Classroom Problem & Solution

Submitted By:
Md.Mizanur Rahman
Id: 161 – 35 – 1494

This **Project** report has been submitted in fulfillment of the requirements for the Degree of Bachelor of Science in Software Engineering.

Department of Software Engineering
Daffodil International University
Fall – 2019

APPROVAL

This **Project** Report submitted by **Md. Mizanur Rahman, ID: 161 – 35 – 1494** to the Department of Software Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of Bachelor of Science in Software Engineering and approval as to its style and contents.

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DECLARATION

I here by declare that, this **Project** Report has been done by me under the supervision of **Asif Khan Shakir**, lecturer, Department of Software Engineering, Faculty of Science and Information Technology, Daffodil International University. I also declare that neither this report nor any part of this report has been submitted else where for award of any degree.

Submitted By:

.....

Md. Mizanur Rahman
ID: 161 – 35 – 1494
Department of Software Engineering
Faculty of Science and Information Technology
Daffodil International University

Certified By:

.....

Asif Khan Shakir
Lecturer
Department of Software Engineering
Faculty of Science and Information Technology
Daffodil International University

Acknowledgement

First of all, I am grateful to the Almighty Allah for making me eligible to complete this project. Then I would like to thank my supervisor **Asif khan Shakir, Lecturer**, Department of Software Engineering. I am extremely grateful and indebted to him for his expert, sincere and valuable guidance and encouragement extended to me.
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I would like to thank them who were helped in my project by their very important suggestions without their passionate participation and input; the project could not be successfully conducted.
I take this opportunity to record my sincere thanks to all the faculty members of the Department of Software Engineering for their help and encouragement.
Last but not least, I would like to thank my parents, for their unconditional support, love and without this we would not have come this far.

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Chapter I

Introduction

1.1. Project Overview

Classroom Problem & Solution is an android base application. Classroom Problem & Solution involves managing classroom related problem and solution more efficiently. It helps student to submit their classroom problem easily. It also helps the department co-ordinator to solve classroom related problem.

1.2. Project Purpose

1.2.1. Background

To manage classroom related problem in our department is very lengthy process because when any problem find in our classroom then the teacher manually write down the problem then the co-ordinator collect the problem and solve step by step. That's why it takes long time to solve any problem. But now it will connect the student teacher and co-ordinator by using this application. When a user submit any problem the co-ordinator get this problem with a few moments by using a smart phone.

1.2.2. Benefits & Beneficiaries

Benefits:

• handle classroom related problem more efficiently
• Helps the student to submit classroom related problem within a moments.
• Co-ordinator able to know about any problem in any classroom.

Beneficiaries:

• Students of software engineering department
• Teachers of software engineering department

1.2.3. Goals

Every project has some goals. Classroom Problem & Solution application has goals too. The goals of Classroom Problem & Solution are:

• To meet a solution to manage the classroom related problem and solution.
• To help the students submit any problem in their class.
• To help the co-ordinator able to know the classroom problem

1.3. Stakeholders

Stakeholder are usually who are the interest for any system and who will be use the system . The primary stakeholders of Classroom Problem & Solution are:

- **Students of the software engineering department of DIU**
- **Teachers of the software engineering department of DIU**
- **Software engineering department of DIU**

1.4. Proposed System Model

Proposed system model is a simplified representation of a software process. Each model represents a process of a project from specific perspectives. Classroom Problem & Solution has also a system model.

1.4.1. Agile-Model

The proposed system model of Classroom Problem & Solution is agile model which is an incremental process of software development. Each iteration lasts one to three weeks on average. Engineering actions are carried out by cross functional teams. In software development the term "agile" means the ability to respond to changes-changes from requirements, technology and people.

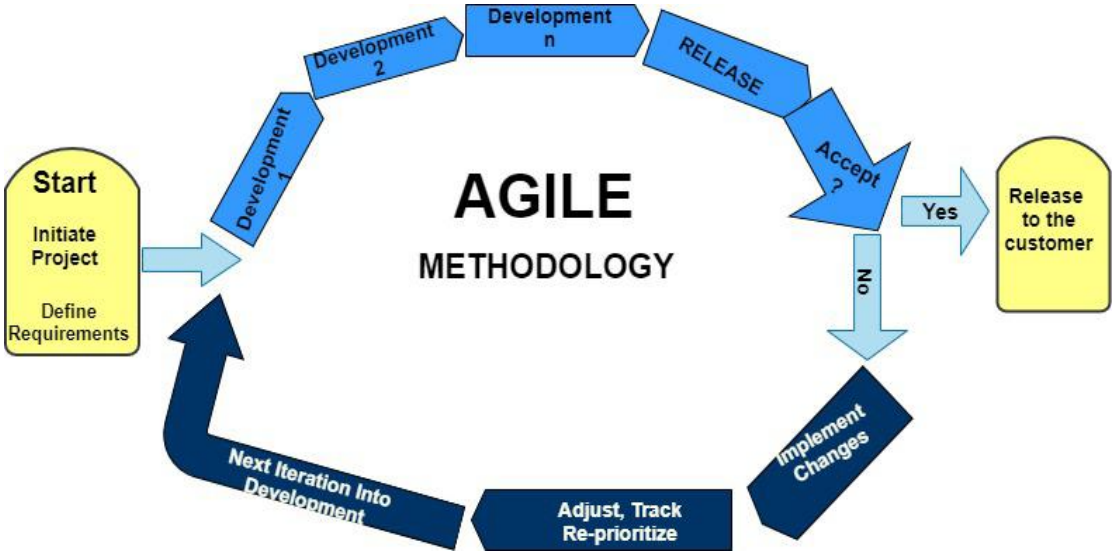

Figure 1: Agile-Model

1.5. Project Schedule

Project scheduling is a very important term for developing any project because it defines how many time takes for each step of development. Project managers tend to define various task and project milestones and then arrange them keeping various factors in mind.

1.5.1. Gantt Chart

Weeks **Works**	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Feasibility Study														
Analysis Phase														
Project Proposal														
Project UI														
Mid-term defence														
Implementation of the project														
Testing														
Document of the project														
Final defence														

Figure 2: Gantt chart

1.5.2. Planning for Development Phase

1. Planning for project
2. Project analysis
3. Requirement gathering

- Brainstorming
- Interview
- Observation
- Analysis

4. Design

- System design
- Database design
- User interface design

5. Development

- Student Module
- Teacher Module
- Others

6. Testing

- Test plan
- Test Case
- Test Execution

1.5.3. Release Plan

Release 1: Version 1.0.0 on 15/11/2019
Release 2: Version 2.0.0 on 30 /11/2019

Chapter II

Software Requirement Specification

2.1. Functional Requirements

Table 1: Functional Requirements

SRS NO	Requirement name	Priority
FR001	Sign up	High
FR002	Log in	High
FR003	Add Room	High
FR004	Add problem	High
FR005	View problem list	High
FR006	Delete problem	High
FR007	Submit problem	High

2.2 Data Requirements

Table 2: Data Requirements

No.	Description	Priority
01	Students and teachers have to verified the sending email.	High
02	Students have to provide the login credentials accurately.	High
03	Teachers have to provide accurate login credential to login to the application.	High
04	Students have to select all the field accurately when submit any problem.	High
05	Teachers have to select all the field accurately when submit any problem.	High

2.3. Performance Requirements

2.3.1. Speed and Latency Requirements

Table 3: Speed and Latency Requirements

No.	Description	Priority
01	The verification email should reach as quickly as possible.	Medium
02	The Application must have a high speed of manipulation data and reply to the user request.	Medium

2.3.2. Precision or Accuracy Requirements

Table 4: Precision or Accuracy Requirements

No.	Description	Priority
01	The input data should be validate when Student, teachers or admin provide data to the system.	Medium
02	All data should be placed accurately where the data is associated.	Medium

2.3.3. Capacity Requirements

Table 5: Capacity Requirements

No.	Description	Priority
01	The application must able to load all data from server.	Medium
02	System should support 1k user at the beginning version.	Low
03	System should support 1000 request per second.	Low

2.4. Dependability Requirements

2.4.1. Reliability Requirements

Table 6: Reliability Requirements

No.	Description	Priority
01	Confidential data must have to be encrypted.	Medium
02	The data should be collected from users by permission and by accepting privacy policy.	Low
03	Users data cannot be used by anyone for any other purpose except system needs.	Low

2.4.2. Availability Requirements

Table 7: Availability Requirements

No.	Description	Priority
01	Application should work 24 hours a day.	Medium
02	Application should provide the desired data to the user in time.	Low

2.4.3. Robustness or Fault-Tolerance Requirements

Table 8: Robustness or Fault-Tolerance Requirements

No	Description	Priority
01	Application should not be crashed more than one time in a day.	Low
02	Application must be responsive to all kind of smart phone screen size.	Low

2.5. Maintainability and Supportability Requirements

2.5.1. Maintenance Requirements

Table 9: Maintenance Requirements

No.	Description	Priority
01	The Application maintenance should be as quick as possible.	Low

2.5.2. Supportability Requirements

Table 10: Supportability Requirements

No.	Description	Priority
01	The Application must support latest android studio version.	Medium
02	Should support all the screen size.	Low

2.5.3. Adaptability Requirements

Table 11: Adaptability Requirements

No.	Description	Priority
01	The Application must adapt all upgraded version and time.	Low
02	New version of Application should support latest gradles.	Low

2.6. Security Requirements

2.6.1. Access Requirements

Table 12: Access Requirements

No.	Description	Priority
01	The access of all users have to be limited with their use case boundaries.	Low
02	Users like students, teachers need to be authorized first to access data.	Medium
03	User's boundaries should be within the application.	Low

2.6.2. Integrity Requirements

Table 13: Integrity Requirements

No.	Description	Priority
01	Authorized users can add or delete data only with their respective accessibility.	Low

2.6.3. Privacy Requirements

Table 14: Privacy Requirements

No.	Description	Priority
01	Users data must not be visible publicly.	High
02	User data should not contain any private issues	Medium
03	All of the confidential data should be encrypted.	Medium

2.7. Usability and Human-Interaction Requirements

No visible usability and Human-Interaction requirements.

2.8. Look and Feel Requirements

2.8.1. Appearance Requirements

Table 15: Appearance Requirements

No.	Description	Priority
01	The user interface must be as attractive as possible.	High
02	The user interface must be user friendly.	Medium
03	The user interface must be as user interactive as possible.	Medium

2.8.1. Style Requirements

Table 16: Style Requirements

No.	Description	Priority
01	The user interface color should be flat or material.	Medium

Chapter III

System Analysis

3.1. Use Case Diagram

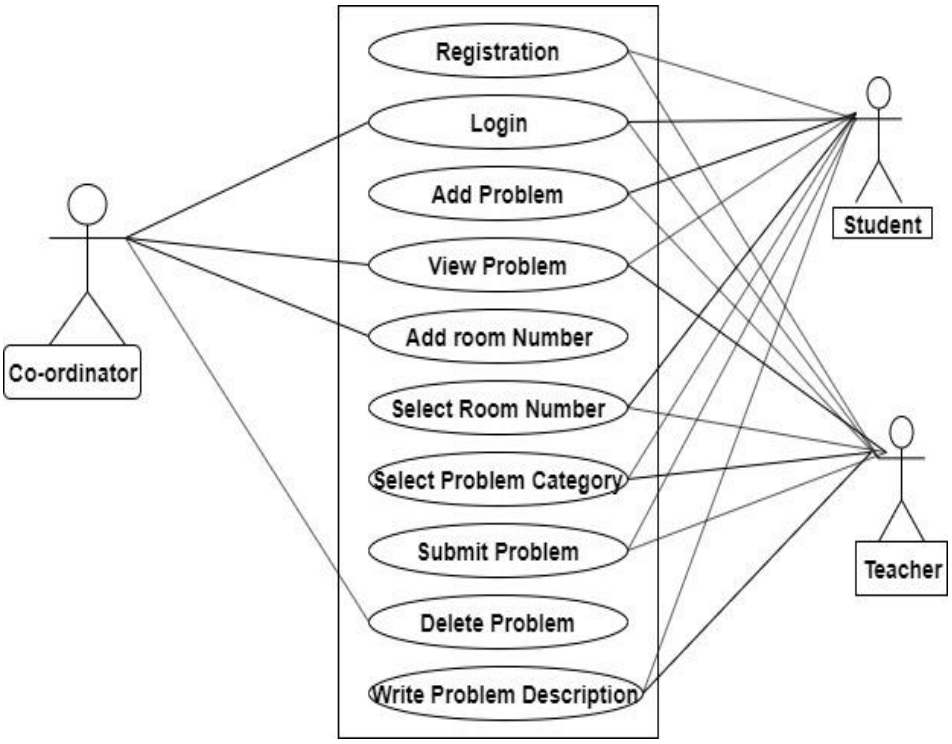

Figure 3: Use Case Diagram

3.2. Use Case Description

3.2.1. Registration

Students or teachers have to register to use the application. After registration a verification link will be sent to email of the students or teachers.

Table 17: Registration

Use case id:	UC-001
Use Case Name:	Registration
Scenario :	To use the application the user must register first.
Brief Description:	Students or teacher have to register first. Then they will be able to use the application after logging in to the system.
Actor:	Student, Teacher
Precondition:	User have to have the application installed in his/her device.
Post condition:	Users must use the verification link to login that was sent through Email.

3.2.2. Login

Students have to login to the application by providing email and password.

Table 18: Login

Use case id:	UC-002
Use Case Name:	Login
Scenario :	Students or teachers have to login to enter into the application.
Brief Description:	After signing up and verify through verification email users need to login to enter into the application.
Actor:	Student, Teacher, Co-ordinator
Precondition:	Users have to sign up and verify his or her account.
Post condition:	Users have to keep the login credentials secret.

3.2.3. Add Problem

Student or Teacher click to the add problem button and filling up the required option to added any problem.

Table 19: Add Problem

Use case id:	UC-003
Use Case Name:	Add Problem
Scenario :	Students or teachers notice any problem their classroom they add this problem.
Brief Description:	If user want to add any problem then they login into the application and click the add problem button to add the problem.
Actor:	Student, Teacher
Precondition:	User must login to the application.
Post condition:	User can fulfil the all require field.

3.2.4. View Problem

User can view only their own problem that they submit by clicking view problem.

Table 20: View Problem List

Use case id:	UC-004
Use Case Name:	View Problem List
Scenario :	Student,Teacher and Co-ordinator can see the problem list by clicking view problem.
Brief Description:	User can see their own problem list that they submit already but admin can all the list that all user submit.
Actor:	Student,Teacher and Co-ordinator
Precondition:	User already add a problem.
Post condition:	User can view their own list and co-ordinator can view all list.

3.2.5. Add Room Number

Co-ordinator add all the room number that already exists the software engineering department.

Table 21: Add Room Number

Use case id:	UC-005
Use Case Name:	Add Room Number
Scenario :	Co-ordinator add all the room number in software engineering department.
Brief Description:	Co-ordinator add room number by clicking add room button. Then he/she enter the room number and click add room button. If new room available then also those room by follow previous process.
Actor:	Co-ordinator
Precondition:	New room must be available in software engineering department.
Post condition:	After add room co-ordinator can see 'Room Added" Message.

3.2.6. Submit Problem

User add the problem after that they submit the problem.

Table 22: Submit Problem

Use case id:	UC-006
Use Case Name:	Submit Problem
Scenario :	Student and Teacher submit the problem that they add in add problem interface.
Brief Description:	Student and Teacher notice any problem then they add this problem details that they notice. After fulfil the problem details they click submit button to submit that problem.
Actor:	Student, Teacher
Precondition:	Fulfil the required field the problem details.
Post condition:	User can see a 'Submit Successfully' message.

3.2.7. Delete Problem

Co-ordinator delete problem from the list after solve the problem.

Table 23: Delete problem

Use case id:	UC-007
Use Case Name:	Delete problem
Scenario :	When any problem solve in classroom then the co-ordinator delete the problem from list.
Brief Description:	Co-ordinator view the problem list then he/she identify the problem after that he/she takes necessary step to solve this problem. When the problem is solved then she/he delete this specific problem from the problem list.
Actor:	Co-ordinator
Precondition:	View the problem list and solve the problem.
Post condition:	The specific problem remove from the problem list.

3.2.8. Select Room Number

User select the room number from the drop down menu.

Table 24: Select Room Number

Use case id:	UC-008
Use Case Name:	Select Room Number
Scenario :	User select the specific room number in which room they notice problem
Brief Description:	At time of submit any problem user must select the room number where they find problem. They select the specific room from the drop down menu.
Actor:	Student, Teacher
Precondition:	User must have to add a problem.
Post condition:	User can show the room number as a message.

3.2.9. Select Problem Category

User select the room number from the radio button.

Table 25: Select Problem Category

Use case id:	UC-009
Use Case Name:	Select Problem Category
Scenario :	User select the specific problem category in what type of problem they notice.
Brief Description:	At time of submit any problem user must select the problem category which kind of problem they have faced. They select the problem type from the radio button.
Actor:	Student, Teacher
Precondition:	User must have to add a problem.
Post condition:	User can show the category type as a message.

3.2.10. Write problem Description

User write a short description about the problem.

Table 26: Write problem description

Use case id:	UC-010
Use Case Name:	Write problem description
Scenario :	User write a short description about which kinds of problem he select
Brief Description:	At time of submit any problem user go to the write description option and he write a short description about the problem that he wanted to submit.
Actor:	Student, Teacher
Precondition:	User must have to add a problem.
Post condition:	N/A

3.3. Activity Diagram

3.3.1. Activity Diagram for Student

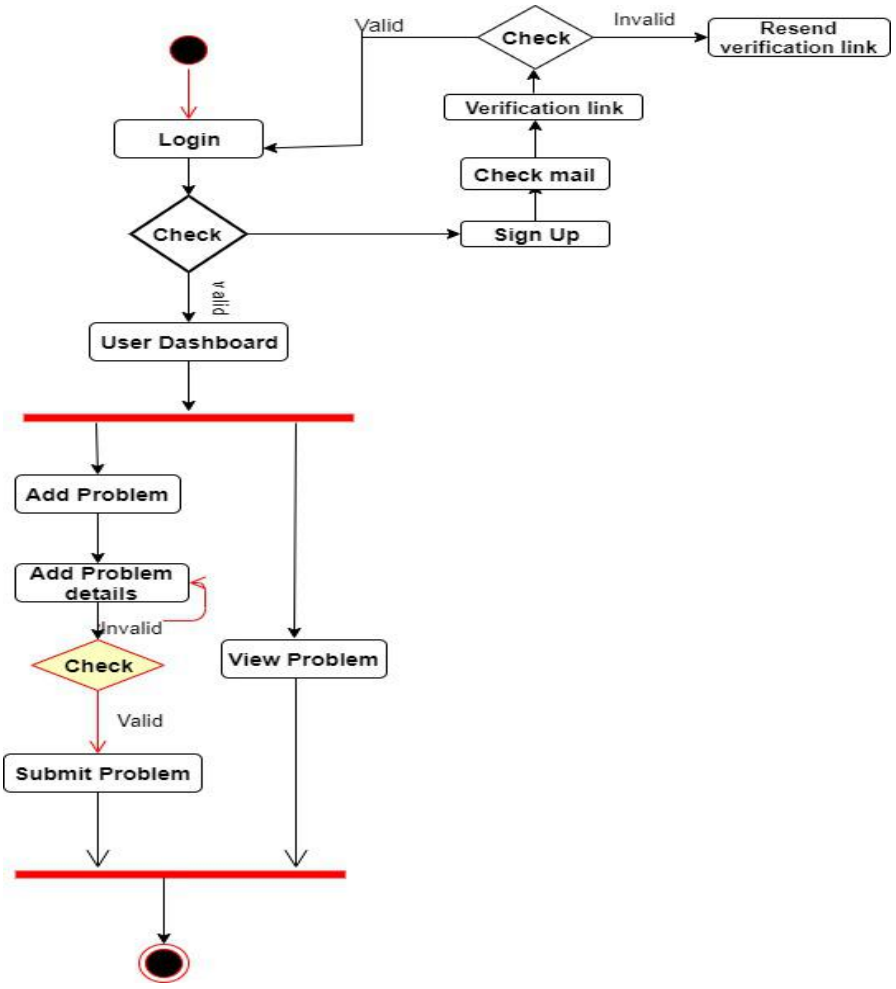

Figure 4: Activity for students

3.3.2. Activity for Co-ordinator

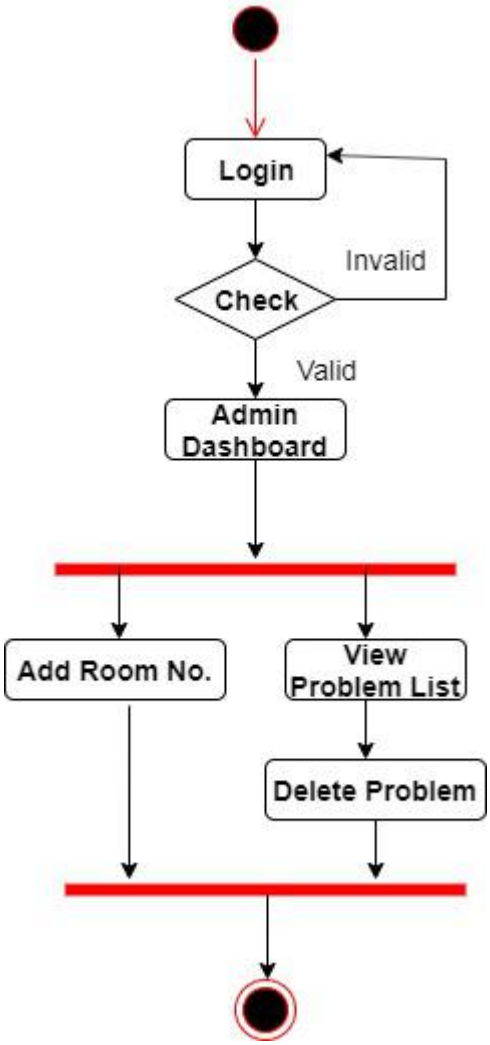

Figure 5: Activity for Co-ordinator

3.3.3. Activity for Teacher

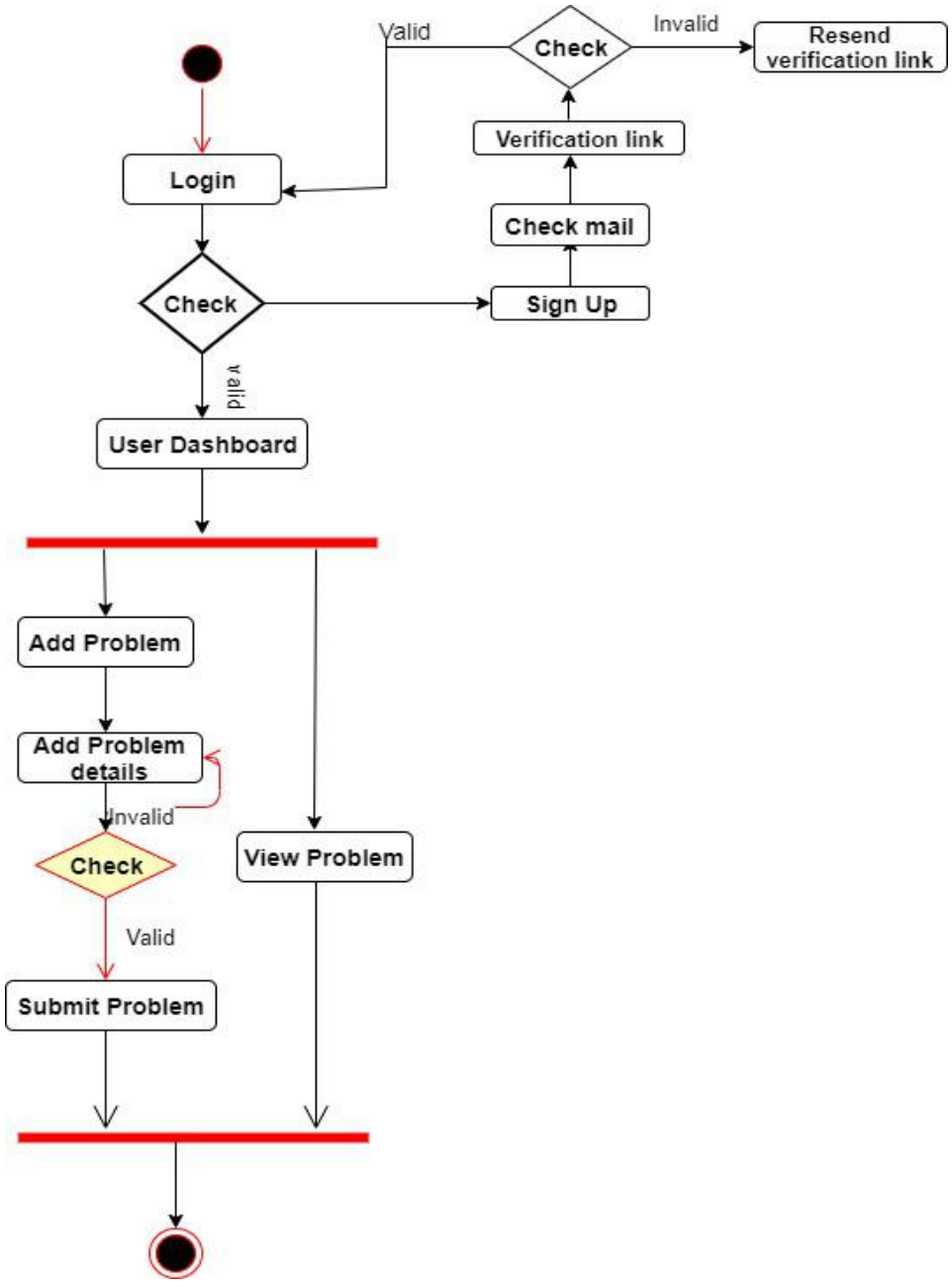

Figure 6: Activity for Teacher

Chapter IV
System Design Specification

4.1 Sequence Diagram

4.1.1. Sequence diagram for students

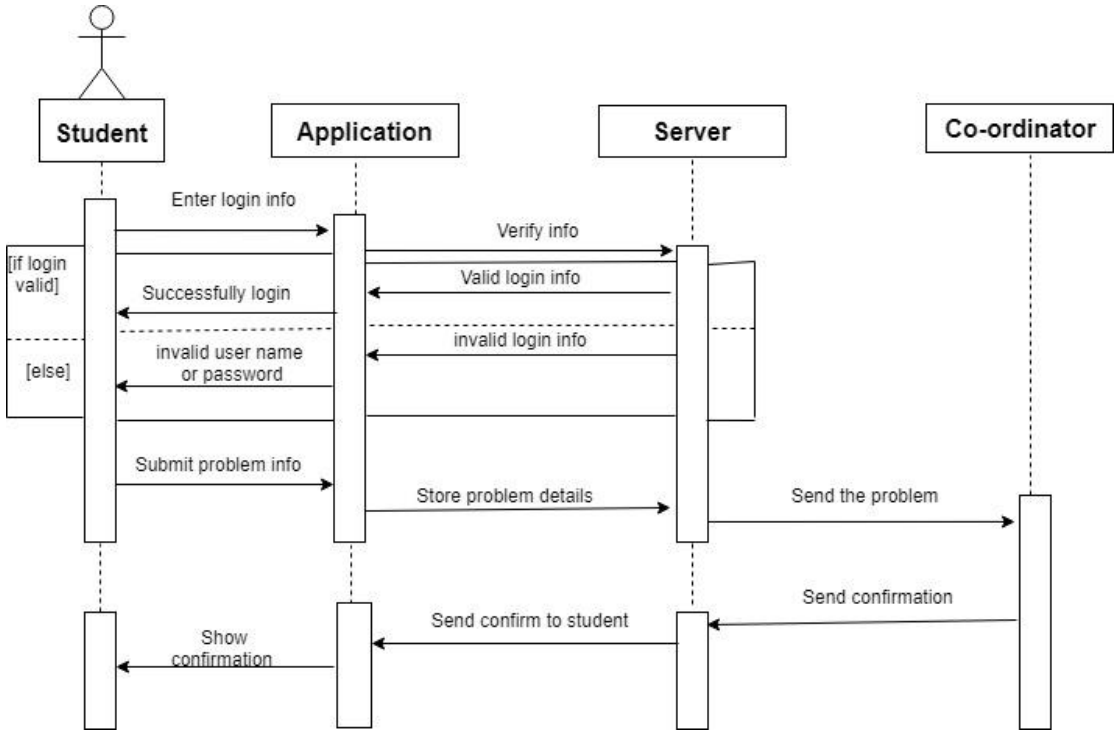

Figure 7: Sequence diagram for students

4.1.2. Sequence diagram for teacher

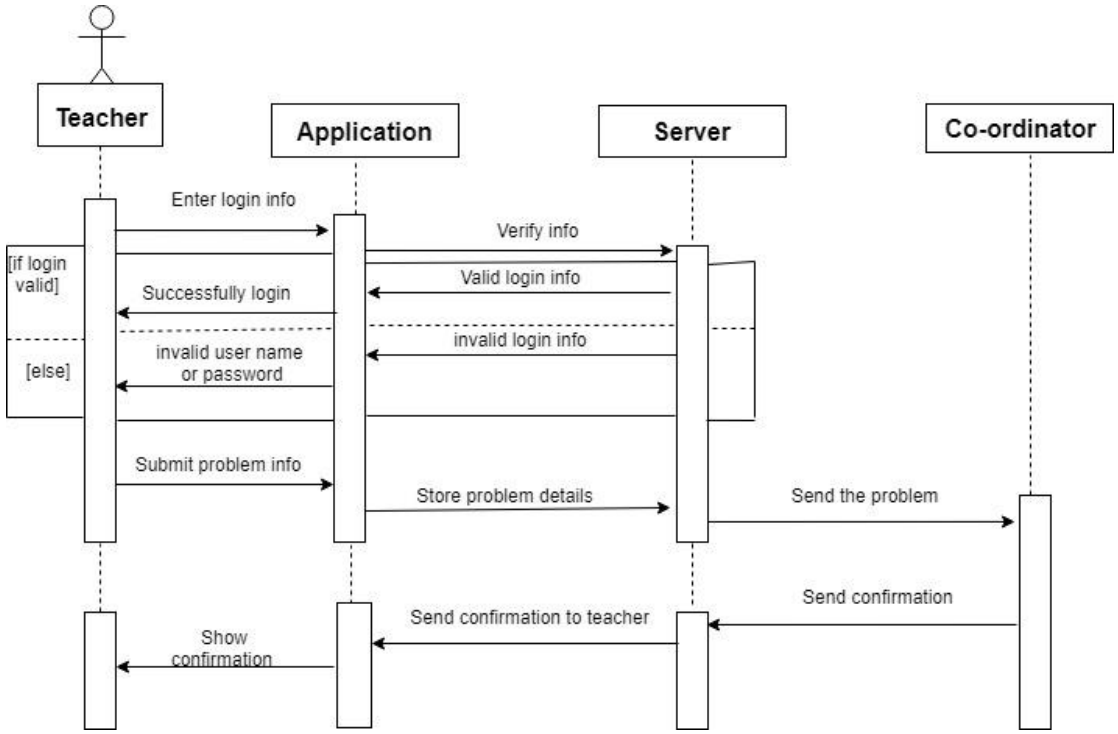

Figure 8: Sequence diagram for teacher

4.1.3. Sequence diagram for Co-ordinator

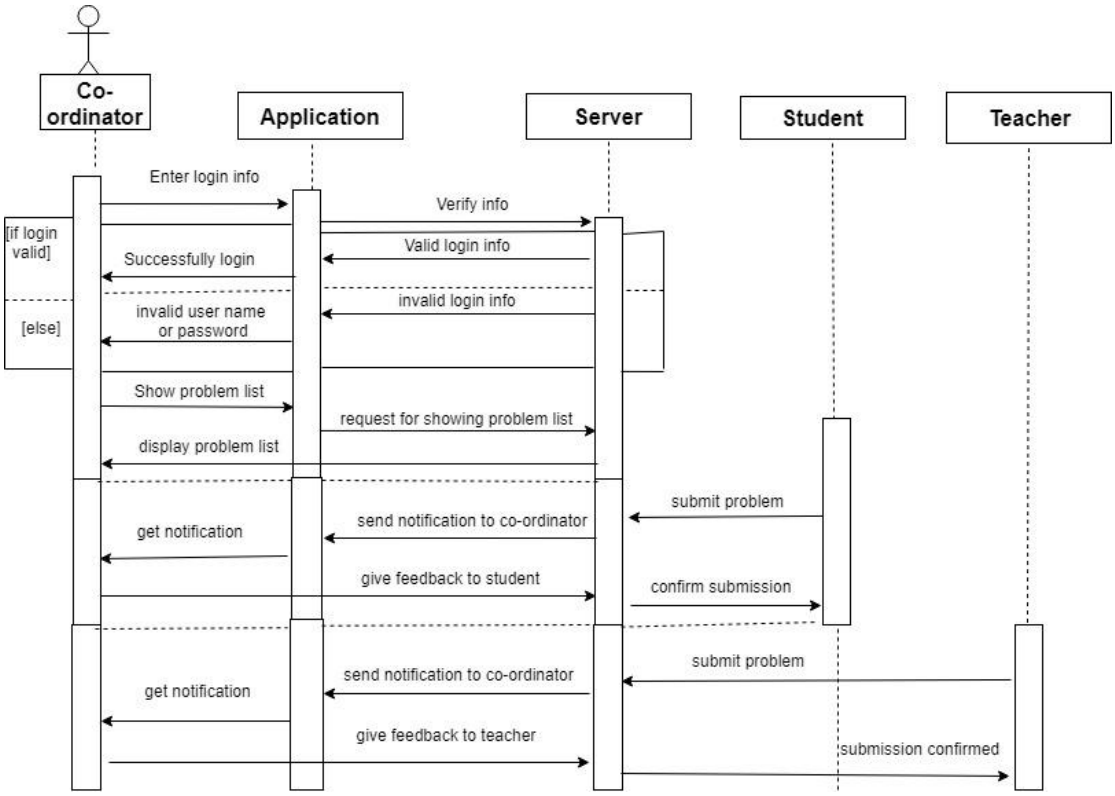

Figure 9: Sequence diagram for Co-ordinator

4.2. Data flow Diagram

4.2.1. DFD Level-0

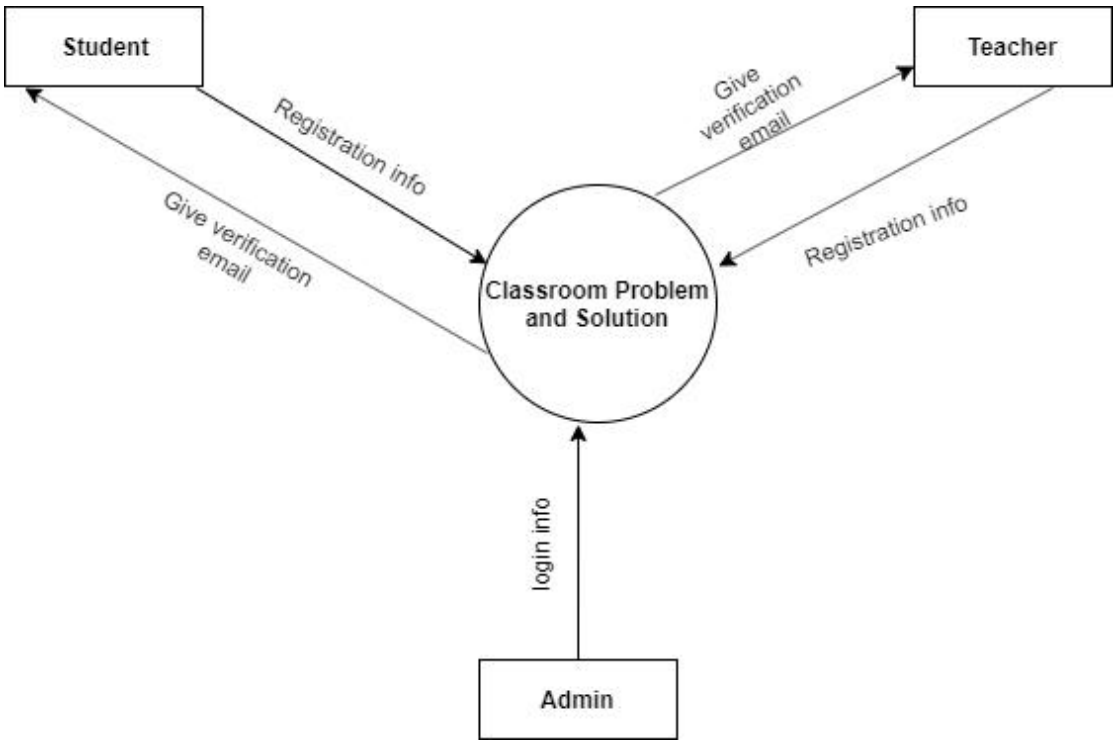

Figure 10: DFD Level-0

4.2.2. DFD Level-1

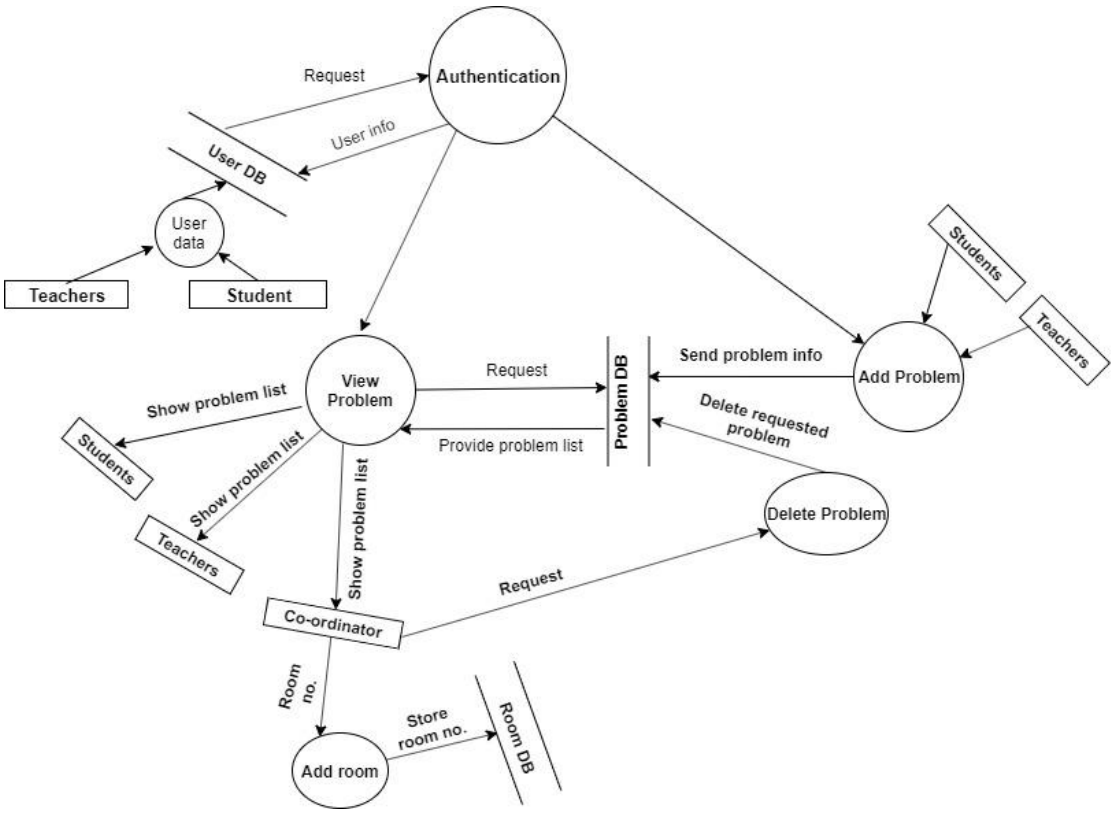

Figure 11: DFD Level-1

4.3. ER Diagram

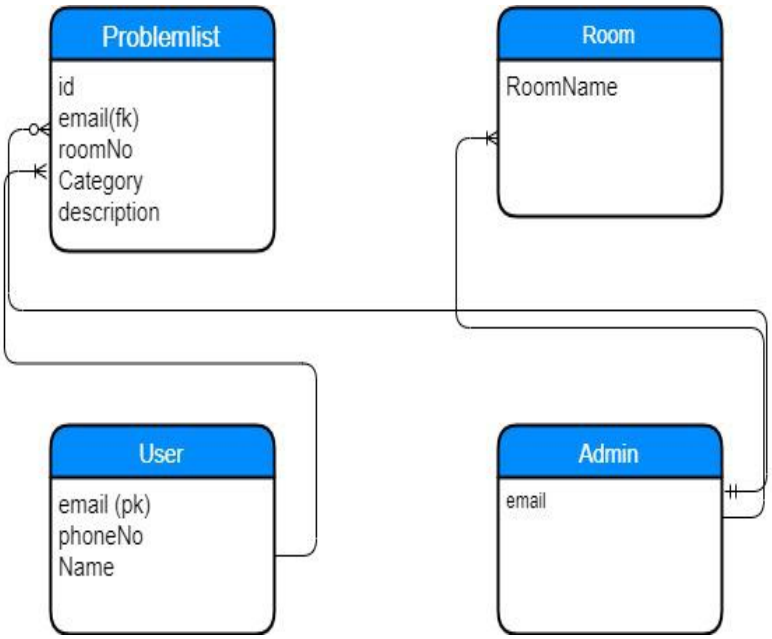

Figure 12: ER diagram

Chapter V
User Interface

5.1. User Interface

5.1.1. Home Page

This is the home page of the application. From this page user can select their own option.

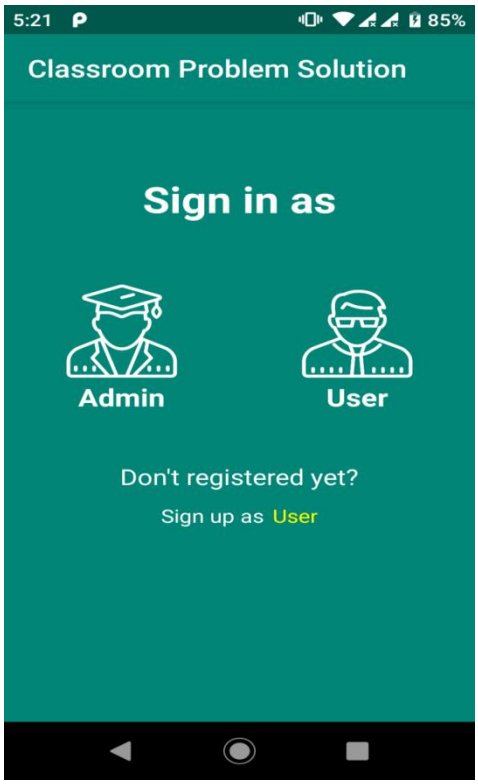

Figure 13: Home page

5.1.2. User Registration

User can registered in this page by providing necessary information.

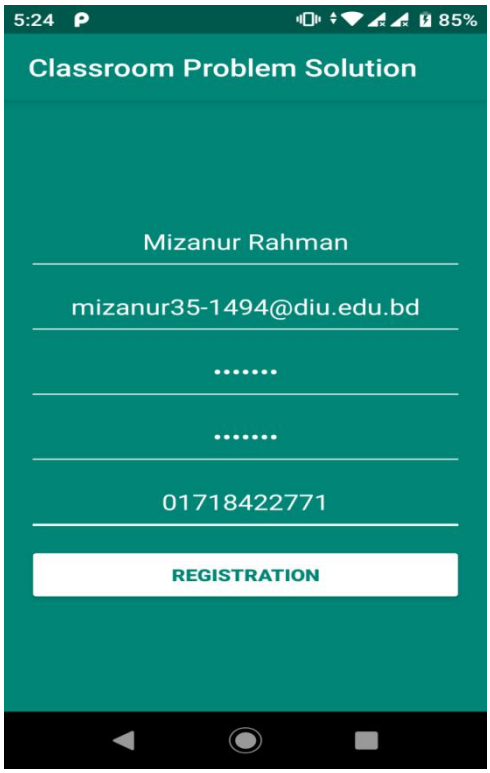

Figure 14: User registration

5.1.3. Login as Admin

Admin will provide email and password, then they click the login button. If the provide information are valid Admin will login to the system.

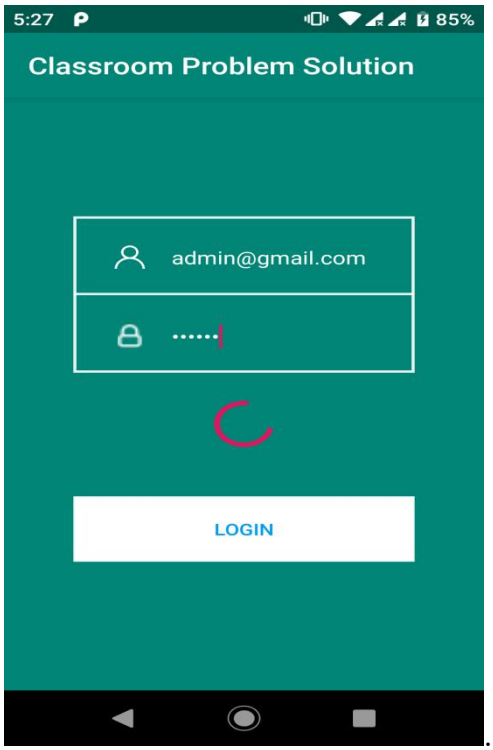

Figure 15: Admin Login

5.1.4. Login as User

User will provide email and password, then they click the login button. If the provide login credential are valid User can login to the system.

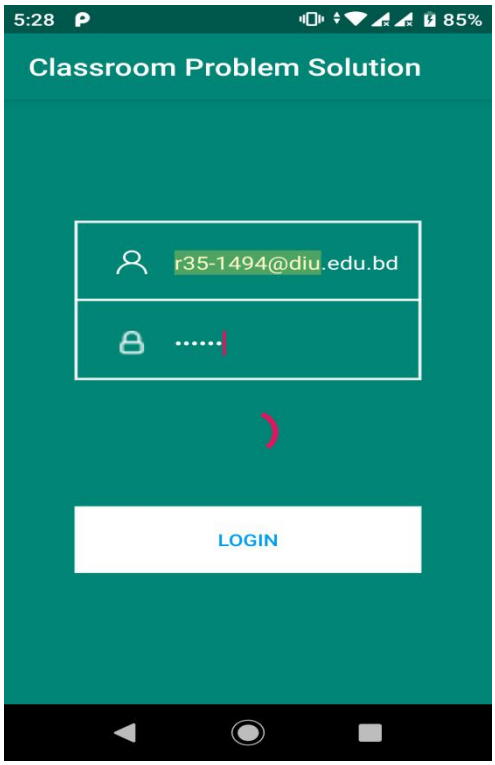

Figure 16: User Login

5.1.5. Admin dashboard

This is the admin dashboard. From this page admin will able to perform his activity. By clicking add room button admin can added new room and by clicking view problem list admin can see the problem that submitted the user.

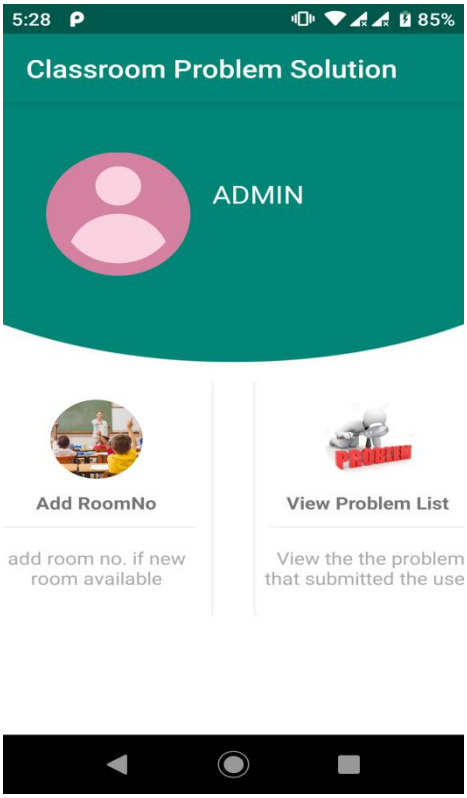

Figure 17: Admin Dashboard

5.1.6.Add room

Admin can add a room if any new room include the department.

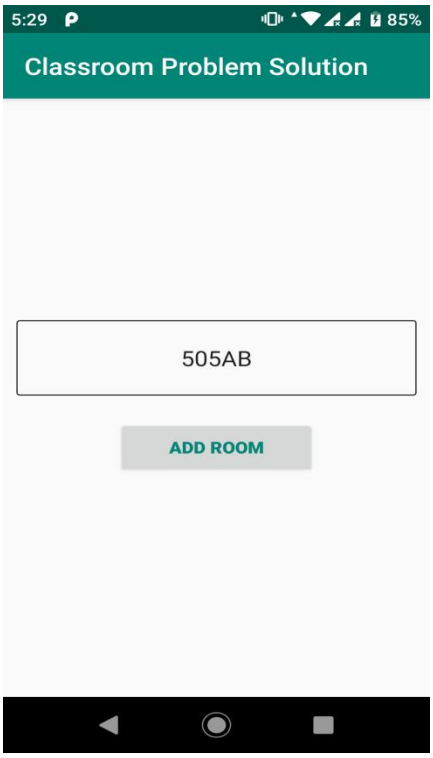

Figure 18: Add room

5.1.7. Admin View and delete Problem list

Admin can see those problem in this list that submitted by the user. After solving a problem admin delete this problem from the list.

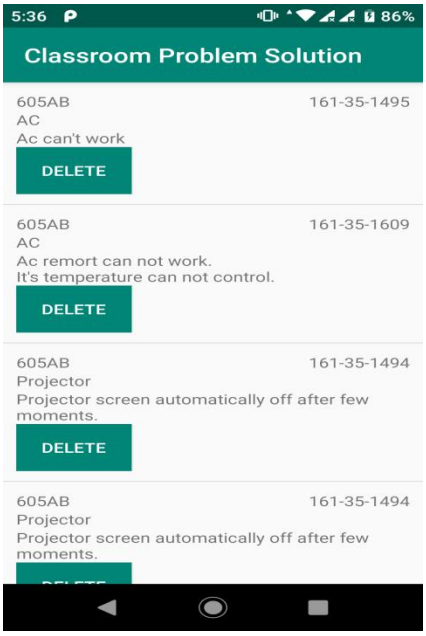

Figure 19: Admin view and delete problem list

5.1.8. User dashboard

This is the user dashboard. From this page user will able to perform their activity. By clicking ‘Add problem’ button user can added new problem and by clicking view problem list a user can see those problem that submitted by him.

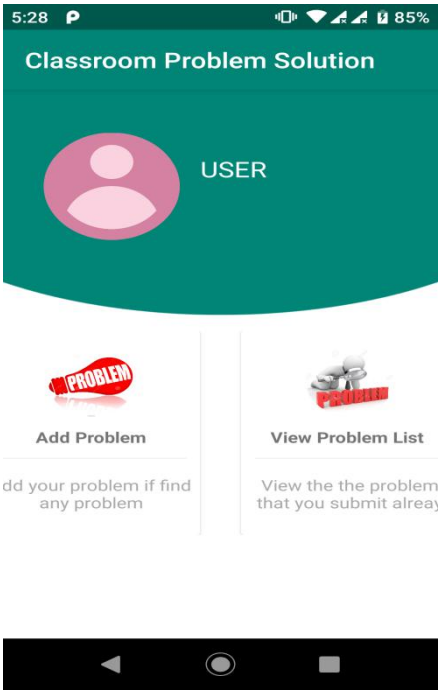

Figure 20: User Dashboard

5.1.9. Add Problem

User will be able to add any problem by providing the necessary information.

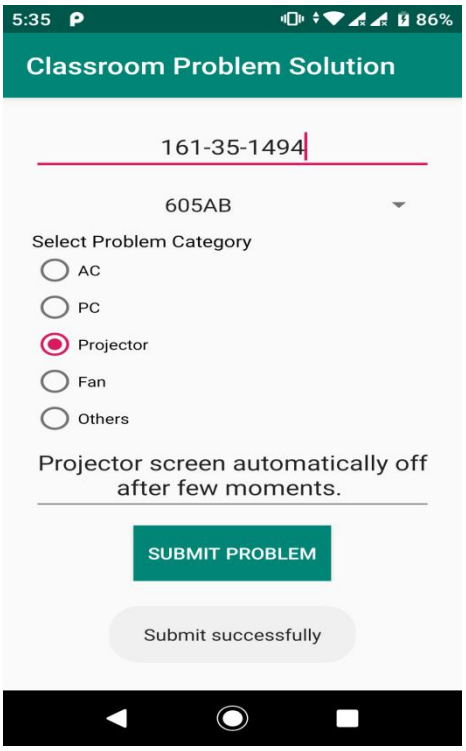

Figure 21: Add Problem

5.1.10. User view problem

User can see the problem list that submitted by him. If the problem is solved then the admin remove from the list after that user can see the empty list.

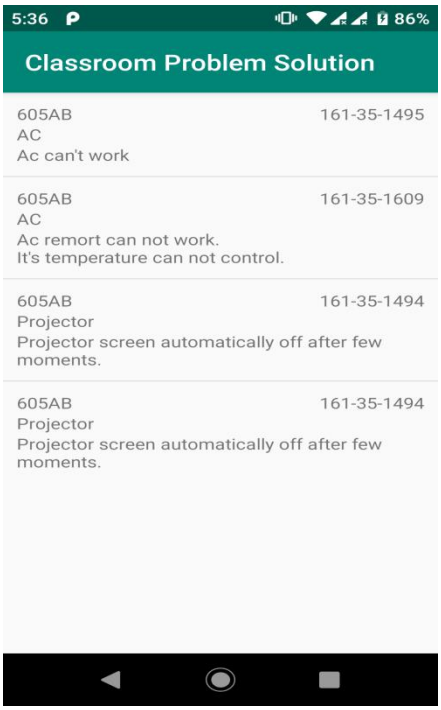

Figure 22: User view problem list

Chapter VI

Development Tools & Technologies

6.1. User Interface Technologies

• XML

6.2. Implementation Technologies

• JAVA
• Firebase realtime database

6.3. Platform & Environment

6.3.1. Hardware

- Processor: Intel Core i3.
- RAM: 4GB.
- Hard drive: 1TB.
- Windows 10

6.3.2. Tools

- IDE/Editor: Android studio.

6.3.3. Version Control

- Github (a web based version control for software project)

https://github.com/iammizanur/Classroom-Problem-And-Solution

Chapter VII

System Testing

7.1. Introduction

System testing is done to identify errors. The main objective of system testing are to ensure that the actual process done by the application is correct ad meets the requirements. By doing system testing the errors can be detected efficiently.

7.2. Test Plan Strategy

Test plan strategies are really important. The significance of the test plan strategies is to show how the application will be tested and also gives the steps to be followed during the test plans. At first the data is identified and then tested thoroughly.

7.3. Test Case

Test cases are set of conditions in which a tester will determine whether an application under the requirements works properly or not. The process of developing test cases can identify problems in the requirements or design of an application.

7.3.1. Test case of Admin login

Test case #01	**Test case name:Testing the admin login phase**
System: Classroom Problem and Solution	Subsystem: Login
Designed By: Mizanur Rahman	Design date:02-08-2019
Executed By: Mizanur Rahman	Executed date:02-08-2019
Short Description: This field will test the login functionality of the application.	
Precondition: Installing the application	

Steps	Action	Action Result	Expected System Response	Pass/Fail
01	Submit valid email and valid password	Get logged in.	Logged in into the system.	Pass
02	Submit valid email and invalid password	Not logged in and error message.	Not logged in and error message.	Fail
03	Click login button without any data	Required message	Required message	Fail

Table 27:Test case Admin login

7.3.2. Test case of User login

Test case #02	**Test case name:Testing the user login phase**
System: Classroom Problem and Solution	Subsystem: Login
Designed By: Mizanur Rahman	Design date:02-09-2019
Executed By: Mizanur Rahman	Executed date:02-09-2019
Short Description: This field will test the login functionality of the application.	
Precondition: Installing the application	

Steps	Action	Action Result	Expected System Response	Pass/Fail
01	Submit valid email and valid password	Get logged in.	Logged in into the system.	Pass
02	Submit valid email and invalid password	Not logged in and error message.	Not logged in and error message.	Fail
03	Click login button without any data	Required message	Required message	Fail

Table 28: Test case User login

7.3.3. Test case of User sign up

Test case #02	**Test case name:Testing the user sign up phase**
System: Classroom Problem and Solution	Subsystem: Login
Designed By: Mizanur Rahman	Design date:02-010-2019
Executed By: Mizanur Rahman	Executed date:02-10-2019
Short Description: This field will test the login functionality of the application.	
Precondition: Installing the application	

Steps	Action	Action Result	Expected System Response	Pass/Fail
01	Click Register without any data	Required message	Required message	Fail
02	Click Register after filling some data	Not signed up and required message	Not signed up and required message	Fail
03	Click Register with valid data and password less than 6 characters.	Signed up in and error message.	No Required message	Fail
04	Click Register with valid data and password not matching with confirm password.	Not Signed up in and error message.	Not signed up in and error message	Fail
05	Click Register with valid data and password	Signed up and redirected to main landing page	Signed up and redirected to main landing page.	Pass

Table 29:Test case User sign up

Chapter VIII

Project Summary

8.1. GitHub Link

https://github.com/iammizanur/Classroom-Problem-And-Solution

8.2. Limitations

- The application is only for software engineering department of DIU.
- Required internet connection for user smart phone.

8.3. Obstacle & Achievements

Obstacle:

- Learning new technology and environment
- Limited time

Achievements

- Learnt new technologies
- Successfully build a full project

8.4. Conclusion

The project was developed to help the software engineering department to manage the classroom related problem and solution. The objective was to help the teachers and students to use classroom problem free and.

8.5. Future Work

The project has some limitation such as change room number or delete any room. Hope that it will be added in future. Maximum security will be ensured in the project further.

Key of Terms

A

Abstract

Acknowledgement

Approval

Activity Diagram

Analysis

E

Entity Relationship Diagram

I

Implementation

T

Testing

Test case

Tools

Technical writing

N

Non Functional requirements

U

Use case Diagram

C

Conclusion

Class Diagram

Context Diagram

D

Definition

Data flow diagram

Database

S

Software Requirement Specification

System Design

System description

System Overview

System Specification

F

Functional requirements

Feasibility study

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