**Proposal for Pharmacy Management System using VB.NET and MySQL**

* **UNIVERSITY: JKUAT**
* **COURSE: BSC COMPUTER SCIENCE**
* **UNIT: DESIGN AND IMPLEMENTATION OF COMPUTER APPLICATIONS**

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**Brief Description:**

The proposed Pharmacy Management System aims to streamline the operations of pharmacies by automating various tasks such as inventory management, prescription tracking, sales recording, and customer management. This system will provide an efficient and user-friendly interface for pharmacists and staff to manage their daily operations effectively. Potential clients/users include pharmacies of all sizes, including standalone stores, chain pharmacies, and hospital pharmacies.

**Functional Requirements:**

1. Inventory Management:

- Track stock levels of drugs and medical supplies.

- Receive alerts for low stock items.

- Generate purchase orders for replenishment.

2. Prescription Tracking:

- Record and manage prescription details.

- Allow pharmacists to verify prescriptions electronically.

3. Sales Recording:

- Process sales transactions.

- Generate invoices and receipts.

4. Customer Management:

- Maintain customer profiles and purchase history.

- Provide loyalty program functionality.

5. Reporting:

- Generate reports on sales, inventory, and financials.

- Allow customization of reports based on user requirements.

**Non-Functional Requirements:**

- Software:

- Development Platform: VB.NET for frontend development.

- Database Management System: MySQL for backend data storage.

- Hardware:

- Server: Minimum Intel Core i5 processor, 8GB RAM, 500GB HDD.

- Client Machines: Minimum Intel Core i3 processor, 4GB RAM, 250GB HDD.

- Network Infrastructure: Local area network (LAN) setup for multi-user access.

**Schedule/Project Plan:**

**Week 1-2: Feasibility Study**

- market research to assess the need for the pharmacy management system.

- Analyze the feasibility of implementing the proposed system.

- Identify potential challenges and risks.

**Week 3-4: Design Phase**

- Interface Design: Develop mockups and prototypes for the user interface.

- Database Design: Design the database schema for storing pharmacy data.

- Program Design: Plan the architecture and modules of the software.

**Week 5-6: Development Phase**

- Implementation of the frontend using VB.NET, incorporating the designed interface.

- Set up the MySQL database and develop the backend logic for data processing.

- Integrate frontend and backend components to create a functional system.

**Week 7: Testing and Deployment**

- Conduct rigorous testing to ensure the system meets functional and non-functional requirements.

- Gather feedback from stakeholders and make necessary improvements.

- Deploy the Pharmacy Management System to production environment.

*This proposal outlines the plan for developing a Pharmacy Management System using VB.NET and MySQL. By adhering to the proposed schedule, we aim to deliver a robust and efficient system that meets the needs of pharmacies and enhances their operations.*

**Feasibility Study: Josh Pharmacy Management System**

**1. Introduction:**

The feasibility study evaluates the viability and potential success of implementing the Josh Pharmacy Management System (JPMS) at Josh Pharmacy. The purpose of this study is to assess the technical, economic, operational, and schedule feasibility of deploying JPMS to streamline pharmacy operations, improve efficiency, and enhance customer service.

**2. Background:**

Josh Pharmacy currently relies on manual processes and legacy systems for inventory management, prescription processing, sales recording, and customer management. These systems have become inefficient, prone to errors, and unable to meet the growing demands of the pharmacy. As a result, there is a need to explore the implementation of JPMS to modernize operations and address existing challenges effectively.

**3. Objectives:**

The objectives of the feasibility study are as follows:

* Evaluate the technical feasibility of implementing JPMS within the existing IT infrastructure.
* Conduct a cost-benefit analysis to determine the economic feasibility of deploying JPMS.
* Assess the operational feasibility by analyzing the impact of JPMS on existing workflows and staff.
* Determine the schedule feasibility by estimating the time required for development, testing, and implementation of JPMS.

**4. Methodology:**

The feasibility study will involve gathering information through interviews, surveys, and analysis of existing systems and processes at Josh Pharmacy. Data will be analyzed using appropriate tools and criteria to assess technical, economic, operational, and schedule feasibility.

**5. Technical Feasibility:**

The technical feasibility assessment will focus on evaluating:

* Compatibility of JPMS with existing hardware and software infrastructure.
* Availability of skilled IT personnel for development, implementation, and maintenance of JPMS.
* Integration capabilities with third-party systems and services used by Josh Pharmacy.

**6. Economic Feasibility:**

A cost-benefit analysis will be conducted to:

* Estimate the initial investment required for developing and implementing JPMS.
* Identify potential cost savings, revenue opportunities, and other benefits associated with JPMS.
* Calculate the Return on Investment (ROI) and payback period to determine the economic viability of deploying JPMS.

**7. Operational Feasibility:**

Operational feasibility will be assessed by:

* Analyzing the impact of JPMS on existing workflows, processes, and staff roles.
* Evaluating the usability and user acceptance of JPMS among pharmacy staff.
* Identifying training needs and support requirements to ensure successful adoption and integration of JPMS into daily operations.

**8. Schedule Feasibility:**

The schedule feasibility assessment will involve:

* Estimating the time required for system development, testing, and deployment of JPMS.
* Planning for data migration, user training, and transition from legacy systems to JPMS.
* Identifying potential risks and challenges that may affect the timeline of JPMS implementation.

**9. Conclusion:**

Based on the findings of the feasibility study, it is concluded that the implementation of the Josh Pharmacy Management System is feasible and beneficial for addressing the challenges faced by Josh Pharmacy. Recommendations will be provided for moving forward with the development and deployment of JPMS, including considerations for resource allocation, risk management, and stakeholder engagement.

**Design Phase:**

The design phase of the Pharmacy Management System involves creating detailed plans and specifications for the software's user interface, database structure, program architecture, and workflow. This phase lays the foundation for the development process and ensures that the final product meets the requirements of users and stakeholders.

**1. Interface Design:**

* **Mockups and Prototypes:** Design mockups and prototypes of the user interface to visualize the layout, navigation, and functionality of the system.
* **User Feedback:** Gather feedback from stakeholders and potential users to refine the interface design and ensure usability and intuitiveness.
* **Accessibility:** Ensure that the interface is accessible to users with disabilities and complies with accessibility standards.

**2. Database Design:**

* **Entity-Relationship Diagram (ERD):** Develop an ERD to model the relationships between different entities such as drugs, customers, prescriptions, and sales.
* **Normalization:** Normalize the database schema to minimize redundancy and improve data integrity.
* **Indexing and Optimization:** Implement indexing and optimization techniques to enhance database performance, especially for large datasets.

**3. Program Design:**

* **Architecture:** Define the overall architecture of the software, including the frontend and backend components, as well as any third-party integrations.
* **Modular Design:** Divide the system into modular components to facilitate development, testing, and maintenance.
* **Data Flow:** Create data flow diagrams to illustrate the flow of information within the system and between different modules.
* **Error Handling:** Implement robust error handling mechanisms to gracefully handle exceptions and errors encountered during runtime.

**4. Flowcharts and Sequence Diagrams:**

* **Flowcharts:** Develop flowcharts to visualize the logical flow of processes within the system, such as inventory management, sales processing, and prescription verification.
* **Sequence Diagrams:** Create sequence diagrams to depict the interactions between different system components and actors during use cases such as placing an order or generating a report.

**5. Security Design:**

* **Authentication and Authorization:** Implement secure authentication mechanisms to verify the identity of users and control access to sensitive data and functionality.
* **Data Encryption:** Encrypt sensitive data such as customer information and prescriptions to protect confidentiality and privacy.
* **Audit Trail:** Incorporate an audit trail mechanism to track and log user actions for accountability and compliance purposes.

**Conclusion:** The design phase lays the groundwork for the development of the Pharmacy Management System, providing detailed specifications for the user interface, database structure, program architecture, and security mechanisms. By following the design principles outlined above, we ensure that the final product meets the needs of users, adheres to best practices, and is scalable and maintainable.

**Interface Design for the System:**

The interface design of the Pharmacy Management System is crucial for providing users with an intuitive and efficient platform to manage pharmacy operations. The design should focus on ease of use, clarity, and accessibility to ensure that users can perform their tasks efficiently. Below are the key components of the interface design:

**1. Dashboard:**

* Upon logging in, users are greeted with a comprehensive dashboard that provides an overview of key metrics and tasks.
* The dashboard includes widgets for quick access to important modules such as inventory management, prescription tracking, sales recording, and reporting.

**2. Navigation Menu:**

* A prominent navigation menu is located either on the top or side of the interface, providing easy access to different modules and functionalities.
* The menu is organized logically, with categories such as Inventory, Sales, Customers, Reports, and Settings.

**3. Inventory Management:**

* The inventory management module allows users to view and manage the stock levels of drugs and medical supplies.
* Users can search for specific items, view detailed product information, update stock quantities, and receive alerts for low stock items.
* Functions for adding new products, editing existing entries, and generating purchase orders are easily accessible.

**4. Prescription Tracking:**

* The prescription tracking module enables pharmacists to record and manage prescription details efficiently.
* Pharmacists can verify prescriptions electronically, view prescription history, and mark prescriptions as filled or pending.
* Integration with external systems for electronic prescription processing may be implemented for seamless workflow.

**5. Sales Recording:**

* The sales recording module facilitates the processing of sales transactions, generating invoices, and receipts.
* Users can add products to the cart, apply discounts, calculate taxes, and finalize the sale with payment options.
* Sales history and transaction details are easily accessible for reference and reporting purposes.

**6. Customer Management:**

* The customer management module allows users to maintain customer profiles, including contact information, purchase history, and loyalty program details.
* Functions for adding new customers, editing existing profiles, and managing loyalty points are available.
* Customer search and filtering options enhance usability for quick retrieval of customer information.

**7. Reporting:**

* The reporting module provides users with customizable reports on sales, inventory, financials, and other relevant metrics.
* Users can generate reports based on specific criteria, such as date range, product category, or customer segment.
* Report visualization options such as charts and graphs may be included for better data interpretation.

**8. Accessibility and Responsiveness:**

* The interface design prioritizes accessibility features to ensure usability for users with disabilities.
* The system is designed to be responsive, adapting to different screen sizes and devices for optimal user experience.

**Conclusion:** The interface design of the Pharmacy Management System focuses on providing users with an intuitive and efficient platform for managing pharmacy operations. By incorporating user-friendly navigation, clear layouts, and accessibility features, the design aims to enhance user productivity and satisfaction.

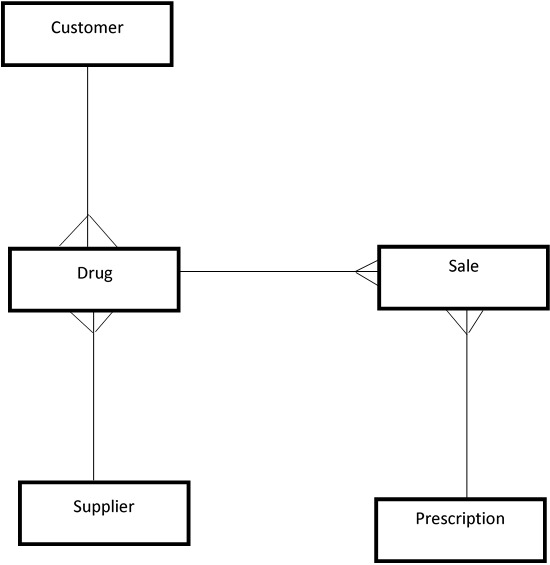
**Database Design for Pharmacy Management System:**

The database design of the Pharmacy Management System is crucial for efficiently storing and managing pharmacy-related data. A well-structured database schema ensures data integrity, scalability, and optimal performance. Below are the key components of the database design:

**1. Entity-Relationship Diagram (ERD):**

* Develop an ERD to model the relationships between different entities within the system, such as drugs, customers, prescriptions, sales, and suppliers.
* Identify the primary entities and their attributes, along with their relationships and cardinalities (e.g., one-to-many, many-to-many).
* Ensure that the ERD accurately represents the business requirements and supports the functionalities of the system.

**ERD(General)**



**ERD Detailed**

Prescription

Customer

Supplier

Drug

Sale

**Entities and their Primary Keys**

1. **Drug:**
   * Attributes:
     + DrugID (Primary Key)
     + Name
     + Description
     + Quantity
     + Price
     + ExpiryDate
     + SupplierID (Foreign Key)
2. **Customer:**
   * Attributes:
     + CustomerID (Primary Key)
     + Name
     + Address
     + Phone Number
     + Email
3. **Prescription:**
   * Attributes:
     + PrescriptionID (Primary Key)
     + CustomerID (Foreign Key)
     + DoctorName
     + IssueDate
     + ExpiryDate
4. **Sale:**
   * Attributes:
     + SaleID (Primary Key)
     + CustomerID (Foreign Key)
     + SaleDate
     + TotalAmount
     + PaymentMethod
5. **Supplier:**
   * Attributes:
     + SupplierID (Primary Key)
     + Name
     + Address
     + Phone Number
     + Email

**Relationships:**

* + **One-to-Many Relationships:**
    - A Drug can have multiple Sales (One-to-Many).
    - A Prescription can have multiple Sales (One-to-Many).
    - A Supplier can supply multiple Drugs (One-to-Many).
  + **Many-to-One Relationships:**
    - Many Sales can be associated with one Customer (Many-to-One).
    - Many Sales can be associated with one Prescription (Many-to-One).
    - Many Drugs can be supplied by one Supplier (Many-to-One).

**2. Database Tables:**

* Create database tables based on the entities identified in the ERD, with each table representing a distinct entity or concept.
* Define appropriate attributes (columns) for each table to store relevant data, ensuring proper data types, lengths, and constraints.
* Establish primary keys and foreign keys to enforce referential integrity and facilitate data retrieval and manipulation.

**The tables are as follows:**

|  |
| --- |
| Drugs |
| Drug ID (Primary Key)  Drug name  Drug description  Quantity  Expiry date  Price  Supplier ID (Foreign Key) |

|  |
| --- |
| Customer Table |
| Customer (Primary Key)  Name  Address  Phone Number  Email |

|  |
| --- |
| Prescription |
| Prescription (Primary Key)  Customer (Foreign Key)  Doctor Name  Issue Date  Expiry Date |

|  |
| --- |
| Sales |
| Sale ID (Primary Key)  Customer ID (Foreign Key)  Sale Date  Total Amount  Payment Method |

|  |
| --- |
| Supplier |
| Supplier (Primary Key)  Name  Address  Phone Number  Email |

**Tables SQL**

**1)Drugs Table**

CREATE TABLE Drug (

DrugID INT PRIMARY KEY,

Name VARCHAR(255),

Description VARCHAR(255),

Quantity INT,

Price DECIMAL(10, 2),

ExpiryDate DATE,

SupplierID INT,

FOREIGN KEY (SupplierID) REFERENCES Supplier(SupplierID)

);

**2)Customer**

CREATE TABLE Customer (

CustomerID INT PRIMARY KEY,

Name VARCHAR(255),

Address VARCHAR(255),

PhoneNumber VARCHAR(15),

Email VARCHAR(255)

);

**3)Prescription**

CREATE TABLE Prescription (

PrescriptionID INT PRIMARY KEY,

CustomerID INT,

DoctorName VARCHAR(255),

IssueDate DATE,

ExpiryDate DATE,

FOREIGN KEY (CustomerID) REFERENCES Customer(CustomerID)

);

**4)Sale**

CREATE TABLE Sale (

SaleID INT PRIMARY KEY,

CustomerID INT,

SaleDate DATE,

TotalAmount DECIMAL(10, 2),

PaymentMethod VARCHAR(50),

FOREIGN KEY (CustomerID) REFERENCES Customer(CustomerID)

);

**5)Supplier**

CREATE TABLE Supplier (

SupplierID INT PRIMARY KEY,

Name VARCHAR(255),

Address VARCHAR(255),

PhoneNumber VARCHAR(15),

Email VARCHAR(255)

);