Sri Lanka Institute of Information Technology

Research Project Management Tool

SRS Document

Application Frameworks

Project Group: SE3030_WE_35

Submitted By:

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Declaration

We declare that the this project report or part of it was not a copy of a document done by any organization, university any other institute or a previous student project group at SLIIT and was not copied from the Internet or other sources.

Project Details

Project Title	Research Project Management Tool
Project ID	SE3030_WE_35

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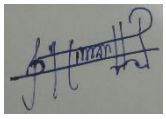
IT20424732	Pigera A.I.H	

Abstract

This project is a project tool management system. System administrator, Staff members including supervisor and co-supervisor, students are the main characteristics that can be find from this project.

As for the major requirements the admin can view roles, create submissions, update submission users, delete users, create marking schemes, upload documents and templates and allocate panel members. From the student role, he can create students groups, register research topic, request supervisors and co-supervisors, submit documentaries, download templates are the major activities that they can engage with. When it comes to supervisor/co-supervisor actor, they can accept topics, chat with groups, evaluate documents evaluate student's presentations are the major activities. Most of all before starting the activities users are required to register to the system and login to the system.

All database records, hope to keep in a highly secure manner. So that human mistakes can be prevented by utilizing created systems in a variety of ways, such as calculating average marks, and other sensitive data. Because this system is a web-based application, users may access it from anywhere at any time over the internet. In order to deliver an efficient product, the system was constructed utilizing the MongoDB database, the Express framework, ReactJs, and NodeJs.

Acknowledgement

The work described in this document is the demo of our project for the module Application Framework Project. As the SE3030_WE_35 group members we hereby express our heartiest gratitude to everyone who provided us guidance and necessary support that will give to complete our project task successfully. Special thanks go to all the lecturers and instructors attach to

Application Framework (AF) module, especially Mr. Thusithanjana Thilakarathna and Ms. Karthiga Rajendran. Finally, to all the members of the group who have put their maximum effort and commitment to successfully complete the project work so far.

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1. Introduction

1.1 Problem Statement

There is a risk of not all transactions being documented in certain occasions which will eventually lead to data loss. On the other hand, with the current situation most of the things have shifted to vitual, therefore with all these reasons and to make documenting less of a hassle the user has decided that they need a new automated system to expand the business further.

1.2 Product Scope

The automated system is mainly divided into four managements as it is easier to be managed.

1.2.1 Scope

1.2.1.1 Admin Management Function

In this function it has 8 other sub functions. They are,
1. Group management
2. User Update and Delete function
3. Create, Update, Delete User submission Function
4. Create Panel Members
5. Notification Management

1. Group management
In here Admin can update Delete, registered research groups .and also admin can add co supervisors and supervisors to the group. All the group related forms are handling in here. Admin can get feed backs from the group. All student related status can be handling in this function.

2. User Update and Delete function

In this system it has 3 main users including Student, Supervisor, Co supervisors. All the users can register to the system, but they can't update some fields in their registration and also, they can't delete their groups from the system. All the updates are handling using forms.

3. **Create, Update, Delete User submission Function**

Admin can create students' submissions and expiry dates for the submissions. And also, he can update and delete those links. User submission types can jpg, docx.jpeg etc. All submission types and links are handling using this function.

4. **Create Panel Members**

By specifying the research areas of the supervisor's admin can create panel members. Creating, updating and deleting are done by this sub function. In here admin can categorize all the supervisors by their research topics.

5. **Notification Management**

Admin can add, update and edit notifications in the page. All the important notification can be display in the home page.it can't be update or delete by the users.

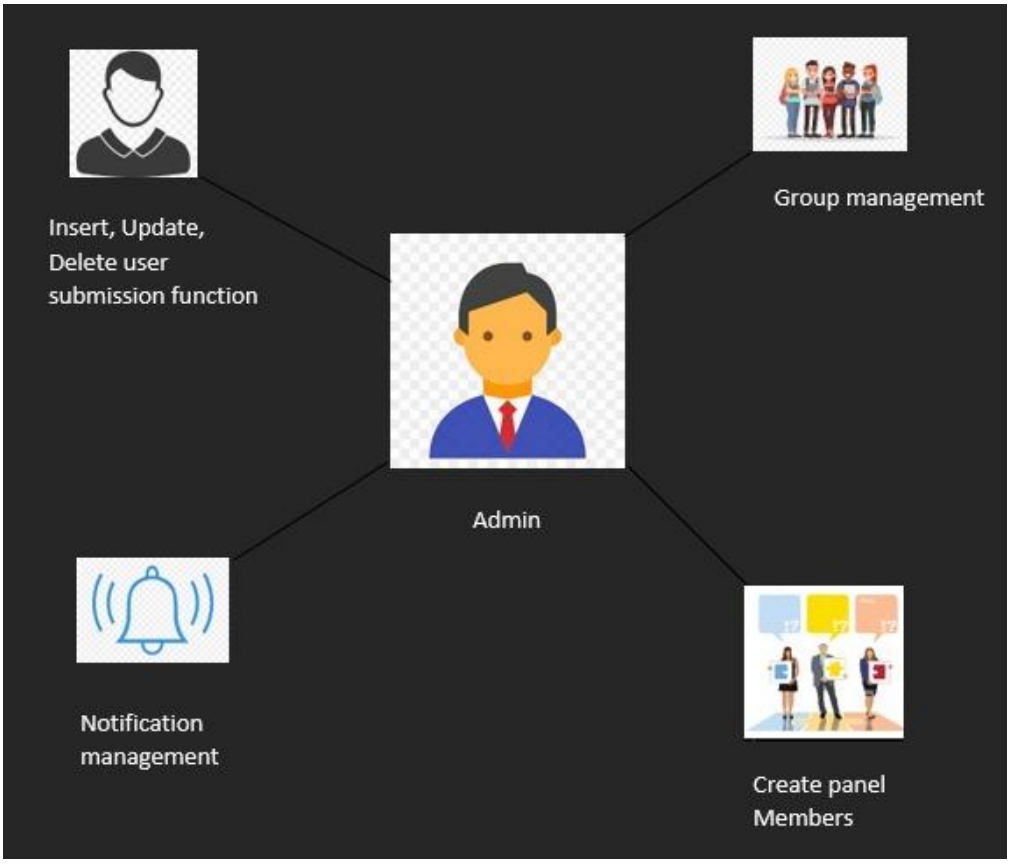

Figure 1: Admin Management function

1.1.1.2 Student Management function

In this Student, there have several functions.

They are,

- Register Student.
- Create Student Group.
- Register research topic.
- Request a supervisor.
- Request Co-supervisor.
- Submit document.
- Download templates.

Register Student

In this function to get the research topic, all the student have to login to this system. After login student need to select a suitable topic for the final research. For that students have to register to this system. In Registration page it provides a form to input student details like name, registration number, NIC etc... Without registering student cannot select a topic. Student can register by clicking the register button.

Create Student Group

After registering to this system they have to create a group for do this final research. Only registered students can grouping. When create a group that group must have 4 members. When navigate to this page it provides a form to input group details to assign group. Students must have input group member's registration numbers for fill this form. Only group leader must fill this form.

Register Research Topic

After grouping they have to select a research topic. By navigate to that page students can see all the research topics that are available in the system. When selecting a suitable topic in particulate field it should navigate to the page that include the topic details and the supervisors for that particular research topic. By selecting the supervisor they can request a supervisor and once the supervisor accept that topic, they have to request a co-supervisor from the same research field.

Submit document and Download Templates

After that Students can submit the document including the topic details of the research and students can download the templated by using this system.

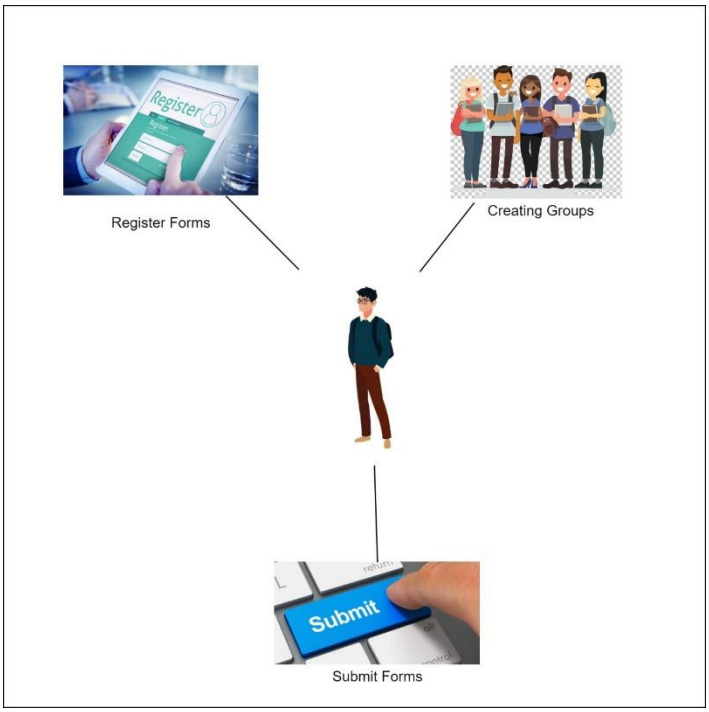

Figure 2: Student Management Function

1.1.1.3 Staff Management function

Staff can be divided into two parts.

1. **Supervisor/co-supervisor**
   After registering to the system supervisor/co-supervisor should have to go to the topic list page which submitted by the students. Supervisor will check them and if it is acceptable, accept the topics. Finally, supervisor should send feedback to the relevant group. And also admin have to guide/ supervise each and every group. Supervisor can chat with the groups and provide their needs. Admin also should evaluate the documents submitted by groups using the provided marking scheme.

2. **Panel member**
   After registering to the system, panel member should view the topics. Go through them and evaluate students' presentations according to the provided marking scheme

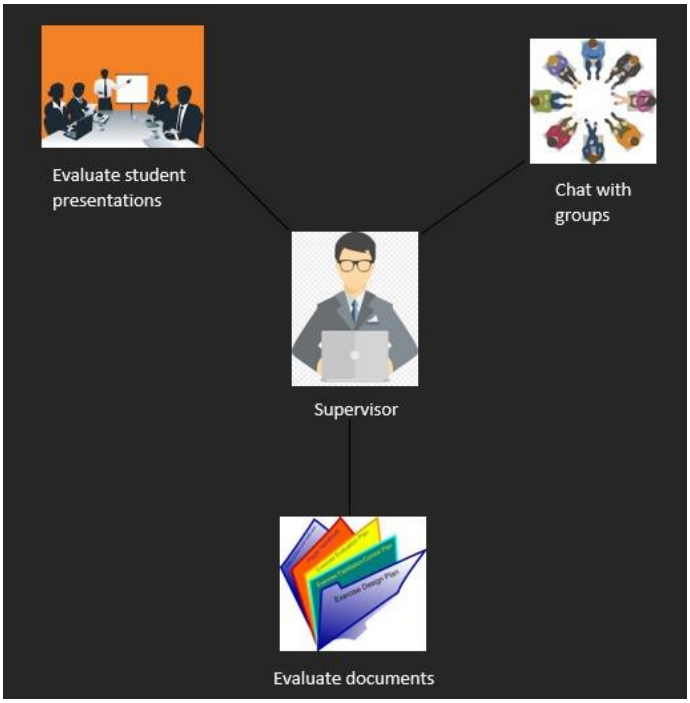

Figure 3: Staff management function

1.2 Functional requirements

1. Admin

Database Management - Admin need to control the database and keep track of all records of students and staff.

Panel member's allocation - Admin should allocate panel members to relevant student groups.

Create submission types - Admin should create different submission types

For students

-to submit research topic to submit research topics, documents
-to submit research topic details to evaluation panel
Create marking schemes – Admin need to create marking schemes to provide it to the panel for marking

Upload document/presentation templates- Admin will create document/presentation templates for students
View Roles – Admin can view all the roles assigned in the system.

2. Student

Login- Student must have a valid login id to enter into the system.

Registration- New students can sign up by creating new ID

Create student groups- Group leader have to create groups by submitting group members details

Register research topic- Students need to register their selected research topic. To register the topic, first of all student must need to send the topic to the supervisor. After that student must need to find a co-supervisor. Finally, students need to send the topic details for the topic evaluation panel and get the feedback. If the topic is accepted, they can continue to do the project. If rejected, they must find a new topic and submit it back.

Request supervisor- After getting the topic approval from the panel, students need to request a supervisor in relevant research field.

Request co-supervisor- Students need to request a co-supervisor as well.

Submit documents- Students need to submit documents to the supervisor/ Co supervisor.

Download Templates- Students can view or download the document/presentation templates uploaded by the admin.

3. Staff

Staff members are divided into 2 parts.
1. Supervisor/Co-supervisor
2. Panel member

Register – Staff should have to register to the system.

4. Supervisor / Co-Supervisor

Supervisor/ co-supervisor is a staff member

Accept topics - Supervisor/ co-supervisor should have to accept topics submitted by the students.

Chat with the groups- Supervisor/co-supervisor can chat with students groups, supervise them, and guide them.

Document evaluation - Evaluate Documents submitted by groups using the provided marking scheme.

5. Panel Member

Panel member is also a staff member.

Evaluate topics- After supervisor accepting the topic, panel member have to evaluate Students' presentation according to the marking scheme provided by the admins.

1.3 Project Report Structure

Rest of the project report includes following sections.

1. Methodology

a) Requirement and analysis

Functional requirements are described using user stories and non-functional requirements are also explained. Use case diagram represents the interaction between system and actors. Activity diagram shows the behavior of this system.

b) Design

High level architecture diagram will give an overall idea about this system. Class diagram describes the classes and their relationships used in this system. Structure of the database is described using the ER diagram. Sequence of messages between objects of the system will be shown in a sequence diagram. At last user interfaces of this web application are included in this section.

c) Technologies to be used

This section contains the details about languages used to implement this system. And the database that used to store data

2. Conclusion

Summary of this whole project will be in this section. It will discuss the realization of the original goals. And also, it will highlight the limitations of this system and suggestions to overcome them.

3. References

List of sources referred to write the report is included in this section.

2 Methodology

2.1 Requirement and analysis

2.1.1 Functional Requirements

2.1.1.2 User stories

As an Admin I need to Delete/Update users.	**As an Admin I need to create submission types**
As an Admin I need to allocate panel members to student groups	**As an Admin I need to create marking schemes**
As an Admin I need to upload document/presentation templates	**As an Admin I need to view Roles**
As a student I need to register to the system	**As a student I need to create student groups**
As a student I need to select research topic	**As a student I need to request supervisor**

As a student I need to request co-supervisor

As a student I need to submit documents

As a Supervisor / Co-Supervisor I need to register to the system

As a Supervisor / Co-Supervisor I need to accept topics

As a Supervisor / Co-Supervisor I need to chat with the groups

As a Supervisor / Co-Supervisor I need to evaluate Documents submitted by groups using the provided marking scheme

As an admin I need to add panel members to a panel

As a panel member I need to evaluate topics

As a panel member I need to evaluate students' presentations according to the provided marking scheme

2.1.1.3 User case scenarios

Admin Use case Scenario

01)

Number	01	
Name	Allocate panel members	
Summery	Admins allocate panel members	
Priority	5(1-lowest 5-highest)	
Preconditions	Admin log in to the system	
Postconditions	Admin checks the create student groups and allocate panel members	
Primary actors	Admin	
Main scenario	Step	Action
	1	Admin visit the admin home page
	2	Admin check supervisors research areas
	3	System display research areas of supervisors
	4	Admin check the details about created student groups
	5	System display created student groups
	6	Admin get the student groups research topics
	7	Admin selects the research topics of student groups
	8	Divide the groups into relevant panels
	9	Admin confirms the panel groups
	10	System sends the panel information to students and to panel members
Extensions	Step	Branching action
	7a	System will generate error message if exceeds the number of panels
	8a	System will display an error message if there is no supervisors for relevant topic

02)

Number	02	
Name	Delete/ update users	
Summery	Admin delete / update users	
Priority	5(1-lowest 5-highest)	
Preconditions	Admin log in to the system	
Postconditions	Admin checks the relevant users and update or delete them	
Primary actors	Admin	
Main scenario	Step	Action
	1	Admin visit the admin home page
	2	Admin visit the user list
	3	System display the user list
	4	Admin select the relevant user to be updated
	6	Admin update the user details
	7	System will display a message that successfully updated the user
	8	If needed, admin select the relevant user and delete it
	10	System will display a message that successfully deleted the user
Extensions	Step	Branching action
	7a	If there is an error, system will display a message user is not updated
	8a	If there is an error, system will display a message user is not updated

Student Use case Scenario

01)

Number	03	
Name	Register research topic	
Summery	Students are required to register the research topics	
Priority	5(1-lowest 5-highest)	
Preconditions	Login to the system	
Post conditions	Students have to select a relevant topic and register the research topic.	
Primary actors	Student	
Main scenario	Step	Action
	1	Student sends the research topic to the relevant supervisor
	2	Student check for the feedback
	3	System views the feedback from the supervisor
	4	If the topic is accepted, student finds the co-supervisor for relevant field
	5	After finalizing, student send the topic details to topic evaluation panel
	6	Student check for feedback
	7	System view the feedback sent from topic evaluation panel
	8.	If topic is accepted, register the topic
Extensions	Step	Branching action
	4a	If the feedback is negative, student have to find a new topic and submit again
	8a	If the topic is not accepted, student can re submit another topic

02)

Number	04	
Name	Create student groups	
Summery	Students are required to create student groups	
Priority	5(1-lowest 5-highest)	
Preconditions	Login to the system	
Post conditions	Students have to create student groups by adding student details	
Primary actors	Student	
Main scenario	Step	Action
	1	Student visit the student page
	2	Student find the create student groups form
	3	System display the form
		Assign group leader and add his/her details
	4	Group leader add group member's name
	5	Group leader add group member's registration no
	6	Group leader submit the form
	7	System display a message successfully created the group
Extensions	Step	Branching action
	7a	If there is an invalid input, system display an error message

Supervisor / Co-supervisor Use case Scenario

01)

Number	05	
Name	Evaluate documents	
Summery	Co-supervisor/supervisors are required to evaluate documents	
Priority	5(1-lowest 5-highest)	
Preconditions	Supervisor/Co-supervisor login to the system	
Postconditions	Co-supervisor/supervisors have to evaluate student's documentations.	
Primary actors	Co-supervisor/supervisors	
Main scenario	Step	Action
	1	Co-supervisor/supervisor view the supervisor page
	2	Co-supervisor/supervisor checks the marking scheme
	3	System display the marking scheme
	4	Co-supervisor/supervisor checks the given feedback about the previous evaluation
	5	System display the details of the feedback
	6	Co-supervisor/supervisor checks the final thesis
	7	System display the final thesis
	8	Co-supervisor/supervisor gives feedback about the document
	9	System sends the given feedback to the student.
Extensions	Step	Branching action
	4a	If the feedback is negative and the student has ignored it co-supervisor/supervisor will not mark the document
	8a	User will mark the feedback according the marking scheme

02)

Number	06	
Name	Accept topics	
Summery	Co-supervisor/supervisors are required to accept topics of students	
Priority	5(1-lowest 5-highest)	
Preconditions	Supervisor/Co-supervisor login to the system	
Postconditions	Co-supervisor/supervisors have to accept research topics	
Primary actors	Co-supervisor/supervisors	
Main scenario	Step	Action
	1	Co-supervisor/supervisor view the supervisor page
	2	Co-supervisor/supervisor view the research topics submitted by the students
	3	System display the research topics
	4	Co-supervisor/supervisor check the topics and work on it
	5	If the topic is good, co-supervisor/supervisor accept the topic
	6	Co-supervisor/supervisor send the feedback to the students
	7	System display a message feedback is sent successfully
Extensions	Step	Branching action
	5a	If the topic is not acceptable, co-supervisor/supervisor will ignore the topic
	7a	If there is an error in input, system will display an error message

Panel Member Use case Scenario

01)

Number	07	
Name	Evaluate topics	
Summery	Panel Members are required to evaluate research topics of students	
Priority	5(1-lowest 5-highest)	
Preconditions	Panel member login to the system	
Post conditions	Panel member have to evaluate research topics	
Primary actors	Panel member	
Main scenario	Step	Action
	1	Panel member view the panel page
	2	Panel member view the research topics submitted by the students
	3	System display the research topics
	4	Panel member check the topic and evaluate it
	5	If the topic is good, panel member accept the topic
	6	Panel member send the feedback to the students
	7	System display a message feedback is sent successfully
Extensions	Step	Branching action
	5a	If the topic is not acceptable, panel member will ignore the topic
	7a	If there is an error in input, system will display an error message

02)

Number	08	
Name	Evaluate students' presentations according to the provided marking scheme	
Summery	Panel Members are required to evaluate students' presentations	
Priority	5(1-lowest 5-highest)	
Preconditions	Panel member login to the system	
Post conditions	Panel member have to evaluate students' presentations	
Primary actors	Panel member	
Main scenario	Step	Action
	1	Panel member view the panel page
	2	Panel member schedule the presentations for students
	3	System display scheduled presentation details
	4	Panel member attend to the presentation session on relevant date and time
	5	System allow the member to attend the session
	6	Panel member check the provided marking scheme
	7	Panel member evaluate the students' presentations
	8	Panel member send feedback to the students
	9	System display a message successfully sent the feedback
Extensions	Step	Branching action
	4a	If the credentials are incorrect, attend again to the session
	9a	If there is an error in input, system will display an error message

2.1.1.3 Use case diagram

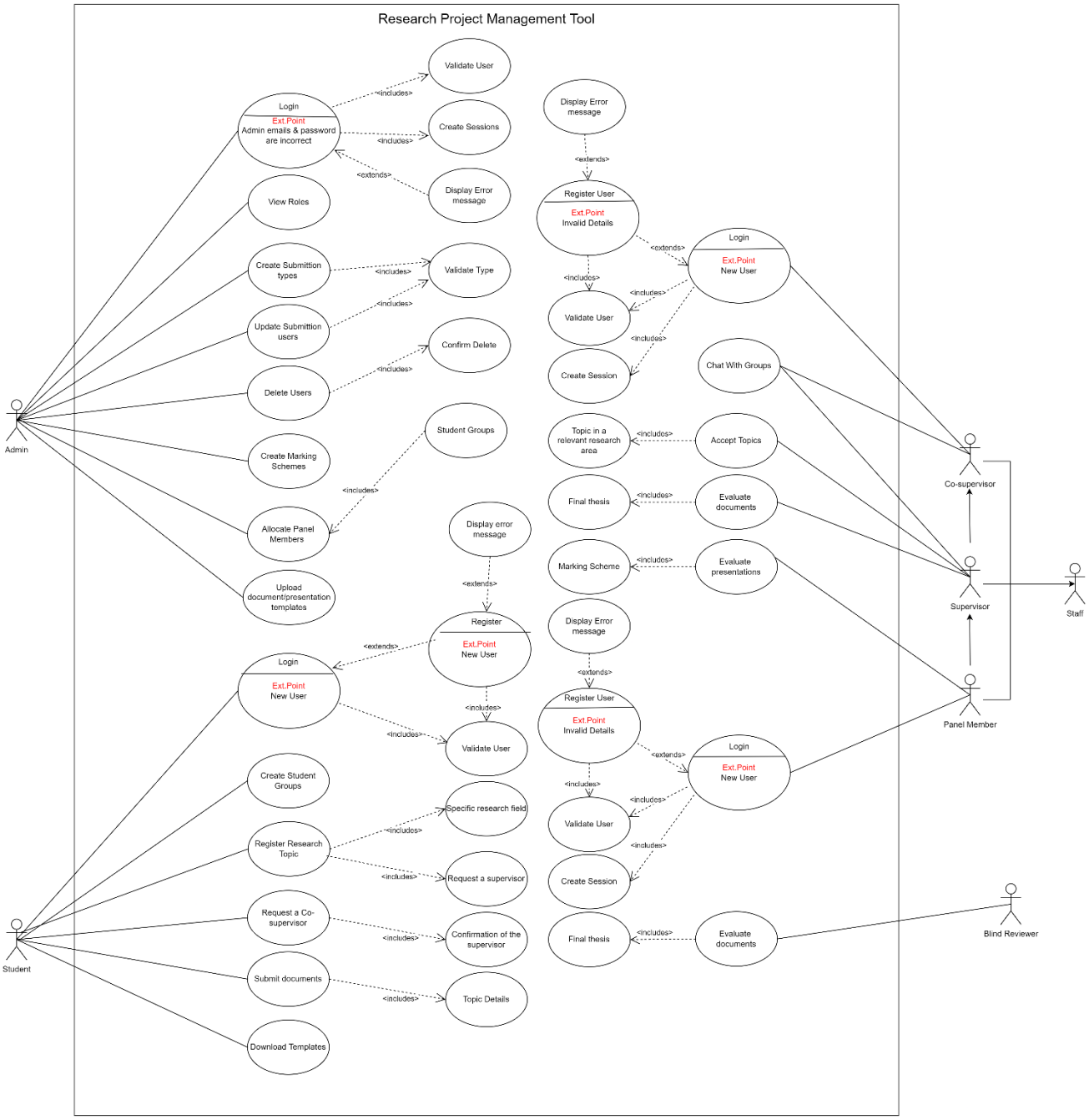

Figure 4: Use case diagram

2.1.1.4 Activity diagrams

Student – Activity Diagram

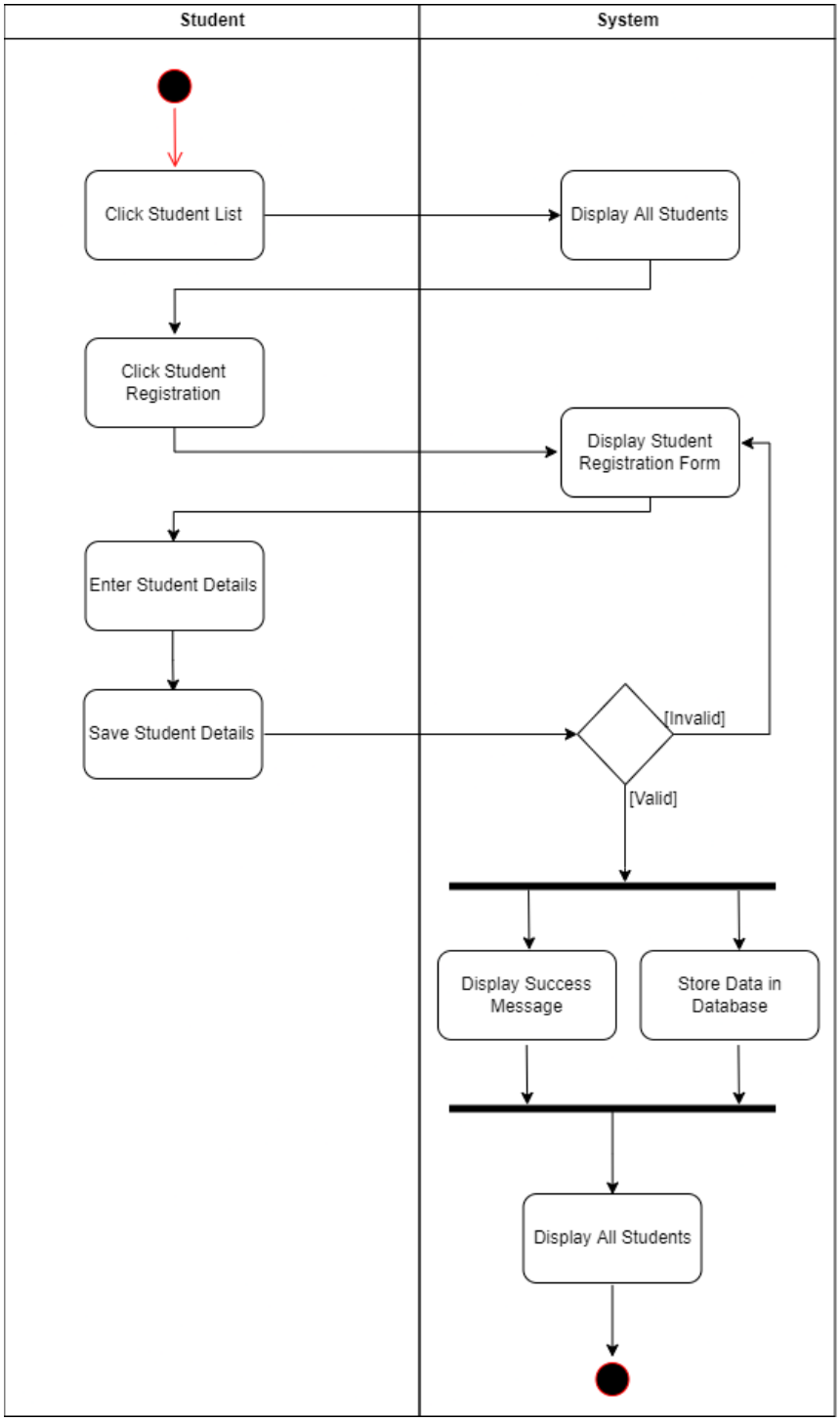

Figure5: Activity diagram of Student registration

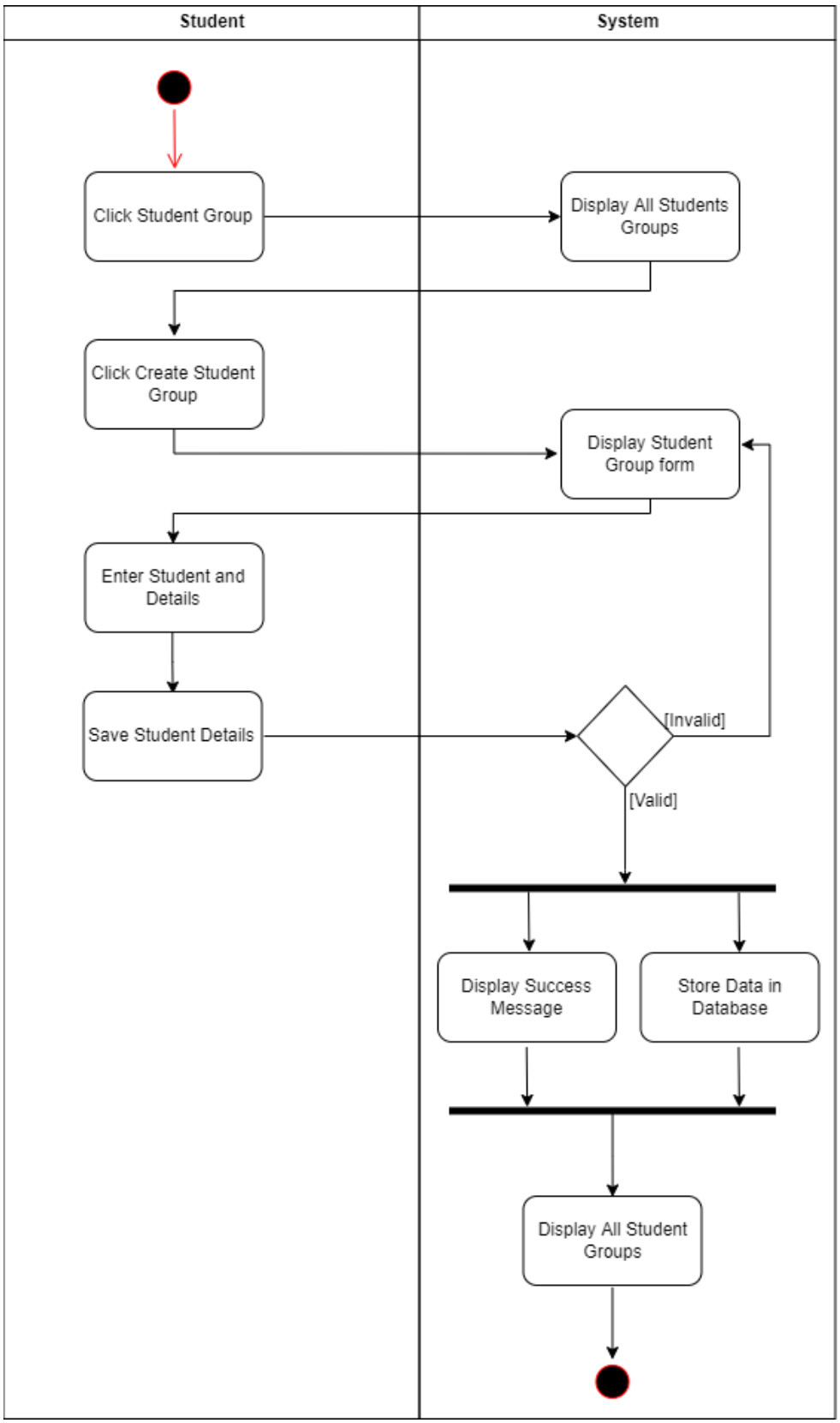

Figure6: Activity diagram of Student create groups

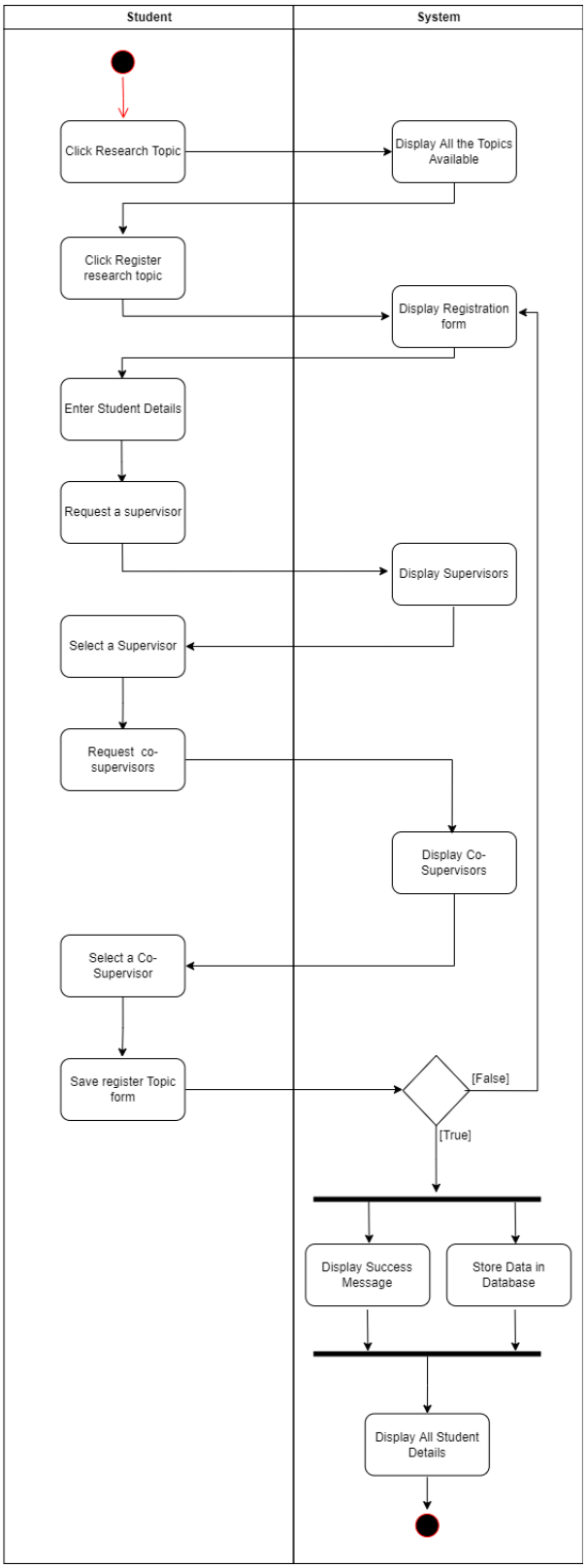

Figure7: Activity diagram of Student register research topic

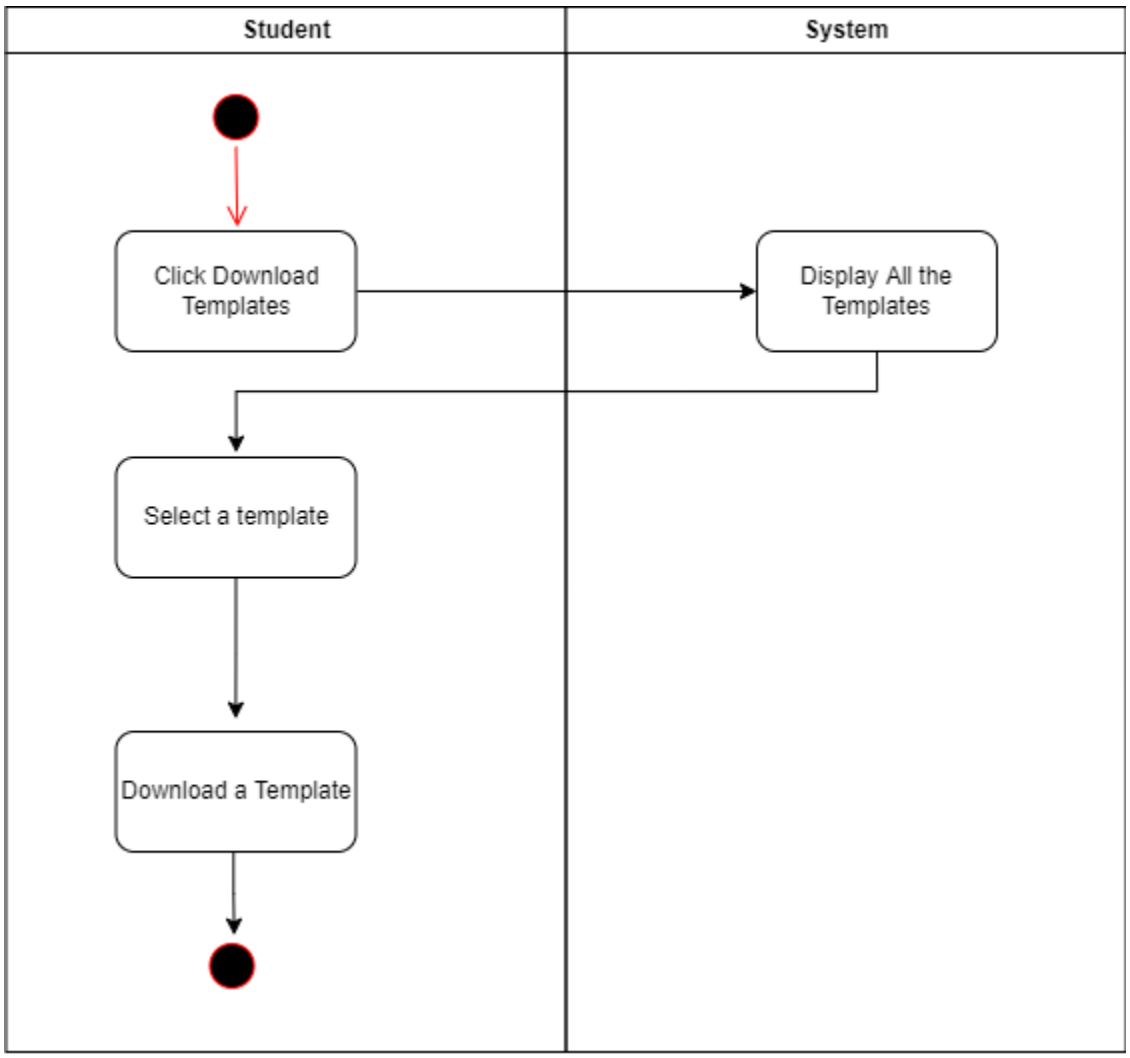

Figure8: Activity diagram of student download templates

Admin – Activity Diagram

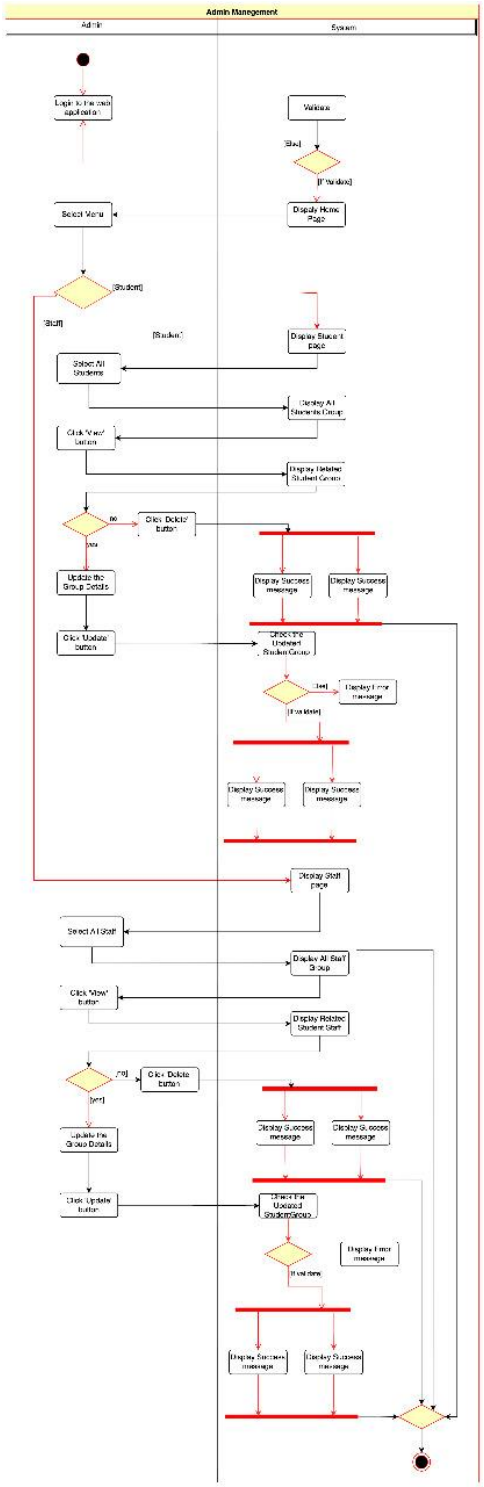

Figure9: Activity diagram of delete/update user

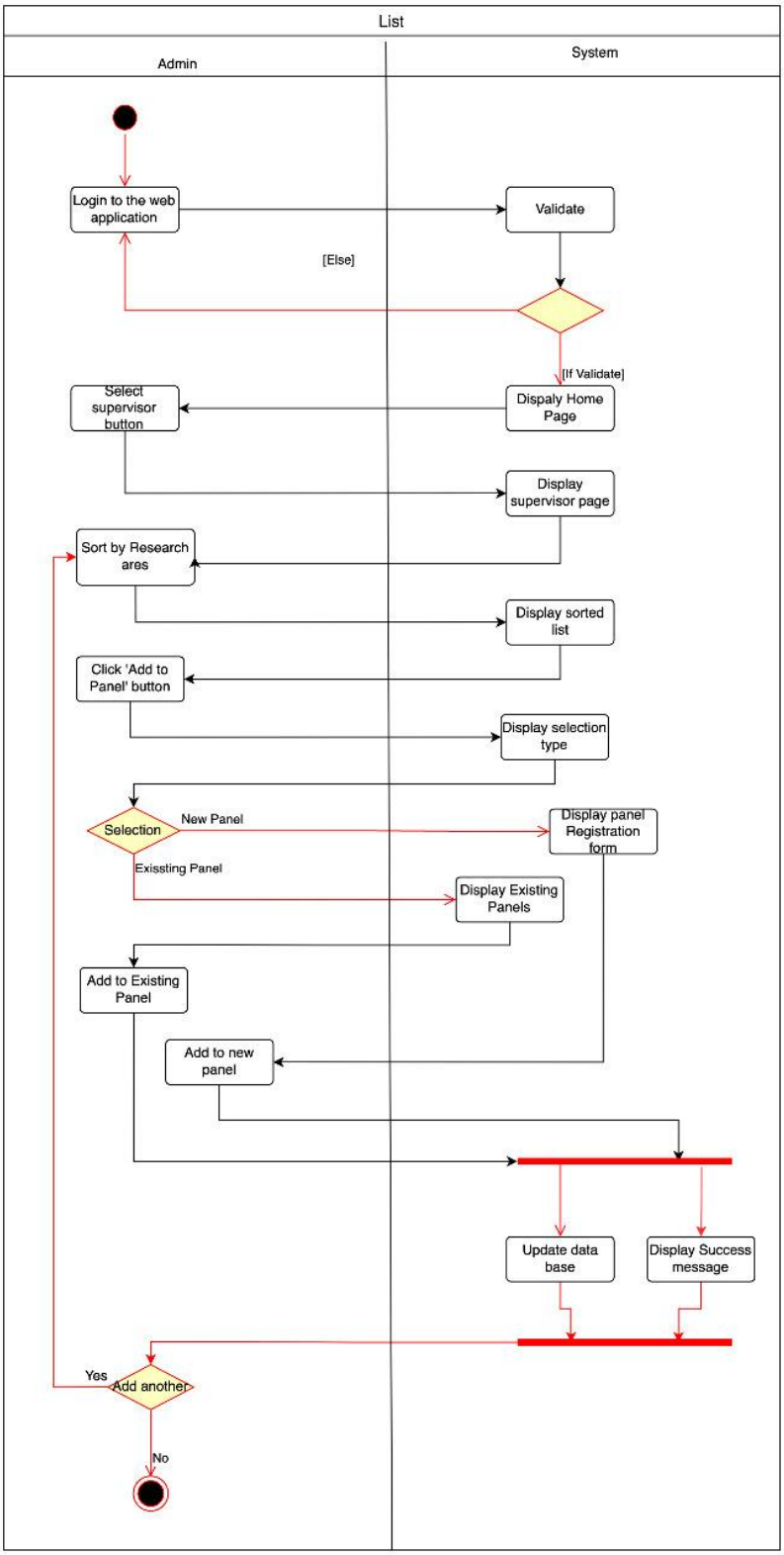

Figure10: Activity diagram of allocate panel members

Staff – update/delete

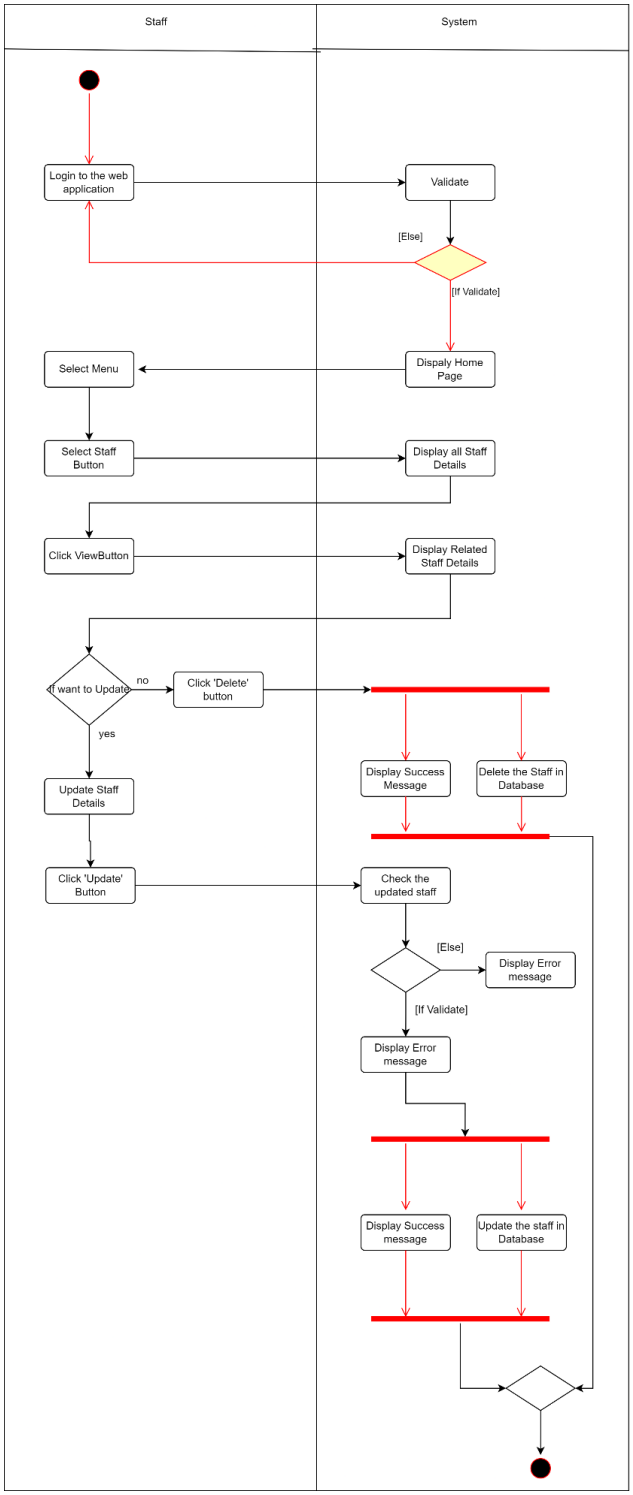

Figure11: Activity diagram of update/delete admin

2.1.2 Non- functional requirements

Performance
A significant number of students, supervisors, panel members, admin are working in the system. All the automated tasks should be fast and accurate. So, the performance of the system can be considered as a major nonfunctional requirement.

Security
The important details of project management should be stored in a safe manner. With the automated system, it assures that all the data entered to the system will be protected against any unauthorized access.
And also, the data should be safe against malware threats.

Usability
Users will be able to navigate between different pages and components easily and the interfaces will be pleasant to use. All the functions have different components, and it will be easier to handle all data entry operations. Users will be able to complete their actions fast and smoothly with the application.

Availability
Many of the tasks happening in the system have to be done on time and it is a must to have an available system. Registrations, Send feedbacks, Evaluate research topics and student presentations, Create student groups can be done at any time with the system. Availability is one of the main nonfunctional requirements which has to be fulfilled within the application.

2.2 Design

2.2.1 High level architecture diagram

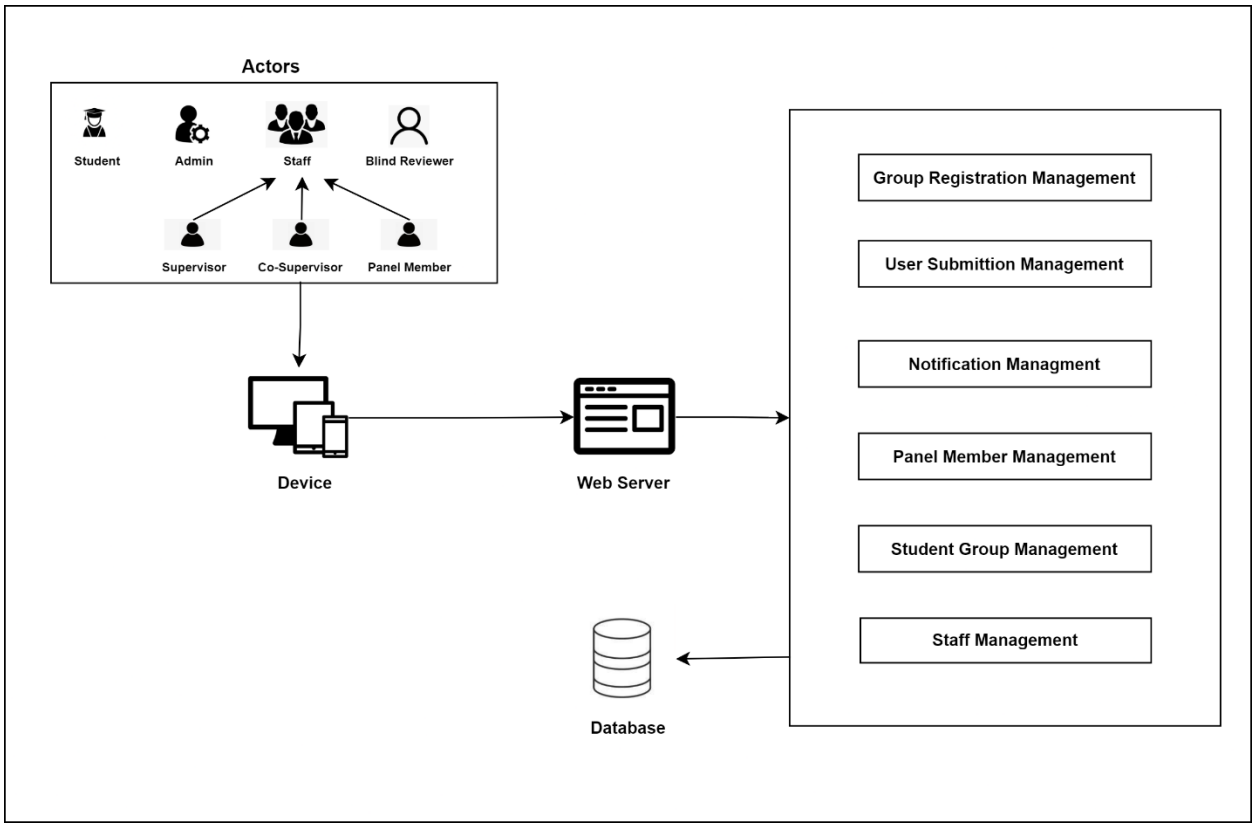

Figure12: High level architecture diagram

2.3 Technologies to be used

Tools

- IntelliJ IDE
- VS Code IDE

Technologies

ReactJS - React.js is an open-source JavaScript library that is used for building user interfaces specifically for single-page applications.

NodeJS - It's used for traditional web sites and back-end API services.

KoaJS or ExpressJS - Main between Koa and Express is how they handle middleware. Express includes routing and templates in the application framework. Koa requires modules for these features, therefore making it more modular or customizable.

JSON based Web Services - JSON API supports CRUD processes for creating, updating, and deleting resources.

NoSQL Database (MongoDB) - With MongoDBs flexible schema approach, it's popular with development teams using agile methodologies.

JEST - Jest is a JavaScript testing framework designed to ensure correctness of any JavaScript codebase. It allows you to write tests with an approachable, familiar and feature-rich API that gives you results quickly.

Git-Hub - Version Control Git is software for tracking changes in any set of files, usually used for coordinating work among programmers collaboratively.

3.Conclusion

We have discussed the complete introduction of the project. We have tried our best to prepare this report. As for the framework, we will use a newly introduced technology called the MERN stack. So that, we will face many challenges such as difficulty finding resources, engaging with the implementations, etc. To get rid of all of these difficulties, we hope to referred to many tutorials and read many documentations. Apart from this, implementing a web application like this will be an excellent opportunity for the business, applicable to the current situation. Because with the pandemic situation the most of the systems have turned into virtual, therefore with all these reasons and to make documenting less of a hassle the we have decided that they need a new automated system to expand the business further. While implementing this project, we will gain a knowledge about new technology with new programming languages, and at the same time, we will also increase our group collaboration.As for the further implementations before deploying this project, we hope to add securable notifications, and add extra functionalities for our managements and increase the user interface appearance.