

DESIGN AND IMPLEMENTATION OF HOSTEL MANAGEMENT SYSTEM USING JAVA AND MYSQL

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ABSTRACT— The Hostel Management System framework is a software which is design to provide the facilities to the staff members as well as the students that saves the time that required by those paper works. As many students willing to live at hostel for studies the number of hostel buildings are increased that needs to be handle smartly by using the web application that decreases the stress or strain to the authorities. This application requires students and administrators login details to take them over the application dashboard where they all can easily access the information regarding their registration for hostel rooms, fee payments, can check student records as well as allow to update whenever required. This application overcomes the drawbacks of the past methods of management system; it is user friendly, GUI interface or environment, reliable and secured with best IT department professionals. Working on such application brings transparency in the environment that builds the trust between students and management as well as trust on the digital world.

Keywords— *Hostel management, login, Java, MySQL, NetBeans, Database, JDK*

I. INTRODUCTION

Hostel Management is a tedious task that needs lot of supervision and time. In such case, it is imperative for hostel to have software that deals with all the things of the hostel management because a normal paper work is intensive task which leads to the poor resource utilization and can have negative impact on hostels as well as institutions. This project favors the students and administration group which encourages them to spare the records of all things of hostel.

A computerized process that uses NetBeans which is integrated development environment (IDE) for java which is free, open source, feature rich and easy to use, great support for developing mobile application with java. NetBeans support 2 types of server and this project use Apache tomcat. The GUI builder helps in visually design layout and drag, drop interface components.

MYSQL is an open source relational database management system software (RDBMS) based on SQL. It manages all the records of students in a well oriented manner i.e. enable users to meet the database challenge. It will be at back end.

This project works on JAVA and SQL languages. JAVA is object-oriented programming language that is design to have few implementation dependencies as possible and SQL is structured query language which lets u access and manipulates the database. At first students are provided their code through which they can generate their login id's (primary key) and password. The next page contains all the information of student which can be edit or update by students. These all can be check and edit by the wardens anytime and above this administrators can do all things.

It is specially designed to allocate and manage accommodation spaces in hostel.

The system has unique approach to tracking information and makes the system more robust. The objective of this process is to implement a streamline registration process that reduces the administrator task and paperwork to improve the registration cycle process flow.

II. LITERATURE REVIEW

This paper begins with a short review of the literature regarding the Hostel Management System, we came across a number of ideas, implementations and designs. Some of them are given below:

According to Ritesh Kumar Bista's paper [1], the management system limits the human work and makes the hostel allocation much easier for students through web application. The software automatically selects the student from waiting list and also keep track of mess billing, out pass generation, complaint registration etc.

According to Bikash Choudhary's paper [2], Author have created PHP-MySQL which focuses on reducing the paperwork and also the efforts made by the hostel manager for managing the hostel. The framework replaces the manual hostel administration issues and also provides the data for example, hostel rooms data, hostel accounts data. As it is an online application anyone can access it from anyplace which makes the hostel management more efficient.

According to U. Elakkiya's paper [3], system consists of six modules, Student information, Room allocation, Attendance entry module, Mess payment calculation, Stock availability, Gate pass. It helps with adjusting the paper-based system to site-based framework. It encourages the administrative staff from manual work from which it is really hard to track the record of students.

The Management System proposed by Srikant Patnaik, Khushboo Kumari Singh[4], consists of eight main modules which are Registration module, student module, Hotel Management module, etc. The system helps to manage student information and it also keep the record of their room number and fee details. The system makes the work easier as it is paperless and it can be controlled from anywhere.

According to Kola Ayanlowo's paper [5], there

has been an enormous increase in educational institutions established mainly in last four decades. Accordingly, which has supported produce population of knowledgeable citizens. However, most of these new educational institutions are using the old techniques for managing the system especially hostel facilities which have its own negative impacts on the overall efficiency of the educational system. According to this paper they proposed the development of an automated hostel accommodation management system. The automated system was developed using Visual Basic and Microsoft Access for the database, in-built authentication system for preventing unauthorized access. The developed system is Graphical-User-Interface (GUI) oriented, and more efficient than traditional hostel management system.

3. System Requirements:

The **System requirements** specifies to the need of the user for an effective management system. The unique user requirements are given below.

3.1 User Requirements:

To access the registration form user would need:-

- *A username*
- *A unique password*
- *A personal computer setup with database and JDK installed*

3.2 User-Interface (UI) requirements:

A **User-Interface** is the designed login and registration pages through which a user and the porter (Warden) can register themselves or login themselves. It also includes pages where a user can see his details and the porter can manage or update the details.

- Home Page(User and porter)

- Fill in Details page(user)
- Information Page(User and Porter)
- Search/Update page(porter)
- Forgot Password page(porter)

3.3 Hardware and Software Requirements:

Hardware Requirements:- Processor-i3, Hard Disc-10GB, RAM memory- 1GB RAM.

Software Requirements:- Java Development Kit

Platform:- Windows XP, Windows 7 and other updates versions

Programming languages/IDEs:- Java, MySQL, IDEs- NetBeans

4. Proposed System:

To enhance the current existing system, a new framework named as Hostel Management System is proposed which is a java-based UI and MySQL based database system. The proposed system addresses the drawbacks of the existing system and ensures data integrity. This system provides smoothening of operations in retrieving data and thus saving much of the human effort and time. In figure 1, flowchart for various workflow is shown.

4.1. Designing:

Designing is an approach that creates things using the parts of standard independent interfaces. This helps in customization and upgradation of the app more convenient. It is an idea that makes a system in subdivisions so that it can be created individually and independently and then can be used in different systems for performing various functionalities. In fig.2, various processes are shown which are combined to do a hostel management functionality.

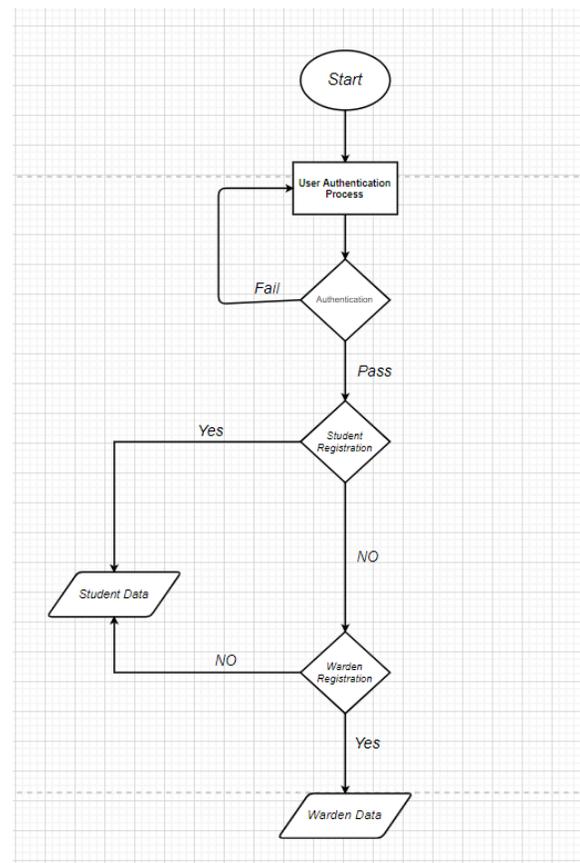


Fig 1 Data Flowchart of registration process

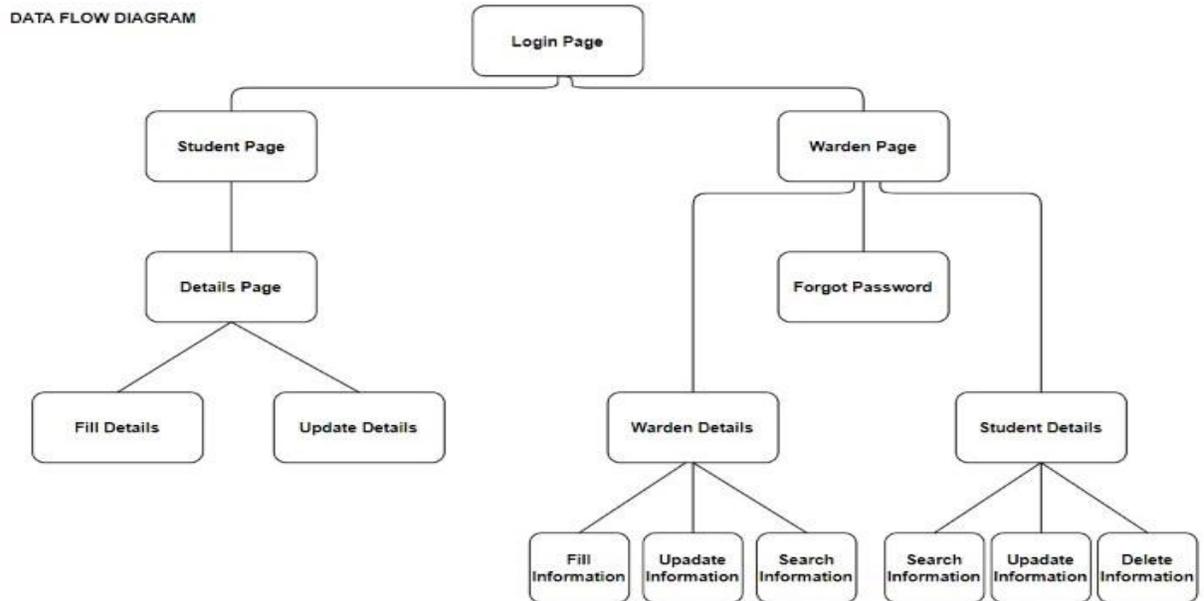


Fig 2. Data Flow Diagram of Hostel Management System

5.1 System Modules:

System Modules includes the sub-divisions of the main proposed system so that the sub divided modules can work independently when and if used in different systems to provide various functions. The proposed System consists of three different modules:

- ❖ Administrator Module
- ❖ Warden Module
- ❖ Student Module

5.1.1 Administrator Module:

The **Administrator** can do following functionalities:-

- **Login:** Only the authorized user can login into the admin page after verifying themselves by entering the desired password and username.
- **Managing:** The user (admin) is allowed to manage students i.e. he can remove or add or update any student data.

- **Managing Wardens:** Only user has the authority to manage the data of wardens i.e. adding or updating their data.
- **Password:** User can also change the password whenever he wants by using the old password.

5.1.2 Warden Module:

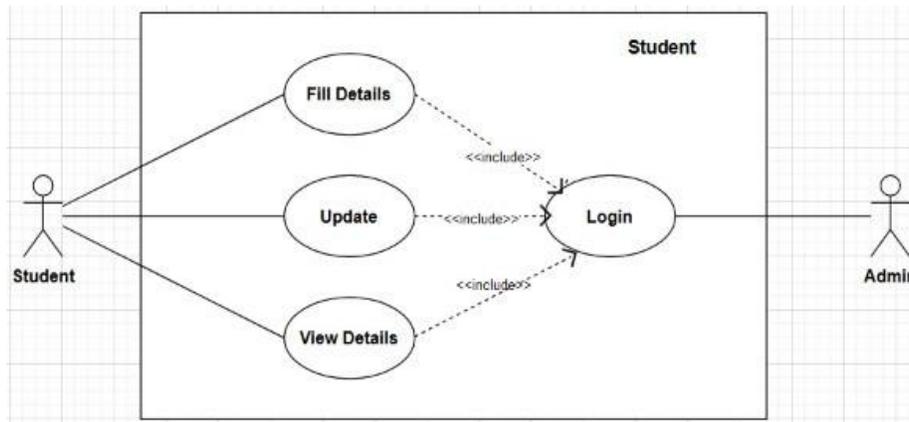
The **Warden** can do following functionalities:-

- **Login:** Only the authorized users can login into the warden details page after verifying themselves by entering the desired password and username.
- **Details:** The user can update the information of themselves.
- **Managing:** The user (Warden) is allowed to manage students i.e. he can remove or add or update any student data.
- **New Password:** User can get a new password by clicking on the forgot password link and entering the required details.

5.1.3 Student Module:

As shown in fig.3, the **Student** can do the following functionalities:-

- **Login:** Only the authorized users(students) can login into the student details page after verifying themselves by entering the given username and password.
- **Details:** The user can see and fill the details of themselves only.
- **Updation:** The user can update their information only
- **Passwords:** The user cannot change the password by themselves for that they must approach the administrator or the warden



In fig.4, the **Administrator** can do following functionalities:-
Login, Managing, Managing Warden Data, Managing Passwords

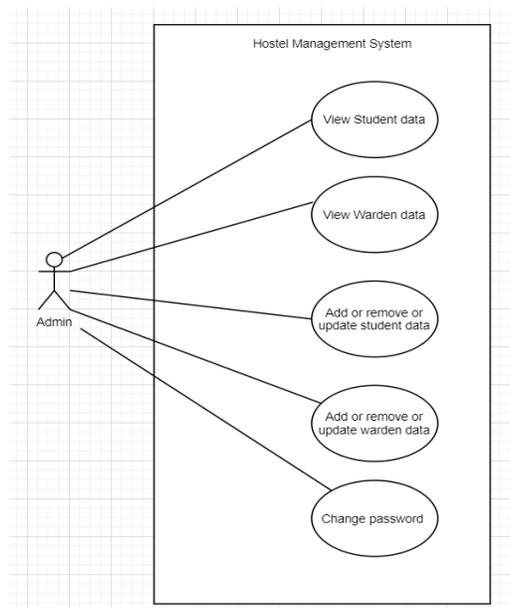


Fig 4. Admin Use Case Diagram

In fig.5, the **Warden** can do following functionalities:-

Login, Details of students, Managing Data, Add or remove data of students, change passwords

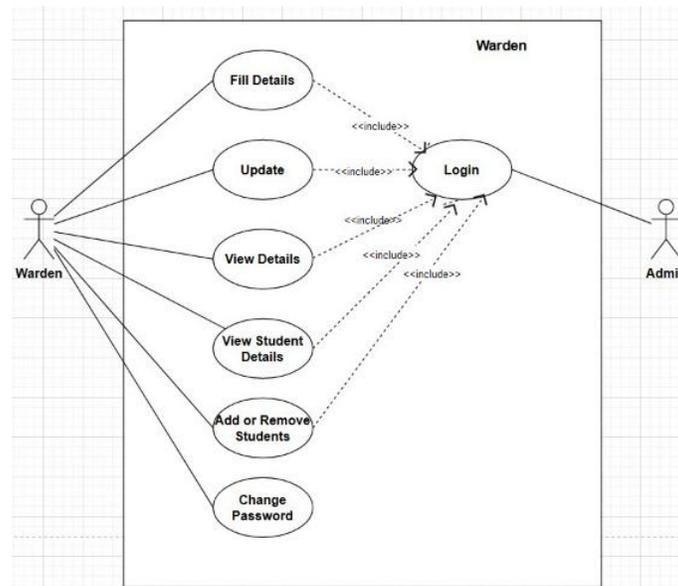


Fig 5. Warden Use Case Diagram

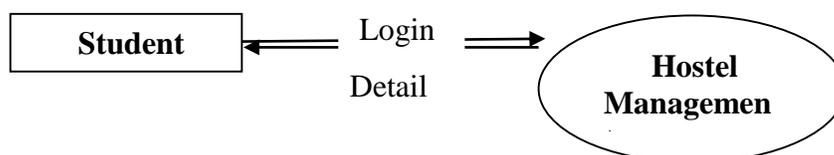
5.2 Input Design:

Input Design is the process which starts from converting a user-oriented description of input into a compiled output-based system. This design is important for avoiding errors in the input data process. This help to give a proper direction to the management team for getting data smoothly and accurately.

This system requires data regarding asset items, student info, validation/verifications checks. The error detection method in the database software helps in detecting wrong input or no input.

DFD diagrams:

In fig 6, the various processes done in the login pages are shown:-



5.3 Process Design:

Process Design is the act to transform an organization's visions, views, and goals into a discernible, presentable means of achieving the vision of the organization. In this we deployed the **Data Flow Diagram (DFD)** tool for the process design. The DFD is drawn using various symbols. Every process has a source and a destination. The process is represented using circles and source and destination are represented using squares, also arrows are used to represent data flow.

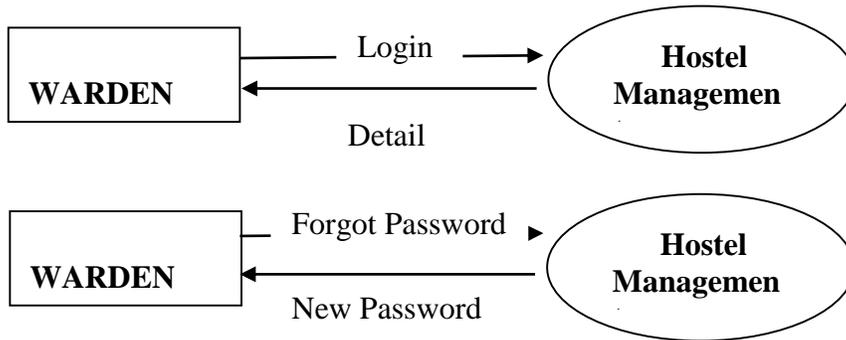


Fig. 6 Login Page Processes

In fig 7, the authentication process done by the student and the warden during login are shown:-

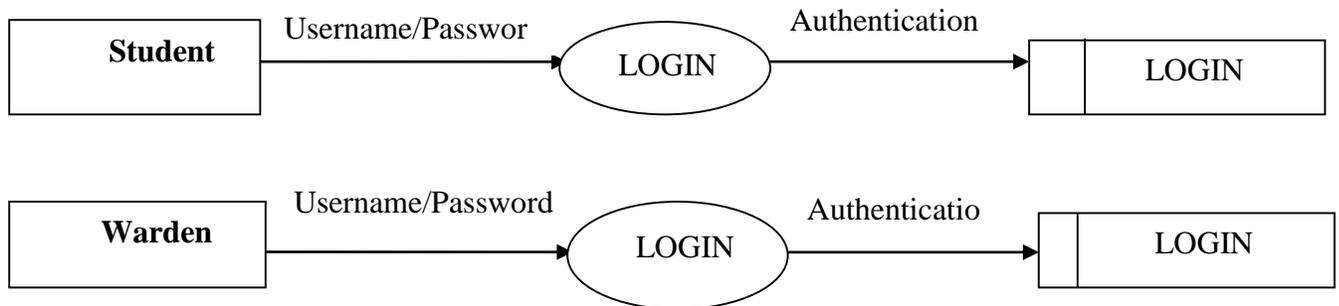


Fig. 7 Authentication

In fig 8, the process of filling the details i

len) and storing of details into the

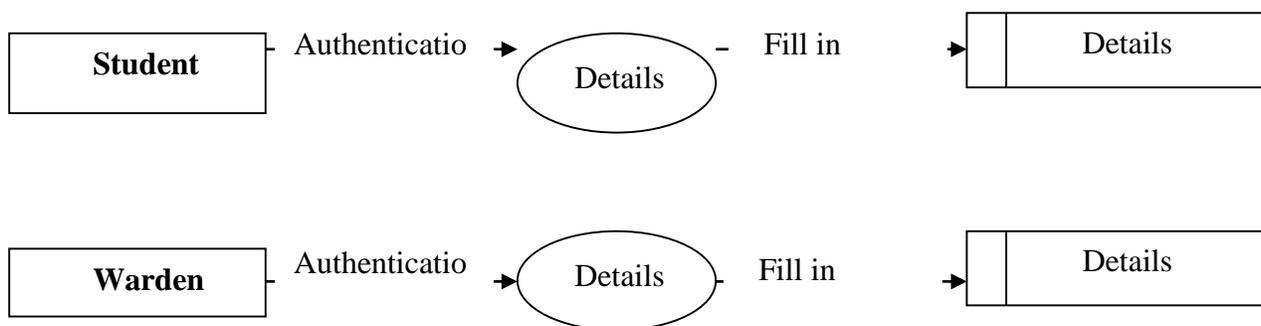


Fig. 8 Details

In fig 9, the various processes done in the login pages are shown:-

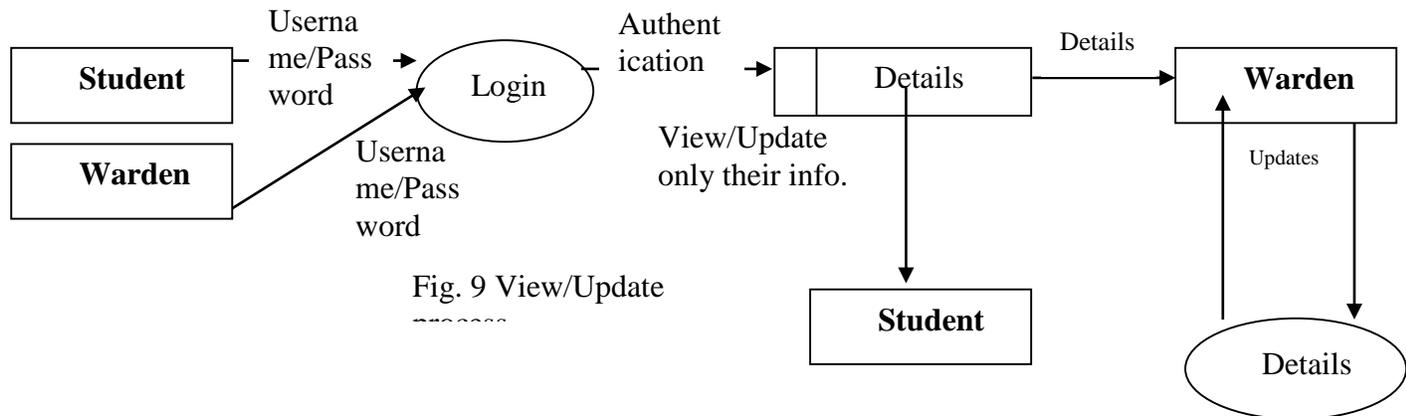


Fig. 9 View/Update

5.4 Database Design:

Database Design is a collection of processes that provide the following functionalities:- Designing, Development, maintenance of the individuals or organization's data management systems. The Proposed database is easy to maintain and improves data retrieval. It is also very cost effective in terms of disk storage space and processor. The main motive to use this database design is as it reduces data concurrency and inconsistency. The MySQL database was chosen for the database proposed design.

5.5 Output Design:

Useful output is essential to ensure the use and acceptance of the information system. It is important as it helps in delivering an appropriate amount of output which is essential and make sure the output should be there where it is needed.

6. Advantages of the Proposed system:

- It is very User-friendly and improves efficiency of the existing Hostel Management System.
- It automates all the activities so makes the registration faster and easier.
- The use of database makes data retrieval simple and fluent.
- It also controls data concurrency as it works on a server and so many users can register at the same time.
- It provides a proper data integration and makes things less complex for the management to manage.
- It improves data security as only authenticated users can update or remove data

7. Implementation and Results:



Fig. 10 Student Login Page

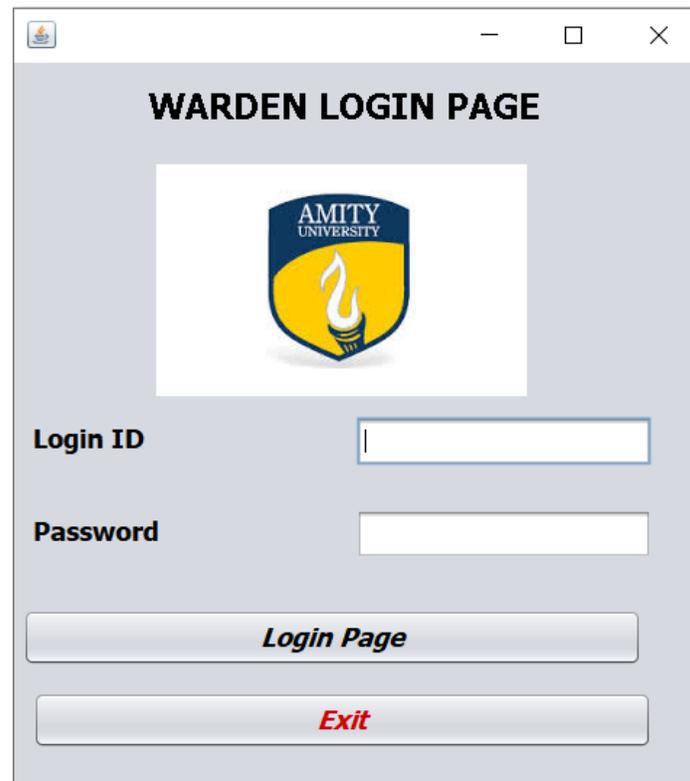
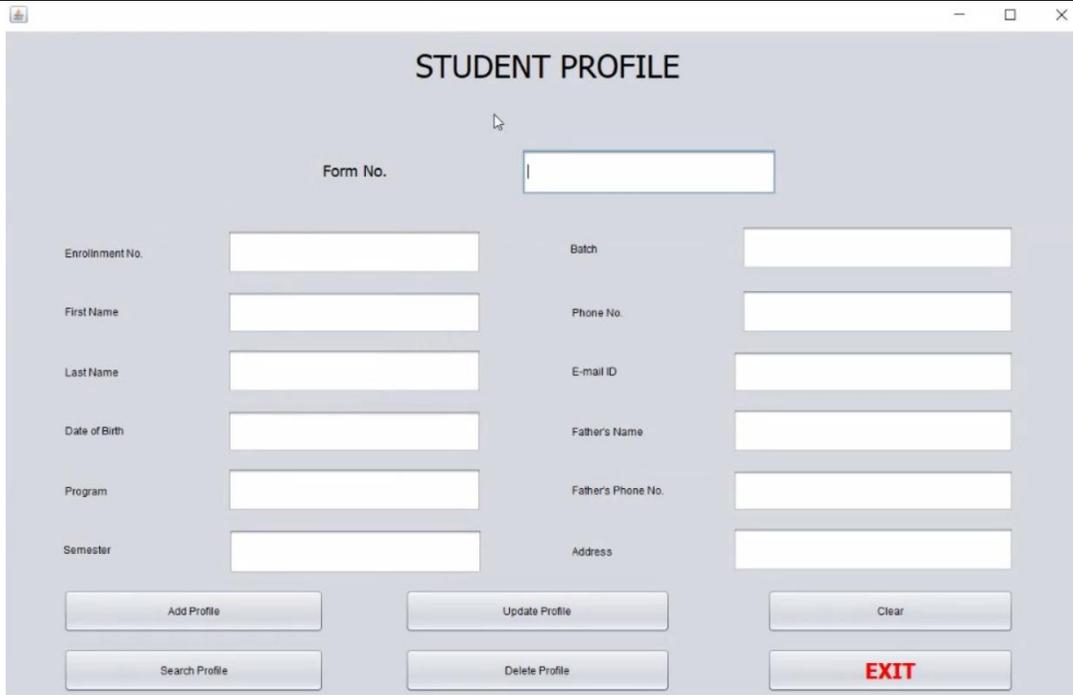
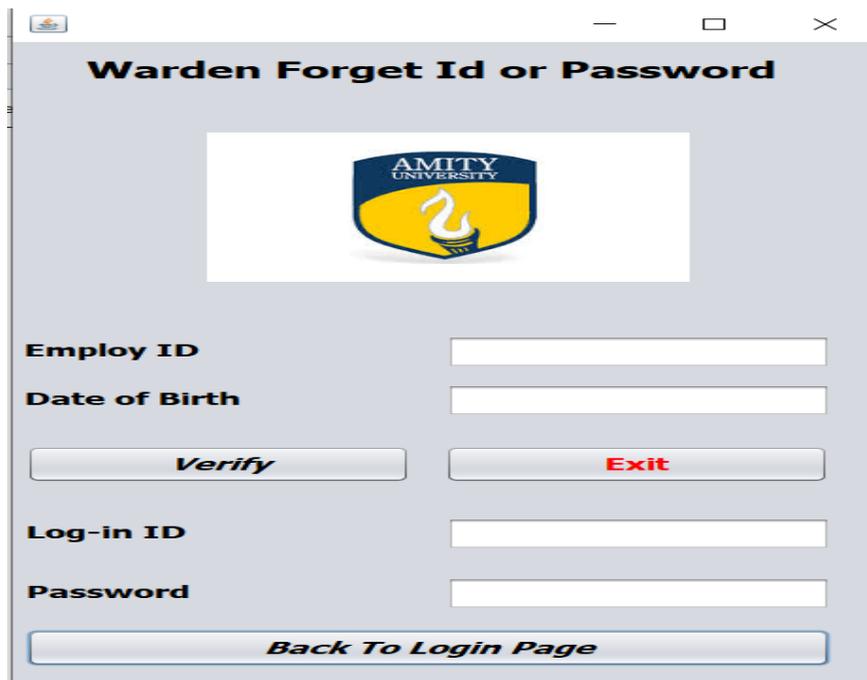


Fig 11 Warden Login Page



The screenshot shows a web application window titled "STUDENT PROFILE". It contains a form with the following fields: Form No., Enrollment No., First Name, Last Name, Date of Birth, Program, Semester, Batch, Phone No., E-mail ID, Father's Name, Father's Phone No., and Address. At the bottom, there are six buttons: "Add Profile", "Update Profile", "Clear", "Search Profile", "Delete Profile", and "EXIT".

Fig. 12 Student Profile Page



The screenshot shows a web application window titled "Warden Forget Id or Password". It features the Amity University logo at the top. Below the logo, there are input fields for "Employ ID" and "Date of Birth", followed by "Verify" and "Exit" buttons. At the bottom, there are input fields for "Log-in ID" and "Password", and a "Back To Login Page" button.

Fig. 13 Warden Forgot Password Page



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III. CONCLUSION

The hostel management system is a web application that manages hostel facilities in reliable manner. It is design to automate and look after the overall process of records of students, malpractice can be lessened and decrease human errors. Project offers stability, cost-effectiveness and flexibility. Emergence of new technology reduces time and provides better result. It is specially designed to allocate and manage accommodation spaces in hostel. The system has unique approach to tracking information and makes the system more robust. The objective of this process is to implement a streamline registration process that reduces the administrator task and paperwork to improve the registration cycle process flow.

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