A TECHNICAL REPORT

ON

A HOTEL BOOKING MANAGEMENT SYSTEM

DEVELOPED WITH

THE PURPOSE OF SOLVING RESERVATION ISSUES AMONGS USERS

DEVELOPED BY

<ADD_NAME_HERE>

SUBMITTED TO

<ADD_NAME_OF_DEPARTMENT>

IN TOTAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF
<ADD THE DEGREE OR CERTIFICATION TO BE OBTAINED>

MAY 2024

ACKNOWLEDGEMENTS

I deeply appreciate the Almighty God for His sufficient grace which cannot be overemphasized, and enablement to undergo this program in due time. My profound thanks to my instructor <Name of instructor> for your efforts towards making sure i become great in computer science. To all other instructors at the institution i say a big thanks to you all for your passion and great impact in my life. <You can edit it further

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ABSTRACT

This technical report is a complete documentation of the total software development lifecycle of a hotel book management system. The project enabled me to identify a core challenge the society faces as regards making reservations. Therefore, this project aims at individuals who for some reason could not meet up appointments in the past due to accommodation challenge to finally be able to secure fancy accommodation even at the comfort of their country. Hence, with this challenge finally dealt with, we hope that the idea of making online reservations before the time of an event will fully be incorporated.

CHAPTER ONE

INTRODUCTION

1.1 Problem Statement: What if instead of a customer to drive down to a hotel, there was a way it could be done online. Imagine if a person spent hours on a flight and such person has a board meeting the next day, only for the person to arrive at the city very late, then decides to go to a nearby hotel, only to hear that all rooms have been booked. Imagine such disappointment. This is what led to the development of a system that is able to handle users data and also enable users to effectively make reservations online without a physical presence. The purpose of this booking system is to ease off stress by providing a comfortable way of securing adequate accommodation, therefore users can efficiently meet their schedules as at when due. The system also displays various prices of hotels that enables the users to choose according to their pockets.

1.2 Aims and Objective: As mentioned earlier, the aim of this project is to provide services to a particular customer. The system provides services by ensuring that users can effectively make reservation in other for them to meet up with schedules or the purpose of visiting a country or state. This app goes furthre in ensuring that it provides a seamless navigation for users, so that users can enjoyably navigate various hotels and make reservation.

1.3 Tools And Technologies: This is a full stack project, therefore lots of tools and technologies were employed during its development lifecycle. Firstly the project was built with the AERN stack which is (Postgresql, Expressjs, Angularjs and Nodejs).

1.3.1 Reasons For Tools and Technologies

1.3.1a Postgresql: Postgresql is a robiurst database that has the ability to handle large chunks of data. It is a best choice for developing web application in which lots of user datas witll daily be integrated. Figuring that the app would require users to sign up, make reservations, therefore i had to use a database system that would effectively acommodate that without backlogs.

1.3.1b ExpressJs: ExpressJs is a popular backend framework offered by node js. Expressjs was used for my schema implementation. This schema was configured to communicate with my already set up database. Express js was used in this project in other to provide a seamless connection between the frontend interface and the backend implementation.

1.3.1c Angularjs: For building amazing user interfaces react takes a top chart. Angular is a frontend framework widely used for building user interfaces. It is widely acceptable and has a wide community that keeps adding new features and update in other to enable developers build their apps without having to worry about its design. Therefore angular was used to properly set up a welcoming interface that would effectively make a user always want to try it out.

1.3.1d Nodejs: Nodejs is a javascript runtime environment that has packages that developers constantly use for boh frontend and backend purposes. Nodejs offers supports to powerful frameworks like Angularjs and Expressjs which were successfully integrated and configured in

this project. Like other runtime environment, Nodejs has a faster runtime, that is once the node script is called, the server is spunned up immediately unlike some runtime that could sometimes

experience backlogs.

1.3.1e Vercel: Vercel is a production tool that is widely used for deploying frontend applications. It offers great support to javascript technologies hence the decision to use it as a production tool for deploying the project.

Further technologies/dependencies have been included in package.json file of the project which is used to deployed the project successfully to the development server and then to the production server which completes the total lifecycle of the project.

CHAPTER TWO

PROJECT ANALYSIS

2.1 Analysis Process Requirements: Analyzing the needs of users to effectively make reservations without distance constraint, brought about the development of a system that could handle such function. This system was developed as a service management system whose special aim is to help users with temporaral accommodation issue that could result from imminent relocation or placement. The tools and technologies were configured to ensure that the scope of this project was still in view at all times during development. There is of course room for advancement of the system, but currently it serves fully the intended purpose

2.2 Methodologies: Like earlier stated, the method in which the project was developed was that the frontend which contains the user interface of the project was first set up using angular, and then I went ahead to create a database, my database was not created locally so that it can effectively be used even during deployment of the system. Since VERCEL offers a POSTGRESQL database. Hence the database was integrated and configured to work effectively with my project. Then after the database setup was completed, I went on to set up my backend, which was just primarily for authentication and authorization during the navigation of the system. So that only authenticated users can effectively access the amazing features the system has to offer. A Json Web Token was fully utilized to achieve this goal of authentication by creating an access token to users which is stored at the header and access by all section of the application. The access token is retrieved and then stored in a local storage at the front-end. Each time a user signs in, an access token is generated for the user. The uniform remote locator provided by express js is fed into the front-end using an Axios. Axios is a technology that is used to intercept the request from the backend of an application. Once Axios hits the link from the backend, a payload is then sent as a request to the backend and then the backend sends a response which is also a form of payload. This way the backend and frontend can effectively communicate and sharing of contents or files from the backend to the frontend can effectively be achieved.

2.3 Choices Made In Technologies: Before the development, research was made, this research was the reason for the choices reached especially as regards database. Choice of a good database is always key because a wrong choice of database can lead to data loss, mismatched data or even breaching of data privacy. Postgresql like other relational Database provides a convenient way in which only authenticated users can have access to their data saved on the database. In terms of choosing a framework, what was considered was a user friendly app that everyone can easily welcome, and making this choice has to do greatly with how the user interface is being configured, and for the backend implementation, a framework that integrates nicely with angularjs, since react is a framework written in JavaScript, Express.js is also of its kind. Therefore, all these was greatly considered while developing the system.

CHAPTER THREE

DESIGN OF SYSTEM

3.1 The archetecture of a hotel booking system is a critical aspect of its design impacting its scalability, performance, security and maintainability. By adopting suitable architectural practices, employing scalable technologies and implementing robourst security measure, this system therefore provides a seamless and secure booking experience for users while meeting the business requirements of the organization. The architecture of this booking system typically comprises of multiple layes and component, each serving a diferent purpose in the system functionality. Therefore the breakdown of this architecture is as follows:

3.1.1 The Presentation Layer: This layer is responsible for handling users interactions and displaying the users interface, user input is collected and processed before being sent to the next layer

3.1.2 The Application Layer: The application layer contains the business logic of the hotel booking system. It processes user request, coordinates actions between different components and enforces business rules.

3.1.3 Data Access Layer: This layer handles interactions with the underlying data storage systems, it includes component responsible for querying, updating and managing data stored in database. Object oriented mapping(ORM) or direct database access methods are used to interact with the database.

3.1.4 Integration Layer: The integration layer facilitates communication between different intenal and external systems. It may include API calls, messages or queues or other integration mechanism to exchange data with external services like the payment gateways, third party booking platform or internal system like inventory management.

3.1.5 Microservices: The system is broken down into smaller independently deployable services, each responsible for a specific function. This architecture promotes flexibility and allows team to work on different services simultanously.

3.1.6 User Authentication and Authorization: It manages users account, authentication and authorization using the Json web token, this ensures that only authorize users can perform certain actions like making bookings and accessing sensitive information.

3.1.7 Payment Process: Integrate with payment gateways to process payments securely, and it also handles payment authorization, capture and refunds

3.2 Class Diagram of Hotel Management System

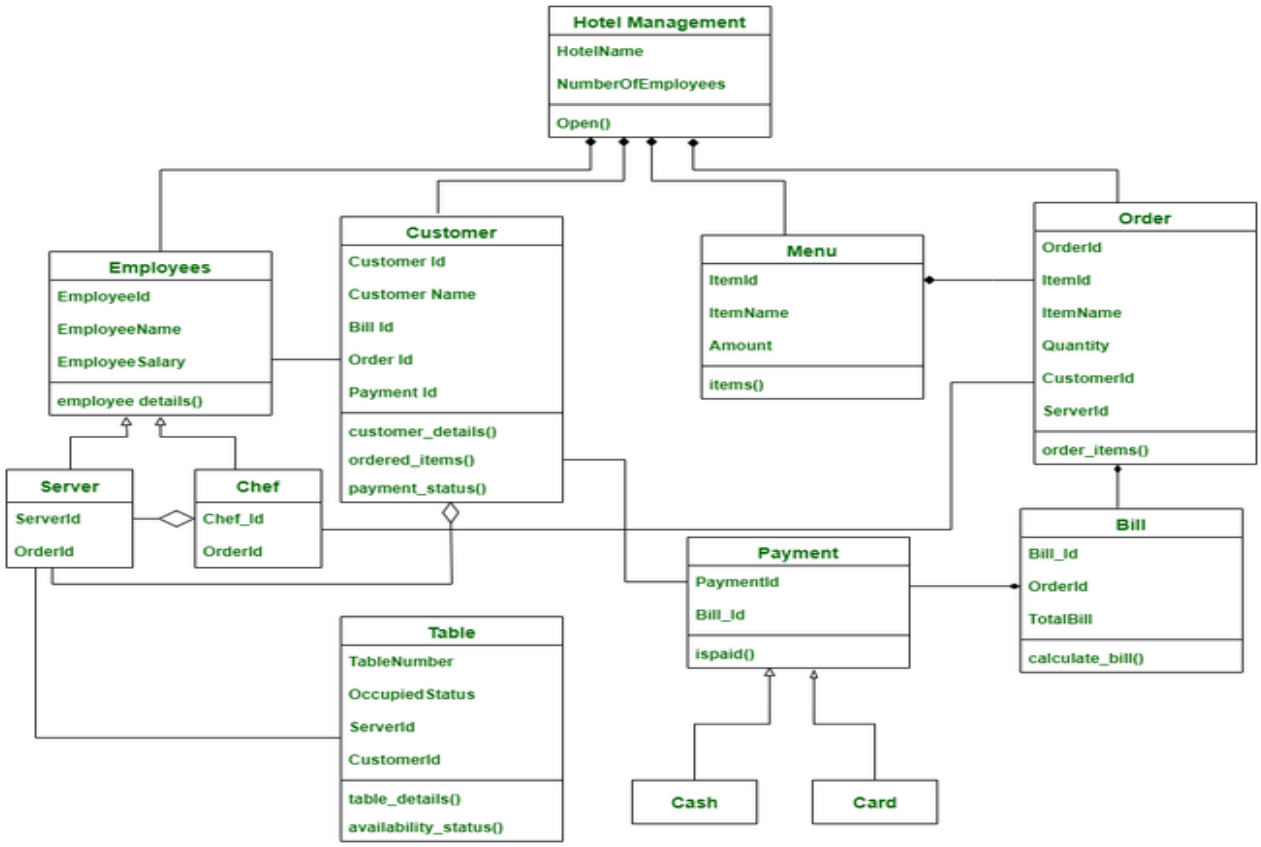

Fig1.0 Class Diagram of Hotel Management System

CHAPTER FOUR

IMPLEMENTATION

4.1 Implementation Process: The technologies were carefully selected after which i set up the framework for both the frontend and the backend. Before the frameworks were set up, i first

made i had the command line(CLI) of both frameworks since i will working at length on the shell. I installed the angular cli using the “npm i angular-cli" and also set up the expressjs using the node package manager. Both were contained in seperate folders and they were duely labelled Frontend which represents the frontend client side and backend which represents the backend server side. After this step was completed, i went ahead to set up my database. As earlier stated, i used the vercel postgresql since the scope of project instructed a cloud database was to be implemented. Then the next stage was to set up my schema for each models. After that was done, i began configuring each relevant file of my project, in this process i had to install lots of dependecies and libraries which was duly utilized. After the oproject was ready, I deployed to development server using the ng serve for angularjs and npm run dev for expressjs. I also handled authentication and authorization by using the Json Web Token (JWT) which was fully implemented on the backend which led to the generating of an access token that that was sent to the frontend. This access token ensures that only authorized users can have access into the system.

4.2 Challenges Faced During Implementation: During the total software development life cycle of this full stack service system, lots of challenges were encountered. Below shows the list of challenges and how i was able to overcome them.

4.2.1 Choice of technology: There are tons of stacks out there, but some of these stacks can barely finish a development as you would want it. Hence this became a challenge to me because i had to research deeply some of the technologies i thought about. I wrote them on a paper and began to know how each technology would fit into the project at hand, of all the technologies, angular js and expressjs really stood out

4.2.2 Database Communication: This was a small but yet big challenge, the challenge in configuring a cloud database is in a developer’s ability to be meticulous in getting every detail in that connection string. A connection string contains the following:

4.2.2a Name of Database

4.2.2b User name of Database

4.2.2c Password of Database

4.2.2d Hostname of Database(This is usually the cloud server host name)

4.2.2e Port(This determines what port number the database should listen to whenever there is an inbound request, if the port number is not correctly stated, the request will be blocked by the database server, this security measures ensures that data integrity is also considered thereby allowing onl authenticated users to have access to the database.

CHAPTER FIVE

CONCLUSION

5.1 In summary, a hotel booking management system is a digital platform designed to streamline the process of reserving accommodations. It typically includes features such as room avaliability, tracking, online booking capabilities, guest profile management, payment processing, and reservation modification or cancellation. These systems aim to improve efficiency for both hotel staff and guest, providing a seamless experience from booking to check-out. It was an interesting project and i am really thankful to the organizers for this challenging yet fun project. During the period of this project, my skills were enhanced as i got familiar with lots of technologies and framework that greatly impacted

5.2 Recommendation: Based on the hands on experience i gained by being a full participator of the total software development lifecycle of this project, i therefore recommend this project as a great start off for any aspiring developer because the project would not just open such developer to great tools and technology, but it will also let the aspiring developer to know what it really feels like undertaking a full software development project. Therefore i thank the team that i worked with as collaborators in this project, i thank my parents for their full supports especially financially, and lastly i thank God once more for making me a part of this great project. I seek to enjoy the impact this project has given me both in this institution and beyond.

5.3 Future Advancement: In the coming future we aim to enhance our hotel booking management system by implementing advanced AI-driven personalization features. By leveraging machine learning algorithms, we will provide guests with tailored recommendations a offers based on their preferences and past interactions. This will not only elevate the guest experience but also drive increased engagement and loyalty. Additionally, we plan to integrate seamless communication channels, enabling real time interactions between guests and staff to ensure prompt assistance and superior service delivery