PROJECT REPORT

ON

Research Information Management System (RIMS) An Android Application.

BY

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This Report Presented in Partial Fulfillment of the Requirements for the Degree of Bachelor of Science in Computer Science and Engineering

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DHAKA, BANGLADESH

JANUARY 2023

APPROVAL

This Project titled "**Research Information Management System (RIMS) an android application.**", submitted by **Goutom Roy** to the Department of Computer Science and Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on January 2023.

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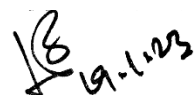Daffodil International University

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DECLARATION

We hereby declare that this project has been done by us under the supervision of **Mst. Eshita Khatun, Lecturer (Senior Scale), Department of CSE** Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for the award of any degree or diploma.

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ACKNOWLEDGMENT

First I express my heartiest thanks and gratefulness to almighty God for His divine blessing makes it possible to complete the final year project successfully.

I am really grateful and wish my profound indebtedness to **Mst. Eshita Khatun**, **Lecturer (Senior Scale) Department of CSE**, Department of CSE Daffodil International University, Dhaka. Deep Knowledge & keen interest of our supervisor in the field of "Mobile App Development" to carry out this project. Her endless patience, scholarly guidance, continual encouragement, constant and energetic supervision, constructive criticism, valuable advice, reading many inferior drafts and correcting them at all stages have made it possible to complete this project.

I would like to express our heartiest gratitude to **Mst. Eshita Khatun, Lecturer (Senior Scale) Department of CSE and** Head**,** Department of CSE, for his kind help to finish my project and also to other faculty members and the staff of CSE department of Daffodil International University.

At last, I must acknowledge with due respect the constant support and patients of my parents. Without their mental and financial supports, I should not ready to finish my project.

ABSTRACT

The Research Information Management System (**RIMS**) is an android-based application that helps students with their academic research. Starting from forming a research group to getting a research supervisor, all can be done following a few simple steps. The research groups can see all the available research faculties and their area of research interest. Through this system now research groups don't need a physical meeting to share their research proposals with the supervisors, as they can send them to them directly online. Faculties now have a better way to go through students' research proposals and select groups to supervise. In this paper, we will demonstrate how our RIMS eases the whole research registration process and smoothen the academic-research journey.

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CHAPTER – 1
Introduction

1.1 Introduction

A final-year undergrad must complete academic research to be graduated. From the very beginning of research registration, students face some problems. Most of the students are confused about choosing a topic and finding a supervisor. Primarily a student has no idea about which faculties are available or what their research interests are and who will be a good match. Different faculties have different areas of research interest. To know their research interest or their availability or any kind of information, students have to ask them individually which is time-consuming as faculties can't reply immediately to all the students. At this moment Daffodil International university doesn't have this kind of research-related information management system. Thus the existing manual process is a bit difficult for both the teachers and students. Our android-based application DIU Researchers will be a perfect solution to this problem. The main purpose of our proposed system is to provide research-related facilities to students and teachers.

A student will be able to easily group up with other students online, see which supervisors are available, what are their research interests and research requirements, and send research proposals to the faculties. They can find out whether they meet their supervisor's requirements or not. Faculties will be able to track research groups, can see the proposals, and accept or reject them. Our RIMS mobile app solves various problems that students and teachers are facing today.

1.2 Motivation

Now-a-days people love online buy rather than spending lot of time at physical markets.It became more popular that's why top of the business market move towards to e- marketing management and implement their existing system. It will be a good opportunity for the developers. That's why we became motivated for designing this application and also motivated for

- I will try to create Research Information Management System (RIMS) an Android Application.
- I will gather all the information exactly.
- I am confident about our dream.

1.3 Objective

The main purpose of our proposed system is to provide research-related facilities to students and teachers. Here are some points which will give a clear view to understand our system objectives:

1) Students will be able to
   a) easily group up with other students to form a research team.
   b) see which supervisors are available,
   c) see faculties research requirements and their area of interest,
   d) find whether they meet their supervisor's requirements or not.

2) Teachers will be able to
   a) create their research supervisor profile,
   b) set instructions for the research groups
   c) see all the proposals sent from students,
   d) accept or reject the research proposals.
   e) track research groups under their supervision.
   f) Overall creating a dynamic research information management system.

1.4 Problem statement

The main issue is that the existing process of managing academic research-related works is manual. Thus it got some difficulties. Here are some major problem statements given below:

1. Supervisor Availability: Right now there's no easy way to know the supervisor's availability. Students suffer a lot at this point. They have to email each individual teacher or meet them physically to know whether they are free to supervise a research group.

2. Finding Groups: Students are unable to find group members offline at the right time for research.

3. Topic Availability: Student suffers to know their desired supervisor's research area of interest. So they have to individually email or physically meet them all to know if their chosen research topic matched their desired supervisor.

4. Track Groups Online: Teachers are unable to track the groups that work under his/her supervision.

5. Manage Data: It is difficult to maintain that much information offline. So, a proper online management system with a database is a must.

CHAPTER – 2

BACKGROUND

2.1 Preliminaries/Terminologies

Almost all of us today are using so many mobile applications throughout our day. So, to build our system I have chosen the mobile application platform because it is easier to access. To build our android application we have chosen the native platform as native applications provide the user with the best user experience and are efficient.

2.2 Related Works

1. An Android App for University Management System. [1]
2. An Android Application for Campus Information System. [2]
3. Stud App-Student Data Management Application. [3]
4. RajShree Transport Management System [4]
5. Student Information Management System Based on Android Platform [5]
6. " It has been observed that now a day most of the people are using Android devices like mobile, smartphone and tablet. The android operating System has become one of the most popular operating system based on Linux kernel and it currently developed by Google." [6]

2.3 Comparative Analysis

I have searched for some literature reviews on this study in Scopus (http://www.scopus.com) which is one of the greatest databases for academic journals. For this study, I have considered the sections of computer science. I have also used IEEE Explorer to access various documents from some of the world's most highly-cited publications. I used the keyword' Android-based app on Information Management System.' I have gone through similar articles that matched our research area and took help from those to complete our research.

CHAPTER - 3
Requirement Specification

3.1 Business Process Modeling

As technology is developing day by day, it is now a necessity to switch our day-to-day work from the old manual system to an automatic system. For this reason, to digitalize the research information management system of southeast university I have developed an android application. Our proposed android application will help teachers and students to gather accurate information and connection to study research material. As this app is serving for academic purposes, Teachers and students can access the application anywhere, anytime beyond the campus.

The main purpose of creating this application is to solve the research management

issue and make it easy for everyone in a university. It provides a portable environment, but the working of the application varies depending upon the requirement of the user to user. Students are able to see research topics and send proposals by creating a group. Students are also able to see the supervisor list and information.

Teachers are able to see students' proposals, students' personal information, and students' group information. Teachers can also create their own information, update that information, and delete information. the authors designed and develop an application with the help of Android Studio and Firebase Database. The authors also check the performance of the application using Google's performance monitoring SDK.

3.1 Requirement Collection and Analysis:

Student's Dashboard

1. Sign up & login
2. form a Research Team
3. view supervisor list
4. send proposals to the research facilities
5. View teacher info

Teacher's Dashboard

1. Sign up & login
2. create research supervisor's profile
3. view students' proposals
4. accept or reject student's proposals
5. set instructions for the student's

3.2 Feature in Details:

Sign up & login: Both students and the faculties must sign up and log in with the university email. No other email will be validated.

Form a Research Team: when there is more than one member, students can form a research group filling in their information.

View supervisor list: students can see all the available supervisor list from their dashboard.

Send proposals to the research facilities: students can send research proposals to their desired research supervisors.

View faculty information: This is an extra feature where all the teacher's academic information can be found by searching with the faculty initials.

Create research supervisor's profile: Faculties can create a research supervisor profile to provide students will all the information they need.

View student proposals: Faculties will be able to see all the proposals they got from the students in one single place. They will be able to accept or reject them.

View supervisor list: students can see all the available supervisor list from their dashboard.

Send proposals to the research facilities: students can send research proposals to their desired research supervisors.

3.3 Use Case Modeling:

A use-case model is a model of how different types of users interact with the system to solve a problem. As such, it describes the goals of the users, the interactions between the users and the system, and the required behavior of the system in satisfying these goals.
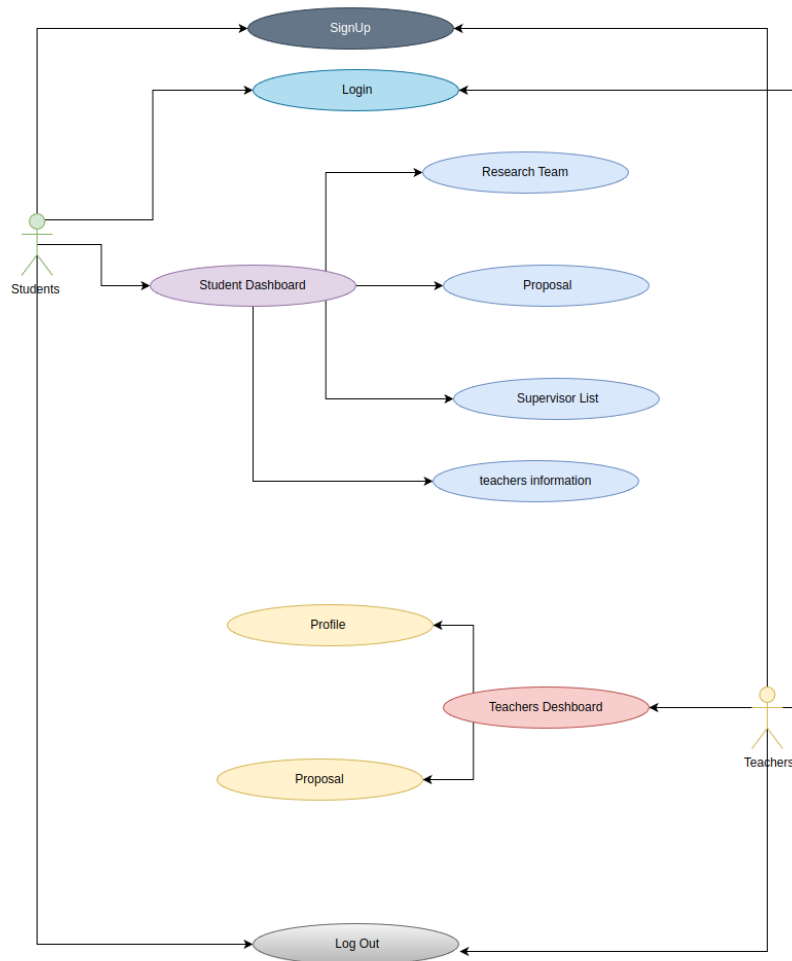

Figure 3.1.1: Use Case diagram of the entire system

Use-case diagrams describe the high-level functions and scope of a system. These diagrams also identify the interactions between the system and its actors. The use cases and actors in use-case diagrams describe what the system does and how the actors use it, but not how the system operates internally.
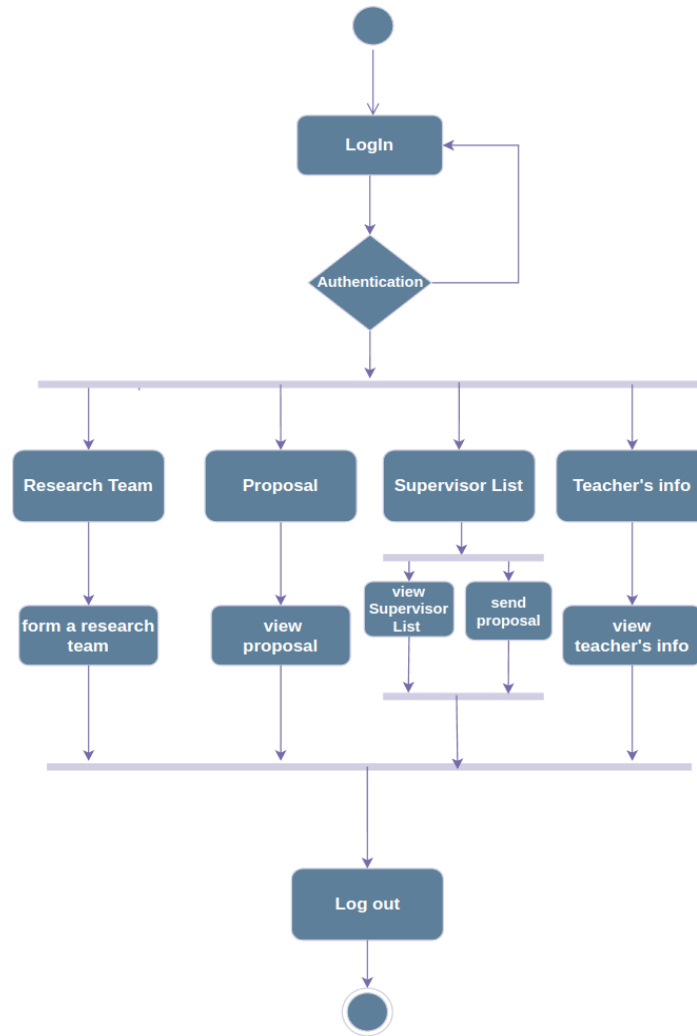
Figure 3.1.2: Diagram of Sign up and login system

A user registration system requires the creation of a username and password, as well as the answers to other security questions. Many user registration systems allow users to customize their accounts and profiles, while others give users their account information.

The first time using the system, the user must register. It's a method of verifying user credentials to access and log on to the system using the username and password created after the initial registration. The username and password required to access data on a computer or other electronic device are referred to as "login".
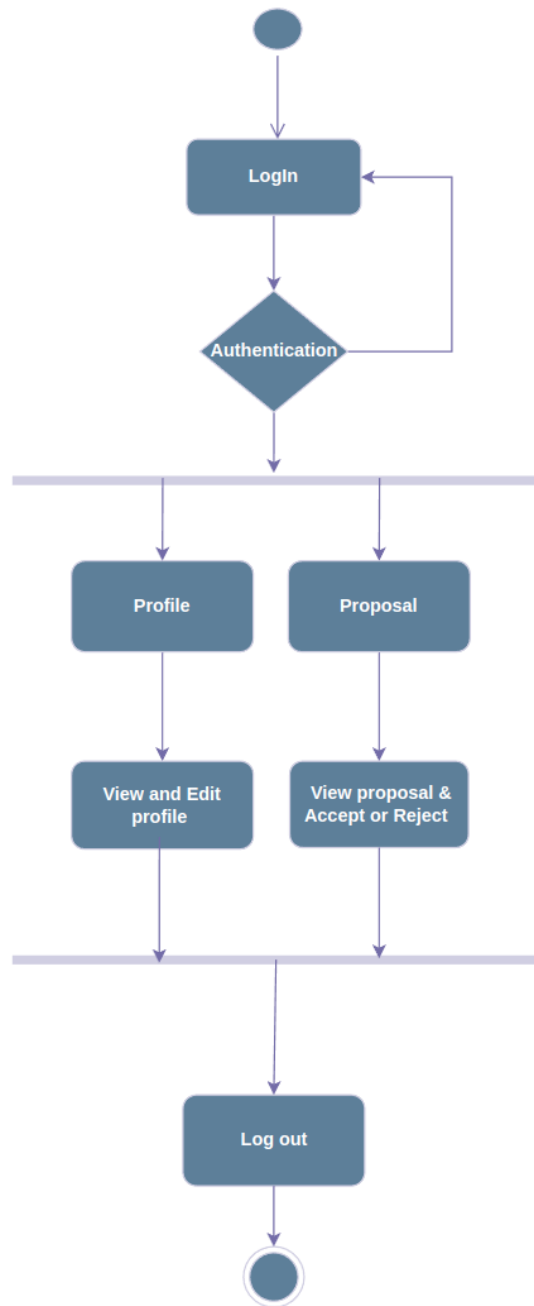
Figure 3.1.2: Diagram of Teacher dashboard

Teacher dashboards are a specific form of analytics in which visual displays provide teachers with information about their students; for example, concerning student progress and performance on tasks during lessons or lectures.

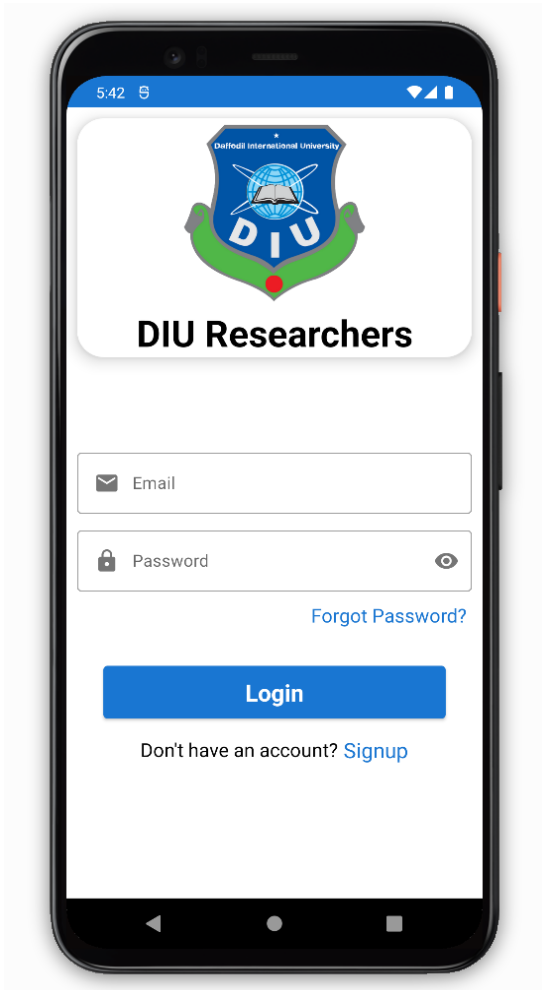# CHAPTER - 4
Design Specification

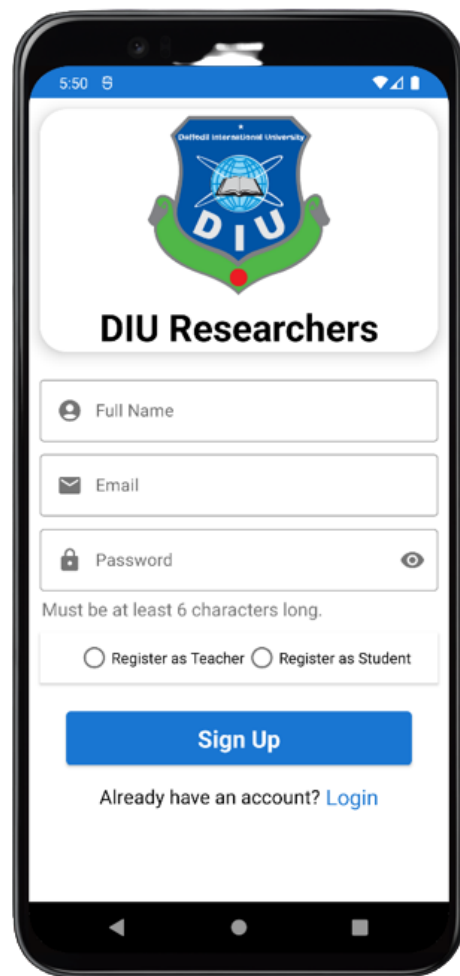## 4.1 Front-end Design

Figure 4.1.1: Login Page.

Figure 4.1.2: Sign up Page.

Here, Fig-4.1.1 and 4.1.2 are the login and sign up page. Both students and the faculties must sign up and log in with the university email. No other email will be validated
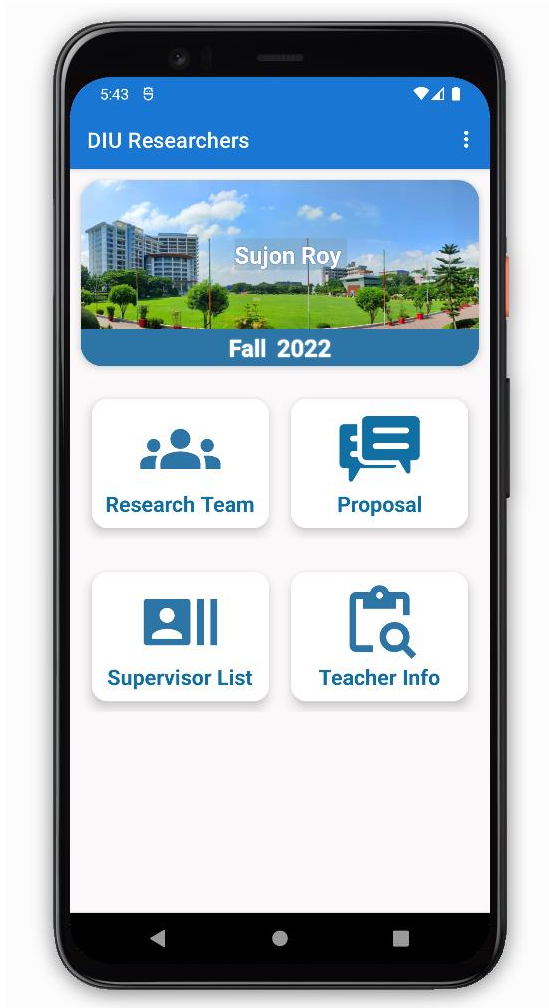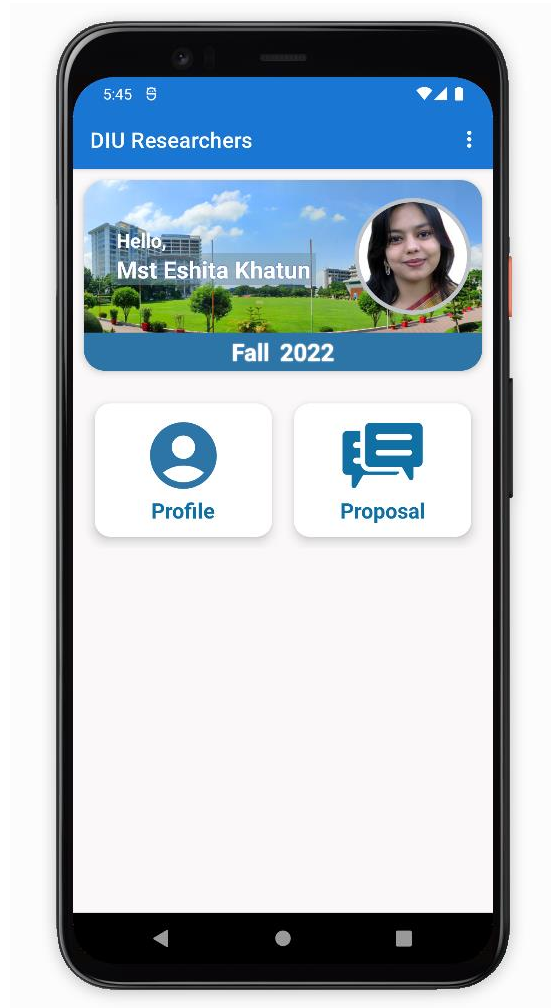
Figure 4.1.3: Student Dashboard.

Figure 4.1.4: Faculty Dashboard.

Here, Fig-4.1.3 is the screen which is showing student dashboard and Fig-4.1.4 is showing the screen of faculty dashboard.
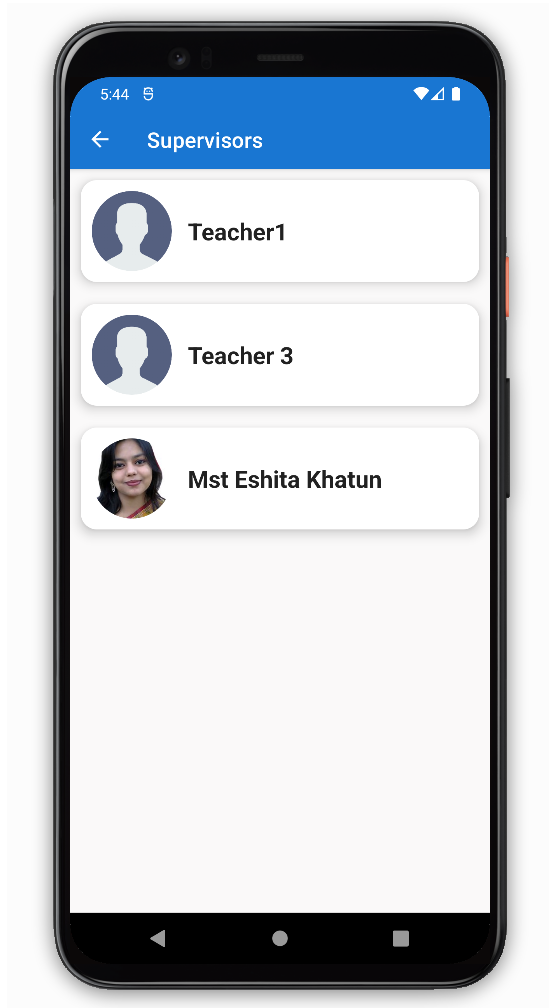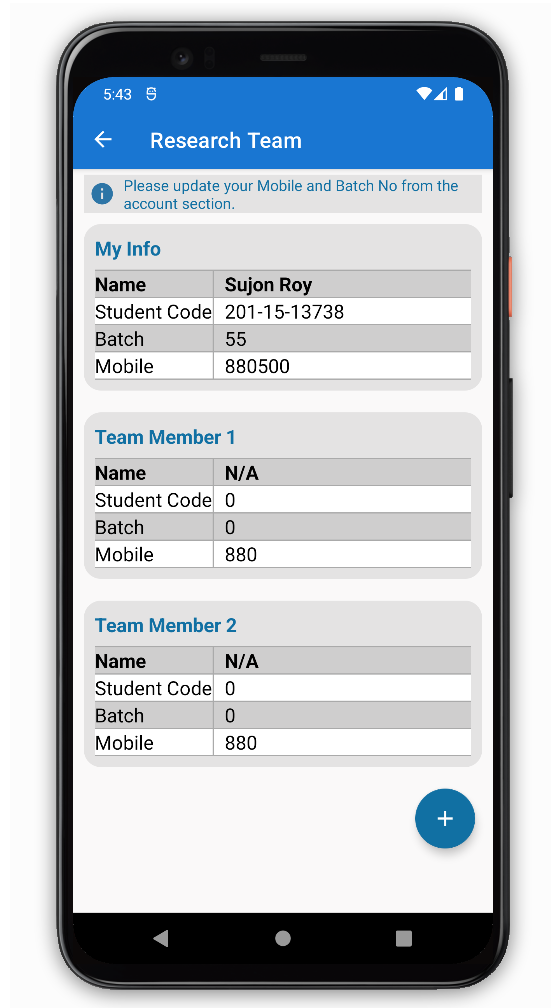
Figure 4.1.5: Supervisor List.   Figure 4.1.6: Forming a Research Team.

Here, Fig-4.1.5 is the screen which is showing the list of supervisor, students can see all the available supervisor list from their dashboard. and Fig-4.1.6 is showing the screen of forming a research team.
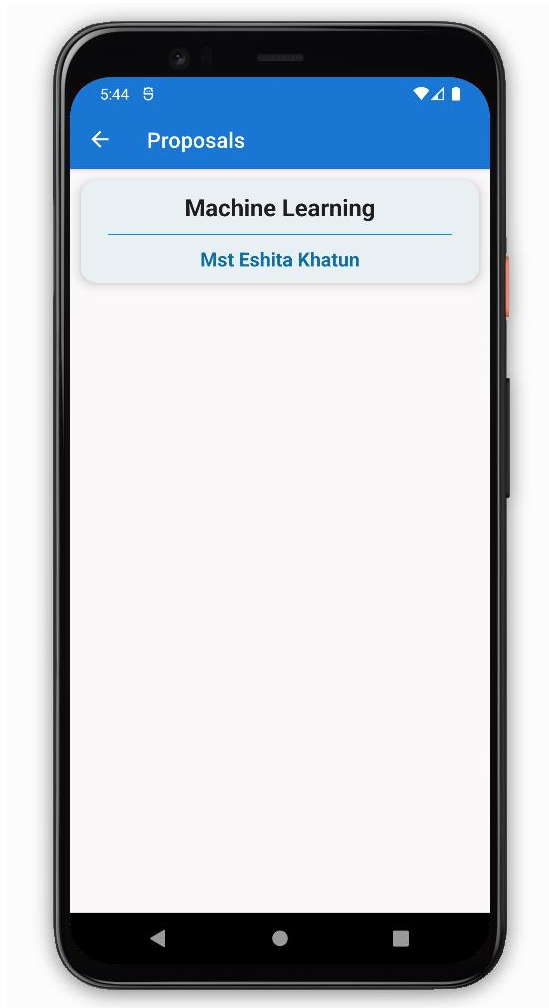
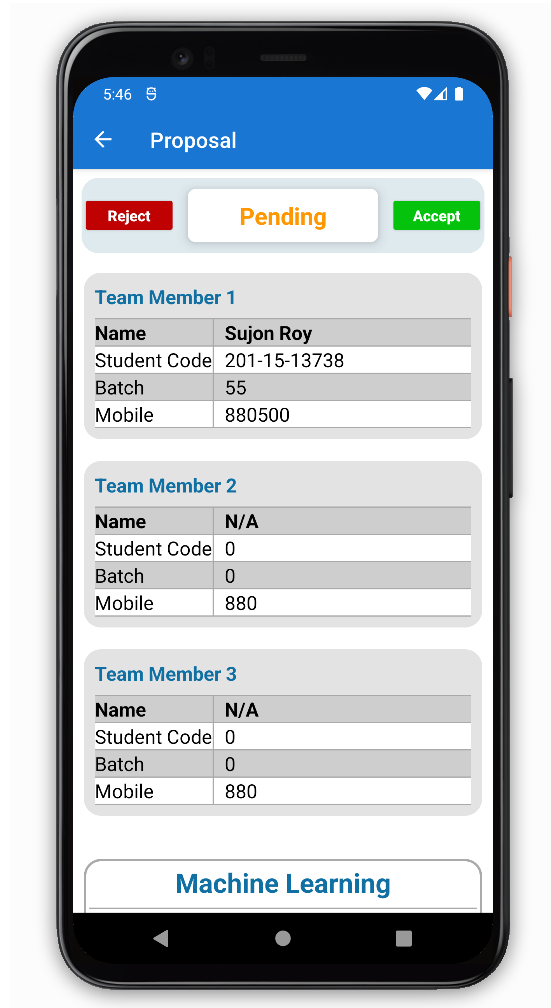Figure 4.1.7: Research Proposals.   Figure 4.1.8: Research Proposals Request.

Here, Fig- 4.1.7 and 4.1.8 are the project/ thesis proposal, faculties will be able to see all the proposals they got from the students in one single place. They will be able to accept or reject them. page which can only show the supervisor/ student's only.
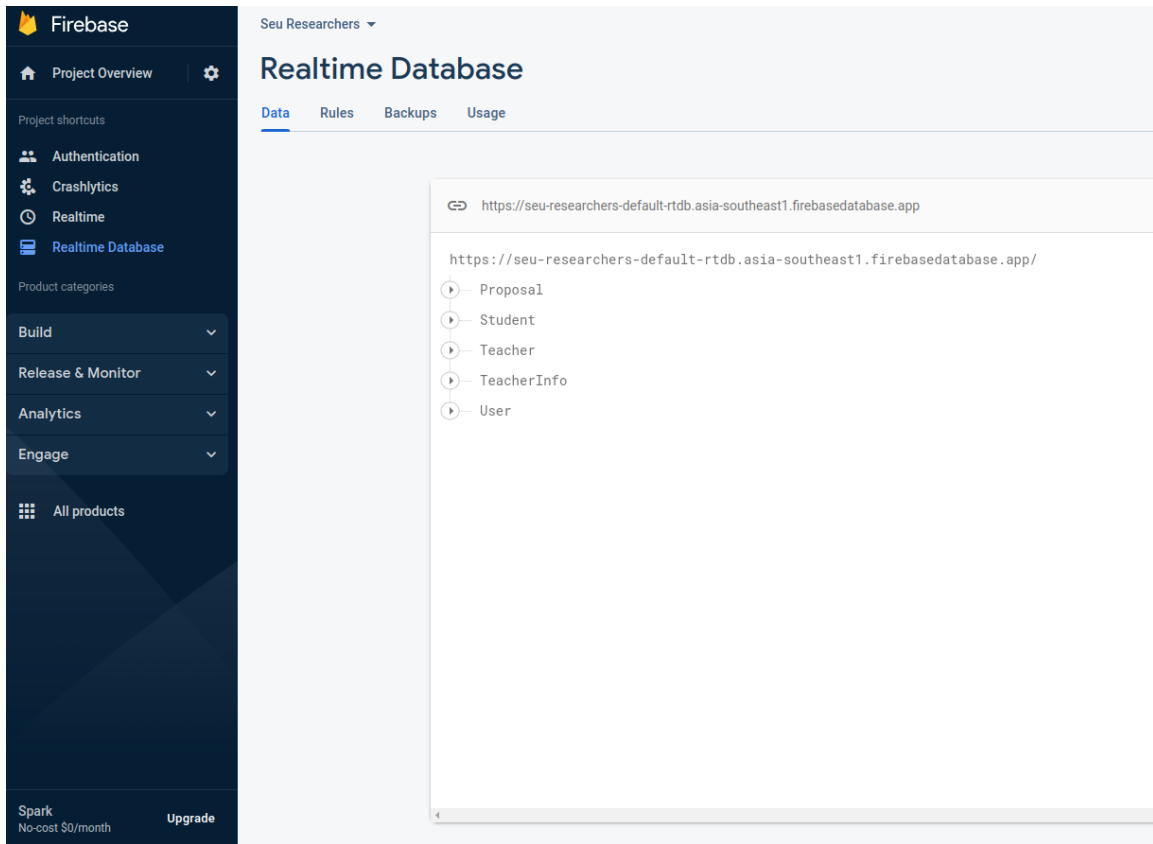
4.2 Back-end Design

Figure 4.2.1: Admin Panel Firebase Database

The admin panel appears above the Timeline when you're using a business Page as an admin. The admin panel is the easiest place to navigate around a Facebook Page, to quickly access different features and maintain your business Page.

Figure 4.2.2: Users Authentication Database

To be able to let authenticated users access the database, we will need to use Firebase's Admin SDK. This framework will give us access to an API to verify authenticated users and pass requests to our database. We will be saving users' data using Firebase's Real-time

Figure 4.2.3: Users Authentication Database
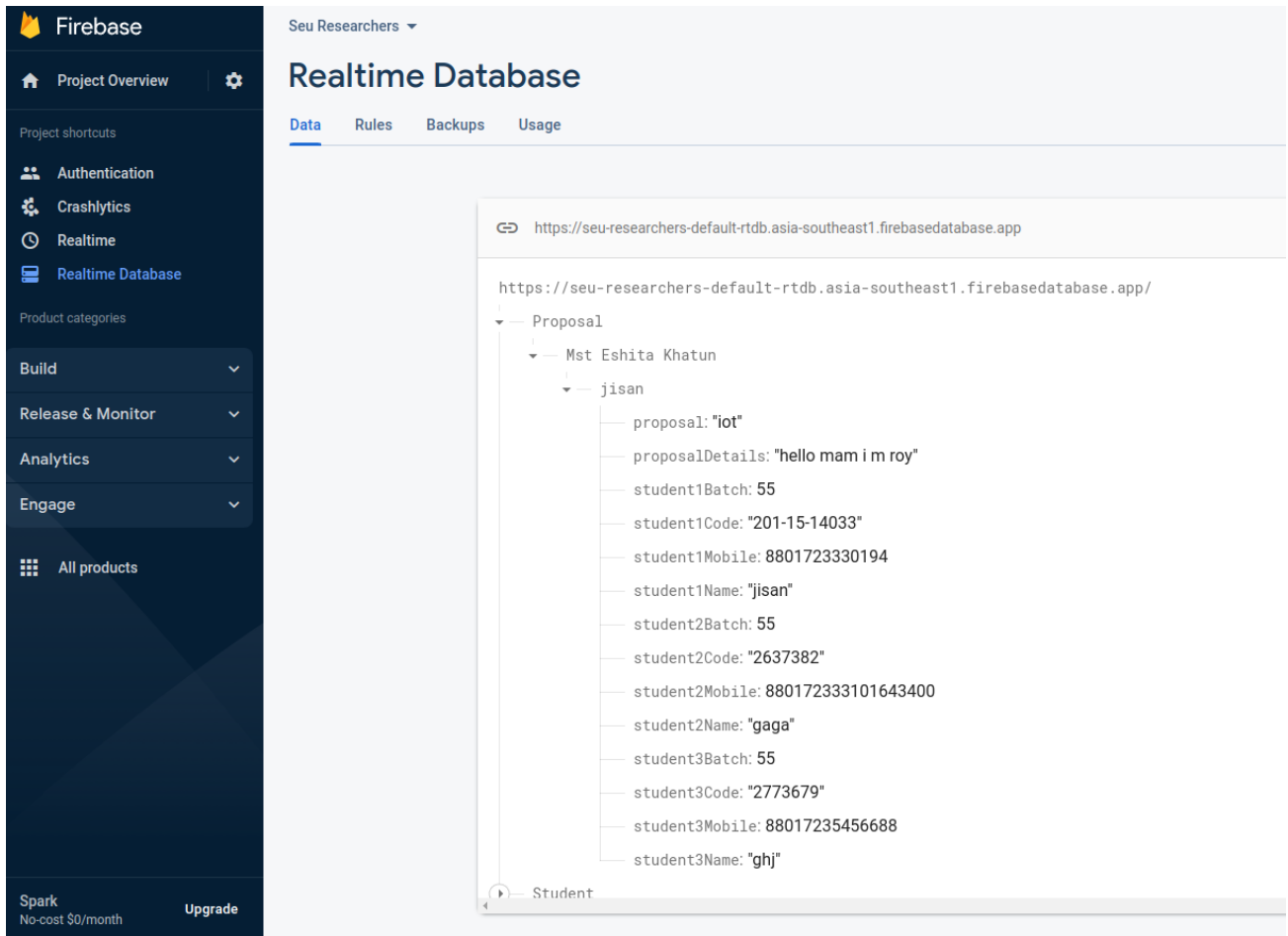
Database authentication is the process or act of confirming that a user who is attempting to log in to a database is authorized to do so, and is only accorded the rights to perform activities that he or she has been authorized to do

4.3 Implementation Requirements

1. Authenticate Firebase instance.
2. Build out the UI.
3. Create the CRUD queries.
4. Link the queries to the UI.

CHAPTER – 5

Implementation and Testing

5.1 Implementation of Database

Design: XML

XML stands for eXtensible Markup Language, which is a way of describing data using a text-based document. Because XML is extensible and very flexible, it's used for many different things, including defining the UI layout of Android apps. [7]

Language: Kotlin

Kotlin is a general purpose, free, open source, statically typed. pragmatic? programming language initially designed for the JVM (Java Virtual Machine) and Android, and combines object-oriented and functional programming features. [8]

Database: Firebase

The Firebase Real-time Database is a cloud-hosted NoSQL database that lets you store and sync data between your users in real-time. [9]

Tools: Android Studio

Android Studio is the official Integrated Development Environment (IDE) for Android app development, based on IntelliJ IDEA. On top of IntelliJ's powerful code editor and developer tools, Android Studio offers even more features that enhance your productivity when building Android apps. [10]

5.2 Implementation of Front End Design

It's very difficult to make a simple UI design for the users, we try make as simple as possible. Nowadays, there are many devices like smart mobile, tablets, desktop, 4k desktop etc. We are trying our website responsive so that user can visit from different devices with marginable scale of the website and easily interact. We make interface relative and standard with the help of bootstrap, JavaScript and JQuery technologies. There are some factors of implementing the front-end design is given below.

- There will be two types of users like Admin and User.
- Every types of user must be registered by filling up the required information fields.
- User can login using their registered email and password.

5.3 Testing Implementation

Testing implementation is process of testing upcoming implementation of a system, where tester or system architect will see cases and specification, is it implementable or have limitation.

Test Case	Test Input	Expectedoutcome	Obtainedoutcome	Pass /fail
1. Login	Login via various devices such as tablet, pc, cell phones	Successfully login	Successfullylogin	Pass
2. Registration	Username,Password	Show restriction to Fill all the fields	Fields must befilled by data	Pass
3. Password	Incorrect password	Warn the incorrect password or field is empty	Show warning	Pass
4. Search Teacher for (RIMS)	Search Teacher by name or id	Show teacher or can't find any teacher	Show the teacher	Pass

5.4 Test Result and Reports

Test report is wanted to reflect testing results in a formal way, which gives a scope to estimate testing results speedily. It is a paper that records data obtained from an evaluation experiment in an organized manner, describes the environmental or operating conditions, and shows the compare of test results with test objectives.

There are many types of testing

- Functionality
- Regression
- Security
- Performance
- Scalability
- Usability
- System interoperability
- Localization
- Disaster recovery
- Installation/ upgrade

If the system passes through all these types of testing it is finally ready to launch so at the end, we can carry out the results as the benefits of usability testing.

- Good Quality of Website.
- System is easier to use.
- Website is more readily accepted by users.
- Easy to use for the new users.
- Better UI for interaction.

5.5 Limitations

I have developed this mobile app in native android, so the only limitation I have, users from other platforms such as iOS are unable to use the app and its features that I'm providing.

5.6 Possible solutions

To implement the RIMS in various platforms, there will be iOS and web versions of the app in near future. So that users can access other platforms and get our services.

CHAPTER -6
Conclusion

6.1 Discussion and Conclusion

This research attempts to modernize the concept of managing and handling the exchange of data in the best possible way. The motive for building this mobile application is to form the university research management process easy for everyone. The system improves the capabilities of the campus and offers a well-managed system to the users. Students and teachers are ready to manage everything about research registration online. It stands out to be very useful for students, faculties, and the campus and helps increase a university's capability.

6.2 Scope for Further Developments

We can finally conclude that the DIU Researchers mobile app can bring a profound change to the full students' and teachers' research registration system. It will not only give relief to both the supervisor and students but also save them valuable time. In the future plenty, more features and opportunities might pop up.

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