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ABSTRACT

The numerous procedures and methods utilised in gathering requirements, planning, executing, and testing the project on the college management system are detailed in this report. The issues with the college's current system were examined and acknowledged. This project seeks to address some of those issues to improve the current system. All the stakeholders' needs were gathered, and then we established a requirements model and designed the programme based on them. The project was carried out as a website utilising the Python framework Django.

We created the college ERP system utilising several features that address the system's current issues, such as a provision to change attendance and grades before locking it at the conclusion, using the many resources and tools we collected along the route. The software was additionally examined using a variety of testing techniques, and the outcomes were promising.

As a result, the outcomes can be incorporated into the current ERP system to enhance functionality and address specific issues.

1. INTRODUCTION

The successor to MRP II's Enterprise Resource Planning (ERP) system provides a solution to manufacturing and service businesses' economic and productivity issues. As a result, the ERP system as a software tool for enterprise management has gained a lot of popularity. At first, the ERP systems have been chosen by larger businesses. Nonetheless, the utilization of ERP has changed and today the term can allude to an organization, regardless of what industry it falls in. In fact, ERP systems are utilized in virtually every organization, regardless of size. A wide range of functions can be covered by the most recent ERP tools, which can combine them into a single database. This made ERP to land up into higher instructive establishments. Any educational institution that wants to stay ahead of the competition and meet the challenges posed by their business processes must now make use of an ERP system. In addition, research reveals that organizations that have not implemented an ERP face a variety of issues with their internal processing, including issues with payroll management, quick decision making, and attendance management, among others. Therefore, in order for the institutions to stand out and be ready for action, they require a central resource planning system that is capable of managing all of their information and operations.

1.1 Identification

The software system being considered for development is referred to as College ERP System. The customer providing specifications for the system are Dr. Radhakrishna Bhat, Asst prof. Ashwath Rao and students, Department of CSE, MIT. The ultimate customer, or enduser, of the system will be the teachers and the HoDs of each department in MIT, Students and Administrators. This is a new project effort, so the version under development is version 1.0.

1.2 Purpose

The goal is to create software for a college database that stores accurate and up-to-date information about the college. That should make college record management more flexible and efficient, and it should also give everyone a common and easy way to access student data. There are various modules in the College Automation System, such as student, faculty, admin, and so on. Our principal object is to make a product which will deal with the working of these various modules. The time required to complete various operational tasks is reduced by the modules' interconnectivity.

1.3 Scope

In today's world, college management is becoming an increasingly important part of education. With the assistance of the College Automation System, we are able to quickly and easily gather all of the necessary management information. All previously manually maintained details are now automated by the College ERP system. When the subtleties are taken care of into the framework or PC there is no requirement for different people to think about independent segments. All the reports and records can only be kept up by one person. Security can also be provided according to the needs of the user.

1.4 Definitions, Acronyms, and Abbreviations

- **Department** The educational sub bodies of the college, which can offer several Programmes and Courses. Each department is managed by a HOD (Head of the Department)
- **Course** The subject offered by a department in a semester, which is compulsory for a Student to take in order to make him/her eligible for SEE, and subsequently, award of BE Degree.

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- **Semester** The 5 Month (or 2 months, in case of supplementary) Duration in student is offered a set of courses by a department and the courses are conducted in a part time or full-time fashion. Each academic year consists of 3 semesters, out of which 2 are regular and 1 is supplementary.
 - **CIE** Continuous Internal Evaluation, series of examinations conducted throughout the semester to assess the academic performance of the student. CIE conducted in the form of MISAC's and FISAC's (Usually 6). Finally, CIE is reduced to a total of 50 marks.

2. PROBLEM STATEMENT AND OBJECTIVE

Problem Statement

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As we know that, a college consists of different departments, such as course departments, fees management, library, event management etc. Nowadays applications and uses of information technologies is increased as compared to before, each of these individual departments has its own computer system to do their own functionalities. By having one main system they can interact with each other from their respected system by having valid user id and password.

Objective

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The objective of College Information Management System is to allow the administrator of any organization the ability to edit and find out the personal details of a student and allows the student to keep up to date his profile. It'll also facilitate keeping all the records of students, such as their id, name, mailing address, phone number, DOB etc. So all the information about a student will be available in a few seconds. Overall, it'll make Student Information an easier job for the administrator and the student of any organization. The main purpose of this project is to illustrate the requirements of the project College Information Management System and is intended to help any organization to maintain and manage personal data. It is a comprehensive project developed from the ground up to fulfill the needs of colleges as they guide their students. This integrated information management system connects daily operations in the college environment ranging from Attendance management to communicational means among students and teachers. This reduces data error and ensures that information is always up to date throughout the college. It provides a single source of data repository for streamlining your processes and for all reporting purposes. It has a simple user interface and is intuitive. This ensures that the users spend less time in learning the system and hence, increase their productivity. Efficient security features provide data privacy and hence, increase their productivity.

3. METHODOLOGY

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3.1 External Interface Requirements

3.1.1 User Interfaces

The User interface is made using Bootstrap. Firstly, there will be a simple login page separate for students and teachers. Each student and teacher will have a unique interface. There will be a fixed sidebar with links to all the modules. The teachers will be able to view their respective students and update their attendance and marks using an effortless interface.

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3.1.2 Hardware Interfaces

Since neither the mobile application nor the web portal have any designated hardware, it does not have any direct hardware interfaces. Any browser can be used to access the webapp.

3.1.3 Software Interfaces

The following is a list of software used in making of the project.

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- **Operating System:** We have chosen Windows operating system for its best support and user-friendliness.

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- **Django:** We have chosen to use Django for the back-end of the website as Django is a simple python framework and is suitable for beginners.

- **Database:** We are using SQLite database, which comes as default with Django.

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3.2 System Design

Various Design concepts and processes were applied to this project. Following concepts like separation of concerns, the software is divided into individual modules that are functionally independent and incorporates information hiding. The software is divided into 3 modules which are students, teachers and administrators. We shall look at each module in detail.

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3.2.1 Student

Each student belongs to a class identified by semester and section. Each class belongs to a department and are assigned a set of courses. Therefore, these courses are common to all students of that class. The students are given a unique username and password to login. Each of them will have a different view. These views are described below.

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- **Student Information**

Each student can view only their own personal information. This includes their personal details like name, phone no, address etc. Also, they can view the courses they are enrolled in and the attendance, marks of each of those.

- **Attendance Information**

Attendance for each course will be displayed. This includes the number of attended classes and the attendance percentage. If the attendance percentage is below a specified threshold, say 75%, it will be marked in red otherwise it will be in green. There will also be a day wise attendance view for each course which shows the date and status. This will be presented in a calendar format.

• Marks Information

There will be 6 internals (MISAC's and FISAC's) and 1 semester end examination for each course. The marks for each of these will be provided in the ERP system.

3.2.2 Teacher

Each teacher belongs to a department and are assigned to classes with a course. Teachers will also have a username and password to login. The different views for teachers are described below.

• Information

The teachers will have access to information regarding the courses and classes they are assigned to. Details of the courses include the credits, the syllabus plan. Details of the class include the department, semester, section, and the list of students in 14 each class. The teacher will also have access to information of students who belong to the same class as the teacher.

• Attendance

The teacher can add and also edit the attendance of each student. For entering the attendance, they will be given the list of students in each class, and they can enter the attendance of the whole class on a day to day basis. There will be two radio buttons next to each student name, one for present and the other for absent. There will also be an option for extra classes. Teachers can edit the attendance of each student either for each student individually or for the whole class.

• Marks

The teacher can enter the marks for the 6 internals and 1 Semester End Examination for each course they are assigned. They also have the ability to edit the marks in case of any changes. Reports such as the

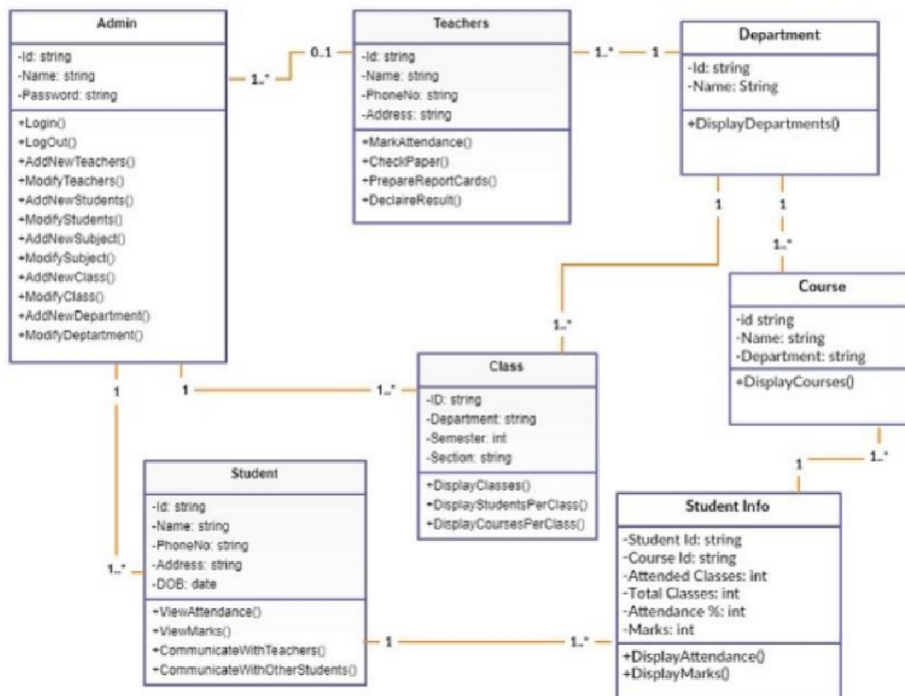
report card including all the marks and CGPA of a student can be generated.

3.2.3 Administrator

The administrator will have access to all the information in the different tables in the database. They will access to all the tables in a list form. They will be able to add an entry in any table and also edit them. The design of the view for the admin will provide a modular interface so that querying the tables will be optimized. They will be provided with search and filter features so that they can access data efficiently.

3.3 Class Diagram

The class diagram states the different classes involved in the software. For each class, a set of attributes and method are included. The relationship between the classes are also specified. For example, the teacher class has the attributes Id, name, phone no, address and methods such as marking attendance, declaring marks and preparing report cards. Each instance of the teacher class belongs to a department. This is specified by the relationship between Teacher and Department classes.



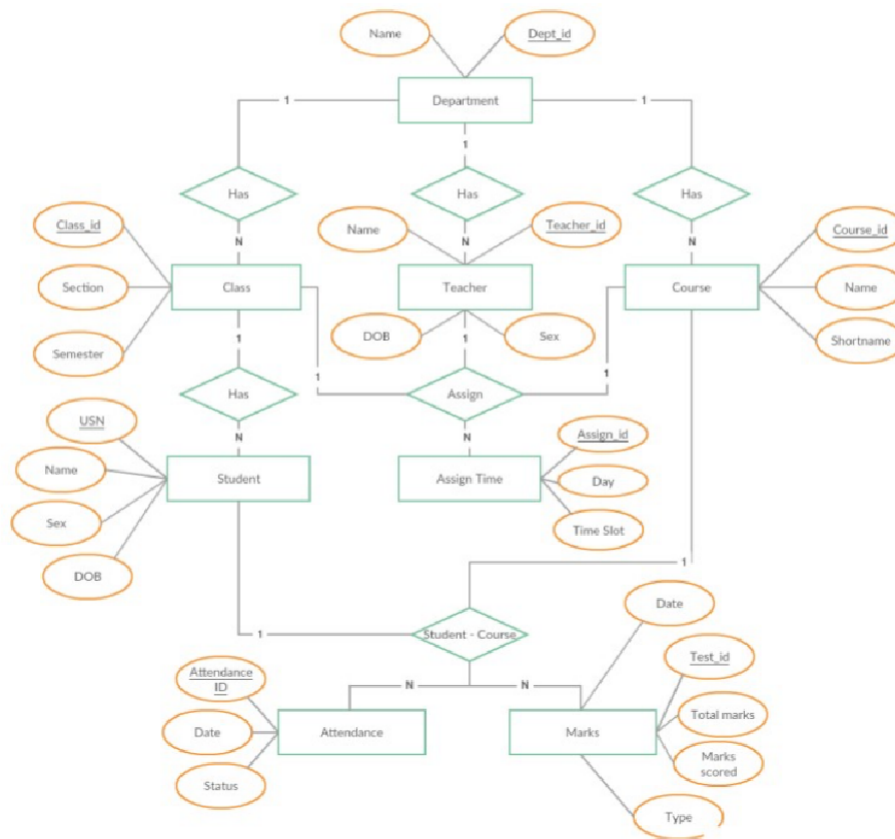
Class diagram of college ERP

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3.4 Entity Relationship Diagram

An entity relationship diagram (ERD) shows the relationships of entity sets stored in a database. An entity in this context is an object, a component of data. An entity set is a collection of similar entities. These entities can have attributes that define its properties.

By defining the entities, their attributes, and showing the relationships between them, an ER diagram illustrates the logical structure of databases. ER diagrams are used to sketch out the design of a database.



Entity Relationship diagram of college ERP

3.5 Implementation

3.5.1 Architectural Model

The ERP software requires the architectural design to represent the design of the software. Here we define a collection of hardware and software components and their interfaces to establish the framework for the development of this software. There exists number of components of the system which are integrated to form a system. The set of connectors will help in coordination, communication, and cooperation between the components. The ERP software is built for computer-based system. It exhibits the data centric style of architecture. The architecture comprises of various modules as given in the figure. There are 3 major categories in which the whole architecture is divided. These are administrator, staff, and student. The architecture is designed such a way that it is

self-explanatory. The admin roles are user management, staff management, student management, staff attendance. Staff and admin perform some common functions like news management, leave management, timetable management, exam management.

The role of staff includes student attendance entering, student examination management, timetable management, leave application management, and put on news on e-notice board. While the roles of students are few and includes their complete profile viewing, view their attendance, give feedback to their respective faculties, view notice and view academic timetable.

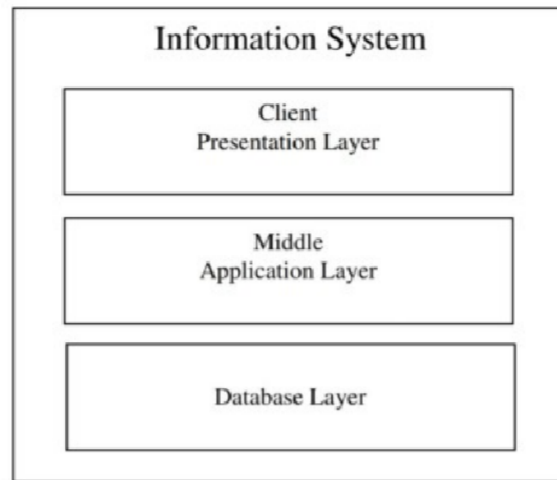
Generalizing E-college architecture is 3 tiers. The 3 tiers comprise of presentation layer, application logic layer and data layer.

Any Information System needs to communicate with external entities, human users, or other computers. Presentation layer allows these entities to interact with the system; it can also be implemented as a GUI interface and can be referred to as the client of the IS.

Application layer do more than information delivery, they perform data processing (Business Logic and calculation) behind the results being delivered. This tier is often referred as

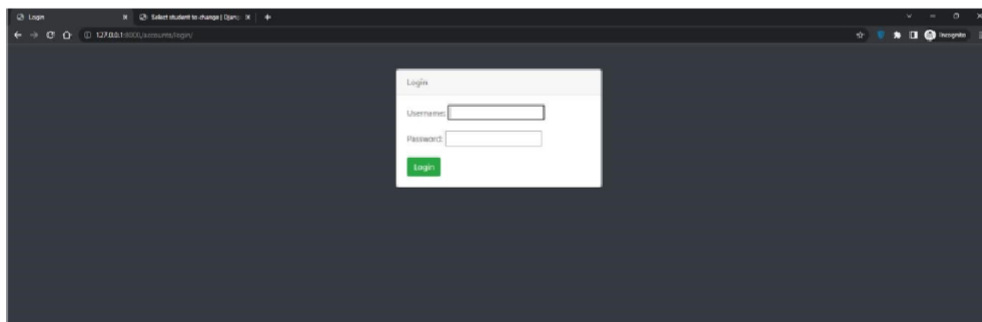
- 1.Services
- 2.Business rules
- 3.Business logic
- 4.Servers

The database layer is implemented using a Database Management System which in our case is MySQL.

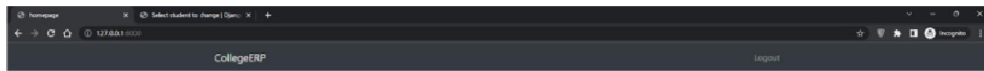


3 tier architecture

4. RESULTS AND SNAPSHOTS



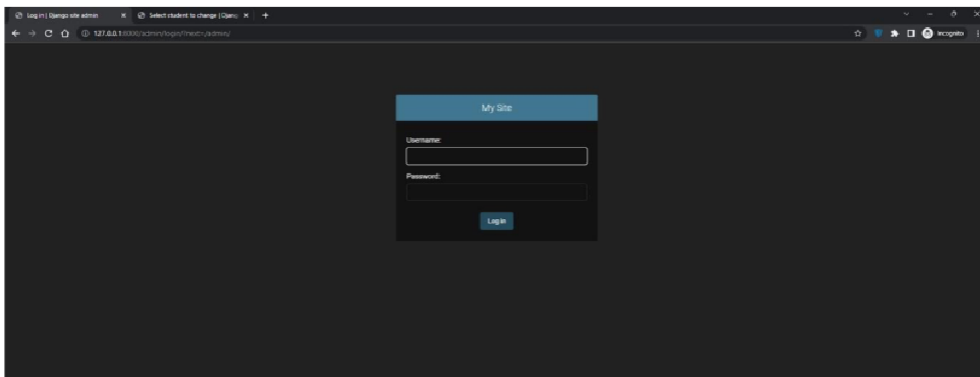
Login Page



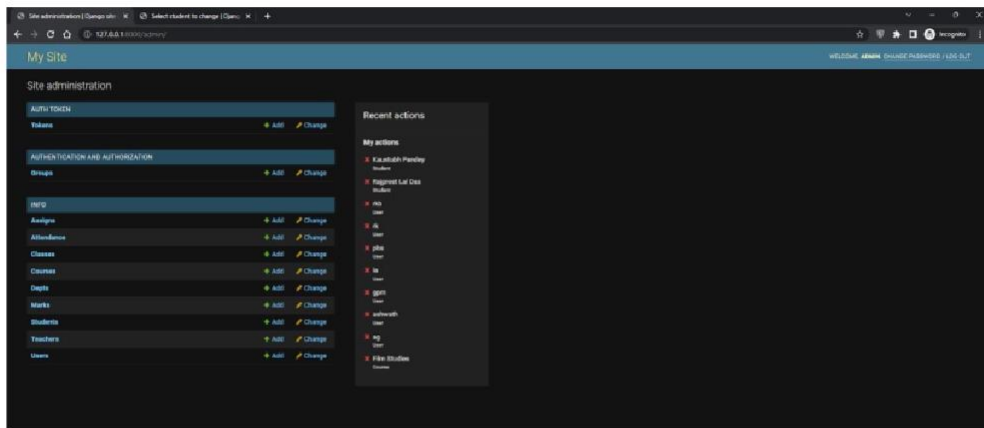
Welcome Admin



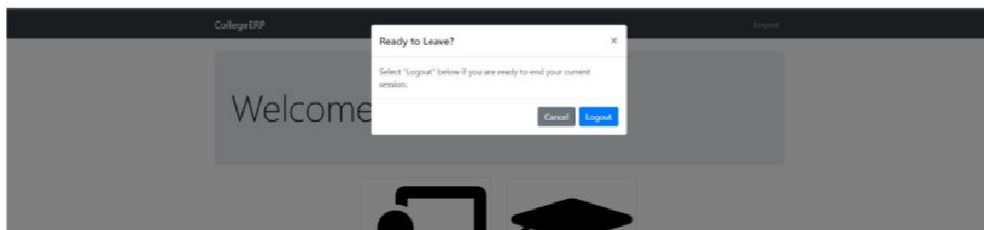
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Admin Page



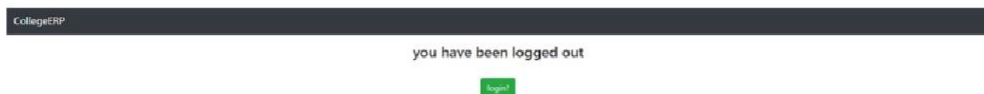
Django Admin Login Page



Django admin page (Site administration page)



Logout Prompt



Logout Page

The screenshot shows the 'Add user' form in the Django Admin interface. The form is titled 'Add user' and has a subtitle 'Enter a username and password.' It contains three main sections: 'Username', 'Password', and 'Password confirmation'. The 'Username' field is a text input with a placeholder 'Required: 1-30 characters or fewer. Letters, digits and @, ., +, -, _ only'. The 'Password' field is a text input with a placeholder 'This password must be 128 characters or longer by default. Your password must contain at least 8 characters. Your password can't be a commonly used password. Your password can't be entirely numeric.' The 'Password confirmation' field is a text input with a placeholder 'Enter the same password as before, for verification.' Below these fields is a 'Save' button. On the left side of the form, there is a sidebar with a list of links: 'Marks', 'Students', 'Teachers', and 'Users', each with an 'Add' button. At the bottom of the form, there are three buttons: 'Save and add another', 'Save and continue editing', and 'Save'.

Prompt to add user from teacher add page (Django site Administration)

The screenshot shows the 'Add teacher' form in the Django Admin interface. The form is titled 'Add teacher' and has a subtitle 'Select student to change (Open)'. It contains several fields: 'Name' (a text input with a placeholder 'Add'), 'ID' (a text input with a placeholder '1234567890'), 'Dept.' (a dropdown menu with 'Computer Science' selected), 'Name' (a text input with a placeholder 'Dr. Ravi Shankar Sharma'), 'Sex' (a dropdown menu with 'Male' selected), and 'DOB' (a date input with a placeholder '1980-01-01' and a note 'You are 1.5 hours ahead of server time'). Below these fields is a 'Save' button. On the left side of the form, there is a sidebar with a list of links: 'Marks', 'Students', 'Teachers', and 'Users', each with an 'Add' button. At the bottom of the form, there are three buttons: 'Save and add another', 'Save and continue editing', and 'Save'.

Teacher add page (Django Site Administration)

Student add page (Django Site Administration)

| Name | Status | Action |
|-------------------|------------|------------|
| RISAC 1 | Marked | Take Marks |
| RISAC 2 | Marked | Take Marks |
| RISAC 3 | Not Marked | Take Marks |
| RISAC 1 | Not Marked | Take Marks |
| RISAC 4 | Not Marked | Take Marks |
| RISAC 2 | Not Marked | Take Marks |
| Semester End Exam | Not Marked | Take Marks |

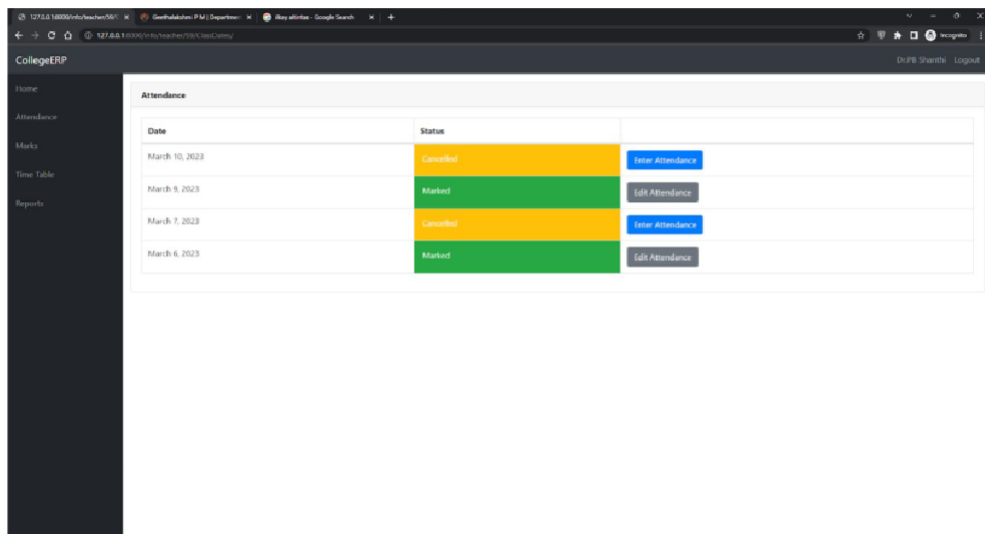
Marks entering page for teachers (ERP)

| Course ID | Course name | MISAC 1 | MISAC 2 | MISAC 3 | FISAC 1 | MISAC 4 | FISAC 2 | End Semester |
|-----------|--|---------|---------|---------|---------|---------|---------|--------------|
| CRA4055 | Big Data Modeling And Management Systems | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| CRA4056 | Big Data Integration And Processing | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| CSE3251 | Distributed Systems | 4 | 4 | 13 | 5 | 12 | 5 | 40 |
| CSE3252 | Parallel Computer Architecture And Programming | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| CSE3202 | Internet Technologies Lab | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| HUM3051 | Engineering Economics And Financial Management | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Marks Page Display for students (ERP)

| | 7:30 - 8:30 | 8:30 - 9:30 | 9:30 - 10:30 | 10:30 - 11:30 | 11:30 - 12:30 | 12:30 - 13:00 | 13:00 - 14:00 | 14:00 - 15:00 | 15:00 - 15:30 | 15:30 - 16:30 | 16:30 - 17:30 |
|------------------|-------------|-------------|--------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Monday | | | | | | | | | CRA4055 | CSE3251 | |
| Tuesday | | CRA4056 | HUM3051 | | CRA4055 | CSE3251 | | | | | |
| Wednesday | | CSE3252 | | | | | | | CSE3252 | | |
| Thursday | | | CSE3251 | | CSE3252 | | | | | | |
| Friday | | | | | | | | | | HUM3051 | |
| Saturday | | | | | CRA4056 | HUM3051 | | | | | |

Timetable for Students (ERP)



Attendance Entering Page for Teachers

| Course ID | Course name | Attended classes | Total classes | Attendance % | Classes to attend |
|-----------|--|------------------|---------------|--------------|-------------------|
| CRA4055 | Big Data Modelling And Management Systems | 0 | 0 | 0 | 0 |
| CRA4056 | Big Data Integration And Processing | 0 | 0 | 0 | 0 |
| CSE3251 | Distributed Systems | 1 | 1 | 100.0 | 0 |
| CSE3252 | Parallel Computer Architecture And Programming | 0 | 0 | 0 | 0 |
| HUM3051 | Engineering Economics And Financial Management | 0 | 0 | 0 | 0 |
| CSE3262 | Internet Technologies Lab | 0 | 0 | 0 | 0 |

Attendance Display for Students

2 5. CONCLUSION

By using Existing System accessing information from files is a difficult task and there is no quick and easy way to keep the records of students and staff. Lack of automation is also there in the Existing System. The

aim of Our System is to reduce the workload and to save significant staff time.

¹⁰ Title of the project as College ERP System is the system that deals with the issues related to a particular institution. It is the very useful to the student as well as the faculties to easy access to finding the details.¹¹ The college ERP provides appropriate information to users based on their profiles and role in the system. This project is designed keeping in view the day-to-day problems faced by a college system.

⁴ The fundamental problem in maintaining and managing the work by the administrator is hence overcome. Prior to this it was a bit difficult for maintaining the timetable and keeping track of the daily schedule. But by developing this web-based application the administrator can enjoy the task, doing it ease and by saving the valuable time. The amount of time consumption is reduced, and the manual calculations are omitted, the reports can be obtained regularly and also whenever on demand by the user. The effective utilization of the work, by proper sharing it and by providing the accurate results. The storage facility will ease the job of the operator. Thus, the system developed will be helpful to the administrator by easing his/her task.

¹⁹ This System² provide the automate admissions no manual processing is required. This is a paperless work. It can be monitored and controlled remotely. It reduces the manpower required. It provides accurate information always. All years together gathered information can be saved and can be accessed at any time. The data which is stored in the repository helps in taking intelligent decisions by the management providing the accurate results. The storage facility will ease the job of the operator. Thus, the system developed will be helpful to the administrator by easing his/her task providing the accurate results. The storage facility will ease the job of the operator.

6. LIMITATIONS AND FUTURE WORK

This document is for limited release only to personnel working on the project and the project mentors and reviewers. The User experience is not very friendly as for major functionalities, we need to access the

Django administration page. This software is suitable for a small operational database. This cannot be deployed on a large-scale network. By using Existing System accessing information from files is a difficult task and there is no quick and easy way to keep the records of students and staff. Lack of automation is also there in the Existing System. The aim of Our System is to reduce the workload and to save significant staff time.

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