4STUDY

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1. Introduction

This project borns for the need of find different students in the same **study** field, in order to build some **study groups**, for which all these students can join them for sharing their **knowledge** and **notes** about the courses.

During the pandemic period, relationships between students decreased because of remote lectures, and so retrieve some informations also became difficult.

So the purpose of **4Study** is to support and increase relationships between students, also remotely.
In particular, 4Study will be developed as a **web application**, in which we will find a lot of features:

- **Find a study group** in your area according to a specific subject
- **Sharing notes and documents** related to specific subject
- Give the possibility to students to **improve their language skills** by using a **chat**
- **Find study rooms**
- **Create announcements** for particular requests
- Management of the **personal timetable**

2. Development methodology

The methodology adopted for developing 4Study is a **Scrum methodology**: this is an Agile method based on daily meetings in which all the group members will share their opinions on the work done until that moment, focusing on what can be improved in the next iterations.

Each sprint will be of the duration of **one/two weeks**.

All the development process has been done fully remotely, by using videoconferences platforms such as **Google Meet** or **Zoom**, and **GitHub** and **Google Drive** platforms for data and content sharing.

3. Requirements' analysis

The requirements' analysis is very important to develop a product which is useful for the end user. In this phase, it is important to define the **needs** of the **users**, in order to deliver an high quality product, which is able to help them to use our product in a simple way.

3.1 User analysis

The first kind of requirement analysis is the **user analysis**, which consists identifying the target that will use our system. Given that our application is addressed for **students**, we have defined our target audience has the following features:

- Age: 14 – 25
- Gender: Male and Female
- State: Worldwide
- Technology: web application (laptop / Desktop)
- Education: high school / university
- Occupation: student

3.1.1 User personas and scenarios

The next step of the user analysis is to define several **user personas** and **related scenarios**.

User personas are useful to describe the potential users of the system, based on the user profile defined above.

A **scenario** is a story that describes how a particular persona completes a task or behaves in a given situation.

3.1.1.1 First Persona: Roberta

Roberta is a 17 years-old high school student who is studying at Liceo Scientifico Galileo Galilei in Rome. She doesn't like study a lot, she has troubles in learning and focusing both when she is at school and when she is at home. She loves spend time with other people.

It is a Wednesday afternoon and Roberta is going back home after a school morning. After lunch, she tries to study, but due to her inability to focus during study hours, she decides that it is better to find a study group, in order to improve her school marks.

3.1.1.2 Second Persona: Kevin

Kevin is a 22 years-old university student who is studying at La Sapienza University of Rome. He is strongly convinced that all the knowledge should be open and easily accessible to everyone. So, he would like a tool where he can share his notes.

It is a Tuesday afternoon and Kevin is studying. Meanwhile, a lot of his friends message him by asking for his Physics notes, but Kevin doesn't want to waste time by sending his notes to all his friends, one by one. So he would like to use a tool where the notes can be shared forever to all of them.

3.1.1.3 Third Persona: Alice

Alice is a 19 years-old high school student who is studying at Liceo Scientifico Shakespeare in Rome. She likes to study a lot and in particular, given that she is at her final year of high

school education, she would like to enroll a language study course at university, and so she would like to improve their language skills after the end of the school.

It is a Monday morning and Alice is attending an extra English course, but she is not satisfied about the dialogue skills that the course gives. She would like to find a person to chat with, in order to improve her language knowledge

3.2 Competitors

The next phase of user requirements step is to identify **competitors** and to analyze the **pros** and the **drawbacks** of 4Study with respect to the other applications.

	4Study	**StudyDrive**	**Docsity**
Unique Features	All in one: it offers all services useful to students	Job market and companies search	Marketplace notes
Design strengths	Learn English Study groups by map	Mobile app	Video Private lessons
Design weakness	Location based difficulties People matching language skills	Social based approach (Post) Not worldwide availability	Only teaching material Contents not free
Customer base	Customer size unknown	2.400.000	6.600.000
Satisfaction score	Not available	80	Not available
Requirements	Accessible on all browser types	Available on all browser types and mobile OS	Accessible on all browser types
Core features:			
Sharing notes	v	v	v
Find study groups	v	v	x
Language chat	v	x	x
Job search	x	v	x
Video lessons	x	x	v
Earn money	x	x	v
Find study rooms	v	x	x
Create announcements	v	v	x

3.3 Questionnaire

There are many ways that can be used to reach real audience, get an initial **feedback** about our idea and investigate user needs, expectations, perspectives, priorities and preferences.

The most used one is the **questionnaire**, which is easy to use and gives a quick feedback from users, and furthermore it can be useful to present several choices to our users in a clear way.

In order to reach a good amount of users we used **Google Form**.

Questionnaires principal **advantages** are:

- Quickly collecting quantitative data from a large number of users
- Collect information from a large number of users simultaneously
- If designed correctly, it can be quick & easy to analyze the data
- Relatively cheap
- The evaluator must be skilled in creating unbiased surveys (this requires training)
- If it is posted to the web, little effort is required to distribute it Medium

4. Task and Dialogue Analysis

The next steps that we need to do are the **task analysis** and the **dialogue analysis**. They are both considered very important when we deal with the most relevant and representative **use cases** of our system. Obviously, the uses cases of the application can be defined if and only if we previously went through a deep analysis of the requirements, by identifying the main users, the users' needs, and by looking at the competitor's analysis and the results of the questionnaire.

Let's start by introducing the **task analysis**: this is a method used to analyze **people's jobs**, in particular what they do, what things they work with and what they must know. The system analysis' method is different from the task analysis' method, because the first one focuses more on the system design, while the second one focuses more on the **user**.

At the same time, we have differences between cognitive models and task analysis, because the first one focuses more on the internal mental state and the tasks intended as individual work units, while the second one focuses more on the **external actions** and the **whole work** behind the task itself. The general method associated to task analysis is to **observe**, **collect unstructured list of words and actions** and finally **organize using notation or diagrams**. There are several approaches related to task analysis, but we will focus on **task decomposition**, which consists into splitting a task into **subtasks**: in particular, with task decomposition we can describe the actions people do, structure them within task subtask hierarchy and describe order of subtasks. The variant of task decomposition we will use is **Hierarchical Task Analysis (HTA)**, which is the most common. For generating the hierarchy when analyzing a task, we first need to get list of tasks, then we group tasks into higher level tasks and finally we decompose lowest level tasks further.

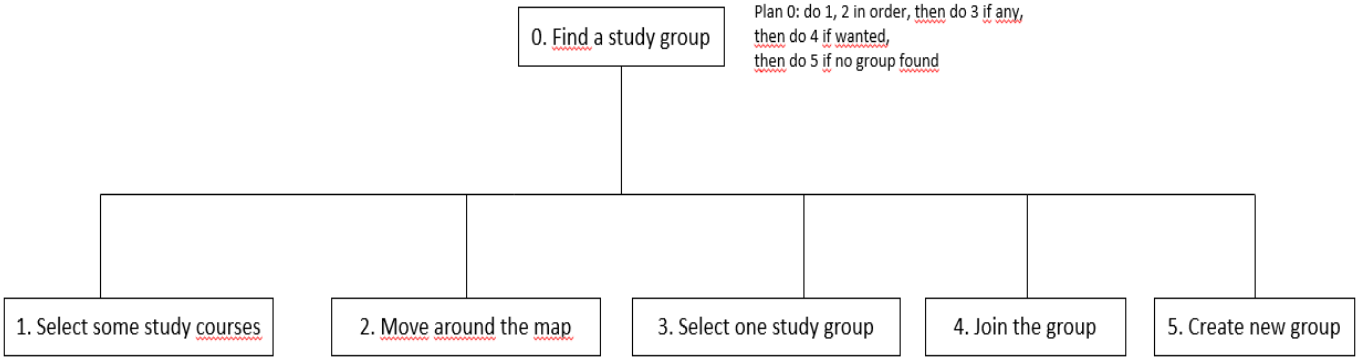
Now let's focus on **dialogue analysis**. The dialogue is also considered very important in the human computer interaction literature, especially from the point of view of **user interfaces**, when we deal with the syntactic level of **human-computer conversation**. The dialogue analysis helps us gain a better understanding of the whole system, from a lot of point of views. In order to conduct the dialogue analysis, we will use the **State Transition Network (STN)**, one for each of our most relevant tasks for which we have first defined the HTAs. A STN is a **directed graph** where each node represents a **state** in which the user will go through during the execution of the task, while each edge represents a **transition** from a state to another state, that is triggered by a **user action** and performed by the **system** in response to the user trigger.

We have identified four relevant tasks for our application, and now we will show, for each of them, their HTAs and STNs.

4.1 Hierarchical Task Analysis

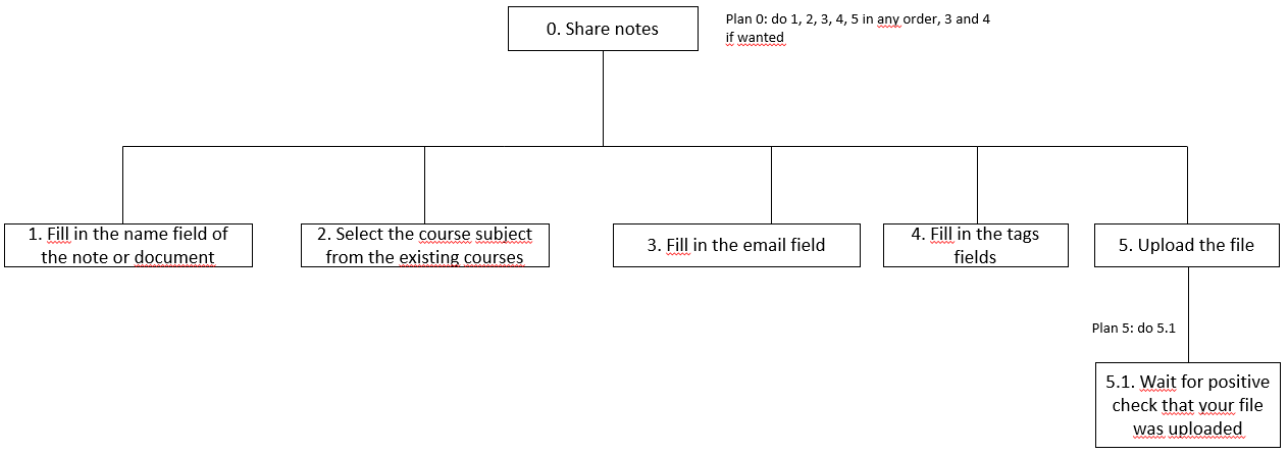
4.1.1 Find a study group

The first task we show is the one of **finding a study group**. This task allows the user to filter possible existing study groups on an interactive map, in order to join one of them if any available or, in case no group is found, to create himself a new group. This task is representative for the application, because one of the main goal of our application is that of making possible for students to improve their knowledge and concentration by studying with other people. Below we report the HTA:



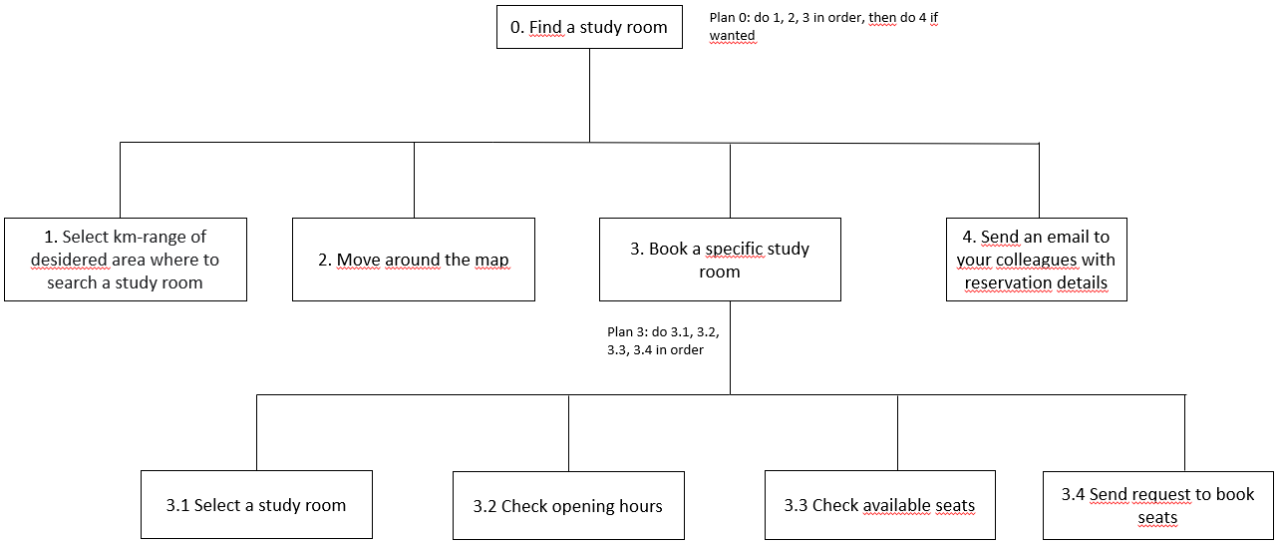
4.1.2 Share notes

The second task we show is the one of **sharing notes**. This task allows the user to upload files on the application, in order to share notes with other people: in particular, it will be required to insert the name of the document and the course subject and, if desired by the user, the tags and the email addresses of some specific users, in order to send them the document. This task is representative for the application, because another main goal of our application is that of making possible for students to share their knowledge on the application, in order for a student who wants to study at home alone to improve in one or more specific subjects. Below we report the HTA:



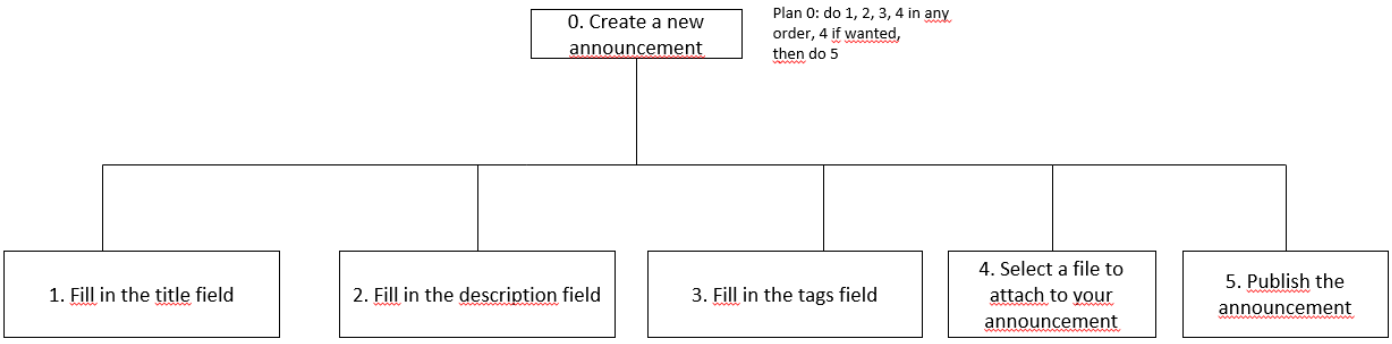
4.1.3 Find a study room

The third task we show is the one of **finding a study room**. This task allows the user to find a study room: in particular, the user will have the possibility to select the km-range of the desired area where to search a study room, and then, by using an interactive map, he will book a specific study room, if possible. Also, he will have the possibility to book the room for his colleagues, by sending an email with reservation details. This task is representative for the application, because another main goal of our application is that of making possible for students to exploit the university/school environments, in order for them to improve their study skills. Below we report the HTA:



4.1.4 Create a new announcement

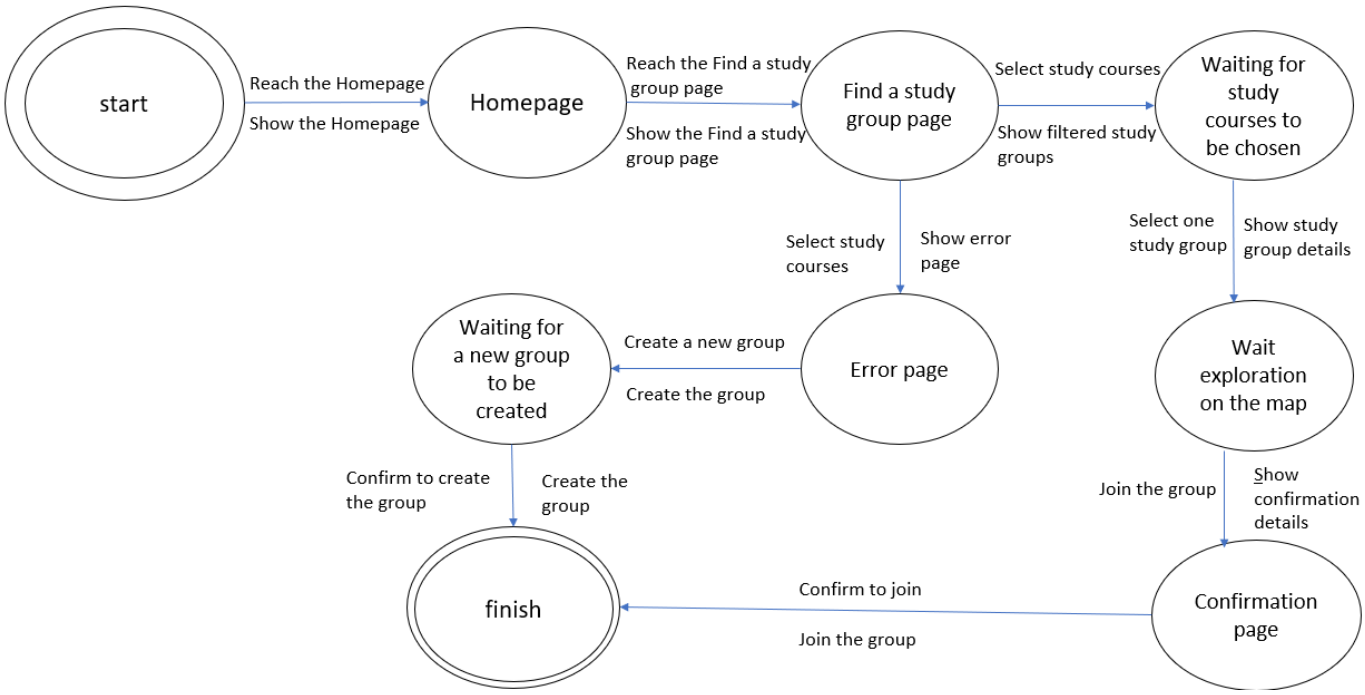
The fourth task we show is the one of **creating a new announcement**. This task allows the user to post an announcement on the application: in particular, the user will be required to insert a title, a description and at least one tag for the announcement, and also to attach a file to it, if he wants. This task is representative for the application, because another main goal of our application is that of making the life of students a lot easier, by giving them the possibility to open a discussion thread below each announcement, for any kind of reasons, such as sharing of personal notes, requests to find people or asking for the solution of exercises. Below we report the HTA:



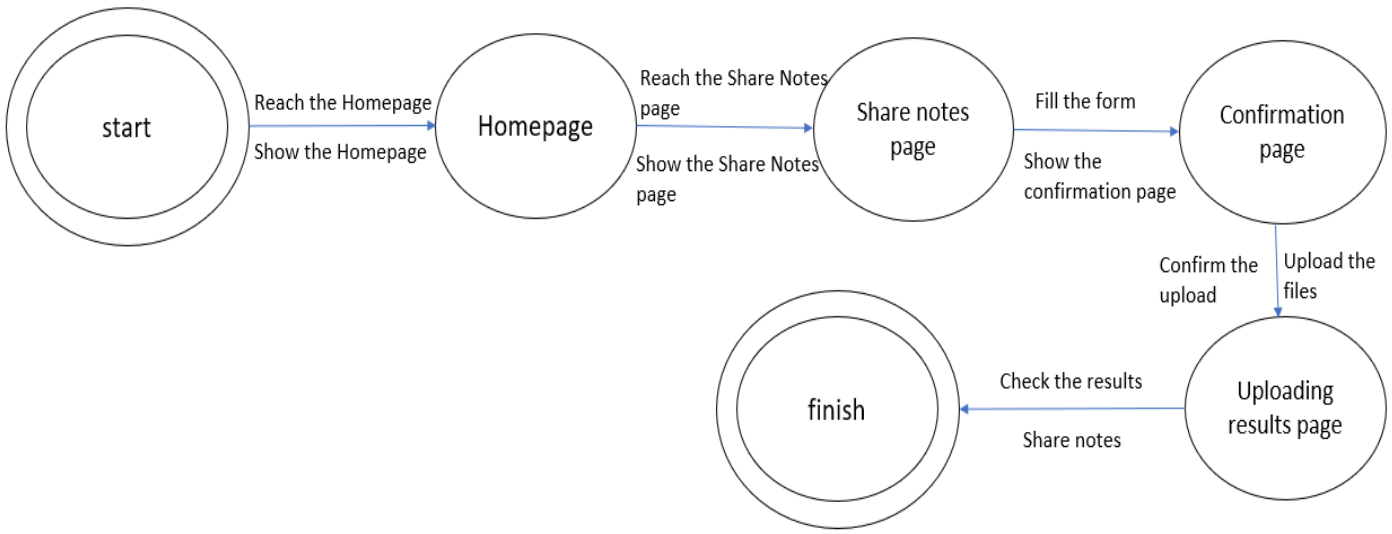
4.2 State Transition Networks

Now we will show the **State Transition Network** for each of the four tasks that we have just analyzed with HTAs.

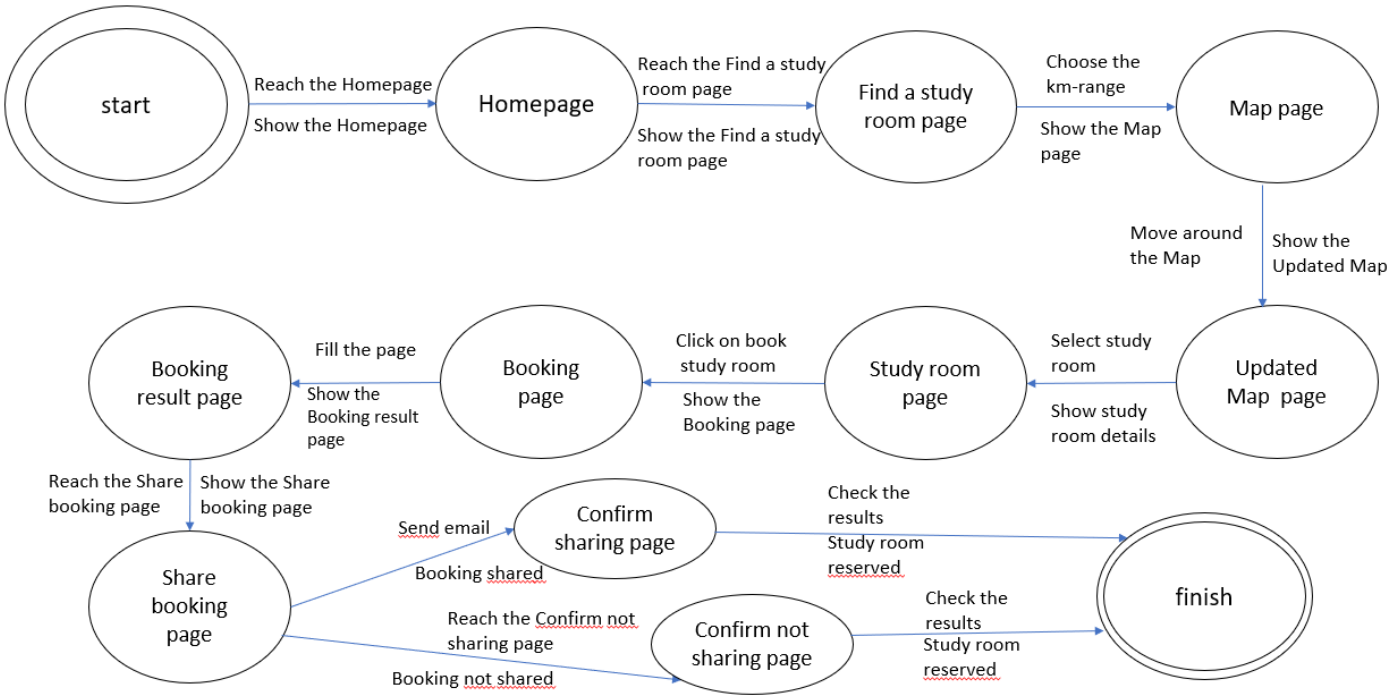
4.2.1 Find a study group



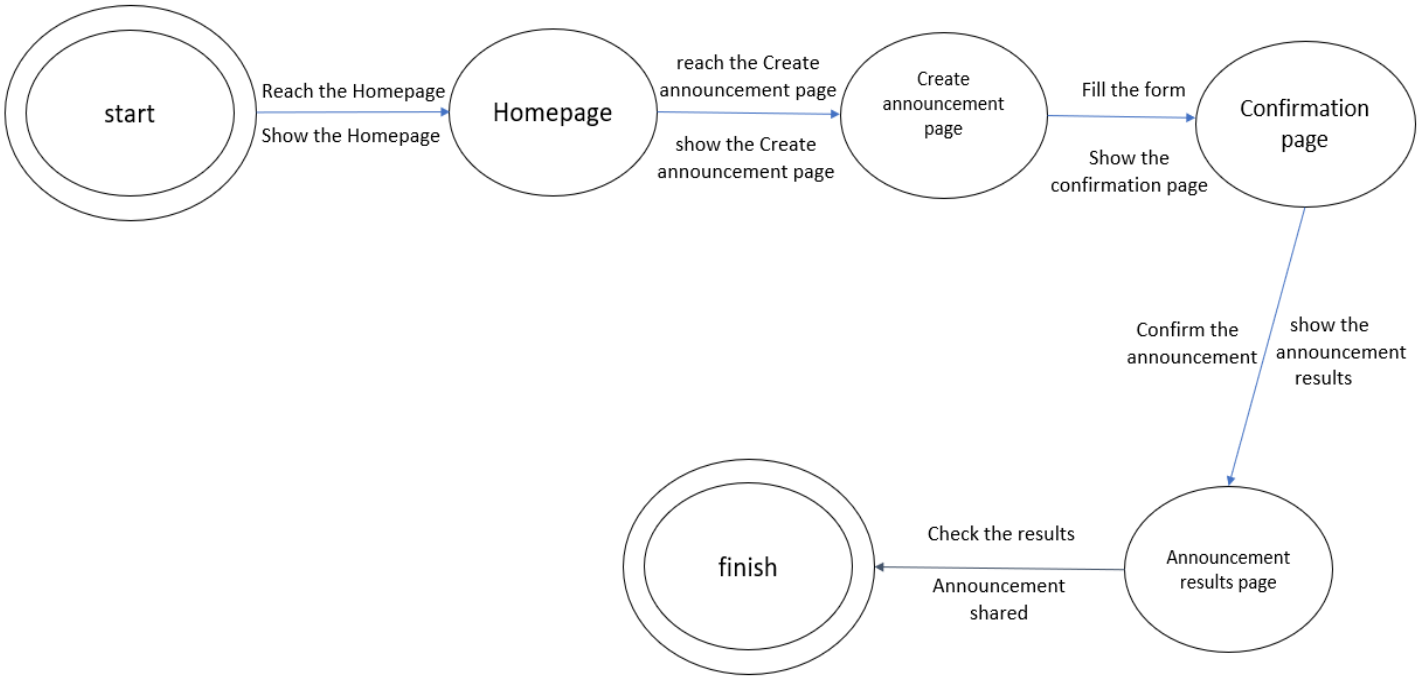
4.2.2 Share notes



4.2.3 Find a study room



4.2.4 Create a new announcement



5. Prototype Zero

Bibliography

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[3] Official website of Google Meet: https://meet.google.com/

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