



Final Report on

# Smart MIS for Research and Educational Organizations

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Date of Submission: December 07, 2022

# LETTER OF TRANSMITTAL

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December 07, 2022

BSSE 4th year Exam committee 2022  
Institute of Information Technology  
University of Dhaka

**Subject:** Submission of Final report on “Smart MIS for Research and Educational Organizations ”

Dear Sir,

With due respect and immense pleasure, I am pleased to submit the technical report on “Smart MIS for Research and Educational Organizations ”. I have tried my level best to produce an acceptable report, although this report may have some shortcomings. I would be highly obliged if you overlooked the mistakes and accept the effort that has been put into this report.

I would be glad if you accept this report and provide your valuable judgment. Your acceptance and appreciation would surely inspire me.

Sincerely yours,

S. M. Shahriyar

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# LETTER OF ENDORSEMENT

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December 7, 2022

BSSE 4th Year Exam Committee  
Institute of Information Technology,  
University of Dhaka

**Subject:** Approval of the Report

This letter is to certify that, S.M. Shahriyar, BSSE-1044, student of Institute of Information Technology, University of Dhaka, has done “Smart MIS for Research and Educational Organizations” under my supervision. I have gone through the report. All the information mentioned in this document is true.

I wish him every success in life and hope that he will continue his effort.

SPL Supervisor

**Dr. Sumon Ahmed**  
Associate Professor  
Institute of Information Technology  
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## ACKNOWLEDGEMENT

At First, I would like to thank my Institute, Institute of Information Technology (IIT) for providing such a wonderful opportunity for students.

I take this opportunity to express my profound gratitude and special thanks to my supervisor Md. Sumon Ahmed (Associate Professor, Institute of Information Technology, University of Dhaka) and Md. Abdur Rahman (Senior Computer Scientist, Centre for Advanced Research in Sciences, University of Dhaka). who are in spite of being extraordinary busy with their duties, took time out to hear, guide and keep me on the correct path. I also take the opportunity to express a deep sense of gratitude to my mentor for his monitoring and constant encouragement.

I am also grateful to Abu Kowsar (Senior Scientific Officer, Advanced Photovoltaic Lab, Bangladesh Council of Scientific & Industrial Research (BCSIR), Bangladesh ) for giving me their project.

Lastly, I would like to thank my classmates. They have always been helpful and provided valuable insights from time to time.

## **ABSTRACT**

This document contains the software requirements and specifications, architectural design and development methodology, implementation details, user interface design, user manual, testing cases of “Smart MIS for Research and Educational Organizations”. This web application can be used for efficient data acquisition and as an user-friendly Management Information System (MIS).

With this application- users can process, store and generate information easily and operate the application smartly. This documentation can be followed to develop the application for the web platform.

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# Chapter 1: Introduction

## 1.1 Preamble

To process data and information of a small organization is easy, but it is laborious and time-consuming for a big organization having several hundred or thousands of employees of diversified job nature. This task would be even more complicated if the organization is comprised of several units located in different places over a long distance in a country or on continents. So, large manpower and too much time are required to operate this system. In fact, the similar work of a large organization could execute very quickly, accurately, and efficiently by developing a user-friendly Management Information System (MIS) incorporating Software Engineering, Information and Communication Technology (ICT), and Artificial Intelligence (AI).

Basically, an MIS is a pool of systems, hardware, ways, and people that work together to process, store, and generate information that is very much useful for an organization to operate smartly. In today's world, MIS is a crucial tool for efficient data acquisition and management, accountability, and good governance.

The intention of developing a web-based intelligent MIS is to help in automatic data acquisition, processing and quick report generation that will ultimately reduce the man-hours and enhance the overall performance of an organization.

## 1.2 Objectives

The purposes of this document are:

- ❖ Identify the requirements that have to be carried out as part of the project.
- ❖ Form the baseline for the construction of the proposed system.
- ❖ Help to reduce the development effort and reveal misunderstandings, and inconsistencies early in the development cycle when these problems are easier to correct

## 1.3 Scopes

The scope of the project is given below:

- ❖ Only the member of BCSIR will use the software initially
- ❖ The system will be developed and initially tested on the windows 10 operating system
- ❖ The Client must have a desktop browser to access the system

## **1.4 Assumptions**

The assumptions of the project are:

- ❖ The underlying network is completely reliable.
- ❖ The user will not try to provide files to try to overflow the server capacity.

# Chapter 2 : Overall Description

This chapter presents the quality function deployment and usage scenario of connected papers.

## 2.1 Quality Function Deployment (QFD)

Quality Function Deployment (QFD) is a technique that translates the needs of the customer into technical requirements for the software. With respect to this project, the following requirements are identified.

### ❖ Normal Requirements

- Authentication and Authorization for user
- Personal Management Information System (PMIS)
- Integrate with 4 different MIS system
- Searching and Filtering

### ❖ Exciting Requirements

- Show scientific paper to the user or organization concerned person.

## 2.2 Usage scenario of the Smart MIS

Smart MIS will be a web based application to help the research and educational organization stakeholders. In this system, an automated scientific paper searching tool will be integrated. For this reason, several meetings are held with the research and educational organization stakeholders to find out their requirements to develop the database pool.

Also, here the scientific paper searching module will find out the individuals and institutions scientific papers automatically and then show the user to add the scientific papers to the individual or organization profile. So it will save a lot of time to process, store and generate information and also helpful for the organization user to operate smartly. Using the PIMS module, users will update their information on the website. With the users information, organizational different operations will be easily done by the employee or concerned person.

### **2.2.1 Adding Information:**

After authentication users will add their personal details and organization related information in the PIMS in the Smart MIS web application. Here User will add personal information, contract information, joining information, spouse and children information, education information, training information, posting information, promotion information, achievements etc.

### **2.2.2 Manage Account:**

Any user will change their information. To change information, he/she has to sign in then change information. He/she has to confirm the changes and the changes will be confirmed.

### **2.2.3 Searching and Adding Scientific Papers:**

Users will be able to search their Scientific Papers using conditional keywords from Smart web Application and add their own scientific papers to their own PMIS profile.

### **2.2.4 Sending Personal Information**

Users will send requests to add their desired information in 4 different external MIS systems of that organization. So that those MIS systems will easily find the user necessary information.

# Chapter 3 : Scenario Based Modeling

Users are involved right from the start, to build prototypes evolving towards the final product. The users are also involved with the testing of the prototypes which is essential for the validation of requirements and help the users to gain an initial experience of the final system during the development itself. This method involves techniques which are applied by one or more professionals working alongside users who are expected to provide and specify their requirements at the beginning as well as evaluate and approve the system upon completion. The user (in a passive capacity) and the designer/builder (an active partner) cooperate to reach a working model where the means of communications are by the examination of preliminary models such as the initial narratives, paper models and graphical representations built to represent the final system functions.

## 3.1 Use Case Diagrams

A use case diagram is a graphic depiction of the interactions among the elements of a system. The purposes of use case diagrams are:

- ❖ Gathering requirements of a system.
- ❖ Getting an outside view of a system.
- ❖ Identifying external and internal factors influencing the system.
- ❖ Showing the interactions among actors.

The first step in writing a use case is to define the set of actors that will be involved in the story. Actors are of two types. They are:

- ❖ Primary Actors: Primary actors are the actors using the system to achieve a goal. They both consume data and produce information.
- ❖ Secondary Actors: Secondary actors are the actors that the system needs assistance from to achieve the primary actor's goal. They either consume data or produce information.

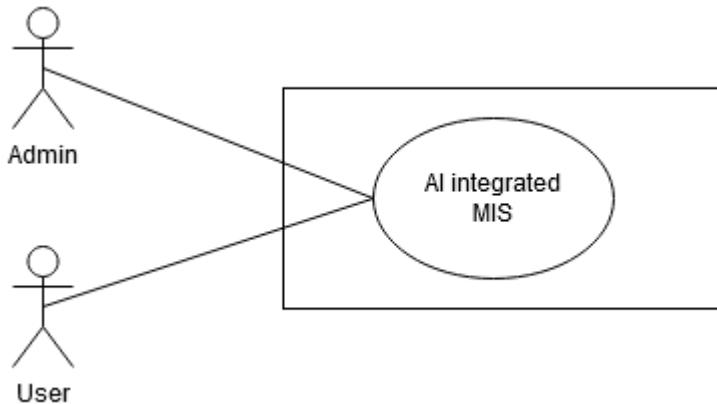
Once actors have been identified, use cases can be developed.

**Level 0:** Smart MIS System

**Primary actor:** User, Admin

**Secondary actor:** Database,

**Goal in context:** The diagram refers to the overview of the Smart MIS



**Level 0**

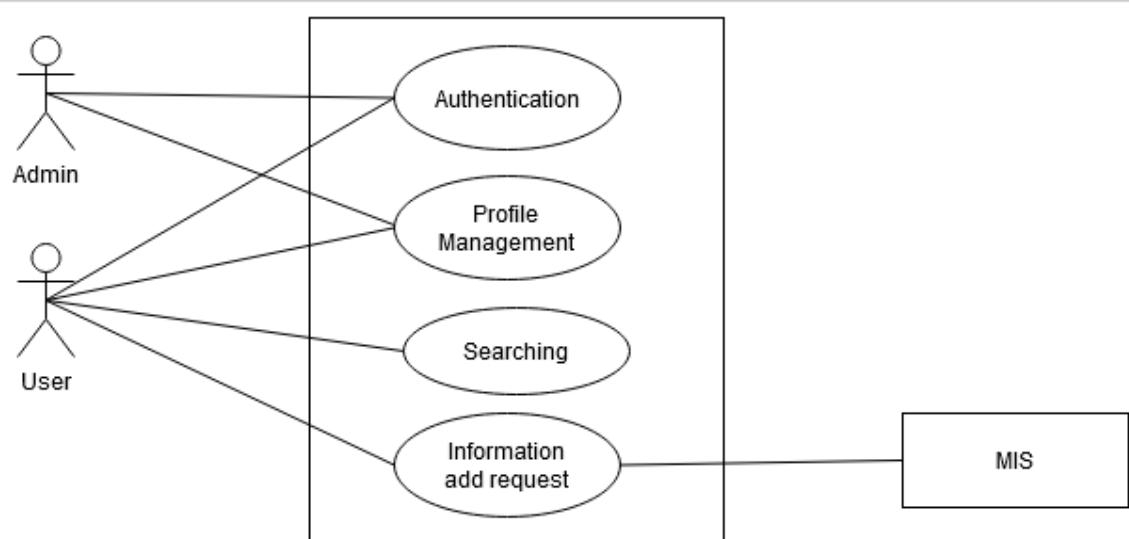
Figure 1: level 0 use-case diagram of Smart MIS

**Level 1:** Modules of Smart MIS System

**Primary actor:** User, Admin

**Secondary actor:** Database, external MIS

**Goal in context:** The diagram refers to all the modules of the Smart MIS System



**Level 1**

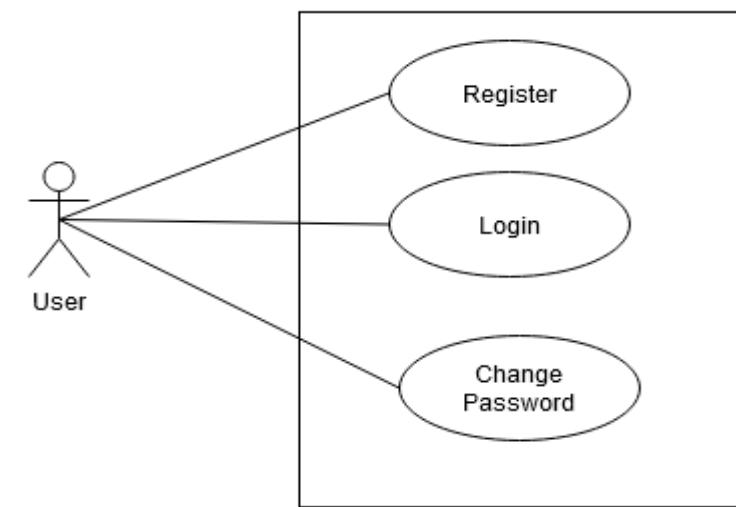
Figure 2: level 1 use-case diagram of Smart MIS

### **Level 1.1: Authentication**

**Primary actor:** User

**Secondary actor:** Database

**Goal in context:** The diagram refers to the details of authentication module of level 1



**Level 1.1**

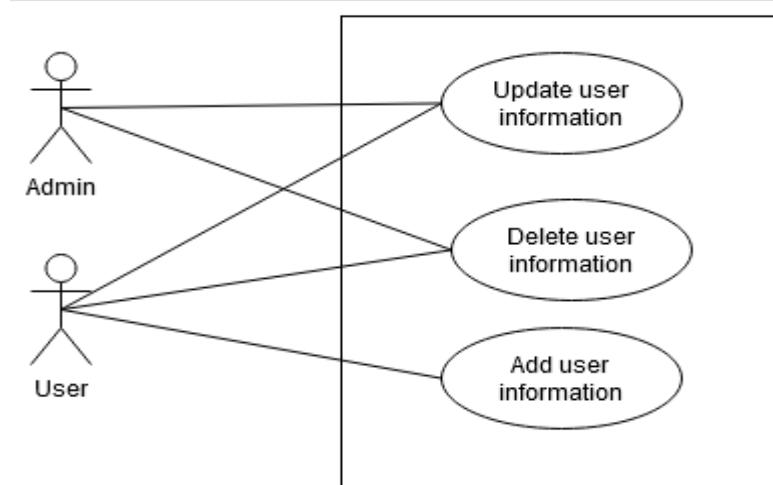
Figure 3: level 1.1 use-case diagram of Smart MIS

### **Level 1.2 : Profile Management**

**Primary actor:** User, Admin

**Secondary actor:** Database

**Goal in context:** The diagram refers to the details of users profile management module of level 1



**Level 1.2**

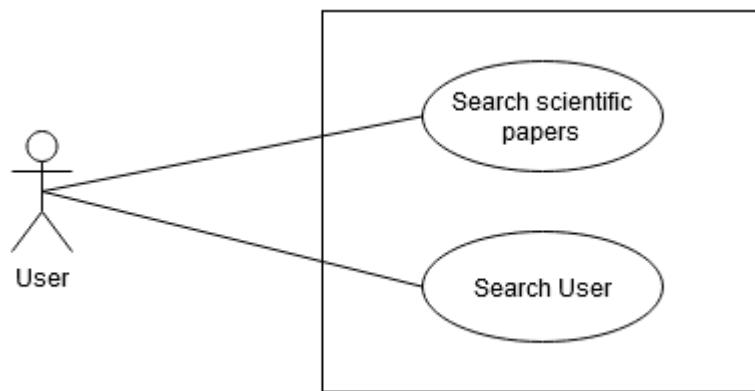
Figure 4: level 1.2 use-case diagram of Smart MIS

**Level 1.3:** Searching

**Primary actor:** User

**Secondary actor:** Database

**Goal in context:** The diagram refers to the details of Searching module of level 1



**Level 1.3**

Figure 5: level 1.3 use-case diagram of Smart MIS

# Chapter 4 : Data Based Modeling

## 4.1 Data Modeling Concept

If software requirements include the need to create, extend, or interface with a database or if complex data structures must be constructed and manipulated, a software team may choose to create a data model as part of overall requirements modeling.

## 4.2 Data Objects

A data object is a representation of information which has different properties or attributes that must be understood by software.

### 4.2.1 Identify Data Objects

Nouns having attributes are selected as data objects. Those who doesn't have any attributes are covered under the data objects. I found the following data objects in Smart MIS.

**Noun Identification**

No	Noun	P/S	Attributes of
1	Authentication	S	
2	Sign Up	S	
3	Sign In	S	
4	<b>User</b>	P	
5	<b>Admin</b>	P	
6	Account	P	
7	Password	S	4, 5
8	Email	S	4, 5, 23
9	Phone No	S	4, 23
10	<b>Personal Information</b>	P	
11	Employee ID/Code	S	10

12	Employee Name	S	10
13	Father's Name	S	10
14	Mother's Name	S	10
15	Birth Date	S	10
16	District	S	10, 23, 29, 47
17	Religion	S	10
18	Passport	S	10
19	Driving License	S	10
20	Address	S	23
21	Post	S	23
22	Upazila	S	23, 47
23	<b>Contract Information</b>	P	
24	Rank	S	29
25	Department	S	29
26	Batch	S	29
27	Grade	S	29
28	Workstation	S	29
29	<b>Joining Information</b>	P	
30	<b>Spouse or Children Information</b>	P	
31	Spouse Name	S	30
32	Org Name	S	30
33	Birth Place	S	30
34	Occupation	S	30
35	<b>Education</b>	P	
36	Degree	S	35
37	Result	S	35
38	Distinction	S	35

39	Board	S	35
40	<b>Training Information</b>	P	
41	Training Type	P	40
42	Institution	S	40
43	Country	S	40
44	Start Date	S	40
45	End Date	S	40
46	Grade	S	29, 40
47	<b>Posting Information</b>	P	
48	From Date	S	47
49	To Date	S	47
50	Office	S	47
51	<b>Promotion Information</b>	S	
52	Designation	S	52, 47
53	Promotion Date	S	52
54	Remarks	P	30, 52
55	<b>Achievements</b>	P	
56	Journal Article	S	
57	Conference Proceeding	S	
58	Developed Process	S	
59	Patent	S	
60	Acceptance Year	S	55
61	Description	S	55
62	Books	S	
63	Award/Grant	S	
64	Year	S	55
65	Search	S	

66	Institution	S	40
67	Joining date	S	29

#### 4.2.2 Potential data object

- **User:** 7, 8, 9
- **Admin:** 7, 8
- **Personal Information:** 11 -19
- **Contract Information:** 8,9,16,20-22
- **Joining Information:** 16, 24-28, 46, 67
- **Family Information:** 31-34, 54
- **Education:** 36-39
- **Training Information:** 41-46, 66
- **Posting Information:** 16, 22, 48-50, 52,
- **Promotion Information:** 52-54
- **Achievements:** 60, 61, 64,

#### 4.2.3 Analysis for finalizing Data Object

- ❖ User, admin are users of Smart MIS. So, all two kinds of users can be merged into a user data object.
- ❖ All other data objects can be used as data objects as they have enough importance in the system.

#### 4.2.4 Final Data Object

1	<b>User:</b> <u>Email</u> , Password, Phone
2	<b>User Information:</b> <u>Employee ID</u> , Employee Name, Father's Name, Mother's Name, Birth Date, Religion, Passport, Driving License, Profile photo, Signature
3	<b>Contract Information:</b> Email, Phone, District, Address, Post, Upazila
4	<b>Joining Information:</b> Upazila, Rank, Department, Batch, office name, Workstation, Joining date
5	<b>Family Information:</b> Spouse Name, Org Name, Org Address, Designation, Birth Place, Occupation, child name, Gender, Birth Country Remarks
6	<b>Education:</b> Degree, Result, Distinction, Board
7	<b>Training Information:</b> <u>Training_id</u> , Training Type, Institution, Country, Start

	Date, End Date, Grade
8	<b>Posting Information:</b> From Date, To Date, Office, Designation, District, Upazila
9	<b>Promotion Information:</b> Designation, Promotion Date, Remarks, Promotion Nature,
10	<b>Achievements:</b> Acceptance Year, Description, type

### 4.3 Schema Table

Table: Schema-User

Attributes	Type	Size
Email	VARCHAR	255
Password	VARCHAR	255
Phone	NUMBER	11

Table: Schema-User Information

Attributes	Type	Size
Employee_ID	VARCHAR	255
Employee_Name	VARCHAR	255
Fathers_Name	VARCHAR	255
Mothers_Name	VARCHAR	255
Birth_Date	DATE	255
Religion	VARCHAR	255
Passport	NUMBER	255
Driving_License	VARCHAR	255
Profile_photo	VARCHAR	255
Signature	VARCHAR	255

Table: Schema-Contract Information

Attributes	Type	Size
Address_type	VARCHAR	255
E_phone	NUMBER	11
E_email	VARCHAR	255
E_contract_relation	VARCHAR	255
District	VARCHAR	255
Address	VARCHAR	255
Post_office	VARCHAR	255
Police_station	VARCHAR	255
Upazila	VARCHAR	255

Table: Schema-Joining Information

Attributes	Type	Size
Upazila	VARCHAR	255
Rank	VARCHAR	255
Department	VARCHAR	255
Batch	VARCHAR	255
Office_name	VARCHAR	255
Workstation	VARCHAR	255
Joining_date	DATE	255

Table: Schema-Family Information

Attributes	Type	Size
Spouse_name	VARCHAR	255
Org_name	VARCHAR	255

Org_address	VARCHAR	255
Designation	VARCHAR	255
Birth_place	VARCHAR	255
Occupation	VARCHAR	255
Child_name	VARCHAR	255
Gender	VARCHAR	255
Birth_country	VARCHAR	255
Remarks	VARCHAR	255

Table: Schema-Education

Attributes	Type	Size
Degree	VARCHAR	255
Result	NUMBER	255
Distinction	VARCHAR	255
Board	VARCHAR	255

Table: Schema- Training Information

Attributes	Type	Size
Traning_id	VARCHAR	255
Traning_type	VARCHAR	255
Institution	VARCHAR	255
Country	VARCHAR	255
Start_date	DATE	255
End_date	DATE	255
Grade	VARCHAR	255

Table: Schema- Posting Information

Attributes	Type	Size
From_date	DATE	255
To_date	DATE	255
Office	VARCHAR	255
Designation	VARCHAR	255
District	VARCHAR	255
Upazila	VARCHAR	255

Table: Schema-Promotion Information

Attributes	Type	Size
Designation	VARCHAR	255
Promotion Date	DATE	255
Remarks	VARCHAR	255
Promotion_nature	VARCHAR	255

Table: Schema- Achievements

Attributes	Type	Size
Acceptance_year	DATE	255
Description	VARCHAR	255
Achivement_type	VARCHAR	255

## Entity Relationship Diagram:

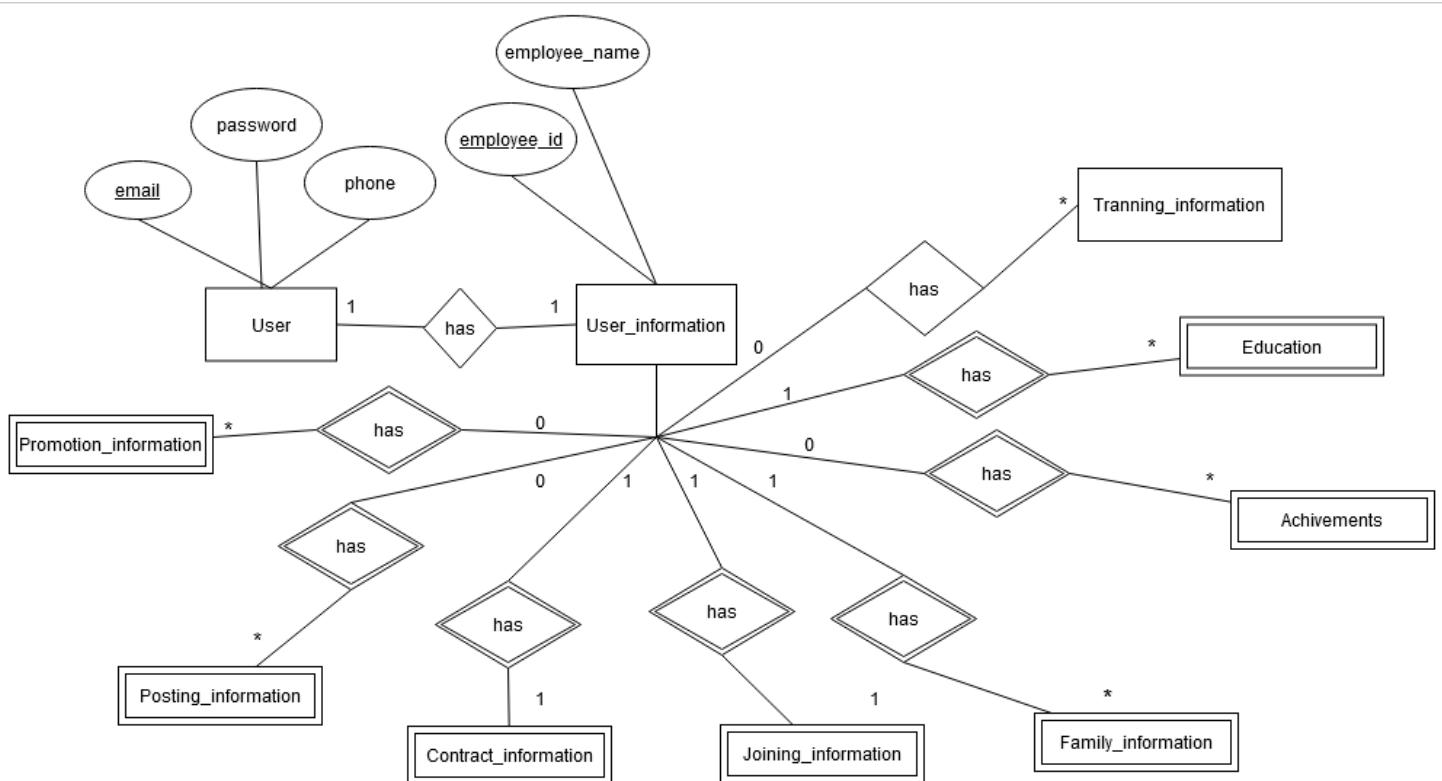


Figure 6: Entity Relationship Diagram

For full version and better view:

<https://drive.google.com/file/d/14-bHi0qO0UDHbOd-FRUqKLw7KdxUzJjL/view?usp=sharing>

# Chapter 5 : Class Based Modeling

This chapter is intended to describe class-based modeling of the Grocery Management System.

## Class Based Modeling Concept

Class-based modeling represents the objects that the system will manipulate, the operations that will be applied to the objects, relationships between the objects and the collaborations that occur between the classes that are defined.

## General Classification

To identify the potential classes, nouns were selected from the solution space of the story. These were then characterized in seven general classifications. The seven general characteristics are as follows:

1. External entities
2. Things
3. Events
4. Roles
5. Organizational units
6. Places
7. Structures

## 5.1 Analysis Classes

After identifying nouns from the scenario, I have filtered nouns belonging to the solution domain using General Classification (External entities, Things, Events, Roles, Organizational units, Places, and Structures). Nouns selected as a potential class were filtered using Selection Criteria (Retained information, Needed services, Multiple attributes, Common attributes, Common operations, and Essential requirements). After performing an analysis on potential classes, I have found the following analysis classes:

- BaseController
- UserController
- ProfileController
- FileManager
- UserTokenHandler

- SearchActivity
- SearchService

## 5.2 Class Card

The class cards of the analysis classes are given below:

Table: Class Card - BaseController

<b>BaseController</b>	
Attributes	Methods
	<ul style="list-style-type: none"> <li>+ add()</li> <li>+ delete()</li> <li>+ modify()</li> </ul>
Responsibilities	Collaborators
<ul style="list-style-type: none"> <li>• Forward request to the desire class</li> </ul>	<ul style="list-style-type: none"> <li>• UserController</li> <li>• ProfileController</li> </ul>

Table: Class Card - UserController

<b>UserController</b>	
Attributes	Methods
- user_repository: UserRepository	<ul style="list-style-type: none"> <li>+ login()</li> <li>+ changePassword()</li> </ul>
Responsibilities	Collaborators
<ul style="list-style-type: none"> <li>• Activity for managing login and session</li> </ul>	<ul style="list-style-type: none"> <li>• UserRepository</li> </ul>

Table: Class Card - UserRepository

<b>UserRepository</b>	
Attributes	Methods
<ul style="list-style-type: none"> <li>- user : User</li> <li>- User_handler: User TokenHandler</li> </ul>	<ul style="list-style-type: none"> <li>+ storeUser()</li> <li>+ getUsers()</li> <li>+ login()</li> </ul>
Responsibilities	Collaborators
<ul style="list-style-type: none"> <li>• Manage users fetch</li> </ul>	<ul style="list-style-type: none"> <li>• User</li> <li>• UserTokenHandler</li> </ul>

Table: Class Card - UserTokenHandler

<b>UserTokenHandler</b>	
Attributes	Methods
<ul style="list-style-type: none"> <li>- user : User</li> </ul>	<ul style="list-style-type: none"> <li>+ createUser()</li> <li>+ saveToken()</li> <li>+ regenerateToken ()</li> </ul>
Responsibilities	Collaborators
<ul style="list-style-type: none"> <li>• Manage user create</li> <li>• Manage session and token</li> </ul>	<ul style="list-style-type: none"> <li>• User</li> <li>• UserRepository</li> </ul>

Table: Class Card - ProfileController

<b>ProfileController</b>	
Attributes	Methods

- profileRepository: ProfileRepository	+ storeUserInfo() + updateUser() + fetchUsers() + searchUserDetails() + addFile() + deleteFile() + getFile()
Responsibilities	Collaborators
<ul style="list-style-type: none"> <li>● Activity for managing user crud</li> <li>● Controller for managing file crud</li> </ul>	<ul style="list-style-type: none"> <li>● ProfileRepository</li> </ul>

Table: Class Card - ProfileRepository

ProfileRepository	
Attributes	Methods
<ul style="list-style-type: none"> <li>- user : User</li> <li>- crawlerHandler : CrawlerHandler</li> </ul>	<ul style="list-style-type: none"> <li>+ updateUser()</li> <li>+ uploadFile()</li> <li>+ searchUserDetails()</li> <li>+ deleteFile()</li> <li>+ getFile()</li> </ul>
Responsibilities	Collaborators
<ul style="list-style-type: none"> <li>● Manage user crud</li> <li>● Manage file crud</li> </ul>	<ul style="list-style-type: none"> <li>● CrawlerHandler</li> <li>● User</li> </ul>

Table: Class Card - CrawlerHandler

CrawlerHandler	
Attributes	Methods
- baseURL: BaseURL	<ul style="list-style-type: none"> <li>+ searchIndex()</li> <li>+ SearchUser()</li> <li>+ searchComplete()</li> <li>+ sort()</li> <li>+ filter()</li> </ul>
Responsibilities	Collaborators
<ul style="list-style-type: none"> <li>● Search user scientific papers from given url</li> </ul>	<ul style="list-style-type: none"> <li>● ProfileRepository</li> <li>● BaseURL</li> </ul>



## Class Responsibility Collaboration Diagram

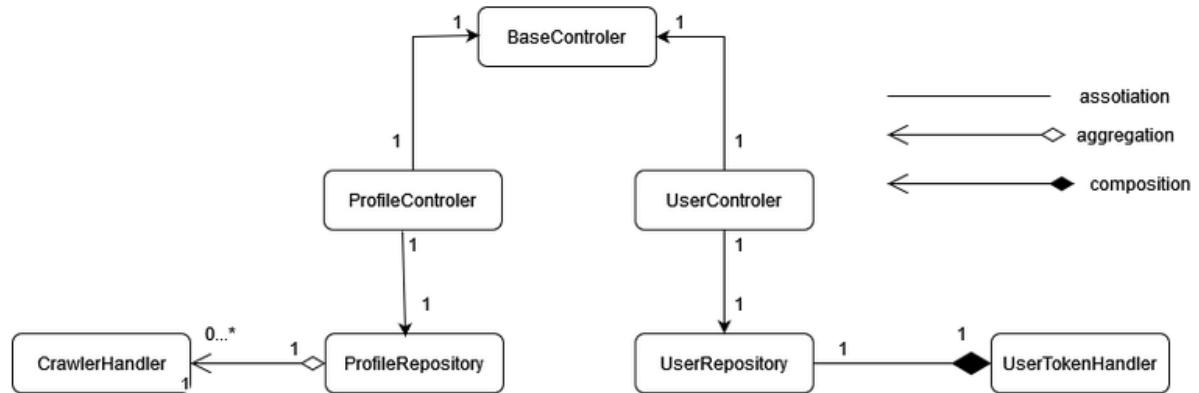


Figure 7: Class Responsibility Collaboration Diagram

# Chapter 6 : Architectural Design

As architectural design begins, the software to be developed must be put into context, that is- the design should define the external entities (other systems, devices, people) that the software interacts with and the nature of the interaction. This information can generally be acquired from the requirements model and all other information gathered during requirements engineering. Once context is modeled and all external software interfaces have been described, you can identify a set of architectural archetypes.

This chapter describes the architectural design of the AL integrated MIS.

## 6.1 Architectural Overview

AL integrated MIS will follow the MVT(Model-View-Template) architecture of the Django framework.

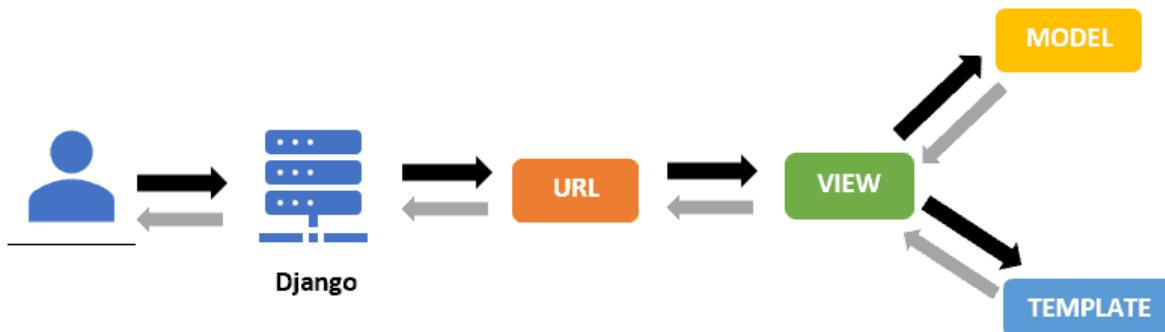


Figure 8: Steps of the whole system architecture

### Model:

A **Model** is an object that defines the structure of the data in the Django application. It is responsible for maintaining the entire application's data for which it provides various mechanisms to add, update, read and delete the data in the database. It's nothing but a database table. It is a python class that is linked to a database. When we create a model with some data we are actually saying to Django to create a database table for that data. So a model contains necessary data for a particular request. A view fetches necessary data from its corresponding model.

### **View:**

A **View** is a handler function that accepts HTTP requests, processes them, and returns the HTTP response. It retrieves the necessary data to fulfill the request using Models and renders them on the user interface using Templates. It can also create an HTML page using an HTML template dynamically, and populate it with data fetched from the model.

### **Template:**

A **Template** is a text file that defines the structure or layout of the user interface. The text file can be any type of file; for example HTML, XML, etc. It can accept data from the view and render it using jinja syntax. To generate HTML dynamically Django uses DTL(Django Template Language) along with static HTML. Using DTL Django is able to show data from models dynamically.

## **6.2 Architectural Context Diagram**

An architectural context diagram is used to model the manner in which software interacts with entities external to its boundaries. Systems that interoperate with the target system are represented as-

**Superordinate systems** —those systems that use the target system as part of some higher-level processing scheme. (There is no superordinate system in this case)

**Subordinate systems** —those systems that are used by the target system and provide data or processing that are necessary to complete the target system functionality. (Database and webPage in this case)

**Peer-level systems** —those systems that interact on a peer-to-peer basis (i.e., information is either produced or consumed by the peers and the target system. (There is no peer-level system in this case)

**Actors** — entities (people, devices) that interact with the target system by producing or consuming information that is necessary for requisite processing. (User in this case)

Each of these external entities communicates with the target system through an interface (the small shaded rectangles).

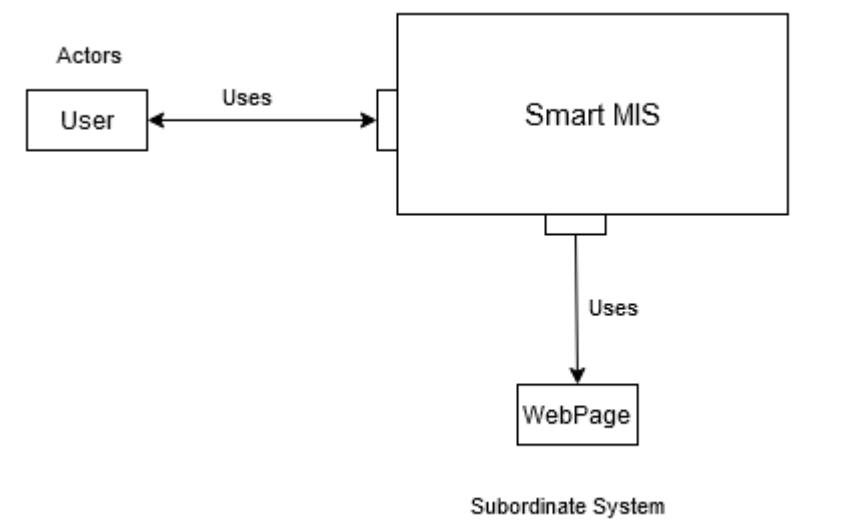


Figure 9: Architectural Context Diagram of Smart MIS

## 6.2 Mapping Requirements to Software Architecture

The presentation layer will deal with user input and display all of the necessary information to its users. It will communicate with the business logic layer/server and request it to show or send all necessary information in response. The business logic layer will perform all the necessary computations and will be responsible for user register, update, login, session management, profile creation/modification/deletion, image management, and searching. Users must log in to the web application to get responses. Everything else, that is all the necessary tasks will be performed efficiently in the background by the presentation layer, business logic layer, and data access layer. Thus, all the requirements are met by this architecture.

# Chapter 7 : Methodology

This chapter explains the operation of our project's scientific article search tool and how it presents the user with accurate search results.

## 7.1 Automatic Scientific Paper Search Module

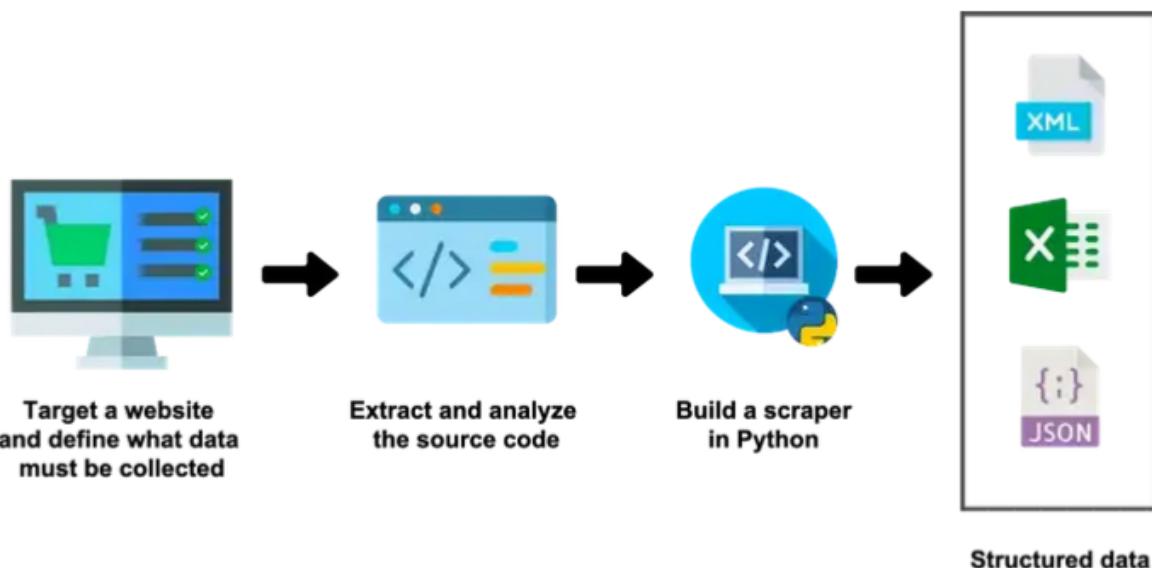


Figure 10: Usual scraping workflow

### Taking Searching Parameters:

The user must first enter all of the necessary information into the system. Our system will search the user's scientific papers using the information they have provided. These details are absolutely necessary for searching and receiving the right results. Because our search engine uses these details as parameters when it searches. Every piece of information is crucial in this case, including the special characters, as each of these factors is essential to the search process.

### Add Proxy for Routing:

After taking the parameters, our search module chooses the desired online link and appends the desired format of parameters to the web link. Actually, the links created lead to numerous websites that search for scientific papers. Our searching module will gather all the search results after reaching the desired webpage for further processing.

But here, a significant problem has emerged. When our search engine hits the same website repeatedly from the same server machine, the targeted website flags our server's IP address as a threat and blocks it. It is therefore very impossible to obtain the desired data from the

specified web page. Therefore, in order to remedy this problem, we employ a proxy routing address to access the desired webpage and crawl the search information.

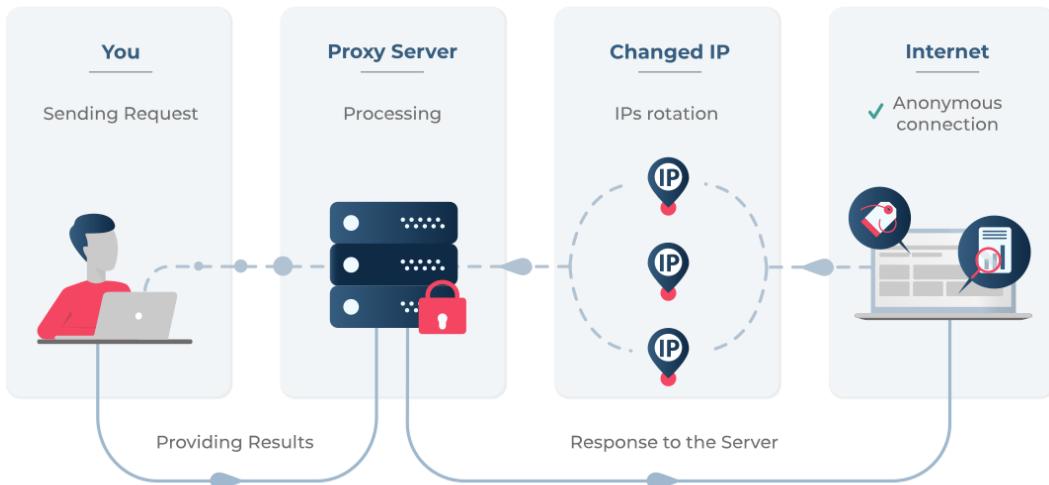


Figure 11: Proxy Routing System

### Crawling Data from Targeted Web Source:

Here is the main part of our scientific paper searching tool. After hitting the desire web address, the web address will give a response data. Through our searching module, we gather the web response data using the Python Requests package. The requests module allows sending HTTP requests using Python. The HTTP request returns a Response Object with all the response data (content, encoding, status, etc). After receiving the response, we use BeautifulSoup python library to pulling data out from responses which are mainly HTML and XML files. From the response, it generates a parse tree that can be used to extract data in a hierarchical and more legible way.

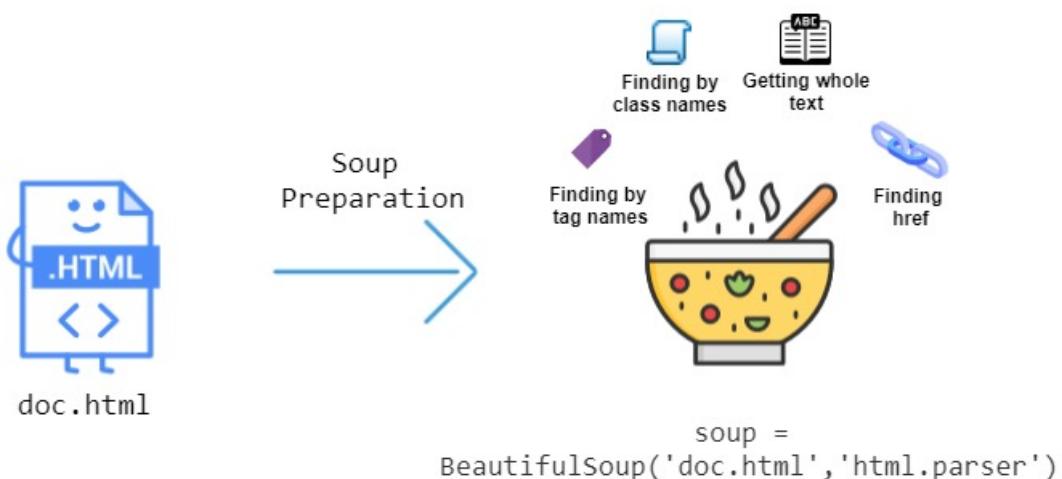


Figure: Parsing data using BeautifulSoup

### **Sorting Data:**

After parsing the formatted data from response data, we just do some queries to find out the targeted data from the formatted data. Then we do some validation to find the accurate data and do the previous processes again and again until we get our desired data. After getting the desired data, then show it to the user.

# Chapter 8 : Implementation

This chapter explains the operation of our project's scientific article search tool and how it presents the user with accurate search results.

## 8.1 Technologies Used in Implementation

### 8.1.1 Front-end (Client) Tech Stack:

- HTML
- CSS
- JavaScript
- Ajax javascript
- Bootstrap v5 - Front-end framework

### 8.1.2 Front-end (Server) Tech Stack:

- Python 3.10.5
- Django 3.2.9
- ScraperAPI
- Special Libraries:
  - BeautifulSoup - python library to pulling data out from HTML, XML
  - Requests - allows sending HTTP requests using Python
  - Django dynamic formsets - Python library to add html form dynamically

## 8.2 Source Code Details

Coding implementations are in 2 parts- Server side and Client side. Their short details are given below:

### 8.2.1 Client Side

The client-side implementation of the Smart MIS is done using bootstrap 5 framework for developing the user interface. Here HTML, CSS, Javascript and Ajax are used to dynamic the system frontend. In the client side user main operations are-

- **Authorization:** Every user of the Smart MIS must be authenticated to use the system.
- **Input User Information:** After authentication, users will input the required information to the system. It will create a data hub for the organization.
- **Searching:** By clicking the search button users will get their own achievements information like scientific paper information as suggestions.

### **8.2.2 Server Side**

The server-side implementation of the Smart MIS is done using python 3 and Django which is a web application framework in python. Here we use different python libraries to fulfill different purposes. In the server side system main operations are-

- User authentication verification
- Data input and retrieve from the database
- Searching user achievements using the scientific paper searching module.
- Sending the result back to the client

### **8.3 Source Code Repository**

Github Links-

Full project- <https://github.com/ShahriyarHridoy/SPL-3>

# Chapter 9 : User Interface Design

## 9.1 User Interfaces:

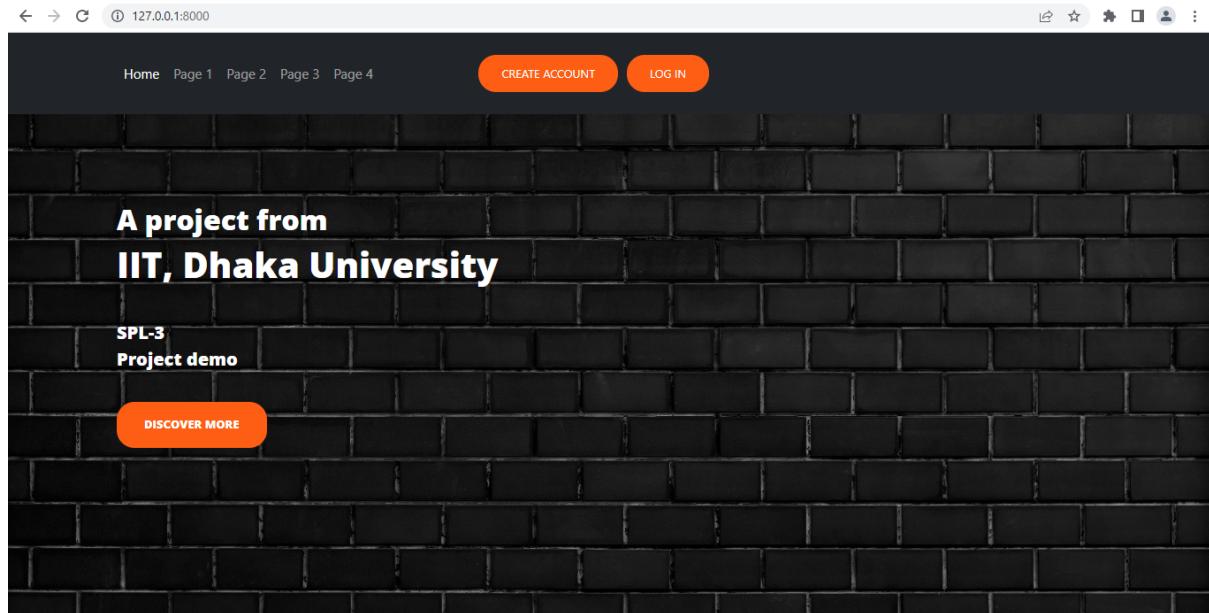


Figure: Webpage home view

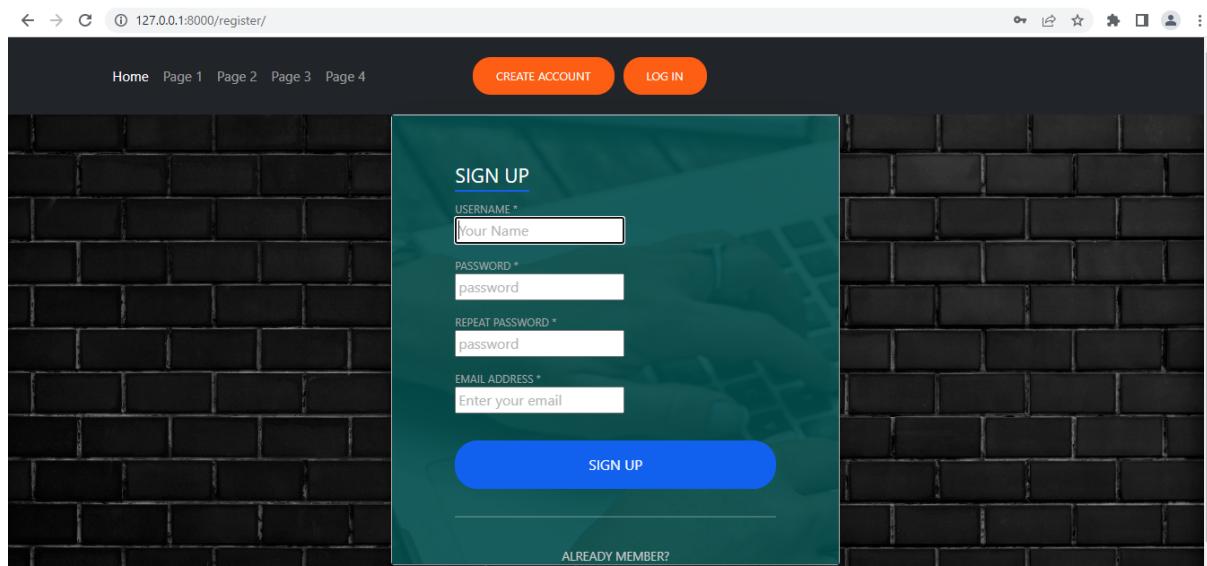


Figure: User Registration Page

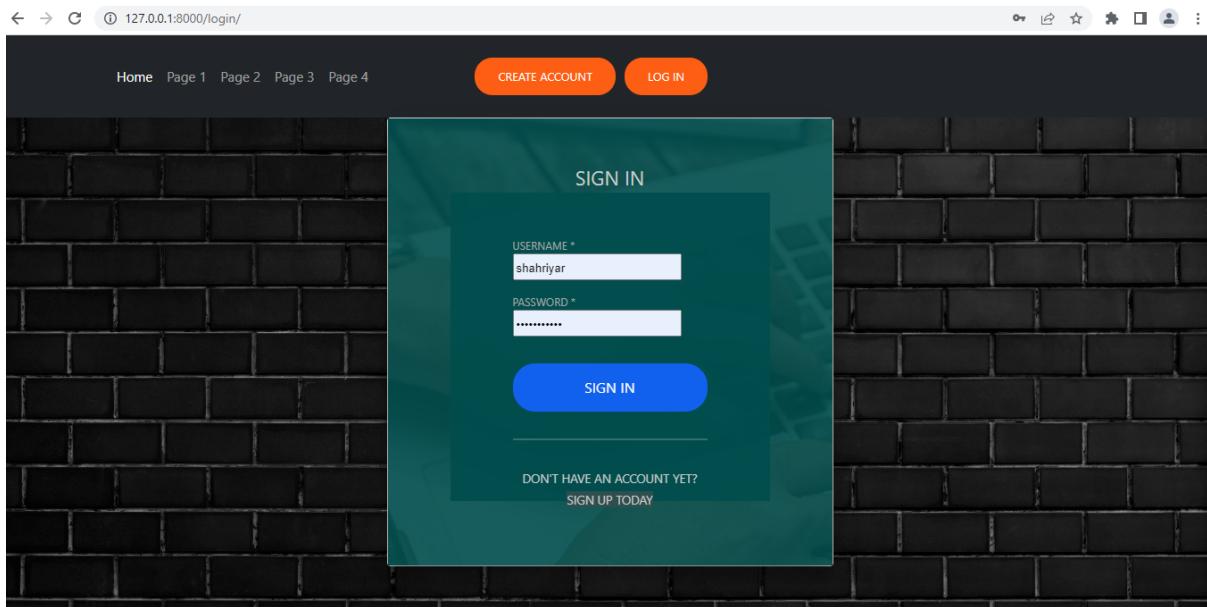


Figure: User Sign In page

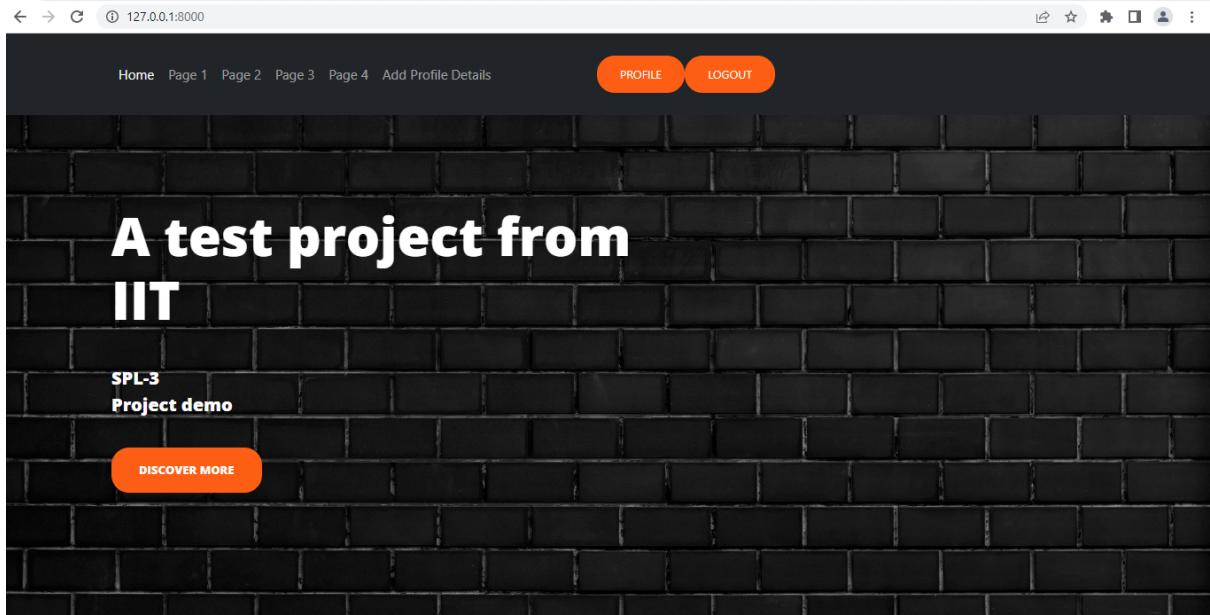


Figure: User logged in home page

← → ⌂ ① 127.0.0.1:8000/add-profile/#step-1

Home Page 1 Page 2 Page 3 Page 4 Add Profile Details PROFILE LOGOUT

### Personal Management Information System (PMIS)

**Step 1 Personal Info** Step 2 Contract Info Step 3 Spouse & Children Info Step 4 Education Info Step 5 Joining Info Step 6 Posting Info Step 7 Promotion Info Step 8 Leave/Deputation Info  
Step 9 Traning Info Step 10 Research Interest Step 11 R & D Projects Step 12 Achievement Info Step 13 Thesis Supervision Step 14 Formar/Other Service Step 15 Other Activities/Assignments All Done

Choose Picture

Choose your Signature

No file chosen

EMPLOYEE ID

EMAIL

UNIT

EMPLOYEE NAME

DIVISION

FATHER'S NAME

MOTHER'S NAME

SUMMARY ABOUT YOU

Figure: PIMS first page ( User Personal Information adding Page part -1)

FIELD OF SPECIALIZATION

CELL NO

RELIGION:

None

MARITAL STATUS

MARRIED

UNMARRIED

DIVORCED

Previous Next

Figure: PIMS first page ( User Personal Information adding Page part -2)

← → ⌂ ⓘ 127.0.0.1:8000/add-profile/#step-2

Step 1 Personal Info	<b>Step 2 Contract Info</b>	Step 3 Spouse & Children Info	Step 4 Education Info	Step 5 Joining Info	Step 6 Posting Info	Step 7 Promotion Info	Step 8 Leave/Deputation Info
Step 9 Traning Info	Step 10 Research Interest	Step 11 R & D Projects	Step 12 Achievement Info	Step 13 Thesis Supervision	Step 14 Formar/Other Service	Step 15 Other Activities/Assignments	All Done

### Contract Information

Present Address	Parmanent Address	Emergency Contract
Address	Address	Name
Post Office	Post Office	Relation
Police Station	Police Station	Address
District	District	Phone
Upazila	Upazila	Cell No
Telephone Number	Telephone Number	Email

[Save Contract Info](#)

Figure: User Contract Information adding Page

← → ⌂ ⓘ 127.0.0.1:8000/add-profile/#step-3

Home Page 1 Page 2 Page 3 Page 4 Add Profile Details [PROFILE](#) [LOGOUT](#)

### Personal Management Information System (PMIS)

Step 1 Personal Info	Step 2 Contract Info	<b>Step 3 Spouse &amp; Children Info</b>	Step 4 Education Info	Step 5 Joining Info	Step 6 Posting Info	Step 7 Promotion Info	Step 8 Leave/Deputation Info
Step 9 Traning Info	Step 10 Research Interest	Step 11 R & D Projects	Step 12 Achievement Info	Step 13 Thesis Supervision	Step 14 Formar/Other Service	Step 15 Other Activities/Assignments	All Done

### Spouse and Children Information

[Add Spouse Information](#)

[Add Children Information](#)

[Previous](#) [Next](#)

Figure: User Spouse and Children information adding view page (part-1)

← → ⌂ ① 127.0.0.1:8000/add-profile/#step-3

### Personal Management Information System (PMIS)

Step 1 Personal Info Step 2 Contract Info Step 3 Spouse & Children Info Step 4 Education Info Step 5 Joining Info Step 6 Posting Info Step 7 Promotion Info Step 8 Leave/Deputation Info  
Step 9 Traning Info Step 10 Research Interest Step 11 R & D Projects Step 12 Achievement Info Step 13 Thesis Supervision Step 14 Formar/Other Service Step 15 Other Activities/Assignments All Done

#### Spouse and Children Information

**Add Spouse Information**

Spouse Name	Home District	Occupation	Designation
Org Name	Org Address	Cell No	

**Save Spouse Information**

**Add Children Information**

Previous Next

Figure: User Spouse and Children information adding view page (part-2)

← → ⌂ ① 127.0.0.1:8000/add-profile/#step-4

### Personal Management Information System (PMIS)

Step 1 Personal Info Step 2 Contract Info Step 3 Spouse & Children Info Step 4 Education Info Step 5 Joining Info Step 6 Posting Info Step 7 Promotion Info Step 8 Leave/Deputation Info  
Step 9 Traning Info Step 10 Research Interest Step 11 R & D Projects Step 12 Achievement Info Step 13 Thesis Supervision Step 14 Formar/Other Service Step 15 Other Activities/Assignments All Done

#### Education Information

Degree	Group/Department	Board/University	Passing year	Result (Division/GPA/CGPA)	Distinction
1. DEGREE* <input type="button" value="Choose degree"/>	<input type="button" value="Group/Department"/>	<input type="button" value="Board/University"/>	<input type="button" value="Passing Year"/>	<input type="button" value="Result"/>	<input type="button" value="Distinction"/>
<input type="button" value="Add Another Form"/>					

**Save Education Info**

Previous Next

Figure: User Education Information adding page

**Personal Management Information System (PMIS)**

**Step 5 Joining Info**

**Joining Information**

Rank \ Class	Enter Rank \ Class	Grade	Enter Grade
Post/ Designation	Post/ Designation	Batch	Batch
Department	Department	Order No & Date	Order No & Date
Office Name	Office Name	PRL Date	Select PRL date
WorkStation - Institute	WorkStation/ Posting Place	Joining Date	your Joining Date
District	District	Confirmation Date	Select Confirmation Date
Upazila	Upazila	Gazatted Date	Select Gazatted Date
Job Nature	None	Endorsement Date	Select Endorsement Date

**Save Joining Information**

Figure: User Joining Information adding page

127.0.0.1:8000/add-profile/#step-6

**Posting Information**

	Designation	Office	District	Upazila	Form Date	To Date	Till Today
1.	Designation	Office	District Name	Upazila Name	<input type="button" value="mr"/>	<input type="button" value="mr"/>	Grade
2.	Designation	Office	District Name	Upazila Name	<input type="button" value="mr"/>	<input type="button" value="mr"/>	Grade
3.	Designation	Office	District Name	Upazila Name	<input type="button" value="mr"/>	<input type="button" value="mr"/>	Grade

**Add Another Form**

**Save Posting Info**

Figure: User Posting Information adding page

← → ⌂ ① 127.0.0.1:8000/add-profile/#step-7

### Personal Management Information System (PMIS)

Step 1 Personal Info Step 2 Contract Info Step 3 Spouse & Children Info Step 4 Education Info Step 5 Joining Info Step 6 Posting Info Step 7 **Promotion Info** Step 8 Leave/Deputation Info  
 Step 9 Traning Info Step 10 Research Interest Step 11 R & D Projects Step 12 Achievement Info Step 13 Thesis Supervision Step 14 Formar/Other Service Step 15 Other Activities/Assignments All Done

#### Promotion Information

Designation	Nature	Promotion Date	Order No	Order Date	Remarks
1. Designation	Choose <input type="button" value="▼"/>	mm/dd/yyyy <input type="button" value="..."/>	Order No.	mm/dd/yyyy <input type="button" value="..."/>	Remarks

[Add Another Form](#)

[Save Promotion Info](#)

[Previous](#)
[Next](#)

Figure: User Promotion Information adding page

← → ⌂ ① 127.0.0.1:8000/add-profile/#step-8

Home Page 1 Page 2 Page 3 Page 4 Add Profile Details [PROFILE](#) [LOGOUT](#)

### Personal Management Information System (PMIS)

Step 1 Personal Info Step 2 Contract Info Step 3 Spouse & Children Info Step 4 Education Info Step 5 Joining Info Step 6 Posting Info Step 7 **Promotion Info** Step 8 Leave/Deputation Info  
 Step 9 Traning Info Step 10 Research Interest Step 11 R & D Projects Step 12 Achievement Info Step 13 Thesis Supervision Step 14 Formar/Other Service Step 15 Other Activities/Assignments All Done

#### Leave/Deputation Information

1. TYPE*	FROM*	TO*	DESCRIPTION*
Choose Type <input type="button" value="▼"/>	mm/dd/yyyy <input type="button" value="..."/>	mm/dd/yyyy <input type="button" value="..."/>	Leave description

[Add Another Form](#)

Figure: User Leave/ Deputation Information adding page

127.0.0.1:8000/add-profile/#step-9

### Personal Management Information System (PMIS)

Step 1 Personal Info Step 2 Contract Info Step 3 Spouse & Children Info Step 4 Education Info Step 5 Joining Info Step 6 Posting Info Step 7 Promotion Info Step 8 Leave/Deputation Info

Step 9 Training Info Step 10 Research Interest Step 11 R & D Projects Step 12 Achievement Info Step 13 Thesis Supervision Step 14 Formar/Other Service Step 15 Other Activities/Assignments All Done

#### Training Information

Type (Local/Foreign)	Title	Institution	Country	Start Date	End Date	Grade	Position
1. Choose	Training Name	Institution Name	Country Name	mm/c	mm/c	Grade VI	Position
2. Choose	Training Name	Institution Name	Country Name	mm/c	mm/c	Grade VI	Position

[Add Another Form](#)

[Save Training Info](#)

[Previous](#) [Next](#)

Figure: User Training Information adding page

127.0.0.1:8000/add-profile/#step-10

Home Page 1 Page 2 Page 3 Page 4 Add Profile Details PROFILE LOGOUT

### Personal Management Information System (PMIS)

Step 1 Personal Info Step 2 Contract Info Step 3 Spouse & Children Info Step 4 Education Info Step 5 Joining Info Step 6 Posting Info Step 7 Promotion Info Step 8 Leave/Deputation Info

Step 9 Training Info Step 10 Research Interest Step 11 R & D Projects Step 12 Achievement Info Step 13 Thesis Supervision Step 14 Formar/Other Service Step 15 Other Activities/Assignments All Done

#### Research Interest Information

1. interested fields name
---------------------------

[Add Another Form](#)

[Save Research Interest Info](#)

[Previous](#) [Next](#)

Figure: User Research Interest adding page

← → ⌂ ① 127.0.0.1:8000/add-profile/#step-11

Personal Info Contract Info Spouse & Children Info Education Info Joining Info Posting Info Promotion Info Leave/Deputation Info

Step 9 Training Info Step 10 Research Interest Step 11 R & D Projects Step 12 Achievement Info Step 13 Thesis Supervision Step 14 Formal/Other Service Step 15 Other Activities/Assignments All Done

### R & D Projects

1. PROJECT TYPE\*  PROJECT NAME\*  ROLE IN PROJECT\*  PROJECT STATUS\*  TENURE\*

2. PROJECT TYPE\*  PROJECT NAME\*  ROLE IN PROJECT\*  PROJECT STATUS\*  TENURE\*

3. PROJECT TYPE\*  PROJECT NAME\*  ROLE IN PROJECT\*  PROJECT STATUS\*  TENURE\*

Figure: User R&D Projects adding page

← → ⌂ ① 127.0.0.1:8000/add-profile/#step-12

Personal Info Contract Info Spouse & Children Info Education Info Joining Info Posting Info Promotion Info Leave/Deputation Info

Step 9 Training Info Step 10 Research Interest Step 11 R & D Projects Step 12 Achievement Info Step 13 Thesis Supervision Step 14 Formal/Other Service Step 15 Other Activities/Assignments All Done

### Achievement Information

Achievement Type Publishing Year or Year of Acceptance Description (Add reference where needed)

1. Choose Type  mm/dd/yyyy

2. Choose Type  mm/dd/yyyy

3. Choose Type  mm/dd/yyyy

4. Choose Type  mm/dd/yyyy

Figure: User Achievement Information adding page (manual)

← → ⌂ 127.0.0.1:8000/add-profile/#step-12

Training Info Research Interest R & D Projects Achievement Info Thesis Supervision Form/Other Service Other Activities/Assignments All Done

### Achievement Information

Achievement Type	Publishing Year or Year of Acceptance	Description (Add reference where needed)
1. Choose Type	mm/dd/yyyy	achievement information
<input type="button" value="Add"/>		

[Add Another Form](#) [Search Achievement](#)

### Search Achievement Results

# 1

<https://dl.acm.org/doi/abs/10.1145/3340482.3342745>  
Classifying non-functional requirements using RNN variants for quality software development  
Book  
2019/8/27  
Non-Functional Requirements (NFR), a set of quality attributes, required for software architectural design. Which are usually scattered in SRS and must be extracted for quality software development to meet user expectations. Researchers show that functional and non-functional requirements are mixed together within the same SRS, which requires a mammoth effort for distinguishing them. Automatic NFR classification would be a feasible way to characterize those requirements, where several techniques have been recommended eg IR, linguistic knowledge, etc. However, conventional supervised machine learning methods suffered for word representation problem and usually required hand-crafted features, which will be overcome by proposed research using RNN variants to categories NFR. The NFR are interrelated and one task happens after another, which is the ideal situation for RNN. In this approach ...  
[Add Info](#)

Figure: User Achievement Information adding page (automatic with search result), part-1

← → ⌂ 127.0.0.1:8000/add-profile/#step-12

### Search Achievement Results

# 1

<https://dl.acm.org/doi/abs/10.1145/3340482.3342745>  
Classifying non-functional requirements using RNN variants for quality software development  
Book  
2019/8/27  
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[Add Info](#)

# 2

<https://ieeexplore.ieee.org/abstract/document/8934499/>  
Non-Functional Requirements Classification with Feature Extraction and Machine Learning: An Empirical Study  
Conference  
2019/5/3  
Non-Functional Requirements (NFR) describe a set of quality attributes required for a software such as security, reliability, performance, etc. Extracting and considering NFR from software requirement specification can help developers to deliver quality software which meets users expectations completely. Since, the functional and non-functional requirements are mixed together within the same SRS, it requires a lot of human effort for distinguishing them. This paper proposed automatic NFR classification approach for quality software development by combining machine learning feature extraction and classification techniques. An empirical study with seven machine learning algorithms and four feature selection approaches have been applied to automatically classify NFR for finding out the best pair. The experiments were measured with statistical analysis including precision, recall, F1-score, and accuracy of the ...  
[Add Info](#)

Figure: User Achievement Information adding page (automatic with search result), part-2

motivation derived prioritisation approach by focusing collaboration of different SDLC phases named requirements, design and code. Since, each of the SDLC phase has its own impact on test case, unique priority constants are assigned to every phase, which are used for constructing final priorities. The proposed framework was experimented on different projects, and results have been compared to several prominent schemes considering individual phase of SDLC. On average ...

# 16

<http://www.mecs-press.net/ijitcs/ijitcs-v11-n4/v11n4-5.html>

Subset Matching based Selection and Ranking (SMSR) of Web Services

Scholar articles

Web service is a software application, which is accessible using platform independent and language neutral web protocols. However, selecting the most relevant services became one of the vital challenges. Quality of service plays very important role in web service selection, as it determines the quality and usability of a service, including its non-functional properties such as scalability, accessibility, integrity, efficiency, etc. When agent applications send request with a set of quality attributes, it becomes challenging to find out the best service for satisfying maximum quality requirements. Among the existing approaches, the single value decomposition technique is popular one; however, it suffers for computational complexity. To overcome this limitation, this paper proposed a subset matching based web service selection and ranking by considering the quality of service attributes. The proposed method creates a quality ...

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Add Info

Save Achievement Info

Previous Next

Figure: User Achievement Information adding page (automatic with search result), part-3

Personal Management Information System (PMIS)

Step 1 Personal Info Step 2 Contract Info Step 3 Spouse & Children Info Step 4 Education Info Step 5 Joining Info Step 6 Posting Info Step 7 Promotion Info Step 8 Leave/Deputation Info

Step 9 Trainig Info Step 10 Research Interest Step 11 R & D Projects Step 12 Achievement Info Step 13 Thesis Supervision Step 14 Formar/Other Service Step 15 Other Activities/Assignments All Done

**Thesis Supervision**

1. THESS TYPE\* ChooseType

2. THESS TYPE\* ChooseType

SUPERVISORS NAME\* supervisors name STUDENT NAME\* student name STUDENT SESSION\* E.g. 2016-17 THESIS TITLE\* enter thesis title

SUPERVISORS NAME\* supervisors name STUDENT NAME\* student name STUDENT SESSION\* E.g. 2016-17 THESIS TITLE\* enter thesis title

Add Another Form

Save Thesis Supervision Info

Previous Next

Figure: User Thesis Supervision Information adding page

Personal Management Information System (PMIS)

Step 1 Personal Info Step 2 Contract Info Step 3 Spouse & Children Info Step 4 Education Info Step 5 Joining Info Step 6 Posting Info Step 7 Promotion Info Step 8 Leave/Deputation Info

Step 9 Training Info Step 10 Research Interest Step 11 R & D Projects Step 12 Achievement Info Step 13 Thesis Supervision Step 14 Formar/Other Service Step 15 Other Activities/Assignments All Done

### Formar/Other Service

1. SERVICE TYPE\* ADDRESS\* DESIGNATION\* FROM\* TO

Service Type address designation mm/dd/yyyy mm/dd/yyyy

2. SERVICE TYPE\* ADDRESS\* DESIGNATION\*

Service Type address designation mm/dd/yyyy mm/dd/yyyy

Add Another Form

Save Other Service Info

Previous Next

Figure: User Previous/ Other Service adding page

Personal Management Information System (PMIS)

Step 1 Personal Info Step 2 Contract Info Step 3 Spouse & Children Info Step 4 Education Info Step 5 Joining Info Step 6 Posting Info Step 7 Promotion Info Step 8 Leave/Deputation Info

Step 9 Training Info Step 10 Research Interest Step 11 R & D Projects Step 12 Achievement Info Step 13 Thesis Supervision Step 14 Formar/Other Service Step 15 Other Activities/Assignments All Done

### Other Activities/Assignments

1. ACTIVITY/ASSIGNMENT TYPE\* ROLE\* FROM\* TO

activityType role mm/dd/yyyy mm/dd/yyyy

2. ACTIVITY/ASSIGNMENT TYPE\* ROLE\* FROM\* TO

activityType role mm/dd/yyyy mm/dd/yyyy

Add Another Form

Save Other Activities Info

Figure: User Other Activities adding page

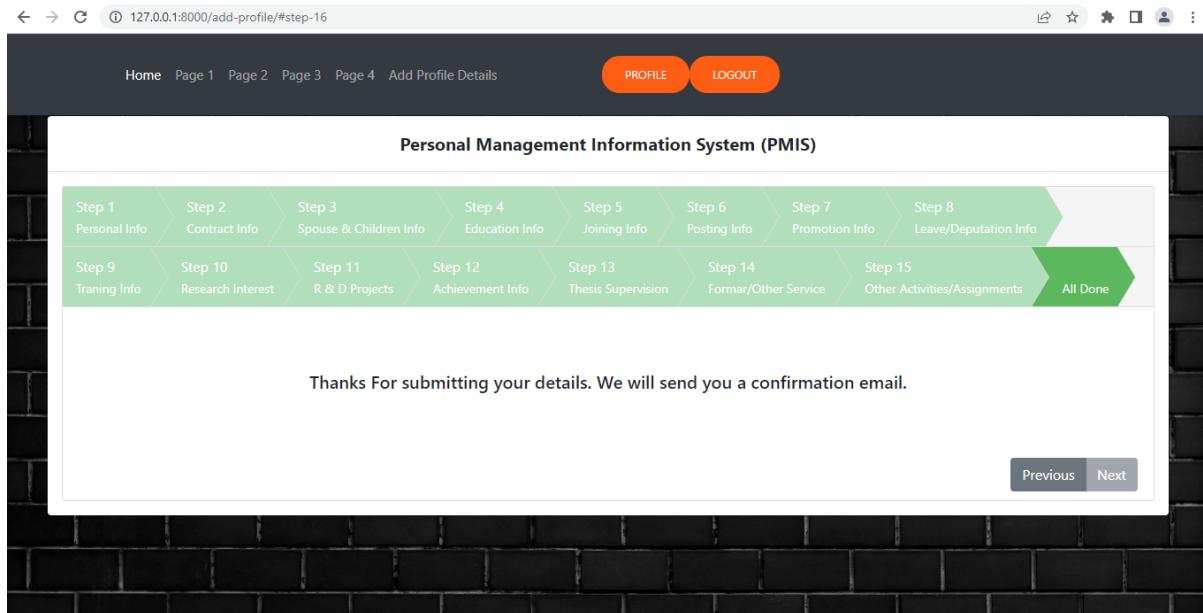


Figure: User Information submission confirmation page

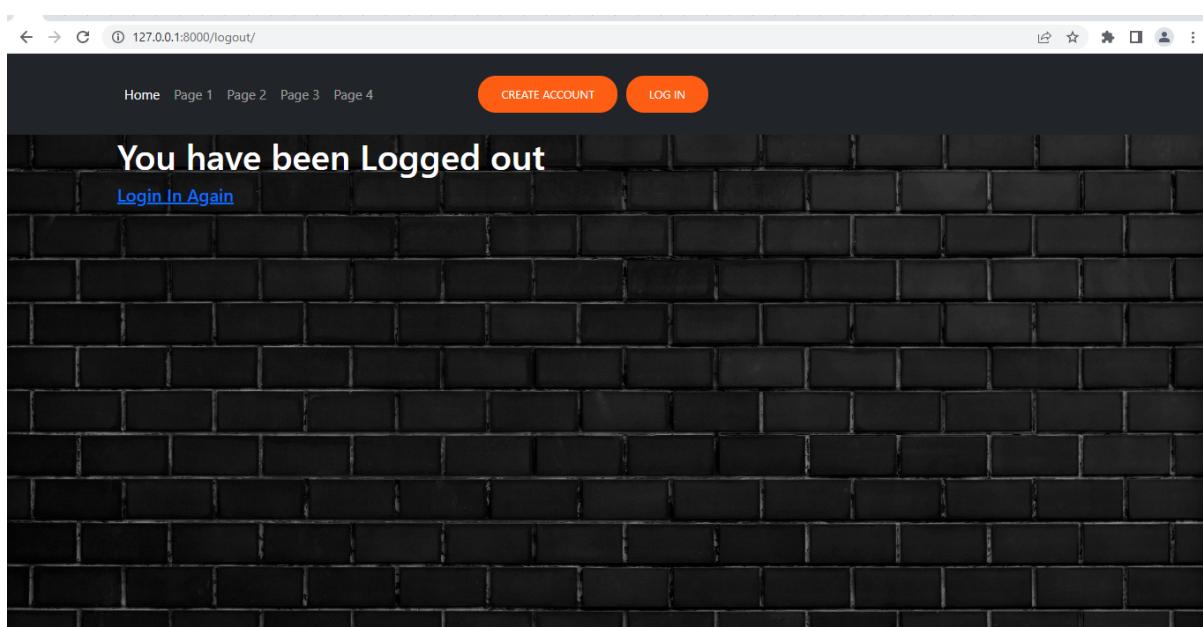


Figure: User Logged out Page

The screenshot shows the Django Admin interface for managing users. The top navigation bar includes links for 'Home', 'Authentication and Authorization', and 'Users'. The main content area is titled 'Select user to change' and displays a table of users. The table has columns for 'USERNAME', 'EMAIL ADDRESS', 'FIRST NAME', 'LAST NAME', and 'STAFF STATUS'. Two users are listed: 'shahriyar' (shahriyarridoy@gmail.com) with a green checkmark in 'STAFF STATUS' and 'test' (test@gmail.com) with a red error icon. A search bar and a 'Go' button are above the table. On the left, a sidebar lists various application modules under 'AUTHENTICATION AND AUTHORIZATION' and 'USERS'. On the right, a 'FILTER' sidebar provides options to filter by staff status (All, Yes, No), superuser status (All, Yes, No), and active status (All, Yes, No). An 'ADD USER' button is located at the top right of the main content area.

USERNAME	EMAIL ADDRESS	FIRST NAME	LAST NAME	STAFF STATUS
shahriyar	shahriyarridoy@gmail.com			✓
test	test@gmail.com			✗

Figure: Admin User control panel page

# Chapter 10 : Testing

I will use black box testing technique to test the Smart MIS System. All the tests have been conducted on Windows 10 (64-bit) and Chrome browser (Version 108.0.5359.94)

## 10.1 High-level description of testing goals

The Smart MIS System will undergo high level testing which is popularly known as Black-box testing. Black Box Testing is a software testing method in which the functionalities of software applications are tested without having knowledge of internal code structure, implementation details and internal paths. Black Box Testing mainly focuses on input and output of software applications and it is entirely based on software requirements and specifications.

Serving as a bridge between users and the development team of a product, the ultimate goal of software testing is to troubleshoot all the issues and bugs as well as control the quality of a resulting product. The goals of high level software testing is given below:

- To ensure that the system works properly that means the system functionalities works without any issues
- To ensure that the system satisfies the user requirements and works as desired.
- To find any existing bug
- To improve the system

## 10.2 Summary of items and features to be tested

### Client-Side Testing:

The test cases for client-side testing, input test data, steps to be executed, and expected results are given in table:

Table : Test cases for client-side testing

Test ID	Test Case	Input Data	Steps to be executed	Expected Result	Pass/ Fail
T1	Test if sign up works	Required information	Click on the “Register” button	A user will be created and logged in to the system.	pass

T2	Test if login works	Provide credentials	Click on the “Login” button	Logged in successfully and the home page appears	pass
T3	Test if profile details added	Required information	Click on the ‘Add Profile Details’ button	Show “Details added successfully” message	pass
T4	Test if profile photo and signature added	Photo and signature file	Click on the “Add Photo” and “Signature Photo” button	File saved in the fileSystem and will show in profile	pass
T5	Test if profile details update works	Change profile information	Click on the “Update Profile” button	Updated Details will be showed	pass
T6	Test if user scientific paper searching shows	Required information	Click on the “Search Scientific Papers” button	Show user scientific papers	pass

### Server-Side Testing:

Unit testing will be performed on all the classes of the server side to check if all the actual outputs match with the expected outputs.

# Chapter 11 : User Manual

This web application is for a specific large organization or university employee or members. To use this application, a member first needs a browser (chrome recommended) to hit the web application URL. ( As the application is not yet on production level so we just use the localhost url to access the web application ).

1. An employee or members first hit the web application URL on a browser
2. Then employees or members will see a landing page as below. Then, employees or members need to sign up first to be an authorized user. So user click on **Create Account** button first

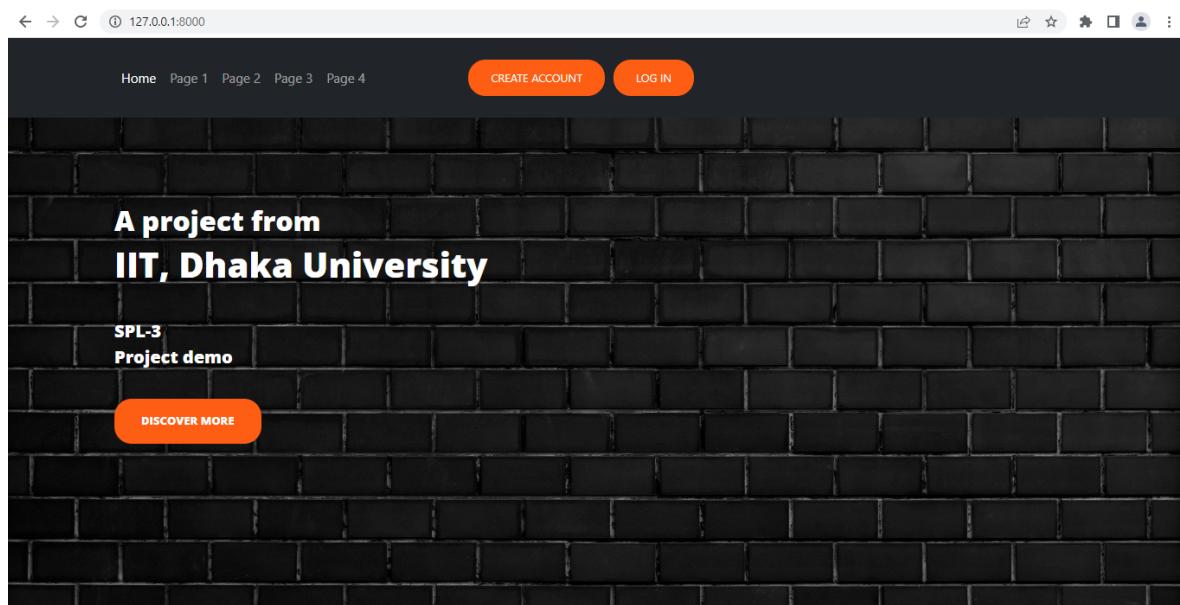


Figure: Webpage home view

3. Then, an employee or member will view a web page like below and fill up all required information. then click on the **Sign Up** button

A screenshot of a web browser displaying a user registration form. The background is a dark grey brick wall texture. At the top, there is a navigation bar with links: Home, Page 1, Page 2, Page 3, Page 4, CREATE ACCOUNT (in orange), and LOG IN (in white). Below the navigation bar, a "SIGN UP" form is centered. It contains four input fields: "USERNAME \*", "PASSWORD \*", "REPEAT PASSWORD \*", and "EMAIL ADDRESS \*". Each field has a placeholder text: "Your Name", "password", "password", and "Enter your email" respectively. Below the fields is a large blue "SIGN UP" button. At the bottom of the form, there is a link "ALREADY MEMBER?".

Figure: User Registration Page

4. After successfully Signing up, the system will redirect the user to the **Sign In** page. Then the user has to fill up the username and password filed correctly to login the web application by clicking on the **Sign In** button.

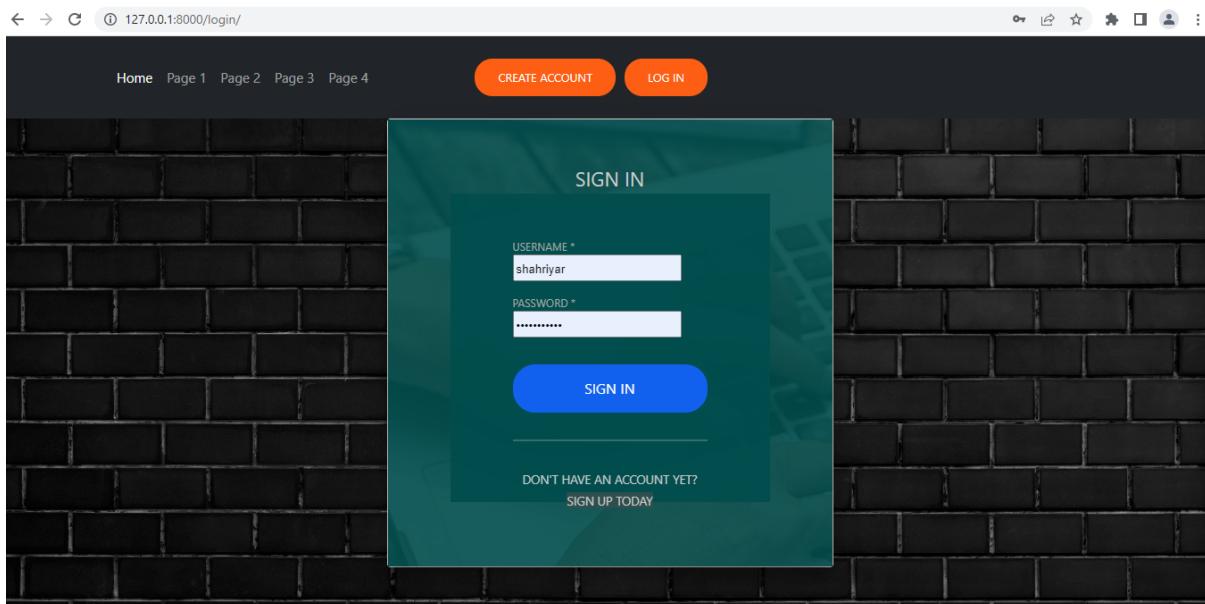


Figure: User Sign In page

5. After logged in successfully, user will see a home page like below. Then to add the user's own details, user will click on the **Add Profile Details** button.

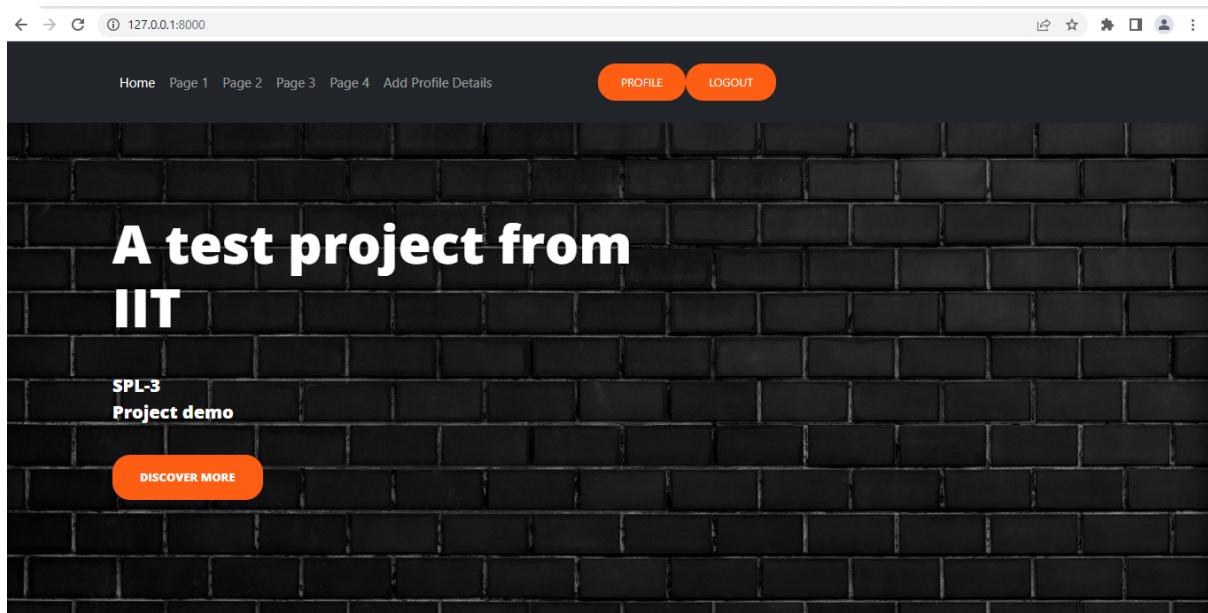


Figure: User logged in home page

6. After that the user will see the PIMS page like below. On the PMIS step-1 page user have to add all personal information that are required.

Figure: PIMS first page ( User Personal Information adding Page part -1)

7. After fill up all the information, user must click on the save button and click next to go to the next form page.

Figure: PIMS first page ( User Personal Information adding Page part -2)

8. Then user will see the next page like below. On the PMIS step-2 page user have to add all contract information that are required and click on the save button. And then click next button.

The screenshot shows the 'Contract Information' section of the PMIS profile setup. The top navigation bar displays 15 steps, with Step 2 ('Contract Info') highlighted in green. The main form area is titled 'Contract Information' and contains three rows of input fields:

- Present Address:** Address, Post Office, Police Station, District, Upazila, Telephone Number.
- Permanent Address:** Address, Post Office, Police Station, District, Upazila, Telephone Number.
- Emergency Contact:** Name, Relation, Address, Phone, Cell No, Email.

A blue 'Save Contract Info' button is located at the bottom of the form.

Figure: User Contract Information adding Page

9. Then user will see the next page like below. On the PMIS step-3 page user have to add all the children and spouse information that are required and click on the save button. And then click on the next button.

The screenshot shows the 'Spouse and Children Information' section of the PMIS profile setup. The top navigation bar displays 15 steps, with Step 3 ('Spouse & Children Info') highlighted in green. The main form area is titled 'Personal Management Information System (PMIS)' and contains two green buttons:

- Add Spouse Information**
- Add Children Information**

At the bottom right of the form, there are 'Previous' and 'Next' buttons.

Figure: User Spouse and Children information adding view page (part-1)

Figure: User Spouse and Children information adding view page (part-2)

10. Then user will see the next page like below. On the PMIS step-4 page user have to add all the education information that is required. User will add multiple education information by clicking + or **Add Another Form** button and click on the save button. And then click on the next button.

Figure: User Education Information adding page

11. Then user will see the next page like below. On the PMIS step-5 page user have to add all the joining information that is required and click on the save button. then click on the next button.

**Personal Management Information System (PMIS)**

**Step 5 Joining Info**

Rank \ Class: Enter Rank \ Class

Post/ Designation: Post/ Designation

Department: Department

Office Name: Office Name

WorkStation - Institute: WorkStation/ Posting Place

District: District

Upazila: Upazila

Job Nature: None

Grade: Enter Grade

Batch: Batch

Order No & Date: Order No & Date

PRL Date: Select PRL date

Joining Date: your Joining date

Confirmation Date: Select Confirmation Date

Gazatted Date: Select Gazatted Date

Endorsement Date: Select Endorsement Date

**Joining Information**

**Save Joining Information**

Figure: User Joining Information adding page

12. Then user will see the next page like below. On the PMIS step-6 page user have to add all the posting information that is required. User will add multiple posting information by clicking + or **Add Another Form** button and click on the save button. Then click on the next button.

**Posting Information**

	Designation	Office	District	Upazila	Form Date	To Date	Till Today
1.	Designation	Office	District Name	Upazila Name	<input type="button" value="mr"/>	<input type="button" value="mr"/>	Grade
2.	Designation	Office	District Name	Upazila Name	<input type="button" value="mr"/>	<input type="button" value="mr"/>	Grade
3.	Designation	Office	District Name	Upazila Name	<input type="button" value="mr"/>	<input type="button" value="mr"/>	Grade

**Add Another Form**

**Save Posting Info**

Figure: User Posting Information adding page

13. Then user will see the next page like below. On the PMIS step-7 page user have to add all the promotion information that is required. User will add multiple promotion information by clicking + or **Add Another Form** button and click on the save button. Then click on the next button.

**Promotion Information**

	Designation	Nature	Promotion Date	Order No.	Order Date	Remarks
1.	<input type="text"/> Designation	<input type="button" value="Choose"/>	<input type="text"/> mm/dd/yyyy	<input type="text"/> Order No.	<input type="text"/> mm/dd/yyyy	<input type="text"/> Remarks
<b>+ Add Another Form</b>						

**Save Promotion Info**

**Previous** **Next**

Figure: User Promotion Information adding page

14. Then user will see the next page like below. On the PMIS step-8 page user have to add all the Leave/Deputation information that is required. User will add multiple leave/deputation information by clicking + or **Add Another Form** button and click on the save button. Then click on the next button.

**Leave/Deputation Information**

1.	TYPE*	FROM*	TO*	DESCRIPTION*
	<input type="button" value="Choose Type"/>	<input type="text"/> mm/dd/yyyy	<input type="text"/> mm/dd/yyyy	<input type="text"/> Leave description
<b>+ Add Another Form</b>				

Figure: User Leave/ Deputation Information adding page

15. Then user will see the next page like below. On the PMIS step-9 page user have to add all the promotion information that is required. User will add multiple promotion information by clicking + or **Add Another Form** button and click on the save button. Then click on the next button.

Figure: User Training Information adding page

16. Then user will see the next page like below. On the PMIS step-10 page user have to add all the promotion information that is required. User will add multiple promotion information by clicking + or **Add Another Form** button and click on the save button. Then click on the next button.

Figure: User Research Interest adding page

17. Then user will see the next page like below. On the PMIS step-11 page user have to add all the R&D projects information that is required. User will add multiple R&D projects information by clicking + or **Add Another Form** button and click on the save button. Then click on the next button.

The screenshot shows the PMIS Step 11: R & D Projects page. The navigation bar at the top has tabs for Personal Info, Contract Info, Spouse & Children Info, Education Info, Joining Info, Posting Info, Promotion Info, and Leave/Deputation Info. Below the tabs, a progress bar shows Step 9 (Training Info) through Step 15 (Other Activities/Assignments) and All Done. The main content area is titled "R & D Projects". It contains three rows for adding project details. Each row has a dropdown for "PROJECT TYPE", a text input for "PROJECT NAME", a text input for "ROLE IN PROJECT", a dropdown for "PROJECT STATUS", and a text input for "TENURE". There are also red minus and green plus buttons. At the bottom are "Add Another Form", "Save R&D Project Info", "Previous", and "Next" buttons.

Figure: User R&D Projects adding page

18. Then user will see the next page like below. On the PMIS step-12 page user have to add all the acivement information that is required. User will add multiple achievement information by clicking + or **Add Another Form** button and click on the save button. Then click on the next button.

The screenshot shows the PMIS Step 12: Achievement Info page. The navigation bar at the top has tabs for Personal Info, Contract Info, Spouse & Children Info, Education Info, Joining Info, Posting Info, Promotion Info, and Leave/Deputation Info. Below the tabs, a progress bar shows Step 9 (Training Info) through Step 15 (Other Activities/Assignments) and All Done. The main content area is titled "Achievement Information". It contains four rows for adding achievement details. Each row has a dropdown for "Achievement Type", a date input for "Publishing Year or Year of Acceptance", and a text input for "Description (Add reference where needed)". There are also red minus and green plus buttons. At the bottom are "Add Another Form", "Search Achievement", and "Save Promotion Info" buttons.

Figure: User Achievement Information adding page (manual)

19. User also add the achievement information by clicking on the **Search Achievement** button. After clicking the button system will show the user of their own scientific papers.

The screenshot shows a web application interface for adding achievement information. At the top, there is a navigation bar with tabs: Training Info, Research Interest, R & D Projects, Achievement Info (which is highlighted in green), Thesis Supervision, Former/Other Service, Other Activities/Assignments, and All Done. Below the navigation bar, the main content area has a title 'Achievement Information'. It contains three input fields: 'Achievement Type' (with a dropdown menu showing '1. Choose Type'), 'Publishing Year or Year of Acceptance' (with a date input field showing 'mm/dd/yyyy' and a calendar icon), and 'Description (Add reference where needed)' (with a text input field containing 'achievement information'). Below these fields are two buttons: 'Add Another Form' (green) and 'Search Achievement' (blue). Underneath the search button is a section titled 'Search Achievement Results' which displays a single result: '# 1 https://dl.acm.org/doi/abs/10.1145/3340482.3342745 Classifying non-functional requirements using RNN variants for quality software development Book 2019/8/27 Non-Functional Requirements (NFR), a set of quality attributes, required for software architectural design. Which are usually scattered in SRS and must be extracted for quality software development to meet user expectations. Researchers show that functional and non-functional requirements are mixed together within the same SRS, which requires a mammoth effort for distinguishing them. Automatic NFR classification would be a feasible way to characterize those requirements, where several techniques have been recommended eg IR, linguistic knowledge, etc. However, conventional supervised machine learning methods suffered for word representation problem and usually required hand-crafted features, which will be overcome by proposed research using RNN variants to categories NFR. The NFR are interrelated and one task happens after another, which is the ideal situation for RNN. In this approach ...' At the bottom of this result section are two buttons: 'Add Info' (blue) and 'Edit Info' (blue).

Figure: User Achievement Information adding page (automatic with search result), part-1

The screenshot shows a 'Search Achievement Results' page. It lists two items: '# 1' and '# 2'. Item #1 is the same research paper as in the previous screenshot. Item #2 is: '# 2 https://ieeexplore.ieee.org/abstract/document/8934499 Non-Functional Requirements Classification with Feature Extraction and Machine Learning: An Empirical Study Conference 2019/5/3 Non-Functional Requirements (NFR) describe a set of quality attributes required for a software such as security, reliability, performance, etc. Extracting and considering NFR from software requirement specification can help developers to deliver quality software which meets users expectations completely. Since, the functional and non-functional requirements are mixed together within the same SRS, it requires a lot of human effort for distinguishing them. This paper proposed automatic NFR classification approach for quality software development by combining machine learning feature extraction and classification techniques. An empirical study with seven machine learning algorithms and four feature selection approaches have been applied to automatically classify NFR for finding out the best pair. The experiments were measured with statistical analysis including precision, recall, F1-score, and accuracy of the ...' At the bottom of this list are two buttons: 'Add Info' (blue) and 'Edit Info' (blue).

Figure: User Achievement Information adding page (automatic with search result), part-2

The screenshot shows a web page titled "User Achievement Information adding page (automatic with search result), part-3". The page displays a list of achievements. Each achievement entry includes a "Save Achievement Info" button. At the bottom right, there are "Previous" and "Next" navigation buttons.

Figure: User Achievement Information adding page (automatic with search result), part-3

20. Then user will see the next page like below. On the PMIS step-13 page user have to add all the Thesis Supervision information that is required. User will add multiple thesis supervision information by clicking + or **Add Another Form** button and click on the save button. Then click on the next button.

The screenshot shows a web page titled "Personal Management Information System (PMIS)". The page displays a progress bar with 15 steps. Step 13, "Thesis Supervision", is highlighted in green. Below the progress bar, there are two sets of input fields for "Thesis Supervision". Each set includes dropdowns for "THESSIS TYPE\*", text inputs for "SUPERVISORS NAME\*", "STUDENT NAME\*", "STUDENT SESSION\*", and "THESSIS TITLE\*", and a red minus sign button. A green plus sign button is also visible. At the bottom left is a "Save Thesis Supervision Info" button, and at the bottom right are "Previous" and "Next" navigation buttons.

Figure: User Thesis Supervision Information adding page

21. In a similar way- On the PMIS step-14, 15 page, user have to add all the service and other activities information that is required. User will add multiple information by clicking + or **Add Another Form** button and click on the save button. Then click on the next button.

The screenshot shows the 'Personal Management Information System (PMIS)' interface. The top navigation bar includes links for Step 1 through Step 15, with Step 14 currently active. The main content area is titled 'Formar/Other Service'. It contains two identical input forms for adding services. Each form has fields for 'Service Type', 'Address', 'Designation', and date ranges ('FROM\*' and 'TO'). Below the forms is a green 'Add Another Form' button. At the bottom right is a 'Save Other Service Info' button. Navigation buttons 'Previous' and 'Next' are also present.

Figure: User Previous/ Other Service adding page

The screenshot shows the 'Personal Management Information System (PMIS)' interface. The top navigation bar includes links for Step 1 through Step 15, with Step 15 currently active. The main content area is titled 'Other Activities/Assignments'. It contains two identical input forms for adding activities. Each form has fields for 'ACTIVITY/ASSIGNMENT TYPE', 'ROLE', and date ranges ('FROM\*' and 'TO'). Below the forms is a green 'Add Another Form' button. At the bottom right is a 'Save Other Activities Info' button. Navigation buttons 'Previous' and 'Next' are also present.

Figure: User Other Activities adding page

22. Then user will see the next page like below. Here user will see a confirmation message after fill up all the PIMS form steps.

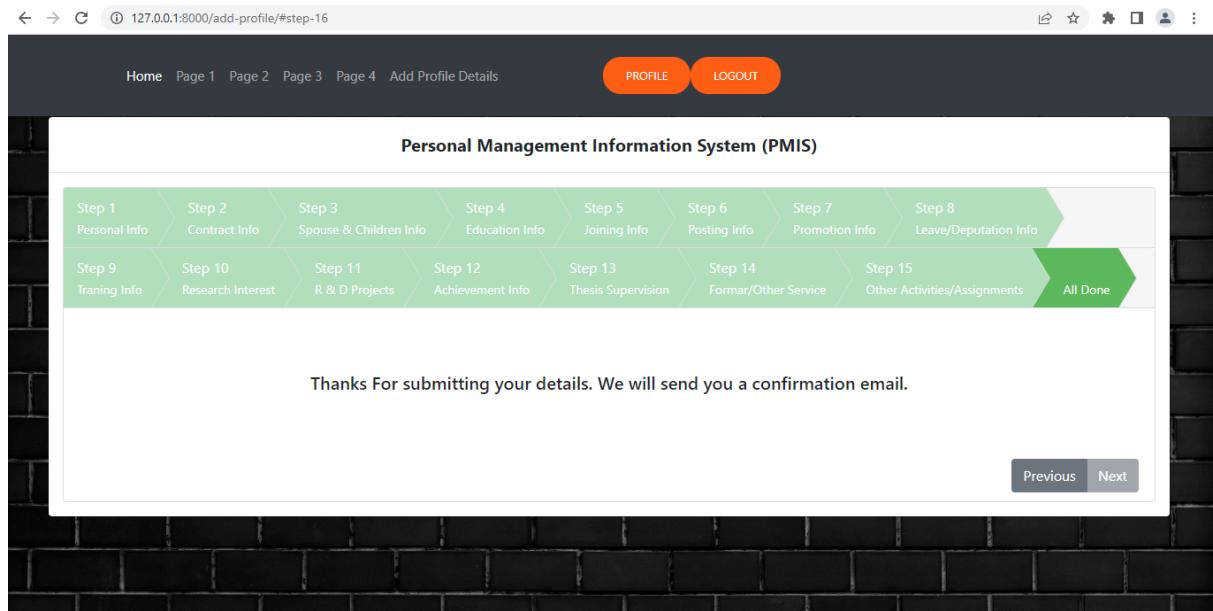


Figure: User Information submission confirmation page

23. User will see the log out page like below when click on the **Log Out** button.

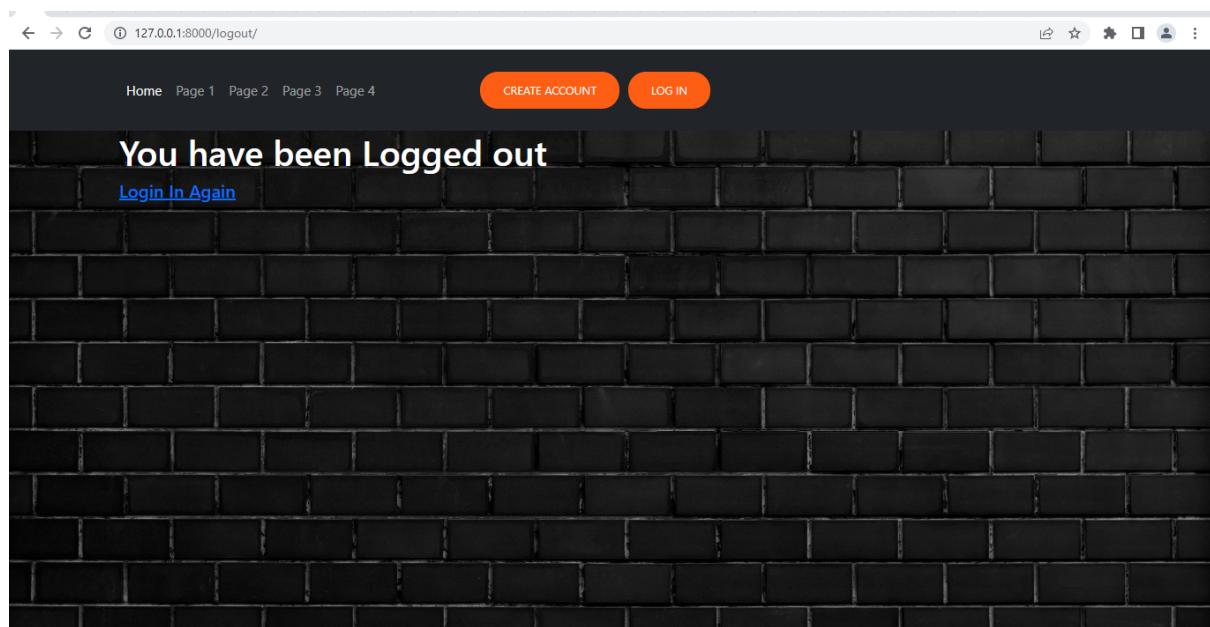


Figure: User Logged out Page

24. Admin users will see the page like below when the admin user is already logged in and hit the admin dashboard url. Here admin can manipulate any data of an user or data table.

The screenshot shows a web-based administrative interface for managing users. The top navigation bar includes links for 'WELCOME, SHAHRIYAR', 'VIEW SITE / CHANGE PASSWORD', and 'LOG OUT'. On the left, a sidebar menu lists various sections under 'AUTHENTICATION AND AUTHORIZATION' and 'USERS', with options like 'Groups', 'Users', 'Achievement informations', etc., each with an 'Add' button. The main content area is titled 'Select user to change' and displays a table of users. The table has columns for 'USERNAME', 'EMAIL ADDRESS', 'FIRST NAME', 'LAST NAME', and 'STAFF STATUS'. It shows two entries: 'shahriyar' (email: shahriyarridoy@gmail.com, staff status: Yes) and 'test' (email: test@gmail.com, staff status: No). A search bar at the top of the table allows for filtering users. To the right of the table, there is a 'FILTER' sidebar with sections for 'By staff status' (All, Yes, No), 'By superuser status' (All, Yes, No), and 'By active' (All, Yes, No). A large 'ADD USER +' button is located in the top right corner of the main content area.

Action:	Go	0 of 2 selected			
<input type="checkbox"/>	USERNAME	EMAIL ADDRESS	FIRST NAME	LAST NAME	STAFF STATUS
<input type="checkbox"/>	shahriyar	shahriyarridoy@gmail.com			✓
<input type="checkbox"/>	test	test@gmail.com			✗

Figure: Admin User control panel page

## Chapter 12 : Conclusion

It was so challenging for me to prepare this final report by interviewing this project stakeholder and collecting proper requirements and then writing all the implementation details properly. I have tried my level best to implement the system as flawlessly as possible. However, there is still room for improvement. In the future, I will make the server multi-threaded to improve performance. I think this report has been written in an easy-to-read way as well as with full information required to have a good concept over the idea. The reader should easily understand the information of the report. I am always open to constructive criticism and suggestions. I hope this report can be used effectively to maintain the software development cycle. It will be very easy to understand the whole project using this project report.

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