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College Automation System

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ABSTRACT: In the current technology era, the majority of universities still manage their day-to-day operations and administration using an extraordinary, traditional method. Every students ' daily management is still done manually, and there may be hundreds of them, which takes a significant amount of time. The suggested application is a mobile application that will be used to free up the efforts and time of the office staff, students, and faculty members at our college.or faster and easier communication among some of the students, it is essential to use both traditional and modern methods of expression, such as smartphone technology. Android is the communication medium.Respectively the front end and back end were created using Android Studio and Google Fire Store, respectively (Database). Payment is made through rayzorpay application's programming interface. RBAC, or role-based access control, is used to manage access as according role. On the college area network, the College Automation System Project will operate. All four of college's departments will be present.According to the use of bootstrap, the system is much more responsive. This system's major goal is to reduce down on paperwork and manual processing. For quicker and simpler communications among the students, it is essential to employ both traditional and innovative modes of expression, such as smartphone technology. Android is the method of communication. Implementing an android-based Mobile Campus application is the project's main goal in order to progress the institution and educational system. The staff, teachers, and students will all use the application.

KEYWORDS: College, Firestore, API, Automation.

I. INTRODUCTION

A software programme called College Automation System benefits the college's administrative staff as well as the students. Our college automation system has the capacity to store student and teacher information as well as keep their information in a dynamic arrangement. There is a requirement for information to be sent more quickly due to advancements in time and technology. This software can assist us in investigating all the college-related activities about which we as students are unaware.

It may manage the administration department's, teachers', and students' details. The College Automation System is composed of different modules, which include student, faculty, admin, and many others. Our major objective is to create software that will handle how these various modules work. The time required to complete various operational activities is decreased by the interconnectivity between modules.

This system provides a detailed description of the college's departments and facilities. All departments' functions are controlled through our system. in every aspect of a certain student's course. Additionally, he is allowed to post any notification relevant to his department. He also may authorise the students' attendance and payment for the exam. The main objective of this system is to reduce paperwork and manual processing.

II. LITERATURE SURVEY

Due to a lack of infrastructure, half of the educational system in developing countries uses the antiquated method of managing information systems with stand-alone computer devices and storing information in various departmental systems. These systems' implementations lack process integration and are unable to interact with each other. There is no application of the concept of a service architecture in these types of system implementations.This system aims to create an important online intranet college automation system for colleges or educational institutions. The M-ERP solution will combine all business processes, such as keeping track of attendance and student data, into a single

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database. M-ERP promises to offer a practical, simple, and secure approach to managing college business operations. Some systems use the MVC design pattern to create modules that are more effective and platform-independent. The presentation, business, and database connection logic are separated from one another thanks to the MVC design pattern.

A. ***"Review based on College Automation System (6, Aug 2016)"***

Due to a lack of infrastructure, half of academic institutions in developing countries still administer their information systems and keep their data on stand-alone PCs, according to Pooja S. Sharma in Reshma R. Shetty's "College Automation System." The software implementations of these systems lack process integration and are incompatible with one another. The idea of a service architecture is not applicable to various kinds of system implementation. With the help of this system, a college or other educational facility will be able to develop a significant online and intranet college automation system. The college ERP system makes use of RFID tags and is hosted on the cloud. The project's main objective is to completely automate the user's encounter. All business operations, including monitoring attendance and student information, will be consolidated into a single database via the M-ERP solution. M-ERP promises to offer a useful, easy-to-use, and safe method of managing college daily operations. Some systems produce more efficient, platform-independent modules using the MVC architectural pattern. The MVC design pattern helps to keep the presentation, business, and database connection logic separate from one another. [1]

B.*"Review based on Institute management systems"*

Dr. Deepak Mehetre and numerous other people This online application aids in the system's transformation into a website-based program. This art is digital. Because it can be controlled and monitored remotely, fewer people are required. It constantly provides reliable data. Every piece of data can be simply preserved and accessed whenever necessary. The project's data is kept in order to help management make informed decisions. A web-based management system is therefore preferred. Everyone on staff can easily get the knowledge they require. This framework is essential for colleges and universities. Sangamesh K., and further This project, which produces centrally managed software, streamlines work administration and management and provides comprehensive information on the management of academic institutions in contrast to current methods of doing so. a user's selected topic with just one mouse click. In order for all of the educational institution's services to interact with one another and share information, access to centralised software with an easy-to-use interface may be provided. Since this is a ReST API hosted on an AWS cloud server, the user will be able to access the resources from a distance. More services can be added in the future without requiring changes to the existing code because the application was developed using an agile development process and a micro-service architecture. Together with others, Aradhna Singh The system offers stability, effectiveness, and ease of use. Parents of students can check information about the curriculum, attendance, and results using this programme. Students can access alerts and information at any time and from any location. The tool will greatly speed up and simplify the process of managing and preparing results. High security is provided, and a system that uses less time and resources than a traditional approach is also provided. The suggested system offers a novel method of computation and a user-friendly user interface for displaying the results of an operation. Following a review of the relevant literature and an examination of the current system, we concluded that the proposed system would not only assist the institution in automating but also in digitising the system, allowing for more efficient resource distribution. [2]

C.*"Review based on Role-Based Access Control for College System".*

Liu Dongdong and others, p. The role through which users and permissions are directly connected to the role of authorization to regulate the ownership of the user's access to the system's operation is known as role-based access control (RBAC). What exactly is a role? The system can assign users to various roles in order to provide them with the necessary access, and the user can function within the set of system permissions. Roles and permissions are also many-to-many links between users and roles. Roles and permissions have many relationships with one another, and there are multiple roles. Through this mechanism, the user can only have rights that are related to their function. According to the fundamentals of RBAC, each user in the landing system will create a session, and through the session, the user's role and the role that encompasses all of their privileges will be activated. A role-inheritance relationship can exist in the RBAC model, indicating that an upper-level role may inherit all or part of the responsibilities for the next level of authority. This role-inheritance relationship creates the hierarchy's roles. Cruz, Jason Paul, et al. Control of access based on role Smart contract usage According to RBAC, users are linked to roles, and roles are linked to services. Such a framework is used by many businesses and organisations to implement their internal access control requirements in their computer systems. how to implement their internal access control requirements in their computer systems. For instance, quality assurance staff only have access to the frontend source codes, whereas programmers at a company

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have access to both the backend and frontend source codes. This access control is widely used within an organization, but it should be noted that RBAC is a flexible framework, and roles are frequently used across organisational boundaries. Haitham Yaish and others Control of Multi-tenant Database Access In A brand-new multi-tenant database solution called cloud data storage has just surfaced to provide databases for many users who can store and access their data online. This multi-tenant database is intended for use by several tenants, each of whom may have a number of users. Therefore, this database type requires a unique multi-tenant access control architecture that enables access control for both multiple tenants and numerous users per tenancy, in addition to multiple tenants. In this paper, we propose an elastic extension tables-based multi-tenant database schema for multi-tenant access control (EET). In this model, we define the EET access grants that can be given to users who are tenants as well as the access control data architecture. Additionally, we provide an access control method that permits users to access the data granted to them in accordance with a number of groups or roles assigned to these individuals. [3]

D. *"Review based on Android-based College Fees Payment Application"*

Among others, Chandra Mouli Gupta, This research paper's main goal is to develop a mobile payment method for college fees. College students have traditionally paid all of their fees manually while standing in lengthy lines, wasting not only their own precious time but also the time of the college administration. These expenses include tuition, mess, hostel, and other college-related fees. As a result, institutions are forced to manually update their databases with all the information related to fees. This paper assumes the development of an Android application that would allow students the flexibility to pay their fees whenever they wanted, wherever they were. although there may be a time constraint because of college. This Android software eliminates all sorts of delay and tension associated with the manual system of processing college fees, making it a more dependable and efficient way to pay for tuition. Niranjana Murthy M.in created the Android-based college fee payment app Razor Pay. This paper provides information, suggests an online payment technique, and makes comparisons with other top online payment systems. A payment gateway is a feature offered by an application service provider for electronic commerce that allows online companies, brick-and-click stores, and electronic enterprises to accept credit card payments. Nearly a quarter of all online customers select PayPal as their preferred mode of payment. With a reputation for security, PayPal looks out for both the interests of consumers and businesses. It is a practical choice for both customers and businesses. Customers take less time to provide their information, and businesses may easily set up a payment system without having to pay anything up front. Kalbande, Jaiganesh This essay describes a study of an electronic transaction that was made using a secure payment gateway. According to current research and development, an electronic payment system for an electronic transaction must be secure for participants like payment gateway servers, bank servers, and merchant servers on the Internet. The security architecture of such systems is made to not only safeguard against, but also to avoid or completely eradicate, potential attempts at fraud that may occur in such a payment transaction with stolen cards and client information. E-commerce involves the use of money in some way to purchase goods and services online. It is clear from the research and studies that doing such a trade on the Internet is a little less secure and reliable. The primary goal of this paper is to go over a description of an asymmetric key crypto-methodology, systems that primarily use a security protocol, secure communication tunnel techniques, and finally secure electronic transaction implementation over the Internet. These techniques prevent the transmission of conventional transaction information like account and card numbers, amounts, and other information. [4]

E. *"Review based on Android-based Attendance Management System"*

Using an application that runs on the Android platform, a way of taking attendance is suggested in this study. Once installed, this programme can be used to retrieve the list of students from a certain web server. The gadget will then function as a scanner to individually scan each student card to validate and verify the students' attendance based on the downloaded list of students. The barcode printed on the student cards will be scanned by a sensor attached to the device's camera. The revised attendance list is next posted to a database online, where it can also be saved as a file and then copied to a PC. This approach will aid in eradicating the current issues and, at the same time, encourage a paperless workplace. There is no additional hardware expense necessary because this programme may be installed on lecturers' existing Android devices.[5]

III. PROBLEM STATEMENT

In the existing systemIt takes a lot of time and paper work to manage different modules in the existing system, including the student module, administrative module, and exam cell, among many others. There are now several items

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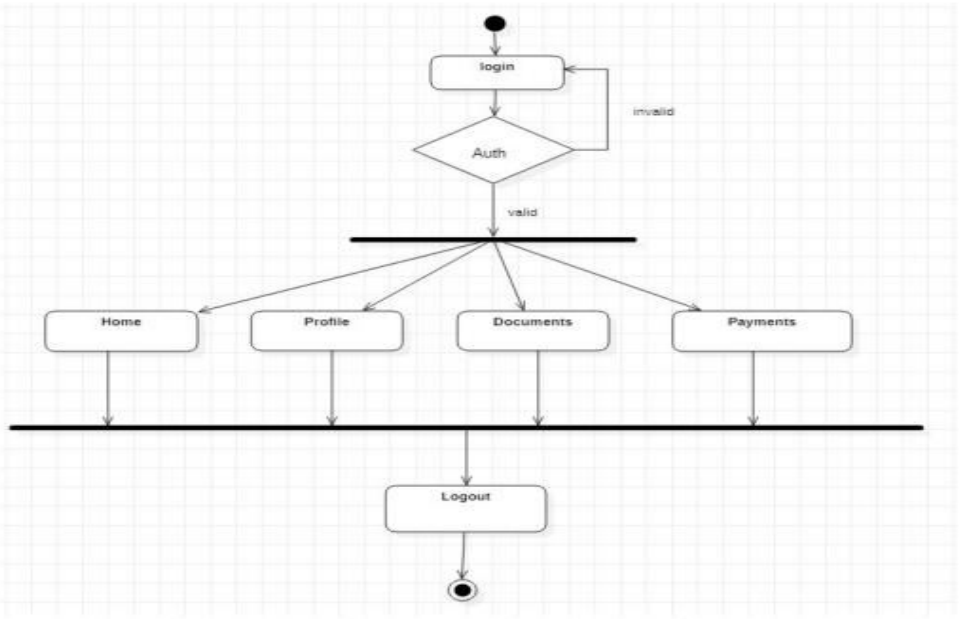
in the Student module that require paper work, which include login, the notice board, attendance, permission status, documents, etc. The main goal of the strategy is to reduce the workload of instructors by employing a central database from which each teacher may access the records and make additions, updates, or deletions. Today, pen and paper are still used for all significant academic projects. The pen-and-paper method requires significantly more work and time than it does to type. The suggested application is a mobile application that will be utilised to streamline college professors', administrative personnel's, and students' time and efforts.

The project focuses on various extracurricular college offerings. The major goal is to create software that will allow for paperless work and service time savings. Numerous procedures are included in our current system according to responsibilities, including profile, notice, QR code, etc. The user can access features including requesting permission, paying fees, receiving notifications, storing documents, and visiting the support department. It has to do with the system operations in our model. For instance, while paying tuition to a college online at any time and using a card, UPI, NEFT/RTGS, or Net-Banking,

The system now has role-based access. several jobs, including student, instructor, administrator, etc. Each student and member of staff has a username that serves as their email address and a password that allows access.

IV. PROPOSED METHODOLOGY

The proposed methodology of a College Automation System using Android &Cloud Fire-Store typically involves the following steps:



Its goal is to centralise and automate the entire system of several departments. We are trying to make improvements to the pen-and-paper system we currently have. Because of their simplicity and versatility, the system uses Apache Tomcat Server and Cloud Fire-Store as its databases. This database contains all of the data related to students and professors and models the information using certain processes. These operations could involve document storage, student attendance tracking, or authentication credentials. The Student, Staff, Admin, and Teacher modules—the three most crucial components of any college automation system—are managed by our system. Each user has a username and password that are used to access the system, which has role-based access.

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Student Module:

The student signs in to the programme with their password and email. If the user's email address and password are correct, they will be directed to their static screens. Once they have been matched, the system determines their state and transfers control to the appropriate user interface. Students can request permission at various levels and view the history of their requests to see whether they have been granted or denied. When a student requests a concession payment, the teacher receives both the request and a notification. The concession request is approved or rejected by the class teacher, and the student is notified of the status of the concession. Students can also store and download the most crucial instructional documents 24 hours a day. Notices about various sections are given to students. for additional assistance with various services like registration, payment, and documents.

Admin Module:

Admins can access the system by entering their credentials in the Admin module. A class teacher and staff member can be added, their information can be updated, and they can be deleted along with pupils. The administrator can view and manage every log of student data. Moreover, the admin can upload notices about admission forms, etc. Admin can see every student and provide their approval. The majority of the maintenance and addition of personnel and teachers will be completed in this module. Every service in the programme has rights that belong to the administrator.

Staff Module:

The application is accessed by staff members using their email and password. The admin login information is entered, encrypted, and sent to the server for validation. The actions are only taken once the authentication has been successful. If the password and email do not match, the user can visit the next static screen and upload office section notices before removing them. Staff members also keep records of certificates of validity and fee schedules. Check your payment balance and payment history. Staff will contact a student if they fail to make a payment.

Teacher Module:

The teacher enters their email and password to access the program. When a student requests a concession payment, the teacher receives both the request and a notification. The concession request is approved or rejected by the class teacher, and the student is notified of the status of the concession. A teacher may also approve or reject a student's request for permission. A teacher may keep a record of student attendance.

Notification Module:

This module enables the department HOD to notify students of any information pertaining to the college. The application's UI allows the pupils to view notifications. Only options that are available, such as all students, all faculty, a specific faculty, and all, can receive messages from the HOD.

Database Module:

Because of its ease of use and flexibility, the system's database is known as Cloud Fire-Store. This module stores all student and faculty data and models it according to predetermined operations. These operations could involve keeping track of student attendance, notifications, documents, or login credentials.

V. PROJECT PURPOSE

The major goal of this project is to make the process of maintaining student information more mobile and automated. a university. By offering centralised control over the entire system, the system fills the gap between end users and contrivance planning managers. The system is used by many departments to sequence various processes that are carried out in isolation from one another.

The intranet-based software known as College Automation System enables faculty to manage permissions, attendance, and other materials while also assisting students with admission, seeing notices, and keeping track of attendance. Using

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this method, an administrator can easily and quickly keep track of the records of multiple students. An administrator can quickly find information about each student. The system now has role-based access for several jobs, including student, instructor, administrator, etc. Each employee, including students, has a username that serves as their email address and a password to access the system.

VI. FUTURE SCOPE

From the viewpoint of the students' and teachers' perspectives, the system being built is economically sound. The idea of information retrieval, filtering, and secure random algorithms is to retrieve usable information from an unstructured input. to create an improved student information management system that can aid in resolving issueswith the current ERP system. Our fundamental strategy aims to create an Android-based smart phone application that may be utilised to make this procedure simpler, more secure, and less error-prone. Through this system, information will be obtained more effectively. to give users mobile access to college, department, submitted document, permissions, a discussion form, and daily schedule information.

For colleges, it is more convenient and effective. By lowering the requirement for paper work, it lowers the amount of manpower required to do various jobs. If everything is computerized, there will be no room for error.Additionally, since information can be easily stored and retrieved, tasks can be completed quickly and on schedule.Furthermore, it is simple to save and retrieve information, making it possible to complete tasks faster. Automation is needed for the planned system, which will use centralised databases for all departments to reduce redundancy.

The College Automation System is a constantly evolving programme that may be altered in countless ways to facilitate simple communication between all active departments of a college. The storage of students' previous year's information when they are promoted to a different semester could not be included in this project due to a lack of an advanced database.All of the student and teacher records must be kept in an effective data storage system in order for this project to be financially sustainable.

Features and Benefits:

It is user-friendly.

Report generation is simple.

very little paperwork

Controls are used by a computer.

VII. CONCLUSION

In our "College Automation System" project, we created a system to digitally transform college services and make them available to stakeholders for things like paying tuition, exchanging documents, getting staff approval, notifying students, and other things. Communication between college staff and students is facilitated by this technology. We used Google Fierstore as the back-end, Android Studio as the front-end, and the Razorpay API as the payment gateway to implement this solution. The created system offers a solution that satisfies our desire to lessen the workload of college employees and students. Some functions, such as interaction between the library and students, an attendance system, the ability to store exam records, student performance, etc., are not available in our current system. In the future, we'll work to add these features so that the system can function better and be more interactive. The suggested system offers a fresh approach to computing and playing back operations, along with a responsive and appealing user interface. Therefore, based on a review of the literature and an analysis of the current system, we have determined that the proposed system will not only help the institution automate but also help to digitise the system, which will help to efficiently allocate resources.

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