ÇANKAYA UNIVERSITY
FACULTY OF ENGINEERING
COMPUTER ENGINEERING DEPARTMENT

Project Report

Version 1

CENG 407

Innovative System Design and Development I

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STUDYING STATION APPLICATION

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ABSTRACT

It is a platform where people can see the appropriate environments and collective workplaces they are looking for. Thanks to the comments and points given by the people present or present in these environments, they can actively rate these environments and talk to each other through this platform.

INRODUCTION

This study was carried out within the scope of the graduation project of Cankaya University Computer Engineering Department. The main purpose of the study is to provide benefit to the students by showing our programming skills. We have put forward the idea of this project based on the difficulties we face in our student life. The program will save students time and share information. You now have a common goal with students you do not know. To understand the course and to pass with good grades.

1.LITERATURE REVIEW DOCUMENT

1.1 ABSTRACT

It is a platform where people can see suitable environments and collective working areas that they are looking for in order to study. They can actively evaluate these environments thanks to the comments and scores given by people who have been to these environments or have been there at that moment, and can also talk to each other with this platform.It will be available for only students. They must enter their education information like their university,department,and class.Additionally,students can study together the same courses if they want.Thus,more effective studying environment is can be created.

1.2 INTRODUCTION

To decide this project idea, it must be more efficient and find out sense of work for university students. From the moment students start university, they can meet and socialize with new people and at the same time we aim to find suitable working environment and suitable study places where they can work

This application also provides a chat environment that allows students to communicate with each other interactively. Thanks to this environment, they can talk to each other, determine where they will work together, make comments and ratings about these places and make other users who use the application have an idea. When designing this mobile application, it is aimed that the application will work on all operating systems. So this application will be cross-platform. As a result, the main target is that students do not need to be in the same school or get to know each other when they talk or exchange ideas.

1.3 CROSS PLATFORM AND XAMARIN

Cross-platform development is the ability to build and deliver apps that can run across multiple device platforms, such as iOS, Android, and the Universal Windows Platform. Beyond mobile, it is the process of creating software, applications, or services that can run on more than one platform or operating system.

Cross-platform development is the key to giving users software access across devices and platforms. In the past, it was enough for an app to work on a single platform, but today people expect apps that work across all devices and platforms. To stay relevant, companies will need to be able to provide employees with apps that run on any device—whether desktop, laptop, or mobile—and deliver seamless user experiences anywhere employees choose to work.

There are several different approaches to cross-platform development, including creating different versions of the same application, with each designed to work on different operating systems, such as Apple and Microsoft. Another popular strategy is to make specific parts of an application abstract in order to allow it to work within different software environments. This is often defined as "platform agnostic", meaning the application doesn't support any specific platform.

Cross-platform development enables companies to create low-cost custom apps that are secure, stable, easy to maintain, and easy to iterate—providing a faster development cycle that frees IT departments from the long timelines of traditional app development projects.

1.3.1 Xamarin

Founding Xamarin

On May 16, 2011, Miguel de Icaza announced on his blog that Mono would be developed and supported by **Xamarin**, a newly formed company that planned to release a new suite of mobile products. According to de Icaza, at least part of the original Mono team had moved to the new company.

The name Xamarin comes from the name of the Tamarin monkey, replacing the leading T with an X. This is in line with the naming theme used ever since Ximian was started.

After Xamarin was announced, the future of the project was questioned, since MonoTouch and Mono for Android would now be in direct competition with the existing commercial offerings owned by Attachmate. It was not known at that time how Xamarin would prove they had not illegally used technologies previously developed when they were employed by Novell for the same work.

In July 2011, however, Novell - now a subsidiary of Attachmate - and Xamarin announced that Novell had granted a perpetual license for Mono, MonoTouch and Mono for Android to Xamarin, which formally and legally took official stewardship of the project.

Product development

In December 2012, Xamarin released Xamarin.Mac, a plugin for the existing MonoDevelop Integrated development environment (IDE), which allows developers to build C#-based applications for the Apple's macOS operating system and package them for publishing via the App Store.

In February 2013, Xamarin announced the release of Xamarin 2.0. The release included two main components: **Xamarin Studio**, a re-branding of its open-source IDE Monodevelop; and integration with Visual Studio, Microsoft's IDE for the .NET Framework, allowing Visual Studio to be used for creating applications for Android, iOS and Windows.

The Xamarin company produces an open source software platform by the same name, and Xamarin 2.0 was released in February 2013. Xamarin extends the .NET developer platform with tools and libraries specifically for building apps for Android, iOS, tvOS, watchOS, macOS, and Windows primarily with C# in Visual Studio. Developers can re-use their existing C# code, and share significant code across device platforms. Several well-known companies including 3M, AT&T, and HP have used the platform to create their apps. Xamarin integrates with Visual Studio, Microsoft's IDE for the .NET Framework, and subsequently is available for use by macOS users through Visual Studio for Mac. Xamarin also released a component store to integrate backend systems, 3rd party libraries, cloud services and UI controls directly into mobile apps.

Xamarin.Forms

Introduced in Xamarin 3 on May 28, 2014 and allows one to use portable controls subsets that are mapped to native controls of Android, iOS and Windows Phone.

1.4 TOPIC AREA

Today most people use mobile devices. Many things can be solved without the need for a computer thanks to mobile applications. At the same time, these applications provide ease of access and save time. In this way, people work with less effort. Target group of our mobile application is to students and to influence their school and social life at the same time.

1.5 MAIN FINDINGS

In the applications made before, we can only comment on the places and offer points or chat only. Our application aims to combine these two features and carry these features into the educational life.

1.6 CHALLENGE AREAS

The necessary data are collected and processed. The intended audience is designed to be of sufficient beauty in terms of visuality and ease of use. The locations should be added and presented to the users in an appropriate and trouble-free manner, there should be no interruption in the chat environment and no communication breaks.

Having sufficient knowledge about the programming languages to be used, necessary researches are carried out and it is aimed to avoid problems at the application level.

1.7 CONCLUSION

As a result, we will present an application that will be useful for both social and education.

2. SOFTWARE REQUIREMENTS SPECIFICATION

2.1 INTRODUCTION

2.1.1 Purpose

It is a platform where people can see suitable environments and collective working areas that they are looking for in order to study. They can actively score these environments thanks to the comments and scores given by people who have been to these environments or have been there at that moment, and can also talk to each other with this platform. It will be available for only students. They must enter their education information like their university, department, and class. Additionally, students can study together the same courses if they want. Thus, more effective studying environment is can be created.

2.1.2 Scope of the Project

To decide this project idea, it must be more efficient and find out sense of work for university students. From the moment students start university, they can meet and socialize with new people and at the same time we aim to find suitable working environment and suitable study places where they can work This application also provides a chat environment that allows students to communicate with each other interactively. Thanks to this environment, they can talk to each other, determine where they will work together, make comments and ratings

about these places and make other users who use the application have an idea. When designing this mobile application, it is aimed that the application will work on all operating systems. So this application will be cross-platform. As a result, the main target is that students do not need to be in the same school or get to know each other when they talk or exchange ideas.

Today most people use mobile devices. Many things can be solved without the need for a computer thanks to mobile applications. At the same time, these applications provide ease of access and save time. In this way, people work with less effort. Target group of our mobile application is to students and to influence their school and social life at the same time.

In the applications made before, we can only comment on the places and offer points or chat only. Our application aims to combine these two features and carry these features into the educational life.

As a result, we will present an application that will be useful for both social and education.

2.2 OVERVIEW OF THE DOCUMENT

The second part of the document describes functionalities of the Studying Station Application. This application provides to comment on the places and offer points or chat. Our application aims to combine these two features and carry these features into the educational life.

2.3 OVERALL DESCRIPTION

2.3.1 Product Perspective

The chat section is important for students to communicate easily with each other. Students will strengthen their social aspects while at the same time providing a convenient environment in which to study. And so they make new colleagues. Chat section has three options, continue chat, remove chat and select chat. If the students want to chat, they can enter the “Select Chat’’ and then

decide to chat partner. When the students keep going on a chat they used ‘’Continue Chats” options. If the students don’t want to chat somebody, they can select the ‘’Remove Chat’’.

The location section provides us with effective and brief information about the environments to be studied. In this way, they will know both the noise level and the quality of the service. They will also be able to view the study areas on the map so that students can find them easily. Our support with the map will save them time. It will be an effective application since it makes the study more social and it will make it easier for students to share information. Location section has four options, add location, remove location, change location and score place. If there is an suitable environment, students can add this location. The environment is not suitable like noisy or not appropriate for studying, this place can remove or change. When the students want to see environments’ score and comment, they can see score of place that it scored before by students.

2.3.2 Development Methodology

For developing the project, we have planned to use Scrum which is an agile software development methodology. Scrum is incremental and iterative. In scrum, main work is divided into sprints which should be completed within a certain period of time which could.

Over time, many projects started to fail due to problems such as the projects becoming larger and more complex, but the users could not see the big picture and did not fully meet their requirements, the rapid changes in technology and the rapid change of requirements and the inability to integrate it into our project. Thus, managing the project process became an important issue and the “Agile Software Development Manifesto ‘’ is occurred.

What is this Agile Software Development Manifesto? Rather than process, it is based on individuals being more interactive, responding to the software rather than comprehensive documentation, collaboration with the user rather than

contract bargaining, rather than sticking to a plan. Thus, changing requirements became acceptable even in the final phase of the project, shorter notifications reduced error margin and the running software was presented to the user, the owner and the software developers worked together throughout the process, providing information exchange because it was based on face-to-face communication.

What is Scrum? Scrum; Agile is one of the project management methodologies. Used to manage complex software processes. In doing so, it breaks the whole; it follows a repetitive method. It ensures the achievement of the target through regular feedback and planning. In this sense, it has a need oriented and flexible structure. As it is shaped according to the needs of the user, it provides structuring according to the feedback of the users. Communication and teamwork are very important. Therefore, we aimed to use scrum. Scrum is based on 3 basic principles;

Transparency; The progress of the project, problems, developments should be visible to everyone.

Check; The progress of the project is checked regularly.

Adaptation; The project should be able to adapt to any changes that may be made.

Cross-platform development is the ability to build and deliver apps that can run across multiple device platforms, such as iOS, Android, and the Universal Windows Platform. Beyond mobile, it is the process of creating software, applications, or services that can run on more than one platform or operating system.

Cross-platform development is the key to giving users software access across devices and platforms. In the past, it was enough for an app to work on a single platform, but today people expect apps that work across all devices and platforms. To stay relevant, companies will need to be able to provide employees with apps that run on any device—whether desktop, laptop, or mobile—and

deliver seamless user experiences anywhere employees choose to work. There are several different approaches to cross-platform development, including creating different versions of the same application, with each designed to work on different operating systems, such as Apple and Microsoft. Another popular strategy is to make specific parts of an application abstract in order to allow it to work within different software environments. This is often defined as "platform agnostic", meaning the application doesn't support any specific platform. Cross-platform development enables companies to create low-cost custom apps that are secure, stable, easy to maintain, and easy to iterate—providing a faster development cycle that frees IT departments from the long timelines of traditional app development projects.

2.4 USER CHARACTERISTIC

2.4.1 Participants

2.4.1.1 Participant must be students that they can registered on the application.

2.4.1.2 Participant must enter course, university, class and department information.

2.4.1.3 Participant must score the place.

2.4.2 Functional Requirements

2.4.2.1 Profile Management Use Case

Use Case:

- Sign In
- Sign Up
- Exit

Diagram:

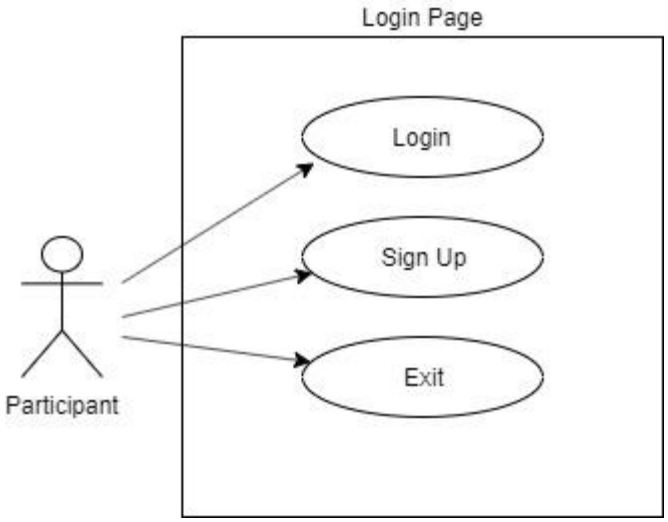


Figure 1 Profile Management Use Case

Brief Description:

In Profile Management diagram (Figure 1) explains the basic operations which is related to entering system of participant. Participants are able to use the following function: Exit. Participants can also use the Login function and Sign Up functions.

Initial Step by Step Description:

1. Participant shall login to the system using e-mail address and password.
   1.2. If the password is invalid for the participant e-mai address, participant should re-login.
2. Participants can open the app and create a new record
   2.1. Fill in registration information
      2.1.1. If records are already exist change information and should re-sign up.
3. Participants can exit from the system.

2.4.2.2 Options Menu Use Case

Use Case:

- Settings
- Add Media
- Edit Information
- Exit

Diagram:

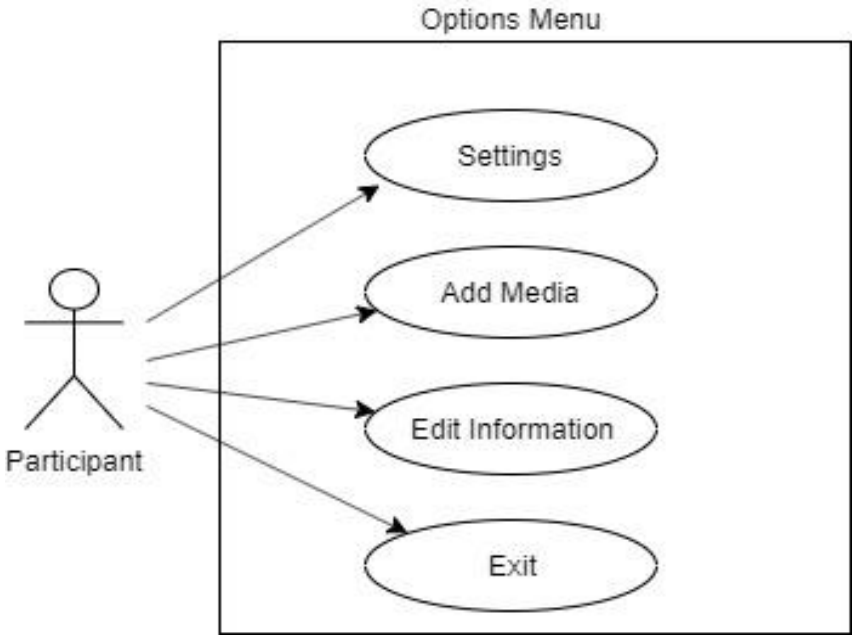


Figure 2 Options Menu Use Case

Brief Description:

In Options Menu diagram (Figure 2) explains the basic operations which is related to Options Menu. Participants are able to use the following function: Exit.

Participants can also use the Settings function, Add Media function and Edit information.

Initial Step by Step Description:

1. Participant can use and select settings and then change application settings.
2. Participants can open Add Media function.

   2.1. Add new media

   2.2. Remove exist media

   2.3. Change Profile Picture
3. Participant use Edit information function and change information, editing.
4. Participants can exit from the options menu.

2.4.2.3 Main Page Use Case

Use Case:

- Options
- Chats Page
- Location Page
- Start Chat
- Course and Department Page
- Show Profile

Diagram:

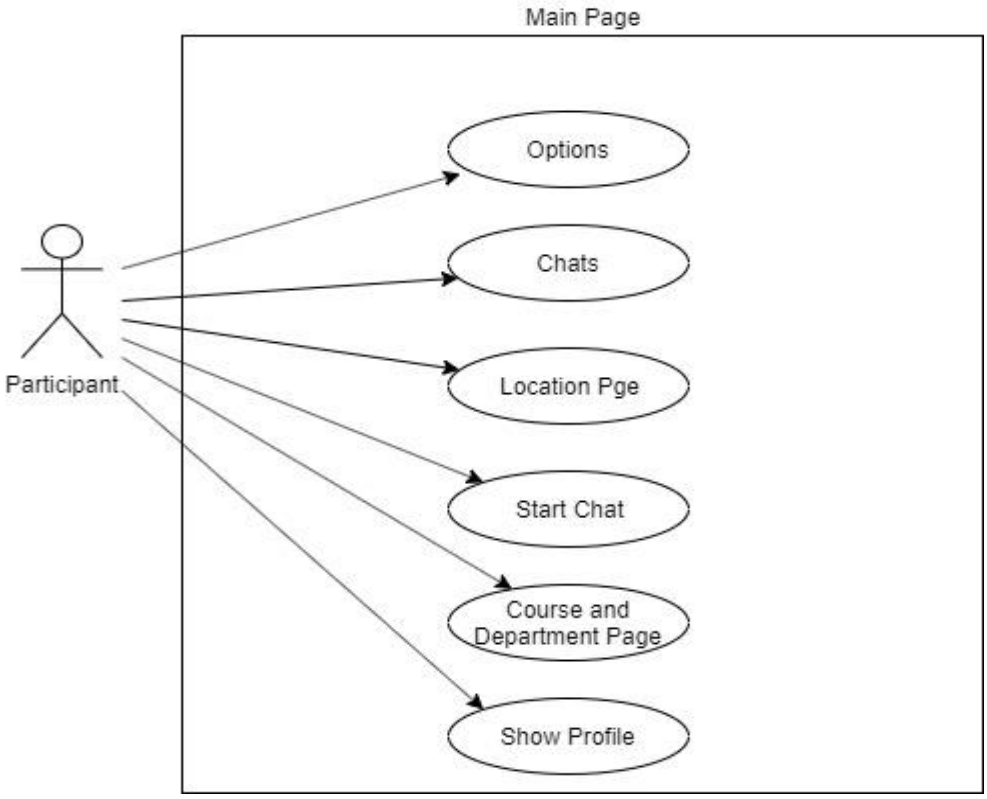


Figure 3 Main Page Use Case

Brief Description:

In Main Page diagram (Figure 3) explains the basic operations which is related to Main Menu. Participants are able to use the following function: Options, Chats Page, Location Page, Start Chat, Course and Department Page and Show profile functions.

Initial Step by Step Description:

1. Participant can use and select options and go to the options page.
2. Participants can select Chats function and go to the Chats Page.
3. Participant use Location function and go to the Location Page.
4. Participants can start chat function.

   4.1. Starting new chat immediately with select other user.

5. Course and Department Page function leads to this page.
6. Participant can select show profile function and go to the selected other user profile page.

2.4.2.4 Location Page Use Case

Use Case:

- Add Location
- Remove Location
- Change Location
- Score Place

Diagram:

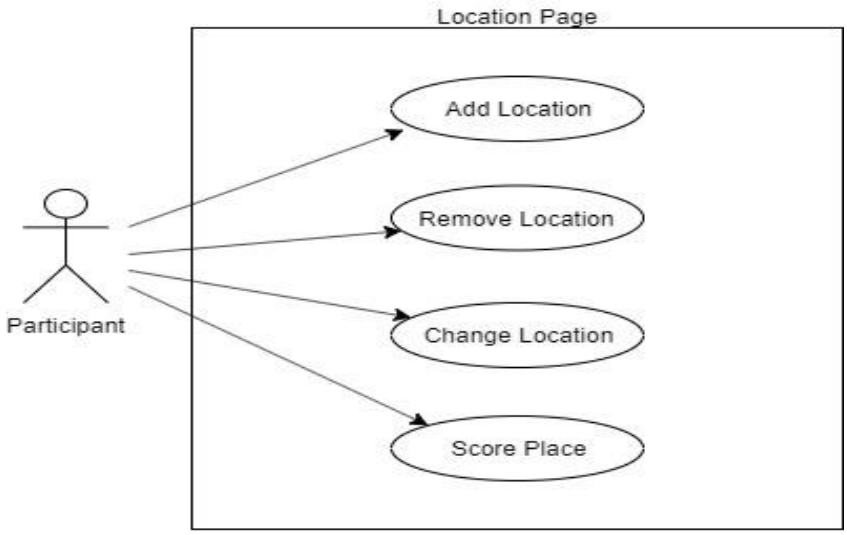


Figure 4 Location Page Use Case

Brief Description:

In Location Page diagram (Figure 4) explains the basic operations which is related to Location menu . Participants are able to use the following function: Add location can also use the remove location function, Change location function and give score with score place function.

Initial Step by Step Description:

1. Participant can use Add location and with this function immediately adding current location.
2. Participants can remove currently location with Remove Location function.
3. Participant use change location function and change currently location.
4. Participants can giving scores for place with score place function.

2.4.2.5 Chat Page Use Case

Use Case:

- Continue Chat
- Remove Chat

Diagram:

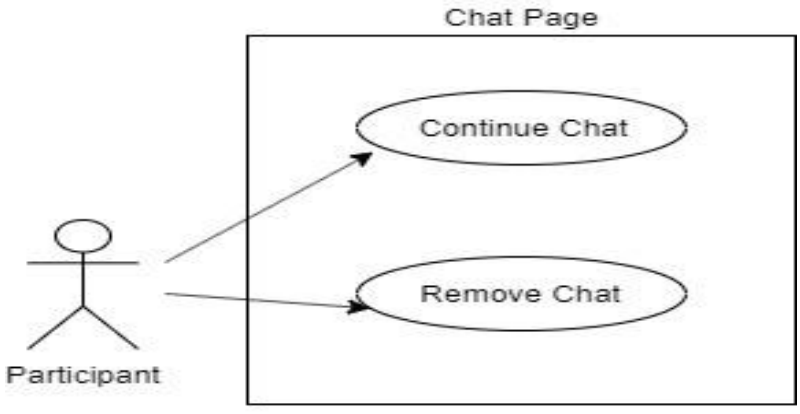


Figure 5 Chat Page Use Case

Brief Description:

In Chat Page diagram (Figure 5) explains the basic operations which is related to Chat page. Participants are able to use the following function: Continue Chat function and Remove Chat functions.

Initial Step by Step Description:

1. Participant can use Continue chat and with this function continue chatting with a previously chat user.
2. Participants can remove previously chat window with Remove chat function.

2.4.2.6 Course and Department Page Use Case

Use Case:

- Add Department
- Add Course
- Change
- Delete

Diagram:

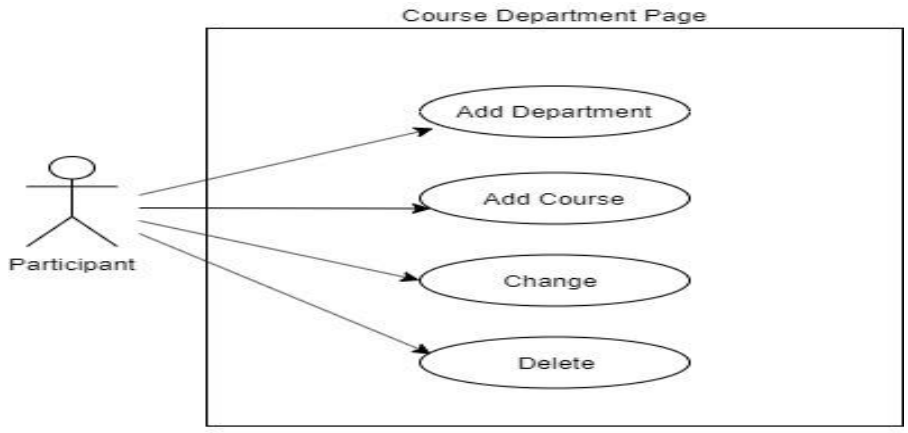


Figure 6 Course and Department Page Use Case

Brief Description:

In Course and Department Page diagram (Figure 6) explains the basic operations which is related to Course and Department Page. Participants are able to use the following function: Add department, Add Course, Change and Delete functions.

Initial Step by Step Description:

1. The participant can use the add department function and add which department he / she is currently studying in his / her school.
2. Participants can remove previously searched course with delete function.
3. Participants can change previously searched course with change function.
4. Participants can instantly add the course they want to search with the add function.

3.SOFTWARE DESIGN DOCUMENT

3.1 INTRODUCTION

3.1.1 Purpose

It is a platform where people can see suitable environments and collective working areas that they are looking for in order to study. They can actively score these environments thanks to the comments and scores given by people who have been to these environments or have been there at that moment, and can also talk to each other with this platform. It will be available for only students. They must enter their education information like their university, department, and class. Additionally, students can study together the same courses if they want. Thus, more effective studying environment is can be created.

3.1.2 Scope of the Project

To decide this project idea, it must be more efficient and find out sense of work for university students. From the moment students start university, they can meet and socialize with new people and at the same time we aim to find suitable working environment and suitable study places where they can work this application also provides a chat environment that allows students to communicate with each other interactively. Thanks to this environment, they can talk to each other, determine where they will work together, make comments and ratings about these places and make other users who use the application have an idea. When designing this mobile application, it is aimed that the application will work on all operating systems. So this application will be cross-platform. As a result, the main target is that students do not need to be in the same school or get to know each other when they talk or exchange ideas.

Today most people use mobile devices. Many things can be solved without the need for a computer thanks to mobile applications. At the same time, these applications provide ease of access and save time. In this way, people work with less effort. Target group of our mobile application is to students and to influence their school and social life at the same time.

In the applications made before, we can only comment on the places and offer points or chat only. Our application aims to combine these two features and carry these features into the educational life.

As a result, we will present an application that will be useful for both social and education.

Motivation

We are a group of senior students in computer engineering department who are interested in cross platform mobile application. The aim of our cross-platform is to save time and labor. At the same time, today's technology is advancing in this direction, and we, as computer engineers, have to keep up with this technology. When writing this application we chose Xamarin cross platform programming language. And we did the necessary C # research. We chose Xamarin because they are constantly innovating in this field and they have enough technology in terms of the opportunities they provide us.

Architecture Design

We planned to use Scrum, an agile software development methodology, to manage the project. For each iteration, the fast run time must be equal because scrum is an agile development method. Our project team should have a daily meeting every morning which should be maximum 15 minute. Scrum has three main roles which are product owner, scrum master and development team. Product owner is the person who delivers the requirements, scrum master is the person who manages the development team again for this project are the students in our project. The development team is the group of developers working on the project according to the program, that is, the students in our graduation project. The scrum method for this project has several advantages and disadvantages for us, but the advantages are greater for our limited time in this project, so it is more useful.

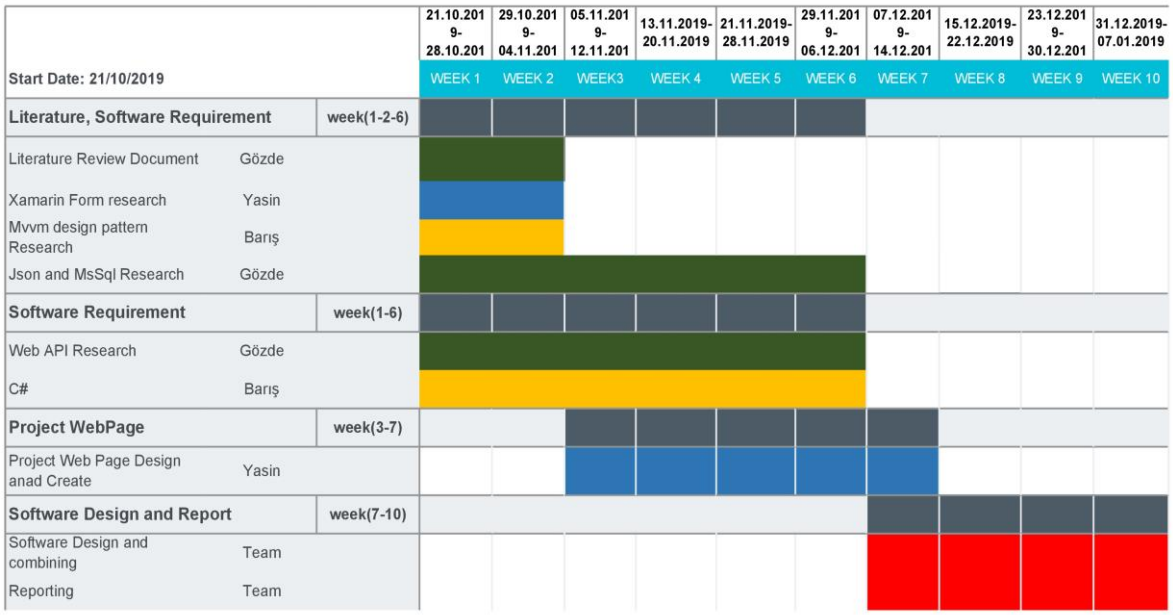


Figure-1 Work Plan

Our weekly work program is divided into research and documentation parts. This work plan shows the work intervals and what subjects each person in the team will do research on. At the same time, the time intervals are in weeks, and these week intervals are scheduled according to the required documentation. Each sprint should be completed within the specified time intervals in work plan and has unique tasks.

After completing researching and release at the end of each sprint, if there are any tasks which are not completed, we used the period from the next week until this sprint was over.

3.2.1 Class Diagram

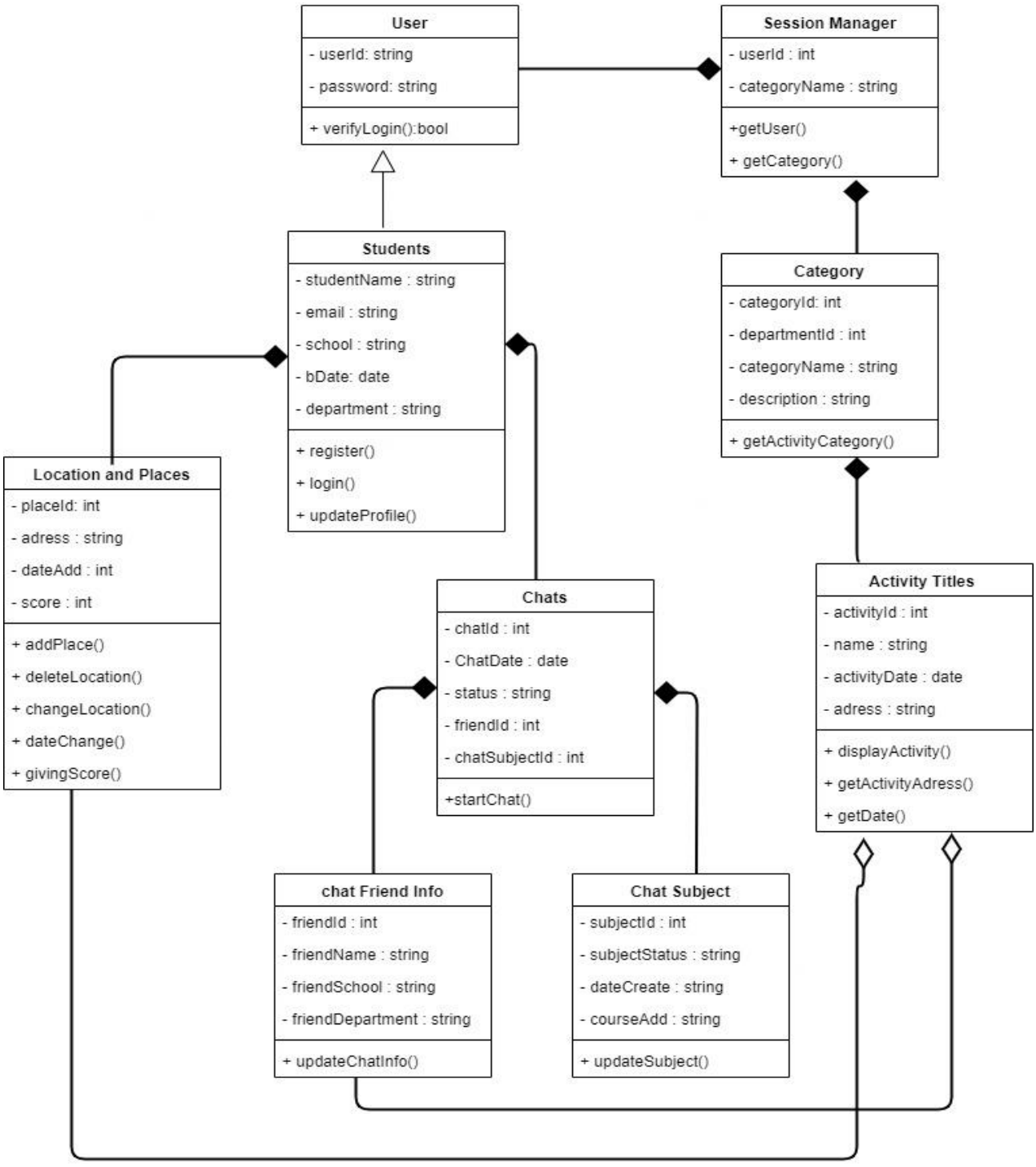


Figure-2 Class Diagram

Figure 2 shows information about connections between the systems within the mobile application. Students Class is the main system, which contains other systems.

It is responsible for connections between other systems such as Location and Places and Chats. User class represents all the users who use the application. Chat Class provides to connection between the users and also chat each other. Location and Places Class represent that allows users to instantly share locations and rate and comment on added locations. Session Manager Class represents in which users and user information is temporarily held and saved, as well as category numbers of activity titles. Activity Title Class of activity headers that users create as a result of the connection between users.

3.2.2 Architecture Design

3.2.2.1 Profile Management Summary:

This system is used by users. Users can login, register, and update personal information and exit from the system. In addition to this, each users can delete their own account.

Actor: Users

Precondition: Users must run the program.

Basic Sequence:

1. User must register if s/he doesn't have an account.

2. Each e-mail address must be unique.

3. Users shall login to the system by entering his/her e-mail and password.

4. Students can update his/her personal information by selecting Update Profile button from Options menu.

5. User can exit from the system by selecting exit button.

Exception: Database connection can be failed.

Post Conditions: None

Priority: Medium

3.2.2.2 Options Menu

Summary: Users can add media, update information (editing) and open settings.

Actor: Students (Users)

Precondition: Users must be logged in and selected options button.

Basic Sequence:

1. Users selects options button.

2. Users can continue application button from Exit options menu.

3. Users can change and add their own media by selecting Add Media from options menu.

4. Users can display and change information by selecting Edit Information button from option menu.

5. Users can view and change the settings of the application by pressing the setting button.

6. Users can exit from the system by selection exit button.

Exception: None

Post Conditions: None

Priority: Medium

3.2.2.3 Location and Places Menu

Summary: Users can add current location and give score any location in this option.

Actor: Students (Users)

Precondition: Users must be logged in and select location menu.

Basic Sequence:

1. Users selects Location and Places button.

2. Users can add location from Add Location button.

3. Users can delete their location from Delete Location button.

4. Users can change location information by selecting Change Location button.

5. Users can score the places by selecting Giving Score button.

6. Users can back to the main menu by selection exit button.

Exception: Maps Connection

Post Conditions: None

Priority: High

3.2.2.4 Chats Menu

Summary: Users can access previous conversations and start new conversations with other users.

Actor: Students (Users)

Precondition: Users must be logged in and select Chats Options.

Basic Sequence:

1. Users selects Chats button.

2. Users can start to chat other users from Start Chats button.

3. Users identify chat topic then start chat with this subject.

4. Users can see date of conversation from Chat Date.

5. Users can see status of conversation.

6. Users can back to the main menu by selection exit button.

Exception: FireBase Setup and Connection

Post Conditions: None

Priority: High

3.2.2.5 Activity Titles Menu

Summary: Users can specify the event topic and view the event time and address.

Actor: Students (Users)

Precondition: Users must be logged in and select Activities Options.

Basic Sequence:

1. Users selects Activities button.

2. Users can specify the title of activity.

3. Users can identify the date of activity.

4. Users can see and provide activity location.

5. Users can back to the main menu by selection exit button.

Exception: Database Connection

Post Conditions: None

Priority: High

3.2.3 Activity Diagram

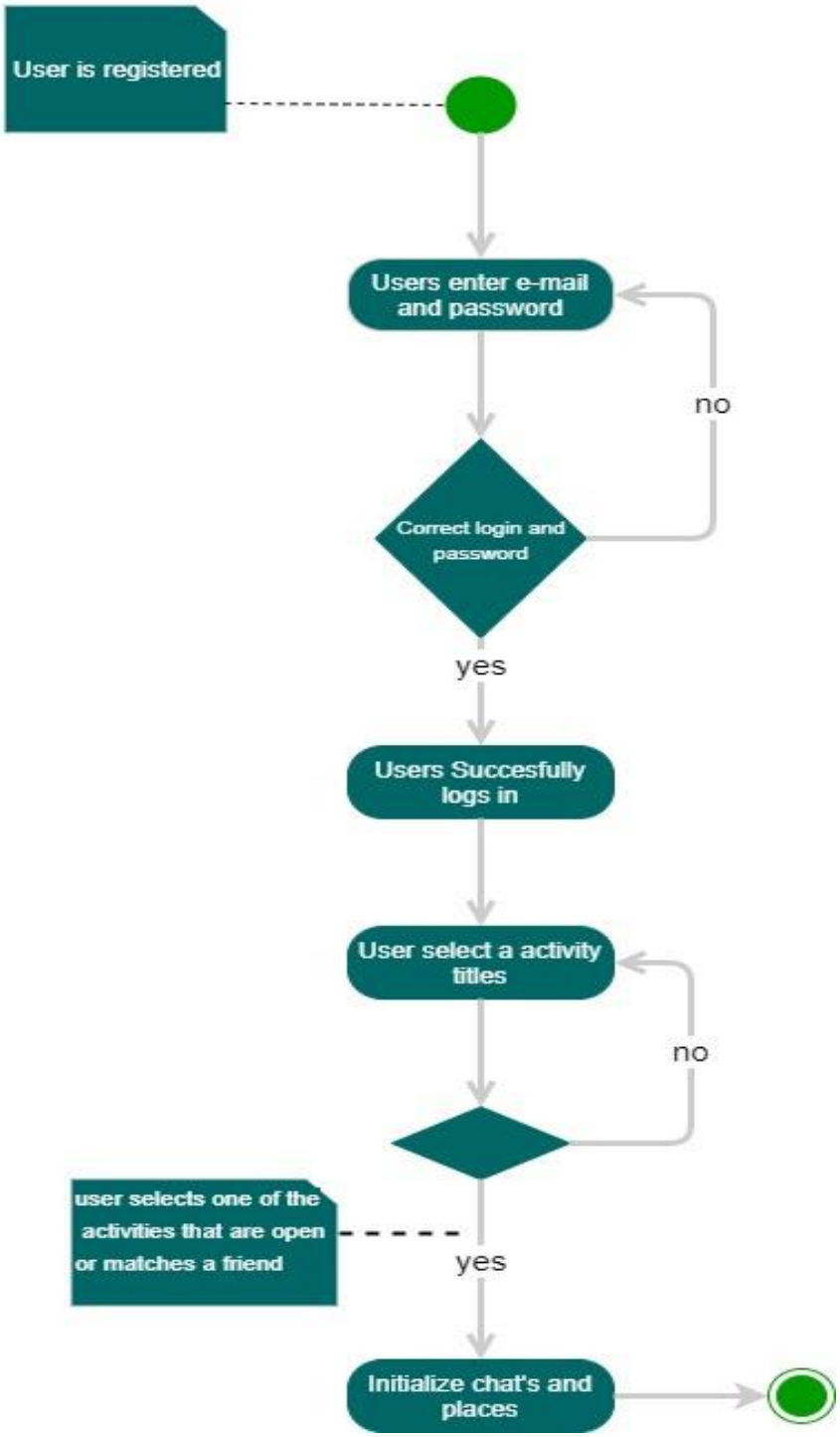


Figure-3 Activity Diagram

Figure 3 shows how to start application processes in our activity diagram. Users must be registered to use the application. The user must register to start using the application. Those who are registered should log into the application. Mail address and password must be entered correctly. Place and chat interface is initialized on the topics chosen by the user.

3.2.4 Design

In this application, there are two main components of the system which have their own sub-systems. Firstly and most important is graphical user interface design. This design has many sub systems. Secondly environment design. This environment design part about maps for location and places in our application.

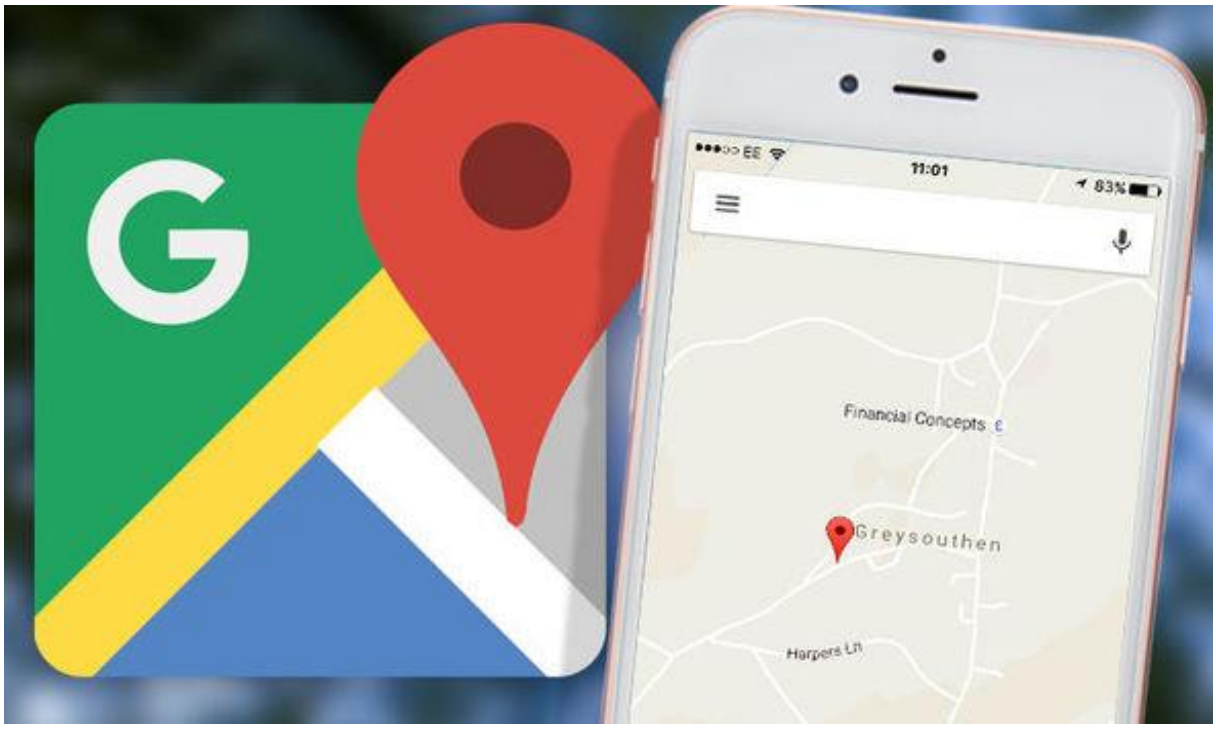
3.2.4.1 Graphical User Interface (GUI) Design

GUI design is responsible for interaction between the users and the system. There are six sub-systems in this design which are Login Page, Main Page, Location Page, Course-Department(Activity Page), Chat Page and Options Page. Login Page is a start page, user can register, login and exit from the system. Secondly, the user login is redirected to the main page after successful. With the main page loading, the user can switch from this page to the options page, chat page, location and places page and finally to the activity page. If the user select Options page then change and add media, editing information finally change settings, update profile. User select Location and places page then user can add current location, remove and change location, finally giving score of these places. User select chat page then user start chat other users and provide previous conversation. Finally course and activity page users add activity titles then add date and location for this title in this page.

3.2.4.2 Environment Design

Environment Design is responsible for managing environment which the user interacts with. This environment design includes maps and the user can make instant location sharing with these maps. In addition, these maps can make

comments about the places registered with the environmental design and can rate these places. The maps in this environmental design generally focus on places for education and study purposes. The reason is for the purpose of the application.



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