

College Erp System

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Abstract: The college consists of multiple departments, each responsible for managing student information and the college database. These departments are interconnected, leading to issues of data repetition and lack of proper interlinking. To overcome these challenges, we introduce the College ERP System, a centralized and automated solution. This system features a user-friendly interface and an advanced data management mechanism, making it highly valuable for efficient college operations.

Keywords: College ERP System, Enterprise resource planning, Module, management system architecture

1. INTRODUCTION

The College ERP System is designed to replace manual and paper-based processes with a centralized digital infrastructure. It integrates various modules and functionalities to create a cohesive ecosystem that encompasses student information management, admissions and enrollment, course management, faculty management, attendance tracking, examination management, finance and accounting, library management, and more.

One of the primary goals of the College ERP System is to optimize data management. It provides a centralized database that consolidates student and staff information, academic records, financial data, and other relevant data points. This centralization promotes data accuracy, reduces redundancy, and ensures easy accessibility of information when needed. Administrators, faculty, and staff can access and update data in real-time, leading to efficient decision-making and improved communication.

Security can also be provided based on the needs of the user.

- With ease, large amounts of data can be saved.
- File maintenance is efficient and adaptable.
- Records are constantly updated.
- It is possible to easily edit stored data and operations.
- Calculations are accurate and flawless, and manpower is decreased.
- This can create a detailed report.

2. Literature Survey

A literature survey of college ERP systems reveals several key findings and trends in this area.

1. Integration and Automation: College ERP systems aim to integrate various departments and automate their processes. These systems streamline administrative tasks such as student admissions, course registration, fee payment, and academic record management. Integration and automation lead to improved efficiency, reduced manual errors, and enhanced data accuracy.

2. Centralized Database: College ERP systems typically employ a centralized database to store and manage student information, faculty details, course catalogs, and other relevant data. This centralization facilitates easy access to information, eliminates data redundancy, and enables real-time updates across different departments.

3. Modules and Functionality: College ERP systems offer a range of modules and functionalities tailored to meet the specific needs of educational institutions. These may include student management, attendance tracking, examination management, library management, hostel management, finance and accounting, and human resources management. The modular approach allows colleges to select and implement the required modules according to their unique requirements.

4. User-Friendly Interface: One crucial aspect of a college ERP system is its user-friendly interface. These systems are designed to be intuitive and easy to navigate, ensuring that both administrative staff and end-users (students, faculty, parents) can access and interact with the system without extensive training or technical expertise.

5. Scalability and Customizability: College ERP systems should be scalable and customizable to accommodate the evolving needs of educational institutions. As colleges grow in size or introduce new programs, the ERP system should be capable of handling increased data volumes and adapting to changing requirements.

6. Security and Data Privacy: Given the sensitive nature of student and faculty data, security and data privacy are of utmost importance. College ERP systems employ robust security measures such as user authentication, role-based access controls, encryption, and data backup to safeguard against unauthorized access, data breaches, and loss of information.

7. Integration with External Systems: College ERP systems often need to integrate with external systems such as learning management systems (LMS), examination bodies, financial institutions, and government databases. Seamless integration with these systems enhances data exchange, improves efficiency, and facilitates regulatory compliance.

College ERP system is provide great user friendly interfaces for college data. It is an online Web-Based system. The goal of this system's adoption and execution is to replace manual college systems with an web-based system. This ERP system also manages data that has been stored for a long time in an accurate and efficient manner. College ERP systems provide a single point of access to all administrative systems at colleges.

Previously, all departments operated independently and separately. Such methods make it impossible for anyone to obtain such info collectively.

A system analysis of such a system reveals that all booking was done manually on registers, which was an extremely difficult job. The old system also made it impossible to generate reports for all records. College work was also manually kept and stored. All of this information is kept in the college's register or file system.

3. System Design

A. Detailed Problem Statement

The College ERP software solution will encompass several essential modules/components,

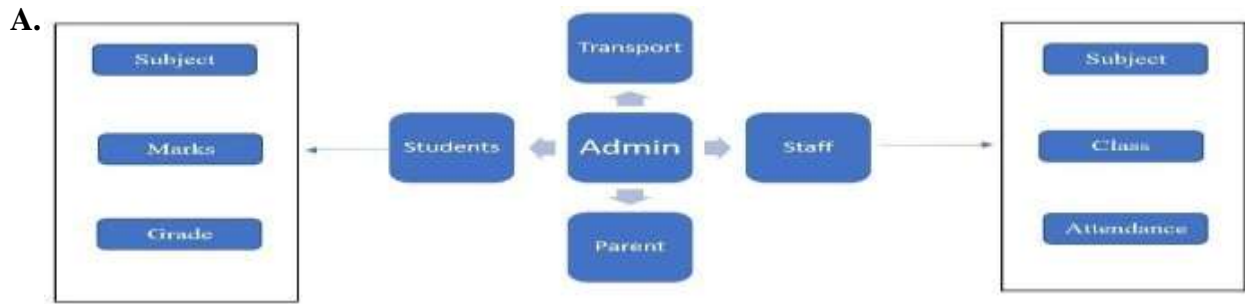
including:

- 1. Student Management:** This module handles student-related functionalities such as admissions, enrollment, course registration, academic records, attendance tracking, and grades management.
- 2. Financial Aid:** The Financial Aid module manages the application, approval, and disbursement of financial assistance to eligible students, including scholarships, grants, and loans.
- 3. Finance:** The Finance module handles financial management tasks such as budgeting, accounts payable and receivable, general ledger, payroll, and expense management.
- 4. Human Resources:** The Human Resources module facilitates employee management, including recruitment, onboarding, attendance tracking, leave management, performance evaluations, and employee benefits.
- 5. Advancement:** The Advancement module focuses on alumni relations, fundraising campaigns, donor management, and development efforts to support the college's growth and initiatives.
- 6. College Data Warehouse:** The College Data Warehouse serves as a centralized repository for storing and managing data from various departments, ensuring data integrity, and supporting reporting and analytics functionalities.
- 7. Reporting and Analytics:** This module provides tools and capabilities for generating comprehensive reports, analyzing data trends, and gaining insights into various aspects of college operations for informed decision-making.
- 8. Workflow and Document Management:** This module streamlines and automates business processes by defining and managing workflows, routing documents, and facilitating collaboration among different departments.
- 9. Student, Faculty, and Staff Portal:** The portal offers a user-friendly interface for students, faculty, and staff to access relevant information, such as course schedules, grades, class materials, calendars, announcements, and personal profiles.

B. System Architecture

In software engineering and systems engineering, a System Diagram (SD) is a visual representation that depicts the external actors interacting with a system. It provides a high-level overview of the system, including its inputs and outputs with external elements. System diagrams are commonly used in systems design to highlight the crucial external aspects that interact with the system being analyzed. These diagrams typically show the system at the center, without delving into its internal structure, while encompassing all other relevant interacting systems, environment, and activities. The purpose of a system diagram is to emphasize the events and factors external to the system that need to be considered when formulating a comprehensive set of system requirements and constraints.

Fig. 3.1 System Design



Core Modules

- Admin
- Student
- Staff
- Parent
- Transport

B. Admin Module

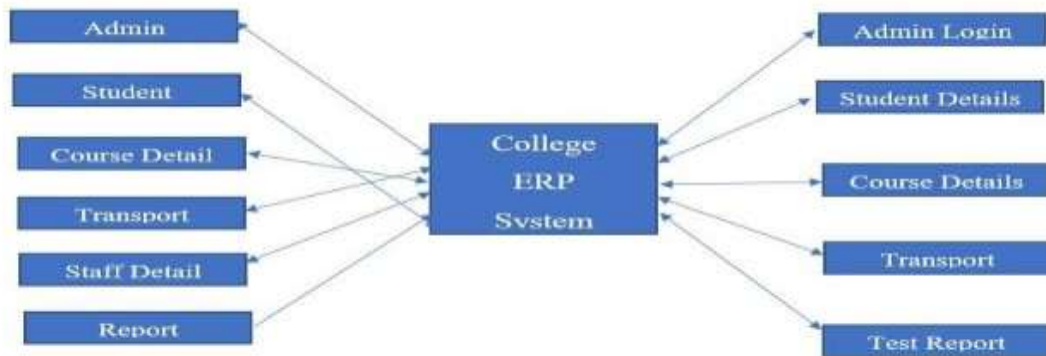


Fig. 3.2 Core Modules

The administrator of the system has full access and control over various functionalities, including student admission, staff registration, academics, SMS gateway, transportation, and class schedules. Initially, the administrator adds personnel from different departments to the system. Then, classes are created and assigned a staff member as the class coordinator. Following this, the student acceptance procedure commences, and the administrator oversees all the tasks related to it. Other users do not have permission to utilize this feature. The administrator has the authority to manage the accounts of all students, employees, and parents within the system. They are responsible for creating and delivering student reports to their respective parents. Additionally, the administrator can view and manage all logs related to student information. All the manual working of Admin is skipping through this system.

Here is a revised version of the workflow for the Admin model:

- START
- LOGIN
- ADD/DELETE STAFF
- ADD/DELETE/EDIT COURSE
- ADD/DELETE/EDIT CLASS

- ADD/DELETE/EDIT STUDENT
- ADD/DELETE/EDIT ROUTINE
- MANAGE TRANSPORT
- MANAGE NOTICE BOARD
- MANAGE SMS
- MANAGE DISCIPLINARY ACTIONS
- LOGOUT
- STOP

C. Student Module

The workflow of the Student Module, where only administrators have access to the system, can be described as follows:

- START
- LOGIN
- VIEW PERSONAL INFORMATION
- VIEW SUBJECTS
- VIEW TEACHERS
- VIEW MARKS
- VIEW CLASS ROUTINES
- VIEW TRANSPORT
- VIEW NOTICE BOARD
- LOGOUT

In this module, students can log in using their generated login and password. Once logged in, they can access and view their personal information, including details such as their name, contact information, and other relevant data. They can also view the subjects they are currently enrolled in, along with the respective teachers assigned to each subject.

Additionally, students can access and review their marks or grades for various assessments or examinations. They can view their class routines to stay updated on their daily schedules and timing. By utilizing the transportation module, students can check their designated bus route and bus number for convenient commuting.

Students also have access to the notice board, where they can view notifications, announcements, and important updates from their respective departments. This allows them to stay informed about any forthcoming events, deadlines, or important information. Once students have completed their tasks or need to end their session, they can choose to log out from the system. This workflow provides a streamlined process for students to access and utilize the essential features and information available to them within the system.

D. Staff Module

The workflow of the Staff Module, where the admin registers staff members and generates login credentials that can be managed by staff, is as follows:

- START
- LOGIN
- VIEW STUDENT INFORMATION
- VIEW/EDIT STUDENT'S MARKS
- MANAGE DAILY ATTENDANCE OF STUDENTS
- ADD NOTES
- VIEW SUBJECTS
- VIEW PERSONAL CLASS ROUTINE
- VIEW TRANSPORT

In this module, staff members can log in using their assigned login credentials. Once logged in, they can access and view information about the students in their respective classes. This

includes details such as student names, contact information, and other relevant data. Staff members have the capability to view and edit the marks or grades of students in their subjects. They can manage and update the marks based on assessments, tests, or assignments. Additionally, staff members can manage the daily attendance of students in their classes, keeping track of their presence or absence. Staff members can also add notes or announcements related to their specific subjects. This allows them to provide important information, reminders, or resources to the students. They can upload materials such as study materials, lecture notes, or reference materials for easy access by the students. The module enables staff members to view the subjects they are responsible for teaching. They can see the class schedules or routines specific to their subjects and classes, ensuring they are aware of the timings and topics to be covered. Staff members also have access to the transport information, which includes details about the transportation facilities available for students.

3. ERP Architecture

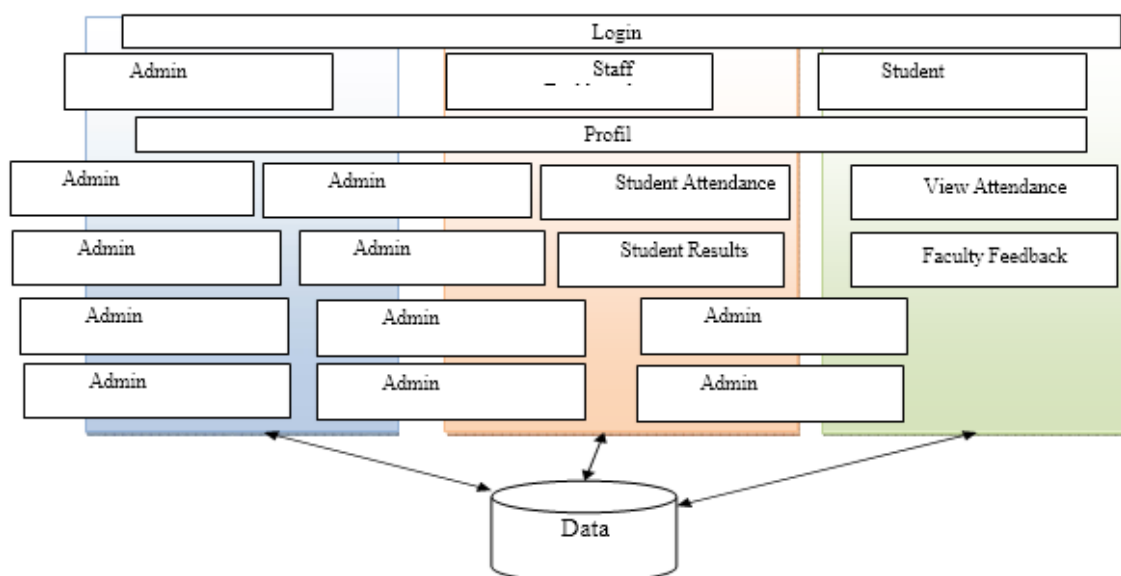


Fig 4.1 ERP Architecture

In the architecture of the e-college system, there are three major categories: the administrator, the staff, and the student. Each category has specific tasks and functionalities within the system. The architecture is designed to be self-explanatory and consists of various modules as depicted in the diagram.

The administrator is responsible for tasks such as user management, staff management, student management, and staff attendance. They handle functions like news management, leave management, time schedule management, and exam management. The staff members have their own set of responsibilities, which include entering student attendance, managing student examinations, handling timetables, managing leave applications, and posting news on the e-notice board. The student's role is relatively limited, but they have access to their entire profile, attendance records, the ability to provide comments to their respective faculties, view notices, and access academic timetables. The architecture of the e-college system is divided into three layers: the presentation layer, the application logic layer, and the data layer. The presentation layer enables communication between the system and external entities such as

humans or other computers. It can be implemented as a graphical user interface (GUI) and serves as the client interface of the information system. The application logic layer performs data processing, including business logic and computation, behind the results presented to the users. It is responsible for information transmission and is often referred to as services, logic in business, business regulations, or the server. The data layer stores and manages the data used by the system. It serves as the repository for student information, staff details, attendance records, exam data, and other relevant data required by the e-college system. In summary, the architecture of the e-college system comprises three categories (admin, staff, and student) with their respective tasks and functionalities. The system is organized into three layers: presentation layer, application logic layer, and data layer, each serving a specific purpose in the overall functioning of the system. The database layer is built with a database management system, in this case MySQL.

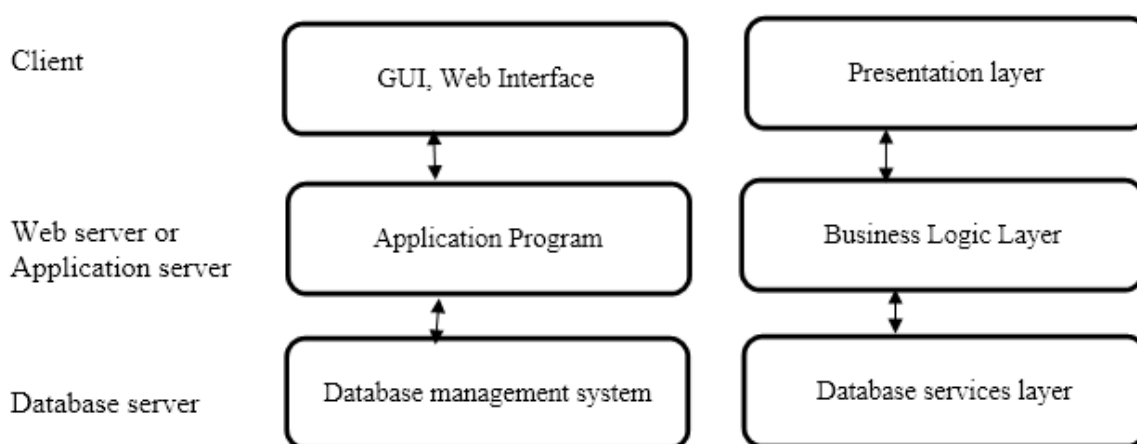


Fig 4.2 Three tier client server architecture

3. Conclusion

The e-college system architecture consists of three main categories: the administrator, staff, and students. Each category has specific roles and functionalities within the system. The architecture is designed to be intuitive and is composed of different modules as illustrated in the diagram. The administrator is responsible for managing user accounts, staff members, students, and staff attendance. They handle tasks such as news management, leave management, time schedule management, and exam management. Staff members have their own set of responsibilities, including recording student attendance, managing examinations, handling timetables, processing leave applications, and sharing news on the e-notice board. Students have limited access but can view their profiles, attendance records, provide feedback to their respective faculties, access notices, and check academic timetables.

The e-college system architecture is structured into three layers: the presentation layer, application logic layer, and data layer. The presentation layer facilitates communication between the system and external entities such as users or other systems. It often takes the form of a graphical user interface (GUI) and serves as the client interface for the information system. The application logic layer performs data processing, including business logic and computations, to generate the desired outcomes presented to the users. It encompasses services, business rules, and the server responsible for information transmission. The data layer stores and manages the data utilized by the system. It serves as the repository for

student information, staff details, attendance records, exam data, and other relevant data necessary for the e-college system. In conclusion, the e-college system architecture comprises three categories (administrator, staff, and students) with their respective roles and functionalities. The architecture includes three layers: presentation layer, application logic layer, and data layer, each serving a specific purpose in supporting the system's overall functionality.

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