



A  
Project Report  
on  
**ERP (Enterprise resource planning)**  
submitted as partial fulfillment for the award of  
**BACHELOR OF TECHNOLOGY**  
**DEGREE**

SESSION 2023-24

in  
**Computer Science**

By

Avinash Kumar(2000290120050)

Varun Kumar Tiwari(2000290120186)

**Under the supervision of**

Ms. Neha Shukla  
Assistant Professor

**KIET Group of Institutions, Ghaziabad**

Affiliated to

**Dr. A.P.J. Abdul Kalam Technical University, Lucknow**

**May, 2024**

## **DECLARATION**

I/We hereby declare that this submission is our own work and that, to the best of our knowledge and belief, it contains no material previously published or written by another person nor material which to a substantial extent has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgment has been made in the text.

Signature

Name- Avinash Kumar  
Roll No. :2000290120050  
Date:

Signature

Name- Varun Kumar Tiwari  
Roll No.: 2000290120186  
Date:



**KIET**  
GROUP OF INSTITUTIONS  
*Connecting Life with Learning*

**nirf**  
NATIONAL INSTITUTIONAL  
RANKING FRAMEWORK  
NIRF-2022  
Engineering Rank - 187  
Pharmacy Rank Band - 97

**NAAC**  
Accredited by  
NAAC with Grade "A+"

**NBA**  
NATIONAL BOARD FOR  
TECHNICAL EDUCATION  
NBA Accredited Courses  
CSE, ECE, EEE, IT, ME, CE, MCA,  
MBA and B.Pharm

**ARIIA**  
ANNUAL RANKINGS OF INSTITUTIONS  
ONE INDIA'S PRESTIGIOUS ACADEMIC AWARDS  
3<sup>rd</sup> Rank  
"Private Institutions (Technical)"  
in India by ARIIA 2021 Ranking

**i-GAUGE**  
Diamond Rating with iGauge  
An exemplary ode to quality  
education

---

## DEPARTMENT OF COMPUTER SCIENCE

---

### CERTIFICATE

This is to certify that Project Report entitled “Enterprise Resource Planning” which is submitted by **Avinash Kumar and Varun Kumar Tiwari** in partial fulfillment of the requirement for the award of degree B.Tech. in the Department of Computer Science of Dr. A.P.J. Abdul Kalam Technical University, Lucknow is a record of the candidates own work carried out by them under my supervision. The matter embodied in this report is original and has not been submitted for the award of any other degree.

**Date:**

**Supervisor**

Neha Shukla

## **ACKNOWLEDGEMENT**

It gives us a great sense of pleasure to present the report of the B. Tech Project undertaken during B. Tech. Final Year. We take the opportunity to acknowledge the contribution of Dr. Ajay Kumar Shrivastava, Head of the Department of Computer Science, KIET, Ghaziabad, for his full support and assistance during the development of the project. We also do not like to miss the opportunity to acknowledge the contribution of all the department's faculty members for their kind assistance and cooperation during the development of our project.

We also owe special debt of gratitude to Professor **Neha Shukla**, Department of Computer Science, KIET, Ghaziabad, for her constant support and guidance throughout the course of our work. Her sincerity, thoroughness and perseverance have been a constant source of inspiration for us. It is only his cognizant efforts that our endeavors have seen light of the day.

Last but not least, we acknowledge our friends for their contribution in the completion of the project.

Date :

Signature:

Name : **Avinash Kumar**  
Roll No.: **2000290120050**

Name: **Varun Kumar Tiwari**  
Roll No.: **2000290120186**

## **ABSTRACT**

ERP HRMS is a Web Application that provides an integrated real-time view of core business processes, using common databases maintained by a database management system. Human Resources Management System (HRMS) as a discipline and in particular basic HR activities and processes within the information technology field, the programming of data processing systems evolved into standardised routines and packages of enterprise resource planning (ERP) software. To reduce the manual workload of these administrative activities, organizations began to electronically automate many of these processes by introducing specialized human resource management systems

## **TABLE OF CONTENTS**

	<b>Page</b>
	<b>No.</b>
DECLARATION.....	ii
CERTIFICATE.....	iii
ACKNOWLEDGEMENTS.....	iv
ABSTRACT.....	v
LIST OF FIGURES.....	ix
LIST OF TABLES.....	xi
LIST OF ABBREVIATIONS.....	xii

### **CHAPTER 1 INTRODUCTION**

- 1.1 Introduction to Project
- 1.2 Project Category

### **CHAPTER 2 LITERATURE REVIEW**

- 2.1 Literature Review
- 2.2 Problem Formulation
- 2.3 Objectives

### **CHAPTER 3 PROPOSED SYSTEM**

- 3.1 Proposed System
- 3.2 Unique Features of The System (Difference from Existing System)
- 3.3 Structure of Report

### **CHAPTER 4 REQUIREMENT ANALYSIS AND SYSTEM SPECIFICATION**

- 4.1 Feasibility Study (Technical, Economical, Operational)

4.2 Software Requirement Specification Document Which Must Include the Following:(Data Requirement, Functional Requirement, Performance Requirement, Maintainability Requirement, Security Requirement)

4.3 SDLC Model to Be Used

4.3.1 System Design Using DFD Level 0 And Level 1

4.3.2 Use Case Diagram

4.3.3 Database Design

4.3.4 ER Diagram

## CHAPTER 5 IMPLEMENTATION

5.1 Introduction to Languages, Tools and Technologies Used for Implementation.

## CHAPTER 6 TESTING, AND MAINTENANCE

6.1 Testing Techniques and Test Cases Used

## CHAPTER 7 (RESULTS AND DISCUSSIONS)

7.1 User Interface Representation (Of Respective Project)

7.2 Brief Description of Various Modules of The System

7.3 Snapshots of System with Brief Detail of Each

7.4 Back Ends Representation (Database to Be Used)

7.5 Snapshots of Database Tables with Brief Description

## CHAPTER 8 CONCLUSION AND FUTURE SCOPE

## LIST OF FIGURES

<b>Figure Number</b>	<b>Description</b>	<b>Page Number</b>
<b>3.1</b>	Structure Diagram	
<b>4.1</b>	ERP Software Development Lifecycle	
<b>4.2</b>	Workflow Diagram	
<b>4.3</b>	DFD	
<b>4.4</b>	Use Case Diagram	
<b>4.5</b>	ER Diagram	
<b>7.1</b>	User Interface	
<b>7.2</b>	Create Datesheet	
<b>7.3</b>	Create Seating Plan	
<b>7.4</b>	Detainee Approval	
<b>7.5</b>	Generate Hall Ticket	
<b>7.6</b>	Invigilation Roaster Report	
<b>7.7</b>	Invigilation Duty Chart	
<b>7.8</b>	Login Screen for Attendance Room incharge	
<b>7.9</b>	Dashboard Screen for Attendance Room incharge	
<b>7.10</b>	Block Selection Screen for Attendance Room incharge	
<b>7.11</b>	Room Selection Screen for Attendance Room incharge	

## **LIST OF ABBREVIATIONS**

<b>Abbreviation</b>	<b>Description</b>
ERP	Enterprise Resource Planning
HRMS	Human Resource Management System
HOD	Head Of The Department
SDLC	Software development life cycle
COE	Controller Of Examination

# **CHAPTER 1**

## **INTRODUCTION**

### **1.1 INTRODUCTION TO ERP COE**

- COE, or Controller of Examination, integrated into the "KIET Pariksha" app, modernizes academic administration by automating crucial tasks such as generating Datesheets, Seating Plans, and Invigilator Requirements. This automation not only saves significant time for administrators but also minimizes the likelihood of errors, ensuring the seamless organization and execution of examinations.
- COE promotes a culture of transparency and inclusivity within the academic institution. By centralizing examination processes and data within the KIET Pariksha app, stakeholders including faculty members, students, and administrators have easy access to vital information such as attendance records and invigilator assignments. This fosters collaboration, communication, and accountability, ultimately enriching the academic experience for all involved.
- With COE, students enjoy unparalleled convenience and accessibility to essential examination-related information. Real-time access to Datesheets, Seating Plans, and other pertinent details empowers students to plan their study schedules effectively, alleviating stress and enhancing their overall exam experience. Moreover, improved attendance tracking encourages a more proactive approach to class participation and engagement.

## **1.2 PROJECT CATEGORY (FULL STACK WEB DEVELOPMENT AND MOBILE APPLICATION)**

COE, or Controller of Examination, is a web development project aimed at streamlining academic operations through the "KIET Pariksha" mobile app. It facilitates the generation of essential documents like Datesheets, Seating Plans, Invigilator Requirements, and Attendance Roasters. With seamless integration into the mobile app, COE simplifies administrative tasks, ensuring efficient management of examinations and class attendance. This innovative solution enhances accessibility, transparency, and organization, benefiting both administrators and students within the academic ecosystem.

## CHAPTER 2

### LITERATURE REVIEW

#### 2.1 LITERATURE REVIEW

Sr. No.	Authors	Name of the paper	Description
1	Prof. S. S. Aravinth	Exam Hall Seating Arrangement System	The paper most important goal for developing this software program is to computerize the traditional way of carrying out exams
2	Prof . Gautami G. Shingan	Automated Supervision Allocation System	The paper introduces a gadget which used for college leave management. The faculty who are allocated the supervision but for any cause they're now not present at that time then the to be had faculty is sent mails for the supervision
3	Dinesh Chandewar, Mainka Saha	Automatic Seating Arrangement of University	The paper is to lessen the significant mission of manually allocating seats at some point of an exam. The device will provide an effective measure to dynamically allocate students in a lecture room

<b>4</b>	R.Gokila, Antony Rohan Das	Examination Hall and Seating Arrangement Application using PHP	The paper describes system is evolved to generate the examination corridor seating arrangement for students efficaciously. The advanced machine is helpful for each group of workers and college students
<b>5</b>	R.Chandrasekr	Automation of Hall Seating Arrangement System	This paper shows off a venture which offers a solution to examination seating arrangement problems by means of executing the proposed chromatic polynomial set of rules.
<b>6</b>	Vamsi Krishna Yepur	Examination Management Automation System	This paper provides a comparative look at various techniques and devices that exist and are being used broadly.
<b>7</b>	Shazia Anjum, Madhuri	Automation of Exam Hall Allotment and Seating Arrangement	This challenge allows in the technology of stories of seat preparations made and helps in producing random order of precise path or segment exams in every week.

## 2.2 PROBLEM FORMULATION

The system being developed is economic with respect to a general organization. It is cost-effective in the sense that it has eliminated the paperwork completely. The system is also time effective because the calculations are automated and are made at the end of the month or as per the user's requirement. The results obtained contain minimum errors and

are highly accurate as the data is required.

The system is economical as it does not use any other additional Hardware and software.

The system working is quite easy to use and learn due to its simple but attractive and informative interface. Users require no special training for operating the system.

The UI of the project will be designed using AngularJS so the system is easily accessible to all users and is operationally feasible.

## **2.3 OBJECTIVES**

The primary objective of the COE (Controller of Examination) project is to modernize and streamline the examination administration process within the academic institution. Its core goals include:

### **Efficiency Enhancement**

By automating the generation of crucial documents such as Datesheets, Seating Plans, and Invigilator Roasters, COE aims to significantly reduce the administrative burden on examination coordinators and administrators. This efficiency enhancement translates into time savings and a reduction in manual errors, ultimately ensuring smoother examination logistics.

### **Data Centralization and Reporting**

COE facilitates the centralization of examination-related data, enabling seamless communication and reporting between different stakeholders. It provides a mechanism for direct attendance reporting to the COE team, detention list management, and preventing detainees from marking attendance. Additionally, it generates comprehensive final attendance reports for Head of Departments (HODs), empowering them with accurate and up-to-date information to make informed decisions.

## **Transparency and Accountability**

By promoting transparency in examination processes, COE fosters trust and accountability within the academic ecosystem. Through features like real-time attendance tracking and detainee management, the project aims to ensure fairness and integrity in the assessment process. This transparency not only benefits administrators but also cultivates a culture of responsibility among students and faculty members.

## **Enhanced Student Experience**

Ultimately, the COE project seeks to enhance the overall student experience by providing timely access to essential examination-related information. Students benefit from features such as real-time access to Datesheets and Seating Plans, enabling better preparation and reducing anxiety during examinations. Moreover, improved attendance tracking mechanisms encourage student engagement and participation in classes, contributing to a more enriching academic environment.

# **CHAPTER 3**

## **PROPOSED SYSTEM**

### **3.1 PROPOSED SYSTEM**

The proposed system for the COE (Controller of Examination) project represents a transformative step in modernizing examination administration within the academic institution. It introduces a comprehensive digital platform accessible through web browsers and mobile devices, ensuring seamless user experiences for administrators, faculty members, and students. At its core, the system automates critical processes such as generating Datesheets, Seating Plans, and Invigilator Roasters, thereby significantly reducing manual effort and potential errors.

Moreover, robust attendance tracking mechanisms enable faculty members to record student attendance directly within the platform, with real-time data aggregation facilitating effortless generation of attendance reports. Additional features include detainee management and prevention of detainees from marking attendance, ensuring fairness and integrity in the assessment process. Communication and notification functionalities keep stakeholders informed about essential events such as examination dates and seating arrangements changes.

Centralization of examination-related data within the system ensures a single, reliable source of information, supported by stringent security measures to protect sensitive data. Seamless integration with the existing KIET Pariksha mobile app provides students with easy access to vital examination-related information. The system's customizable settings and scalability allow administrators to tailor it to the specific needs of different academic departments and examination schedules. Overall, the proposed COE system aims to enhance efficiency, transparency, and the overall academic experience for all stakeholders involved in the examination process.

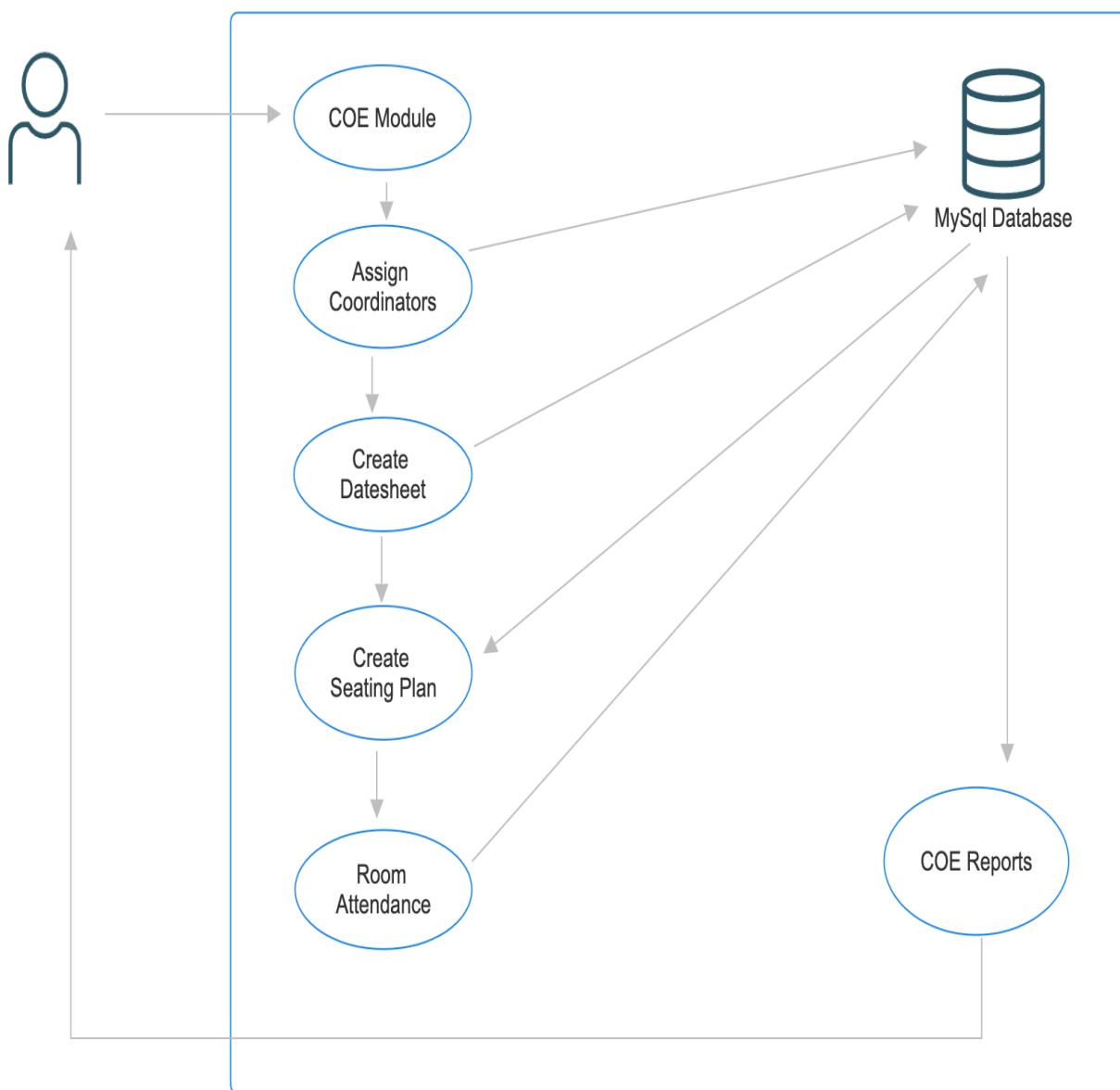
## **3.2 UNIQUE FEATURE OF THE SYSTEM**

- An online system.
- A web-based application-It is a web-based application as it can be used by any agent connected across the organization. It is based on technologies like AngularJS and Django.
- A common universal process-It is based on a standard and common universal process for all kinds of organizations. Different user levels like COE Head, Datesheet Head, Seating Plan Head, etc. although have different roles, and follow a common procedure for using their respective features and roles.
- Keep track of information.

## **3.3 STRUCTURE OF SYSTEM**

A workflow diagram, also known as a process flow diagram or flowchart, is a graphical representation of the sequential steps, activities, and decisions involved in a workflow or process. It illustrates the movement of tasks, information, and resources from one step to another, highlighting the relationships and dependencies between different elements of the workflow.

A workflow diagram typically consists of various shapes and symbols connected by arrows, indicating the flow and direction of the workflow.



*Figure 3.1: Structure diagram*

# **CHAPTER 4**

## **REQUIREMENT ANALYSIS AND SYSTEM SPECIFICATION**

### **4.1 FEASIBILITY STUDY**

#### **4.1.1 Economically Feasibility:**

The system being developed is economic with respect to a general organization. It is cost-effective in the sense that it has eliminated the paperwork completely. The system is also time effective because the calculations are automated and are made at the end of the month or as per the user's requirement. The results obtained contain minimum errors and are highly accurate as the data is required.

#### **4.1.2 Technical Feasibility:**

The technical requirement for the system is economic and it does not use any other additional Hardware and software.

#### **4.1.3 Behavioural Feasibility:**

The system working is quite easy to use and learn due to its simple but attractive and informative interface. Users require no special training for operating the system.

#### **4.1.4 Operational Feasibility:**

The UI of the project will be designed using AngularJS, so the system is easily accessible to all the users and is operationally feasible.

## 4.2 Software Requirements Specification

An ERP system integrates many functions across the business, such as financial management, human resources, sales, and manufacturing, to deliver benefits such as increased productivity and efficiency. ERP implementation describes the process of planning, configuring, and deploying an ERP. The process typically continues for a few months—and it's complex because an ERP system supports and automates many different functions.

To ensure a successful implementation, the organization needs to carefully define its requirements, determine how to redesign processes to take advantage of the system, configure the ERP system to support those processes and rigorously test it before deploying it to users. Successfully navigating all those steps on schedule requires careful planning and a structured, phased implementation approach.

### ERP Implementation Stages

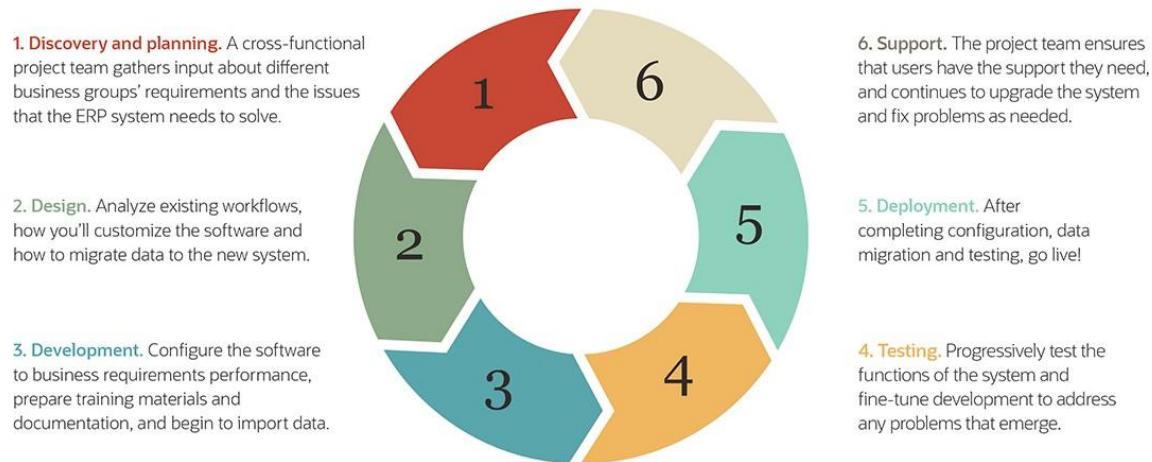


Figure 4.1: ERP Software development lifecycle

**The phases are :**

- I. Discovery and planning
- II. Design
- III. Development
- IV. Testing
- V. Deployment
- VI. Support

#### **4.2.1 DETAIL DESIGN**

Only authorized users will be able to access the website by entering the correct login name and corresponding password. The website can be maintained in the present or future. It will be easy to incorporate new requirements in the individual modules. As the website is online it will be easily portable on various systems. The website will also be easily portable on any Windows-based system with a web browser installed.

#### **Hardware Requirements**

The minimum Hardware requirements for running the development software are as follows:

- Processor – Intel Pentium 4 or Later
- Installed Memory (RAM) – 2GB minimum, 4GB recommended
- System type-64-bit Operating System.

#### **Hardware Requirements(For development)**

The minimum Hardware requirements for running the development software are as follows:

- Processor – i5 8th generation @1.90GHz 1.90 GHz.
- Installed Memory (RAM) – at least 8048 MB.
- System type-64-bit Operating System.

## **Software Requirements (For development)**

The tools used to develop this application are:-

- i. VS Code
- ii. GitHub
- iii. Postman
- iv. ReactJs
- v. MySQL
- vi. ReactJS-oAuth2
- vii. PhpMyAdmin

## **4.3 SDLC MODEL**

The Software Development Life Cycle (SDLC) is a methodology used to develop and manage software projects. While the SDLC is primarily focused on software development, it can be adapted and applied to various types of projects, including Enterprise Resource Planning (ERP) implementations. ERP systems are complex software solutions that integrate and manage various aspects of an organization's operations, such as finance, human resources, supply chain, and customer relationship management.

Here's how the SDLC can be applied to an ERP implementation:

- I. **Requirements Gathering:** The first phase involves understanding the organization's requirements for the ERP system. This includes identifying the specific modules and functionalities needed, as well as any customization or integration requirements.
- II. **System Design:** In this phase, the overall system architecture and design are

planned. This includes defining the data model, user interface, workflows, and integrations with other systems.

**III. Development:** The development phase involves building the ERP system according to the design specifications. This may include configuring the ERP software, customizing modules, developing additional functionalities, and integrating with existing systems.

**IV. Testing:** Once the system is developed, thorough testing is performed to ensure that it meets the organization's requirements and functions correctly. This includes functional testing, integration testing, performance testing, and user acceptance testing.

**V. Deployment:** After successful testing, the ERP system is deployed to the production environment. This involves migrating data from legacy systems, setting up infrastructure, and configuring security and access controls.

**VI. Training and User Acceptance:** Users and stakeholders are trained on how to use the ERP system effectively. User acceptance testing is conducted to ensure that the system meets the users' needs and expectations.

**VII. Maintenance and Support:** Once the ERP system is live, ongoing maintenance and support are required. This includes addressing issues, providing updates and enhancements, and ensuring system stability and security.

Throughout the SDLC, it is important to follow best practices such as documentation, change management, and project management methodologies to ensure the success of the ERP implementation. Additionally, organizations may choose to follow specific ERP implementation methodologies, such as the SAP Activate or Oracle Unified Method (OUM), which provide more detailed guidelines and frameworks for ERP projects.

### 4.3.1 SYSTEM DESIGN USING DFD LEVEL 0 AND LEVEL 1

The data flow diagram makes communication between us and the user easier. DFDs help understand the flow of data and identify potential bottlenecks, data dependencies, or areas for improvement within a system. They provide a high-level overview of the system's functionality and data interactions. In a DFD, the system is represented as a collection of interconnected processes that receive input data, perform specific actions or transformations on the data, and produce output data. The data flows between these processes are represented by arrows, indicating the direction of data movement.

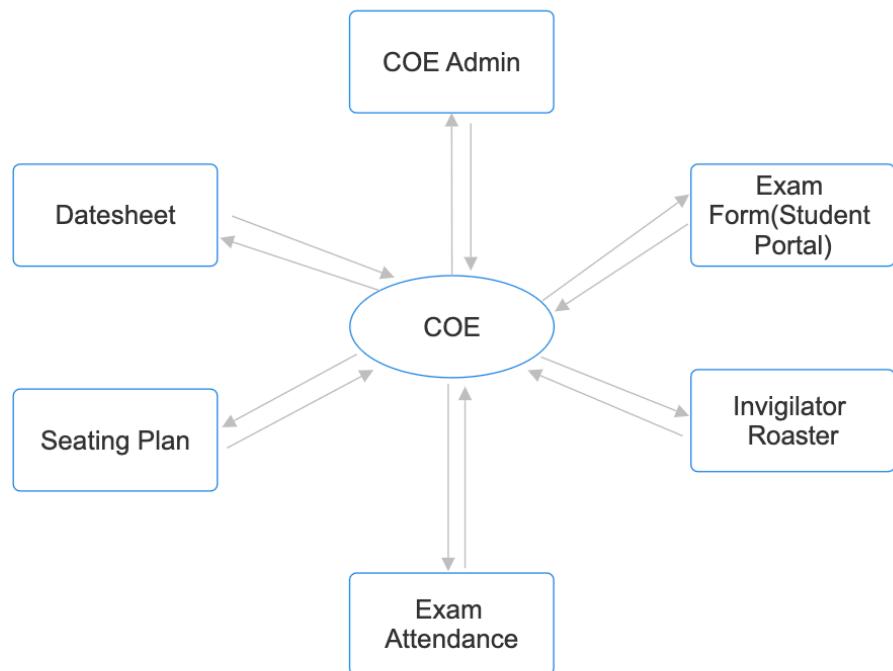


Figure 4.2: Workflow diagram

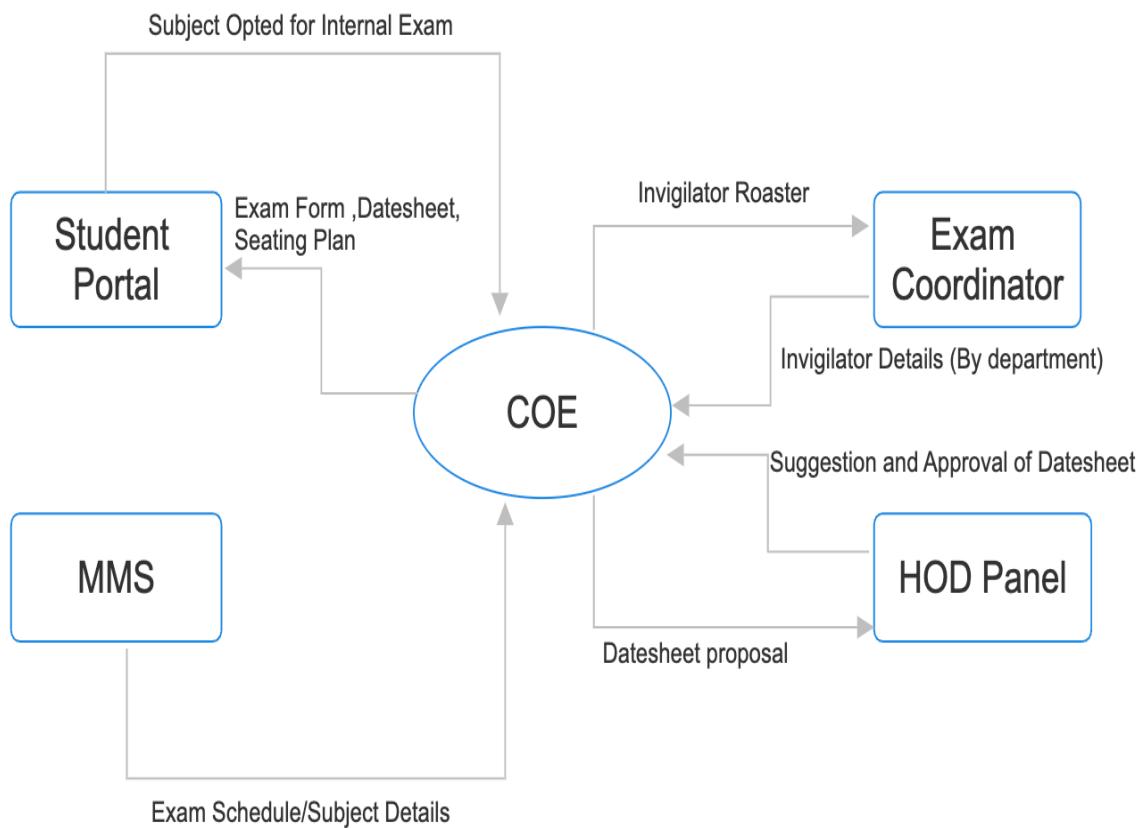


Figure 4.3: DFD

### 4.3.2 USE CASE DIAGRAM

A use case diagram is the primary form of system/software requirements for a new software program underdeveloped. Use cases specify the expected behavior (what), and not the exact method of making it happen (how). Use cases once specified can be denoted both textual and visual representation (i.e., use case diagram). A key concept of use case modeling is that it helps us design a system from the end user's perspective. It is an effective technique for communicating system behavior in the user's terms by specifying all externally visible system behavior.

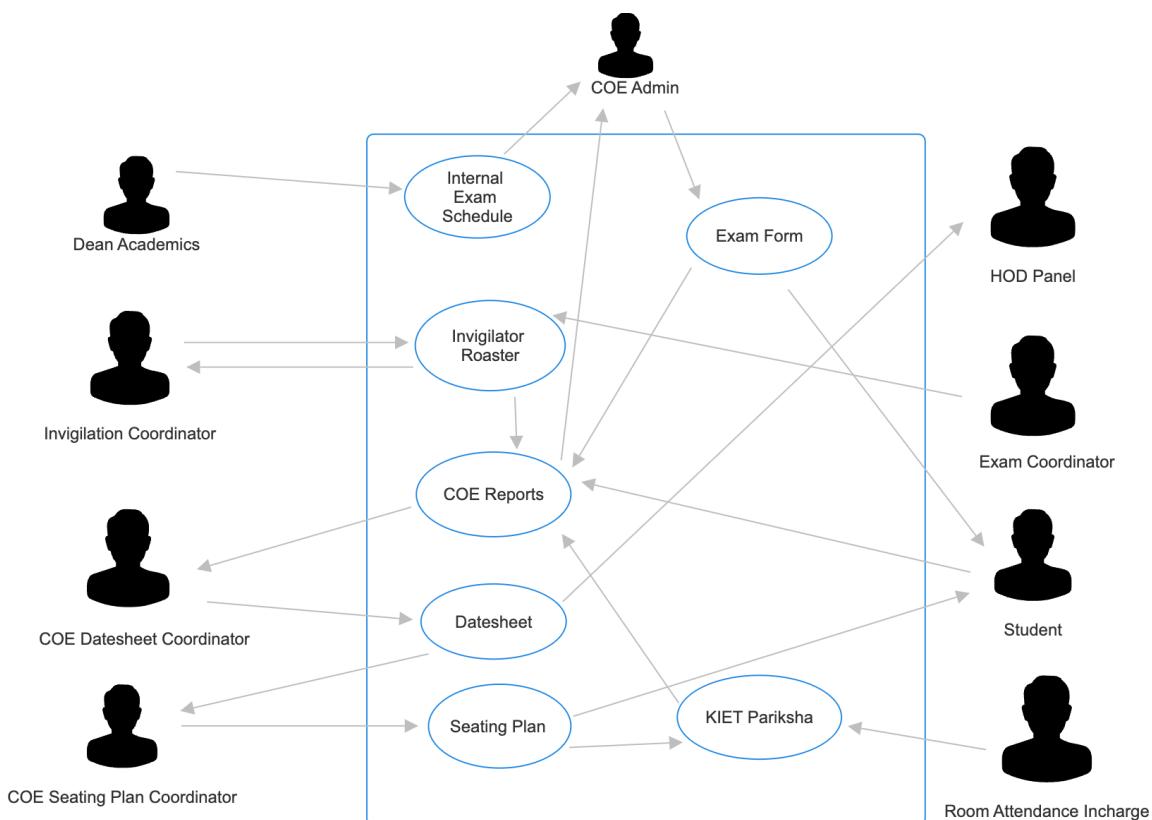
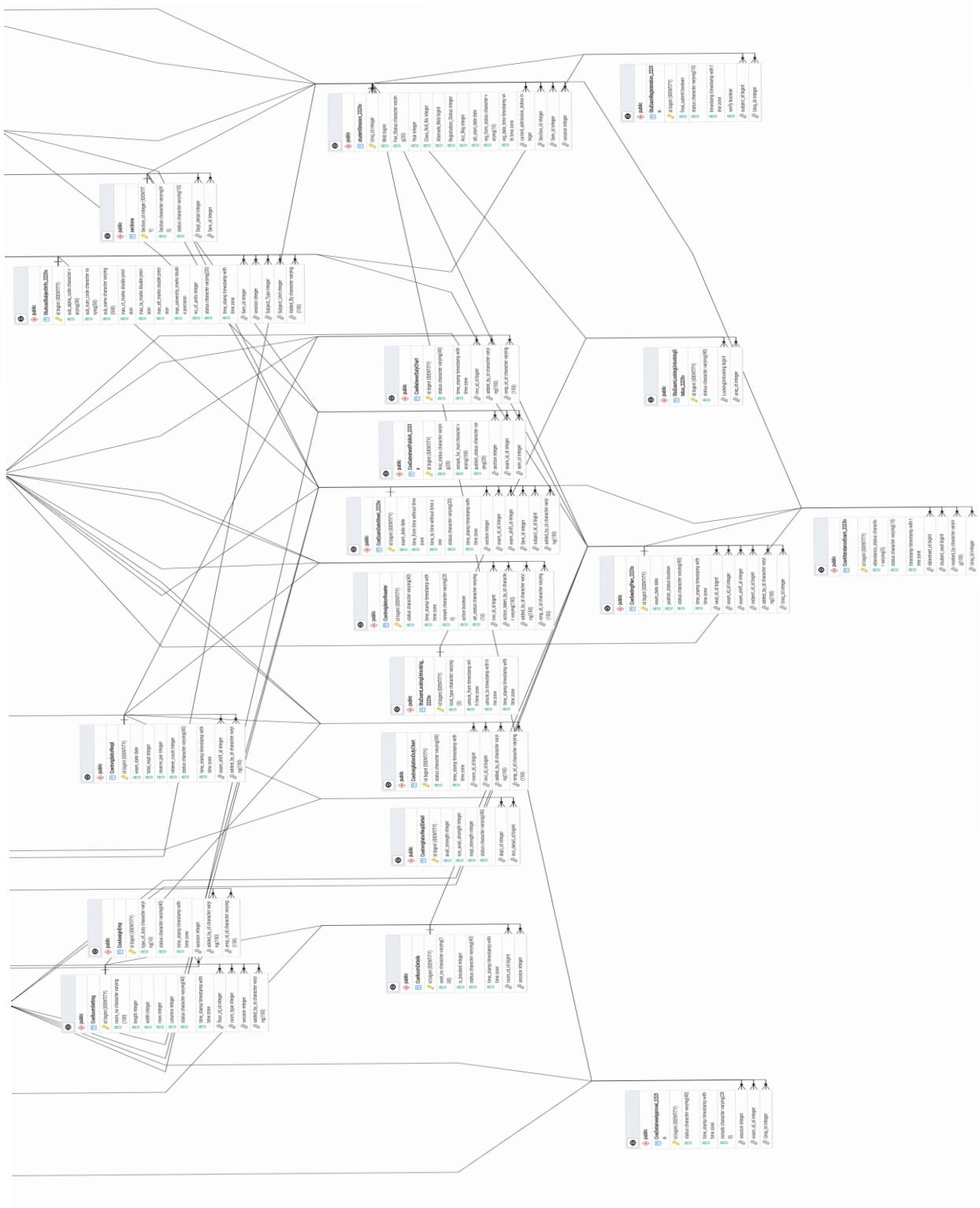


Figure 4.4: Use Case Diagram

#### 4.3.4 ER DIAGRAM



*Figure 4.5: ER Diagram*

# **CHAPTER 5**

## **IMPLEMENTATION**

### **5.1 Introduction to Languages, Tools and Technologies Used for Implementation**

#### **5.1.1 Languages Used:**

##### **5.1.1.1 Python:**

1. Python is a high-level, interpreted programming language known for its simplicity and readability.
2. It has a clean and elegant syntax, making it easy to learn and write code quickly.
3. Python supports multiple programming paradigms, including object-oriented, procedural, and functional programming.
4. It has a vast standard library and a rich ecosystem of third-party packages, providing a wide range of functionalities.
5. Python is widely used in various domains, including web development, data analysis, artificial intelligence, scientific computing, and more.
6. It emphasizes code readability and follows the principle of "There should be one—and preferably only one—obvious way to do it" (Pythonic philosophy).

##### **5.1.1.2 JavaScript:**

1. JavaScript is a versatile scripting language primarily used for front-end web development.
2. It enables interactivity and dynamic behavior in web pages by manipulating the Document Object Model (DOM).
3. JavaScript can also be used on the server-side (with Node.js) to build back-end applications. It supports event-driven programming and asynchronous operations,

making it suitable for interactive web applications.

4. JavaScript has a wide range of frameworks and libraries such as React.js, AngularJS, and Vue.js, which simplify and enhance web development.
5. It is a core technology of the World Wide Web and plays a crucial role in modern web development.

#### **5.1.1.3 CSS (Cascading Style Sheets):**

1. CSS is a style sheet language used to describe the presentation and layout of a document written in HTML.
2. It separates the structure (HTML) from the design (CSS) of a web page, allowing developers to control the visual appearance.
3. CSS provides various selectors and properties to target and style specific elements on a web page.
4. It enables the creation of responsive designs, allowing websites to adapt to different screen sizes and devices.
5. CSS supports cascading and inheritance, making it easy to apply consistent styles across multiple pages.
6. CSS3 introduced advanced features like animations, transitions, and transformations, enhancing the visual experience of web pages.

#### **5.1.1.4 HTML (Hypertext Markup Language):**

1. HTML is the standard markup language used to create the structure and content of web pages.
2. It uses tags and elements to define the different components of a web page, such as headings, paragraphs, images, links, and forms.
3. HTML provides a semantic structure, allowing search engines and assistive technologies to understand the content better.
4. It forms the backbone of the World Wide Web and is supported by all web browsers.
5. HTML5 introduced new elements and APIs that enable multimedia playback, offline

- capabilities, and interactive features without the need for plugins.
6. HTML is often combined with CSS and JavaScript to create visually appealing and interactive web pages.

#### **5.1.1.5 SQL (Structured Query Language):**

1. SQL is a standard language for managing relational databases.
2. It is used to create, retrieve, update, and delete data from databases (e.g., MySQL, PostgreSQL, Oracle, SQL Server).
3. SQL allows developers to define the structure of databases using Data Definition Language (DDL) statements.
4. It provides powerful querying capabilities through Data Manipulation Language (DML) statements like SELECT, INSERT, UPDATE, and DELETE.
5. SQL supports various operations, including filtering, sorting, grouping, joining, and aggregating data.
6. It is widely used in web development, data analysis, and any application that involves working with structured data.
7. SQL is declarative, meaning you specify what you want, and the database engine figures out how to retrieve or modify the data.

#### **5.1.2 Technologies Used:**

##### **5.1.2.1 AngularJS:**

1. AngularJS is a JavaScript-based open-source front-end web application framework developed by Google.
2. It follows the Model-View-Controller (MVC) architectural pattern, which helps in separating concerns and building scalable applications.
3. AngularJS provides a set of directives that extend HTML and enable the creation of dynamic views.
4. It supports two-way data binding, allowing automatic synchronization between the model and the view.

5. AngularJS provides dependency injection, making it easier to manage and test components.
6. It offers features like routing, form validation, and reusable components, which aid in rapid development.
7. AngularJS is suitable for building single-page applications (SPAs) and has a steep learning curve compared to other frameworks.

### **5.1.2.2 React.js:**

8. React.js is a JavaScript library developed by Facebook for building user interfaces.
9. It follows the component-based architecture, where the UI is divided into reusable and independent components.
10. React.js uses a virtual DOM (Document Object Model) to efficiently update and render components.
11. It supports one-way data flow, making it easier to understand and debug the application.
12. React.js provides a declarative syntax using JSX (JavaScript XML) to describe the structure and appearance of components.
13. It can be used for building both single-page applications (SPAs) and complex user interfaces.
14. React.js has a large and active community with extensive third-party libraries and tooling support.

### **5.1.2.3 Django:**

15. Django is a high-level Python web framework that follows the Model-View-Template (MVT) architectural pattern.
16. It provides a robust set of tools and libraries for building web applications efficiently.
17. Django follows the "batteries included" philosophy, offering features like an ORM (Object-Relational Mapper), URL routing, authentication, and admin interface out of the box.
18. It emphasizes reusability and modularity using apps, which are self-contained

- components that can be plugged into different projects.
- 19. Django enforces good practices like secure coding, protection against common web vulnerabilities, and separation of concerns.
- 20. It has excellent documentation and an active community, making it easy to find resources and get help.
- 21. Django is well-suited for building database-driven web applications and has been used for various high-traffic websites.

#### **5.1.2.4 React Native:**

- 22. React Native is a JavaScript framework developed by Facebook for building native mobile applications.
- 23. It allows developers to write mobile apps using React.js syntax and components, which are then translated into native UI components.
- 24. React Native offers a single codebase that can be used for both iOS and Android platforms, reducing development time and effort.
- 25. It provides access to native APIs and device features, enabling the creation of highly performant and feature-rich mobile apps.
- 26. React Native supports hot reloading, allowing developers to see the changes instantly during the development process.
- 27. It allows the integration of third-party libraries and existing native code, providing flexibility and extensibility.

React Native has a large and active community with a wide range of resources and libraries available.

#### **5.1.3 Tool Used:**

##### **5.1.3.1 VS Code (Visual Studio Code):**

VS Code is a popular source code editor developed by Microsoft. It is lightweight, highly customizable, and supports a wide range of programming languages. It provides features such as syntax highlighting, intelligent code completion, debugging

capabilities, version control integration, and a vast library of extensions that enhance its functionality. VS Code has gained popularity among developers due to its simplicity, performance, and extensive community support.

### **5.1.3.2 Linux:**

Linux is an open-source operating system that serves as an alternative to proprietary operating systems such as Windows or macOS. It is built on the Unix kernel and is known for its stability, security, and flexibility. Linux distributions are available in various flavors, such as Ubuntu, Fedora, and CentOS, each with its own set of features and package management systems. Linux is widely used for web servers, development environments, embedded systems, and as the foundation for many other software projects.

### **5.1.3.3 PhpMyAdmin:**

PhpMyAdmin is a web-based graphical user interface (GUI) tool for managing and administering MySQL or MariaDB databases. It allows users to interact with databases through a web browser, providing functionalities such as creating and modifying databases, tables, and columns, executing SQL queries, importing and exporting data, and managing user permissions. PhpMyAdmin simplifies database administration tasks and is commonly used by web developers and database administrators for managing MySQL or MariaDB databases efficiently.

# **CHAPTER 6**

## **TESTING AND MAINTENANCE**

### **6.1 Testing Techniques and Test Cases Used**

#### **6.1.1 Testing Techniques:**

Testing techniques and test cases used in Enterprise Resource Planning (ERP) implementations can vary depending on the specific ERP system being used and the organization's requirements. However, here are some commonly used testing techniques and test cases in ERP projects:

##### **6.1.1.1 Functional Testing:**

1. Test the core functionalities of the ERP system, such as finance, inventory management, procurement, sales, and HR.
2. Validate that the system performs calculations accurately, processes transactions correctly, and generates expected outputs.
3. Verify that the system follows business rules and workflows defined by the organization.
4. Test different scenarios, such as creating, modifying, and deleting records, and ensure the system behaves as expected in each case.

#### **6.1.1.2 Integration Testing:**

5. Test the integration points between the ERP system and other external systems, such as CRM systems, supply chain management systems, or third-party applications.
6. Validate data exchange and synchronization between systems.
7. Verify that information flows correctly between different modules within the ERP system.

#### **6.1.1.3 Performance Testing:**

8. Test the ERP system's performance under different load conditions, including normal usage, peak loads, and stress conditions.
9. Measure response times for key operations and transactions.
10. Verify the system's ability to handle a high volume of concurrent users and large data sets.

#### **6.1.1.4 Security Testing:**

1. Test the security features and controls of the ERP system to ensure data confidentiality, integrity, and availability.
2. Verify user access controls, authentication mechanisms, and authorization rules.
3. Conduct penetration testing to identify vulnerabilities and weaknesses in the system's security.

#### **6.1.1.5 User Acceptance Testing (UAT):**

4. Involve end users and stakeholders in testing the ERP system to ensure it meets their requirements and expectations.
5. Validate that the system's user interface is intuitive and easy to use.
6. Test typical user workflows and scenarios.
7. Gather feedback and address any usability issues or functional gaps identified during UAT.

### **6.1.1.6 Regression Testing:**

8. Perform regression testing after system changes, upgrades, or patches to ensure that existing functionalities are not affected by the updates.
9. Re-test previously executed test cases to ensure they still pass after changes are made.
10. Focus on critical and high-impact areas to ensure the system's stability and reliability.

### **6.1.1.7 Data Migration Testing:**

11. Test the accuracy and completeness of data migration from legacy systems to the ERP system.
12. Validate that data is correctly transformed, mapped, and loaded into the ERP system.
13. Perform data validation checks to ensure data integrity and consistency. It's important to note that ERP testing can be a complex and comprehensive process due to the interconnected nature of ERP systems and their impact on various business processes. It is recommended to involve experienced testers and domain experts to design and execute effective test strategies and test cases specific to the organization's ERP implementation.

## **6.2 Test cases:**

### **6.2.1 Student Registration for Exam:**

Function	Description	Expected Output	%TC Executed	%TC Passes	TC Pending	Priority	Remarks
Duplicate Registration	Attempt to register a student who is already registered for the same exam.	System detects the duplicate registration and notifies the user.	100	100	0	High	PASSED

Registration Date passed	Check whether the student can still register after registration date is passed	Notifies the student that the exam form fill date is passed.	100	100	0	High	PASSED
--------------------------	--------------------------------------------------------------------------------	--------------------------------------------------------------	-----	-----	---	------	--------

### 6.2.2 Datesheet Module:

Function	Description	Expected Output	%TC Executed	%TC Passes	TC Pending	Priority	Remarks
No Exams Scheduled	When no exams scheduled there is no exams showing on student and faculty panel of old session	System provides a message indicating there are no exams to schedule.	100	100	0	High	PASSED
Empty Date Sheet	Attempt to create a seating plan for an exam with an empty date sheet	System prompts the user to schedule exams before creating a seating plan.	100	100	0	High	PASSED

### 6.2.3 Seating Plan Creation:

Function	Description	Expected Output	%TC Executed	%TC Passes	TC Pending	Priority	Remarks
No Available Classrooms	Creating a seating plan when there are no available classrooms.	System notifies the user and prompts to add classrooms.	100	100	0	High	PASSED

Invalid Seating Capacity	Assigning a seating plan with a capacity exceeding the maximum classroom capacity.	System rejects the assignment and asks for a valid configuration.	100	100	0	High	PASSED
--------------------------	------------------------------------------------------------------------------------	-------------------------------------------------------------------	-----	-----	---	------	--------

#### 6.2.4 Invigilation Duty Chart:

Function	Description	Expected Output	%TC Executed	%TC Passes	TC Pending	Priority	Remarks
Generate Duty Chart for Single Exam	Request to generate the invigilation duty chart for a single exam	System generates a duty chart with assigned invigilators for each session of the exam.	100	100	0	High	PASSED
Duty Chart for Multiple Exams	Request to generate the invigilation duty chart for multiple exams scheduled on the same day.	System creates a comprehensive duty chart considering all exams without conflicts.	100	100	0	High	PASSED
No Invigilators Available	Attempting to generate a duty chart when there are no available invigilators.	System prompts the user to assign invigilators before generating the duty chart.	100	100	0	High	PASSED
Overlapping Exam Sessions	Scheduling exams with overlapping sessions	System detects the overlap and prompts for resolution or adjustment before generating the duty chart	100	100	0	High	PASSED

Uneven Distribution of Invigilation	Requesting a duty chart for exams where invigilation duties are unevenly distributed	System attempts to distribute duties as evenly as possible and notifies if any imbalances occur	100	100	0	High	PASSED
Unavailability of Invigilator	Invigilator marked as unavailable for a specific time slot.	System accommodates the unavailability and assigns an alternative invigilator.	100	100	0	High	PASSED
Dynamic Changes in Invigilator Availability	Changes in invigilator availability after the duty chart is generated	System allows dynamic updates to the duty chart to reflect the changes in availability.	100	100	0	High	PASSED
Exceeding Maximum Hours for Invigilation	Attempting to assign an invigilator duties exceeding their maximum allowed hours.	System prevents the assignment and notifies about the limit breach.	100	100	0	High	PASSED

NAME	EMP ID	Designation	Gender	D.O.J
Prof. Neha Shukla	21005	Ass. Professor	Female	4-July-2019
Dr. Gaurav Dubey	21324	Professor	Male	8-July-2022
Ms. Akanksha	21131	Ass. Professor	Female	7-june-2021
Mr. Abhishek Goyal	21330	Ass. Professor	Male	18-july-2022
Arti Sharma	21004	Ass. Professor	Female	3-july-2019
Ms. Jyoti Srivastava	3670	Ass. Professor	Female	10-june-2018

### **6.2.5 Taking Attendance through Mobile App:**

Function	Description	Expected Output	%TC Executed	%TC Passes	TC Pending	Priority	Remarks
Offline Attendance Sync Failure	Attempting to sync offline attendance data with the main database when the data is corrupted.	System detects corruption, logs the issue, and prompts for manual intervention.	100	100	0	High	PASSED
Check for detained student	Checking if the student is detained or not by comparison with detained criteria	System doesn't allow to mark the attendance of the detained student	100	100	0	High	PASSED

# CHAPTER 7

## RESULTS AND DISCUSSIONS

### 7.1 User Interface Representation

*Figure 7.1: User Interface*

### 7.2 Brief Description of Various Modules of The System

#### 7.2.1 MobiKIET

- This mobile application tracks all the institutional activities of a student.
- It helps a student to check his marks, attendance, previous activities, mentor form, and many other things.
- It is a paperless solution to institutional tasks and reduces the manpower of employees.
- Any information which is essential to the student can be delivered immediately with the help of an in-built app notification feature.
- Provides receipts of all the payments made to the institution.
- **Scope:**
  - The students can use the application 24x7 from any place.
  - Reduces the work of calculation.

- Cost effective.

### **7.2.2 KIETKaksha**

- The objective of this application is to give faculties an easy-to-use platform which has selected important features of the HRMS portal and a few extra features which can come in handy in daily institutional work.
- Some of the available features are timetable, academic calendar, add/delete attendance, mentor form update, etc.
- Scope:
  - It is a live application and can be used 24x7 from any place
  - It can be used in the case of no internet availability.
  - Saves manpower.
  - Cost effective.

### **7.2.3 Notification Module**

- In this module a CSV file of the dataset should be uploaded. From the dataset groups and subgroups can be made and saved for further use.
- Designed a Template that will render the content dynamically as entered by the user. The task Scheduling Frequency and message body can be defined dynamically.
- The access to the groups and subgroups is restricted to specific users. The authorized users can choose the groups or specific members and initiate the process and accordingly, the notification is sent
- Scope:
  - Save the environment by saving paper.
  - Save manpower.
  - Save Time
  - Cost effective.

## 7.2.4 Appraisal Module

- Conceptualized a complete online portal for the faculty & staff of the college for their annual appraisal
- where the Employee(s) have to fill their various achievements in the particular academic year which was
- evaluated by the software, based on the evaluation the reports were sent to higher levels (like HOD,
- Dean, and Director) for the approval.
- Here the most interesting part was to design a user-friendly portal providing rich user experience.
- Scope:
  - On the basis of past work and achievements the data is automatically processed to give the points on different categories and accordingly appraisal is calculated.

## 7.3 Snapshots of ERP's COE

The screenshot shows a web-based application interface for the Controller Of Examination (COE) at KIET Group of Institutions. The top navigation bar includes links for 'HOME', 'COE', and 'CREATE DATESHEET'. The main content area is titled 'Create Datesheet' and contains several input fields:

- EXAM NAME\***: Choose One
- EXAM SHIFT\***: Choose One
- TIME FROM\***: From Time
- TIME TO\***: To Time
- COURSE\***: Select Some Options
- BRANCH\***: Select Some Options
- SEMESTER\***: Choose One
- SUBJECT TYPE**: Select Some Options
- SUBJECT\***: Select Some Options
- DATE**: Select Date

At the bottom of the form, there is a 'Submit' button and a link to 'Show Previous'. A note at the bottom states: "Note: Kindly Select Exam Name, Exam Shift, Course, Branch and Semester for Show Previous".

The left sidebar contains a vertical menu with the following items:

- COE REPORTS ROLES
  - Exam Registration Reports
  - DateSheet Reports
  - Seating Plan Reports
  - Invigilation Reports
  - Exam Attendance Report
  - Subject Count Report
- DY. COE INVIGILATION & DATESHEET ROLES
  - Create Datesheet
  - Datesheet Status Report
  - Invigilation Requirement
  - Invigilation Roaster Report
  - Invigilation Duty Chart

Figure 7.2: Create Datesheet

tech.kiet.edu/HRMS/COE/#/erp/COE\_CreateSeatingPlan

**EASY** Powered by KIET Group of Institutions

Controller Of Examination 2022-2023 Even

**Create SeatingPlan**

**DY. COE INVIGILATION & DATESHEET ROLES**

- Create Datesheet
- Datesheet Status Report
- Invigilation Requirement
- Invigilation Roaster Report
- Invigilation Duty Chart
- Assign Reliever Duty
- Reserve Faculty Report

**DY. COE SEATING PLAN ROLES**

- COE Setting
- Seating Plan
- Create Seating Plan

**EXAM NAME\*** Choose One

**EXAM SHIFT\*** Choose One

**TIME FROM** -----

**DATE\*** Select Some Options

**FLOOR\*** Select Some Options

**ROOM NAME\*** Select Some Options

**SIDE - A**

**COURSE\*** Select Some Options

**BRANCH\*** Select Some Options

**SEMESTER\*** Select Some Options

**SECTION\*** Select Some Options

**SIDE - B**

**COURSE\*** Select Some Options

**BRANCH\*** Select Some Options

**SEMESTER\*** Select Some Options

**SECTION\*** Select Some Options

Generate Seating Plan

Figure 7.3: Create Seating Plan

**Detainee Approval**

**EXAM NAME\*** CT

**COURSE\*** B.TECH ✕ B.PHARMA ✕

**BRANCH\***

- IT ✕
- CSE ✕
- ECE ✕
- CE ✕
- EIE ✕
- EN ✕
- ME ✕
- CSIT ✕
- CS ✕
- CSE(AI) ✕
- CSE(AI&ML) ✕
- KSOP ✕

**SEMESTER\***

- 6 ✕
- 8 ✕

**SECTION\***

- A ✕
- B ✕
- C ✕
- D ✕
- E ✕

Submit

Show Previous

Figure 7.4: Detainee Approval

### Generate Hall Ticket

EXAM NAME*	CT ✕	EXAM DATE*	02-04-2024
COURSE *	B.TECH ✕	BRANCH *	CS ✕
SEMESTER *	8 ✕		
STUDENT(S) *	VARUN KUMAR TIWARI (2000290120186) ✕   AVINASH KUMAR (2000290120050) ✕		
<input type="button" value="Submit"/>			

[Print Hall Tickets](#)



Hall Ticket For :	KOE-094(CT)	Building :E-BLOCK	Room No. :105		
Student Name :	AVINASH KUMAR	University Roll No.:	2000290120050		
Exam Date :	2024-04-02	Department :	CS		
Roll No. :	48	Semester - Section :	8-A		
This Hall Ticket is valid for only 2024-04-02.					
Controller Of Examination					

<b>KIET</b> <b>GROUP OF INSTITUTIONS</b> <i>Connecting Life with Learning</i> (Toll Free no.: 1800 1200 106 Mobile: 8588811998, 9911150880)			
Hall Ticket For :	KOE-094(CT)	Building :E-BLOCK	Room No. :114
Student Name :	VARUN KUMAR TIWARI	University Roll No.:	2000290120186

Figure 7.5: Generate Hall Ticket

### Invigilation Roaster Report

EXAM DATE*	01-04-2024(Monday)	EXAM SHIFT*	MORNING
------------	--------------------	-------------	---------

### Invigilation Roaster Report

[Export to Excel](#) [Print Table](#)

Total Rows : 12

Filtered Rows : 10

Sno.	Department	Requirement	Employee Data
1	CE	2	SHIKHA TYAGI (20754),KUNAL (20918)
2	CS	4	NEHA SHUKLA (21005),RAHUL KUMAR (21425),SHREELA PAREEK (21494),VIVEK KUMAR SHARMA (21509)
3	CSE	5	MADHU GAUTAM (21036),PREETI GARG (21073),SAURAV CHANDRA (21113),KARNIKA DWIVEDI (21548),MANISH KUMAR MAURYA (21575)
4	CSE(AI&ML)	2	SAYANI GHOSAL (21485),ABHA KIRAN RAJPOOT (21492)
5	CSE(AI)	2	SAPNA JUNEJA (21202),ABHISHEK KUMAR (21499)

Figure 7.6: Invigilation Roaster Report

Invigilation Duty Chart

EXAM DATE*	01-04-2024(Monday)	EXAM SHIFT*	MORNING
<input type="button" value="Submit"/>			

Invigilation Duty Chart

[Export to Excel](#) [Print Table](#)

**KIET GROUP OF INSTITUTIONS,GHAZIABAD**

**Invigilation Duty Chart**

**Exam Date : 01-04-2024**

**Exam Shift : MORNING**

Room No:	Employee	Department	Designation	D.O.J
C-207	MOHAMMAD SHARIZ ANSARI(11840)	EN	ASSOCIATE PROFESSOR	2010-07-29
	VIDHI BISHNOI(21565)	ECE	ASSISTANT PROFESSOR	2023-12-18
C-208	RICHA GOEL(12073)	KSOP	ASSOCIATE PROFESSOR	2011-07-31
	RAHUL KUMAR(21425)	CS	ASSISTANT PROFESSOR	2022-12-12

Figure 7.7: Invigilation Duty Chart

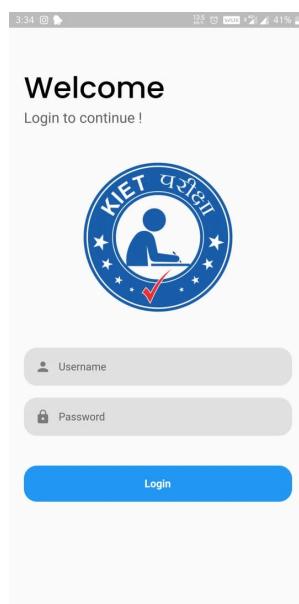


Figure 7.8: Login screen for attendance room incharge

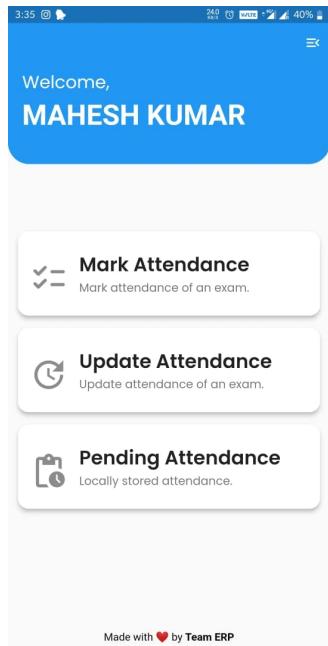


Figure 7.9: Dashboard screen for attendance room incharge

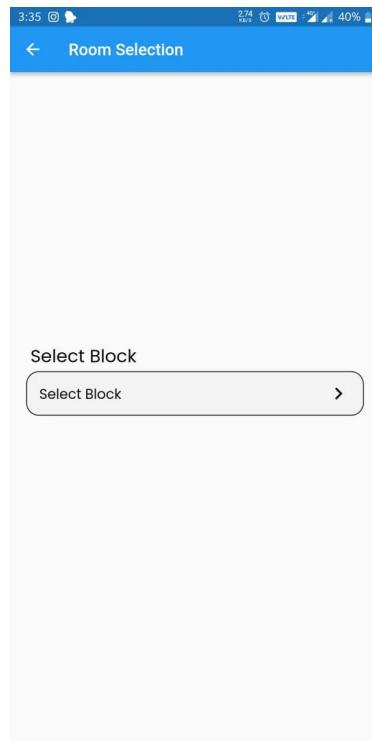


Figure 7.10: Block selection screen for attendance room incharge

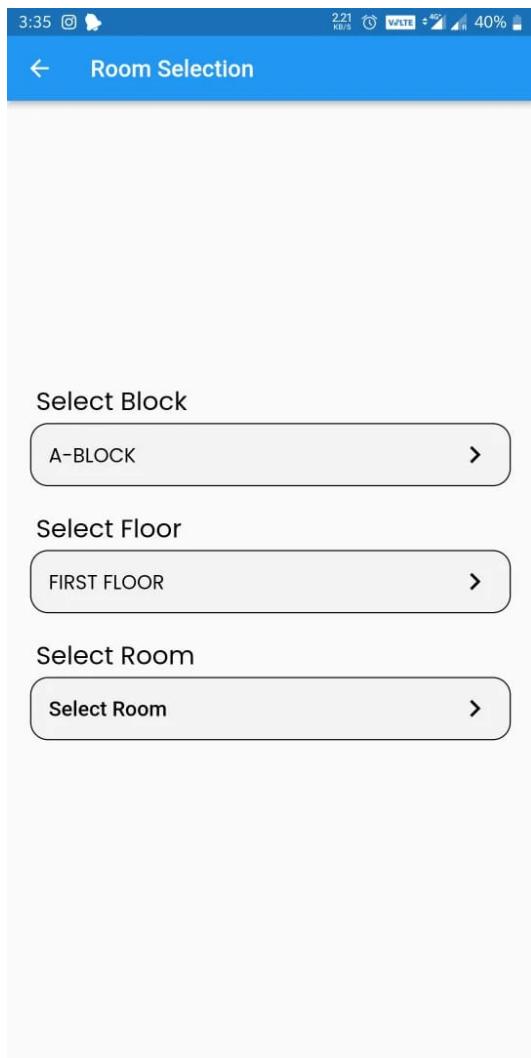


Figure 7.10: Room selection screen for attendance room incharge

# **CHAPTER 8**

## **CONCLUSION AND FUTURE SCOPE**

### **8.1 Goals of Proposed System**

#### **Operational Goal:**

Automates all business and functional processes thereby increasing overall efficiency.

#### **Customer Satisfaction:**

E-resource ERP solutions help in enhancing internal business processes and enable organizations to improve customer satisfaction.

#### **Easy Access:**

Our web-based ERP solution enables easy accessibility and availability of timely information, which results in better decision making and forecasting

#### **Flexibility:**

E-resource ERP packages have a flexible and scalable structure thereby enabling organizations to adapt and cater to future business expansions and requirements.

#### **Cost Effective:**

E-resource ERP for Small and Medium Enterprises is affordable, quick to implement thus enabling the SMEs to focus on growth and improvement of their business rather than worrying about software and over and above, ERP work with you jointly to deliver the most favorable ERP solution for your organization, to help you further maximize your return on the investment

## **8.2 User Characteristics**

- Increase Operational efficiency
- Gain Business Visibility
- Improve Customer Relationship
- Streamline Production and Planning
- Optimize IT Investments
- Comply with Regulations
- Cut Cost
- Bring product to market sooner
- Monitor and control and expenses
- Reduce errors
- Get accurate, timely information
- Support your changing needs
- Make better business decisions
- Deliver the right product at the right time
- Keep customer promises
- Ability to modify/configure statutory changes
- Reduced product cost, reduced expediting
- Improved closure rates, Increased market share
- Improved sales and opportunity visibility better customer relationships, lower customer
- Global reach, better inventory visibility, reduced distribution costs, higher/

## **REFERENCES**

- Prof. S. S. Aravindh: Exam Hall Seating Arrangement System
- Prof . Gautami G.Shingan: Automated SupervisionAllocation System
- Dinesh Chandewar,Mainka Saha: Automatic SeatingArrangement of University
- R.Gokila, Antony Rohan Das :Examination Hall and Seating Arrangement Application using PHP
- R.Chandrasekr : Automation of Hall Seating ArrangementSystem
- Vamsi Krishna Yepur : Examination Management Automation System
- Shazia Anjum, Madhuri : Automation of Exam Hall Allotment and Seating Arrangement