HOSTEL MANAGEMENT SYSTEM

MINOR PROJECT SYNOPSIS

BACHELOR OF TECHNOLOGY

Information Technology

SUBMITTED BY

ASHUTOSH SHARMA

URN :1905311

ASTHA

URN : 1905312

DIVYANSHU KUMAR

URN : 1905326

D3ITA

Department of Information Technology,

Guru Nanak Dev Engineering college

Ludhiana-141106

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1 Introduction

React (also known as React.js or ReactJS) is a free and open-source front-end JavaScript library for building user interfaces based on UI components. It is maintained by Meta (formerly Facebook) and a community of individual developers and companies. React can be used as a base in the development of single-page, mobile, or server-rendered applications with frameworks like Next.js.

It allowed developers to create reusable components that are independent of each other. With fantastic feature called Virtual DOM that enables developers to implement SSR without needing to update the whole view each time during an update.

Node.js is an open source, a server-side script which runs on the top of Google's open-source scripting engine V8. Node.js is fast, lightweight and efficient. It uses the asynchronous mode of operation, event-driven Input/Output rather than using the traditional threads or separate threads for each process.

JavaScript is a text-based programming language used both on the client-side and server-side that allows you to make web pages interactive. Where HTML and CSS are languages that give structure and style to web pages, JavaScript gives web pages interactive elements that engage a user. JavaScript is used Adding interactive behaviour to web pages, creating web and mobile apps, building web servers and developing server applications and game development

MySQL is a fast, easy-to-use RDBMS being used for many small and big businesses. MySQL is developed, marketed and supported by MySQL AB, which is a Swedish company. MySQL is a very powerful program in its own right. It handles a large subset of the functionality of the most expensive and powerful database packages. MySQL is customizable. The open-source GPL license allows programmers to modify the MySQL software to fit their own specific environments.

2 Rationale

Guru Nanak Dev engineering College, one the prestigious, oldest institution of Northern India, was established under the aegis of Nankana Sahib Education Trust (NSET) in 1956. Ever since the establishment it has not only provide education but accommodation to thousands of students from all over the country. Our college provides the facility of hostel to our students. The college constitutes in total 5 hostels, namely Hostel no 1, 2, 3, 5 for boys and hostel no 4 for girls.

The hostel accommodates more than 1000 students, including additional facilities like hostel mess, electricity, hygiene, and so on. Taking care of each and every student along with keeping a collective maintenance of the hostel becomes a difficult task. In this era, where everything can be done with just a click, functioning offline makes difficult.

Facilities like closing mess account when going home, paying mess bill, filling form for maintenance of hostel resources, complaint redressal, meal management, service charges payment and so on has been carried offline so far. The student has to physically go to the mess office and pay the bill or check the status of the account and so on. All this makes it more tedious , time consuming and leaves scope for procrastination and errors. Hence to relieve the students as well as the management from the pain of it, the need for Hostel Management System is realised.

Hostel Management System will allow the users as well as the management to any related task anytime and anywhere. It not only makes the job easier but also keeps the users updated.

3 Objectives

1) To facilitate online record keeping and management of the hostel

2) To provide controlled access to concerned person (user/admin/employee)

3) To provide easy access to all stakeholders

4) To enable online payment of bills

4 Literature view

The system aims at the maintenance and management of the different hostels in the college campus. It mainly takes care of the Hostel management at the core area of the database.

The system provides the information and facilities both to the students by providing data regarding the meals for the day, room allotment , students' payments, complaint redressal and to the employees via features such as vendor payment, bill management, cost management and so on.

The students and employees alike can visit the site and get with the required information that is expected by the system. Every student needs to submit their data once only at the time of admission and for the rest of the degree the data will be updates accordingly. The students are scheduled with the information of the meal schedule, payment of mess bill and opening and closing of mess accounts as per will.

The total front end is dominated using React and JavaScript. Node JS is utilised for the purpose of fetching data. At all proper levels high care was taken to check that the system manages the date consistency. The database recordkeeping and connectivity is managed through MySql. The authorization and authorization will be cross checked at all stages.

The user level accessibility has been restricted into three zones the administrative, employee and the student user zone.

5 Feasibility study

• System aims to improve availability to the students and employees anytime and anywhere.

• The system will be reliable for the administration, employees and student to be dependent on the system.

• We hope to improve the presentation and durability of information, through this system.

• The entire hostel management will be upgraded and productivity of service will be enhanced.

6 Methodology

The data collected and stored with the help MySQL is used as record, once the data is collected it is ther used as a record for different implementations.

Node.js uses the "Single Threaded Event Loop" architecture to handle multiple clients at the same time

In a multi-threaded request-response model, multiple clients send a request, and the server processes each one before sending the response back. However, multiple threads are used to process concurrent calls. These threads are defined in a thread pool, and each time a request comes in, an individual thread is assigned to handle it. Hence, in our system, multiple requests from different users be it administration, student or employee can be handled concurrent requests.

Node.js allows you to build non-blocking input/output JavaScript applications by using an event queue that can handle multiple requests at the same time. By using built-in asynchrony in JavaScript, we can create a highly scalable server application that maximizes your server's CPU and memory while handling more requests at the same time than usual multithreaded servers. This functionality makes Node.js a great choice for real-time applications and those that require a lot of input/output operations.

Since this system will hopefully be tested, used and adapted in our college, hundreds of students and tens of employees will become a part of it. So, the choice of Node.js makes the processing fast and hence the system more efficient.

Many popular JS frameworks like React are written in JavaScript, which is the main language of most modern browsers. By using Node.js on the server, you get all the benefits of the scripting language on both sides: backend and frontend. Having the same frontend and backend language is very good for providing support for your application and coordination between your team members.

React JS is used to create components for web applications. A React component can be anything in your web application like a Button, Text, Label, or Grid. Since our system needs a lot of testing for implementing in reality. Traditional UI browser testing is a hassle to setup. On the other hand, you require very little or no configuration for testing in React.

Traditional UI browser requires browsers for testing, but you can test React components quickly and easily using the node command-line

Traditional UI browser testing is slow. But command-line testing is fast, and you can run a considerable amount of test suites at a time.

7 Facilities required for proposed work

1. 8 gb RAM
2. Ryzen 5, i5
3. Runtime environment Node JS installed
4. IDE
5. MySql server installed

8 Expected outcome

1. Working website
2. Hostel management portal
3. Employee /Admin/ Student login

9 References

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