An Undergraduate Internship/Project on Restaurant Management System

By

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Spring, 2021

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June 16, 2021

Dissertation submitted in partial fulfillment for the degree of Bachelor of Science in Computer Science

Department of Computer Science & Engineering

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Attestation

This is to certify that the report is completed by me, Ahsan Sadman Khan (1730451), submitted in partial fulfillment of the requirement for the Degree of Computer Science and Engineering from Independent University,Bangladesh (IUB). It has been completed under the guidance of Md. Asif Bin Khaled. I also certify that all my work is genuine which I have learned during my Internship. All the sources of information used in this project and report has been duly acknowledged in it.

Ahsan	June 16, 2021
Signature	Date
Ahsan Sadman Khan	
Name	

Acknowledgement

I take this opportunity to express my gratitude to the people who have been instrumental in the successful completion of this report. Any report's success depends heavily on the encouragement and guidelines of many individuals. I would like to express my gratitude to my internship supervisor Md. Asif Bin Khaled for providing me the report with clear guidelines and instructions throughout my internship program. Without his help, suggestion and cooperation, this report would not have been completed successfully.

Moreover, I feel fortunate to have the opportunity to work at Ferntech Solution as a Software Developer. I am grateful to Nibras Abdullah Karim (CEO) along with other members from Ferntech Solutions who acted as a mentor to complete my regular task and provided me with valuable information regarding this report.

Finally, I am grateful to Independent University, Bangladesh (IUB), for providing this knowledgeable and wonderful internship experience as a platform.

Letter of Transmittal

20 January,2021
Md.Asif Bin Khaled
Lecturer,
Department of Computer Science and Engineering,
Independent University, Bangladesh

Subject: Letter of Transmittal for Internship Report, Spring 2021

It's my great pleasure to place my Internship report for your kind approval. I, Ahsan Sadman Khan, from Spring 2021, Section 10, have completed my Internship Program and its report. I completed my internship at Ferntech Solutions, which started on 22nd February of 2021. This report contains my experience and work in the company. It is my immense pleasure to presenting you my experience in all the different technology related fields of the company, including research and development, content writing, documentation, designing, software development and also to get acquainted with software development processes and practices.

I hope, this report will reflect my learning and the work i did during the internship program. I also pray and hope that you will find it in order.

Sincerely,
Ahsan Sadman Khan

Evaluation Committee

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Signature

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Name

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Supervisor

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Internal Examiner

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External Examiner

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Convener

Abstract

The experienced i gathered from the internship program conducted at Ferntech Solutions is written in this report. Ferntech Solutions is a Bangladesh based Tech company offering solutions by using technology as just a platform to mobilize the world around us. Ferntech offer's products and solutions to enhance not just businesses but also assist in improving your daily activities. Main services provided by Ferntech solutions are:- Artificial Intelligence, Intelligent Automation, Robotic Process Automation, Software Solutions, Industry 4.0 Consultancy.

I was selected at Ferntech Solution as a web developer to build them a Restaurant Management System which which will complete my internship program as a web developer under the company. The aim of the project was to develop a system which will be a dyanamic moduler based fully customizable system which can be integrated with any restaurant. The system will allow a restaurant to transform their services into a digital platform where customers will be able to order directly from their website. It will also allow the restaurant to monitor and manage their internal system, update and track their inventory system.

Before working on any project, I had to gather initial requirements for the system and submit an action plan for the restaurant management system which consists a documentation of all the functionalities the system will have after development.

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Chapter 1

Introduction

1.1 Overview

All the restaurant currently providing are still using physical labor and interactions to manage the overall system of the restaurant rather than implementing a digital system which can make the processes faster, easier and efficient. Although people are more comfortable and used to physical interactions this pandemic has taught us that sometimes we need to live by with as little physical interactions as possible while still going out. This has made us realize and directed is to take a new approach.
Nowadays, people are opting for more online services than ever. Applications like foodpanda, shohoz food, uber eats are one of the most used services in the country. This shows us that people are now slowly moving to the digital era by using these services.
Ferntech solutions has partnered with Raaga Art Café, a newly opened restaurant located in Uttara to build a fully web based system for their restaurant which will help them manage their internal management system, inventory system, vendor management system and also fully transform their restaurant into a online system where customers can directly interact with the restaurant for services avoiding the physical interactions.

1.2 Objectives

The main objective of this project is to allow a restaurant to transform their services into a digital platform where customers can create their account and directly place their order for the restaurant using the platform. It will give the customers to choose their menu, book a reservation, place order and select their preferred seating arrangement. It will also give customer the opportunity to pay their bill directly from online gateway services. It will also allow the restaurant to manage their internal system, update and track their inventory system.

1.3 Scopes

Features available to the user after the development of this web application:

1. Landing Page – The first page the user will see after visiting the website and choose their preferred dinning category such as – indoor or outdoor
2. Menu page – This page will display all the menu of the selected category and provide user to click a dish and add it to their cart.
3. Cart Page – This page will show user all the items in their cart and ask for their credentials and necessary information's to place and confirm their order.
4. Order page – This page will be only accessed by restaurant staffs who have been given permission to view all the orders currently places and their status.
5. Kitchen Page – This page will only be accessed by kitchen staffs to view each orders placed with each items in detailed preference of the customer.
6. Admin Page - This page will only be accessed by the admin to manage and track the system.

Chapter 2

Literature Review

2.1 Relationship with Undergraduate Studies

CSE 203, Data Structures: This is the most fundamental course that helped me understand the concepts of many data structures and their implementations, allowing me to write logic and functions for my projects. Queue, Priority Queue and Stack, were some of the terms I learned. In my projects, I learned how to design and implement smart sorting and searching algorithms, as well as graphs.
CSE 213, Object-Oriented Programming: The majority of data in the developing world is interpreted as an object. This course has aided me in gaining a thorough understanding of object-oriented programming. In object-oriented programming, I learned modularity and abstraction design concepts and patterns. Classes, Objects, constructors, composition,abstract data types, inheritance, overloading, function chaining and polymorphism were some of the concepts I learned.
CSE 303, Database Management: This course taught me one the most important aspects of programming which is how to design a database and how to manage it. It covered popular planning and strategy practices such as System Development Life Cycle, Rich Picture, Requirement Analysis, Entity Relationship Diagram, Business Process Model and Notation Diagram, and many more.
CSE 307, System Analysis and Design: learned about the methods and techniques used for the design and analysis of information systems in this course, which I had previously learned about in CSE 303. I learned how to evaluate a system and the various life cycle models for system growth. I learned object-oriented analysis techniques such as unified modeling vocabulary and use-case modeling. I also learned how to perform a system's feasibility analysis and formal analysis.
CSE 309, Web Application and Internet: This is the course where the development of web applications was taught. It covered very important technologies that are highly in demand in the industry, such as HTML, CSS, JavaScript, jQuery, View Engines(Handlebars

and embedded JavaScript), Node.js, Express.js, MongoDB.

2.2 Related works

1. Pizza Hut – Pizza Hut is a renowned restaurant in Dhaka who provide online ordering system through their website. The website provides all the details of their outlets, their locations and their various deals. It allows user to find their location via the website and show outlets near them from where users can order their food items. All the deals and menu items are shown from their nearest outlets to users. It allows users to add items to their cart. Register and verify their accounts with the restaurant. It also provides online payment gateway system to the users so that users can pat the bill for their food.

2. Yum Cha District – Yam cha District is a restaurant located in Banani. Their website allows users to learn about the restaurants details, locations and their service hours. Users can also see the menu from the website. The menu items are are shown with their image, title and their price.

Chapter 3

Project Management & Financing

3.1 Work Breakdown Structure

The work breakdown structure (WBS) is a method that breaks a project down into a hierarchy of deliverables, tasks, and sub-tasks. For our project we used the work break down structure in project management because WBS visually defines manageable chunks of a project so that our team can understand, as each part of the work breakdown structure gives further detail. In our WBS, we have used the top-down approach.

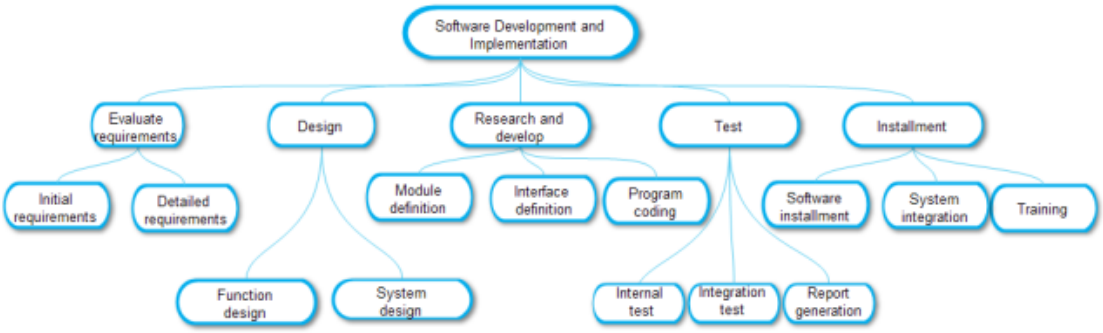

Figure 3.1: Work breakdown structure

3.2 Process/Activity wise Time Distribution

For each of sub-tasks mentioned in the Work Breakdown Structure time was allocated so that the project completed in the given timeline. This table below shows the time allocations and work percentage of the sub-tasks for the project.

Task	Days	Work Percentage
Evaluate Requirements	5	5
Design	7	25
Research and Develop	10	50
Test	14	15
Installment	3	5

Table 3.1: Process/Activity wise Resource & Time Allocation

3.3 Gantt Chart

The Gantt Chart was used to plan and schedule all the activities that were needed to be done to complete the project successfully in the given timeline.

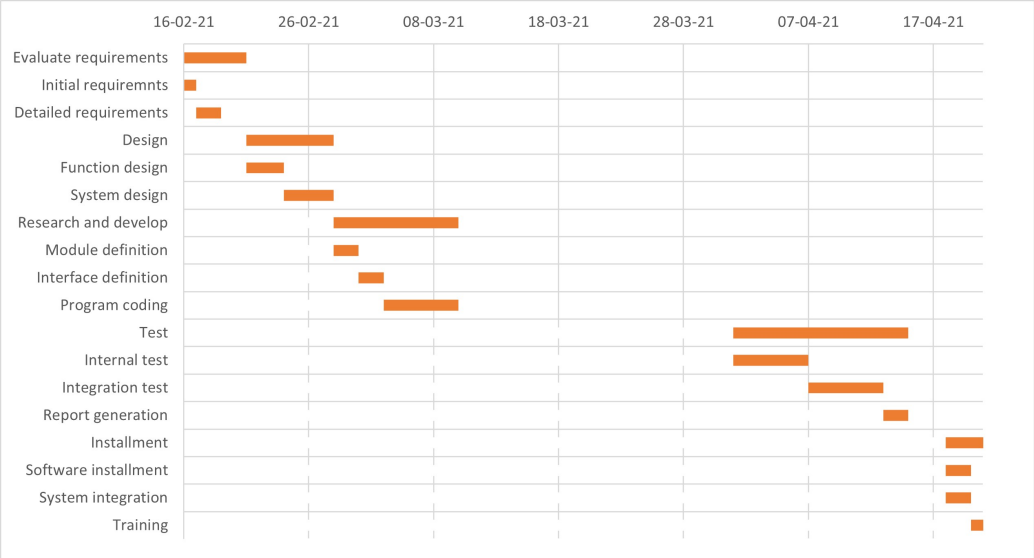

Figure 3.2: Gantt chart

3.4 Estimated Costing

The cost was calculated based one features the client demanded for the web applications. The key dependencies were the size, requirements, features, functionalities, and design of the web application. It includes building the design layout of the website, making the system fully dynamic to have a adaptive capability, social media connections through api's, SSLCOMMERZ integration for online payment service and many other tools that were used to build the web application. The cost of developer and resources used were also taken into account. The approximate cost estimated was Tk.2,50,000.

Work Distribution	Costing
Web application Development	1,50,000
Domain and Hosting	50,000
Salary	50,000
Total	2,50,000

Table 3.2: Estimated costing

Chapter 4

Methodology

A web application, unlike computer-based software programs that run locally on the device's operating system (OS), is software that runs on a web server. The user uses a web browser with an active network link to access web applications.

The Scrum technique was used in the project development process for our project. Agile is an iterative process in which each unit of work should be completed in a limited amount of time (a couple of weeks is ideal). At the end of each iteration, the aim is to provide working functionality to the customer. And, after getting customer input, items are tweaked for the next version.

Each of these iterations is referred to as a sprint in Scrum. This is the most important principle in Scrum. Sprints are typically based on the backlog, which is a prioritized list of specifications provided by the product owner. Throughout the life of a project, the backlog may change.

A sprint preparation meeting is held after the backlog is formed to schedule the work to be completed during a sprint. The backlog is dissected and divided into logical units, which are distributed among development team members. To minimize the probability of changes in requirements or priorities, a sprint should last no more than one month.

The Scrum master's job is to ensure that everyone on the team is focused and understands their position. A regular Scrum, which is essentially a 15-minute standup meeting to rapidly review current progress and answer any questions, is normally held after the sprint has begun.

The sprint analysis and sprint retrospective periods occur at the conclusion of a sprint and before the start of the next sprint. The first is more concerned with the client, while the other is more concerned with the production team.

The Scrum team meets with the product owner and any stakeholders during the sprint review to determine which backlog things have been completed and which are still outstanding. The backlog and goals for the next sprint are normally changed based on the team's success and exchange of ideas.

The Scrum team then meets to discuss the previous sprint's strengths and challenges,

and to use the knowledge to adjust and develop the work methodology for the next sprint.

Chapter 5

Body of the Project

5.1 Work Description

Raaga web application is a project under Ferntech Solutions which is a restaurant management software for Raaga Art Café located in Uttara. But the system was built with dynamic capability being the core requirement so that it can be integrated with any restaurant to allow a restaurant to transform their services into a digital platform where customers can create their account and directly place their order for the restaurant using the platform. The restaurant module will give the customers to choose their menu based on categories, book a reservation, select their preferred seating arrangement for dine in or opt for delivery service, place order and check out. The application also gives customer the opportunity to pay their bill directly from online gateway services. The system allows the admin to control permission and authorizations for the staffs to restrict their access to the system. The staffs such as chefs to see only the ordered dish/items specific to their kitchen (incase a restaurant has multiple kitchens) and mark a dish/item prepared once it is prepared and update the system. The waiters can see the prepared dish/items, from which kitchen to pick the order from and to which customer and their table no. the order to deliver to. The inventory module allows the restaurant to manage their internal system, track their inventory. One of the key capabilities of the system is that the system automatically deducts the raw materials used to make an order and updates the inventory. My job was to build the entire backend system of the web. application.

5.2 System Analysis

5.2.1 Six Element Analysis

Process	Human	Non-computing hardware	Computing Hardware	Software	Database	Communication/Network
Add resource	Admin		Computer	Web Browser	Rdbms	Lan/Wan
Manage Resource	Admin		Computer	Web Browser	Rdbms	Lan/Wan
Update resource	Admin		Computer	Web Browser	Rdbms	Lan/Wan
Delete Resource	Admin		Computer	Web Browser	Rdbms	Lan/Wan
Place Order	Waiter Customer		Computer	Web Browser	Rdbms	Lan/Wan
Update Order	Chef Cashier		Computer	Web Browser	Rdbms	Lan/Wan
Book Reservation	Customer		Computer	Web Browser	Rdbms	Lan/Wan

Table 5.1: Six element analysis

5.2.2 Feasibility Analysis

A feasibility analysis evaluates the project's potential for success; therefore, perceived objectivity is an essential factor in the credibility of the study for potential investors and lending institutions. It decides whether the project is morally, theoretically, economically viable, and whether it is worth investing in the project. Five feasibility studies are considered for this project: -

1. Technical Feasibility: Ferntech Solutions is a very known and established company and they have worked with some of the biggest names in the industry to provide them service such as Robotic process automations, building web applications, integration of AI with systems. All the hardware, software, and other technical requirements needed to complete this project are available making this project technically feasible.

2. Economic Feasibility: The cost and benefits of this website have been considered in this section. The website does not contain any hidden costs for user instead it makes it users to order the food directly from the restaurant website, book reservation, choose their seating arrangements which is the main attraction of the system as it being the only application providing these services. The restaurant aims to profit by adapting with ongoing pandemic while providing delivery service to customer through this web application as indoor dine ins are restricted.

3. Feasibility: All the legal constraints have been considered before proceeding with this project which includes data protection acts, social media laws, or zoning laws so that it does not face any legal constraints in the future.

4. Operational Feasibility: The ongoing pandemic and economic situation make the web-site very feasible as it is now very risky to physically go and dine in restaurant. With the help of this website, customers can order the food directly from the restaurant rather than other food delivery applications which attracts customers to the website as all customers want the restaurants to provide delivery services.

5. Scheduling Feasibility: To make a project successful, it is very important to complete a project at the promised timeline. The project is already operational with all the modules with only one developing module in the project pipeline. It will be completed ahead of project timeline.

5.2.3 Problem Solution Analysis

There were a number of problems that were encountered while completing the project and they were solved accordingly. Some of the problems were:-

1. Systems dynamic capability: As the system's main core requirement expected the system to be fully dynamic and customizable, the problem arose how to fulfill this requirement. This problem was solved by moving the entire database from NOSQL to RDBMS. As relational databased provide the relationships among the models of the system, using the relationships the system was made to dynamic so that it can adapt to any restaurants requirements with only minor changes to the system.

2. Updating the views: This problem was faced while building the fronted of the system. As there are multiple views of a same model with different access controls for different staff users, the system required the views to update with every post request to the server. This problem was solved by setting a time interval in the views to refresh so that with every refresh the views get updated the updated data from the system.

5.2.4 Effect and Constraints Analysis

This website helps the customers to know about the true essence of the restaurant is. Customers can choose their menu, book a reservation, place order and select their preferred seating arrangement and order their food for delivery. Throughout this pandemic customer are no longer reluctant to order their food from restaurant to their doorstep. As being the restaurant own application customer will be encouraged to order from their restaurant's app rather than a third party delivery services. This will not only make customer's lives easier but will also be a big advantage during the ongoing pandemic.

5.3 System Design

5.3.1 Rich Picture

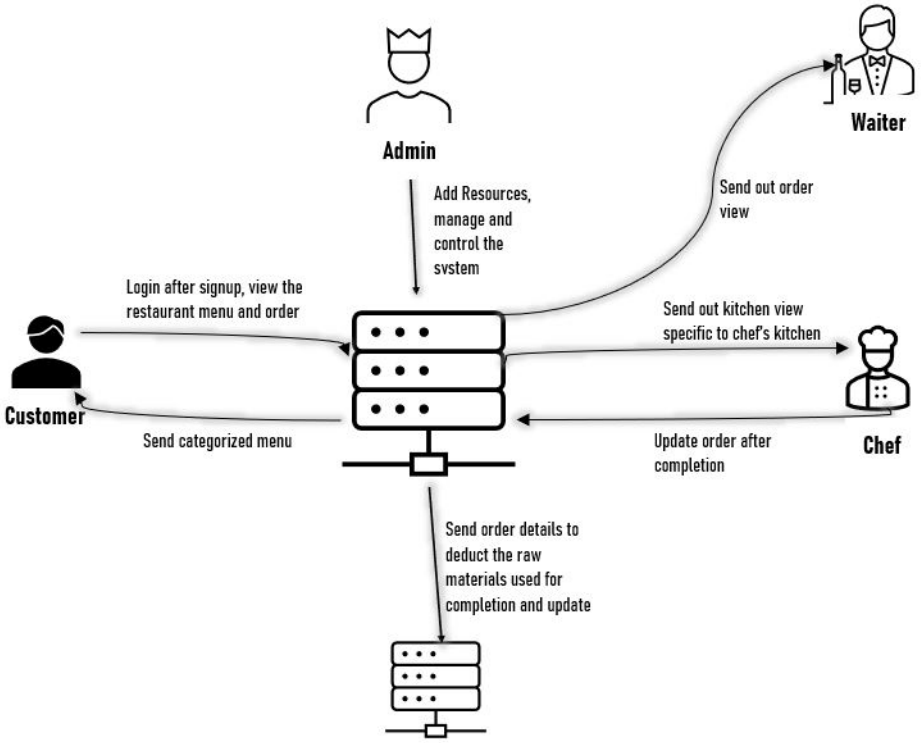

Figure 5.1: Rich picture

5.3.2 UML Diagrams

The activity diagram is an important UML diagram that shows the flow of one activity to another. The activity diagram of the customer, admin, chef, waiter are given to help visualize the flow of their activity in graphical form.

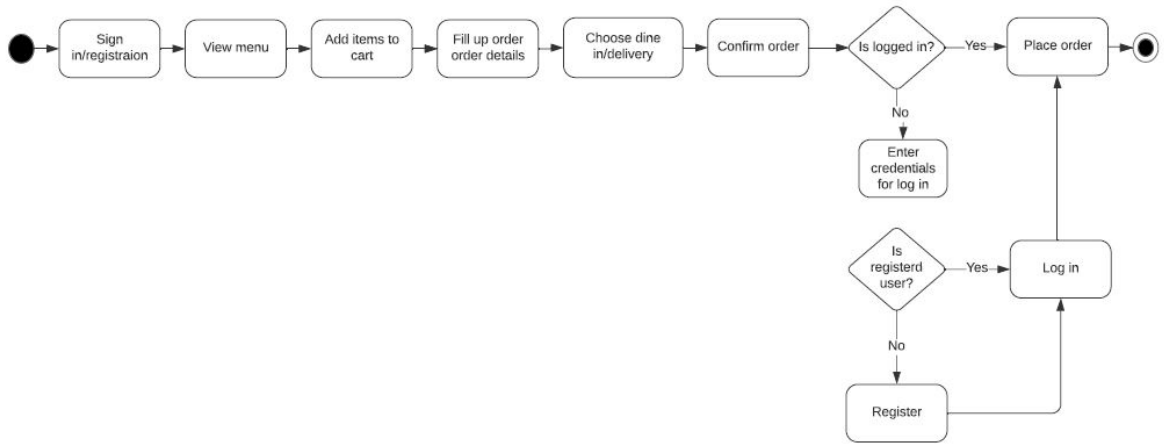

Figure 5.2: Activity diagram of Customer

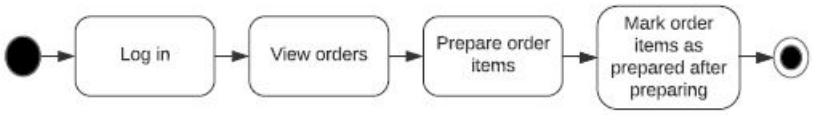

Figure 5.3: Activity diagram of Chef

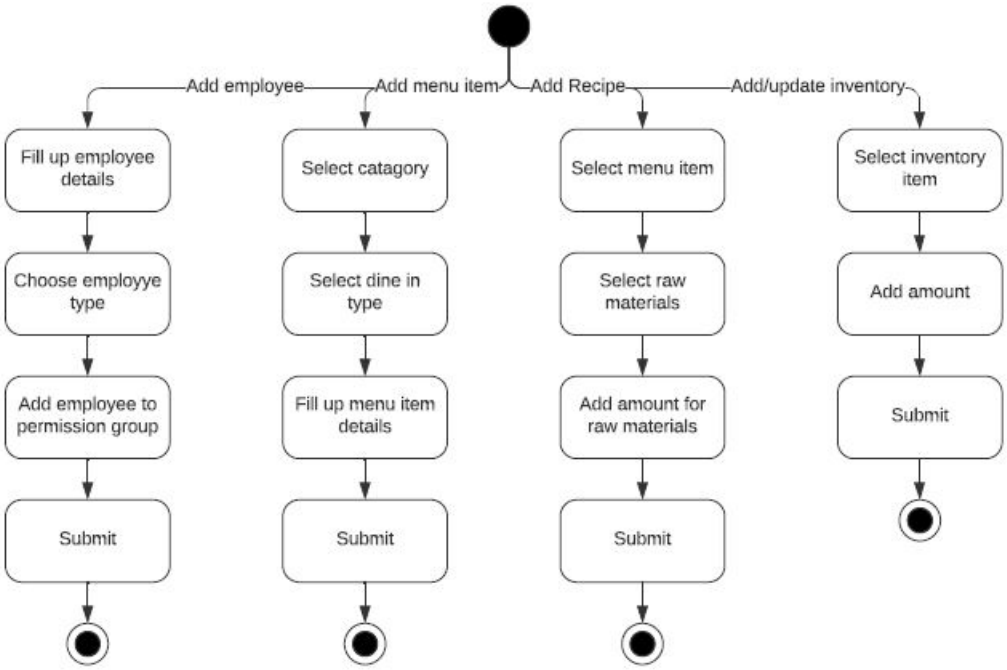

Figure 5.4: Activity diagram of Admin

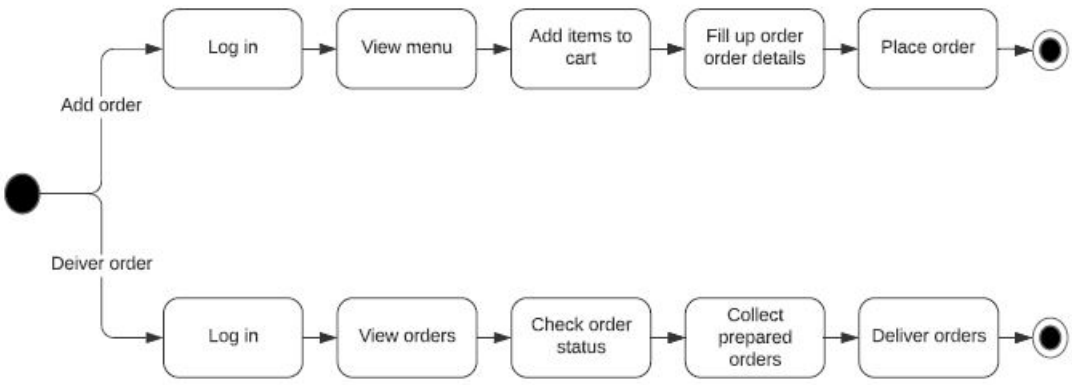

Figure 5.5: Activity diagram of Waiter

Use case diagram: The use case diagram represents the functional requirements of the system. It shows the actors, cases, communication links, system and relationship.

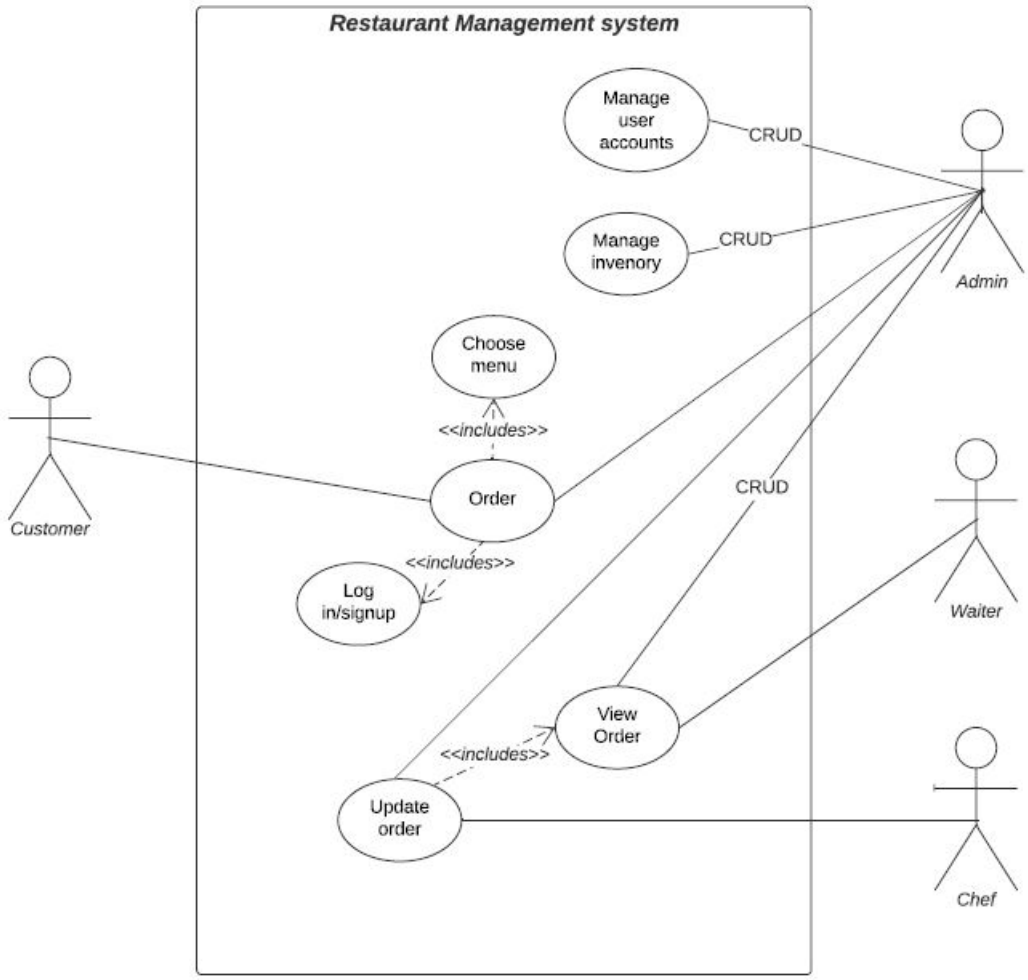

Figure 5.6: Use case diagram

5.3.3 Functional and Non-Functional Requirements

Functional Requirements

Function: Ordering the desired food		
Input: Select category, view menu, select food items, full out order details	Process: Visit the website	Output: Order placed
Precondition: User must have an active internet connect		

Table 5.2: Functional requirement of ordering food

Function: Customer registration		
Input: Fill out registration details or sing in via Facebook or Google	Process: Registering as a customer	Output: Successfully registered
Precondition: User must have a Facebook or Google account in case social login		
Postcondition: System collects user data from Facebook or Google and registers user as a customer		

Table 5.3: Functional requirement of customer registration

Function: View and update orders		
Input: Employee credentials	Process: Visit the order page	Output: View pending orders
Precondition: User must be logged in as an authorized employee account		
Postcondition: Remove the order from the view and update the inventory system as an order is prepared		

Table 5.4: Functional requirement of view and update orders

Non-Functional Requirements

1. Performance and Scalability: Response time of this system is quite instance you don't have to wait for too long. The login process is very smooth and logs in to one's account instantly, user's can also opt for social login like Facebook or Google. Other functions like updating profile ordering, updating orders are also very fast and smooth. The site is responsive for every device. It can be accessed from phone, tablet or laptop without compromising any function.

2. Portability and Compatibility: High end devices or equipment is not required. Any web browser can be used to access this website to access the system but internet access is must. The website is compatible with phone, tablet, laptop and desktop. It runs on any types of browser or operating system.

3. Reliability, availability and maintainability: The system has gone through several performance tests and based on test result it can be said that system will run smoothly for a long time. The maintenance is also easy, system has backups so when the main system goes under maintenance backup up system can be used.

4. Security: Account credential is saved into the database securely. Password of each user's account is encrypted and then saved to database. Only user can view his/her own profile. Every view of system is integrated with authentication and authorization. So a authenticate user cannot view a page if the user is not authorized.

5. Usability: This system is very user friendly and easy to navigate.

5.4 Product Features

5.4.1 Input

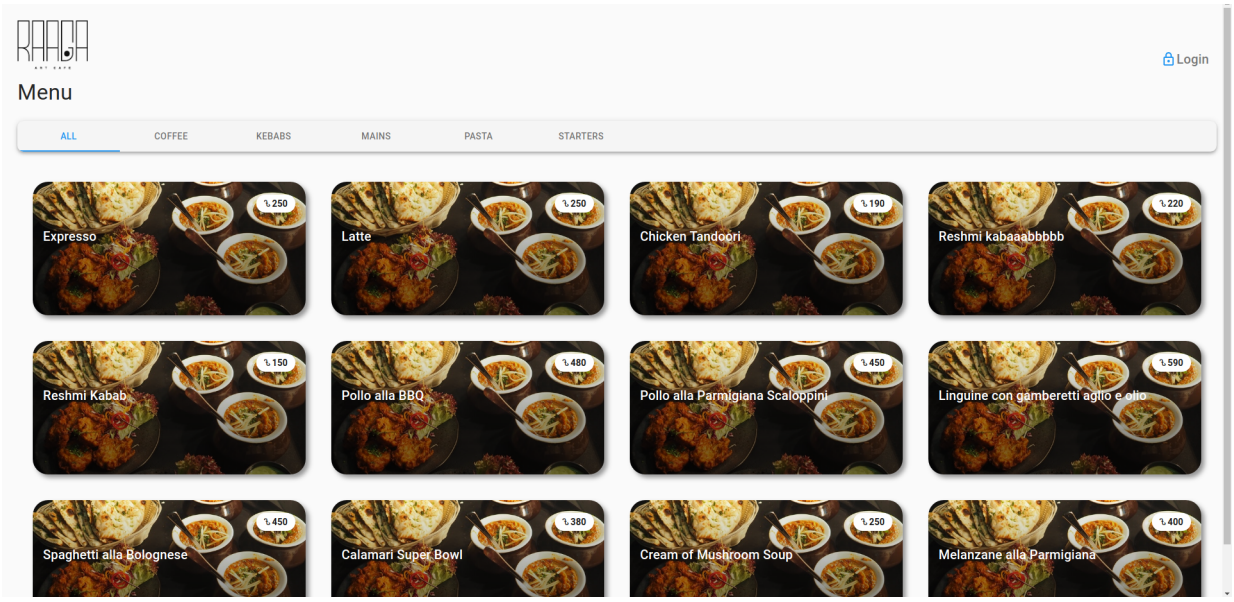

Figure 5.7: Menu input

This is the menu page which is shown when a user visits the page with all the categorized menu items. The user can click on the menu items to add them to his cart, customize his amount for a certain menu item and place order.

5.4.2 Output

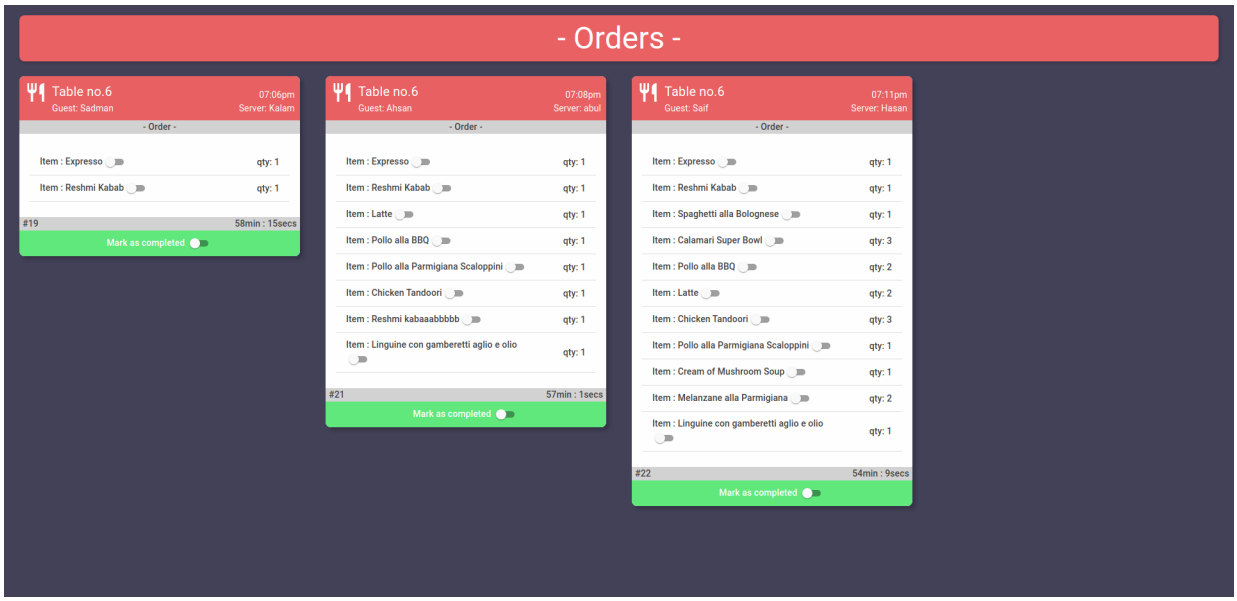

Figure 5.8: Order output

The order is placed with the menu items the user selects from the menu page and is then added to the order list of the order page.

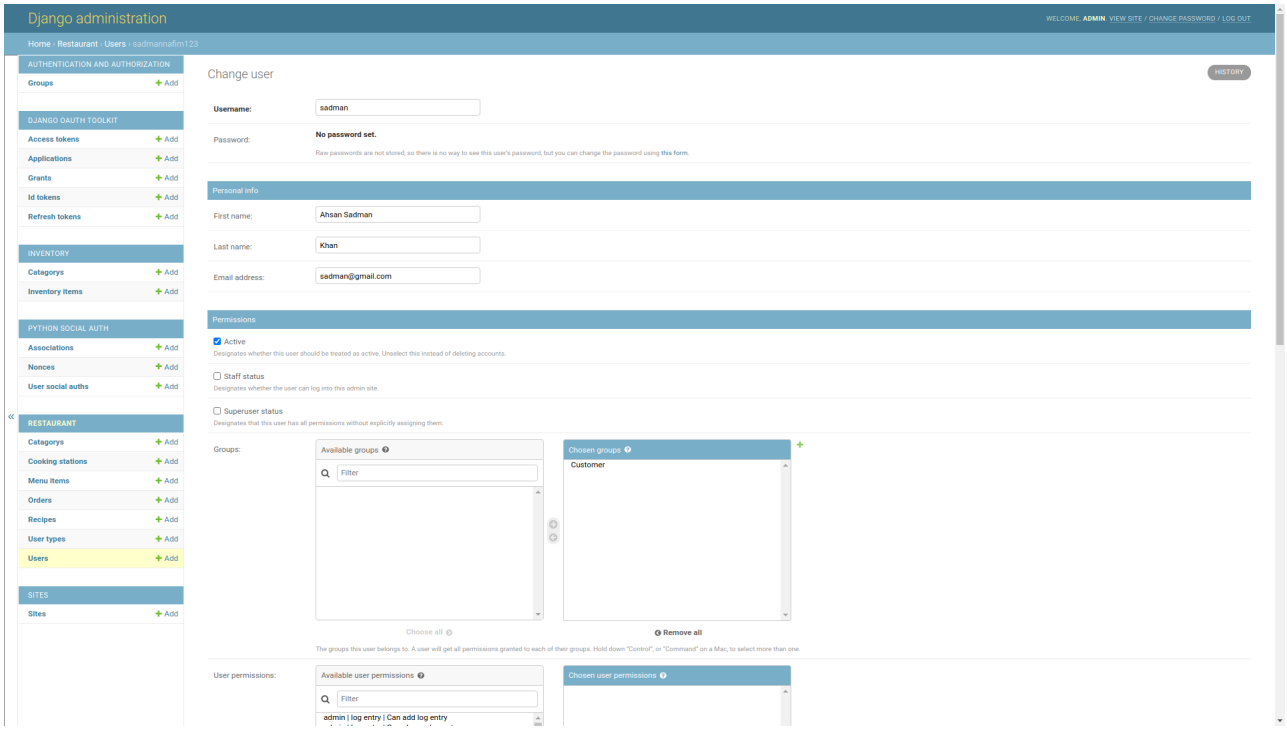

Figure 5.9: User output 1

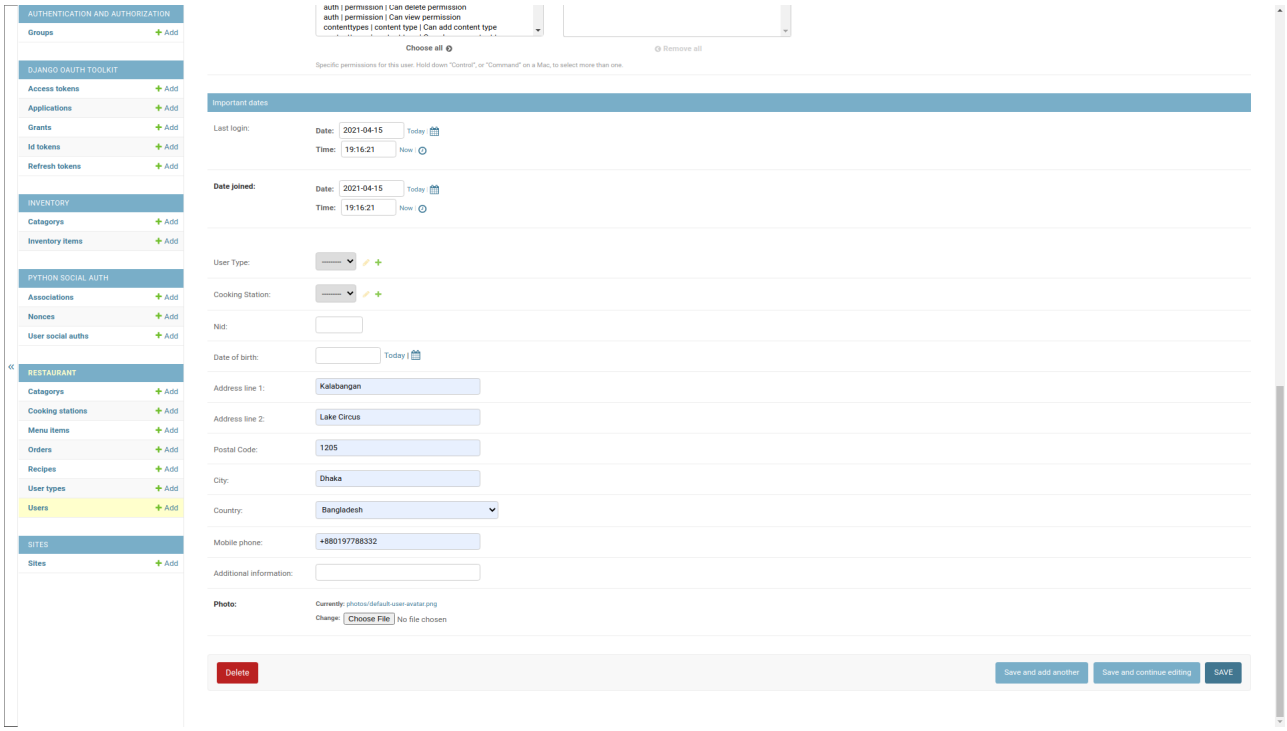

Figure 5.10: User output 2

These the user information which gets stored to system when a user registration is done or the information is collected from social provider when a user logs in via Facebook or Google which is only accessible by users who have admin access.

5.4.3 Architecture

Software architecture is a series of decisions which are based on a wide range of factors which are used in the process of software development. It is a structure that provides the systemic qualities such as modifiability, security, performance, traceability and availability. It also serves like a communication vehicle for the stakeholders. Software architecture is foundation upon which a system is built. Once a software architecture is put in place in a software development, altering them can be hugely expensive and time consuming. Therefore, every decision taken, have a huge impact on satisfying the requirements of the project given the constraints. For this project the MVC software architectural pattern was used.

MVC- Model View Controller pattern

Model view controller is a software design pattern that can be used in a variety of frameworks and programming languages, such as Python, PHP, Ruby, JavaScript, and others. It is the most widely used programming language for creating web and mobile applications. The model view controller is an architectural pattern that divides an application into three logical components:

1. Model
2. View
3. Controller

This method distinguishes between internal data representations and how data is presented to clients. This model view controller architecture is now supported by almost all common programming languages and is used in a wide variety of simple and complex web applications.

Components of MVC

Model: In the server-side of the application, the model is the most important part of the architectural pattern. It is independent of the user interface and holds the application's dynamic data structure. It manages the data, logic, and rules of the system and stores the data structure.

View: A view is a graphical representation of data that is stored in a system's model. The view displays model data to the user in a specific format, such as a map, diagram, table, or types. The view includes all functionality that communicates directly with the user, such as pressing a button.

Controller: The controller is the application's brain. It is linked to the view and model. The controller sits between the view and the model, controlling the application's

various operations. It serves as a connector between the model and view components, processing all logic, performing CRUD operations (create, retrieve, update, and remove data in the model) and incoming requests, manipulating data with the Model component, and interacting with the views to make the final performance.

The controller takes input from the application's view, converts it to demand for the model using logic implemented in the controller, the model then fetches data from the database and transfers it to the controller, who then passes the data received from the model back to view for the user to see in a graphical interface.

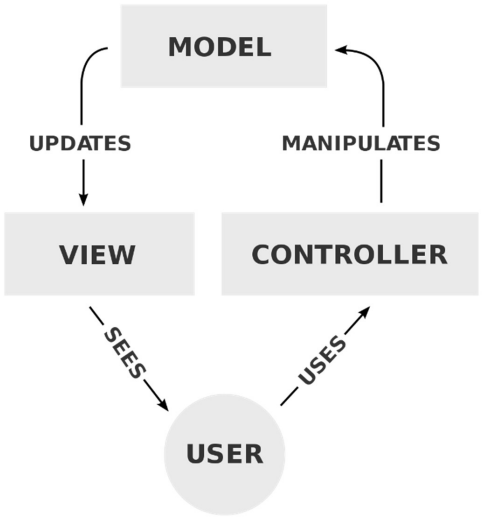

Figure 5.11: MVC architecture

Chapter 6

Results & Analysis

This chapter contains screenshots of the application so that it can be seen what the portal looks like.

Landing Page - This is the page a user is shown when they first visit the website. User can sign in via their account or their social account such as Facebook and Google. They can also continue as a guest.

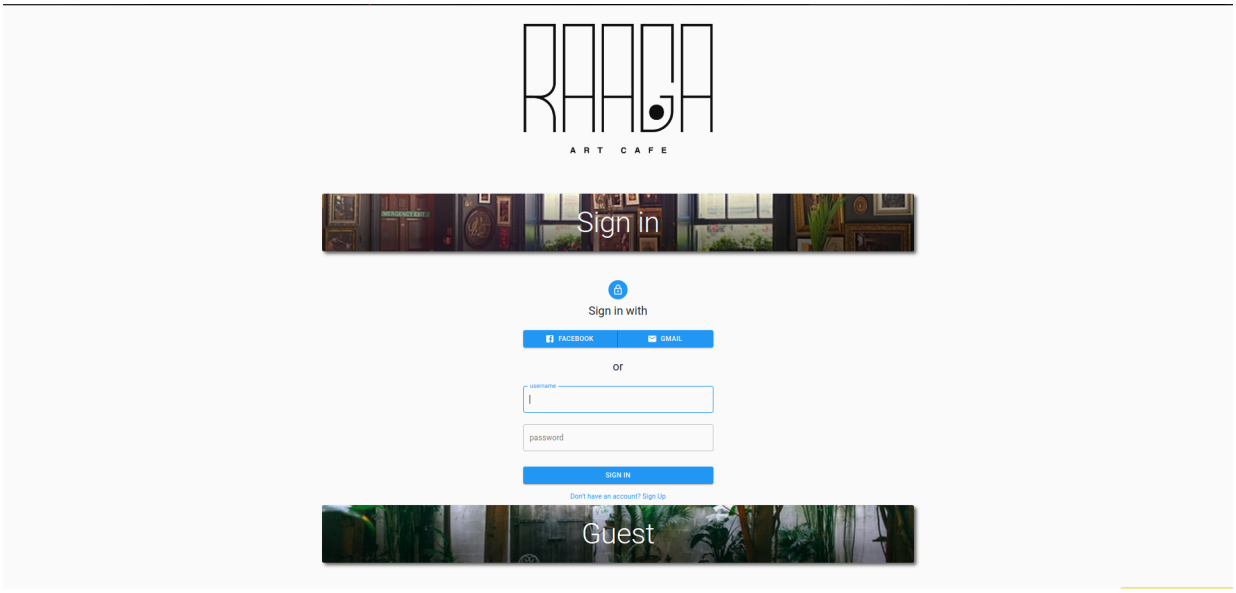

Figure 6.1: Sign in view

Menu Page - The menu page with contains all the menu items of the restaurant in catagorized order. The user can click on the menu items and add them to their cart.

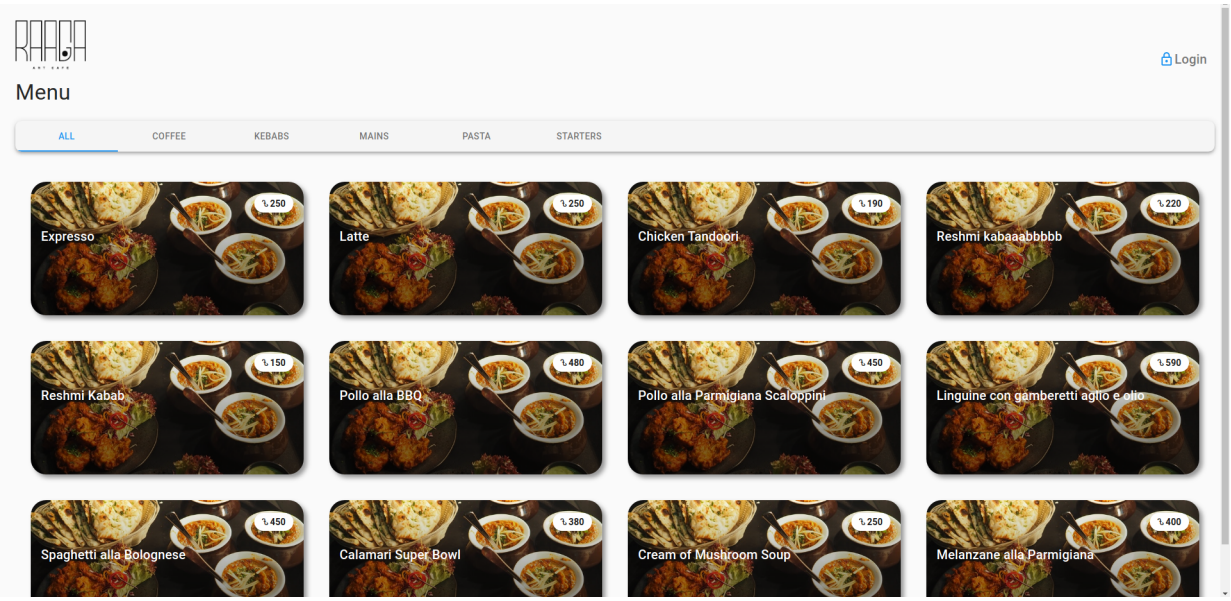

Figure 6.2: Menu view

Order Dashboard - This is the order dashboad when all the order page links of each order page are given. This page and all the linked order pages are only accessible by staffs who have the right authorization.

Figure 6.3: Order dashboard view

Order Main Page - This page is only accessible by cashiers and waiters.

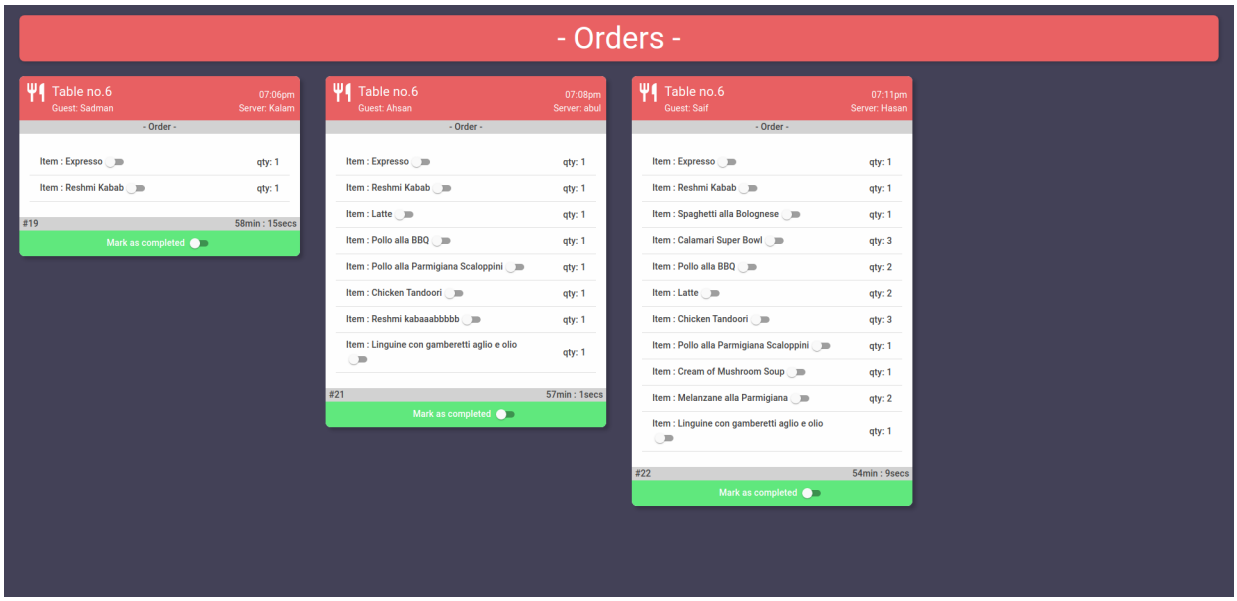

Figure 6.4: All order view

Order kitchen page- This page is only accessible by chefs. They can only see the order items which are addressed to their kitchen of an order.

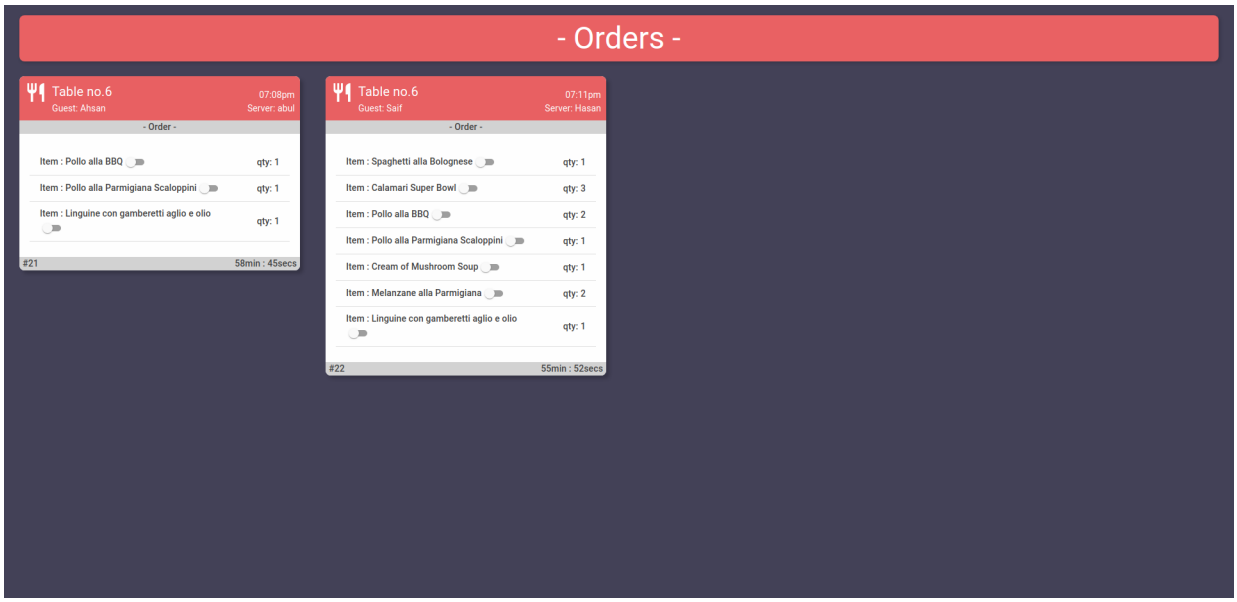

Figure 6.5: Specific order view

Admin Page- This page is only accessible by admin. This dashboard gives the admin the complete control over the system to perform CRUD operations on the system.

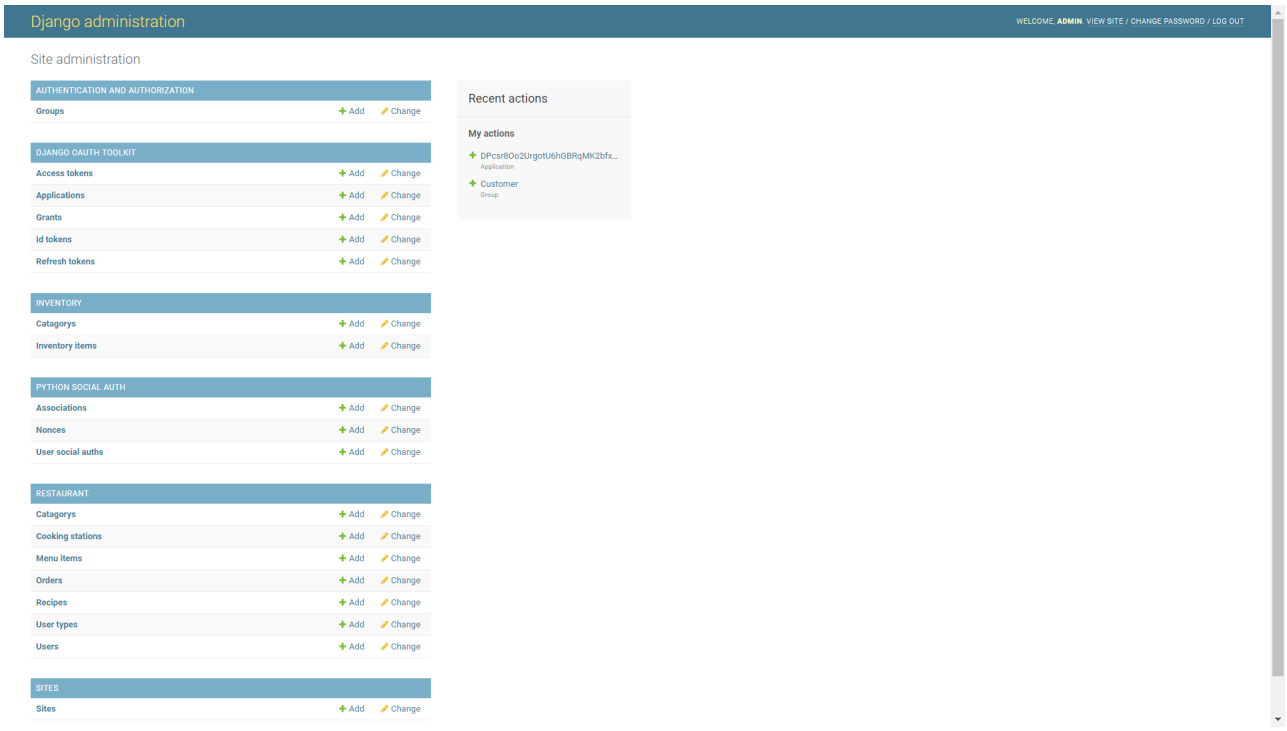

Figure 6.6: Admin view

Chapter 7

Project as Engineering Problem Analysis

7.1 Sustainability of the Project/Work

The sustainability of the product refers to its ability to be maintained and updated. In the modern world, every application or website being released needs to be maintained and continuously updated for its user base.

The website is made in a user friendly way and easy to navigate through. The website aesthetics are added to provide the ultimate viewing satisfaction to user.

The admin has complete control over the system so he can create, manage, update, delete any unnecessary data from the system that is no longer needed.

7.2 Social and Environmental Effects and Analysis

Social Effect: The main goal of this project is to transform a restaurant into a online platform, incorporate all the physical tasks that a restaurant need to perform into a online based system to physical labour is no longer needed. The system provides all the functionalities from managing the system, taking and delivering orders, managing the inventory. Customer can easily order foods to their from the restaurant or make a reservation at the restaurant with a few taps by using the website.

Environmental Effect: The website will act as a boon during this global pandemic as it's not safe to travel like before anymore and sit at a restaurant. People are more careful and prefer to stay at their home. The website allows people to order foods from the restaurant within the comfort of their homes rather than going out in this pandemic.

7.3 Addressing Ethics and Ethical Issues

In the world of smartphones with so much data collection, hacking, cybercrime, etc. there are some unspoken rules and ethics guidelines that need to be followed when working on creating and releasing an website. The developers made sure there was no breach of conduct and all the points were taken into serious consideration. Some of them are as follows:

Collecting only relevant User data: The website only collects user data that is needful, like the name, email address, phone number, country, city and addresses for home delivery. In case of social registration such as Facebook and Google the user data is received from their servers and other necessary information is taken from user. No other extra data is taken.

Data Storage Security: Only the admin has access to the backend server and database. Since they are hosted in the cloud and can only be accessed via the admins login credentials; the data stored can be deemed safe and secure.

No Discrimination or Favoritism: The website does not discriminate of any kind based on race, sexuality, gender, religious beliefs, color, language, political or other opinions, national or social origin, property, birth, or another status.

Chapter 8

Lesson Learned

8.1 Problems Faced During this Period

The main problem I faced during my internship period was my lack of practical knowledge of building production level software. All I had was my theoretical knowledge I had gained from different courses while completing my degree. I had to gather software requirements directly from the client, make an action plan with the core functionalities of the software which would have to meet the clients' requirements and how I was going to approach building and building the software.

During my internship period, I had to build the backend system on the Python Django framework, which I had knowledge of from my experience I had gained while working on my personal projects. But for this system, I had to learn and build the system using the Django Rest Framework because the system had to be built on a RESTful API so that it could communicate with the frontend, which was being built on the JavaScript React framework. Because I was building the backend by myself, I had to complete a lot of work within a short period of time.

Another challenging part was the lack of communication with the frontend developer. As we had to work remotely from our home during the recent lockdown period, often lack of communication caused longer time to fix the bugs which arose while integrating the frontend with the backend.

8.2 Solution of those Problems

Being new to the Django Rest framework, I have read a lot of documentation, learning all the ins and outs of the framework while building the system. As I was the only backend developer working on the backend system of the software, I had to plan out my work plan for the week ahead so that I could deliver the system within the given timeline.

The lack of communication was solved by having a daily meeting with the frontend

developer to discuss all the issues, bugs and how to fix them. These daily meetings again took us back to our own track of our project timeline.

Chapter 9

Future Work & Conclusion

9.1 Future Works

The project main system the restaurant management module and the inventory management module have be developed, integrated with the frontend, tested and deployed. The e-ticketing module along with the financial module is in the pipeline and will be developed within one month. The Android and iOS version of the application will also be delivered within the given timeline.

9.2 Conclusion

In this project, i have learned new frameworks, new libraries, gathered more knowledge on Python, dove deep into the realm of Django and DJango Rest Framework. I have come across multiple problems and learned techniques on how to find workaround on the problems while developing the system from scratch. I have learnt how to find solutions, implement functionalities as per user's requirements, how to override libraries and write custom code to meet those requirements. I have learned how to collect user requirements, design, develop, integrate and test an entire commercial based software while building the entire backend for this application. This experience has helped me significantly increase my knowledge and skills on building web application software's.

Bibliography

[1] K. Schwaber and M. Beedle, *Agile software development with Scrum*, vol. 1. Prentice Hall Upper Saddle River, 2002.

[2] H. F. Cervone, "Understanding agile project management methods using scrum," *OCLC Systems & Services: International digital library perspectives*, 2011.

[3] R. C. Tausworthe, "The work breakdown structure in software project management," *Journal of Systems and Software*, vol. 1, pp. 181–186, 1979.

[4] J. Fu, D. Sun, J. Chai, J. Xiao, and S. Wang, "The "six-element" analysis method for the research on the characteristics of terrorist activities," *Annals of Operations Research*, vol. 234, no. 1, pp. 17–35, 2015.

[5] H. Maylor, "Beyond the gantt chart:: Project management moving on," *European management journal*, vol. 19, no. 1, pp. 92–100, 2001.

[6] D. Bell, "Uml basics: An introduction to the unified modeling language," *The Rational Edge*, 2003.

[7] "Order pizza online for delivery: Home."

[8] "Yum cha district."