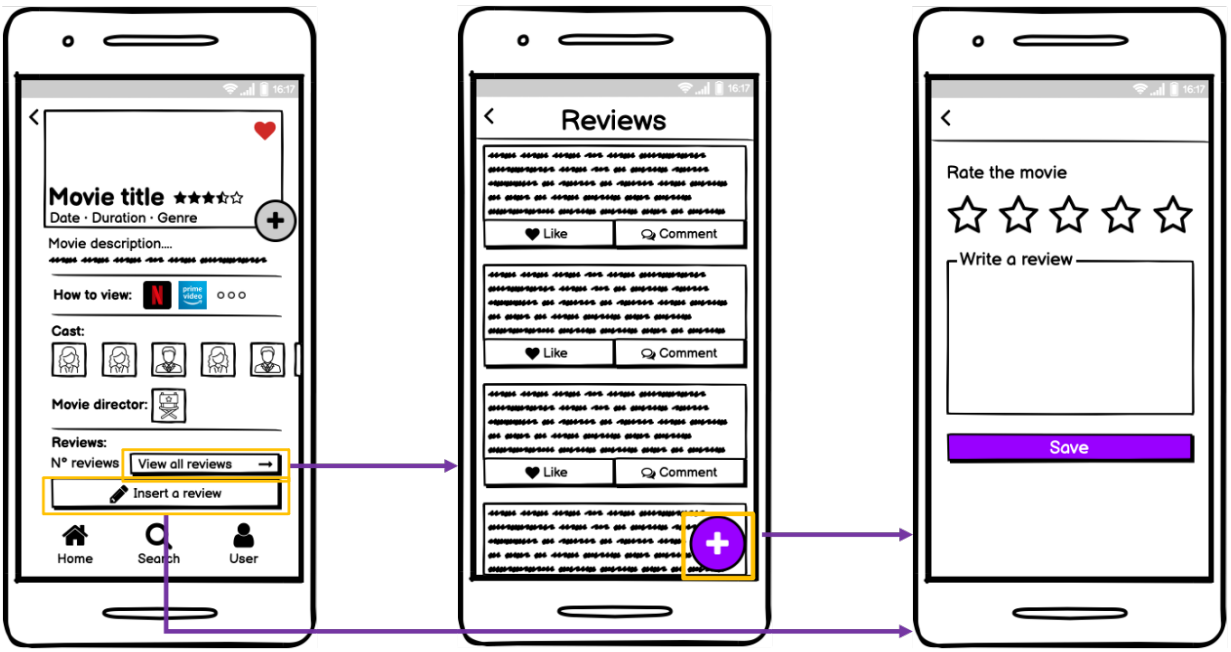


Figure 4.11: How to make a review

Comment other reviews

Tapping on "Comment" button, the user can see the comments of the other users and write a comment. He can also tap on "Like" button in order to leave positive feedback regarding a certain review.

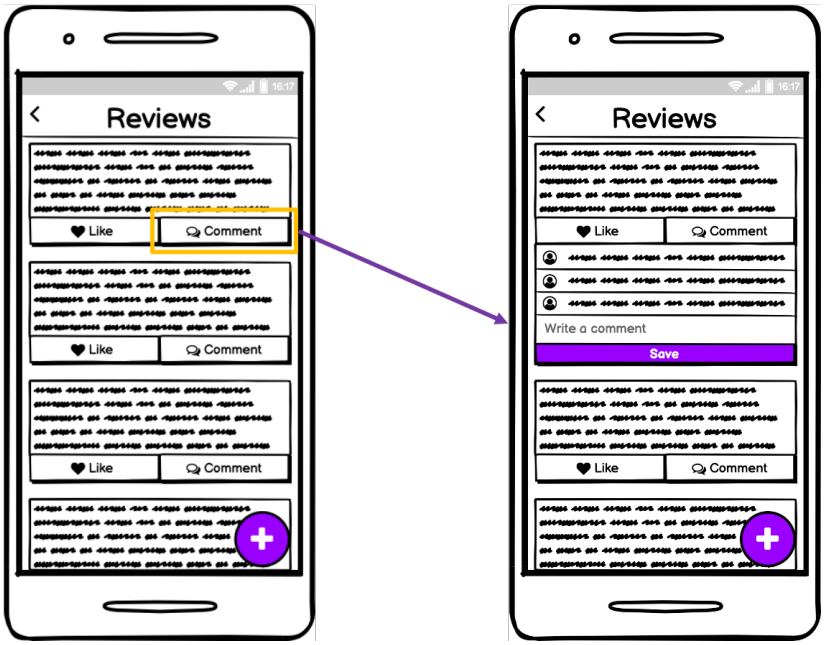


Figure 4.12: Comment other reviews process

User profile settings

Moreover, from the settings page, the user can change some profile settings like image profile, username and password. Also, if the user has not done it before, he can link his profile with his Google or Facebook account. Finally, here, the user can logout from the app.
These are not main functionalities, but we thought that they can be useful in order to support the user.

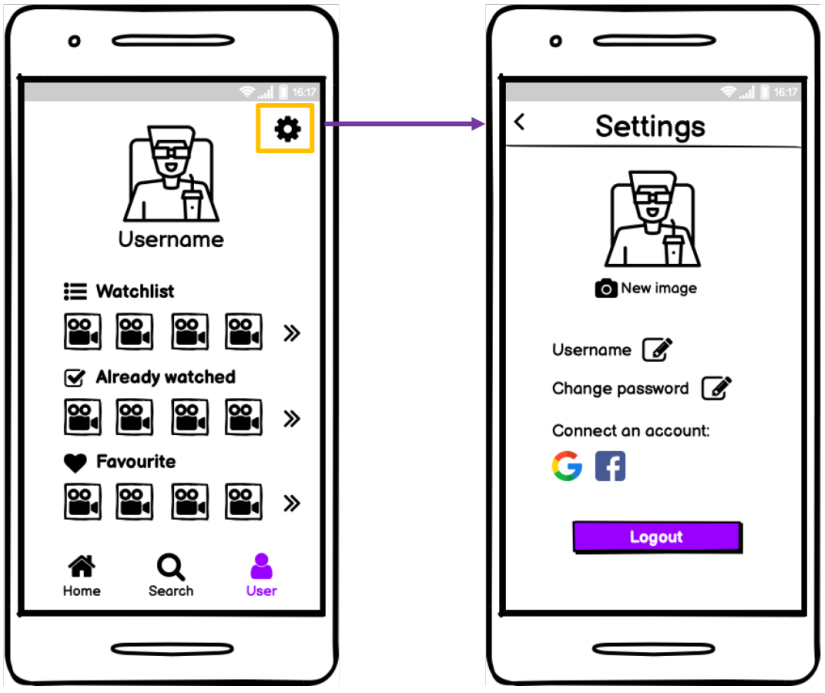


Figure 4.13: User profile and user profile settings pages

Figure 4.14: Change username

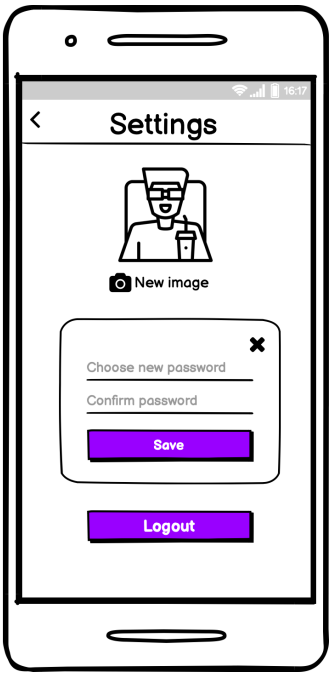


Figure 4.15: Change password

Figure 4.16: Connect google account

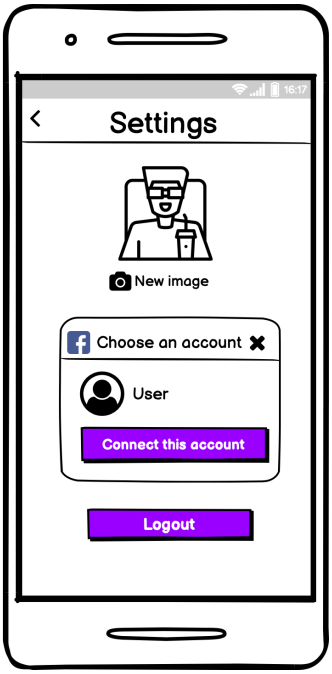


Figure 4.17: Connect facebook account

5 Expert Based Evaluation

The expert evaluation is based on our first prototype, the *mockups*. This is a very useful method because it allows us to detects problems in early stage of the development in order to avoid them in the final implementation.

We submitted our *mockups* to professor Valeria Mirabella that performed two different types of expert based evaluation: ***Heuristic Evaluation*** and ***Cognitive Walkthrough***.

5.1 Heuristic Evaluation

Heuristic Evaluation is a method used to evaluate if the system follows general usability criteria. Its main goal is to identify any problem associated with the design of user interfaces. The expert should check if the system is consistent and, if a usability problem occurs, evaluates if it is a major problem, a minor problem or just something that could be left as it is. There are various severity levels, and they are assigned in order to made the evaluation.
The Heuristic Evaluation used is based on the Jakob Nielsen's 10 Usability 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 users' 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.

6. *Recognition rather than recall*: make 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.

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, 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. whenever appropriate.

After the expert based evaluation, in the following table, it has been reported that the following heuristics have been violated:

Frame	**Heuristic violated**	**Severity**	**Description / Comment**
Login form	Help users recognize, diagnose and recover from errors	3	Include a Forgot password? link
Registration form	Error prevention	2	Provide function to show password in clear text
Registration form	Error prevention	2	If you have set some rules for the format of user password, make them clear before the user click to submit
Movie detail	Aesthetic and minimalist design	3	In the same page you have a lot of information. Prioritize the content and features to support primary goals.
All	Recognition rather than recall	4	You can arrive in the same page navigating different sections. It could be confusing. Support wayfinding, for example by including breadcrumbs
Add a review (ore rate a movie)	Error prevention	3	Present users with a confirmation option before publish the review

The severity number identify:

- 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

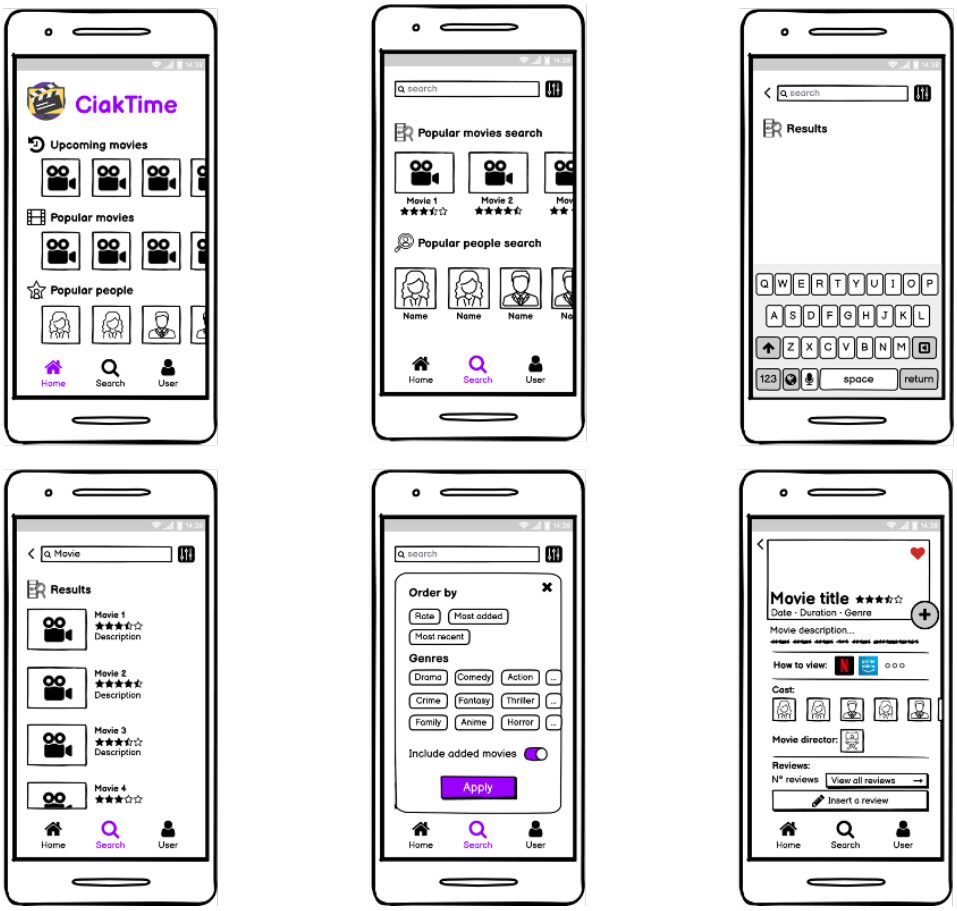
5.2 Cognitive Walkthrough

Cognitive Walkthrough is related with the idea of discovering user's cognitive efforts and how much system's design supports it performing the actions in order to reach its goals. The idea of method is that provides the expert walks through the system in order to understand if the actions provided by the system well support the user in doing such task. The idea of the method is that the experts make use of cognitive psychology in order to understand if the user is well supported, while doing a task, by the actions provided by the system; more precisely, experts aim to consider the impact of an interaction on the user, the cognitive process that it requires and which learning problems could arise from it. The analysis is guided by four predefined questions:

- Q1: Is the effect of the action the same as the user's goal at that point?
- Q2: Will users see that the action is available?
- Q3: Once users have found the correct action, will they know it is the one they need?
- Q4: After the action is taken, will users understand the feedback they get?

Task 1 - Search the movie "Harry Potter and the Deathly Hallows - Part 2" to see the movie details.

Action 1: open the application (assuming that the user is already logged in)
Response 1: homepage is opened
Action 2: tap on the search icon
Response 2: the search page is displayed
Action 3: tap on the search bar
Response 3: the keyboard shows up
Action 4: type "Harry Potter"
Response 4: each digit is displayed as typed and the system shows the corresponding results
Action 5 – 6 – 7: [OPTIONAL] tap on filters' icon, select "most recent" filter and tap on apply
Response 7: the system shows the results according to the chosen filter
Action 8: select "Harry Potter and the Deathly Hallows - Part 2" from the list of the results
Response 8: the systems shows the page of the selected movie containing all the related details



Expert evaluation:

Action 1: open the application (assuming that the user is already logged in)
Response 1: homepage is opened

Q1 - Is the effect of the action the same as the user's goal at that point?
Yes
Q2 - Will users see that the action is available?
Yes
Q3 - Once users have found the correct action, will they know it is the one they need?
Yes
Q4 - After the action is taken, will users understand the feedback they get?
Yes

Action 2: tap on the search icon
Response 2: the search page is displayed

Q1 - Is the effect of the action the same as the user's goal at that point?
Yes
Q2 - Will users see that the action is available?
Yes
Q3 - Once users have found the correct action, will they know it is the one they need?
Yes
Q4 - After the action is taken, will users understand the feedback they get?
Yes

Action 3: tap on the search bar
Response 3: the keyboard shows up

Q1 - Is the effect of the action the same as the user's goal at that point?
Yes
Q2 - Will users see that the action is available?
Yes
Q3 - Once users have found the correct action, will they know it is the one they need?
Yes
Q4 - After the action is taken, will users understand the feedback they get?
Yes

Action 4: type "Harry Potter"
Response 4: each digit is displayed as typed and the system shows the corresponding results

Q1 - Is the effect of the action the same as the user's goal at that point?
Yes
Q2 - Will users see that the action is available?
Yes
Q3 - Once users have found the correct action, will they know it is the one they need?
Yes
Q4 - After the action is taken, will users understand the feedback they get?
Yes

Action 5 – 6 – 7: [OPTIONAL] tap on filters' icon, select "most recent" filter and tap on apply
Response 7: the system shows the results according to the chosen filter

Q1 - Is the effect of the action the same as the user's goal at that point?
Yes
Q2 - Will users see that the action is available?
Yes
Q3 - Once users have found the correct action, will they know it is the one they need?
Users with no experience could not recognize the icon
Q4 - After the action is taken, will users understand the feedback they get?
Yes

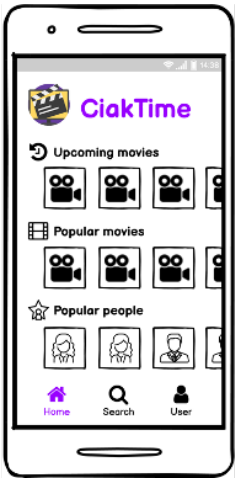
Action 8: select "Harry Potter and the Deathly Hallows - Part 2" from the list of the results
Response 8: the systems shows the page of the selected movie containing all the related details

Q1 - Is the effect of the action the same as the user's goal at that point?
Yes
Q2 - Will users see that the action is available?
Yes
Q3 - Once users have found the correct action, will they know it is the one they need?
Yes
Q4 - After the action is taken, will users understand the feedback they get?
Yes

Task 2 - Add a popular movie to the watchlist.

Action 1: open the application (assuming that the user is already logged in)

Response 1: homepage is opened
Action 2: tap on a movie from "popular movies" section
Response 2: the movies page is displayed
Action 3: tap on the "+" button
Response 3: lists' popup is displayed
Action 4: tap on watchlist
Response 4: the movie is added to watchlist



Expert evaluation:

Action 1: open the application (assuming that the user is already logged in)
Response 1: homepage is opened

Q1 - Is the effect of the action the same as the user's goal at that point?
Yes
Q2 - Will users see that the action is available?
Yes
Q3 - Once users have found the correct action, will they know it is the one they need?
Yes
Q4 - After the action is taken, will users understand the feedback they get?
Yes

Action 2: tap on a movie from "popular movies" section
Response 2: the movies page is displayed

Q1 - Is the effect of the action the same as the user's goal at that point?
Yes
Q2 - Will users see that the action is available?
Yes
Q3 - Once users have found the correct action, will they know it is the one they need?
Yes
Q4 - After the action is taken, will users understand the feedback they get?
Yes

Action 3: tap on the "+" button
Response 3: lists' popup is displayed

Q1 - Is the effect of the action the same as the user's goal at that point?
It could be not clear that the + button is needed to reach the goal
Q2 - Will users see that the action is available?
Yes
Q3 - Once users have found the correct action, will they know it is the one they need?
Yes
Q4 - After the action is taken, will users understand the feedback they get?
Yes

Action 4: tap on watchlist
Response 4: the movie is added to watchlist

Q1 - Is the effect of the action the same as the user's goal at that point?
Yes
Q2 - Will users see that the action is available?
Yes
Q3 - Once users have found the correct action, will they know it is the one they need?
Yes
Q4 - After the action is taken, will users understand the feedback they get?
There aren't enough elements to answer

6 Prototype 1

After having received the expert evaluation, we have made some corrections based on it.
More specifically, regarding the **Heuristic Evaluation**, we have made the following corrections:

Login

In the login screen we have added "Forgot password?" button in order to let the user restore his password if he forgot it.

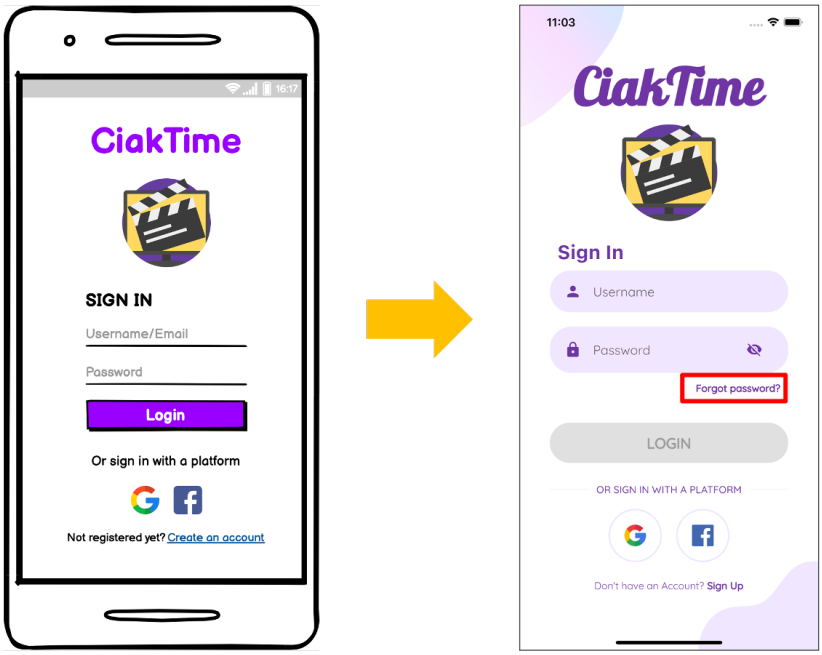


Figure 6.1: "Forgot password?" button added to Login page

Registration

Here we added a button for the informations about password's formattation rules in order to help the user understanding how to correctly write the password. Moreover we added another button in order to allow the user showing/hiding his password.

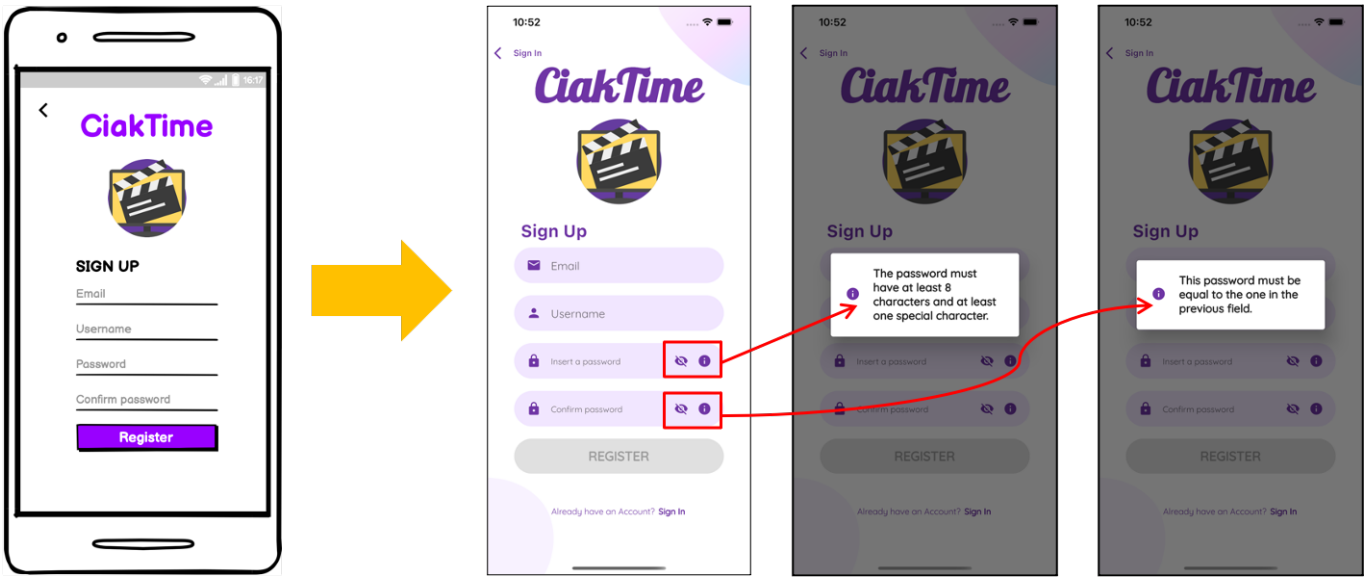


Figure 6.2: "Show/hide password" button and information button added to Registration page

Movie information

Regarding the movie, in the mockups we had a lot of informations concentrated in a single movie page. For this reason we have left in the main movie page only the relevant informations, and we have moved in the new "Movie info" page, accessible by tapping on "View more →", all the other informations.

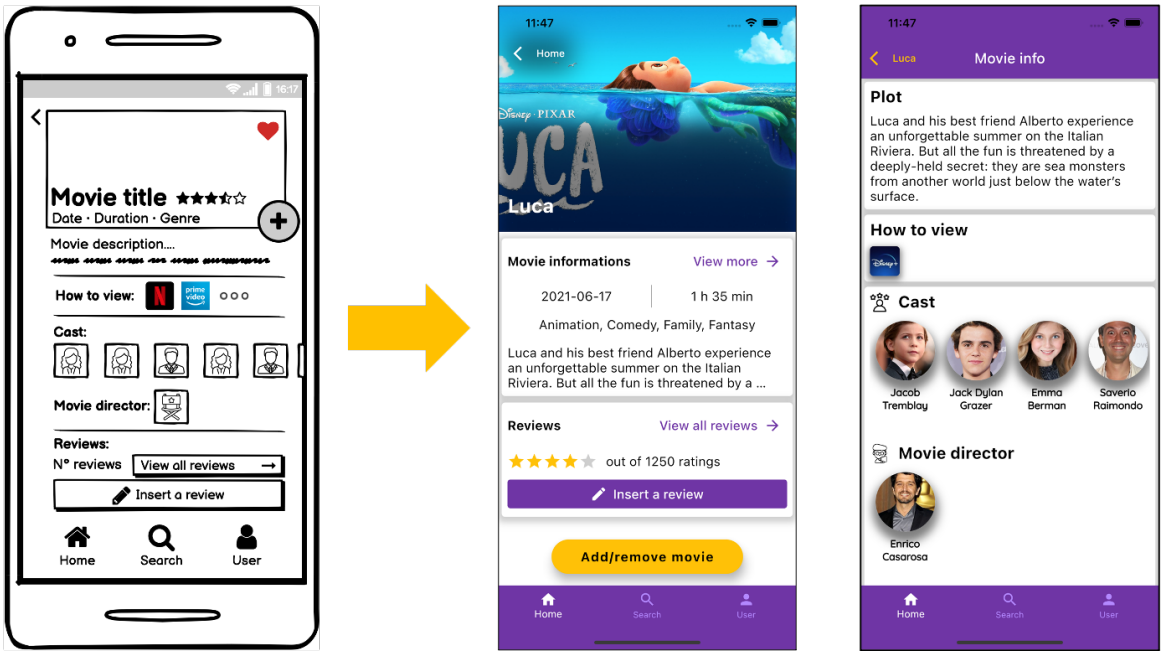


Figure 6.3: "Movie" and "Movie info" pages

The user can arrive in the same page (for example in "Movie" page or "Person" page) from different sections, so we have supported wayfinding by letting the back button change depending on the previous page as we can see in the example below:

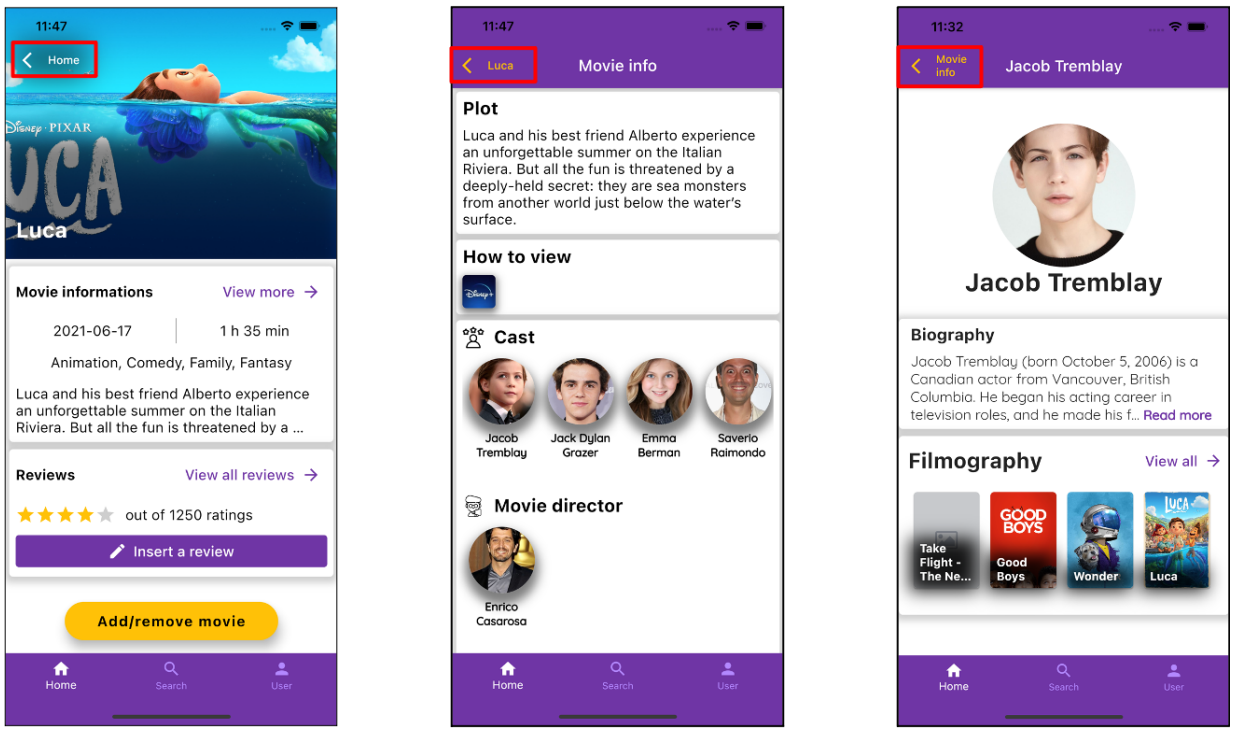


Figure 6.4: Wayfinding support added to all pages

Reviews

Finally, regarding the page to make a review, we added a popup when the user tap on "Save" button in order to support error prevention.

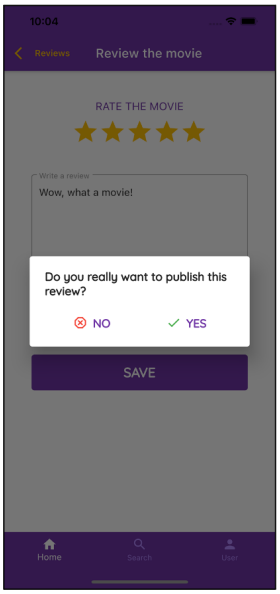


Figure 6.5: Confirm review popup added

Instead, regarding the **Cognitive Walkthrough**, we made the following corrections:

Add movie to a list

Regarding the task that allows users to add a movie to a list, we created a single button "Add/remove movie" instead of the two "+" and "heart icon" buttons, because it could not be clear that they are needed to reach the goal, as we can see in the Figure 6.6. Also, we added a toast (Figure 6.7) that notifies users that the movie is added or removed from a list.

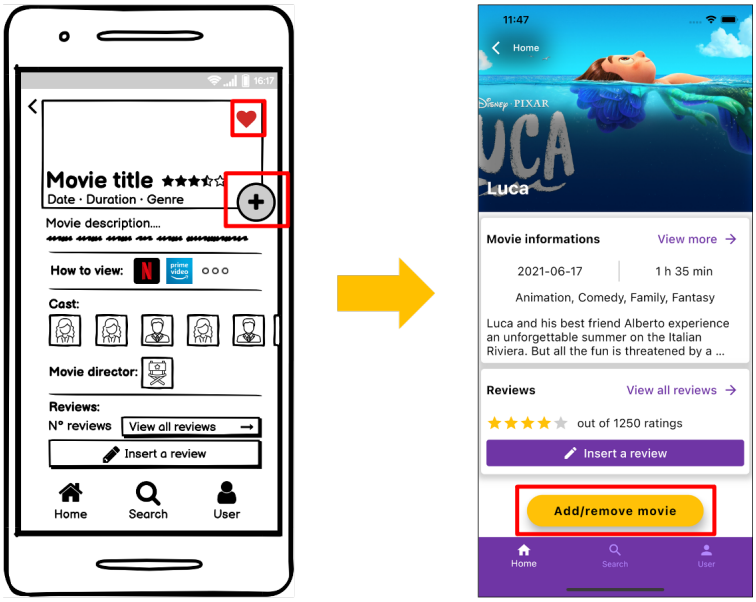


Figure 6.6: "+" and "heart icon" buttons modified

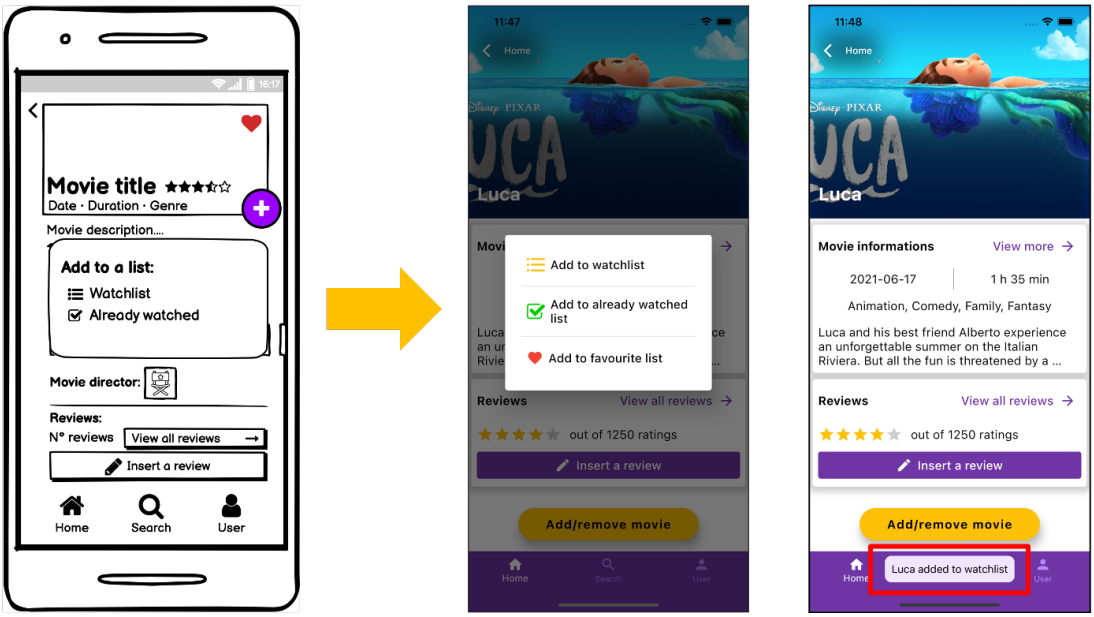


Figure 6.7: Toast added

Search

Since not experienced users could not recognize the "Filter" icon, we modified and repositioned the "Filter" button in order to make it clearer.

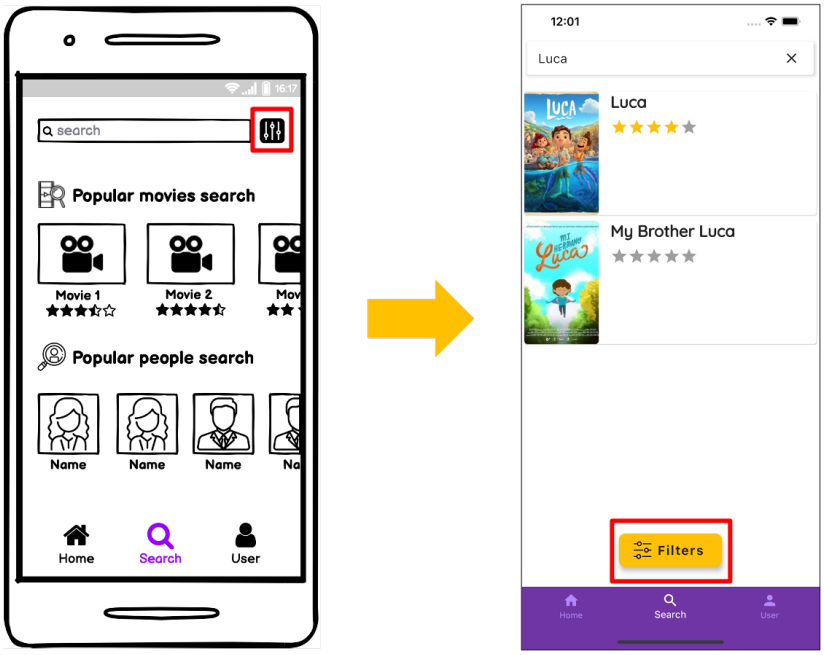


Figure 6.8: "Filters" button modified

7 User Based Evaluation

Once Prototype 1 was up and running based on the corrections related to the expert evaluation, we proceeded with the user based evaluation. More precisely we used two techniques: **Think Aloud** and **Controlled experiment**.
These experiments were conducted over a group of subjects, representative of the future users, that did not participate in any of the previous phases. Due to this emergency time that we are living, we exploited the functionality of Zoom that allowed us to connect with more people in order to have as much results as possible.
Our subjects had an age in a range between twenty - thirty years old that fits the age chosen in our user requirements.

7.1 Think Aloud

The think aloud is a kind of evaluation based on some simple rules. We chose a group of 10 people and performed the experiment using these criteria:

- We explained to the users who we are and what we were doing.
- Each member had to accomplish, individually, the same tasks that are shown below.
- We explained that we were testing our application, and not testing them.
- The experiment took place remotely, and we provided a demo version of our app "CiakTime" to each person in order to allow them to install it on their smartphones.
- While executing the task, each user had to say aloud what he was doing, what he thought it was happening, any doubt, etc., and we were not allowed to help them in any way.
- During the experiment, we recorded each person and we took note by pen and paper.

Task 1: *Recently a lot of people are talking about the new Disney's movie called "Luca". So, in order to understand the reason behind that, you would like to read its plot. After having noticed that the plot is interesting, you would like to add that movie into your "Watchlist" in order to watch it in future.*

Task 2: *After having watched the movie "Luca", you would like to leave a review about this movie and add it to your "Already Watched" list.*

Task 3: *You really liked the movie "The lord of the rings: the fellowship of the ring" and you would know who is the movie director and which other movies he has directed. After having done this search, you would like to go back to the search page in order to do other searches.*

Regarding *Task 1*, some users, while performing this task, had some difficulties, because they tried to tap on the three dots at the end of the plot instead the "View more" button, in order to read the entire plot. Conversely, regarding the other tasks, we notice that our subjects did not encounter any problem to accomplish them.

In general, we have obtained satisfactory results and therefore we asked the users to freely explore the application in order to collect additional advices to further improve it.

In particular, they gave us some feedback regarding the following features:

- Search between movies and persons should be separated.
- On person search results they would prefer to have specified whether a person is an actor or a movie director.
- On the “Movie info” page they would prefer to have specified who is the character that a certain actor plays in that movie.

7.2 Controlled experiment

A controlled experiment is an experiment in which all factors are held constant except for one: the independent variable.

We used controlled experiment in order to evaluate two different solutions at the level of graphical interface. In particular we had two alternatives for the searching page in order to distinguish the search between movie and person, as it has been suggested by the users during the interviews. More specifically we realized these two versions in the following ways:

- **Version 1**: With a ”tab bar”
- **Version 2**: With a ”checkbox”

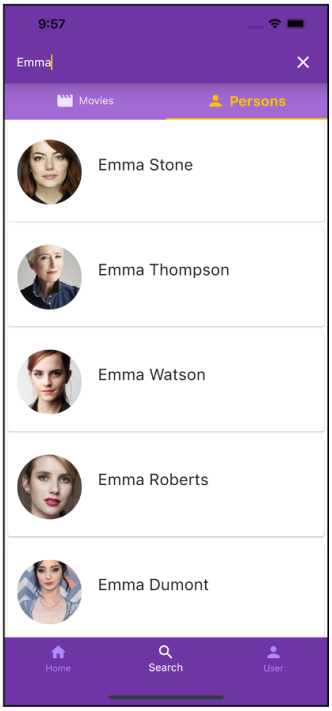


Figure 7.1: Version 1

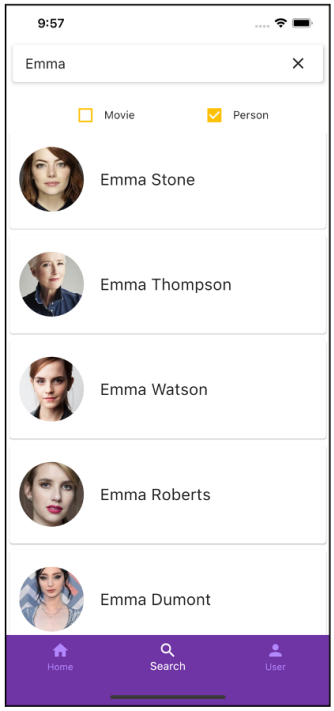


Figure 7.2: Version 2

These two different alternatives are the independent variables.

For the experiment, we define the hypothesis and the null hypothesis:

- **Hypothesis**: Users will operate quicker with the Version 1 in Figure 7.1 than the Version 2 in Figure 7.2.
- **Null hypothesis**: There will be no speed difference between the two above mentioned versions.

Also we have as dependent variable the time that the subjects took to perform the following task:

Task: *You find the actress Emma Watson very good, so you would like get more information about her filmography.*

For this experiment we used 10 subjects that had an age in a range between twenty - thirty years old, that fits the age chosen in our user requirements. We used *within-groups* method, meaning that each subject tested each alternative. With this method there is the problem of transfer learning; so, in order to avoid this problem, we have shown to half of the subjects first Version 1 and then Version 2, and to the other half first Version 2 and then Version 1.

7.2.1 ANOVA

Once we have collected the time values from the subjects while performing the task with the two different versions, we need to analyze them in order to disprove the null hypothesis and to see if we can confirm our hypothesis. For doing that, we used ANOVA, a statistical technique that analyzed variance based on the F-test. We easily computed ANOVA with Microsoft Excel and, in the following Figure (7.3), we show the obtained results.

VERSION 1	VERSION 2					
14	16					
15	35					
11	15					
10	14					
19	25					
24	34					
17	25					
12	26					
16	18					
11	18					
Anova: Single Factor						
SUMMARY						
Groups	*Count*	*Sum*	*Average*	*Variance*		
Column 1	10	149	14,9	18,76667		
Column 2	10	226	22,6	58,26667		
ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	296,45	1	296,45	7,696668	0,012506	4,4138734
Within Groups	693,3	18	38,51667			
Total	989,75	19				

Figure 7.3: ANOVA result

Since F > F crit (7.7 > 4.4), we can reject the null hypothesis and use these data to understand if the first interface (Figure 7.1) is much easier and more immediate to use with respect to the second one (Figure 7.2).
After that, we also asked to the subjects a brief comment on the experience and they told us that they prefer the first interface because is much more intuitive and also because, even though the second version let them see the results for both movies and persons at the same time, they don't care about it because, when they perform the search, they have very clear in mind whether they are searching for a movie or a person.

8 Prototype 2

After the evaluation through user partecipation, we have made some corrections based on it. More specifically, we made the main changes for "Movie" and "Search" pages.

Movie

From the **Think aloud**, we noticed that the users had some difficulties to read the plot because they tried to tap on the three dots at the end of the plot instead of the "View more" button, in order to read the entire plot. So we modified the interface in order to allow them to expand the plot by tapping on "Read more".

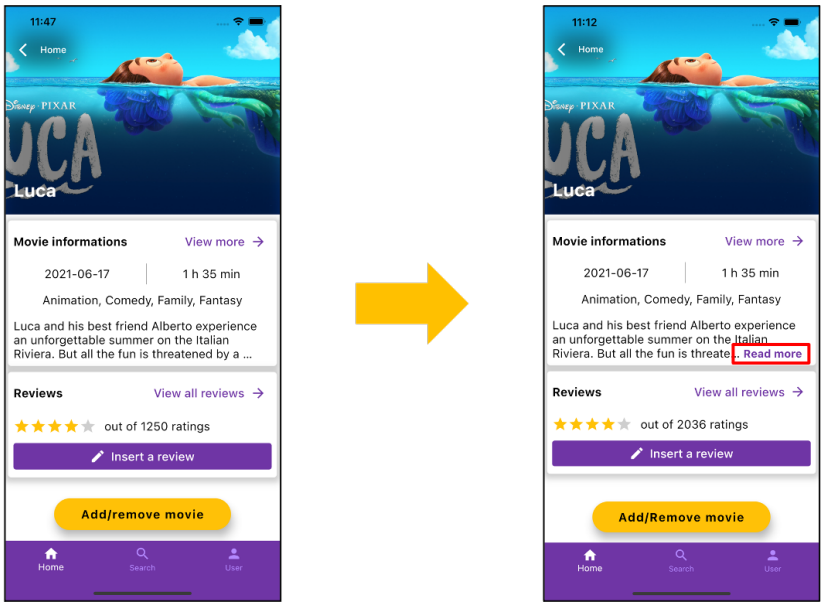


Figure 8.1: "Movie" page

Conversely, from the **interviews**, some users suggested us to specify who is the character that a certain actor plays in the movie; so we decided to add this information.

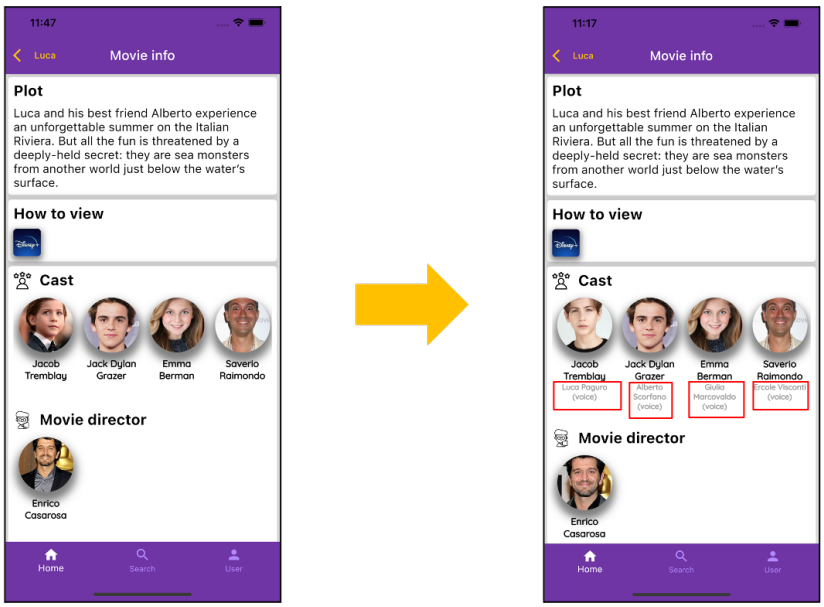


Figure 8.2: "Movie info" page

Search

From the **interviews**, the subjects told us that they would have preferred to have the possibility to distinguish search's results between movies and persons instead of obtaining the results of movies and persons together. Moreover, from **Controlled experiment**, we noticed that, for the users, the interface with "tab bar" was more intuitive and effective, so we decided to keep this version of the interface.

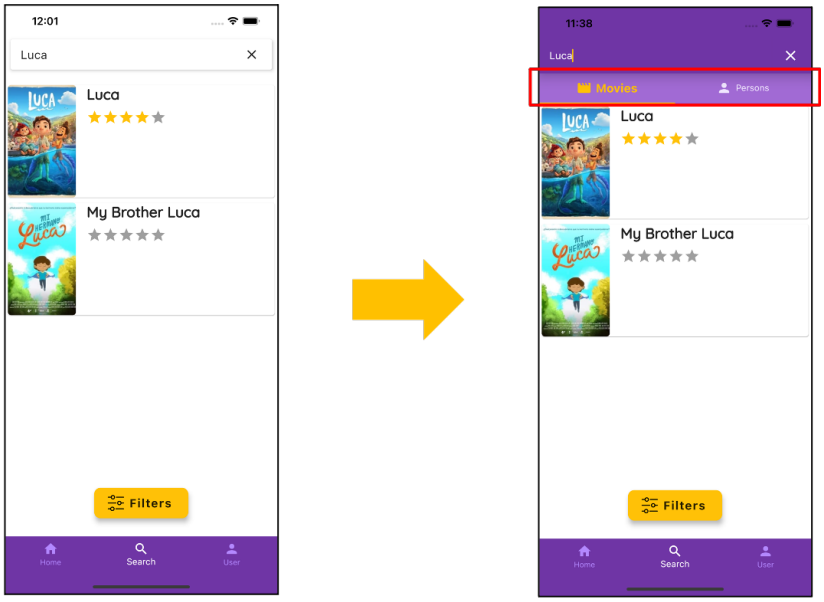


Figure 8.3: "Search" page modified with a "tab bar"

Finally, also here, from the **interviews**, the users told us that they would have preferred to see whether a searched person was an actor or a movie director.

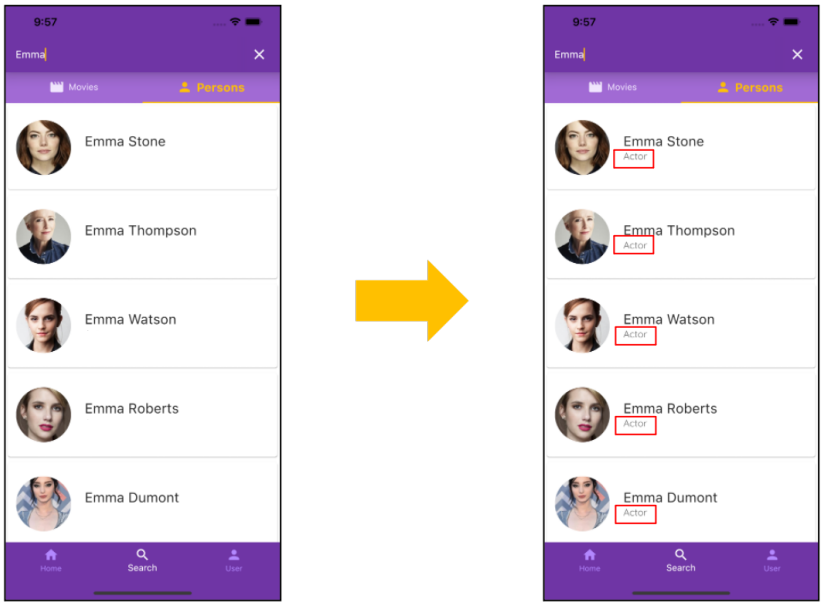


Figure 8.4: Information about persons added

9 Final version

In this section, we present the final result of our appplication.

Login

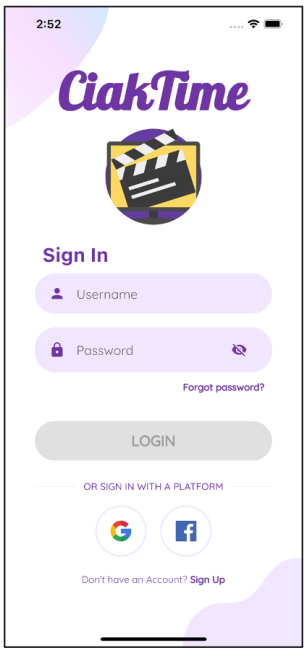


Figure 9.1: Login page

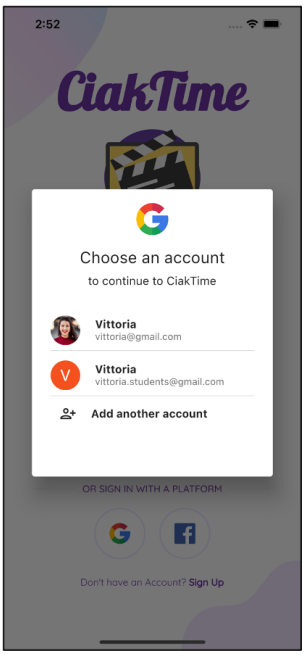


Figure 9.2: Login with Google

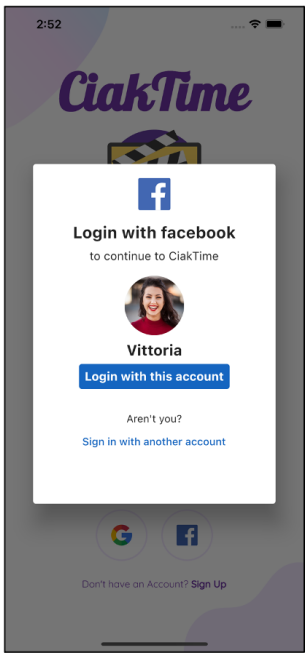


Figure 9.3: Login with Facebook

Registration

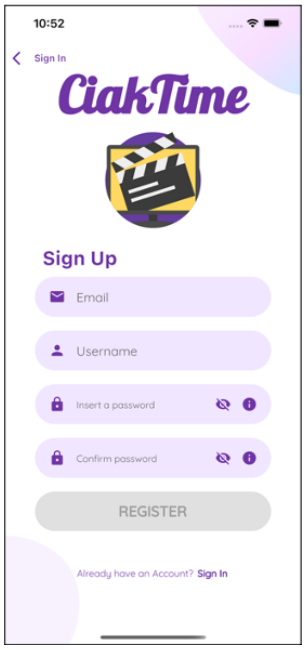


Figure 9.4: Registration page

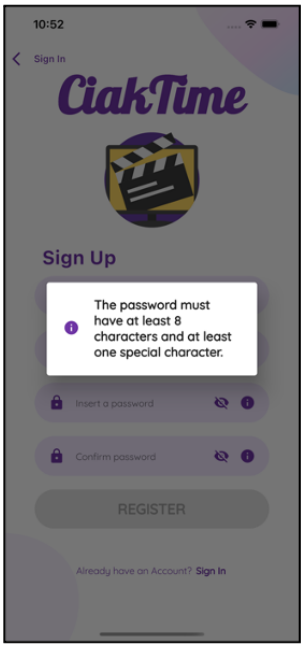


Figure 9.5: Password guidelines

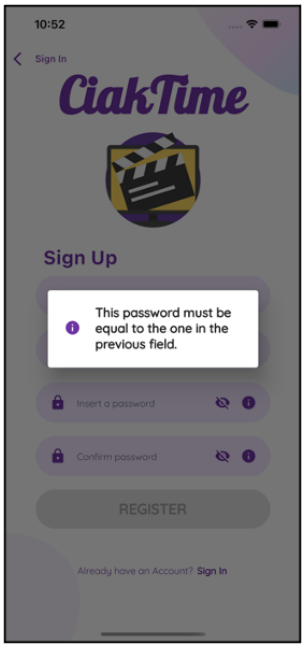


Figure 9.6: Confirm password guidelines

Home

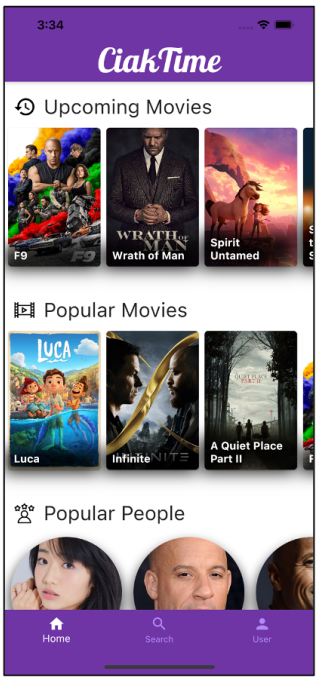


Figure 9.7: Homepage

Search

User

Movie

Review and comment

Person