

Food Ordering website “Cooked with care” developed using MERN stack

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Abstract— Recent developments in wireless technologies and the internet have led consumers to conduct their business digitally. The digital transactions made through these systems can be monitored and carried out efficiently. This article focuses on the need for and construction of a digital web application system, which will help us establish a modern means to carry out the food business for homemakers. The main aim of our website "Cooked with Care Using MERN Stack" is to provide a digital platform for homemakers and mess-owners to provide good and clean food to consumers such as students or employees. Cooked with care is a platform that will provide housewives and restaurant owners the means to sell their products and services online with customer feedback for the provided services. Homemakers and mess owners can use the ordering system to update menu presentations and set up the system in a wireless environment. This research work has utilised MERN as the tech stack, where M stands for "MongoDB," our database for holding customer and management data. "E" is an abbreviation for "ExpressJS," which is utilised on our server. R is an abbreviation for "React," which is a front-end programming language. N is an abbreviation for "NodeJS," which refers to the complete programming environment. To save photos of menu items, the proposed work has leveraged AWS cloud storage. The resultant bills and invoices are generated by using the "react-to-print" library, and entries in an excel sheet using "react-csv." Some issues are considered together with storing and removing the images from the AWS database via the admin panel, but it has ultimately rectified the issue and were able to conduct CRUD operations on it. This paper discusses about the design and implementation of our website, which would make it possible to reduce food wastage without using any manual effort and manpower.

Keywords— *Web services; Wireless food ordering system; Web application; Food ordering; Multi-platform*

I. INTRODUCTION

Rapid improvements in information technology, particularly in cellular communications and web services, are significantly changing how people communicate with one another. However, as wireless technologies have improved, they are now being utilised not simply to give

online services to end users, but also to exchange information among themselves. We can reduce food waste in homes by allowing people to sell their food online through our platform and make money in the process. We may also provide monthly cost-effective packages as well as one-time order choices to our end customers. Because of advancements in web services, the application will be cross-platform. By employing these technologies, we were able to make our system available not just on computer platforms, but also on mobile devices linked to the internet.

We have also established a customer payment gateway via which end users may make payments using credit and debit cards. We will construct a web application with this system that will allow customers to order their favourite cuisine online. Our website allows consumers to assess the menu items they have purchased and analyse the ratings, which will ultimately assist business owners and homemakers in improving their culinary standards. The orders will be handled by building a queue of customer-created orders. Our software will assist company owners in managing the billings and invoices of their consumers. They may also use their dashboard to track their daily sales and revenue. This article will assist us in comprehending our platform's implementation and internal workings.

II. LITERATURE SURVEY

In accordance with conducted literature survey of the existing food ordering systems, functionalities and their technologies that has been already implemented. The objectives that facilitate ordering food in a food ordering system website is user-friendliness and ease of access.

In [1], A platform to track meals/orders is offered to create a meal ordering system for numerous sorts of eateries, allowing consumers to order or make unique cuisine with a single click. This system was created with the help of an Android application for Tablet PCs. The front end was developed using Java, Android while the backend is driven by a MySQL database.

In [2], It is a web-based food-ordering application designed for Android using Java and SQL 2008 is used as

a database to store data. It has an advantage over PDAs because they are unattractive and uninformative as they don't support pictures. The main disadvantage is it uses an outdated database technology such as SQL and uses ZigBee technology which is not secure as well as coverage is limited.

In [3], This system was a rudimentary dynamic database utility system that retrieved all data from a centralised database and utilised android technology. This technology overcomes previous disadvantages of automated meal ordering systems, and it requires a one-time expenditure for devices.

In [4], The integration of hotel management systems is illustrated using web services technology. The Ordering System, Kitchen Order Ticket (KOT), Billing System, and Customer Relationship Management System (CRM) are all held together by the Digital Hotel Management.

In [5], This project's purpose is to develop and build a wireless food ordering system for a restaurant. This system described the technical operations of the Wireless Ordering System (WOS), such as system design, function, limitations, and recommendations. This ubiquitous application will be a terrific tool for improving restaurant management by providing better customer service and reducing human errors.

In [6], For a restaurant, a wireless meal ordering system was devised and deployed in cooperation with user input. A smart phone has been integrated into the adjustable wireless food ordering system with real-time customer feedback implementation to enhance real-time engagement between restaurant owners and consumers.

In Paper [7], The goal of this study was to look at the elements that impact internet users' attitudes on online food ordering in Turkey among university students. Davis's Technology Acceptance Model (TAM) from 1986 was used to evaluate the adoption of the Web environment for restaurant ordering. Along with TAM, trust, innovativeness, and external influences are introduced as major aspects to the model.

In Paper [8], This study discussed the design and implementation of a meal ordering system for restaurants. All menu information will be available through the web-based application on the user's mobile device. The kitchen and cashier wirelessly get the order data from the customer's mobile device. The central database is updated with this order information. The restaurant owner can quickly handle menu changes.

In Paper [9], This study focuses on restaurant owners' efforts to incorporate information and communication technology such as PDAs, wireless LANs, and expensive multi-touch displays to improve the eating experience. This article identifies some of the shortcomings of traditional paper-based and PDA-based food ordering systems and proposes a low-cost touch screen-based Restaurant Management System based on an Android Smartphone or tablet as a solution.

In Intelligent e-restaurant using Android OS (2015) [10], They intend to supply eateries with a tablet menu that will propose items based on an algorithm that has not yet been deployed anywhere. Furthermore, they run the programme on an Android-based tablet rather than an iOS-

based tablet, which is a more expensive option. They store the database on a cloud-based server, which is both economical and secure. [10]

The main purpose of E-Restaurant: Online Restaurant Management system for Android (2015) [11] to create a comprehensive online management system for e-restaurants utilising an Android smart phone with Bluetooth wireless technology. The menu will be shown automatically on the table via an Android application, and we will be able to order meals straight from the phone. The controller is also in charge of displaying the menu items selected on the LCD display unit. The selected goods in the Kitchen area will be shown on the LCD along with the user table number through wireless RF transmission.

The majority of restaurant meal ordering relies on interactions with waiters to place orders into the kitchen. During peak restaurant hours, this coordination is difficult, resulting in customer dissatisfaction. To realize this, Intelligent Restaurant – Menu Ordering System (2015) [12] is designed. To improve the quality of its services and the dining experience of its clients, this restaurant incorporates cutting-edge technology such as a multi-touch module, an RF module, a meal serving robot, and a database. A meal-serving robot is a line-following robot that employs a sensor to trace the black line path designated for serving.

The Cross-Platform Development for an online Food Delivery Application (2017) [14] was built using HTML and CSS on the PhoneGap framework, while MySQL handles the backend database. The benefit of utilising this approach is that it is platform agnostic, as it is a cross-platform application. The primary disadvantages are the antiquated MySQL database technology and the UI designs.

III. PROPOSED METHODOLOGY

This section describes how food ordering website "cooked with care using the MERN stack" was designed and implemented, including all of its functionalities, their internal workings, and technologies used. Cooked with care offers a full digital solution for ordering meals online across many areas, significantly improving ordering and service time. It provides solutions to assist administrators and company owners in tracking their progress and sales, as well as improving their service with the aid of customer feedback [13]. To develop the system, all of the requirements were collected from local restaurants and fellow-consumers from the nearby vicinity, and the system was then developed in accordance with those requirements. Users can use this website for everyday meal ordering as well as monthly subscriptions. The website will provide the functionality to view past food order reviews, view filtered menus, opt for a monthly subscription, bill generation ability, and revenue calculations. Orders are managed through the website's Admin Panel.

The Cooked with Care application provides a dedicated website for end users as well as sellers. It provides a platform for the sellers where each seller can bring their business online. It doesn't matter if it is a restaurant or a single individual trying to setup their shop. It will also help to reduce food wastage in households by providing them with a platform to sell their excess food online at a minimal price. Each seller will be able to customise their

own menu and set their own pricing, which will be beneficial to both parties during difficult COVID-times. Customers can check the available sellers and their products according to their specified location and place an order. They can also check the reviews or ratings of past orders from the seller.

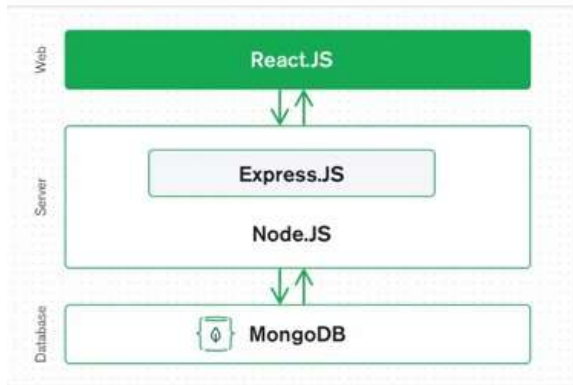


Fig. 1. System Architecture diagram [15]

The Cooked with Care web application will help all the local restaurants, mess owners, and housewives earn extra income without spending money on setting up franchises. It will present them with a great opportunity. As shown in figure 1 [15], the web application uses MongoDB, ExpressJS, ReactJS, and NodeJS. MongoDB will be used as a cloud storage database. ReactJS will be used for the front-end design of the website. On the website, a user can login as a customer or an admin depending upon the provided credentials. The user can manage their orders, menu, billing, and invoices upon logging in as an administrator. When logged in as an end user, they can check the availability of food, order food items, rate a previous order, and make payments for their orders.

While comparing Cooked with Care with other applications as shown in figure 2, we have ensured that our targeted customer base will not only be business owners or restaurant owners, but even a single individual can make use of our application to earn a livelihood.

TABLE I. COMPARISON WITH RELATED WORKS

	Related Works	Our Application
Database	SQL (outdated)	MongoDB, AWS
Target Consumers	Restaurants and mess-owners	Restaurants, businessowners as well as housewives
Verification Mechanism	OTP/Email	OTP/Email, Aadhar card and Pan card
Bill generation	No	Yes
Quality of UX	Not as good as our platform	Excellent

IV. PROPOSED SYSTEM DESIGN

As mentioned, the proposed system is based on MERN stack architecture, the following flowchart displayed in figure 3 will explain the workflow and the functions implemented on the website.

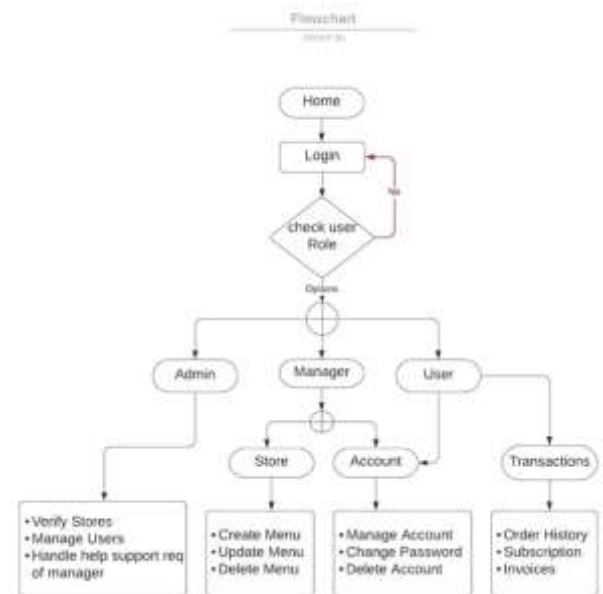


Fig 2. Flowchart of the proposed system

The MERN stack architecture is the foundation of the proposed system. Above diagram figure 3 displays the flowchart of our proposed system. It follows the following steps:

Step 1. User Authentication

The login credentials entered by the users are cross-checked against the stored MongoDB database and, upon successful authentication, they are redirected to the dashboard of the website.

Step 2. Assigned role detection

Different roles for different users are stored subsequently in the database and upon authentication, they are redirected to the dashboard according to their roles defined in the MongoDB database as a key value pair, namely – i. Admin, ii. Manager, iii. User

i. Admin Role: The Admin is the overall system administrator who oversees data storage and authentication. There is just one admin for all restaurant proprietors, and that is the firm's systemadministrator.

ii. Manager Role: The managers are restaurant owners and housewives who have registered on our website to sell their cuisine online via our portal. They sign up and submit their papers and credentials on the "Sign UP" form, and the firm's system administrator verifies their credentials and authenticated them to use the backend dashboard to manage their menu and prices.

iii. End User Role: After successfully logging in on the front-end website, end users are consumers who use the website's front-end and order their favourite meals from their favourite restaurants.

Step 3. Dynamic dashboard generation

We have implemented a "if-else" condition on the admin's dashboard, so that when the system administrator logs in, he/she will be presented with different navigation options, just as managers/business owners will be presented with different navigation options, but the dashboard will remain the same.

Step 4. Upon successful authentication, the Content Management System (CMS) can be accessed by the different business owners who will be assigned the "Manager" role upon successful verification of their business by the admin.

Different use case diagrams for our roles are:

A. Admin Role

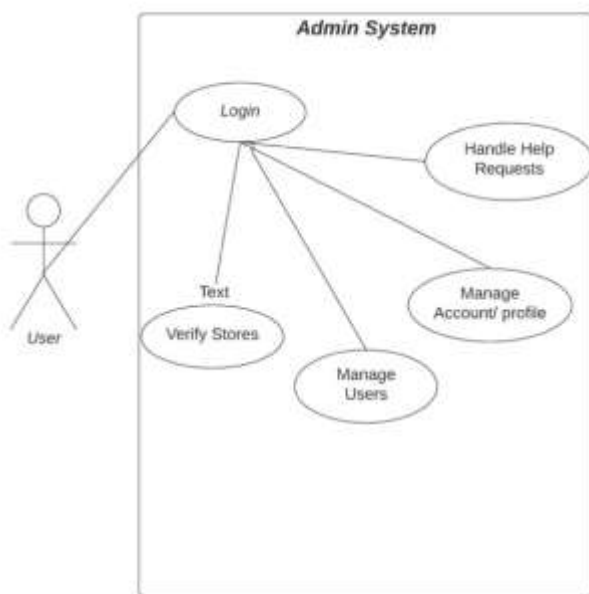


Fig 3. Admin use case diagram

The figure 4 use case diagram above depicts the operations that admin can perform, such as:

- 1. Verify Stores:** Verify the application of business owners with their provided login credentials and documents such as Aadhar card and Pan Card, authenticate and activate their account to allow them to use the website to bring their business online.
- 2. Manage Users:** Allows the admin to make changes to the manager's provided credentials and also deactivate their account, if necessary.

- 3. Manage Account/Profile:** This allows the admin to reset the admin password, change the login credentials for themselves and manipulate data stored in the database.
- 4. Handle Help Requests:** Allows the admin to read the queries raised from the "Manager's side" and provide solutions accordingly.

B. Manager Role

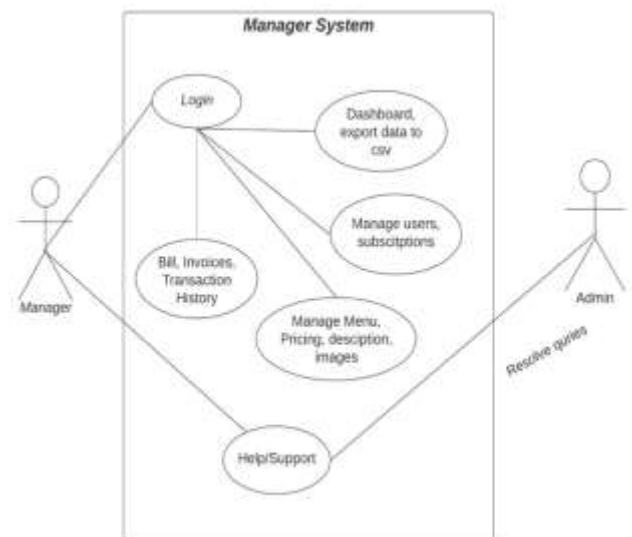


Fig 4. Manager use case diagram

The figure 5 use case diagram displays the operations which can be performed by business owners such as:

- 1. Bill, invoices, transaction history:** Helps to track all the bills and invoices generated from the previous completed orders and displays to the manager.
- 2. Manage Menu:** This module enables business owners to perform CRUD (Create, Read, Update, Delete) operations on the menu's pricing, description, and images.
- 3. Manage Users:** This module helps the business owners to manage their customer database that includes their orders, their monthly subscriptions.
- 4. Dashboard:** The Dashboard reflects the newly created orders, total revenue of the business owners and provides an option to generate the details and insert it into the excel sheet.
- 5. Order Table:** Orders that have been placed are displayed on the Orders page, which can be viewed via the dashboard, along with the address, time, and date of the orders.

C. End User Role

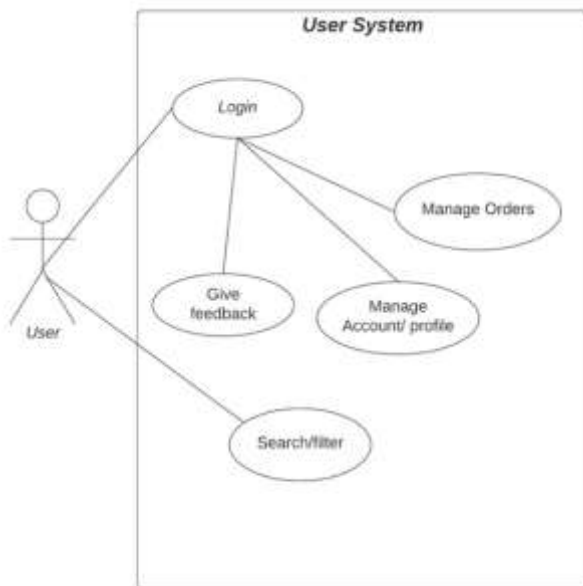


Fig. 5. End User use case diagram

The figure 6 use case diagram displays the operations which can be performed by users such as:

1. **Manage Orders:** Allows the user to display the orders made by them and the amount they paid for each item.
2. **Manage Account/Profile:** This allows the admin to reset the admin password, change the login credentials of themselves and manipulate data stored in the database.
3. **Give feedback:** Allows the user to provide feedback such as reviews & rating on the completed orders which will be directly reflected on the website.
4. **Search/filter:** It can be used to filter the different dishes and search for a particular item on the website.

V. RESULTS AND DISCUSSION

The reservation system of our website will manage all the orders effectively by using the latest and relevant technologies available to us.

Here are some of the snapshots of our system:

1. Login Page

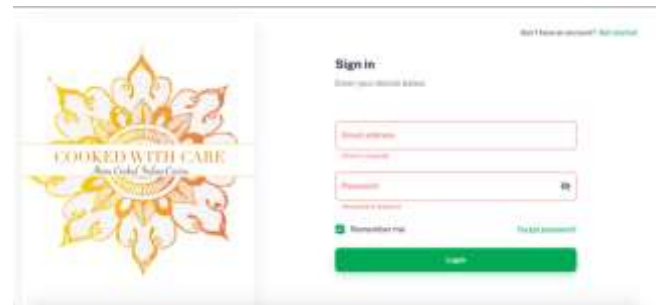


Fig 6. Login Page

a. The figure 7 displayed above is the page used to access the backend of the system

b. The page redirects us to various dashboard depending upon the credentials provided i.e. It verifies whether the credentials entered are of the Admin or Managers/Storeowners against a 'MongoDB' cloud database.

2. Admin Dashboard



Fig 7. Admin Dashboard

Dynamic Dashboard Generation- We have implemented a "if-else" condition on the admin's dashboard, so that when the system administrator logs in, he/she will be presented with different navigation options, just as managers/business owners will be presented with different navigation options, but the dashboard will remain the same.

- a. As shown in figure 8, admin Dashboard displays the side-nav bar with options like Managers & Store Requests
- b. Managers Page displays the number of active store owners.
- c. Under Store requests page, a table is implemented which displays the new stores asking for access to the website to create their own store to sell.

3. Store Signup Page

Fig 8. Store Signup Page

- a. As shown in figure 9, this is the page business owners can use to create their own store and sell their products.
- b. After filling all the details and uploading the asked documents such as Aadhar Card & Pan Card, the data will be shared with the admin and admin will verify the entered data.

4. Create Dish Overlay

Fig 9. Add Dish Overlay

- a. As displayed in figure 10, upon clicking the “Add” button, the overlay appears which can be used to enter the dish records and the image for that dish which will then be inserted into “AWS” cloud and will be displayed on the front-end of our website.

VI. CONCLUSION

In this paper, we have proposed a web-based application "Cooked with Care" using the technology MERN stack. Our website enables users to browse through the various options available in their immediate vicinity. It will help the end users choose a dish based on different reviews and ratings.

Our website focuses on reducing the food wastage of subsequent households by providing them with a platform

to sell their excess amounts of food online and make a business out of it. We keep track of the customer feedback.

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