



Attendance Management System

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Abstract: As digitization has evolved in every sector of the economy, many sectors are adopting this technology for its smooth functionality. Along with various other sectors, the education sector is also adopting this technology at a rapid pace. Computerization and automated technology have made things much easier for schools, colleges, and universities. It has streamlined the whole administrative, academic, and financial day-to-day operations of educational institutions, also known as campus management solutions, and has been developed for automating the daily operations of educational institutions. The software is meant to cater to the assorted needs of students, faculty members, and departmental staff. This software or system can be used to manage a variety of things. In today's era, every educational institution is in the race of proving itself the best in offering education at every level. To draw more and more students into their institutions, these institutes are adapting all kinds of the latest technologies. One such technology called the MERN stack has been used to implement this project to keep the application at par with the latest technology. Index Terms: Full-Stack Development, College Website, Web Design, Web Development, Reactjs, Nodejs, Express, MongoDB.

Keywords: Attendances system ,student attendance system.

I. INTRODUCTION

The project aims at building a web application for college management using the robust technologies that constitute the MERN stack. These technologies include Mongo dB, Expressjs, Reactjs, and Nodejs. MongoDB is a source-available cross-platform document-oriented database program. Classified as a NoSQL database program, MongoDB uses JSONlike documents with optional schemas. Express.js, or simply Express, is a back-end web application framework for Node.js, released as free and open-source software under the MIT License. It is designed for building web applications and APIs. It has been called the de facto standard server framework for Node.js. React is a free and open-source front-end JavaScript library for building user interfaces based on UI components. It is maintained by Meta and a community of individual developers and companies. 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. The MERN stack is a JavaScript stack that's designed to make the development process smoother. MERN includes four entirely open-source components: MongoDB, Express, React, and Node.js. Adopting the stack also addresses critical but repetitive development tasks that redirect efforts toward building and innovating upon a breakthrough application and its testing. Another useful aspect of using the MERN stack is developing Single Page Applications(SPA).

MongoDB is a NoSQL document-oriented database. It has a flexible schema and JSON (JavaScript Object Notation) based query language.[1]NoSQL stands for 'non-relational' SQL. It is essentially not a conventional database where you have tables and columns, called relational databases. There are actually two attributes of NoSQL that differentiate them from conventional.[1]Express is just a web framework for Node.js. Node.js is just a run-time environment that can run javascript. To write a full-fledged web server by hand on Node.js directly is not that easy, and nor is it necessary. Express is that framework that simplifies the task of writing your server code.[1]React anchors the MERN stack. In some sense, this is the defining component of the MERN stack. It is an open-source javascript library maintained by Facebook that can be used for creating views rendered in HTML. Remember the SPA's where only the part which is changed is re-rendered instead of the entire page, React is solely responsible for such behavior. The best example of this is the web WhatsApp.[1]Node.js is a java-script run-time that uses chrome's V8 engine which is an open-source javascript run-time written in C++, that takes JS code and compiles it to machine code. [1]Problem definition The existing system which we are using in our college is a traditional process and is a completely manual process. Nowadays, education is playing a very significant role in society. Day by day, the percentage of illiterates is decreasing and the percentage of literates is increasing. Education will change society in all aspects and everyone wants to study for higher professional degrees. Admissions are increasing day by day so the ratio of the establishment of new colleges and schools is also increasing. But the actual challenge is starting now. Most schools and colleges maintain student information in the record.

II. LITERATURE REVIEW

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society in all aspects, and everyone wants to study for higher professional degrees. Admissions are increasing day by day so thereby. [2]The ratio of the establishment of new colleges and schools is also increasing. But the actual challenge is starting now. Most schools and colleges maintain student [2]information in records. When the number of records increased, it was difficult to maintain the information of each student in the old manual system. Maintaining the records manually leads to error-prone and requires more manpower and it consumes more time for processing the records 3. Feasibility Study Economical Feasibility: The system being developed is economic with respect to the School or college's point of view. It is cost-effective in the sense that has eliminated the paperwork.[2] The system is also time effective because the calculations are automated and are made at the end of the month or as per the user's requirement. The result obtained contains minimum errors and is highly accurate as the data is required. Technical feasibility: The technical requirement for the system is economic and it does not use any other additional Hardware and software. Behavioral Feasibility: The system working is quite easy to use and learn due to its simple but attractive interface. The user requires no special training for operating the system.

III. FEASIBILITY STUDY

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IV. SYSTEM ARCHITECTURE

The following modules have been implemented during the execution of this project:

Home Page: The home page is built using the powerful features of the Reactjs library and is attractive as well as fast. It provides the visitor of the website with the first impressive look and displays basic information about the college such as the name of the college, accreditation details, address of the college, courses offered, and a contact us page. The Home page consists of a navigation bar to navigate to the different pages of the website.

Login Page: The login page first confirms if the visitor of the website is a student, teacher, or the admin himself. After confirmation, accordingly, access to the several pages of the website is provided after the credentials are verified. While the teachers and students can register themselves if new to the college, the credentials of the admin remain fixed to enhance security.

Registration Page: New students and teachers can register themselves using the registration portal. The passwords are hashed while stored in the MongoDB database using the node implementation of Bcrypt.js. Bcrypt is one of the most used encryption libraries today. It incorporates hash encryption along with a work factor, which allows you to determine how expensive the hash function will be (i.e. how long it takes to decrypt it by brute force measures). Therefore, it keeps up with Moore's law, so as computers get faster you can increase the work factor and the hash will get slower to brute force.

Attendance module: The attendance module enables the teachers to enter the student attendance according to their course and generate an attendance report every month.

V. ADVANTAGES

Every section of the school or institute is managed from a single platform. As the administrator deserves universal rights, he/she can keep all the critical data safe and secure within the ecosystem. Students can check the schedule for different courses and exams without hovering over the noticeboard. Implementing a web-based College Management System is a step toward a paperless system.

VI. DISADVANTAGES OF THE PRESENT WORKING SYSTEM

Not User-Friendly: The existing system is not user-friendly because the retrieval of data is very slow and data is not maintained efficiently. Difficulty in report generating: We require more calculations to generate the report so it is generated at the end of the session. And the student did not get a single chance to improve their attendance Manual control: All calculations to generate a report are done manually so there is a greater chance of errors. Lots of paperwork: The existing system requires a lot of paperwork. The loss of even a single register/record led to a difficult situation because all the papers are needed to generate the reports. Time-consuming: Every work is done manually so we cannot generate a report in the middle of the session or as per the requirement because it is very time-consuming. Attendance Management System.



VII. CHARACTERISTICS OF THE PROPOSED SYSTEM

User Friendly:- The proposed system is user-friendly because the retrieval and storing of data are fast and data is maintained efficiently. Moreover, the graphical user interface is provided in the proposed system, which allows users to deal with the system very easily.

Reports are easily generated: reports can be easily generated in the proposed system so the user can generate the report as per the requirement (monthly) or in the middle of the session. Users can give the notice to the students so he/she becomes regular.

Very less paperwork: The proposed system requires very less paperwork. All the data is feted into the computer immediately and reports can be generated through computers. Moreover work becomes very easy because there is no need to keep data on paper.

Computer operator control: Computer operator control will be there so no chance of errors. Moreover, storing and retrieving information is easy. So work can be done speedily and on time.

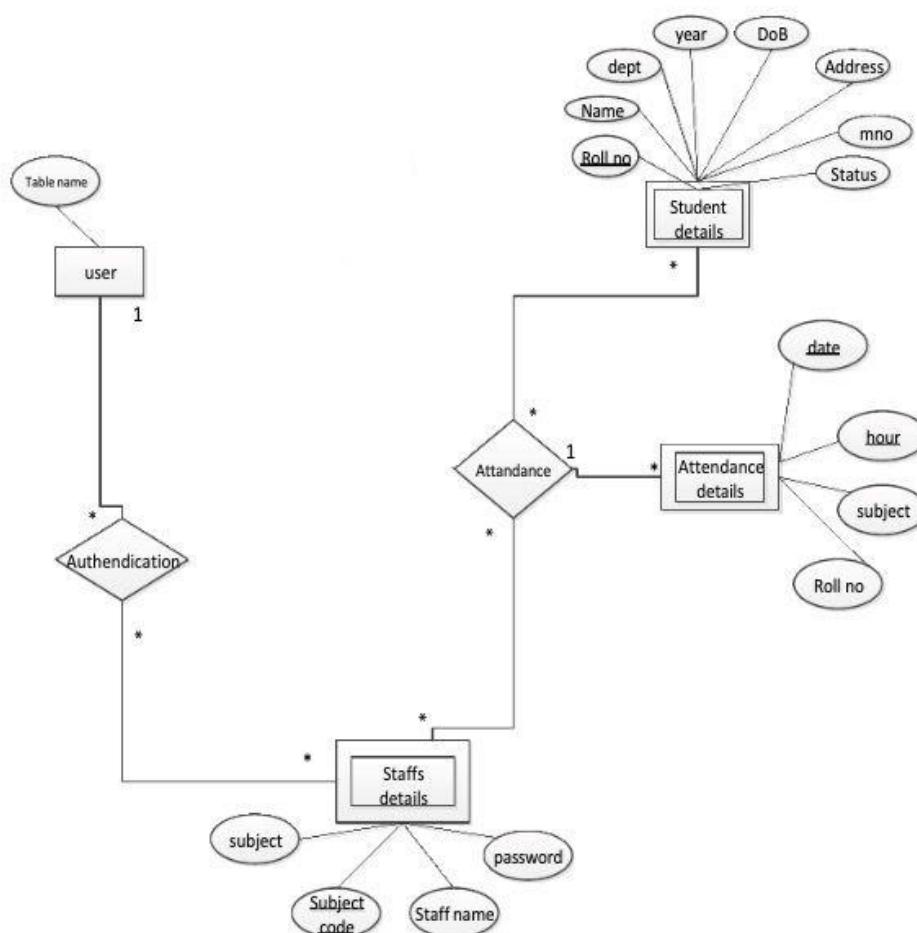


FIG 1: Flow-chart of the methodology and process

VII. BACKGROUND

MERN: MongoDB, Express, React, NodeJS. Enterprise web application(VGS) using MERN Stacks technology. It is full-stack JavaScript developer technology which means they are using all stacks of technologies together even if we remove one of that technology it does not work like that bundle of the stack. It is not a framework but it is an environment for programs. Depending on our requirements, earlier we were doing everything from scratch which is one limitation of CSS. Using CSS we have to create a user-defined class with a set of properties. After the mobile application when we use some margins. Paddling, dimension of the webpage we have to create responsive websites. When we see about dimension desktops have different dimensions. Mobile or tablets have different dimensions. To overcome this problem, a bootstrap feature is used. Java script is an object-based interpreted



scripting language. But now Javascript is one of the implementations of ECMA (ES5, ES6...ES8). Using JavaScript we can do coding on a webpage. After Node js, JavaScript is used on the client side as well as server-side coding. jQuery, React JS is a library that is used in the project. On the Client-side there is HTML less / javascriptes5 but on the back end, there is another technology may be python, Java, or pap. There is a gap between front-end and back-end technology. That gap is filled by Node. Using Node we can create restful API Node j's benefits:- Using Nodejs we can create restful API Using Nodejs we can create a security program We can do file-handling programs

IX. METHODOLOGY AND DEVELOPMENT

This project was conducted based on the new proposed software development methodology called PIID which is the combination of the Prototyping model and also Iterative and Incremental Development. The PIID diagram. This combination of methodology is used because the Prototyping model involves user involvement- ment and the developers can receive quantifiable user feedback while in Iterative and Incremental Development is easier to test and debug during a smaller iteration. In the first PIID phase, we see the client which is a developer in SUK and listen to the scope system.

For the next phase which is the initial phase, we need to plan how many iterations can be included in the systems. There are third iterations which are student attendance, report, and discipline modules. Then we will go to the iteration cycles. There are five phases in each iteration. Firstly, the requirement phase is the phase where we get the entire requirement about functions and operations that need to be included in each iteration.

The requirements can be documented by drawing a diagram that shows all functions that are in the system. The build / revise mock-up phase means we will sketch the interface while the implementation phase means we start to write coding. For the deployment phase, the iteration that has been finished will be sent to the client for testing purposes. Then, the client will test the drive mock-up. After that, the client evaluates the prototype system whether satisfy them or not. If not satisfied, the mock-up screen needs to be revised again.

X. IMPLEMENTATION AND RESULT

This section is to discuss the implementation and results of the system. There are three modules which are student attendance, report, and discipline modules Student Attendance Module: This feature is used by the class teacher to manage student attendance. The class teacher can add, edit student attendance, and also view student attendance reports. Admin Module: This feature is used by an institute to manage both the Student & Faculty panels and to add data. Teacher Module: This Panel allows us to Mark the Attendance of Students, view timetables, etc.

XI. FUTURE RESEARCH

Several recommendations have been received from the client to improve the Attendance Management System application. Future research will improve the AMS in several factors such as visualization and compatibility. From a visualization perspective, improvement will focus on providing a better visualization such as plotting graph charts for comparison and used of the table to visualize the details.

The graph chart is believed able to help user to analyze the attendance result in a better way. For compatibility factor, the improvement will be focused on how the AMS system will be suitable not only for SMA but also able to be modified as an attendance system to be used by other organizations such as primary and secondary schools, tuition centers, colleges, and universities.

XII. CONCLUSION

Attendance Management System (AMS), a web-based application, has been developed and proven on helping school management to manage student attendance. The development design is using context diagram to show the overall task of each user and ERD to show the relationship between database tables. Our experiences indicated that the development design by using context diagrams and ERD is suitable to be implemented in an integrated project such as AMS.



Admin Login:

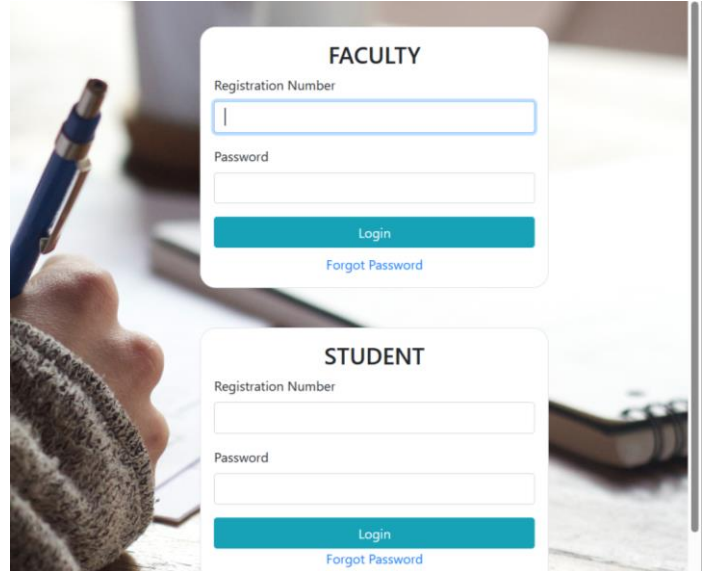
Faculty/Student login:

ADMIN

Registration Number

Password

Login



[TECH AMIGOS](#) [ADD FACULTY](#) [ADD STUDENT](#) [ADD SUBJECT](#) [ADD ADMIN](#) [OUR FACULTIES](#) [OUR STUDENTS](#) [SUBJECTS](#)

Tech Amigos
ADM202201002

Name	Tech Amigos
Email	techamigos@gmail.com
Registration Number	ADM202201002
Joining Year	2022
Department	C.S.E
Contact Number	7976752129

RM [TECH AMIGOS](#) [ADD FACULTY](#) [ADD STUDENT](#) [ADD SUBJECT](#) [ADD ADMIN](#) [OUR FACULTIES](#) [OUR STUDENTS](#) [SUBJECTS](#) [LOGOUT](#)

Faculty Name

DOB

Email

Gender

Designation

Contact Number

Department

Aadhar Card Number

Add Faculty



Database Collection:

AMS.admins

STORAGE SIZE: 36KB LOGICAL DATA SIZE: 1.35KB TOTAL DOCUMENTS: 4 INDEXES TOTAL SIZE: 72KB

Find Indexes Schema Anti-Patterns Aggregation Search Indexes Charts

INSERT DOCUMENT

Filter Type a query: { field: 'value' } Reset Apply More Options

QUERY RESULTS: 1-4 OF 4

```

_id: ObjectId('634da6da7ff228d5dfe3f281')
name: "Siddhu"
email: "coolssjsid@gmail.com"
password: "$2a$10$SVL1Hjhw4zdBIzYs0ckh5uj8kHMhGqJjqIeK8Ge8zL0daphtE/qi6"
registrationNumber: "SID200700002"
department: "C.S.E"
dob: "07-11-2001"

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REFERENCES

- [1] Patel UA, Swaminarayan Priya R. Development of a student attendance management system using RFID and face recognition: a review. *Int J Adv Res Comput Sci Manag Stud.* 2014;2(8):109–19.
- [2] Gangagowri G, Muthuselvi J, Sujitha S. Attendance Management System.
- [3] Anitha V Pai, Krishna A, Kshama PM, Correa M. Web service for student attendance management system. *www.ijarse.com.* 2016 Mar;5(3).
- [4] Ahmad BI. TouchIn: an NFC-supported attendance system in a university environment. *Int J Inf Educ Technol.* 2014;4(5):448.
- [5] Kassim M, Mazlan H, Zaini N, Salleh MK. Web-based student attendance system using RFID technology. In *IEEE*; 2012. p. 213–8.
- [6] Benyo B, Sodor B, Doktor T, Fördös G. Student attendance monitoring at the university using NFC. In *IEEE*; 2012. p. 1–5.
- [7] L. Orsini, "What You Need to Know About Node.js," November 2013.
- [8] Deeksha, Web Technologies, International Journal of Research in Engineering, Science and Management Volume-3, Issue- 5, May-202