Institute of Science & Technology

PROJECT PROPOSAL

Digitization of Billing and Customer Memo System for Food Shop

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1. Project Title

Digitization of Billing and Customer Memo System for Food Shop Using Object-Oriented Programming

2. Project Description

This project aims to develop a digital billing system and customer memo system for Food Shop using Object-Oriented Programming (OOP) principles. The system will streamline billing processes, improve accuracy, and enhance customer relationship management through a well-structured and modular codebase. While the focus will be on OOP, the project will also incorporate Database Management Systems (DBMS) for efficient data handling.

3. Objectives

- **Develop a Digital Billing System:** Automate the billing process using OOP to reduce errors and improve efficiency.
- **Create a Customer Memo System:** Implement an OOP-based memo system to record and manage customer orders, preferences, and feedback.
- **Modular and Maintainable Code:** Ensure the system is designed with modularity and maintainability in mind, utilizing OOP principles such as inheritance, polymorphism, and encapsulation.
- **Efficient Data Management:** Use DBMS for data storage and retrieval to support the OOP-based application.

4. Methodology

1. **Requirements Analysis**:
    - Conduct interviews with Food Shop staff to gather requirements.
    - Identify key functionalities for both billing and customer memo systems.
2. **Implementation**:
    - Develop the application using an OOP language (C++).
    - Implement key OOP concepts:
        - **Classes and Objects**: Define entities such as `Customer`, `Order`, `Pizza`, `Bill`, and `Memo`.
        - **Inheritance**: Create base and derived classes for code reuse
        - **Polymorphism**: Implement different payment types through polymorphism.
        - **Encapsulation**: Protect data using private attributes and public methods.
        - **Abstraction**: Use abstract classes/interfaces for complex operations.
        - **Composition**: Model relationships between objects.
        - **Aggregation**: Implement relationships where objects can exist independently.
        - **Association**: Define relationships between classes.
        - **Interfaces**: Define interfaces for different payment methods and customer interactions.
        - **Exception Handling**: Implement robust error handling to ensure system stability.
        - **File I/O**: Use file input and output for backup and data transfer.
        - **Multithreading**: Improve performance by handling multiple tasks simultaneously.
3. **Testing**:

- Conduct unit testing and debugging.
- Perform user acceptance testing.

4. **Deployment**:
    - Install and set up the system at the food shop.
    - Conduct initial bug fixes and adjustments.
5. **Maintenance**:
    - Provide regular updates and user support.

5. Resources Needed

- **Software:**
    - IDE for development (CodeBlocks, VS code).
    - DBMS software (MySQL, PostgreSQL).
    - Version Control (Git).
- **Hardware:**
    - Computers for development and deployment.
    - Servers for hosting the database and application.
- **Human resources:**
    - Software developers.
    - Database administrators.
    - QA testers.
    - Training personal

6. Expected Outcomes

- **Improved Efficiency:** Faster and more accurate billing process.
- **Enhanced Customer Experience:** Better management of customer orders and preferences.
- **Scalability:** A system that can grow with the business needs.
- **Modular and Maintainable Codebase:** An application built on solid OOP principles for easy maintenance and future expansion.

7. Significance

Digitizing the billing and customer memo system will significantly enhance operational efficiency, reduce errors, and improve customer satisfaction at Food Shop. By focusing on OOP, the project will produce a well-structured and maintainable codebase, ensuring long-term benefits and ease of updates.

8. Conclusion

This project proposal outlines the plan to digitize the billing and customer memo system for Food Shop using Object-Oriented Programming. By leveraging OOP principles and integrating a DBMS for data management, the project aims to deliver a robust, maintainable, and efficient solution that meets the current and future needs of the business.