

**Institute of Science & Technology**

PROJECT PROPOSAL

**Digitization of Billing and Customer Memo System for Food Shop**

**Author:**

Mahidul Islam (22057)

Rashadul Islam Rohan (22002)

**Supervised By:**

**Mohammad Hasan**

Table of Contents

1. Project Title ………………………………………………….…1

2. Project Description………….………………………………….1

3. Objectives……………………………………………………….1

4. Methodology…………………………………………………….1

5. Timeline………………………………………………………….2

6. Resource Needed……………………………………………...3

7. Expected Outcomes……………………………………………3

8. Significance……………………………………………………..3

9. Budget…………………………………………………………...3

10. Conclusion……………………………………………………3

**1**

**Project Proposal: Digitalizing the Billing and Customer Memo System for a Food Shop Using Object-Oriented Programming**

**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. **System Design:**
   * Design the system architecture using UML diagrams (class diagrams, sequence diagrams, use case diagrams).
   * Define classes and objects to represent billing, customers, orders, and other relevant entities
3. **Implementation**:
   * Develop the application using an OOP language (e.g., Java, 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.

**4**

* + - **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.
    - **Design Patterns**: Apply design patterns like Singleton for database connections, Factory for creating objects, and Observer for real-time updates.

1. **Testing**:
   * Conduct unit testing and debugging.
   * Perform user acceptance testing.
2. **Deployment**:
   * Install and set up the system at the food shop.
   * Conduct initial bug fixes and adjustments.
3. **Maintenance**:
   * Provide regular updates and user support.

**5. Timeline**

|  |  |
| --- | --- |
| **Milestone** | **Deadline** |
| Requirements Analysis | [Date] |
| System Design | [Date] |
| Implementation | [Date] |
| Testing | [Date] |
| Deployment | [Date] |
| Training and Maintenance | [Date] |

**3**

**6. 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

**7. 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.

**8. 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.

**9. Budget**

|  |  |
| --- | --- |
| **Item** | **Cost** |
| Software Licenses | [Amount] |
| Hardware | [Amount] |
| Development Team | [Amount] |
| Training Sessions | [Amount] |
| Miscellaneous | [Amount] |
| Total | [Total Amount] |

**10. 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.