

Electronic Data Handling (EDH)



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Batch (2015-2019)

ACKNOWLEDGMNET

First, I would like to thank Allah Almighty for giving me the strength, knowledge, ability and opportunity to undertake this project and to persevere and complete it satisfactorily. Without his blessings, this achievement would not have been possible.

A special gratitude I give to my respected teacher and supervisor Ms. Memoona Afsheen Malik, whose guidance and kindness helped me to coordinate in my project. I would like to express my gratitude to all the faculty of computer science department for their kind support and cooperation.

I take pride in acknowledging the insightful guidance of Sir Imran for sparing his valuable time whenever I approached him and showing me the way ahead.

My acknowledgement would be incomplete without thanking the biggest source of my strength, my parents and my family. This would not have been possible without their unwavering and unselfish love and support given to me at all times.

I have great pleasure in acknowledging my gratitude to my colleagues and fellows and specially my friends Ali Azeem Khan Wardag and Urooj Wahid. Their support, encouragement and credible ideas have been great contributors in the completion of the thesis.

Muhammad Ahmad

04071513029

Abstract

Electronic data handling is a web based application. This application consists of 3 modules Hosted Researchers, General Application and IT resource request.

Hosted researchers will request for the resource by filling the form, CAAD will process the request, generate its unique id and store them. CAAD will also generate reports of different types (word, pdf).

Employee will request for the IT resource, Directors give approval for the request and after approval; managers will assign the resource to the Employee.

General Application includes leaves (medical, marriage, for event etc.). Applications will send to the director for the approval. This module will track the application, display the number of the application send to the directors and will send notification to the person.

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Chapter 1: Software Project Management Plan

1.1 Introduction

Software Project Management Plan is the controlling document for managing a software project; it describes the software approach, milestones and other necessary details to develop software work products that satisfy the product requirements.

1.2 Project Overview

Main overview and existing system with its problems are described below.

1.2.1 Problem Definition

The EDH (Electronic Data Handling) system aims to provide cost effective and user-friendly solutions for reducing administrative overheads throughout the organization. The EDH project needs to consolidate the effort on managing workflow cycle regarding routine official matters. The main objective of the system is to replace the paper-based business procedures (like purchase/transport requisitions, access to computational resources, HR (Human Resources) record update etc.) with streamlined electronic workflow, validating data against corporate databases and automatically generating the end-result with minimum human intervention. To start with, the EDH system should first, handle the navigation of routine official notes/memos taking into account the NCP's (National Centre for Physics) organizational hierarchy. After completion of this first step, the project could look forward to incorporate other essential business procedures ranging from Administration to IT branch.

1.2.2 Existing System

In NCP whenever any employee has to submit any type of application firstly, he has to write the application on paper and then forward it to the hierarchy of directors as follows:

- a) Branch head
- b) Department Head
- c) Directorate
- d) DG

Application must be approved by each person.

For example: When a person (Employee or hosted researcher) registers at NCP, he wants to use NCP resources (Internet, Email and login Ids) until he is a part of NCP. For using resources, he has to submit request form manually, which is a headache for concerned department to manage. After completed his tenure at NCP he has to return resources that are assigned to him. For this purpose, he again has to submit manual form which is again headache.

1.2.3 Problem in existing System

Main problems in existing system are

Editing

When working with paper documents like leave application, it is much harder to make changes. Whenever we want to make a change in our existing document, we will have to make a copy. This means the editing process is more time consuming.

Access Time

Existing Manual document filing is very time consuming. Not only have you to Organize and store the files, finding the information when it is need can take time. It can take time from minutes to hours to find a file, depending on how well your organization is. This can cause annoyance for users as well as for administrator. Their productivity is lowered by having to spend excessive time dealing with a paper filing system.

Data Redundancy

Data Redundancy is another important problem in our existing traditional file processing system. It exists when the same data is stored at different places i.e. name of a person is written separately on every application. The file system's structure makes it difficult to combine data from multiple sources. The problems with the redundancy are anomalies and inconsistency.

1.2.4 Proposed System

As we can clearly see that the above-mentioned system is totally manual based so our basic motive is to fully computerize that system and convert it into web-based system. The Details of our proposed web based system are described as follows.

Name of Project: Electronic Data Handling (EDH)

1.3 Scope

Initially we are handling two main aspects

1.3.1 General Application

It includes any type of application written by any employee regardless of their department and forward to their next directors.

1.3.2 IT Department

It includes the basic forms that are used by the department for IT related problems that includes

- a) Account login request
- b) Email quota

- c) Inspection report
- d) Cluster login request
- e) IT equipment issuance
- f) IT clearance
- g) Machine clearance
- h) Network connection request
- i) New machine issuance
- j) Password reset request
- k) Photocopy color print request
- l) Print quota
- m) Software application request
- n) Telephone extension
- o) Thunderbird Configuration

In these two aspects I have to computerize all the forms that circulate manually in the departments.

1.4 Objective

Main objective of EDH is to overcome the problems that are faced by NCP in manual system. And track the status of applications.

1.5 Project Deliverables

Project Deliverables are

- Software Project Management Plan
- Software Requirements Specifications
- Software Design Description
- Software Test Documentation
- Implementation

1.6 Project Organization

Project Organization contains description of software process model used for the project, roles the people play in the making of the project and tools and techniques to be used in this project.

1.6.1 Software Process Model

For the development of this project agile model will be used. Reasons behind using agile model are.

- It is combination of incremental and iterative process model

- It provides rapid delivery of working software product

Roles and Responsibilities

I am single developer of this project so there is no division of roles and responsibilities and all responsibilities are on me regarding this project.

Tools and Techniques

Table 1: Tools and Techniques

Sr.	Tools and Techniques
1	MS Word
2	Argo UML
3	MS Sql
4	Python, Flask Framework
5	JQuery, Ajax
6	Bootstrap
7	Project Libre
8	PyCharm

1.7 Project Management Plan

Project Management plan describes the task, the deliverables and milestones and resources needed to complete the task.

1.7.1 Tasks

List of tasks needed for doing this project are below

Problem Understanding

a. Description

First Problem understanding is must

b. Deliverable and milestone

None

c. Resources needed

Table 2: Problem Understanding

People	Muhammad Ahmad Madam Memoona Afsheen Malik Dr .Muhammad Imran
---------------	---

d. Dependencies and Constraints

None

e. Risks and Contingencies

None

Software Project Management Plan

a. Description

Secondly, software approach and milestones are identified.

b. Deliverable and milestone

None

c. Resources needed

Table 3: SPMP

People	Muhammad Ahmad Madam Meemona Dr.Muhammad Imran
Software	Ms Word Project Libre
Hardware	Computer

d. Dependencies and Constraints

Problem Understanding

e. Risks and Contingencies None

Software Requirement Specification

a. Description

Thirdly, analysis on how the requirements will meet is included.

b. Deliverable and milestone

SPMP and SRS document

c. Resources needed

Table 4: SRS

People	Muhammad Ahmad Madam Memoona Afsheen Malik Dr. Muhammad Imran
Software	Ms Word Diagram Desiner/Argo UML
Hardware	Computer

d. Dependencies and Constraints

SPMP

e. Risks and Contingencies None

Software Design Description

a. Description

Fourthly, detail design and interface design will be included.

b. Deliverable and milestone

None

c. Resources needed

Table 5: SDD

People	Muhammad Ahmad Madam Memoona Afsheen Malik Dr. Muhammad Imran
Software	Ms Word Diagram Desiner/Argo UML
Hardware	Computer

d. Dependencies and Constraints

SPMP

e. Risks and Contingencies None

Software Test Documentation

a. Description

In this part software test will be make for the validation of final product

b. Deliverable and milestone

SDD and STD document

c. Resources needed

Table 6: STD

People	Muhammad Ahmad Madam Memoona Afsheen Malik Dr. Muhammad Imran
---------------	--

d. Dependencies and Constraints

SDD

e. Risks and Contingencies

None

Software Implementation

a. Description

This part explains about software implementation

b. Deliverable and milestone

None

c. Resources needed

Table 7: Software Implementation

People	Muhammad Ahmad Madam Memoona Afsheen Malik Dr .Muhammad Imran
Software	Eclipse, CMD

d. Dependencies and Constraints

STD

e. Risks and Contingencies

None

1.8 Project Management Plan

1.8.1 Time Table

	Name	Duration	Start	Finish	Pr...	Resource Names
2	Electronic Data Handling (EDH)	173 days?	11/5/18 8:00 AM	7/3/19 5:00 PM		
3	Project understanding	7 days?	11/5/18 8:00 AM	11/13/18 5:00 PM		
4	Software Project Management Plan	10 days?	11/14/18 8:00 AM	11/27/18 5:00 PM	3	Muhammad Ahmad;MS Word;PC
5	Write Introduction	1 day?	11/14/18 8:00 AM	11/14/18 5:00 PM		
6	Define Existing System	1 day?	11/15/18 8:00 AM	11/15/18 5:00 PM	5	
7	Define problems in old system	1 day?	11/16/18 8:00 AM	11/16/18 5:00 PM	6	
8	Propose Solution	1 day?	11/19/18 8:00 AM	11/19/18 5:00 PM	7	
9	Define Scope and Objective	1 day?	11/20/18 8:00 AM	11/20/18 5:00 PM	8	
10	Define Project Deliverables	1 day?	11/21/18 8:00 AM	11/21/18 5:00 PM	9	
11	Selection of Process Model	1 day?	11/22/18 8:00 AM	11/22/18 5:00 PM	10	
12	Define Project Management Plan	2 days?	11/23/18 8:00 AM	11/26/18 5:00 PM	11	Project Libre
13	Review and Modify Whole document	1 day?	11/27/18 8:00 AM	11/27/18 5:00 PM	12	Muhammad Ahmad
14	Analysis and Requirement	64 days?	11/28/18 8:00 AM	2/25/19 5:00 PM	13	Muhammad Ahmad;MS Word;PC
15	Software Requirement Specification	34 days?	11/28/18 8:00 AM	1/14/19 5:00 PM		
16	Give Introduction and Overview	1 day?	11/28/18 8:00 AM	11/28/18 5:00 PM		
17	Identify Specific Requirements	2 days?	11/28/18 8:00 AM	11/29/18 5:00 PM		
18	Identify Use Cases	2 days?	11/30/18 8:00 AM	12/3/18 5:00 PM	17	
19	Make UseCase Diagram	1 day?	12/4/18 8:00 AM	12/4/18 5:00 PM	18	Diagram Designer
20	Review and Refine UC Diagram	2 days?	12/5/18 8:00 AM	12/6/18 5:00 PM	19	Mam Meemona Afsheen Malik;Dr.Muhammad I...
21	Define UseCase descriptions	4 days?	12/7/18 8:00 AM	12/12/18 5:00 PM	20	
22	Review and Refine UC Description	1 day?	12/13/18 8:00 AM	12/13/18 5:00 PM	21	Mam Meemona Afsheen Malik;Dr.Muhammad I...
23	Define System Attributes	4 days?	12/14/18 8:00 AM	12/19/18 5:00 PM	22	
24	Make Domain Model	3 days?	12/20/18 8:00 AM	12/24/18 5:00 PM	23	Diagram Designer
25	Review and Refine SRS	3 days?	12/25/18 8:00 AM	12/27/18 5:00 PM	24	Mam Meemona Afsheen Malik;Dr.Muhammad I...
26	Provide 1st Deliverable	1 day?	12/28/18 8:00 AM	12/28/18 5:00 PM	25	
27	Define Database	1 day?	12/31/18 8:00 AM	12/31/18 5:00 PM	26	

Figure 1: Timetable (a)

	Name	Duration	Start	Finish	Pr...	Resource Names
28	Define Entities	1 day?	1/1/19 8:00 AM	1/1/19 5:00 PM	27	
29	Make ERD	1 day?	1/2/19 8:00 AM	1/2/19 5:00 PM	28	
30	Review ERD	3 days?	1/3/19 8:00 AM	1/7/19 5:00 PM	29	
31	System Sequence Diagrams	1 day?	1/8/19 8:00 AM	1/8/19 5:00 PM	30	
32	Review SSDs	1 day?	1/9/19 8:00 AM	1/9/19 5:00 PM	31	
33	Review Complete SRS	3 days?	1/10/19 8:00 AM	1/14/19 5:00 PM	32	
34	Software Design Description	15 days?	1/15/19 8:00 AM	2/4/19 5:00 PM	33	Muhammad Ahmad;MS Word;PC
35	Give Introduction and Overview	1 day?	1/15/19 8:00 AM	1/15/19 5:00 PM		
36	Make Activity Diagrams	2 days?	1/15/19 8:00 AM	1/16/19 5:00 PM		Diagram Designer
37	Review and Refine Activity Diagram	1 day?	1/17/19 8:00 AM	1/17/19 5:00 PM	36	Mam Meemona Afsheen Malik;Dr.Muhammad I...
38	Make System Architectural Design	3 days?	1/15/19 8:00 AM	1/17/19 5:00 PM		Diagram Designer
39	Review and Refine Architecture Diagram	1 day?	1/18/19 8:00 AM	1/18/19 5:00 PM	38	Mam Meemona Afsheen Malik;Dr.Muhammad I...
40	Make Sequence Diagrams	2 days?	1/21/19 8:00 AM	1/22/19 5:00 PM	39	Diagram Designer
41	Review and Refine SD	1 day?	1/23/19 8:00 AM	1/23/19 5:00 PM	40	Mam Meemona Afsheen Malik;Dr.Muhammad I...
42	Identify Classes	3 days?	1/24/19 8:00 AM	1/28/19 5:00 PM	41	Muhammad Ahmad
43	Make Class Diagram	2 days?	1/29/19 8:00 AM	1/30/19 5:00 PM	42	Diagram Designer
44	Review and Refine Class Diagram	2 days?	1/31/19 8:00 AM	2/1/19 5:00 PM	43	Mam Meemona Afsheen Malik;Dr.Muhammad I...
45	Review and Refine Software Design Description	1 day?	2/4/19 8:00 AM	2/4/19 5:00 PM	44	Mam Meemona Afsheen Malik;Dr.Muhammad I...
46	Make User Manual	6 days?	2/5/19 8:00 AM	2/12/19 5:00 PM	45	Muhammad Ahmad;MS Word;PC
47	Make User Interfaces	3 days?	2/5/19 8:00 AM	2/7/19 5:00 PM		
48	Give Description of UI	2 days?	2/8/19 8:00 AM	2/11/19 5:00 PM	47	
49	Review and Refine UI	1 day?	2/12/19 8:00 AM	2/12/19 5:00 PM	48	Mam Meemona Afsheen Malik;Dr.Muhammad I...
50	Make Software Test Document	3 days?	2/13/19 8:00 AM	2/15/19 5:00 PM	49	Muhammad Ahmad;MS Word;PC
51	Make Test Cases	2 days?	2/13/19 8:00 AM	2/14/19 5:00 PM		MS Word
52	Review and Refine Test Document	1 day?	2/15/19 8:00 AM	2/15/19 5:00 PM	51	Mam Meemona Afsheen Malik;Dr.Muhammad I...
53	Review Analysis and Design Document	5 days?	2/18/19 8:00 AM	2/22/19 5:00 PM	52	Mam Meemona Afsheen Malik;Dr.Muhammad I...
54	Provide 2nd Deliverable	1 day?	2/25/19 8:00 AM	2/25/19 5:00 PM	53	

Figure 2: Timetable (b)

1.8.2 Gantt chart

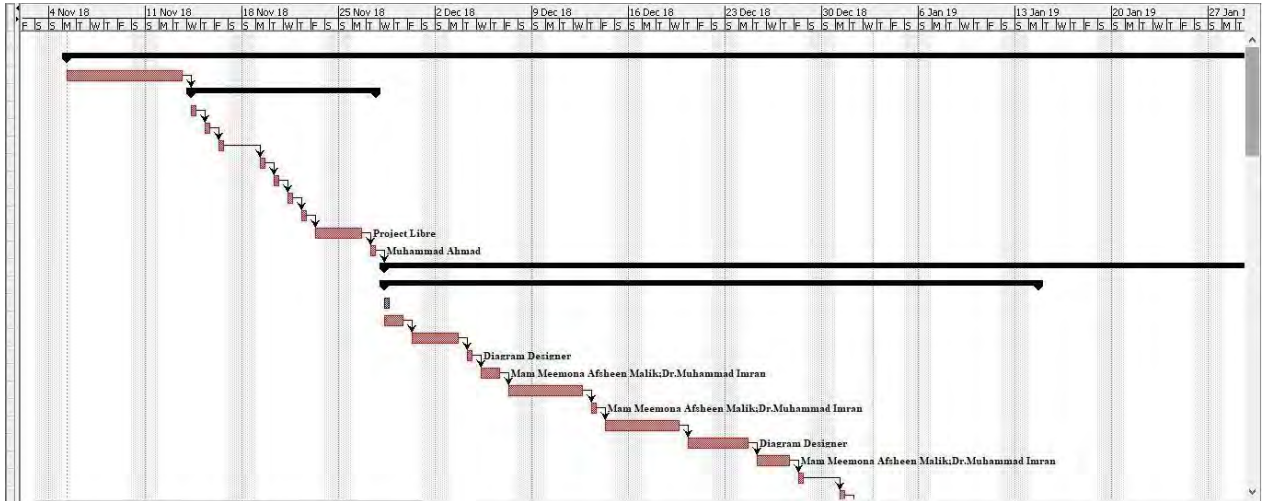


Figure 3: Gantt chart (a)

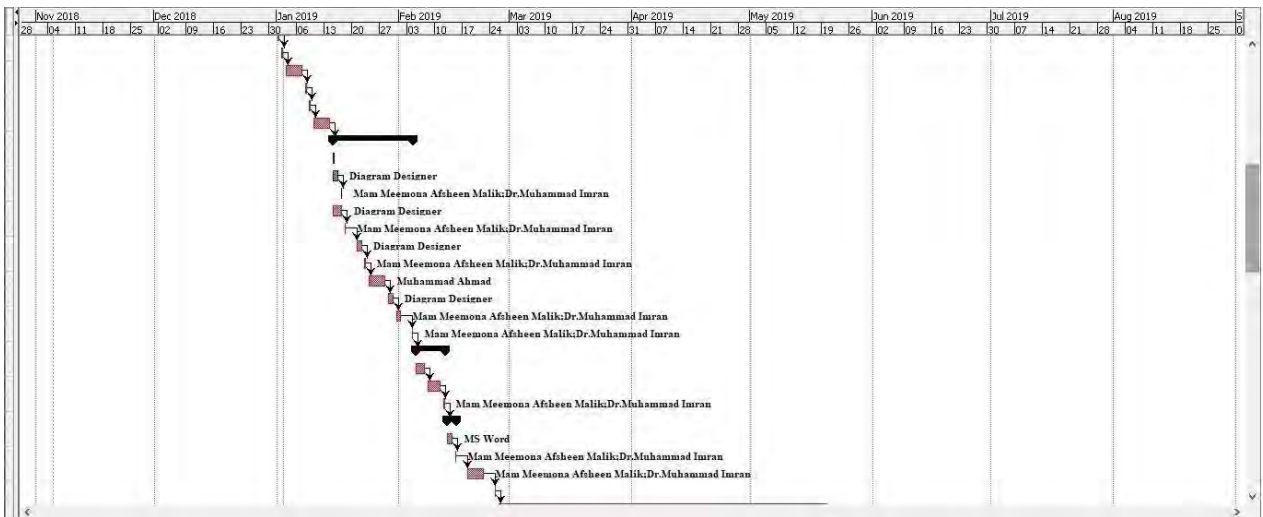


Figure 4: Gantt Chart (b)

1.9 Report Structure

This chapter has briefly introduced the system. It has also elucidated problem description, proposed solution, scope, objective, and described the organization of the project and project management plan. Chapter 2 describes the functional and non-functional requirement specifications of the system. Chapter 3 provides an overview of the software design. Chapter 4 describes the details of implementation phase, and chapter 5 describes the details of testing phase.

Chapter 2: Software Requirement Specification

2.1 Introduction

A software requirements specification (SRS) is a description of a software system to be developed. It lays out functional and non-functional requirements, and may include a set of use cases that describe user interactions that the software must provide.

2.2 Product Overview

The developed web-based application is implemented in Python version 3.5.0 (frame work Flask). Every employee at NCP is eligible to use this application. By using this application, user can submit the application of any type regardless of their department and forward it to hierarchy of directors for approval and also submit request for using the resources that are provided by the NCP to its Employee, hosted researchers and guest.

2.3 Major Inputs and Outputs

2.3.1 Inputs

- User name and password
- Application content
- Resource request
- Tracing ID

2.3.2 Outputs

- Application status
- Report on every form submitted or processed
- Clearance report

2.4 Major Functionality

Major functionality of EDH is

- Filling and submitting forms and reports through website.
- System should be able to generate reports on each of the forms.
- Whenever document is forwarded to any of the directors then an email and notification should be sent to that person from the system acknowledging that he has some requests to process.
- System should be able to maintain records of requested and assigned resources.
- System let the user know about the status of his application.

2.5 Definitions, Acronyms and Abbreviations

Table 8: Definitions. Acronyms and Abbreviations

Terms	Description
CAAD	Administrative department at NCP for the management of hosted researchers and guests
EDH	Electronic Data Handling
Admin	CAAD
Users, CAAD	Employee, Hosted Researcher, Guest, Manager, and Directors
System	Web base application
NCP	National Centre for Physics
Device	Computer, laptop, and mobile phone

2.6 Overview

The rest of the chapter focuses on functional, non-functional and performance requirements, the overall functionality of the system, use cases and their description.

2.7 User Characteristics

This is assumed that users have basic knowledge of computer, laptop and mobile phone and knowledge of the web base application.

2.8 Constraints

Users have computer, laptop and mobile phone with internet connection.

2.9 Specific Requirements

2.9.1 Functional Requirements

The following are the functional requirements

- Login
- Logout
- Sign application
- Register account

- Track application
- Generate reports
- Request resources
- Assign resources
- Forward application
- Write application
- Process clearance
- Check Hosted Researchers Requests
- Generate Hosted Researchers Id
- Print Document

2.9.2 Non-Functional Requirements

Reliability

System should be reliable. There should be no occurrence of the failure. The system should be able to work properly all-time.

Availability

The system should be accessible to the users all of the time. And it is available within organization and as well as outside the organization.

Maintainability

The system is to be developed so that it can be easily maintained. Also, it should allow integrating new requirements in any module of system.

Portability

The system is web based so it is portable on any device that has internet connection.

Security

Each user account is password protected. Only NCP's registered user can request the resources, and write the application to directors.

2.10 Use Case Diagram

The use case diagram of system is as follows in figure 5.

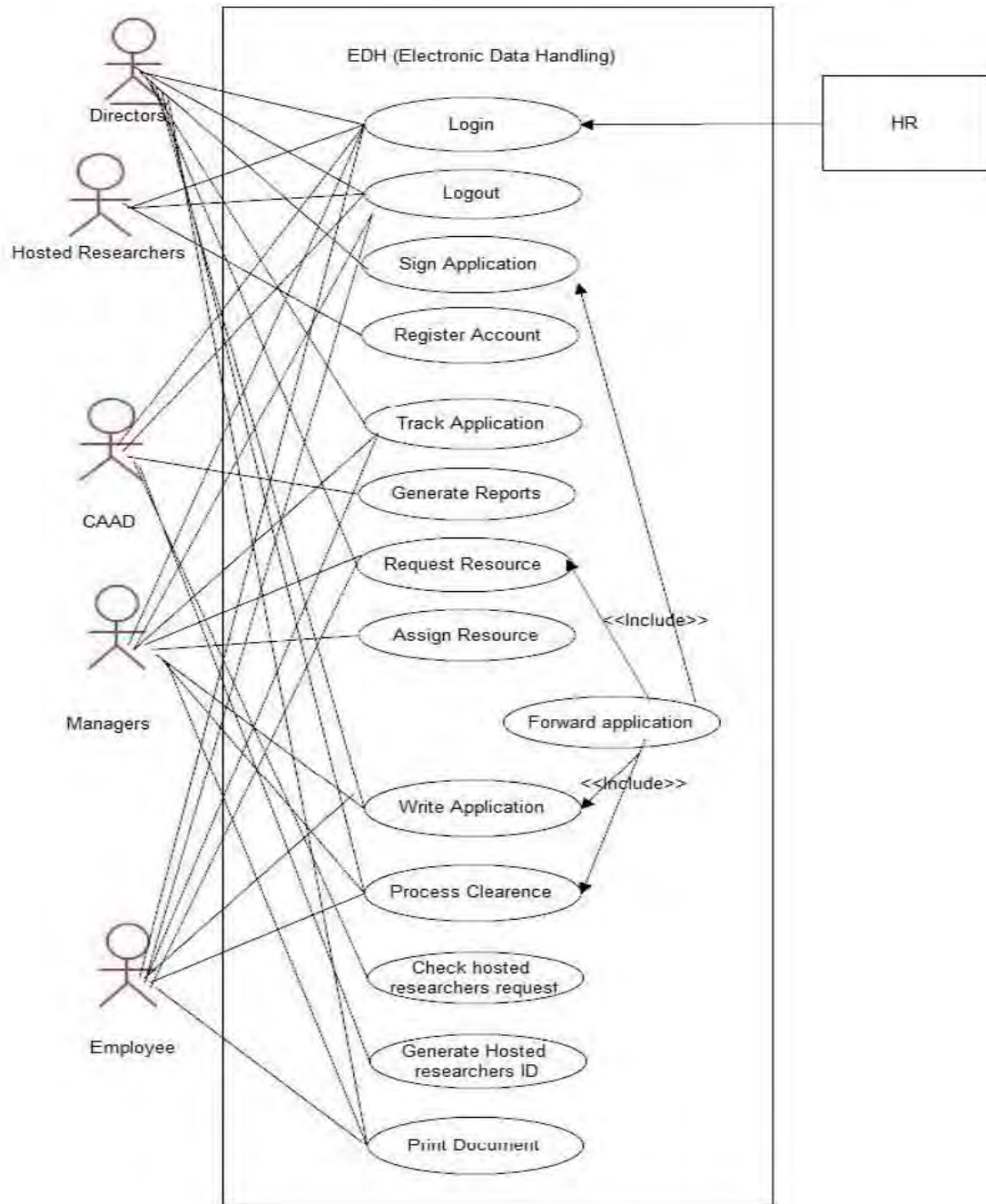


Figure 5: Use Case diagram

2.11 Use Case Description

Use Case 1: Login

Table 9: Login Use Case

ID	UC1
Name	Login
Primary Actor	Hosted Researchers, Managers, Employee, Directors
Pre-Condition	Users are required to have an account.
Post Condition	Users logged in successfully and system displayed dashboard.
Main Success Scenario	<ol style="list-style-type: none">1) Users enter email address and password.2) Users click the login option.3) System displays the dashboard
Alternative flows or Extensions	<p>*Server and internet link down.</p> <ol style="list-style-type: none">1. User's waits until the internet and server recovered.<ol style="list-style-type: none">1a) Users enter incorrect credentials.<ol style="list-style-type: none">1. System prompts hosted researchers and guest to enter correct username.2a) Users submit information without filling all required fields.<ol style="list-style-type: none">2. System asks users to fill all required fields.
Frequency	Could be nearly continuous

Use Case 2: Logout

Table 10: Logout Use Case

ID	UC2
Name	Logout
Primary Actor	Hosted Researchers, Managers, Employee, Directors
Pre-Condition	Users are required be logged in.
Post Condition	Users logged out successfully.
Main Success Scenario	1) Users click logout option. 2) System displays login screen.
Alternative flows or Extensions	*Server and internet link down. 1. Users waits until the internet and server are recovered.
Frequency	Could be nearly continuous

Use Case 3: Sign Application

Table 11: Sign Application Use Case

ID	UC3
Name	Sign Application
Primary Actor	Directors
Pre-Condition	1) Director is logged in to system. 2) Director has received the application.
Post Condition	Application successfully signed by directors.
Main Success Scenario	1) Click on the option (document signed by me). 2) System shows the application. 3) Directors click on sign option. 4) System display application comment box and action option. 5) Director writes comments. 6) Select the action. 7) Click on the submit option. 8) System saves record of signature.
Alternative flows or Extensions	*Server and internet link down. 1. Directors wait until the internet and server are recovered. 1a) Directors not logged in to system 1 System prompt users to login first. 1b) Application is not received by directors. 1. System notifies the sender. 2. Sender again forwards the application to directors 7a) Directors submit the application without filling the comment box and selecting the action. 1. System prompts the directors to fill the comment box and Select the action field.
Frequency	Could be nearly continuous

Use Case 4: Register Account

Table 12: Register Account Use Case

ID	UC4
Name	Register Account
Primary Actor	Hosted Researchers
Pre-Condition	Hosted Researchers is Logged in to system
Post Condition	Hosted researchers and guest registered successfully.
Main Success Scenario	<ol style="list-style-type: none"> 1) Click on the registration option 2) System shows the registration screen. 3) Fill the required information. 4) Click on the submit option. 5) System prompt hosted researches and guest registered successfully.
Alternative flows or Extensions	<p>*Server and internet link down.</p> <ol style="list-style-type: none"> 1. Hosted Researchers waits until the internet and server are recovered. <ol style="list-style-type: none"> 1a) Hosted Researches not logged in to system <ol style="list-style-type: none"> 1 System prompts the Hosted Researchers to login first. 3a) Hosted Researches enters the incorrect information. <ol style="list-style-type: none"> 1 System prompts the Hosted Researchers to enter correct information. 4a) Hosted Researchers submit information without filling all the required fields. <ol style="list-style-type: none"> 1. System prompts the Hosted Researchers to enter all the required fields.
Frequency	Could be nearly continuous

Use Case 5: Track Application

Table 13: Track Application Use Case

ID	UC5
Name	Track Application
Primary Actor	Managers, Employee, Directors
Pre-Condition	1) Users logged in to system 2) Users have already submitted an application.
Post Condition	System displays status of application,
Main Success Scenario	1) Click on the option document created by me 2) The system shows the application. 3) Click on the view option. 4) System displays the application's detail with status.
Alternative flows or Extensions	*Server and internet link down. 1. Users wait until the internet and server are recovered. 1a) Users not logged in to system 1 System prompt users to login first.
Frequency	Could be nearly continuous

Use Case 6: Generate Reports

Table 14: Generating Reports Use Case

ID	UC6
Name	Generate Reports
Primary Actor	CAAD
Pre-Condition	CAAD logged in to system
Post Condition	System generates and displays the report
Main Success Scenario	<ol style="list-style-type: none"> 1) Click on CAAD option. 2) Click on the report option. 3) Select the category in search field. 4) System displays records.
Alternative flows or Extensions	<p>*Server and internet link down.</p> <ol style="list-style-type: none"> 1. CAAD wait until the internet and server are recovered. 1a) CAAD not logged in to system <ol style="list-style-type: none"> 1 System prompt CAAD to login first. 3a) No data found against selected category. <ol style="list-style-type: none"> 1. System prompts Nil messages.
	<ol style="list-style-type: none"> 3b) CAAD click on the generate reports option without selecting any category. <ol style="list-style-type: none"> 1. System prompt CAAD to select the category.
Frequency	Could be nearly continuous

Use Case 7: Request Resource

Table 15: Request Resources Use Case

ID	UC7
Name	Request Resource
Primary Actor	Managers, Employee, Directors
Pre-Condition	1) Hosted researcher and guest should be registered by the CAAD. 2) Users logged in to system.
Post Condition	Notification send to manager.
Main Success Scenario	1) Users click on the required resource option. 2) System displays forms. 3) Users fill the required fields. 4) User click on the submit option. 5) System saves record and will send notification to manger.
Alternative flows or Extensions	*Server and internet link down. 1. Users wait until the internet and server are recovered. 1a) Hosted researcher and guest not registered by CAAD. 1. Hosted researcher and guest are unable to request the resource. 2. Hosted researcher and guest must be registered by the CAAD. 4) Users submit the forms request without filling the fields of required resources. 1. System prompts users to fill the required fields.
Frequency	Could be nearly continuous

Use Case 8: Assign Resources

Table 16: Assign Resources Use Case

ID	UC8
Name	Assign Resources
Primary Actor	Managers
Pre-Condition	<ol style="list-style-type: none"> 1) Managers received request form employee, hosted researchers and guests. 2) Manager is logged in to system.
Post Condition	Requested resources assigned successfully.
Main Success Scenario	<ol style="list-style-type: none"> 1) Click on a link that is send to managers by notification. 2) System shows the requests. 3) Managers click on assign option. 4) System display application comment box and sign option. 5) Manager write details in comment box. 6) Select sign option. 7) Click on the submit option. 8) System saves record of assignments.
Alternative flows or Extensions	<p>*Server and internet link down.</p> <ol style="list-style-type: none"> 1. User waits until the internet and server are recovered. <p>2a) Managers not logged in to system.</p> <ol style="list-style-type: none"> 1. System prompts managers to login first. <p>2b) Resource is not available.</p> <ol style="list-style-type: none"> 1. Employee, hosted researches and guest have to wait until the availability of resource
Frequency	Could be nearly continuous

Use Case 9: Forward Application

Table 17: Forward Application Use Case

ID	UC9
Name	Forward Application
Primary Actor	Employee, Directors
Pre-Condition	<ol style="list-style-type: none"> 1) Employee has typed the application 2) Directors received application. 3) Employee and directors logged in to system.
Post Condition	System forwarded the application to selected directors.
Main Success Scenario	<ol style="list-style-type: none"> 1) Select the directors 2) Click on the forward option.
Alternative flows or Extensions	<p>*Server and internet link down.</p> <ol style="list-style-type: none"> 1. Employee and directors waits until the internet and server are recovered. <ol style="list-style-type: none"> 1a) Application is not written by the employee. <ol style="list-style-type: none"> 1. System prompts the employee to write the application. 1b) Employee and directors not logged in to system <ol style="list-style-type: none"> 2. System prompts the employee and directors to login. 2a) employee and directors not select the next director. <ol style="list-style-type: none"> 1. System prompts employee and directors to select the next director.
Frequency	Could be nearly continuous

Use Case 10: Write Application

Table 18: Write Application Use Case

ID	UC10
Name	Write Application
Primary Actor	Managers, Employee, Directors
Pre-Condition	1) User logged in to system.
Post Condition	System saves the application.
Main Success Scenario	<ol style="list-style-type: none"> 1) Users clicks on the general application option. 2) System return application screen. 3) Users writes the application. 4) Users select the attach document option if there is any. <ol style="list-style-type: none"> 4a) System opens the file explorer to let the user select the document. 4b) Users select the files to be attached option and select the attach option. 4c) System loads the files from the device (computers, mobile) to the website. 5) User clicks the submit option. 6) System saves the application along with the documents(if any)
Alternative flows or Extensions	<p>*Server and internet link down.</p> <ol style="list-style-type: none"> 1. User waits until the internet and server are recovered. <ol style="list-style-type: none"> 1a) Users not logged in to system 1b. System prompt user to log in. 2a) Users exceed the provided character limit. 3) System prompt users about the limitation. 4a) Users saves application without writing anything. <ul style="list-style-type: none"> • System prompt users to write something in application field.
Frequency	Could be nearly continuous

Use Case 11: Process Clearance

Table 19: Process Clearance Use Case

ID	UC11
Name	Process Clearance
Primary Actor	Managers, Employee, Directors
Pre-Condition	1) Employee occupied some resources. 2) Employee, hosted researchers and guest logged in to system.
Post Condition	Occupied resources by hosted researches and employee are roll Backed.
Main Success Scenario	1) Employee click on the clearance option. 2) System displays clearance form. 3) Employee fill the form 4) Employee click the submit option. 5) System save the form.
Alternative flows or Extensions	*Server and internet link down. 1. Employee, hosted researchers and guest wait until the internet and server are recovered. 1a) Employee, hosted researchers and guest not logged in to system 1b) System prompts users to login first. 2a) Employee, hosted researchers and guest occupied no resource. 1. System hide submit option.
Frequency	Could be nearly continuous

Use Case 12: Check Hosted Researchers Requests

Table 20: Check Hosted Researchers Requests

ID	UC12
Name	Check Hosted Researches Requests
Primary Actor	CAAD
Pre-Condition	1) CAAD is logged in to system. 2) Receive requests from hosted researchers.
Post Condition	System will display the Request List of hosted researches.
Main Success Scenario	1) Click CAAD option. 2) Click hosted researcher's option. 3) System will display the request list of the hosted researchers.
Alternative flows or Extensions	*Server and internet link down. 1. CAAD wait until the internet and server are recovered. 1a) CAAD not logged in to system 1. System prompts users to login first.
Frequency	Could be nearly continuous

Use Case 13: Generate Hosted Researchers Id

Table 21: Generate hosted researchers id use case

ID	UC13
Name	Generate Hosted Researchers Id
Primary Actor	CAAD
Pre-Condition	<ol style="list-style-type: none"> 1) CAAD login to the system. 2) Receives hosted researchers request.
Post Condition	System will generate hosted researchers id.
Main Success Scenario	<ol style="list-style-type: none"> 1) Click CAAD option. 2) Click hosted researcher's option. 3) System will display the request list of the hosted researchers. 4) CAAD will click the view option of any hosted researchers in the request list. 5) System will display the details of the hosted researchers. 6) Write id in new ID box 7) Click on the submit option
Alternative flows or Extensions	<p>*Server and internet link down.</p> <ol style="list-style-type: none"> 1. CAAD wait until the internet and server are recovered. 1a) CAAD not logged in to system 1. System prompts users to login first.
Frequency	Could be nearly continuous

Use Case 14: Print Document

Table 22: Print document use case

ID	UC14
Name	Print Document
Primary Actor	Managers, Employee, Directors
Pre-Condition	<ol style="list-style-type: none"> 1) User login to the system. 2) Data of the required printed document exists in database
Post Condition	System will generate the document in pdf format and download the Document into the system.
Main Success Scenario	<ol style="list-style-type: none"> 1) Open document 2) Click print option 3) System will generate the document in pdf format and download the document into the system
Alternative flows or Extensions	<p>*Server and internet link down.</p> <ol style="list-style-type: none"> 1. CAAD wait until the internet and server are recovered. 1a) CAAD not logged in to system 1. System prompts users to login first.
Frequency	Nearly continuous

2.12 Domain Model

The domain model of system is as follows in figure 6.

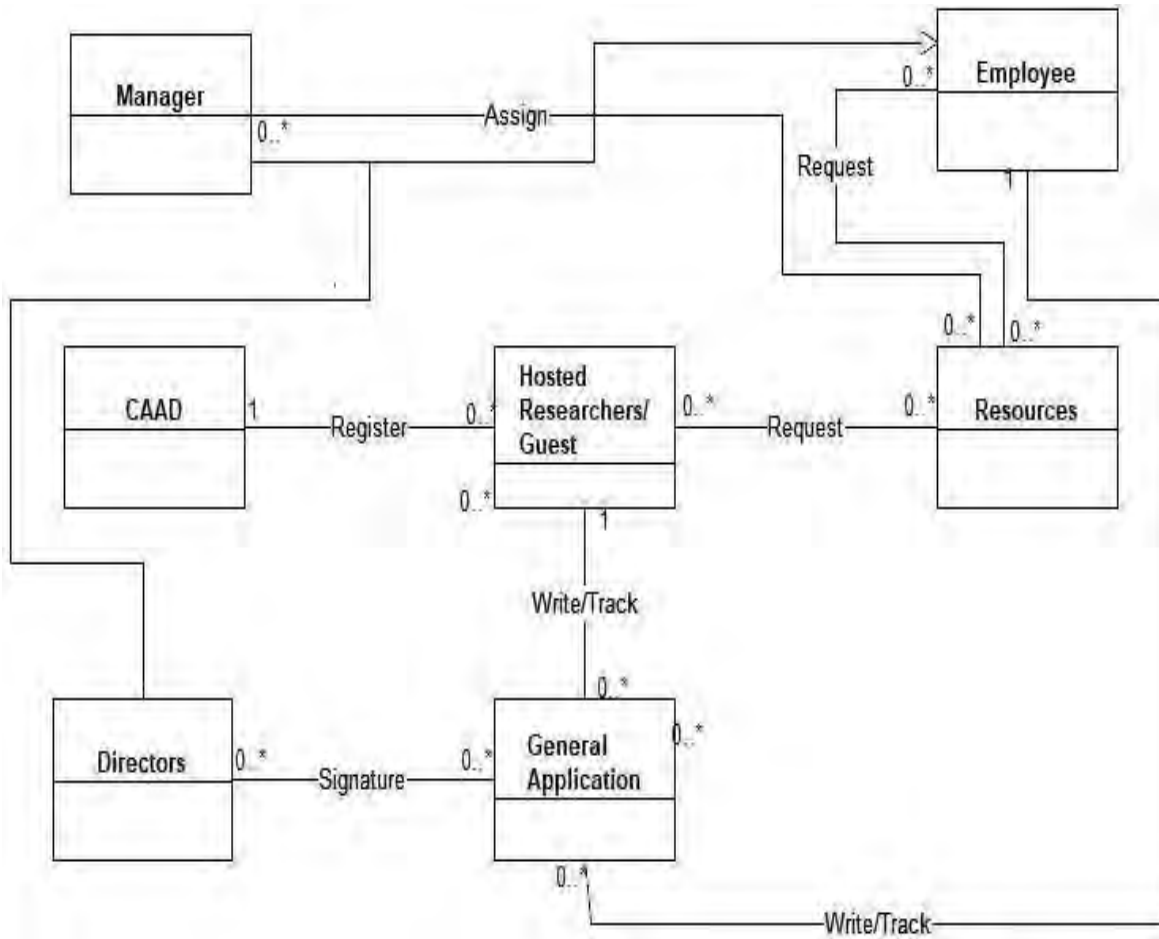


Figure 6: Domain Model

2.13 Entity Relationship Diagram (ERD)

The ERD of the system is follows in figure 7

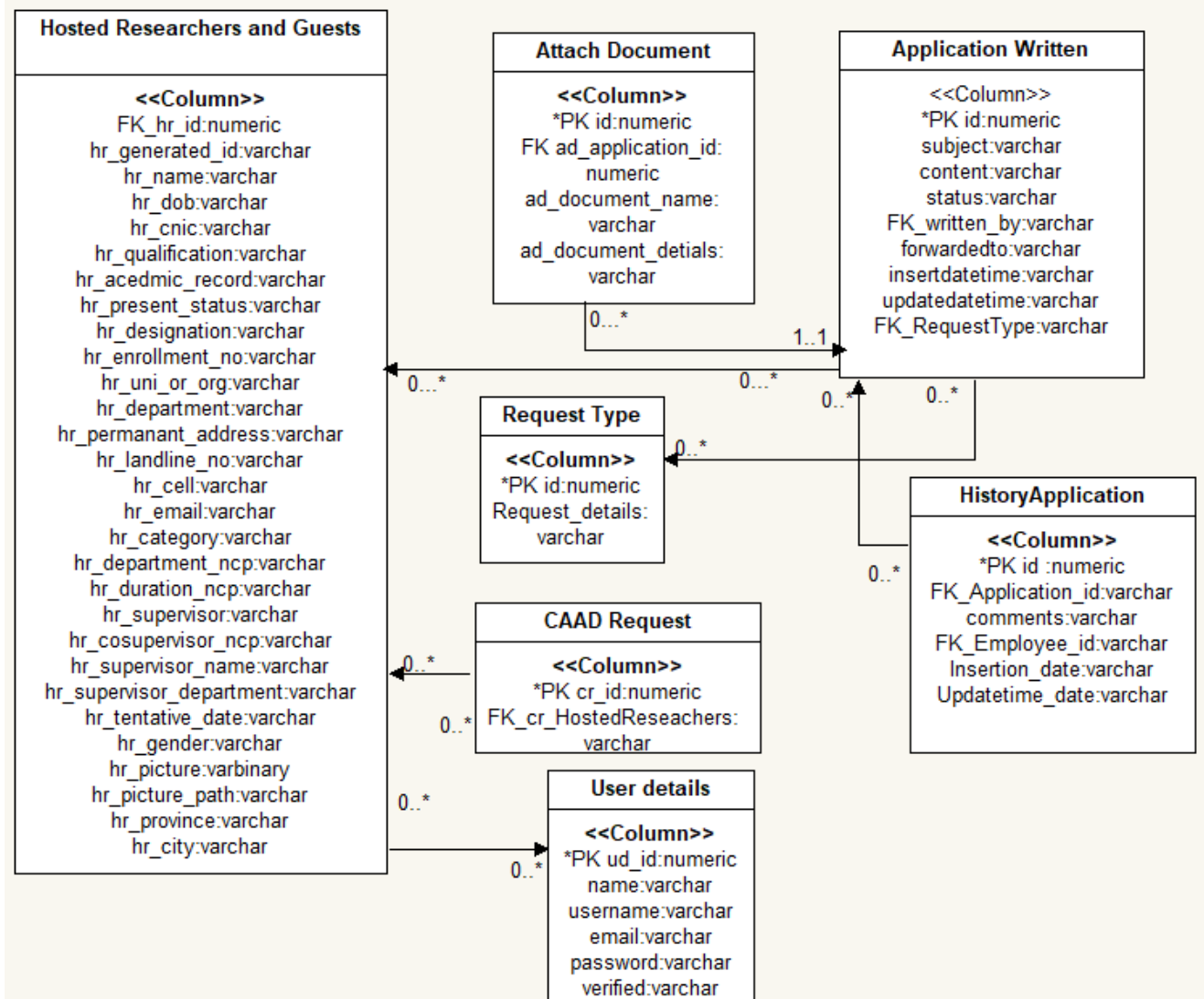


Figure 7: ERD

2.14 System Sequence Diagram

System sequence diagrams are used to show a particular Scenario of use cases.

SSD 1: Login

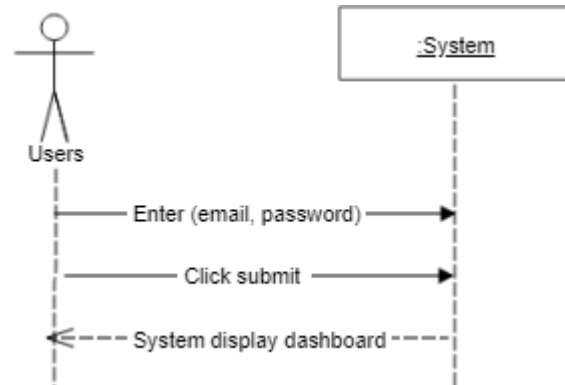


Figure 8: SSD Login

SSD 2: logout

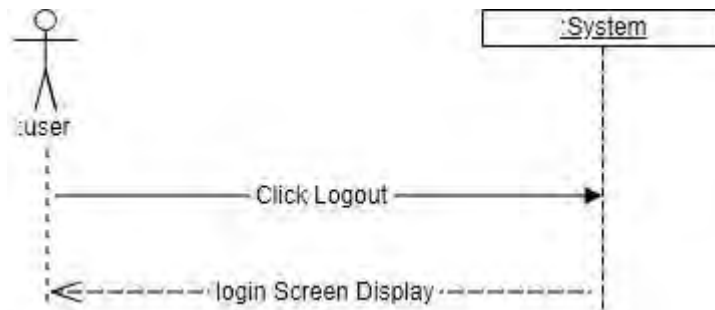


Figure 9: SSD logout

SSD 3: Signed Application

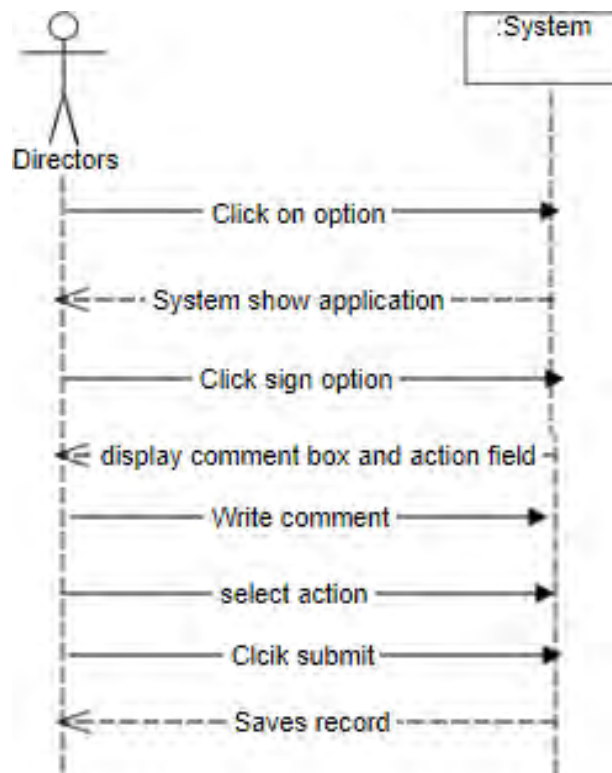


Figure 10: SSD Signed Application

SSD 4: Registration

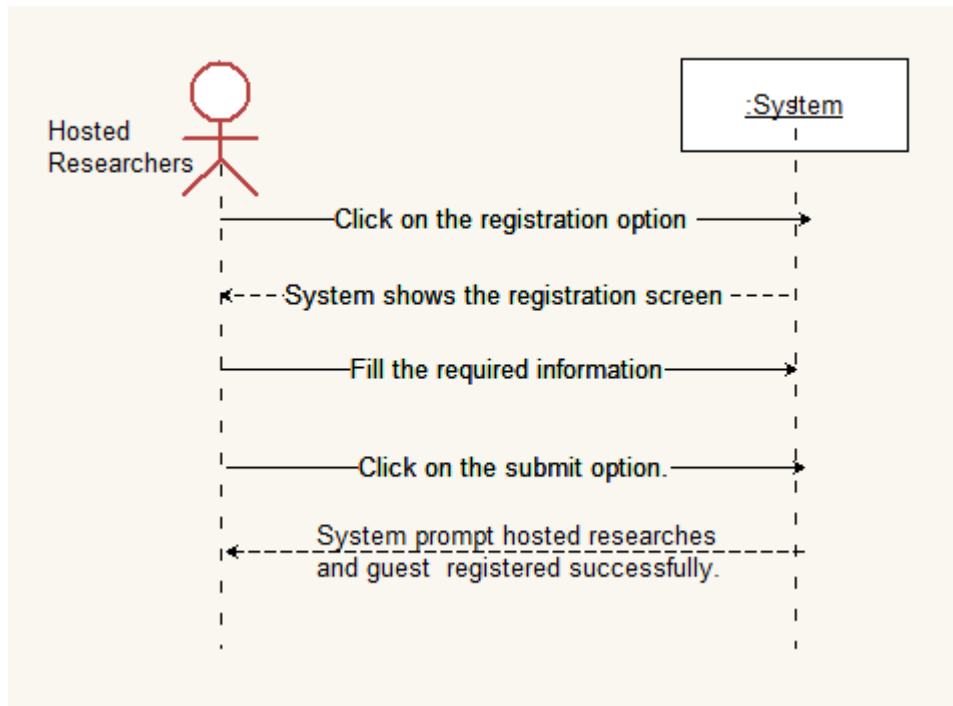


Figure 11: SSD Registration

SSD 5: Write Application

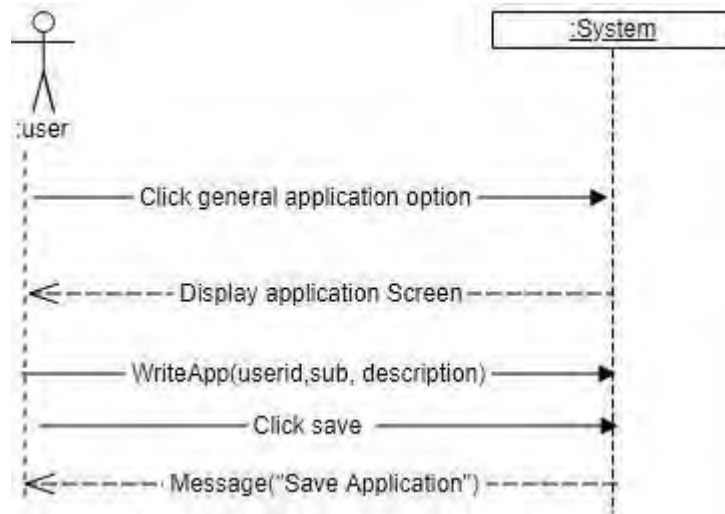


Figure 12: SSD Write Application

SSD 6: Track Application

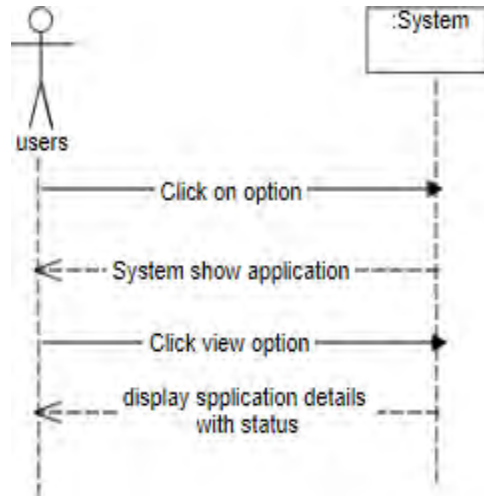


Figure 13: SSD Write Application

SSD 7: Request Resources

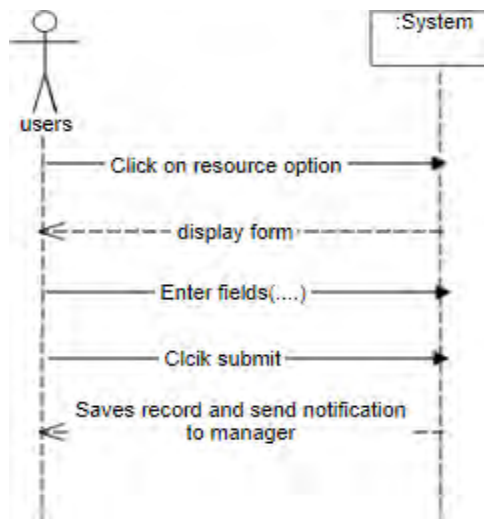


Figure 14: SSD Request Resources

SSD 8: Assign Resources

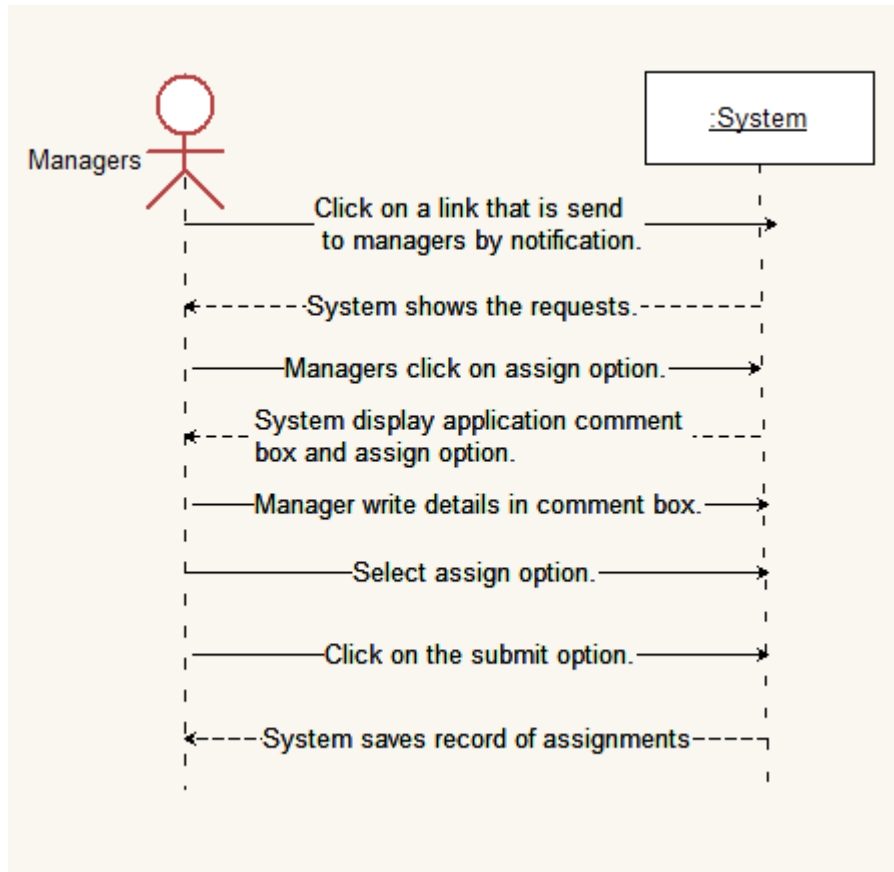


Figure 15: SSD Assign Resources

SSD 9: Generate Reports

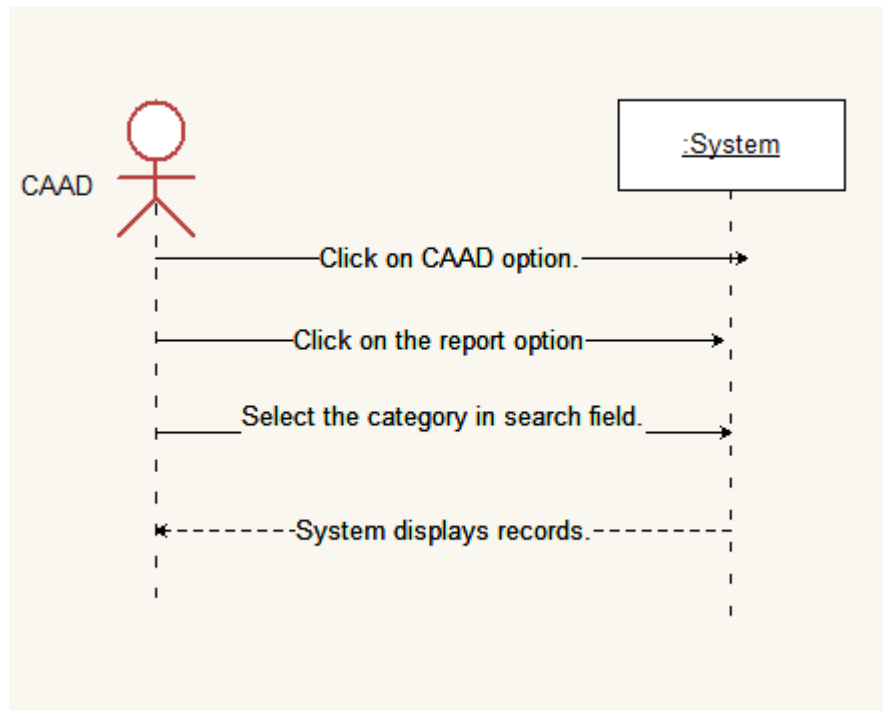


Figure 16: SSD Generate Report

SSD 10: Process Clearance

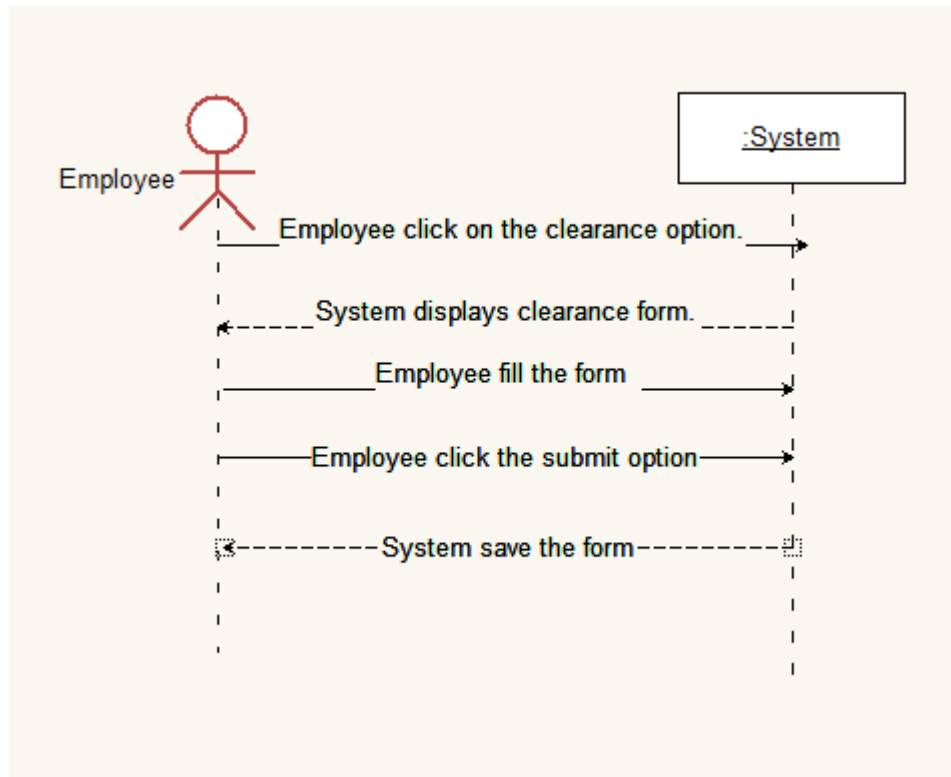


Figure 17: SSD Process Clearance

SSD 11: Check Hosted Researchers Request

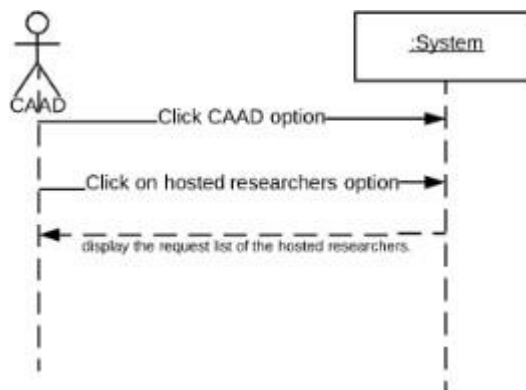


Figure 18: :SSD Check hosted researchers request

SSD 12: Generate Hosted researchers id

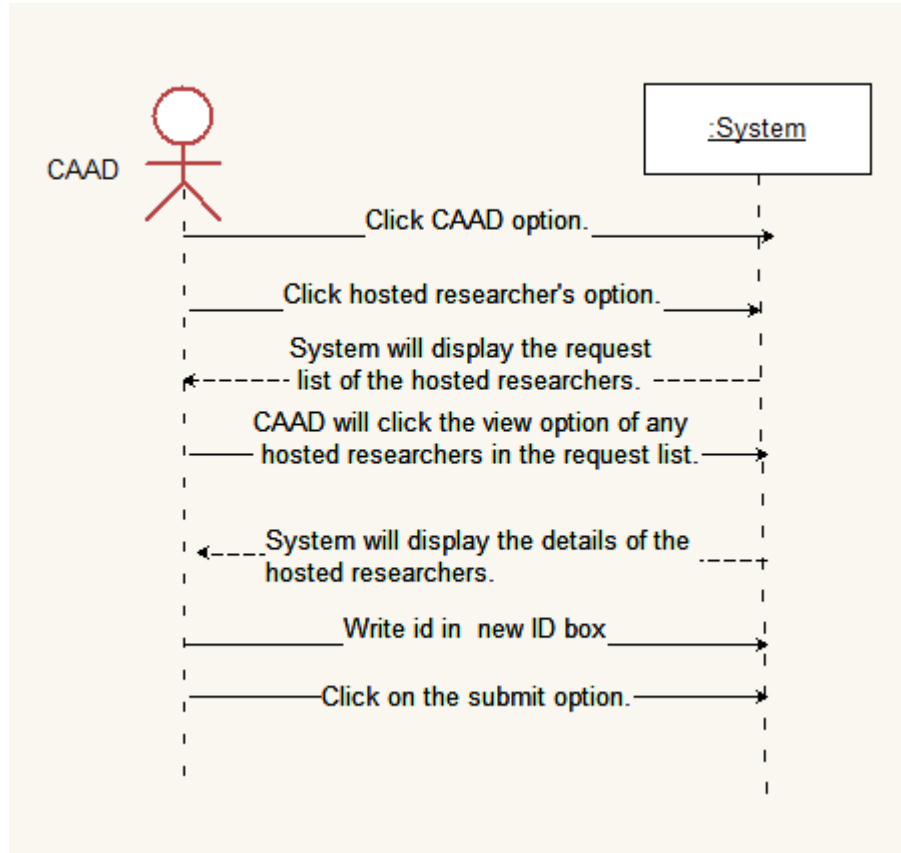


Figure 19: SSD Generate Hosted Researchers ID

SSD 13: Print Document

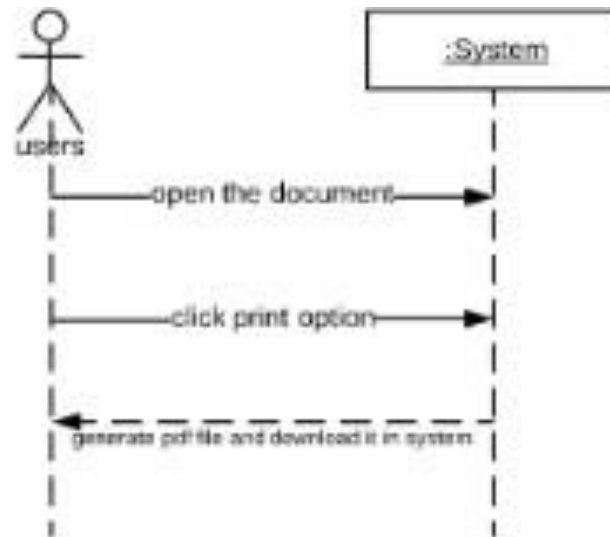


Figure 20: SSD Print Document

Chapter 3: Software Design

Description

3.1 Introduction

The Software Design Document is a document to provide documentation which will be used to aid in software development by providing the details for how the software should be built. Within the Software Design Document are narrative and graphical documentation of the software design for the It includes the description of how the software will meet the requirements.

3.2 Requirement Traceability Matrix

Requirements traceability matrix is a matrix in which we describe that which requirement is mapping with which sequence diagram, test case, and method of class diagram. The purpose of the traceability matrix is that when requirements have to be updated then one can update that requirement using traceability matrix instead of going through the whole document.

Table 23: Requirement Traceability Matrix

Requirement Id	Requirement Name	Sequence Diagram	Interface
UC1	Login	Yes	Yes
UC2	Logout	No	Yes
UC3	Sign Application	Yes	Yes
UC4	Register Account	No	Yes
UC5	Track Application	Yes	Yes
UC6	Generate Reports	No	Yes
UC7	Request Resources	Yes	Yes
UC8	Assign Resources	Yes	Yes
UC8	Forward Application	No	Yes
UC9	Write Application	Yes	Yes
UC10	Process Clearance	No	Yes
UC11		No	No

3.3 System Architecture Design

System architecture is a conceptual model that defines the structure, behavior, and more views of a system. An architecture description is a formal description and representation of a system, organized in a way that supports reasoning about the structures and behaviors of the system.

3.3.1 Chosen System Architecture

Three-tier architecture is a client–server software architecture pattern in which the user interface (presentation), functional process logic ("business layer"), computer data storage and data access are developed and maintained as independent modules, most often on separate platforms.

3.3.2 Architecture Diagram

Architecture diagram of the system is as follow

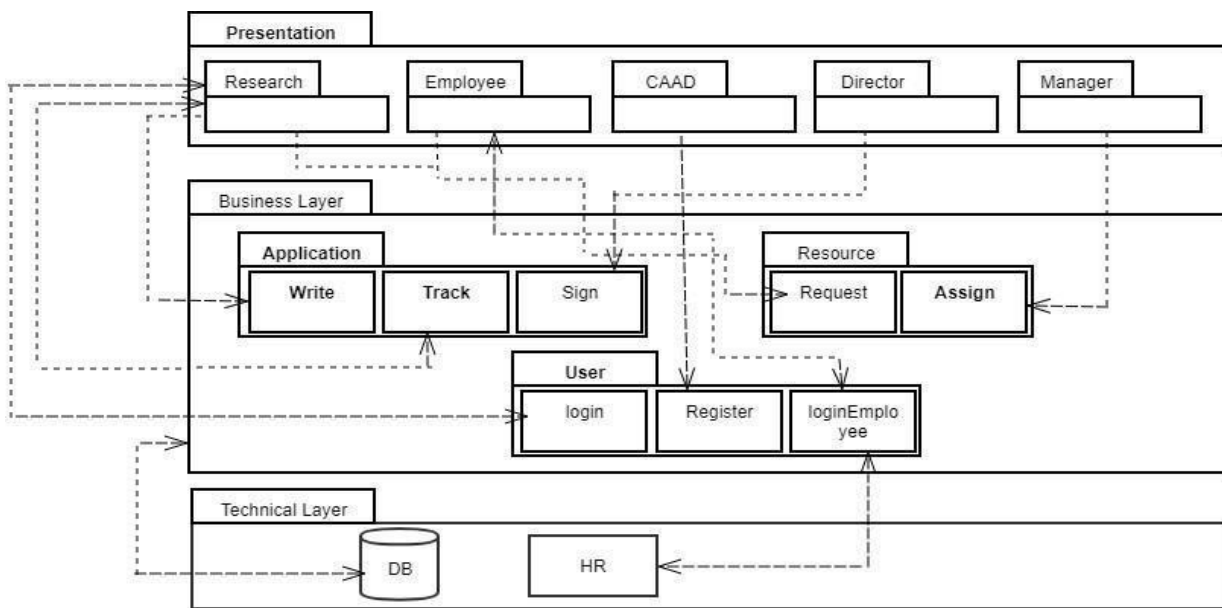


Figure 21: Architecture Diagram:

3.4 Workflow Diagram

A workflow diagram is a visualized representation of a business process, usually done through a flowchart. It uses standardized symbols to describe the exact steps needed to complete a process, as well as pointing out individuals responsible for each step. [1]

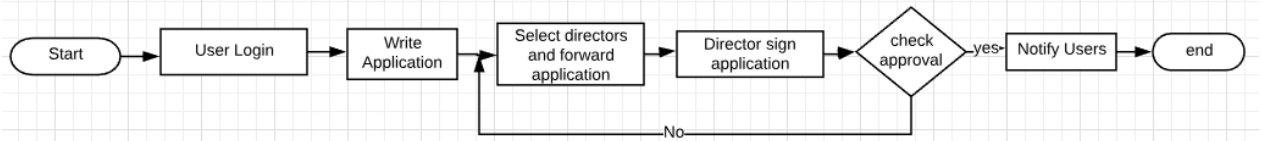


Figure 22: Workflow Diagram (a)

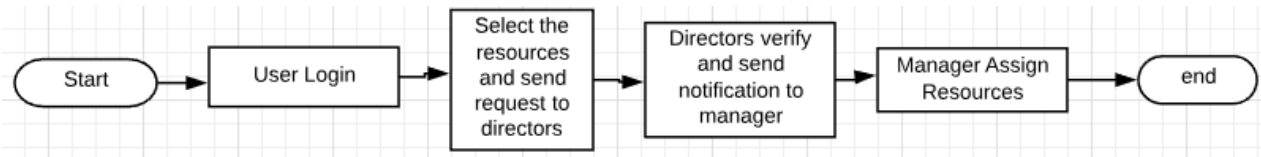


Figure 23: Workflow Diagram (b)

3.5 User Interfaces

User interface design establishes effective communication between a user and a System.

Following are user interfaces.

3.5.1 Home Screen

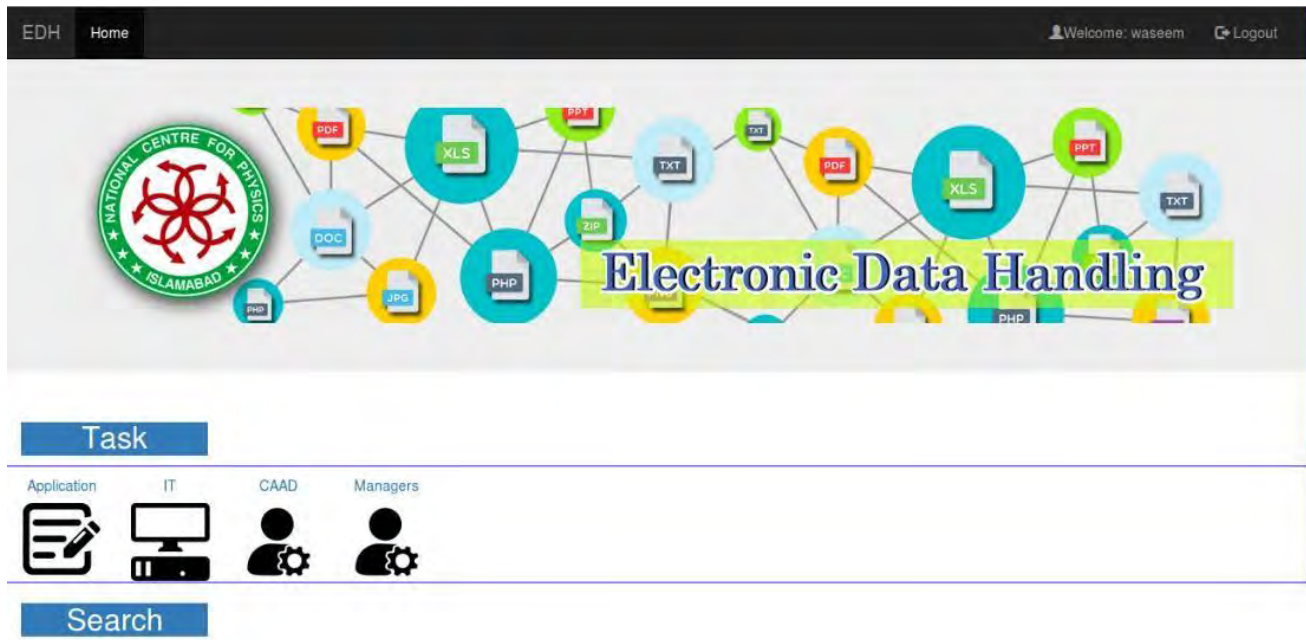


Figure 24: Home Screen

3.5.2 CAAD Screen



Figure 25: CAAD screen

3.5.3 IT Screen

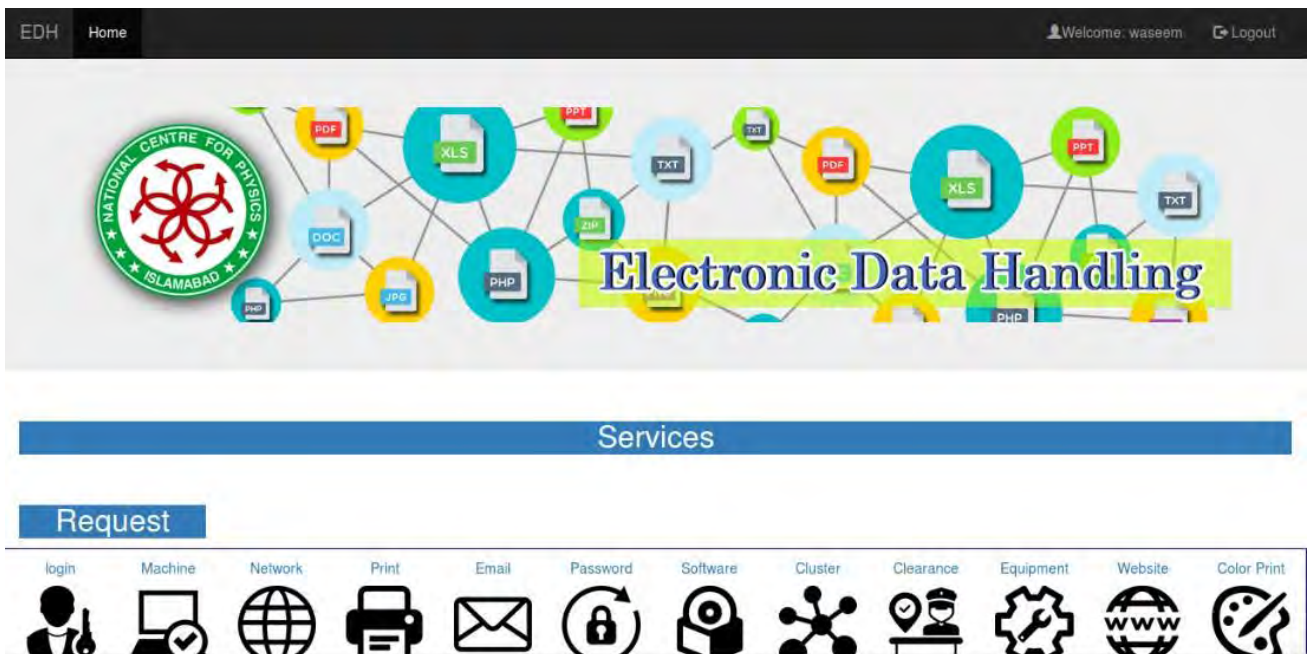
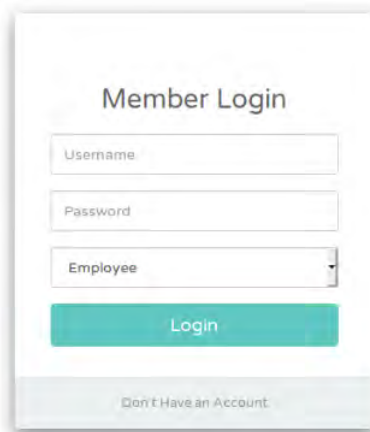


Figure 26: IT Screen

3.5.4 Login Screen



The image shows a 'Member Login' form. It features a title 'Member Login' at the top. Below the title are three input fields: 'Username', 'Password', and 'Employee'. The 'Employee' field is a dropdown menu. Below these fields is a teal 'Login' button. At the bottom of the form, there is a link that says 'Don't Have an Account'.

Figure 27: Login

3.5.5 Message Display Screen

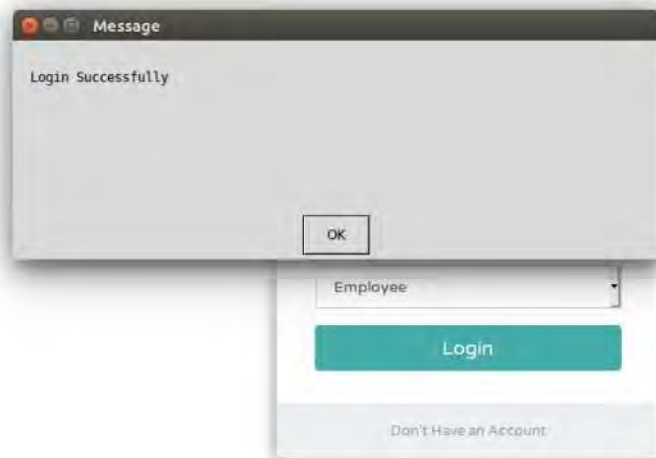


Figure 28: Message display screen

3.5.6 Account Login

Account Login Request Form

NCP ID No.	<input type="text" value="EMP03"/>	Building:	<input type="text" value="Building"/>
Floor:	<input type="text" value="Floor"/>	Room No.:	<input type="text" value="Room No."/>
Services Required		Yes	No
1. Window Login Account		<input type="radio"/>	<input type="radio"/>
2. Email Account		<input type="radio"/>	<input type="radio"/>
3. Print Quota		<input type="radio"/>	<input type="radio"/>
4. Linux (LDAP) Account		<input type="radio"/>	<input type="radio"/>
Specify the time duration of stay (if any)			
From	<input type="text" value="mm / dd / yyyy"/>	To:	<input type="text" value="mm / dd / yyyy"/>
MAC Address:	<input type="text" value="Laptop/Desktop MAC Address"/>	Purpose of IT Account:	<input type="text" value="Purpose of IT Account"/>
Attach the Proof of Affiliation with NCP		<input type="button" value="Browse..."/>	No file selected.
Forward To*	<input type="text" value="Muhammad Imran Designation: DI"/>		

Figure 29: Account login

3.5.7 Write Application

The screenshot shows a web application interface for writing an application. At the top, there is a navigation bar with 'EDH' and 'Home' on the left, and 'Welcome: Faraed Gul' and 'Logout' on the right. Below this is a blue header bar with the text 'Write Application'. The main content area contains a form with the following fields:

- NCP ID:** A text input field containing 'EMP03'.
- Subject*:** A text input field containing 'Application Subject'.
- Content*:** A large text area containing 'Application Content'.
- Forward To*:** A dropdown menu with 'Muhammad Imran Designation: Director' selected.
- Attach file*:** A file upload section with a 'Browse...' button, the text 'No files selected.', and a note 'Select Multiple files one time'.

At the bottom of the form are two buttons: 'Submit' and 'Back'. The footer of the page reads '© Design and Develop By Muhammad Ahmad'.

Figure 30: Write Application

3.5.8 CAAD Report

The screenshot shows a web interface for a CAAD Report. At the top, there is a navigation bar with 'EDH' and 'Home' on the left, and 'Welcome: Fareed Gul' and 'Logout' on the right. Below the navigation bar, there is a search bar and a 'Show 10 entries' dropdown. The main content is a table with the following data:

#	Name	Uni	Category	Department	Gender	View
1	Muhammad Ahmad	QAU	Adjunct Faculty	Theoretical Physics	Male	View
2	Ahmad Amjad	QAU	Adjunct Faculty	Theoretical Physics	Male	View

Below the table, there is a 'Showing 1 to 2 of 2 entries' message and a 'Back' button. On the right side, there are 'Previous', '1', and 'Next' navigation buttons. At the bottom of the page, there is a footer that reads '© Design and Develop By Muhammad Ahmad'.

Figure 31: CAAD Report

3.5.9 IT Department Clearance Form

The screenshot shows a web interface for an IT Department Clearance Form. At the top, there is a navigation bar with 'EDH' and 'Home' on the left, and 'Welcome: Fareed Gul' and 'Logout' on the right. Below the navigation bar, there is a blue header with the text 'IT Department Clearance Form'. The main content is a form with the following fields:

- NCP Id.:** A text input field containing 'EMP03'.
- Comment*:** A text input field containing 'Comment'.
- Forward To*:** A dropdown menu showing 'Muhammad Imran Designation: Di'.

Below the form, there are 'Submit' and 'Back' buttons. At the bottom of the page, there is a footer that reads '© Design and Develop By Muhammad Ahmad'.

Figure 32: IT department clearance form

3.5.10 Cluster Login Request Form

The screenshot shows a web interface for a 'Cluster Login Request Form'. At the top, there is a navigation bar with 'EDH Home' on the left and 'Welcome: Faraed Gul Logout' on the right. Below this is a blue header bar with the title 'Cluster Login Request Form'. The form itself is white and contains several input fields and buttons. The fields are: 'NCP Id.' with the value 'EMP03', 'University/Centre' with the value 'University/Centre', 'Thesis/Researcher Title' with the value 'Thesis/Researcher Title', 'Compiler Required' with the value 'Mentioned Compiler Required', 'Packages Required' with the value 'Mentioned Packages Required (if any)', 'Forward To' with a dropdown menu showing 'Muhammad Imran Designation: Dii', and a date range section with 'From' and 'To' fields both containing 'mm / dd / yyyy'. There is also a section for 'Attach the Proof of Affiliation with NCP*' with a 'Browse...' button and the text 'No file selected.'. At the bottom of the form are two buttons: 'Submit' and 'Back'. The footer of the page contains the text '© Design and Develop By Muhammad Ahmad'.

Figure 33: Cluster login Request form

3.5.11 Photocopy Print Request

The screenshot shows a web interface for a 'Photocopy/Color Print Request Form'. At the top, there is a navigation bar with 'EDH Home' on the left and 'Welcome: Faraed Gul Logout' on the right. Below this is a blue header bar with the title 'Photocopy/Color Print Request Form'. The form itself is white and contains several input fields and buttons. The fields are: 'NCP Id.' with the value 'EMP03', 'No. of Copies' with the value 'No. of Copies', and 'Forward To' with a dropdown menu showing 'Muhammad Imran Designation: Dii'. At the bottom of the form are two buttons: 'Submit' and 'Back'. The footer of the page contains the text '© Design and Develop By Muhammad Ahmad'.

Figure 34: Photocopy Request Form

3.5.12 Documents Created By me

The screenshot shows a web interface with a dark header containing 'EDH Home' and 'Welcome: Fareed Gul Logout'. Below the header is a blue banner with the text 'Documents Created By Me'. The main content area features a table with three rows of document entries. Each row includes a document number, a title, and a 'View' button. Below the table is a 'Back' button. At the bottom of the page, there is a footer with the text '© Design and Develop By Muhammad Ahmad'.

#	Document Title	View
57	Login Request	View
56	Login Request	View
55	Yar mar passowrd reset krwa day	View

[Back](#)

© Design and Develop By Muhammad Ahmad

Figure 35: Document Created By Me

3.5.13 Document Details

The screenshot shows a web interface with a dark header containing 'EDH Home' and 'Welcome: Muhammad Imran Logout'. Below the header is a blue banner with the text 'Document Detail'. The main content area displays a detailed view of a document. It includes fields for '#', 'Title', 'Status', 'Content', and 'Current Status'. Below these fields is a 'Signed By' section with a table listing the signatories. At the bottom of the document details are 'Print' and 'Back' buttons. At the bottom of the page, there is a footer with the text '© Design and Develop By Muhammad Ahmad'.

#	16
Title	Login Request
Status	Forward
Content	Request for window login account: 'No' Email Account: 'Yes' Print Quola: 'Yes' and linux Idap account: 'No'
Current Status	Muhammad Imran

Signed By

Name	Comment	Designation
Samia Inaam	ok allow him	DG

[Print](#) [Back](#)

© Design and Develop By Muhammad Ahmad

Figure 36: Document Details

3.5.14 Documents to Sign By me

EDH Home Welcome, Muhammad Imran Logout

Documents To sign by Me

#	Document Title	Sign
76	Photocopy/ColorPrint Request	Sign
75	Website Modification Request	Sign
74	IT Equipments Issuance	Sign
73	IT Equipments Issuance	Sign
72	Cluster Login Request	Sign
71	Cluster Login Request	Sign
70	Cluster Login Request	Sign
69	Cluster Login Request	Sign
68	Cluster Login Request	Sign

Figure 37: Documents to Sign by me

3.5.15 Mail Quota Request Form

The screenshot shows a web application interface for a 'Mail Quota Request Form'. At the top, there is a navigation bar with 'EDH Home' on the left and 'Welcome: Fareed Gul Logout' on the right. Below this is a blue header bar with the title 'Mail Quota Request Form'. The form itself contains several input fields: 'User Id' with the value 'EMP03', 'Mail Quota Required' with the value 'GB', and 'Forward To' with a dropdown menu showing 'Muhammad Imran Designation: DI'. There are two buttons, 'Submit' and 'Back', below the 'Forward To' field. At the bottom of the form area, there is a footer that reads '© Design and Develop By Muhammad Ahmad'.

Figure 38: mail quota request form

3.5.16 IT Equipment Issuance Form

The screenshot displays the 'IT Equipment Issuance Form'. It features a blue header bar with the title 'IT Equipment Issuance Form'. The form is organized into two columns. The left column contains fields for 'NCP ID No.' (EMP03), 'Time*' (From and To), 'Date*' (From and To), and checkboxes for 'Laptop/PC', 'Keyboard', 'Presenter', 'Projector', and 'HDMI/Apple'. The right column contains fields for 'Location', 'To' (Time and Date), and checkboxes for 'Mouse', 'Speakers', 'Pointer', 'Mico Phone', and 'Tripod Multimedia Screen'.

Figure 39: IT Equipment

3.5.17 New Machine Issuance Form

EDH Home Welcome: Fareed Gul Logout

New Machine Issuance Form

NCP ID:	<input type="text" value="EMP03"/>	Room No.:	<input type="text" value="Room No."/>
Building*:	<input type="text" value="Building"/>	Floor*:	<input type="text" value="Floor"/>
Operating System*:	<input type="text" value="Windows"/>	Mention Linux Flavor*:	<input type="text" value="Linux Flavor"/>
Software Required*:	<input type="text" value="Software Required"/>	Comments:	<input type="text" value="Comments"/>
Attach Requisition Slip	<input type="button" value="Browse..."/> No file selected.		
Select Director:	<input type="text" value="Muhammad Imran Designation: Dii"/>		

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Figure 40: New Machine Issuance Form

3.5.18 Network Connection Request Form

EDH Home Welcome: Fareed Gul Logout

Network Connection Request Form

NCP ID No.:	<input type="text" value="EMP03"/>	Building*:	<input type="text" value="Building"/>
Floor*:	<input type="text" value="Floor"/>	Room No.:	<input type="text" value="Room No."/>
Forward To*:	<input type="text" value="Muhammad Imran Designation: Dii"/>		
Specify the time duration of stay*			
From	<input type="text" value="mm / dd / yyyy"/>	To:	<input type="text" value="mm / dd / yyyy"/>

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Figure 41: Network Connection Request Form

3.5.19 Password Reset Request Form

EDH Home Welcome: Fareed Gul Logout

Password Reset Request Form

NCP Id: EMP03 Reason: Reason

Forward To: Muhammad Imran Designation: Dli

Submit Back

© Design and Develop By Muhammad Ahmad

Figure 42: Password Reset Request Form

3.5.20 Print Quota Request Form

EDH Home Welcome: Fareed Gul Logout

Print Quota Request Form

NCP Id: EMP03 Pages To Add*: pages

Forward To: Muhammad Imran Designation: Dli

Submit Back



© Design and Develop By Muhammad Ahmad

Figure 43: Print Quota reset form

3.5.21 Hosted Researchers Details

EDH Home Welcome: Fareed Gul [Logout](#)

Hosted Resercher Detail

Name:	Muhammad Ahmad	Date of Birth	2019-06-03	CNIC No.	35202-4113988-3
Highest Qualification:	M.Sc	Academic Record	Throughout 1st Class	Present Status	Employee
Designation (If Employed)		Uni/College Enrollment No.		Present Org/Uni	QAU
Department		Permanent Address	Gian Chand Building Laskhmi Chowk,Lahorea]	Mailling Address	Ashi Plaza, islamabad
Landline No.		Cell	03244753263	E-mail	ahmad.amjad09@gmail.com
Category	Adjunct Faculty	Department at NCP	Theoretical Physics	Duration at	3

Figure 44:Hosted researchers part1

Name:	Muhammad Ahmad	Date of Birth	2019-06-03	CNIC No.	35202-4113988-3
Highest Qualification:	M.Sc	Academic Record	Throughout 1st Class	Present Status	Employee
Designation (If Employed)		Uni/College Enrollment No.		Present Org/Uni	QAU
Department		Permanent Address	Gian Chand Building Laskhmi Chowk,Lahorea]	Mailling Address	Ashi Plaza, islamabad
Landline No.		Cell	03244753263	E-mail	ahmad.amjad09@gmail.com
Category	Adjunct Faculty	Department at NCP	Theoretical Physics	Duration at NCP	3
Supervisor from NCP	Yes	Co-supervisor from NCP	Yes	Supervisor Name	Muhammad Imran
Supervisor Department	Theoretical Physics	Tentative Date of Joining	2019-08-20	Gender	Male
Province	Punjab	City	Lahore	ID.	1

[Back](#)

Figure 45: hosted researchers2

3.5.22 Software Application Request Form

EDH Home Welcome: Fareed Gul Logout

Software Application Request Form

NCP Id.: EMP03 Software Name*: Software Name

Type*: New Discription: Discription

Forward To*: Muhammad Imran Designation: Di

Submit Back

© Design and Develop By Muhammad Ahmad

Figure 46: Softawre application Request form

3.5.23 Telephone Extension Requirement Form

EDH Home Welcome: Fareed Gul Logout

Telephone Extension Requirement Form

NCP Id.: EMP03 Building: Building

Floor: Floor Room No.: Room No.

Telephone Type*: Analog

Services Required

	Yes	No
1.Extension only (on campus access)	<input type="radio"/>	<input type="radio"/>
2.Nationwide Outgoing Calls	<input type="radio"/>	<input type="radio"/>
3.International Outgoing Calls	<input type="radio"/>	<input type="radio"/>

Forward To*: Muhammad Imran Designation: Di

Submit Back

© Design and Develop By Muhammad Ahmad

Figure 47: Telephone extension

3.5.24 Website Modification Form

The screenshot shows a web application interface for a 'Website Modification Form'. At the top, there is a dark navigation bar with 'EDH Home' on the left and 'Welcome: Fareed Gul Logout' on the right. Below this is a blue header bar with the title 'Website Modification Form'. The main form area contains four input fields: 'NCP Id.' with the value 'EMP03', 'Webpage*' with a dropdown menu showing 'Modification', 'Detail:' with the value 'Details', and 'Forward To*:' with a dropdown menu showing 'Muhammad Imran Designation: Di'. Below these fields are two buttons: 'Submit' and 'Back'. At the bottom of the form area, there is a copyright notice: '© Design and Develop By Muhammad Ahmad'.

Figure 48: website modification form

3.5 Sequence Diagram

Sequence diagrams are used to present the interaction between actors and objects in a system and interaction between the objects themselves. A sequence diagram shows the interactions that take place during a particular use case or use case scenario.

3.6.1 Login

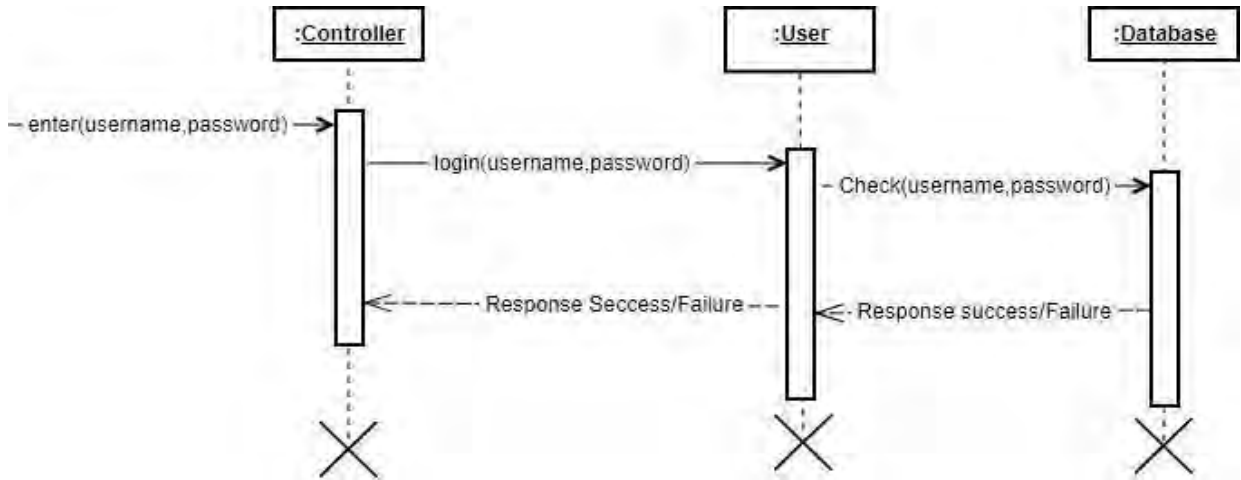


Figure 49: SD Login

3.6.2 Write Application

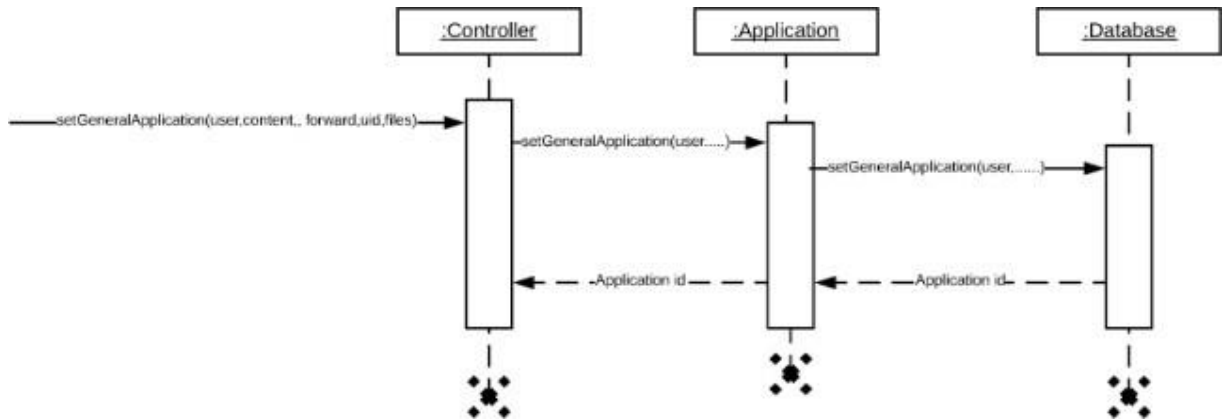


Figure 50: SD Write Application

3.6.3 Track Application

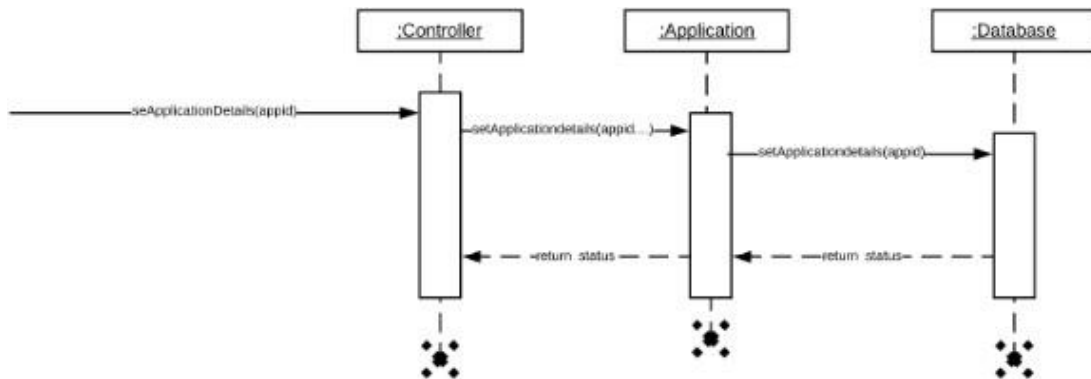


Figure 51: SD Track Application

3.6.4 Sign Application

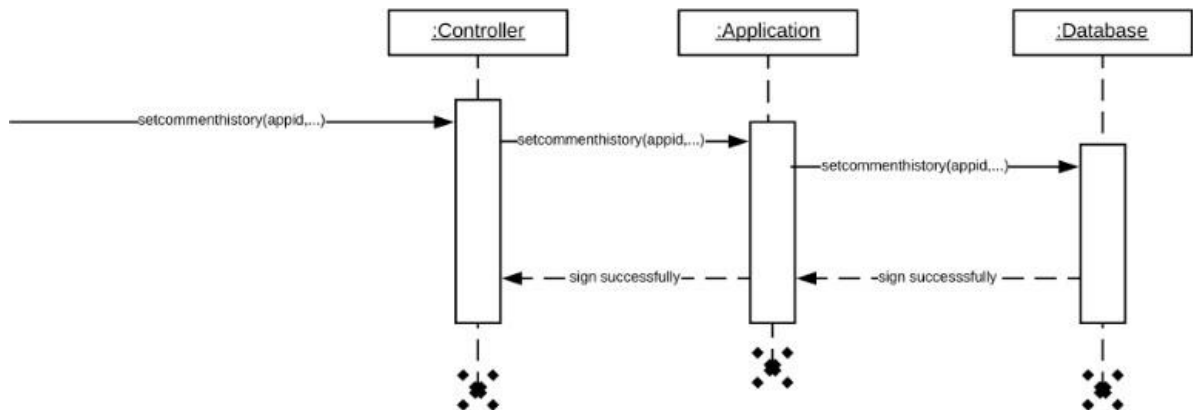


Figure 52: SD Sign Application

3.6.5 Request Resources

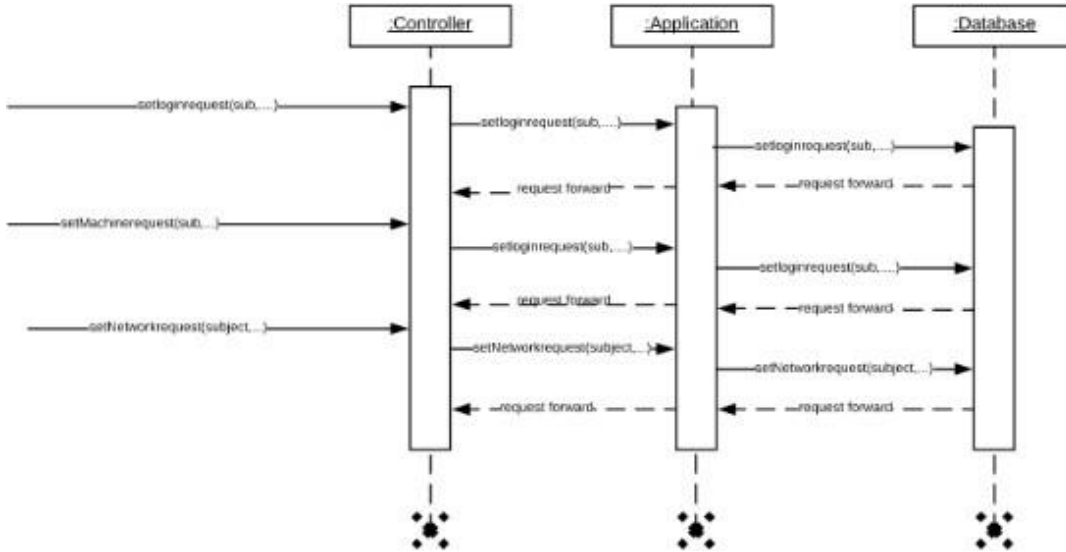


Figure 53: request resource

3.6.6 Assign Resources

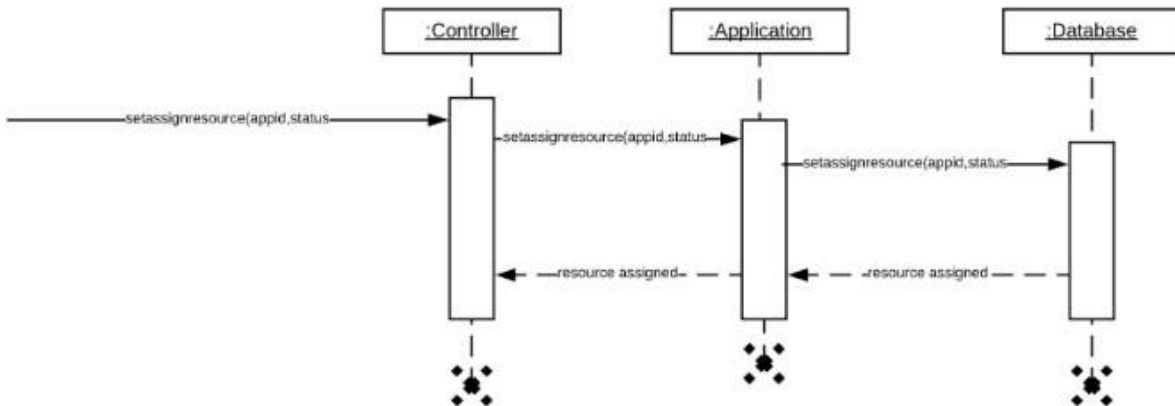


Figure 54: Assign Resources

3.7 Class Diagram

The class diagram is a static diagram. It represents the static view of an application. Class diagram represents classes which can interact with each other to perform the functionality of the system. Following is class diagram of system.

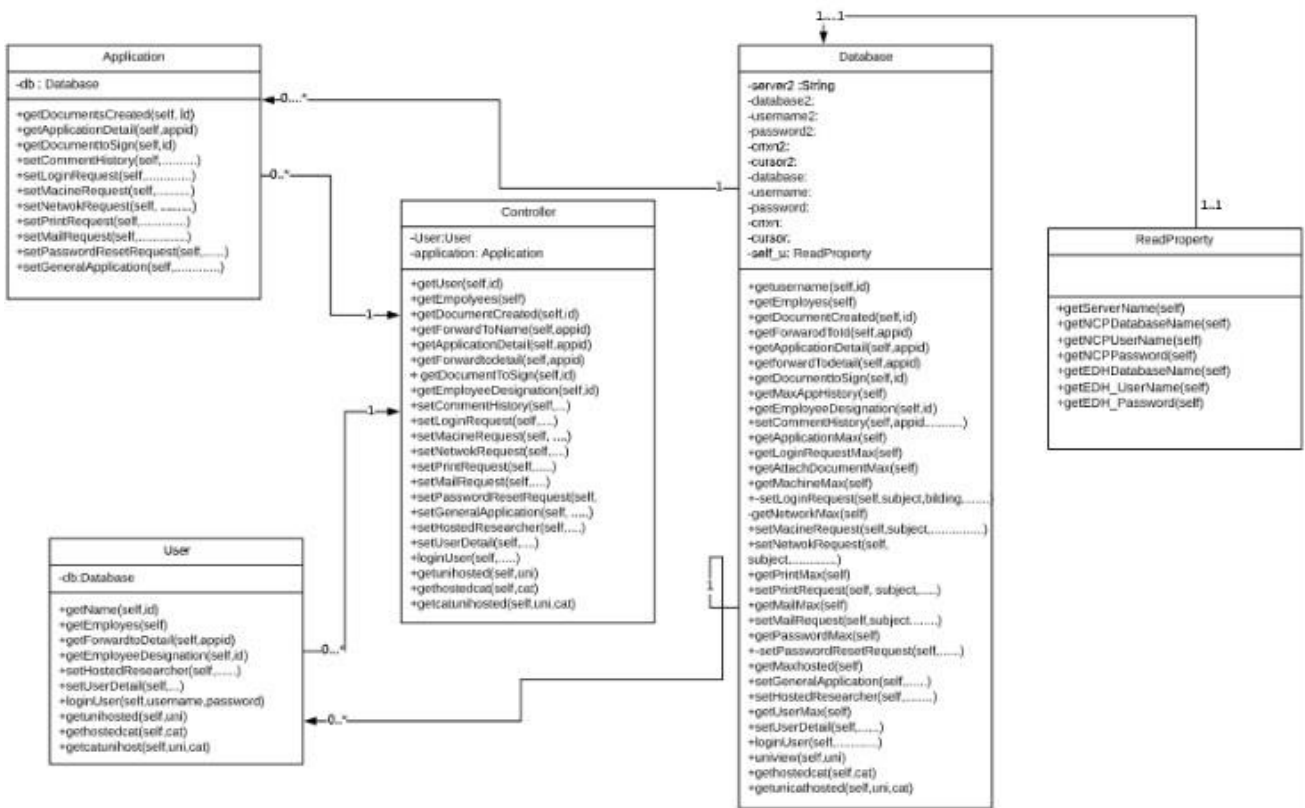


Figure 55: Class Diagram

Chapter 4: Software Implementation

4.1. Introduction

This document describes the project implementation for developing the project planner and scheduler.

4.2 Language Selection

- Python (Flask Framework)
Backend development
- HTML\CSS\ Bootstrap
Front end development
- JavaScript
For Scripting and Validation
- Sql (structured query language) Managed Database

4.3 Tools Selection

- PyCharm
- SqlServer 2012

Chapter 5: Software Test Document

5.1 Introduction

A test case, in software engineering, is a set of conditions under which a tester will determine whether an application, software system or one of its features is working as it was originally established for it to do.

5.2 Test Strategy

A Test Strategy document is a high- level document and normally developed by a project manager. This document defines “Software Testing Approach” to achieve testing objectives. Some companies include the “Test Approach” or “Strategy” inside the Test Plan, which is fine and it is usually the case for small projects. [2]

5.3 Test Plan

A test plan is a document detailing the objectives, target market, internal beta team, and processes for a specific beta test for a software or hardware product. The plan typically contains a detailed understanding of the eventual workflow. [3]

5.4 Featured to Be Tested

The following are the features to be tested.

- User login
- Sign Application
- Write Application
- Request Resources
- Register User

5.5 Testing Tools and Environment

A testing environment is a setup of software and hardware for the testing teams to execute test cases. In other words, it supports test execution with hardware, software and network configured. Test bed or test environment is configured as per the need of the Application under Test. Here black box testing environment is used. Black box testing is a method of software testing that examines the functionality of an application without peering into its internal structures or workings. This method of test can be applied virtually to every level of software testing: unit, integration, system and acceptance.

5.6 Test Cases

The following are the test cases

5.6.1 TC1 Login

Table 24:TC1 Login

ID	TC1
Description	Users will be login into the system.
Tester	Users
Setup	User open a website in order to login to the system.
Instructions:	<ol style="list-style-type: none">1. Enter username (Ahmad).2. Enter password (*****).3. Click login button.4. System displays message "You are Successfully Login"
Expected Results	Message will be displayed that you are successfully login.
Actual Result	As expected,
Status	Pass

5.6.2 TC2 Sign Application

Table 25: TC2 Sign Application

ID	TC2
Description	Directors will sign the application.
Tester	Directors
Setup	Director must be login into system and have some application for signature.
Instructions:	<ol style="list-style-type: none">1. Directors click the option document signed by me.2. System shows the application to the director.3. Directors click the sign option.4. Directors write comments in comment box displayed by system.5. Select the action option.6. System prompts “Guest Registered Successfully”.
Expected Results	Message will be displayed that application signed by directors.
Actual Result	As expected
Status	Pass

5.6.3 TC3 Request Resources

Table 26: TC3 Request Resources

ID	TC3
Description	User will request for resources.
Tester	Users
Setup	<ol style="list-style-type: none">1. Hosted researcher and guest should be registered by the CAAD.2. Users logged in to system.
Instruction	<ol style="list-style-type: none">1. User clicks the resource option.2. Users fill the form displayed by the system3. Users click the submit option.
Expected Result	System saves record and will send to notification to manager.
Actual Result	As expected.
Status	Pass

5.6.4 TC4 Track Application

Table 27: TC4 Track Application

ID	TC4
Description	User will track the application
Tester	Users
Setup	<ol style="list-style-type: none">1. User must be logged into the system.2. User have already submitted an application.
Instructions:	<ol style="list-style-type: none">1. User click the option document signed by me.2. System shows the application.3. User click the view option.
Expected Results	System displays the status of the application.
Actual Result	As expected
Status	Pass

5.6.5 TC5 Write Application

Table 28: TC5 Write Application

ID	T5
Description	User will write an application
Tester	Users
Setup	User logged in to system.
Instructions:	<ol style="list-style-type: none">1. Click on the general application option.2. User write the application.3. User select the attach document option.4. User select document and upload it.5. Users click the submit option.
Expected	Message displayed that system saves application.
Results	
Actual Result	As expected
Status	Pass

Chapter 6 Conclusion and Future Enhancements

6.1 Introduction

This document describes the project conclusions and future enhancements i.e. what type of new features can be added with time.

6.2 Conclusion

All the employees of NCP organization are now able to make use of general application, regardless of their department and can forward to their next directors.

Employees of IT department are now able to be facilitated with

- Account login request
- Email quota
- Inspection report
- Cluster login request
- IT equipment issuance
- IT clearance
- Machine clearance
- Network connection request
- New machine issuance
- Password reset request
- Photocopy color print request
- Print quota
- Software application request
- Telephone extension
- Thunderbird Configuration

6.3 Future Enhancements

- This project is basically for general application routing and for the forms of IT department of NCP and in future we can increase its scope to each and every department of NCP.
- In future we can include the feature of digital signatures to approve or reject. the application/forms

References

- [1] Workflow Diagram <https://www.tallyfy.com/workflow-diagram/>
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