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# College Management Web Application System Using Mean Stack

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**Abstract:** *The main goal of this project is to add mobility and automation to the process of managing student information in the laboratory. In real-world scenarios, for example, on a university campus, information is distributed to students in the form of notifications, handwritten manuals, and word-of-mouth messages. Today, it is important to communicate faster and easier between students using new formats such as mobile phone technology, as well as predictable forms of expression. The central idea of this project is the implementation of a web-based campus application for further development of educational institutions and educational systems. This application is used by students, teachers and parents. In previous systems, all information had to be displayed in a hard file or website. At the same time, searching for information is difficult to access and takes a long time to search existing websites. Therefore, to solve this problem, you can use a Web based application with MEAN Stack to make this process easier, more secure, and less error-prone. This system provides more efficient information.*

**Keywords:** *Mobility, Cryptography, Secure Random, Encryption*

## I. INTRODUCTION

As time and technology advance, information needs to be disseminated more quickly. Many manual processes have been automated, and increasing the benefits of automated systems is now a top priority. Due to the current demand for automated systems, educational infrastructures such as universities required manual systems to work with mobile computer systems. Changes in information technology (IT) allow laboratories to leverage applications such as databases and student information systems to centralize access to records. One of the changes that has emerged is web-based applications. These applications are improvisations of traditional transaction processing systems.

### A. Purpose

The main goal of this project is to add mobility and automation to the process of managing student information in the laboratory. The system bridges this gap between the end user and the device scheduling manager by centrally managing the entire system. Different departments use this system to order different processes that are separated from each other.

### B. Scope

The designed system is economical from a student and teacher's point of view. It aims to extract useful information from unstructured data using the concepts of information retrieval, filtering, and secure random algorithms. This helps solve the shortcomings of existing ERP systems. Our basic approach is to develop intelligent Web-based applications with MEANStack that can be used to make this process easier, safer and error-prone. .. This system provides more efficient information. Provides access to information related to colleges, faculties, uploaded assignments, notes, news and events, exams, discussion forums, and daily schedules on the go.

## II. LITERATURE SURVEY

### A. The development and design of the Student Management system Based on the Network Environment

Authors: Zhi -gang YUE , You-wei JIN

The paper discusses the method of the management information in higher education. On the basis of a comprehensive investigation and analysis on the student management in higher education, we establish the models of the college students' management information by adopting the advanced information technology, and construct the student management information platform. Moreover, we analyze the characteristics of the information management in higher education, and elaborate the methods to solve the difficulties confronting in the students management of the higher education. Finally, the key method and technology to carry out the information management platform are presented.

*B. Attendance Management System for Educational Sector.*

Authors: Zainab Hussein Arif , Nabeel Salih Ali , Nurul Azma Zakaria , Mohammed Nasser Al-Mhiqani

To keep attendance records, some government and educational institutions in many countries still rely on a paper-based attendance approach. This approach has several drawbacks: B. Waste of time and environmental resources. These traditional attendance tracking methods need to be replaced with more efficient ones. Therefore, much work has been done in this direction. In addition, this survey aims to analyze the latest surveys on automated attendance systems from a scheduling perspective. Our critical review highlighted research in existing literature on technology, application domains, and key findings. It also emphasizes most of the numerous studies on any of the previous three aspects.

*C. The Designment of Student Information Management System Based on B/S Architecture*

Authors: JinMei-shan, QiuChang-li , LiJing

This book describes the student information management system using the B / S structure, the system design principle, the system plan and system structure, and the functional modules of the information system according to the current university student information management requirements. It informs large numbers of students and provides an interactive student management platform for managing students.

*D. Research and Implementation of Web Services in Android Network Communication Framework Volley*

Authors: Yang Shulin ,Hu Jieping.

This white paper describes how the combination of web services and mobile devices can accelerate the development of mobile applications. The Volley framework, proposed by Google in 2013, has the advantages of convenient use and faster network requests, but it does not support web services. Extends Volley to support web services. This not only facilitates application development for web services, but also improves access performance for web services. Based on the analysis and research of Volley, Ksoap2, and Java web services, it implements the Http stack interface and extends JSON object requests to provide web service support. The schema uses JSON format for data transfer, supports S SL / TLS protocol requests, custom parameters, and sets or gets request headers. This scheme is highly compatible, easy to use and suitable for applications on the Android platform.

### III. SYSTEM ARCHITECTURE

The overall system design consists of following modules:

*A. User Module*

In this module, you enter a username and password to authenticate the user. If the username and password are valid, they will be displayed on the static screen. When they match each other, the system checks their status and transfers control to their respective user interfaces.

*B. Database Module*

The system uses mongoDB as the database and ExpressJS and NodeJS as the backend server because of its simplicity and flexibility. This module stores all information about students, teachers and models data for specific operations. You can save student attendance, result data, or authentication data for these operations.

*C. Staff Module*

This module is intended for employees who use their mobile phones to record attendance, upload results, and upload university notifications and discussion forums. The administrator data entered is encrypted and sent to the server for verification. The operation will only be performed after successful authentication. If the username and password do not match, you can proceed to the next static screen.

*D. Notification Module*

This module allows the HOD department to provide students with notifications about university-related information. Students can view the notifications provided by the interface provided by the application and send messages only to all students, all faculties, specific faculties, and available options like all.

**E. Discussion Forum Module**

This module is a feature that allows students and teachers to discuss student questions. This discussion takes place through this feature on mobile devices and in a discussion thread dedicated to each interaction. All users involved in this discussion will receive notifications on their device. This discussion forum allows subject teachers to upload notes and answer student questions. Students can ask questions and upload notes at the same time.

**F. News and Event Service**

The news service is for all students and staff . As soon as news about the university/college is released on the university/college website, a notification is sent to all the students and staff .

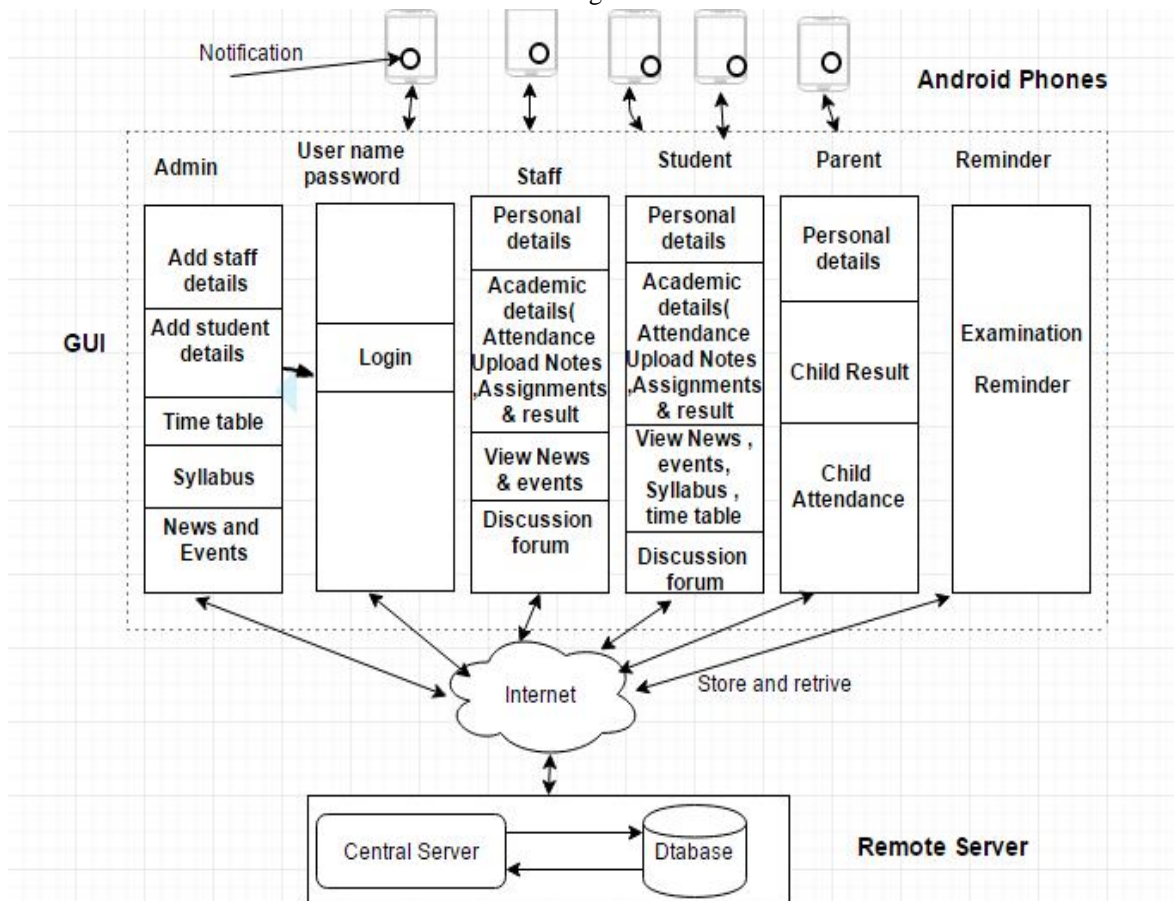
**G. Assignment and Notes Module**

This service is intended for both employees and students, but both use different features. Students can view the following important information in assignments and notes: Number of assigned tasks. After analyzing this data, the system will notify students when they upload new assignments and notes from the faculty. Staff can use their mobile devices to upload useful notes for students and new assignments.

**H. Exam Remainder Module**

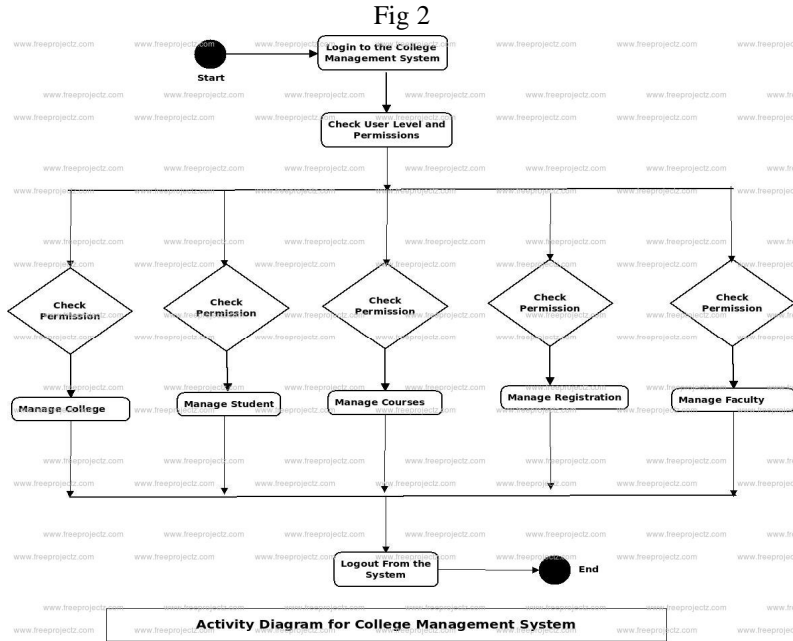
This feature is available for the students. They can set reminders for their exams accordingly.

Fig 1:



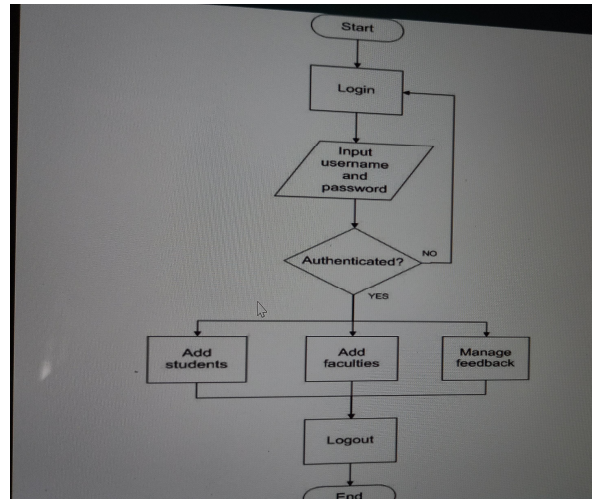
**Block Diagram**

System block diagram

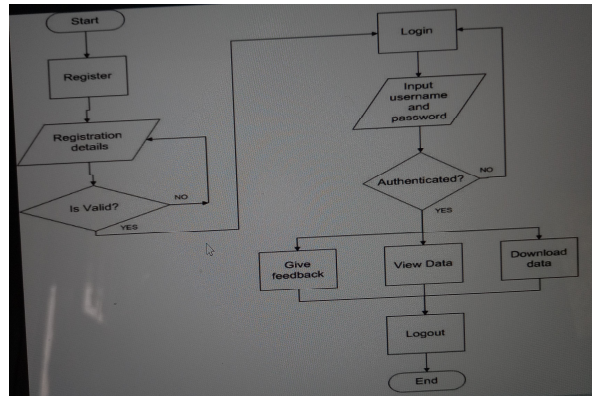


System Flow Diagram

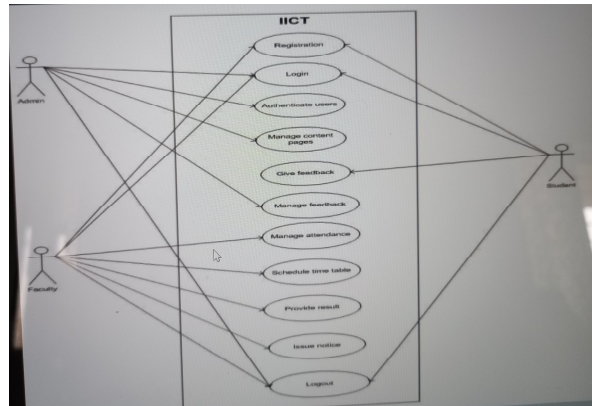
1) Flow Diagram of Admin



2) Flow Diagram of Student

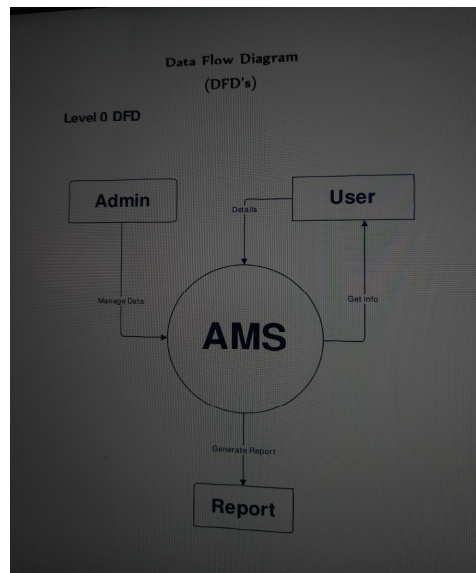


3) User case Diagram

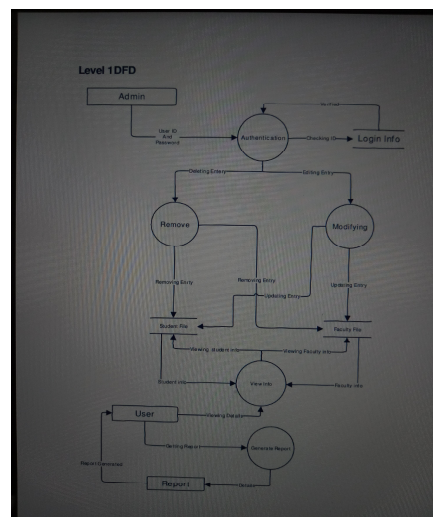


IV. DATA FLOW DIAGRAMS

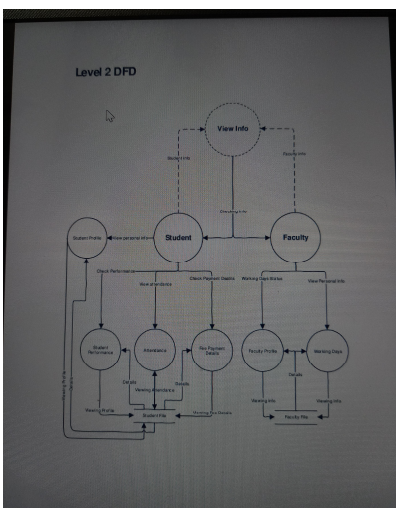
A. Level 0 DFD



B. Level 1 DFD



C. Level 2 DFD



**V. ADVANTAGES**

- 1) Mobility and automation have been added to the process of managing student information at institutions.
- 2) Applications greatly simplify and accelerate the process of processing and managing results.
- 3) Multiple algorithms work together to achieve the best results.
- 4) The system is easy to deploy, safe and easy to use.
- 5) Only authorized personnel can access it.

**VI. FEATURE ASPECT**

- 1) Designing the framework architecture of a system can be difficult to make the framework dynamic.
- 2) Service servers may have their own technology to make them truly secure.

**VII. APPLICATION**

- 1) Generate an automatic attendance report.
- 2) Notifications, events, and events have proven to be very successful.
- 3) Staff can set up discussion forums to assist students.
- 4) You can find gaps in the education system

**VIII. CONCLUSION**

This system provides reliability, time savings, and easy control. Students and their parents can also use this application to view score, attendance, and curriculum details. Students can also view details and notifications anytime, anywhere. This application greatly simplifies and speeds up the process of processing and managing results. This reduces the effort and resources required in traditional processes. The proposed system features a new way of processing data and performs operations with a responsive and attractive user interface. Therefore, based on literature reviews and analysis of existing systems, we conclude that the proposed system not only supports university automation, but also helps digitize the system and thus contribute to the efficient use of resources.

**IX. ACKNOWLEDGEMENT**

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