P.E.S. COLLEGE OF ENGINEERING, MANDYA,571401

(An Autonomous Institution under Visvesvaraya Technological University, Belgaum)

A Project Phase-2 Report

on

ERP Software for Course Registration

In partial fulfillment of the requirement
for the award of the Degree

Bachelor of Engineering

In

COMPUTER SCIENCE AND ENGINEERING

Submitted by

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P.E.S. College of Engineering, Mandya.

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P.E.S COLLEGE OF ENGINEERING
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(An Autonomous Institution Affiliated to VTU, Belgaum)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CERTIFICATE

This is to certify that **Jainam M(4PS18CS043), Mohith S R(4PS18CS058), Suhaas Patel A V(4PS18CS106), Lalrinngheta(4PS18CS049)** are students of VIII Semester B.E in Computer Science and Engineering from P.E.S College of Engineering, Mandya, has satisfactorily completed the project report on **ERP Software for Course Registration** during the year 2021-22. The Project work has been approved as it satisfies the academic requirements in respect of Project work prescribed for the VIII Semester of B.E Computer Science and engineering discipline.

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1.

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ABSTRACT

Enterprise resource planning system (ERP) is the effective use of enterprise resources to improve systems. The main purpose of ERP is to create a system that can be used for the automated processing of data for an institution. Enterprise Resource planning system integrates all modules and functionalities of college system into one system that may be handled by the executive head and accessed by the scholars and colleges with valid user id and password. Thus here we have a tendency to propose an ERP system for Course registration. The main goal of the whole system is to supply a user-friendly interface and powerful data system that makes software effective to use.

Chapter 1

INTRODUCTION

Enterprise Resource planning system integrates all modules and functionalities of the college system into one system that may be handled by the executive head and can be accessed by the scholars and colleges with valid user id and password. In this there is a module of Course Registration that has accessibility for Student, Admin, HOD's and Mentors. Enterprise resource planning system (ERP) is the effective use of enterprise resources to improve systems.

The main purpose of ERP is to create a system that can be used for the automated processing of data for an institution.In the Educational system, accessing information manually is a very difficult task, it is time-consuming and requires a lot of manual effort.ERP system provides an easy interface for maintenance of various students data, courses of a particular semester, departments related data.

All the universities typically have variety of departments and academic modules like courses, semester hence managing the course registration for all the semester and all the departments could be tedious, time consuming and unsystematic task.

Thus here we have a tendency to propose an ERP system for Course registration.The main goal of the whole system is to supply a user-friendly interface and powerful data system that makes this software effective to use.

1.1 Problem Definition

The present way of course registration is on the student software which is inefficient has many bugs and students are not able to register for their desired subjects when they login to select their open elective and professional elective. There are also problems with the existing way of selecting open electives which is first come first serve.

1.2 Motivation

In college, faculty were facing problems regarding storing detailed information of student. and they did not have any software solutions to store the overall information about the students and then college used a third party software to overcome manual work but also had many software issues in it. Hence to overcome this problem we are building an ERP software for course registration.

1.3 Objective

The main objective of the system is to overcome the disadvantages of the existing system and build an ERP Software to select courses of the particular semester using HTML, CSS, JavaScript, Bootstrap and Python.

Chapter 2

LITERATURE SURVEY

- The primary purpose of E-college is to provide mechanisms for automated processing and management of the entire institution. The architecture comprises of various categories in which the whole architecture is divided. These are administrator, staff and student. The admin roles are user management, staff management, student management, staff attendance. Staff and admin perform some common functions like news management, leave management, time table management, exam management. The role of staff includes student attendance entering, student examination management, time table management, leave application management, and put on news on e-notice board. While the roles of students are few in number and includes their complete profile viewing, view their attendance, give feedback to their respective faculties, view notice and view academic time table. This paper provides a limited set of modules and their implementation which are required by educational institutes to function smoothly. It reduces data error, ensures that information is managed efficiently and is always up-to-date. Complete student histories for all years, can easily be searched, viewed and reported on press of button. It is made after extensive study of all the departments like student, faculty, etc of colleges and is provided with the extract of everything a college requires for their database handling, department management and student/staff management. The security issue within ERP has been there for a long time, but most of the solutions are based on the assumption that an ERP system is a closed environment [1].

- In Department activity management system Admin has all the rights to access the system. Admin is able to manage the all the details of department as well as student Admission, staff Registration, Academics.Staff members are registered by admin. Teachers can login in the system only after the admin approval. Staff has rights to manage all the data of their subjects of respective class. Students can login in the system only after the admin approval. After getting registration details of student admitted in the college from student section operator can check the all information which is fill by student. And upload this student list for approval of admin and also if any of the teacher is not available in the college then that time teacher can approve the operator to do all the work of teacher [2].

- In college ERP system , Admin has all the access rights to the system. Admin is able to manage the student Admission, Staff Registration,Academics, SMS gateway, Transport, Class Routines. First he adds all the staff members of respective departments.Students are admitted by admin only to the system. When he got admitted the username and passwords are generated by admin and can be managed by student afterwards.Staff members are registered by admin and login details are generated by admin which can be managed by staff afterwards. Parents are able to track all information and academic records of their respective child. They are not able to view the information relevant to other students. Admin has given the access rights to manage the transport information which is accessible to all the users [3].

- The Student management system ERP Consists of 4 modules i.e. login registration Bonafide and clearance. The functional modules of the student management system are divided into two roles the administrator and the student. The administrator should be able to view to student profile and approve the Bonafide and clearance form. Students can apply for the registration, clearance, and Bonafide form. Student Registration module consists of all the information the student including the basic information history of student registration, academic work etc. In Bonafide Module, the student can apply for the Bonafide certificate by entering his basic details and the reason for Bonafide, once the students have applied, after the approval of the administrator the student would be able to download the certificate. In Clearance module the Student applies for the clearance form if the student record is clear then he would get approval from all the faculty and administrator. After the approval student can Download the clearance [4].

Chapter 3

SYSTEM ANALYSIS

Analysis is a detailed study of the various operations performed by a system and their relationships within and outside of the system. One aspect of analysis is defining the boundaries of the system and determining whether or not a candidate system should consider the related systems. During analysis data are collected on the available files decision points and transactions handled by the present system. This involves gathering information and using structured tools for analysis.

3.1 Existing System

In Existing System students on the student software which is not user friendly and there are many glitches. Students when they login here are not able select their desired electives properly since it is not optimized properly and hence is causing inefficiency. Open elective in the existing system was allotted to students based on first come first serve basis but due to this many students would not get their desired subjects due to a high lag in the website due to many logins at the same time.

3.2 Proposed System

The proposed system is a ERP software for course registration. Course registration is the procedure where students at the beginning of each semester are required to register for their courses that they are currently going to study in that particular semester. After the successful selection of subjects by the students a final list of subjects will be displayed in the end and it will be made available to download in the form of pdf.

Chapter 4

SOFTWARE REQUIREMENT SPECIFICATION

4.1 Introduction

A Software Requirements Specification (SRS) is a complete description of the behavior of the ERP system to be developed. It includes the functional and non-functional requirement for the software to be developed. The functional requirements include what the software should do and non functional requirements include the constraint on the design or the implementation. Requirements must be measurable, testable, related to identified needs or opportunities, and defined to a level of detail sufficient for system design. Software requirement specification will contain states what the software will do. What the software as to do is directly perceived by its users- either

4.2 Purpose of this Document

The main purpose of the requirement document is to understand the requirements specification or document for the system engineers or the software developers to understand the system developed and for the system customer to specify the requirement and read them to check that they meet necessary needs**.**

4.3 Hardware and Software Requirements

The software requirement specification is produced at the culmination of the analysis task. The function and performance allocated to software as part of system engineering are refined by establishing a complete information description, a detailed function description, representation of system behavior, an indication of performance requirement and design constraints appropriate validation criteria, and other information pertinent to requirement. The introduction to software requirements specification states the goals and objectives of the software, describing it in the context of computer-based system. The Information Description provides a detailed description of the problem that the software must solve. Information content, flow and structure are documented. A description of each function required to solve the problem is presented in the Functional Description. Validation Criteria is probably the most important and ironically the most often neglected section of

the software requirement specification. Software requirement specification can be used for different purpose.

4.3.1 MINIMUM HARDWARE REQUIREMENTS

- **Processor**   **:**   Intel i3 2.54GHz
- **Hard Disk**   **:**   40GB
- **RAM**   **:**   4 GB or above

4.3.2 MIMIMUM SOFTWARE REQUIREMENTS

- **Operating System** : Windows 8 above
- **Front end**   **:** HTML,CSS,JS,BOOTSTRAP
- **Back end**   **:** Python
- **Database**   **:** MySQL
- **IDE**   **:** MS Visual Studio

Chapter 5

SYSTEM DESIGN

In the system design, the focus is on identifying the modules, whereas during detailed design the focus is on designing the logic for the modules. In other words in system design attention is on what components are needed, while in detailed design how the components can be implemented in the software is the issue.

5.1 Data Flow Diagram

DFD graphically representing the functions, or processes, which capture, manipulate, store, and distribute data between a system and its environment and between components of a system. The visual representation makes it a good communication tool between User and System designer. Structure of DFD allows starting from a broad overview and expand it to a hierarchy of detailed diagrams. DFD has often been used due to the following reasons:

- Logical information flow of the system
- Determination of physical system construction requirements
- Simplicity of notation
- Establishment of manual and automated systems requirements

5.2 Physical Design

The physical design relates to the actual input and output processes of the system. This is explained in terms of how data is input into a system. In physical design, the following requirements about the system are decided.

1. Input requirement
2. Output requirements
3. Storage requirements
4. Processing requirements
5. System control and backup or recovery

Put another way, the physical portion of system design can generally be broken down into three sub tasks: User Interface, Design Data and Design Process.
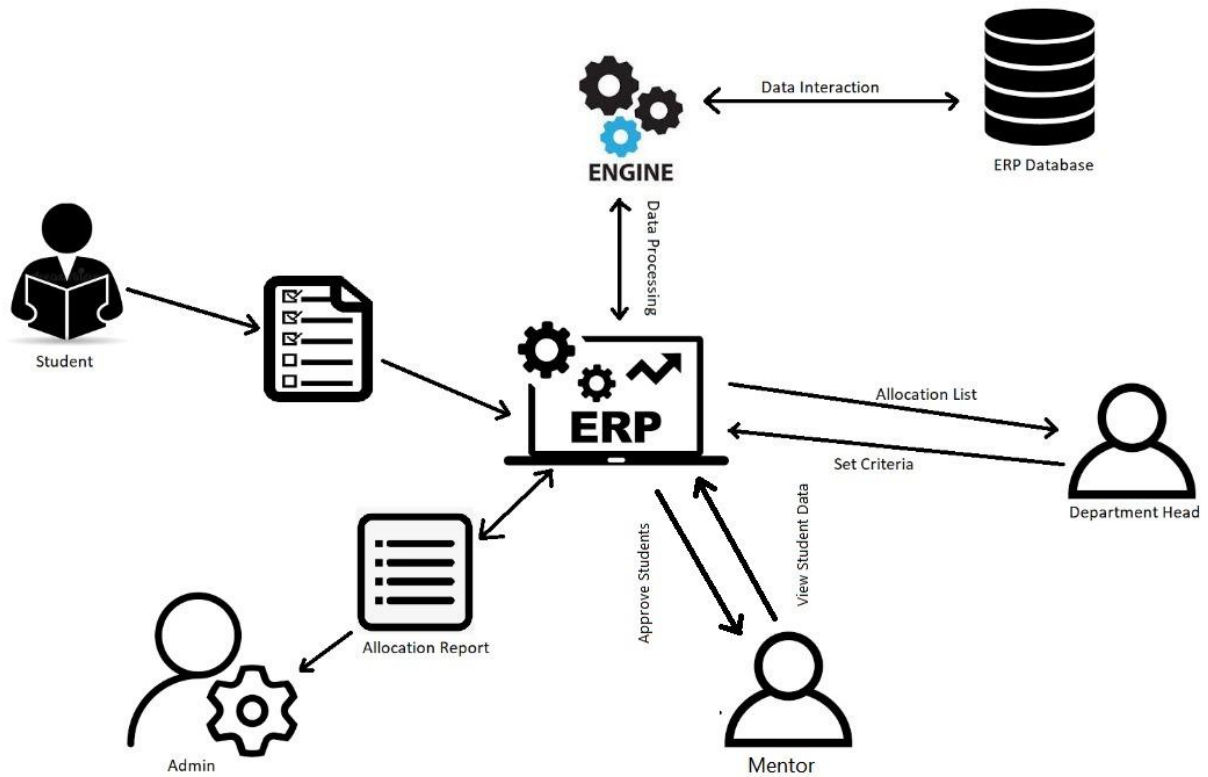
5.3 Architectural Representation model
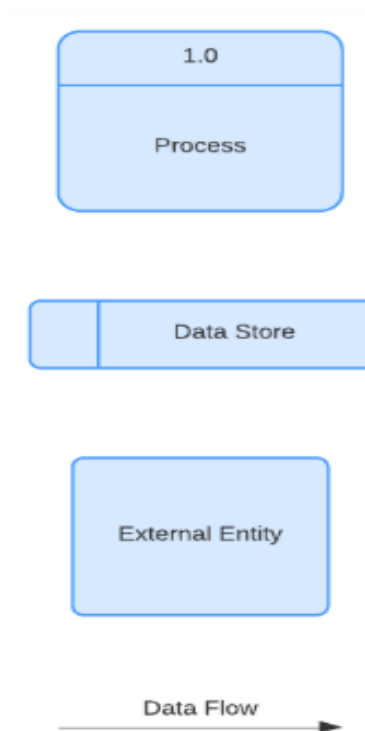
5 .3 Representation of Architecture models

Process: any process that changes the data, producing an output. It might perform computations, or sort data based on logic, or direct the data flow based on business rules. A short label is used to describe the process, such as "Submit payment."

Data store: files or repositories that hold information for later use, such as a database table or a membership form. Each data store receives a simple label, such as "Orders."

External entity: an outside system that sends or receives data, communicating with the system having diagram.They are the sources and destinations of information entering or leaving the system. They might be an outside organization or person, a computer system or a business system. They are also known as terminators, sources and sinks or actors. They are typically drawn on the edges of the diagram.

5.4 Architectural Design

Fig 5.4 Representation of ERP model

- The above is the architecture of the proposed ERP software. The actors in the scene are Student, Admin, HOD and Mentor.
- The role of the admin is to allocate the subjects and electives to the students as per their respective semester.
- The role of the student is to view the subjects and select their desired professional and open electives after they are allocated by the admin in that particular semester.
- The role of the HOD is to create mentor, allocate students to mentors and approve mentors.
- The role of mentor is to approve the subjects selected by the students.
- The engine is the backend of the ERP software connected to the database which is MySQL.
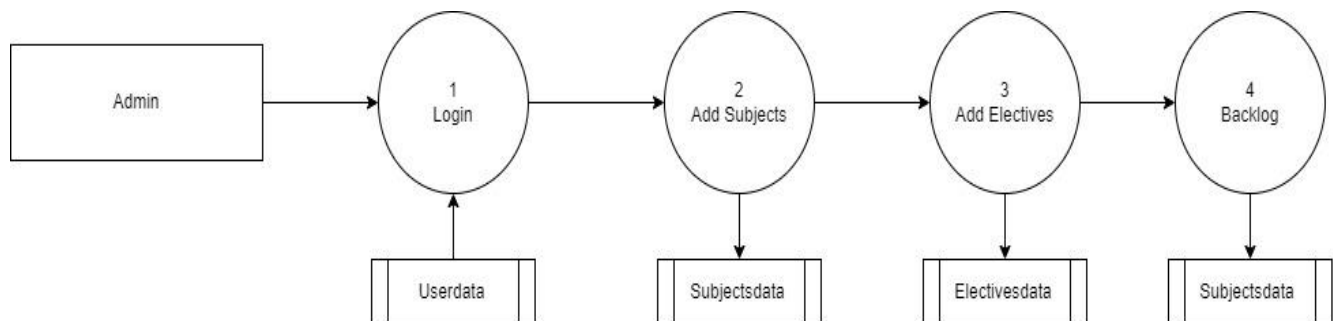- Hence this is the flow of architecture in the proposed ERP.

5.4.1 Data flow Diagrams(DFD)
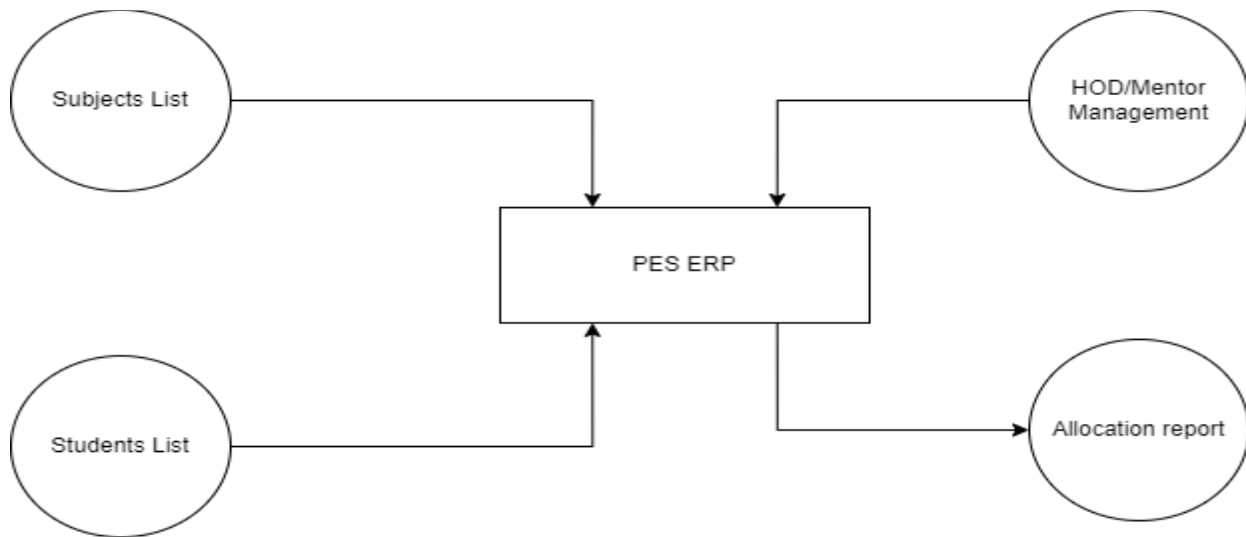
Fig 5.4 Representation of ERP Data Flow

'Data flow' is the route that data takes between the external entities, processes and data stores. It portrays the interface between the other components and is shown with arrows, typically labeled with a short data name.


Fig 5.5 Admin DFD

The above Fig 5.5 is a Admin DFD diagram where Admin can login using their credentials, add subjects and electives for all students according to their respective semester and can add backlog subjects for the students according to their USN respectively.
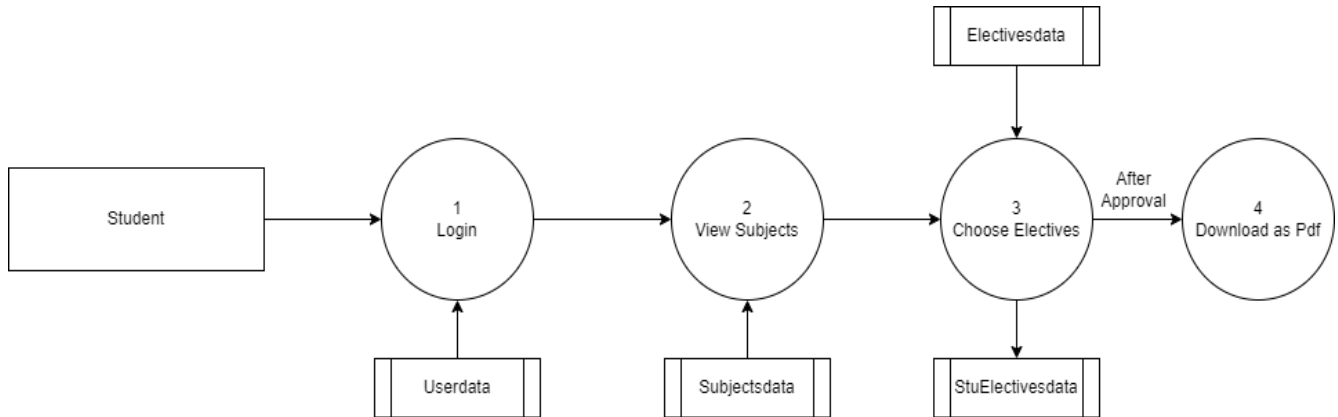
Fig 5.6 Student DFD

The above Fig 5.6 is a student DFD diagram where students can login using their credentials, view their subject list based on the subjects present in their semester, choose their open and professional electives and finally download their final list of subjects as PDF.
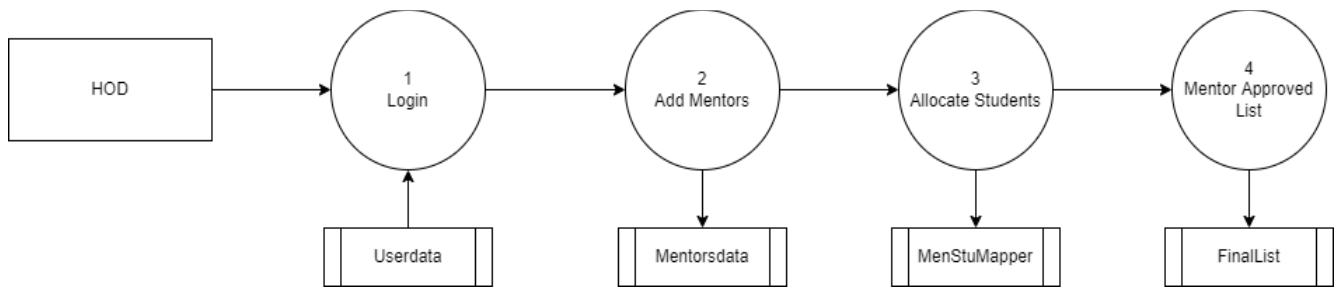
Fig 5.7 HOD DFD

The above Fig 5.7 is a HOD DFD diagram where HOD's can login using their credentials, add a mentor, allocate students to those mentors and can finally approve mentors.
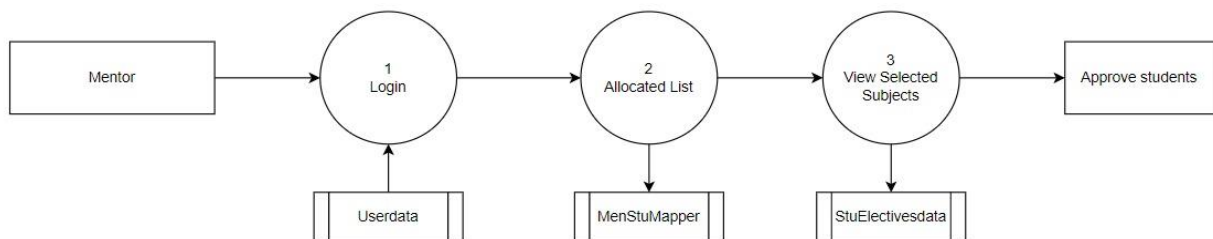
Fig 5.8 Mentor DFD

The above Fig 5.8 is a Mentor DFD diagram where mentors can login using their credentials, view the list of students allocated to them and approve the subjects selected by those students.
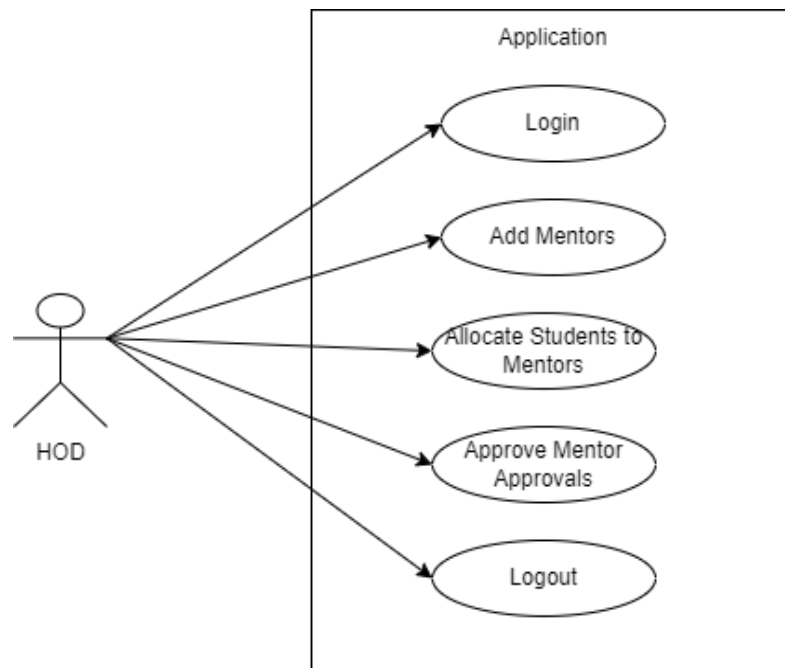
5.4.2 Use case diagram

Use case diagram is a graph of actors, a set of use cases enclosed by a system boundary, communication associations between the actor and the use case. The use case diagram describes how a system interacts with outside actors; each use case represents a piece of functionality that a system provides to its users. A use case is known as an ellipse containing the name of the use case and an actor is shown as a stick figure with the name of the actor below the figure.

The use cases are used during the analysis phase of a project to identify and partition system functionality. They separate the system into actors and use case. Actors represent roles that are played by user of the system. Those users can be humans, other computers, pieces of hardware, or even other software systems.
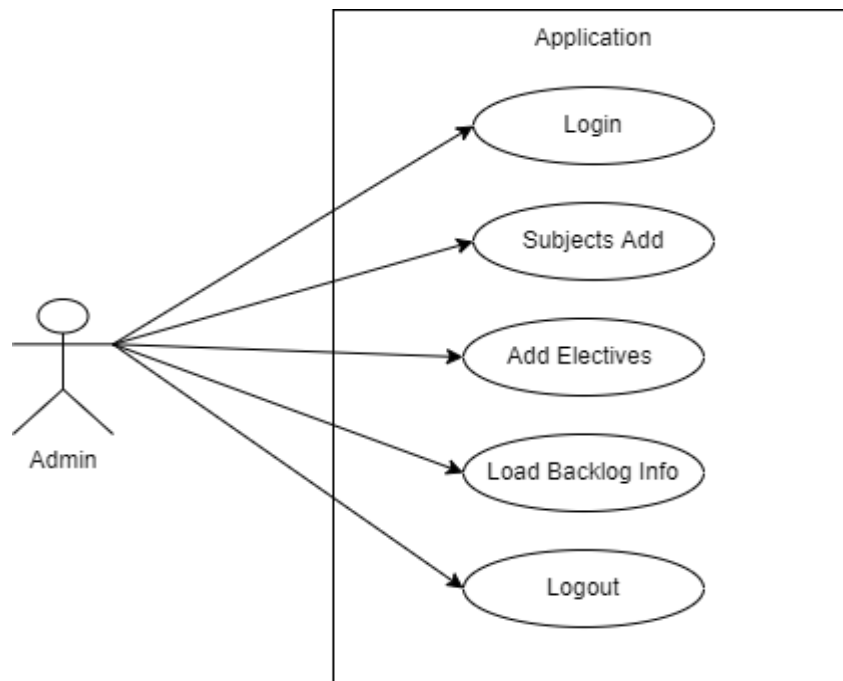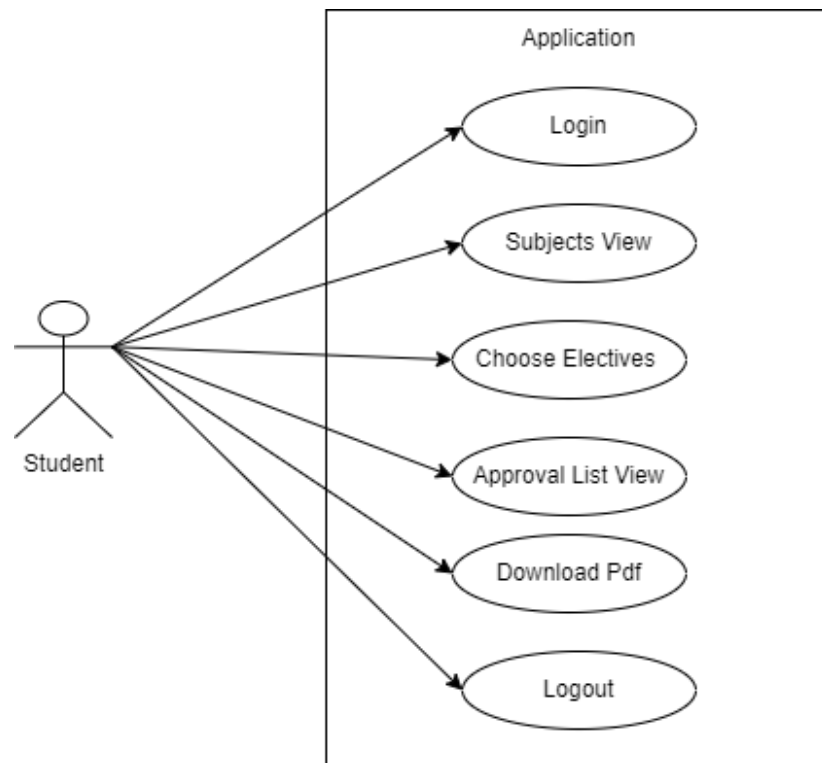

Fig 5.9 Admin Use Case Diagram

Fig 5.10 HOD Use Case Diagram
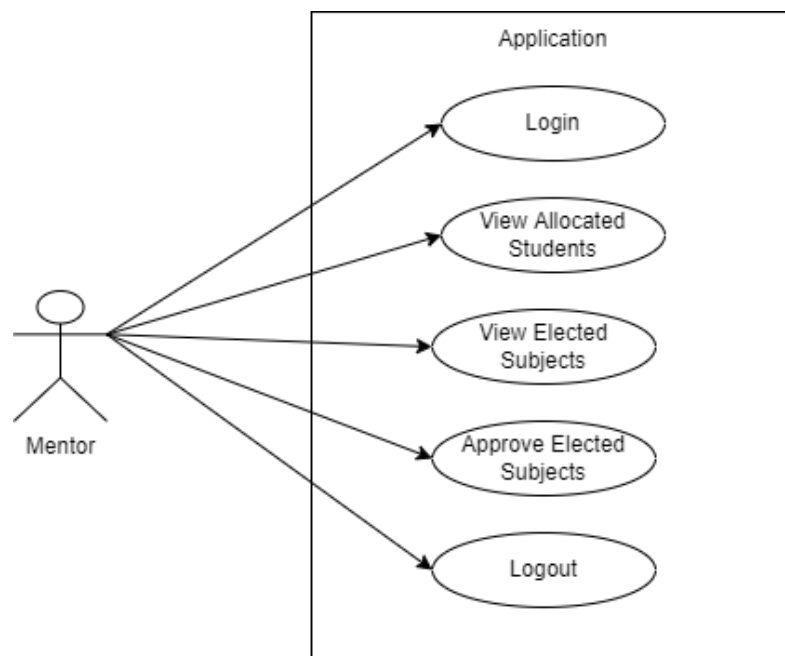
Fig 5.11 Mentor Use Case Diagram

Fig 5.12 Student Use Case Diagram

Chapter 6

SYSTEM IMPLEMENTATION

Implementation is the stage in the project where the theoretical design is turned into the working system and is giving confidence to the new system for the users i.e., will work efficiently and effectively. It involves careful planning, investigation of the current system and its constraints on implementation, design of method to achieve the changeover, an evaluation, of change over methods. A part from planning major task of preparing the implementation is education of users. The more complex system is implemented, the more involved will be the system analysis and design effort required just for implementation. An implementation coordinating committee based on policies of individual organization has been appointed.

The major elements of implementation plan are test plan, training plan, equipment installation plan, and a conversion plan. The implementation state involves the following tasks:

- ➢ Careful planning
- ➢ Investigation of system and constraints.
- ➢ Design of methods to achieve the changeover.
- ➢ Training of the staff in the changeover phase.

6.1 Methodology

• In this software students will be able to login with their USN and password and depending upon their semester 6 main compulsory subjects will be shown out of the total 8 subjects and there will be an option to select the remaining two subjects i.e Professional and open electives.

 • Students will be able to choose their desired professional elective purely on first come first serve basis.

 • The list of the open electives based on students department and semester will be only be shown from which the student will have to select any 6 preferred subjects of his choice.

 • After all the students finish filling out their preferences open electives will now allotted to students based on their current CGPA.

• Student with higher CGPA will be given more preference.If the student is not allotted with any subject he will be sent to the next round.

• This process of rounds will continue until all the students are allotted with an open elective and finally in this way the open elective will be allotted to students.

6.2 Code Snippets

6.2.1 Admin home code:

```
@app.route('/adminhome')

def adminhome():

connection = mysql.connector.connect(host='localhost',database='peserpdb',user='root',password='')

cursor = connection.cursor()

sql_Query = "SELECT count(*) from studentdata"

cursor.execute(sql_Query)

tile1data = cursor.fetchall()

tile1data=tile1data[0][0]

sql_Query = "SELECT count(*) from subjectdata "

cursor.execute(sql_Query)

tile2data = cursor.fetchall()

tile2data=tile2data[0][0]

sql_Query = "SELECT count(*) from mentordata"

cursor.execute(sql_Query)

tile3data = cursor.fetchall()
```

```
tile3data=tile3data[0][0]

connection.close()

cursor.close()

return

render_template('adminhome.html',tile1data=tile1data,tile2data=tile2data,tile3data=tile3data)
```

6.2.2 Mentor home code

```
@app.route('/mentorhome')

def mentorhome():

connection = mysql.connector.connect(host='localhost',database='peserpdb',user='root',password='')

cursor = connection.cursor()

sql_Query = "SELECT count(*) from stualloc where Uname='"+session["uname"]+"'"

cursor.execute(sql_Query)

tile1data = cursor.fetchall()

tile1data=tile1data[0][0]

sql_Query = "SELECT * from stualloc where Uname='"+session["uname"]+"'"

cursor.execute(sql_Query)

studata = cursor.fetchall()

connection.close()

cursor.close()

return render_template('mentorhome.html',tile1data=tile1data,studata=studata)
```

6.2.3 Student home code

```
@app.route('/studenthome')

def studenthome():

    connection = mysql.connector.connect(host='localhost',database='peserpdb',user='root',password='')

    cursor = connection.cursor()

    sql_Query = "SELECT * from studentdata where USN='"+session["usn"]+"'"

    cursor.execute(sql_Query)

    studentdata = cursor.fetchall()

    connection.close()

    cursor.close()

    return render_template('studenthome.html',studentdata=studentdata)
```

6.2.4 HOD home code

```
@app.route('/hodhome')

def hodhome():

dept=request.args['dept']

if dept=="CS":

dept="Computer Science"

session["dept"]=dept

connection = mysql.connector.connect(host='localhost',database='peserpdb',user='root',password='')

cursor = connection.cursor()

sql_Query = "SELECT count(*) from studentdata where Dept='"+session["dept"]+"'"
```

```
cursor.execute(sql_Query)

tile1data = cursor.fetchall()

tile1data=tile1data[0][0]

sql_Query = "SELECT count(*) from mentordata where Course='"+session["dept"]+"'"

cursor.execute(sql_Query)

tile2data = cursor.fetchall()

tile2data=tile2data[0][0]

connection.close()

cursor.close()

return render_template('hodhome.html',tile1data=tile1data,tile2data=tile2data)
```

Chapter 7

SYSTEM TESTING

7.1 Introduction

Testing accomplishes a variety of things, but most importantly it measures the quality of the software we are developing. This view checks whether there are defects in the software under consideration and this view is rarely disproved or even disputed. Several factors contribute to the importance of making testing a high priority of any software development effort. These include reducing the cost of developing the program. Ensuring that the application behaves exactly as explained to the user for the vast majority of programs, unpredictability is the least desirable consequences of using an application.

7.2 Importance of Testing

The importance of software testing and its impact on software cannot be underestimated. Testing is the measurement of software quality. Hence, it is one of the most important stages in the software development process. It involves executing and implementation of the software and its operational behavior to check that is performing as required.

7.3 Test Information Flow

Tests are performed and all the outcomes are documented. Later, this documented test results will be compared with the expected results. When erroneous data is identified, debugging process is restarted with a different input parameter.

The debugging procedure is the most unpredictable element of the testing procedure. An error that indicates a discrepancy of 0.01 percent between the expected and the actual results can take hours, days or months to identify and correct. It is the uncertainty in debugging that causes testing to be difficult to schedule reliability.

7.3 Test Cases

Test Case #	Scenario	Actual Result	Expected Result	Pass/ Fail
1	Uploading file without any dataset	System should parse and stop	System should parse and stop	Pass
2	Uploading student dataset in wrong format(.pdf)	System should not allow the user to select	System should not allow the user to select	Pass
3	Enter valid credentials of the user	System should process and allow user to login based on his role	System should process and allow user to login based on his role	Pass
4	Uploading hod file without any dataset.	System should parse and stop	System should parse and stop	Pass
5	Uploading hod dataset in wrong format(.pdf)	System should not allow the user to select	System should not allow the user to select	Pass
6	Hod adding mentor to the course	System takes input and allocates to that department	System takes input and allocates to that department	Pass
7	Mentor approving student subject allotment in the round	Student subject will be allocated on the basis of his Cgpa will be approved when mentor approves it	Student subject will be allocated on the basis of his Cgpa will be approved when mentor approves it	Pass
8	Mentor approval by HOD	When the mentor approves all his student electives, he should be eligible for approval.	When the mentor approves all his student electives, he should be eligible for approval.	Pass

Chapter 8

RESULTS & ANALYSIS

8.1 Admin's Dashboard
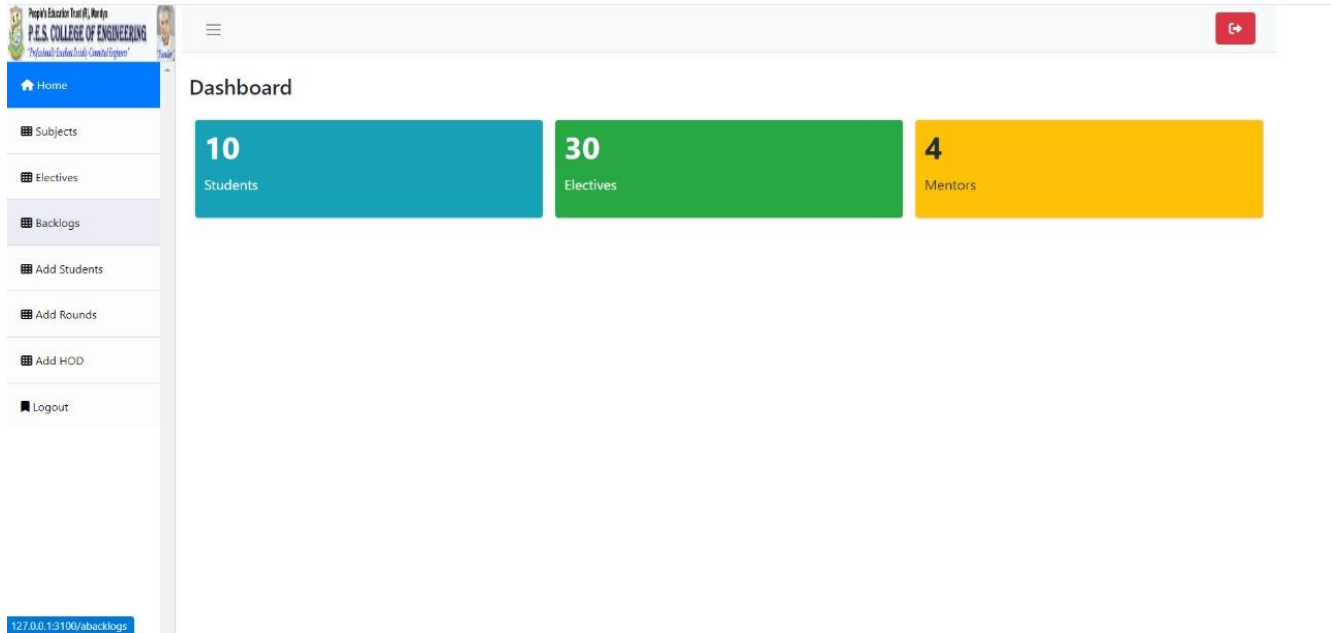
Fig: 8.1 Admin page

- The First actor in this ERP is Admin.
- Admin can login using his credentials and can perform various actions.
- The actions which an Admin can perform are listed below:
    1. Admin can add subjects for all branches and for all semesters.
    2. Admin can add professional and open electives for any semesters as per the current scheme.
    3. Admin can add backlog subjects for any specific student based on his/her USN.
    4. Admin can add students data by creating and uploading CSV file.
    5. Admin can create new HOD if required using CSV file.
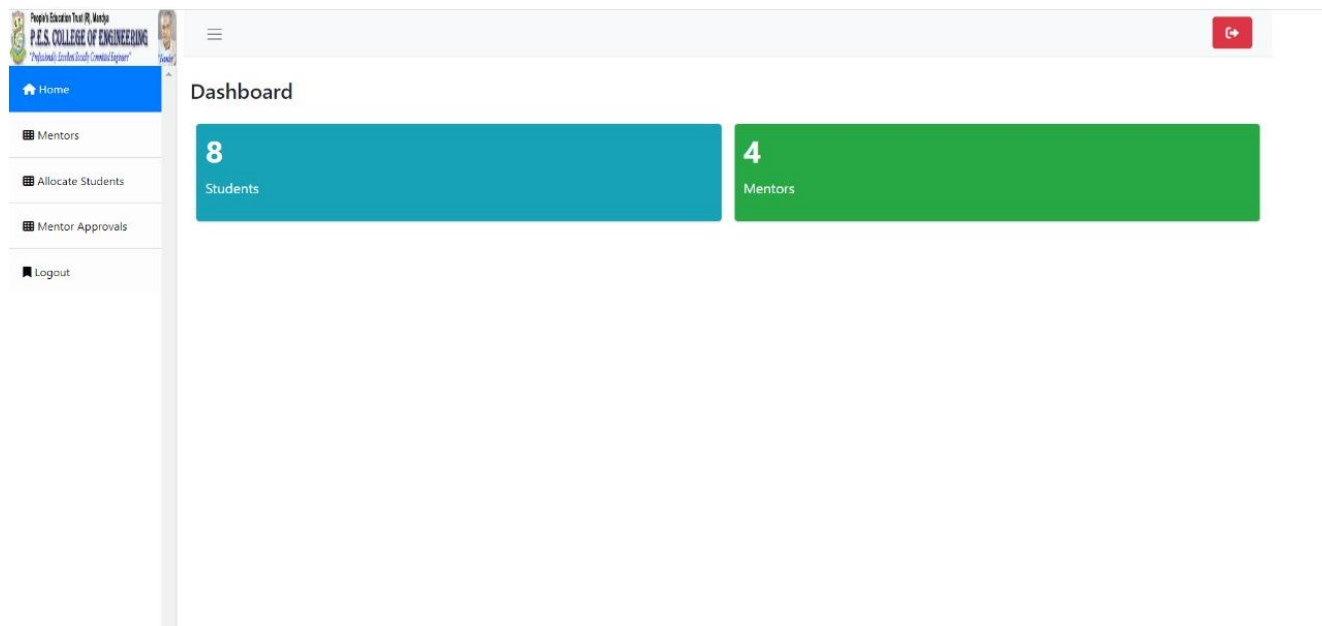
8.2 Student's Dashboard

Fig: 8.2 Student page

- The second actor in this ERP is Student.

- Student can login using his credentials and can perform various actions.

- The actions which a Student can perform are listed below:

  1. Student can view the subjects in the Subject data table with the list of subjects he/she will have in that particular semester and can see if that subject is approved by his/her mentor or not.

  2. Student will be able to choose his/her desired professional and open electives by putting in their preferences.

  3. Finally a student will be able to download the final approved subjects list in the form of a PDF.

8.3 HOD's Dashboard

Fig: 8.3 HOD page

- The third actor in this ERP is HOD i.e. The Head Of Department.
- HOD can login using his/her credentials and can perform various actions.
- The actions which an HOD can perform are listed below:
    1. HOD can create new mentors by creating their credentials.
    2. HOD can allocate students for each of the mentors created by them.
    3. HOD can approve each of their created mentors after the mentors approve the students allocated under them by the HOD.

8.4 Mentor's Dashboard
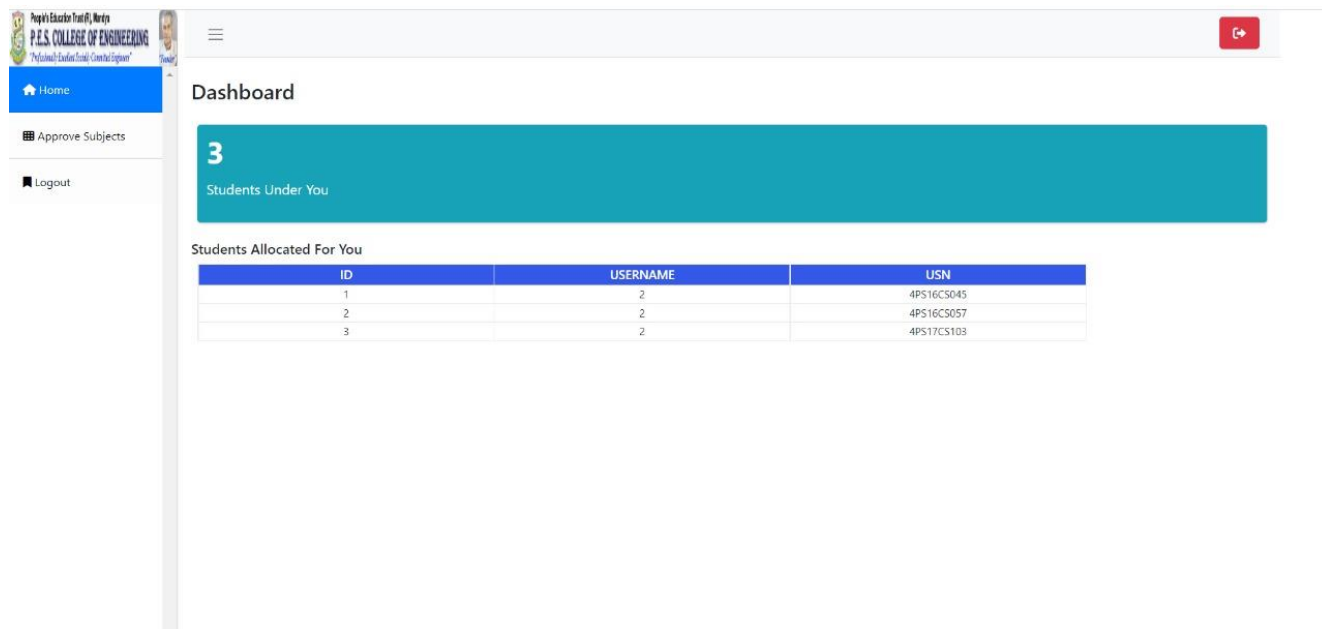
Fig: 8.3 Mentor page

- The fourth actor in this ERP is Mentor.

- Mentor can login using his/her credentials set by the HOD and can perform the below actions:

  1. Mentor will be able to view the students allocated under them by the HOD.

  2. Mentor will be able to approve the subjects selected by the each of the students.

CONCLUSION

This college-based ERP system will provide ease to students to register for their electives without any glitches so that everyone can get their desired subjects. It makes the college information system more efficient and convenient. It reduces the man power needed to perform different tasks by performing the tasks systematically. If all the works are done by using softwares there will be less occurrence of errors. Moreover, it makes storing and retrieving of the information very easy so work can be done speedily and in time.

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