College Automation with Cloud and RFID

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Abstract – "College Automation using cloud and RFID" is a project that will work on a college level. It will provide an interface for all the departments including students, faculty and management. The highlight of this project is that it is web based which can be easily accessed and used on a smartphone and/or PC by students and faculty alike. It will use RFID tag as an ID for students which will be used for Academics, Accountant, Hostel, Library that manages all the tasks performed by student in daily life in college. All the data of the system will be stored in a cloud environment. The system will help in smooth synchronization and parallel working of different departments in a college.

*Key Words***:** Cloud, College Automation, RFID

1.INTRODUCTION

In Existing System for managing various modules such as Student module, administrative module and Exam cell etc. takes lot of paper work as well as time. Other than this, it is also so difficult for a user to navigate using different platforms such as admission form, notice board, re-evaluation form, feedback etc. Students have to take extra steps to keep track of their assignments, results and current progress per semester. "College Automation using cloud and RFID" is a platform that helps both the students and management authorities of the college. This project is capable of storing and maintaining their details in a dynamic order of the students and the teachers. College Management System is becoming a very essential component in managing faculty and students of a college. Using this project, we can gather all the useful information needed to the management in few clicks. Radio Frequency Identification (RFID) is used in many applications such as public transport ticketing, campus access, etc. It allows us quick and legit authentication of a person owning RFID tag. In this system every person will get a unique RFID card that contains a unique ID for them. This card is then be used to communicate with the web app automatically by scanning it. After successful authentication, the user can access the information and features according to their access level. The admin of the system is responsible for doing majority of the task. The process of work done is as follows. If a student has to update any information about him/her, then he/she will go in the admin and scan their RFID card and tell the changes to the admin which can then be updated in the database. Similarly, when issuing a book from library, where the librarian is logged into his/her account in library module of this project. The student will show his/her RFID card in the scanner and select a book and submit. The book will be issued to him/her.

2. RELATED WORK

There are various works done in this field that solve the management of students and faculties in a college environment. These works include management system, web based system, RFID, three-tier architecture required in web development.

[1] This model consists of various functionalities like information about the courses available in the college starting from first grade to graduation. It also enables students to enroll to particular course through online, online fees payment, examination results, and also get notified when important events occur. [2] Enormous grow of students is caused to expand the functionality in the respective educational institutions. This new approach will provide fast processing, efficient student tracking, and produces desired result. This approach will allow students to save their personal details. It is more secure, reliable and easy to use. [3] This research thesis work is a contribution to the implementation of RFID technology in the retail industry and its integration among the different entities of retail supply chain and improves the overall performance of supply chain and provide a framework for RFID implementation for the case company. [4] CMS is an intranet-based application that aims at providing information to all the levels of management with in an organization. This system can be used as a knowledge/information management system for the college. For a given student/staff (technical/non-technical) can access the system to either upload or download some information from the database. [5] This paper will enable colleges to conduct transaction and have automated checking information of the operations based on the processing of college. This paper presents the system that will also provide the facility to find how information is transferred in all over the departments of the college. [6] This paper proposes a design for college student management system utilizing computer aided system, which can play an important role in college management. It organizes the proposed college student management system via a hierarchical structure, which contains (1) Web display layer, (2) Business logic layer, (3) Data access layer, and (4) Database layer.

3. METHODOLOGY

In our project we provide role-based access rights to different users. Several login pages are created for the user based on their access rights.

In this proposed system, students have different set of features and faculty have different set of features as required and all can be viewed on a single platform. Our system manages the five important module of college management system which is Student, Faculty and Admin, Hostel and Library. The system gives a role-based access to every user. Every user is having user id and password which is used for accessing the system. User is registered by the admin and after successful registration a unique Id is created which is then is then issued to the user in the form of RFID card.
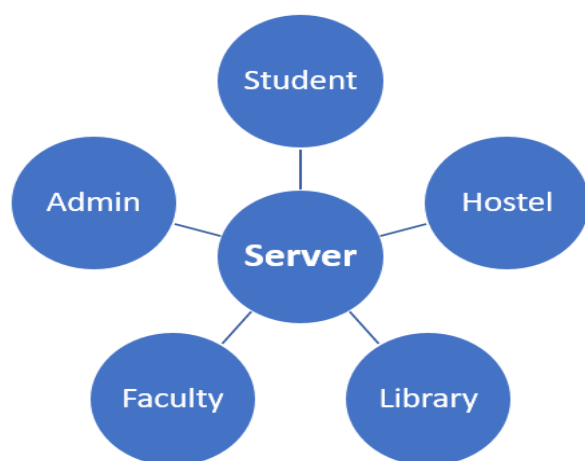

Fig -1: Modules in the proposed system

The main role of adding data to the database, updating the data in the database, deleting the data from the database in this system is given to Admin. Some key works include adding student or faculty (registration), updating their details or deleting their information. Similarly, the access to operations regarding various works in library is given to Librarian. Some works related to Librarian is to add books in the database, issuing books to students etc. Hostel module will take care of the information regarding the student residing in college hostels like floor, room number, goods/materials issued to them etc. Student module will provide students with some set of functionalities like viewing their details, raise query/complaints etc. Faculty module will give information to faculties about themselves, track student records etc.

3.1 User Registration

First, the user has to be registered into the system. This work is done by the admin after the user has submitted the fees (in case of student) or if a faculty has been added to the college. In this process of registration, the system will generate a unique ID for each individual. The user will also be given a role which will decide their access level in the system. Also, after the successful registration of the user in our cloud system, the user will be provided a RFID card corresponding to their unique user ID.

3.2 Accessing the functionality

After successful registration, user can now access the system after a successful authorization. This can be done in two methods. First method is to enter the login credentials manually in the form and login to authenticate. Second method is to scan the RFID card provided to them and the authentication is done automatically. The user can carry the RFID card along with them and go to any department like hostel, library etc. Now all they have to do is to scan the card in the RFID reader and access the respective functionality.
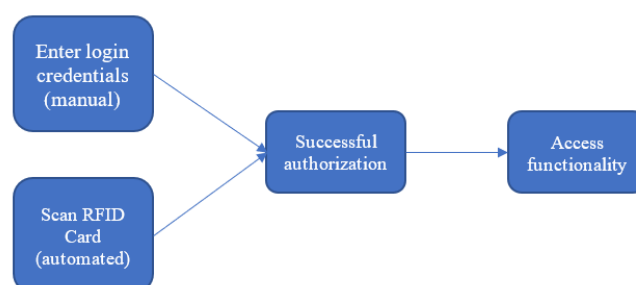

Fig -2: Accessing the functionality.

3.3 Technology Used

This proposed system will be made using the three-tier architecture model. Three-tier architecture is a well-established software application architecture that organizes applications into three logical and physical computing tiers: the presentation tier, or user interface; the application tier, where data is processed; and the data tier, where the data associated with the application is stored and managed. The chief benefit of three-tier architecture is that because each tier runs on its own infrastructure, each tier can be developed simultaneously by a separate development team, and can be updated or scaled as needed without impacting the other tiers.

For the presentation layer HTML, CSS and JavaScript is used to design the User Interface of the

proposed system. For the application layer Node.js is used. Node.js is an open-source, cross-platform, back-end JavaScript runtime environment that runs on the V8 engine and executes JavaScript code outside a web browser. Express (a Node.js framework) is also used to make the development process easier. For the data layer MongoDB is used. MongoDB is an open-source NoSQL database management program. NoSQL is used as an alternative to traditional relational databases. MongoDB is a cross-platform, document-oriented database that provides, high performance, high availability, and easy scalability. MongoDB works on concept of collection and document.

CONCLUSION

The aim of our system is to reduce the workload and to save significant staff time and student time. It can be accessed and controlled remotely by user. It reduces the manpower required and improves efficiency.

This project aims at providing all the functionalities required without using any paperwork. If all the work is done by the computer, then there will be no chances of errors. The storage and retrieval of the data from cloud environment is safe and secure. The stored data in the repository helps in taking intelligent decisions by the management to provide accurate information. Thus, the system developed will be helpful to the administrator by easing his/her task and provide exact information.

FUTURE WORK

College Automation is the core of the digital college management system. As the time goes various advancement will be made to teaching and managing aspect of the college. So, there are various possibilities of including a new feature to the College Automation system. Some of them are:
•Automatic reading of the RFID card if the user is in the proximity of the system.
•Automatic attendance system by scanning RFID card.

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