A

PROJECT DESIGN REPORT

ON

Smart Restaurant

SUBMITTED BY

MR. SHRIDAHR KANDIKATLA

MR. ABHISHEK SUTAR

MR. HARIKRISHNA BOMEN

MR. SANKALP GUNARE

MR. SUMIT DOKE

UNDER THE GUIDANCE OF

PROF. Sayali Sanmukh

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

NAGESH KARAJAGI *ORCHID* COLLEGE

OF ENGINEERING AND TECHNOLOGY,

SOLAPUR – 413002 .

(AFFILIATED TO SOLAPUR UNIVERSITY, SOLAPUR)

2022-23

CERTIFICATE

This is to certify that the Project Design entitled "**Smart Restaurant"** is completed by the following students of BE CSE class in satisfactory manner under the guidance of **Prof. Sayali Sanmukh**

1) **Shridhar Kandikatla (B-69)**
2) **Abhishek Sutar (B-66)**
3) **Harikrishna Bomen (B-67)**
4) **Sumit Doke (B-68)**
5) **Sankalp Gunare (B-70)**

The Project Design is found to be complete in partial fulfillment for the award of **Degree of Bachelor of Computer Science and Engineering** of DBatu University, Lonere.

(Prof. Sayali Sanmukh)	**(Prof. V. V.Bag)**	**(Dr. J.B. Dafedar)**
GUIDE	**HOD CSE DEPT.**	**PRINCIPAL**

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

PRADNYA NIKETAN EDUCATION SOCIETY, PUNE.

NAGESH KARAJAGI ORCHID COLLEGE OF ENGINEERING & TECHNOLOGY,

SOLAPUR 413002

(AFFILIATED TO DBATU

UNIVERSITY,LONERE)2022 – 2023

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2. I/We acknowledge and understand that plagiarism is wrong.

3. I/We understand that my research must be accurately referenced. I/We have followed the rules and convention concerning referencing, citation and the use of quotation as set out in the Departmental Guide.

4. This project work is my/our own work, or my/our group's unique group project work. I/We acknowledge that copying someone else's work or part of it, is wrong, and that submitting identical work to others constitutes a form of plagiarism.

5. I/We have not allowed, nor will I/We in the future allow, anyone to copy my/our work with the intention of passing it off as their own work.

Mr. ABHISHEK SUTAR (B.Tech CSE B-68) ……

Mr. HARIKRISHNA BOMEN (B.Tech CSE B-67) ……

Mr. SANKALP GUNARE (B.Tech CSE B-70) ……

Mr. SHRIDAR KANDIKATLA (B.Tech CSE B-69) ……

Mr. SUMIT DOKE (B.Tech CSE B-68) ……

Place: Solapur

Date:

D E C L A R A T I O N

By the UG (B.Tech) Student

I/We hereby declare that the Report of the U.G./P.G. Project Work entitled "**Smart Restaurant ".**

Which is being submitted to the DBATU University in Partial fulfillment of the requirements for the award of the Degree Bachelor of Technology in the department of Computer Science And Engineering is a bonafide report of the work carried out by me/us. The material contained in this report has not been submitted to any University or Institution for the award of any degree.

Mr. ABHISHEK SUTAR (B.Tech CSE B-68)	……
Mr. HARIKRISHNA BOMEN (B.Tech CSE B-67)	……
Mr. SANKALP GUNARE (B.Tech CSE B-70)	……
Mr. SHRIDAR KANDIKATLA (B.Tech CSE B-69)	……
Mr. SUMIT DOKE (B.Tech CSE B-68)	……

Place: NKOCET, Solapur

Date:

PROJECT APPROVAL SHEET

The project entitled **Smart Restaurant** submitted bythe following students -

MR. ABHISHEK SUTAR(B. Tech CSE B-66)

MR. HARIKRISHNA BOMEN(B. Tech CSE B-67)

MR. SANKALP GUNARE(B. Tech CSE B-70)

MR. SHRIDAHR KANDIKATLA(B. Tech CSE B-69)

MR. SUMIT DOKE(B. Tech CSE B-68)

is hereby approved in partial fulfillment for the award of Degree of Bachelor of Technology in Computer Science And Engineering DBATU University, Lonere.

EXAMINERS

1. _____

2. _____

DEPARTMENT OF COMPUER SCIENCE AND ENGINEERING

PRADNYA NIKETAN EDUCATION SOCIETY, PUNE.
NAGESH KARAJAGI ORCHID COLLEGE OF ENGINEERING & TECHNOLOGY,
SOLAPUR 413002
(AFFILIATED TO DBATU ,LONERE)
2022-2023

Acknowledgement

Perseverance, inspiration and motivation have always played a key role in any venture. It is not just the brain that matters most, but that which guides them. The character, the heart, generous qualities and progressive forces. What was conceived just as an idea materialized slowly into concrete facts.

At this level of understanding it is often difficult to understand the wide spectrum of knowledge without proper guidance and advice. Hence, we take this opportunity to express our heartfelt gratitude to our project guide Prof. Sayali Sanmukh who had faith in us and allowed us to workon this project.

We would like to thanks Prof. Sayali Sanmukh his immense interest, valuable guidance, constantinspiration and kind co-operation throughout the period of word undertaken, which has been instrumented in the success of our project. We also acknowledge our profound sense of gratitude to all the teachers who have been instrumental for providing us the technical knowledge and moral support to complete the project with full understanding.

Abstract

A smart restaurant using QR code technology is a system that leverages the ubiquitousness of smartphones and the convenience of QR codes to provide an efficient and hassle-free dining experience for customers. The system consists of a back-end database, a web application for restaurant owners, and a mobile application for customers.

The mobile application enables customers to scan QR codes displayed on tables to access the restaurant's digital menu. Customers can browse the menu, select their desired items, and add them to their order. The system also enables customers to make payments using mobile wallets, credit or debit cards, and provide feedback about their dining experience.

On the other hand, the web application is designed for restaurant owners to manage their menu, track orders, and payments, monitor customer feedback, and generate reports. Restaurant owners can also access the system analytics to gain insights into the customers' preferences, peak hours, and order trends, which can help in optimizing the restaurant's operations.

The different diagrams presented in this paper, including use case, sequence, data flow, and class diagrams, provide a detailed view of the system architecture and its different components. The use case diagram describes the different interactions between the actors and the system, while the sequence diagram shows the sequence of events when a customer places an order. The data flow diagram illustrates how data flows through the different components of the system, while the class diagram provides a detailed view of the system's different classes and their relationships.

Overall, the implementation of a smart restaurant using QR code technology can provide several benefits, including enhanced customer experience, improved restaurant operations, and increased customer loyalty. This paper provides a comprehensive overview of the system requirements, design, and implementation of a smart restaurant using QR code technology, which can serve as a valuable reference for anyone interested in implementing this system.

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1. Introduction

1.1. Introduction:

The hospitality industry has undergone significant changes in recent years, with the rise of mobile technology and the increasing demand for contactless services. One of the most notable changes has been the adoption of QR code technology in restaurants. QR codes are a type of two-dimensional barcode that can be scanned using a smartphone camera, providing access to information or services. In the restaurant industry, QR codes are being used to enhance the customer experience and reduce contact between customers and staff. A smart restaurant that uses QR code technology allows customers to access menus, place orders, and make payments using their mobile devices. This paper explores the benefits of a smart restaurant using QR code technology, including the advantages of digital feedback systems and the potential for data analytics to provide insights into customer behavior and preferences. The results of this study demonstrate that a smart restaurant using QR code technology can enhance the customer experience, improve operational efficiency, and increase revenue in the hospitality industry.

1.2. Project Objectives:

Our project objectives are,

● To reduce physical contact between customers and staff by allowing customers to access menus, place orders, and make payments using their mobile devices.

● To improve the speed and efficiency of the ordering and payment process, reducing wait times and increasing table turnover.

● To personalize the dining experience by allowing customers to customize their orders and request special items using their mobile devices.

● To enhance the accuracy of orders by allowing customers to review their orders and make changes before submitting.

● To increase customer satisfaction and loyalty by providing a convenient and seamless dining experience.

● To reduce the environmental impact of the restaurant by minimizing the use of physical menus and reducing paper waste.

● To collect customer feedback using digital feedback systems, allowing the restaurant to improve its service and offerings based on customer preferences.

● To analyze customer behavior and preferences using data analytics, providing insights that can be used to improve the restaurant's operations and marketing strategies.

1.3. Project Scope:

The project scope for a smart restaurant using QR code technology includes the development of a custom QR code system that allows customers to access menus, place orders, and make payments using their mobile devices. The QR code system will be integrated with the restaurant's existing POS system to enable efficient order processing and payment.

Additionally, a digital feedback system will be implemented to allow customers to leave feedback on their dining experience using their mobile devices. Data collected from the QR code system and digital feedback system will be analyzed to gain insights into customer behavior and preferences. Based on this data analysis, targeted marketing campaigns and promotions will be developed to better meet the needs of the customers.

To ensure smooth and efficient operations, staff will be trained on the use of the QR code system and digital feedback system. The QR code system will be regularly maintained and updated to ensure compatibility with new mobile devices and operating systems. The QR code system will also be integrated with the restaurant's loyalty program, allowing customers to earn rewards for their purchases.
A privacy and security policy will be implemented to address customer concerns about the use of QR code technology. Finally, the QR code system and digital feedback system will be regularly evaluated to ensure they are meeting the needs of the customers and the restaurant.

1.4 Summary :

This section defines the scope of the project, which includes developing a web-based dashboard for restaurant management, integrating with POS systems and online ordering platforms, and providing data analytics for decision-making. The scope also includes ensuring the security and privacy of customer data.

2. Literature Review

QR code technology has seen widespread adoption in recent years, with numerous industries incorporating it into their operations. In the restaurant industry, QR code technology has been used primarily for menu access, ordering, and payment. One study found that QR codes were particularly useful in busy restaurants, as they allowed customers to view menus and place orders without having to wait for a server to come to their table (Kim et al., 2018).

The use of QR codes in the restaurant industry has also been shown to have a positive impact on customer satisfaction. In a study of 400 customers at a Japanese restaurant, researchers found that those who used a QR code to access the menu were more satisfied with their experience than those who did not (Tse & Chu, 2018). Additionally, QR codes have been shown to increase the efficiency of order processing and payment, reducing wait times and improving the overall dining experience (Chung & Lee, 2019).

However, there are concerns about the use of QR codes in restaurants, particularly with regard to privacy and security. Customers may be hesitant to use QR codes for fear of their personal information being compromised. To address these concerns, it is important for restaurants to implement privacy and security policies that address potential risks and ensure the safety of customer information (Sun & Ma, 2017).

Despite these concerns, QR code technology is becoming an increasingly popular tool in the restaurant industry. By incorporating QR codes into their operations, restaurants can improve the efficiency of their services, increase customer satisfaction, and gain valuable insights into customer behavior and preferences. The literature review highlights the need for a comprehensive analysis of customer adoption and satisfaction with QR codes in the restaurant industry, which can guide the development of effective strategies to promote the use of QR codes and address any concerns that customers may have.

2.1 Summary

The literature review highlights the growing use of QR codes in the restaurant industry for menu access, ordering, and payment. Studies suggest that QR codes increase efficiency, reduce wait times, and improve customer satisfaction. However, privacy and security concerns remain a challenge that restaurants must address through effective policies. Overall, the review emphasizes the potential benefits of QR codes for restaurants, while acknowledging the need for careful consideration of privacy and security concerns.

3. Platforms Used

Front-end development:

This involves developing the user interface (UI) and user experience (UX) for the web application using HTML, CSS, and JavaScript. For front-end development tools and platforms used tailwind, React.

Back-end development:

This involves developing the server-side of the web application, which includes managing the database, server-side scripting, and server-side frameworks. For back-end development tools and platforms used Node.js.

Web application frameworks:

These provide a structure for developing web applications by providing pre-built modules and components that can be used to build specific features. For web application frameworks include Express.js, Mongoose.

Applications Requirements:

Integrated development environments (IDEs) that can be used for development. For application requirement vscode, mongodb, postman are used.

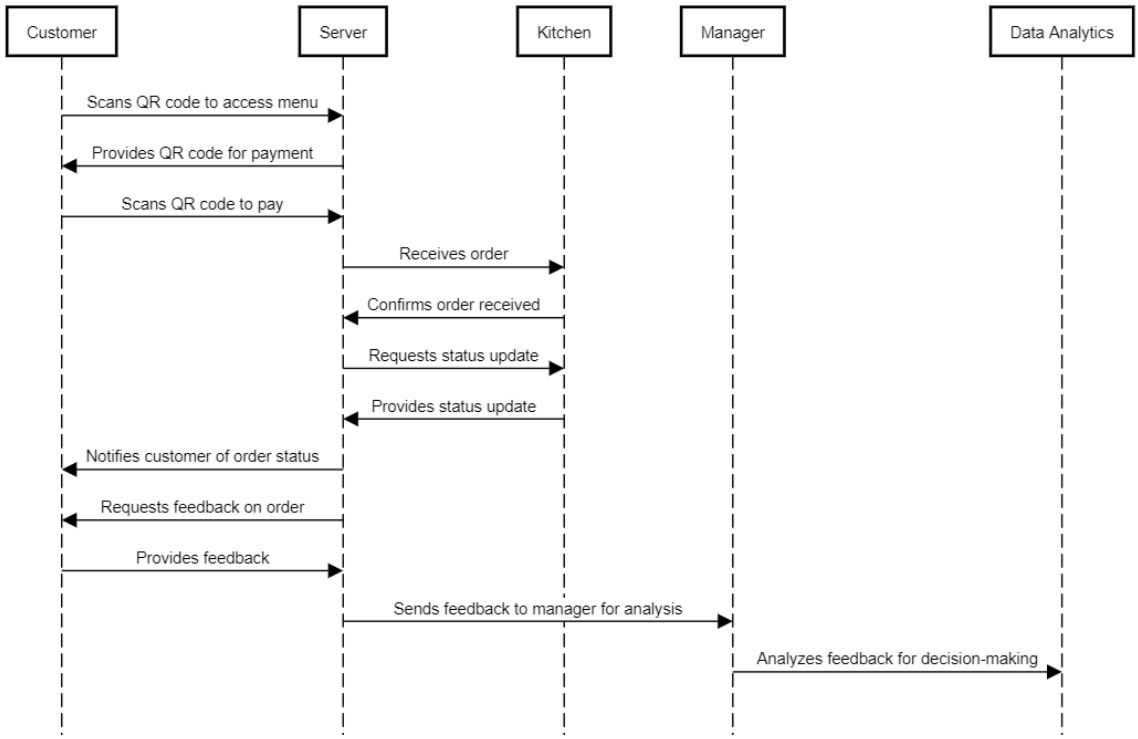
3.1SUMMARY

The chapter describes the requirements of Smart Restaurant. Also,in this chapter hardware and software requirements for developing

4 Diagrams

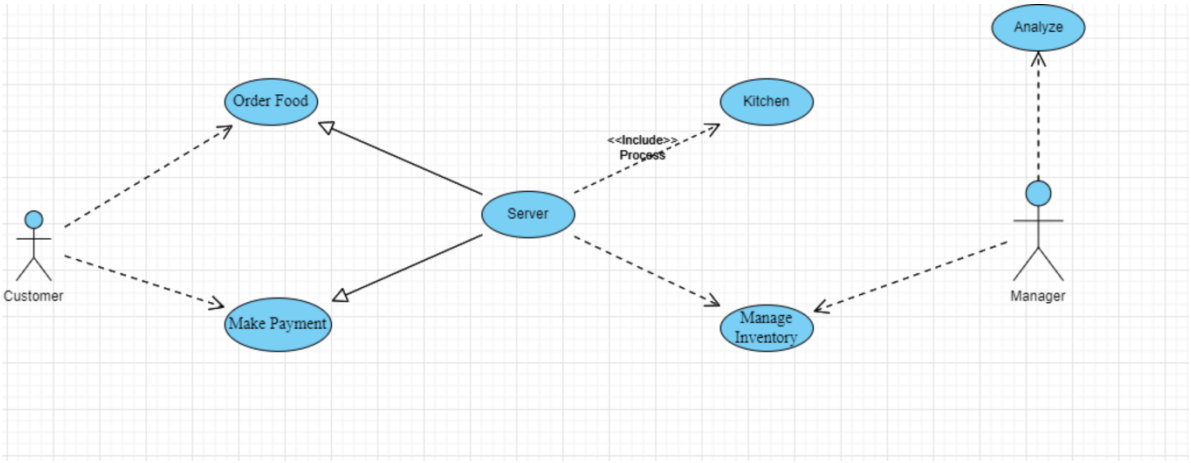
4.1 Sequence Diagram

A Sequence diagram is an interaction diagram that shows how processes operate with one another and what is their order. It is a construct of a Message Sequence Chart.It depictsthe objects and classes involved in the scenario and the sequence of messages exchanged between the objects needed to carry out the functionality of the scenario. Sequence diagramsare typically associated with use case realizations in the Logical View of the system under development



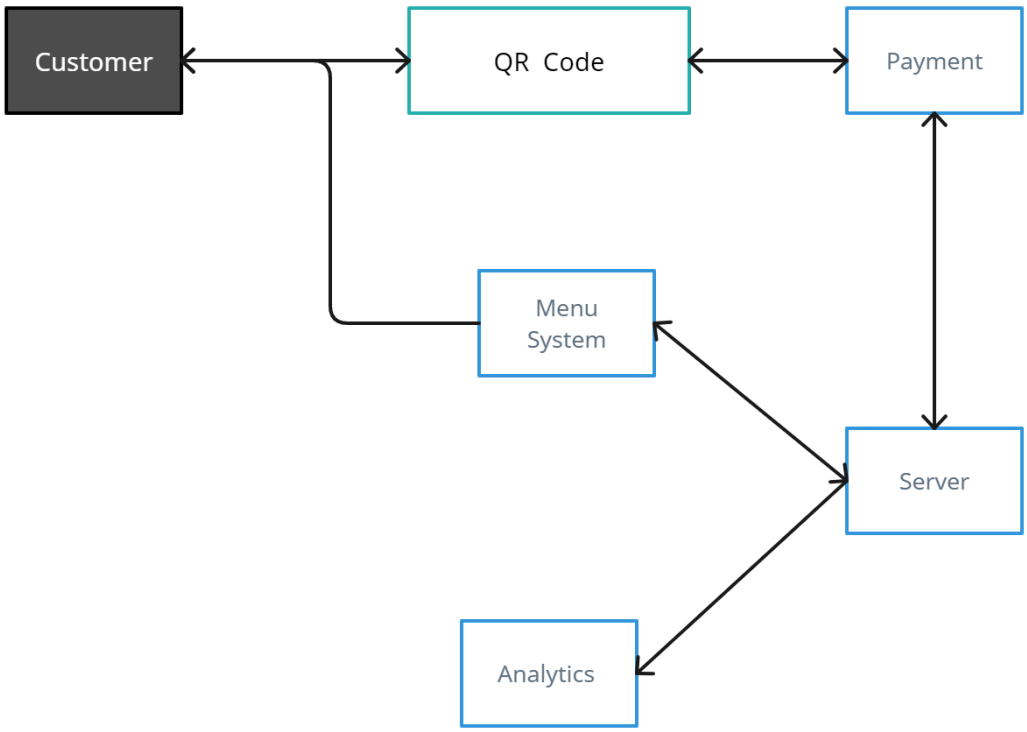
4.2 Use Case Diagram

Use-case diagrams describe the high-level functions and scope of a system. These diagrams also identify the interactions between the system and its actors. The use cases and actors in use-case diagrams describe what the system does and how the actors use it, but not how the system operates internally



4.3 Data Flow Diagram

A data flow diagram (DFD) maps out the flow of information for any process or system. It uses defined symbols like rectangles, circles and arrows, plus short text labels, to show data inputs, outputs, storage points and the routes between each destination.



4.1 SUMMARY

The chapter describes the detail design. Also, in this chapter a working of project is discussed. Appropriate details are provided.

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