**SYNOPSIS**

**Report on**

**BQuick**

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**ABSTRACT**

**“**BQuick**”**is an application designed to streamline restaurant operations during peak hours, enhancing the dine-in experience for both customers and staff. This solution eliminates the need for waiters to manually take orders, reducing service delays and errors.

During peak hours, restaurants often face challenges in managing customer service effectively. It becomes difficult for a single waiter to attend to every visiting customer promptly, leading to long wait times. Additionally, some customers take an extended time to decide on their orders, further delaying the overall service workflow. This can negatively impact the dining experience and operational efficiency.

To address these challenges, this project introduces a MERN stack-based application that streamlines the ordering process, enhancing both customer satisfaction and staff productivity. The application allows customers to place their orders directly from their tables by scanning a QR code. Once an order is placed, it is confirmed and displayed on a kitchen screen, enabling chefs to view and prepare the orders without delay.

Customers can conveniently place their orders by scanning a QR code on their table using their smartphones. Once the order is placed, it is confirmed and seamlessly transmitted to a kitchen display system, where chefs can view the details and prepare the dishes accordingly. This workflow not only speeds up the ordering process but also ensures accurate communication between customers and the kitchen.

This approach eliminates unnecessary delays, reduces the workload on waitstaff, and ensures efficient communication between customers and the kitchen. By streamlining the ordering process, the solution enhances customer satisfaction, improves service speed, and provides a more enjoyable and seamless dining experience, particularly during busy hours.

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**INTRODUCTION**

“BQuick” is an innovative solution designed to streamline customer service during peak hours, ensuring a seamless dining experience. This project addresses the common challenges faced by restaurants, where few single waiters struggle to attend to multiple tables promptly, leading to long wait times and service inefficiencies.

The primary goal of the project is to enhance the ordering process by empowering customers to place orders directly from their tables using a QR code. By eliminating the need for manual order-taking, this solution minimizes delays, reduces staff workload, and ensures faster communication between customers and the kitchen.

The project unfolds in three main phases: conceptualization, development, and execution. During the conceptualization phase, the team identified the key pain points in traditional restaurant workflows and envisioned a customer-centric solution to address them. In the development phase, the team designed a user-friendly interface for customers to view the menu, select their items, and place orders seamlessly. A backend system was developed to transmit confirmed orders directly to a kitchen display, enabling chefs to view and prepare them promptly. Finally, in the execution phase, the system underwent rigorous testing to ensure smooth operation during high customer volumes, addressing potential issues and optimizing the solution for real-world application.

The project's report outlines the problem statement, solution design, key features, challenges encountered, and how the system effectively addresses them. By streamlining the order management process, this system has the potential to transform the dining experience, offering significant advantages in service efficiency, customer satisfaction, and operational management during busy restaurant hours.

**LITERATURE REVIEW**

The study titled "Technology in Enhancing Customer Service Efficiency in Hospitality" examines the growing role of technological solutions in streamlining operations within the hospitality industry. It highlights how innovations like digital ordering systems significantly reduce wait times and improve workflow efficiency. The research underscores the positive impact of such technologies on both customer satisfaction and staff productivity, demonstrating their potential to address common challenges in service-oriented environments.

Another relevant work, "Self-Service Technologies in Restaurants: A Consumer Perspective," explores the adoption of self-service technologies, such as mobile ordering and kiosks, from the customer's point of view. This study identifies critical factors that influence consumer behavior, including the convenience, ease of use, and perceived improvement in service speed. The findings emphasize that customers are more likely to embrace these solutions when they align with their expectations of a modern dining experience.

"Queue Management Systems for Service-Oriented Businesses" delves into the challenges of managing high customer volumes in service industries. The research focuses on the use of digital queue management and order processing systems to address bottlenecks and enhance overall service efficiency. It provides evidence of how such systems can transform traditional workflows, ensuring faster and more accurate service delivery.

**Project/ Research Objective**

The primary objective of this project is to develop a robust and user-friendly web application using the MERN stack (MongoDB, Express.js, React, Node.js) . Specifically, the project aims to:

* **Reduced Staff Workload:**The QR code-based ordering system eases the burden on waitstaff, especially during peak hours. By allowing customers to place orders directly, staff can focus on delivering personalized service and managing other essential tasks. This streamlined workflow minimizes errors and improves overall efficiency, enabling the restaurant to handle higher customer volumes without additional staff.
* **Enhanced Dine-In Experience:**With instant access to the digital menu through QR codes, customers can browse and order at their own pace without waiting for a waiter. The direct communication between customers and the kitchen ensures faster service and fewer errors, creating a seamless and enjoyable dining experience. This modern approach appeals to tech-savvy diners and adds a touch of convenience to traditional dining.
* **Increased Customer Satisfaction:**By reducing wait times and ensuring accurate order processing, the system enhances customer satisfaction. Diners appreciate the control and convenience of placing their orders directly, leading to a smoother experience. Satisfied customers are more likely to leave positive feedback, return for future visits, and recommend the restaurant to others, boosting the restaurant’s reputation.
* **Faster Table Turnover:**With orders being placed and processed more efficiently, the time customers spend waiting for service is significantly reduced. This results in quicker meal preparation and faster table turnover, enabling the restaurant to accommodate more guests during peak hours, ultimately increasing revenue potential.
* **Cost Efficiency:**The system reduces reliance on manual processes and minimizes the need for additional staff during busy periods. By streamlining operations and reducing errors, restaurants can save on labor costs and wastage, making the solution both practical and cost-effective.
* **Improved Order Accuracy:**Manual order-taking is prone to errors due to miscommunication or misinterpretation. The digital ordering system ensures precise communication between customers and the kitchen, reducing the chances of incorrect or incomplete orders. This not only saves time but also avoids customer dissatisfaction caused by order mix-ups.

Overall, the project aims to revolutionize the accommodation search experience for the KIET community by creating a transparent, efficient, and user-centric platform.

**Project Flow/ Research Medology**

“BQuick” is an innovative solution designed to streamline customer service during peak hours, ensuring a seamless dining experience. This project addresses the common challenges faced by restaurants, where few single waiters struggle to attend to multiple tables promptly, leading to long wait times and service inefficiencies.

**1. Requirement Analysis**

* **Non-functional Requirements:** Define performance, scalability, security, and usability requirements.
* **Technology Stack:** Finalize the use of MERN stack (MongoDB, Express.js, React, Node.js) as the core technology for the application.

**2. System Design**

* **Frontend Design:**
  + Create wireframes and user interface (UI) mockups using Figma or similar tools to visualize the user journey.
  + Design a responsive layout for mobile and desktop users, focusing on a simple and engaging experience.
* **Backend Architecture:**
  + Design the backend system using Node.js and Express.js, outlining the APIs that will handle user requests, data retrieval, and real-time updates.
* **Database Design:**
  + Develop the schema for MongoDB, defining collections for users, accommodations, reviews, landlords, and inquiries.
* **System Flow Diagrams:** Create data flow diagrams (DFD) and entity-relationship diagrams (ERD) to outline system interactions and database structure.

**3. Development**

* **Frontend Development (React):**
  + Build the user interface using React, focusing on key functionalities like search, filter, and map integration.
  + Implement responsive design for seamless access across devices.
  + Integrate Material-UI or Bootstrap for a modern look and feel.
* **Backend Development (Node.js, Express.js):**
  + Set up server-side logic to handle user requests, accommodation listings, and search/filter functionalities.
  + Ensure real-time updates for accommodation availability using efficient API calls.
* **Database Setup (MongoDB):**
  + Create and configure the MongoDB database for storing accommodation data, user information, reviews, and communication logs.
  + Use MongoDB’s flexible schema to allow scalable and efficient data management.

**4. Feature Integration**

* **User Reviews and Ratings:** Build a review system where users can rate and review properties, improving the trust and reliability .
* **Real-Time Notifications:** Incorporate real-time updates for new listings, changes in availability, and notifications using WebSockets or other real-time communication protocols.

**5. Testing and Quality Assurance**

* **Unit Testing:** Conduct individual tests on both frontend components and backend API endpoints to ensure each function works as expected.
* **Integration Testing:** Test the integration of all components, ensuring seamless interaction between the frontend, backend, and database.
* **User Acceptance Testing (UAT):** Perform testing with a group of real users (students, professionals) to gather feedback on usability, performance, and design.
* **Bug Fixes:** Identify and fix any bugs found during testing to improve the stability and performance of the application.

**6. Deployment**

* **Frontend Deployment:** Deploy the frontend using a platform such as Vercel or Netlify for easy accessibility and scalability.
* **Backend Deployment:** Host the backend on platforms like Heroku or Render to ensure reliable server performance.
* **Database Hosting:** Use cloud-hosted MongoDB services (such as MongoDB Atlas) for high availability, performance, and scalability.

**7. Post-Deployment Maintenance**

* **Monitoring and Analytics:** Set up monitoring tools like Google Analytics or New Relic to track user behaviour, performance metrics, and potential bottlenecks.
* **User Support and Feedback:** Incorporate user feedback and provide continuous support through email, chat, or forms.
* **Feature Enhancements:** Based on user feedback, iterate and improve existing features, adding new functionalities as required (e.g., payment integration, roommate search).

**8. Documentation**

* **Technical Documentation:** Provide detailed documentation of the system architecture, API endpoints, and database schema to assist future developers.
* **User Guide:** Create a simple user manual outlining how to navigate and use the platform for students, professionals, and landlords.

**9. Future Scope**

* Explore integration of additional features such as automated rent payment systems, roommate matching, and virtual property tours.
* Scale the platform for use at other institutions with similar accommodation needs.

**Project Flow Summary:**

1. Requirement Analysis
2. System Design (Frontend, Backend, Database)
3. Development (Frontend & Backend)
4. Feature Integration (Search, Map, Reviews)
5. Testing (Unit, Integration, UAT)
6. Deployment (Frontend, Backend, Database)
7. Maintenance (Monitoring, Feedback, Enhancements)
8. Documentation (Technical and User)
9. Future Enhancements

This structured approach ensures the successful development and deployment of the web application, addressing the specific needs of students and professionals looking for accommodation near KIET Group of Institutions.

**Project/ Research Outcomes**

* **Reduced Staff Workload:**The QR code-based ordering system eases the burden on waitstaff, especially during peak hours. By allowing customers to place orders directly, staff can focus on delivering personalized service and managing other essential tasks. This streamlined workflow minimizes errors and improves overall efficiency, enabling the restaurant to handle higher customer volumes without additional staff.
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**Proposed Time Duration**

**Proposed Time Duration for "Project hub"**

1. **Planning and Research (2 weeks)**
2. Conduct surveys, interviews, and focus groups with stakeholders.
3. Analyze existing tools and define user personas and use cases.
4. Document and finalize requirements specification.
5. **Design Phase (3 weeks)**
6. Develop wireframe and prototypes; gather feedback.
7. Plan application architecture and design system integration.
8. Define project milestones, timelines, and prepare project plan.

**3.Development Phase (6 weeks)**

1)Implement core functionalities such as task management, communication tools, and progress tracking.

2) Integrate third-party tools and API, perform iterative testing and debugging.

**4.Testing and Quality Assurance (2 weeks)**

1) Conduct unit and integration testing.

2)Perform user acceptance testing (UAT) with beta testers.

3) Address feedback, fix bugs, and finalize testing

**5.Deployment and Launch (1 week)**

1)Deploy the application to production servers.

2)Provide user training, support, and monitor initial performance.

**6.Post-Launch Support and Maintenance (2 weeks)**

1)Collect user feedback and performance metrics.

2) Implement updates and enhancements, provide regular maintenance and support.

**Total Proposed Time Duration: 16 weeks**

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