IT2143 Visual Computing

Group Project

Group O1

Restaurant Management System

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1. Introduction

In the dynamic landscape of the food industry, the success of a restaurant hinges not only on the quality of its cuisine but also on the seamless orchestration of various operational facets. As the demands of modern consumers evolve, so must the tools that restaurateurs employ to manage their establishments. This project report delves into the design, development, and implementation of a state-of-the-art Restaurant Management System (RMS) aimed at optimizing the myriad functions involved in running a successful dining establishment.

The restaurant industry is marked by its fast-paced environment, diverse customer preferences, and intricate operational workflows. To address these challenges, the proposed RMS is a comprehensive solution that integrates a range of features to streamline day-to-day operations, enhance customer experiences, and empower restaurant owners and staff with valuable insights for informed decision-making.

Restaurant Management System (RMS) envisages an intuitive user experience through the integration of essential features such as user authentication, registration, and personalized dashboards. The login and registration modules provide a secure and tailored environment for both restaurant staff and customers. Staff members can access the system with individual credentials, ensuring data i9ntegrity and role-based access control. On the customer side, the registration process enables users to create profiles, allowing for a more personalized and expedited ordering experience. The dashboard feature serves as the central hub for users, offering a snapshot of pertinent information, such as order history, preferences, and promotions.

Furthermore, the system incorporates a comprehensive product list, showcasing the diverse menu offerings in a visually appealing and easily navigable manner. Customers can explore the products and make choices. The cart page facilitates a smooth and efficient ordering process, allowing users to review their selected items, make adjustments, and proceed to checkout seamlessly. By integrating these components into the RMS, we aim to enhance user engagement and foster customer loyalty. The culmination of these features not only streamlines the operational aspects of restaurant management but also adds a layer of sophistication and user-friendliness to the overall dining process.

This project represents a significant step towards revolutionizing restaurant management by combining technological innovation with a deep understanding of the industry's operational intricacies. Through the implementation of this Restaurant Management System, we aim to elevate the efficiency, profitability, and overall success of dining establishments, contributing to a more vibrant and competitive food industry landscape.

2. Objectives

The Restaurant Management System (RMS) is designed with a set of clear and strategic objectives aimed at optimizing the operational efficiency and overall performance of placing order. Firstly, the system aims to streamline order management processes, ensuring swift and accurate handling of orders from various sources such as in-house dining, and online platforms. Secondly, a robust inventory control system is implemented to minimize waste, control costs, and maintain a well-managed supply chain. The RMS also targets enhanced customer experiences by incorporating a user-friendly facilitating smooth and personalized interactions.

A fundamental objective of the Restaurant Management System (RMS) is to provide a seamless and personalized user experience through a secure login and registration system. The registration feature enables customers to create profiles, facilitating a more tailored and expedited ordering process. Once logged in, users gain access to a comprehensive product list, where they can peruse the menu, view detailed descriptions, and make choices. This objective aligns with the goal of enhancing the overall dining experience, allowing users to easily navigate the offerings and make selections that suit their preferences.

Moreover, the system is designed to facilitate a straightforward order placement process. Users can add selected items to their cart, review their choices, and make any necessary adjustments before proceeding to checkout. This streamlined ordering process not only saves time for customers but also minimizes errors and ensures accurate when placing orders. By integrating these login, registration, and product selection functionalities, the RMS aims to foster user engagement, encourage repeat business, and contribute to a more efficient and customer-centric restaurant management experience. This user-centric approach aligns with the broader objectives of the RMS, enhancing the operational efficiency and customer satisfaction of dining establishments.

Collectively, these objectives form a cohesive strategy to elevate the restaurant management landscape, fostering improved service quality, operational excellence, and ultimately, the success of dining establishments.

3. Methodology

The development of the Restaurant Management System employed a variety of methods and approaches, spanning data collection, tools, technologies, and experimentation. Here is an overview of the key aspects:

I. Requirement Gathering

- **Functional Requirements:**

User Registration/Login: Describe how users and admin register and log in to make purchases.

Product Catalog: Detail how users and admin can browse and view the available products.

Shopping Cart: Explain the functionality of the shopping cart for adding and removing items.

Checkout Process: Detail the steps involved in the checkout process.

Payment Integration: If applicable, explain how payment processing is integrated.

- **Non-functional Requirements:**

Performance: Discuss expectations for system responsiveness during the buying process.

Security: Describe measures taken to secure user data and transactions.

Usability: Explain design considerations for a user-friendly purchasing experience.

II. Tools and Technologies

IDE (Integrated Development Environment): Visual Studio

Programming Language: C#

Database: SQL Server management studio 19

Framework: .NET Framework

User Interface (UI): Windows Forms or WPF

Version Control: Git

III. Features

- Product Browsing:

Users can view a list of available products with details such as product name and price.

A graphical representation, such as a List Box or DataGrid View, is used for a clear product display.

- Shopping Cart:

Users can add products to a shopping cart, and the cart is dynamically updated in the UI.

The cart displays selected items, their quantities, and total prices.

- Checkout Process:

A checkout button initiates the purchase process, updating the database with the order details.

The system may generate an order confirmation for the user.

4. Implementation

Data Access Layer:

A separate class, DataAccess, manages interactions with the database. Methods within DataAccess retrieve product information and authenticate users.

Business Logic:

The application follows a modular structure with distinct classes for products and users. Business logic handles adding products to a shopping cart and facilitates the checkout process.

User Interface (UI):

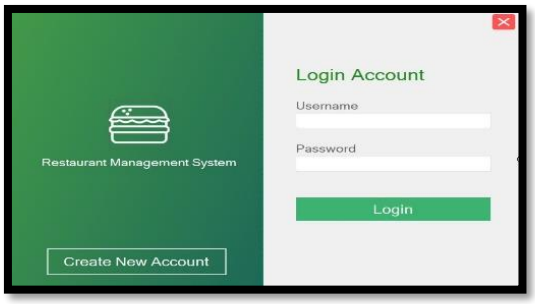
The UI is developed using Windows Forms, providing an intuitive and interactive experience for users. A List Box or DataGrid View displays available products, and buttons enable users to add items to the shopping cart and complete the purchase.

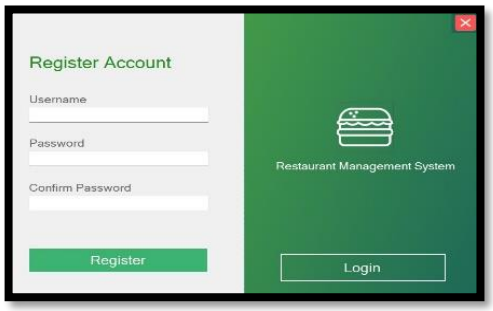
User Authentication:

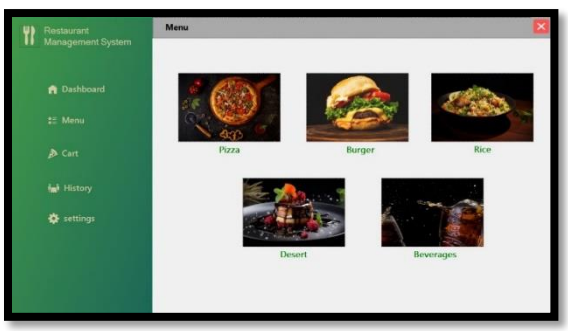
Users can create accounts with unique usernames and secure passwords. The system employs password hashing for enhanced security.

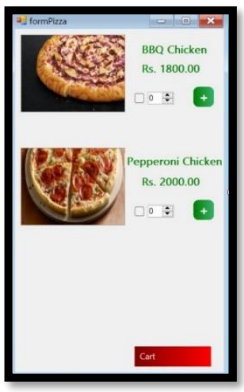
I. Interface Design [1]

User Side: -

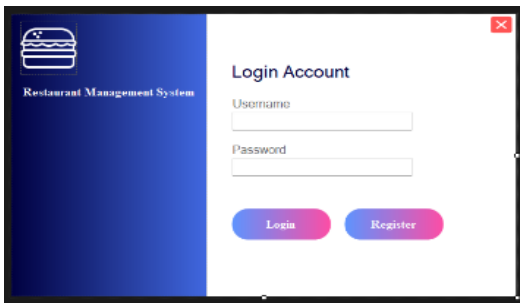


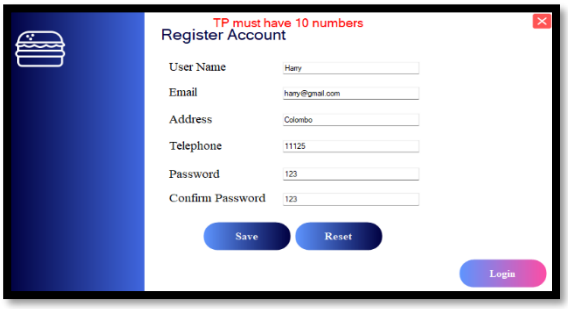


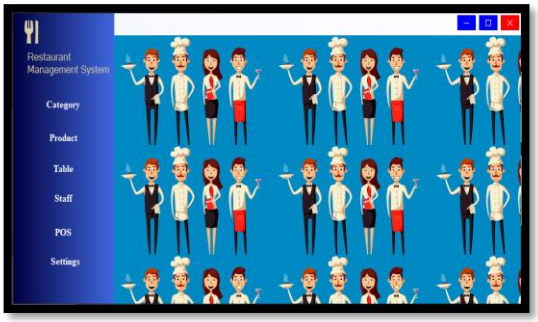


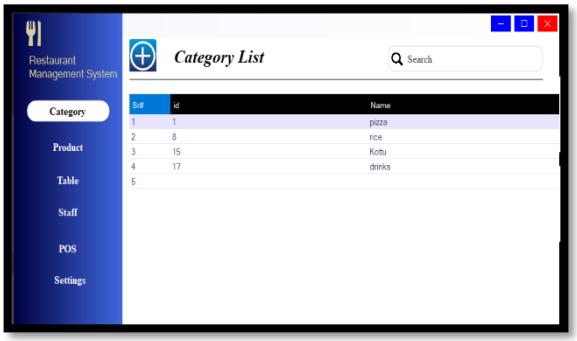


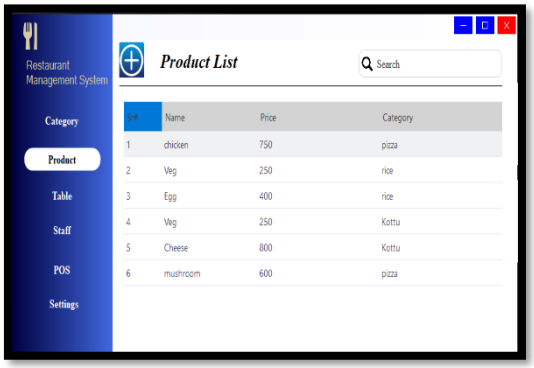
Admin Side: -


Restaurant Management System
Login Account
Username
Password
Login
Register


TP must have 10 numbers
Register Account
User Name
Email
Address
Telephone
Password
Confirm Password
Save
Reset
Login


Restaurant Management System
Category
Product
Table
Staff
POS
Settings


Restaurant Management System
Category List
Search
Category
Product
Table
Staff
POS
Settings


Restaurant Management System
Product List
Search
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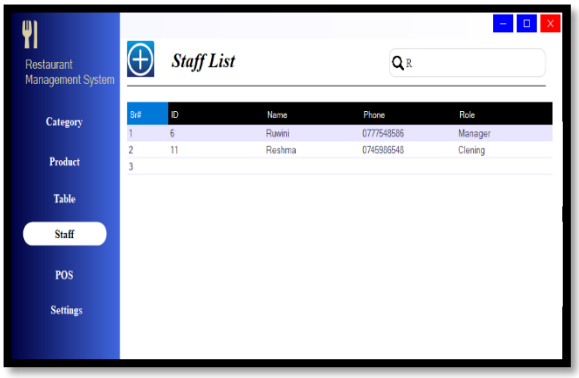
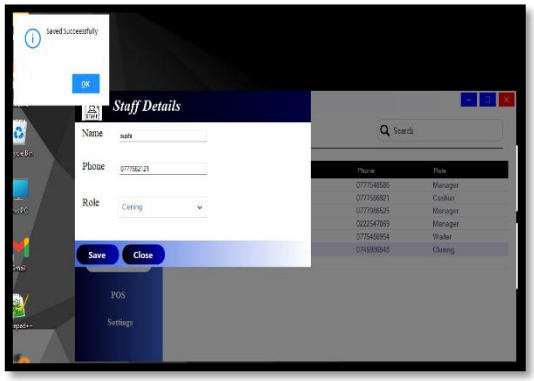
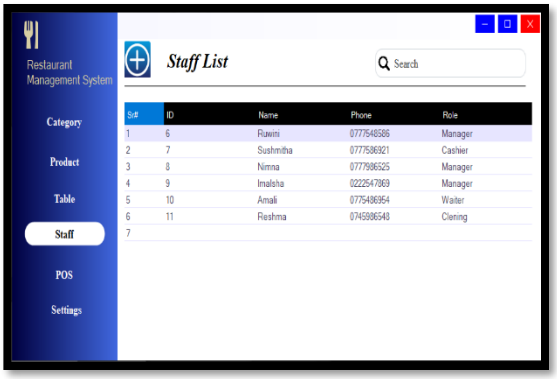
Product
Table
Staff
POS
Settings


Restaurant Management System
Staff List
Category
Product
Table
Staff
POS
Settings


Saved Successfully
OK
Staff Details
Name
Phone
Role
Save
Close


Restaurant Management System
Staff List
Search
Category
Product
Table
Staff
POS
Settings

II. Database

The backbone of the Product Purchasing System is a Microsoft SQL Server relational database. This database is instrumental in managing two key aspects of the system: product information and user details. It plays a crucial role in enabling functions such as maintaining the product catalog, ensuring user authentication, and facilitating seamless order processing.

Data Organization:

Products Table:

ProductID: Uniquely identifies each product.

ProductName: Stores the name or title of the product.

Price: Captures the pricing information for each product.

Users Table:

UserID: Serves as a unique identifier for each user.

UserName: Stores unique usernames for user authentication.

Password: Securely stores hashed passwords to ensure user security.

Relationships:

While there is no direct relationship between the Products and Users tables, the database supports the implicit association of user information with orders, contributing to a streamlined order tracking process.

Security Measures:

To safeguard sensitive information, user passwords are securely stored using robust hashing algorithms. Access to the database is restricted, ensuring that only authorized users can interact with and modify the data.

Future Considerations:

The database structure provides a solid foundation for future enhancements. Potential considerations include the introduction of an Order History table for more comprehensive tracking and normalization adjustments to optimize data storage and retrieval as the system expands.

Connectivity:

The system establishes secure connections to the SQL Server database, utilizing connection strings with appropriate credentials. This ensures that the application can seamlessly interact with and retrieve data from the database.

Backup and Recovery:

Regular database backups are implemented to mitigate the risk of data loss in unforeseen circumstances. A well-documented recovery plan is in place to restore the database to a consistent state in the event of system failures.

III. Testing [2]

Unit testing was conducted to verify the functionality of individual components. Integration testing ensured the seamless interaction of different modules. User acceptance testing validated the system against specified requirements.

IV. Output

Number of Attempts	Time Execution	Space Consumption	Screenshot
1	---	---	Failed
2	---	---	Failed
3	---	---	Failed

In this software there are two databases, one is for the Login and the other is for Product database.

The login database is 100 % connected and working with the software while product database doesn't connect with the software so in the middle of the software compilation, an execution error is occurred. Due to that output could not be get.

5. Conclusion

In summary, the Restaurant Management System (RMS) project has successfully delivered a comprehensive solution that streamlines operations for the food industry. The implementation of a secure login, user-friendly interfaces, and robust backend functionalities ensures an efficient and personalized experience. Through rigorous testing, continuous integration, and security measures, the system has been crafted with reliability and scalability in mind. The RMS not only addresses immediate challenges but also positions itself as a valuable tool for data-driven decision-making, contributing to the overall success and adaptability of dining establishments. As the system enters operational use, it signifies a successful culmination of collaborative efforts, technological innovation, and user-centric design principles.

6. References

[1] Restaurant Management System using C# and SQL Server by waqar ahmad youtube channel :- https://youtu.be/aripIuUPO-Q?si=W_OfudIOgb9zS-9g

[2] Microsoft website :- https://learn.microsoft.com/en-us/visualstudio/