KARACHI INSTITUTE OF ECONOMICS & TECHNOLOGY
College of Engineering
(Department of Software Engineering)

Software Design and Architecture

Complex Engineering Problem

Student Name: Sufyan **Faculty Signature:_____**

Studend Id: 15815 **Date:_____**

CLOs		PLOs		Bloom Taxonomy	
CLO-2		PLO-3 : Design/Development of Solution		C3: Apply	
CLO-3		PLO-01:Engineering Knowledge		C4: Analyze	
SNo.	**Complex Engineering Solving Attributes**	**Excellent (75-100%)**	**Average (50-75%)**	**Poor (<50%)**	**Marks**
CLO-2 (50%)	**WP3 – Extend of applicable code** Have outside problems encompassed by standards and codes of practice for professional engineering.	Identifies the correct approach for solving the problem that applies within a specific context and obtained the output as per requirement.	Identifies the improper approach for solving the problem that applies within a specific context and obtained slightly different output as per requirement.	Unable to identify the approach for solving the problem that applies within a specific context that will lead to wrong output.	
CLO-3 (50%)				.	
				Total Marks:	

Question:

Your task is to **Choose** and design a simple library management system using the most relevant architecture that can be used by a small library. The library has a collection of books and magazines that can be borrowed by members. The library has a librarian who is responsible for managing the library and the books.

Assignment Task:

A. Your library management system should have the following features:

1. **Member Management:** The librarian should be able to add, edit, and delete member details such as name, address, phone number, and email address.
2. **Booking Management:** the librarian should be able to add, edit and delete books in the library. Each book should have unique ID, title, author, and publisher.
3. **Borrowing Management:** Members should be able to borrow books from the library. The librarian should be able to issue books to members, record the due date, and mark books as returned when they are returned.
4. **Reservation Management:** Members should be able to reserve books that are not currently available. The librarian should be able to manage the reservation.
5. **Reporting:** the librarian should be able to generate reports such as a list of books that are currently borrowed, a list of members who have overdue books, and a list of the most popular books in the library. B. Make a Proper SRS report using IEEE format.

You can use any programming language and database management system of your choice to develop the library management system. Your system should be easy to use and should have a user-friendly interface. You should also ensure that the system is secure and can handle concurrent access by multiple users.

Your task entails the selection and design of a straightforward library management system employing an architecture best suited for a small-scale

library. This system is intended to facilitate the borrowing of books and magazines by members, with oversight provided by a librarian responsible for library and inventory management.

The assigned project mandates the inclusion of the following functionalities:

1. **Member Management: The librarian should possess the capability to append, modify, and remove member details encompassing name, address, phone number, and email address.**
2. **Catalog Management: The librarian should wield authority to add, amend, or delete books within the library. Each book entry must possess a unique identifier, along with attributes such as title, author, and publisher.**
3. **Borrowing Administration: Members should have the capability to borrow books from the library. The librarian should be empowered to allocate books to members, record due dates, and update the status of books upon their return.**
4. **Reservation Handling: Members ought to be able to reserve books that are presently unavailable. The librarian should retain the ability to oversee these reservations.**
5. **Reporting: The librarian should have the capacity to generate diverse reports, including lists of borrowed books, members with overdue books, and the most popular library holdings.**

The system should adhere to IEEE standards for Software Requirements Specification (SRS), and flexibility is afforded in the selection of programming language and database management system for system development.

Furthermore, the system should prioritize ease of use, ensuring a user-friendly interface, while also emphasizing security and the ability to accommodate concurrent user access.

Software Requirements Specification(SRS):

Project Title: SAY Online E-Marketing System

Table of Contents

1. Introduction

1.1 Purpose

The SAY Online E-Marketing System aims to provide a robust, user-friendly, and efficient platform for sellers to showcase and manage their products and for administrators to oversee and maintain the system's integrity. The primary goal is to enhance the e-commerce experience for users by offering a streamlined interface and powerful backend capabilities.

1.2 Scope

This system is designed for small to medium-scale e-commerce operations. It serves two primary user roles:

- **Sellers**: Allowing them to manage their product catalogs, track sales, and analyze performance data.
- **Administrators**: Enabling them to oversee the platform's operations, ensure security, and provide a seamless experience for all users.

The platform is built using the MVC (Model-View-Controller) architecture with SQL for database management and HTML/CSS for front-end design. Key functionalities include product management, user authentication, sales tracking, and administrative control, making it a comprehensive solution for e-commerce needs.

1.3 Definitions and Abbreviations

- **SAY Online**: The name of the e-marketing system.
- **MVC**: Model-View-Controller architecture used for system development.
- **SQL**: Structured Query Language for managing the database.
- **HTML/CSS**: Markup and styling languages used for the front-end interface.
- **Admin**: An individual with high-level permissions to manage the platform's settings and users.
- **Seller**: A registered user who lists and manages products on the platform.

1.4 References

- IEEE Standard 830-1998 for Software Requirements Specification documentation.
- Documentation for ASP.NET MVC framework.
- Best practices for responsive web design, secure application development, and SQL database management.

1.5 Overview

This document provides a detailed description of the SAY Online E-Marketing System's requirements, features, and constraints. It outlines the intended functionality, expected performance, and interaction flow between users and the system, with a focus on the technical implementation using MVC, SQL, and HTML/CSS.

2. Overall Description

2.1 Product Perspective

The SAY Online E-Marketing System is a web-based application developed using the MVC architecture. This approach separates the application into three interconnected components:

- **Model**: Manages the database interactions using SQL and represents the application's data logic.
- **View**: Defines the user interface using HTML and CSS for a responsive and interactive experience.
- **Controller**: Handles user inputs, processes business logic, and updates the Model and View accordingly.

The system integrates with external tools such as payment gateways and analytics platforms for enhanced functionality.

2.2 Product Features

- **User Authentication**: Secure login for both sellers and administrators.
- **Seller Features**:
  - Add, update, and delete product listings.
  - View real-time sales performance metrics.
  - Access reports and insights.
- **Admin Features**:
  - Manage user accounts and roles.
  - Monitor platform activities and enforce policies.
  - Generate detailed system reports.

2.3 User Characteristics

- **Admins**: Proficient in system management and familiar with monitoring tools.
- **Sellers**: Entrepreneurs with basic knowledge of web applications who need a simple and efficient interface to manage their products.

2.4 Constraints

- The system will function only on modern web browsers such as Google Chrome, Mozilla Firefox, and Microsoft Edge.
- The initial release will support English as the sole language for interaction.
- The platform will be optimized for desktop and mobile devices.
- All database operations will be managed using SQL, ensuring scalability and reliability.

3. Functional Requirements

3.1 User Authentication

- **FR1**: The system must support secure login functionality for sellers and administrators using MVC's built-in authentication mechanisms.
- **FR2**: Different login pages must be displayed based on the user role.

3.2 Seller Functionalities

- **FR3**: Sellers can add, modify, or remove product details, including images, descriptions, and pricing. Data will be stored in SQL tables.
- **FR4**: Sellers can view detailed dashboards with metrics such as sales volume, product performance, and customer engagement, rendered through Views using HTML/CSS.
- **FR5**: Sellers can download reports summarizing their business activity, generated from SQL queries.

3.3 Admin Functionalities

- **FR6**: Admins can create, edit, or deactivate user accounts using the Controller logic and SQL database updates.
- **FR7**: Admins can monitor activities on the platform, such as product uploads and sales transactions, through interactive dashboards.
- **FR8**: Admins can generate system-wide reports and oversee platform health.

4. Non-Functional Requirements

4.1 Performance Requirements

- The platform should support up to 100 concurrent users without performance degradation.
- SQL queries must be optimized to ensure minimal response times for database interactions.
- Page load times should not exceed 2 seconds under normal operating conditions.

4.2 Security Requirements

- All sensitive data, including user credentials, must be encrypted in transit using HTTPS and at rest using industry-standard encryption algorithms.
- MVC's built-in security features, such as input validation and anti-CSRF tokens, will be used.
- User sessions should expire after a period of inactivity.

4.3 Usability Requirements

- The interface must be intuitive, ensuring a seamless user experience for both sellers and administrators.
- The platform must adapt to various screen sizes and resolutions for optimal usability.

5. System Models

5.1 Use Case Diagram

- Illustrates interactions between Admin, Seller, and the system. Key use cases include product management, sales tracking, and user management.

5.2 Activity Diagram

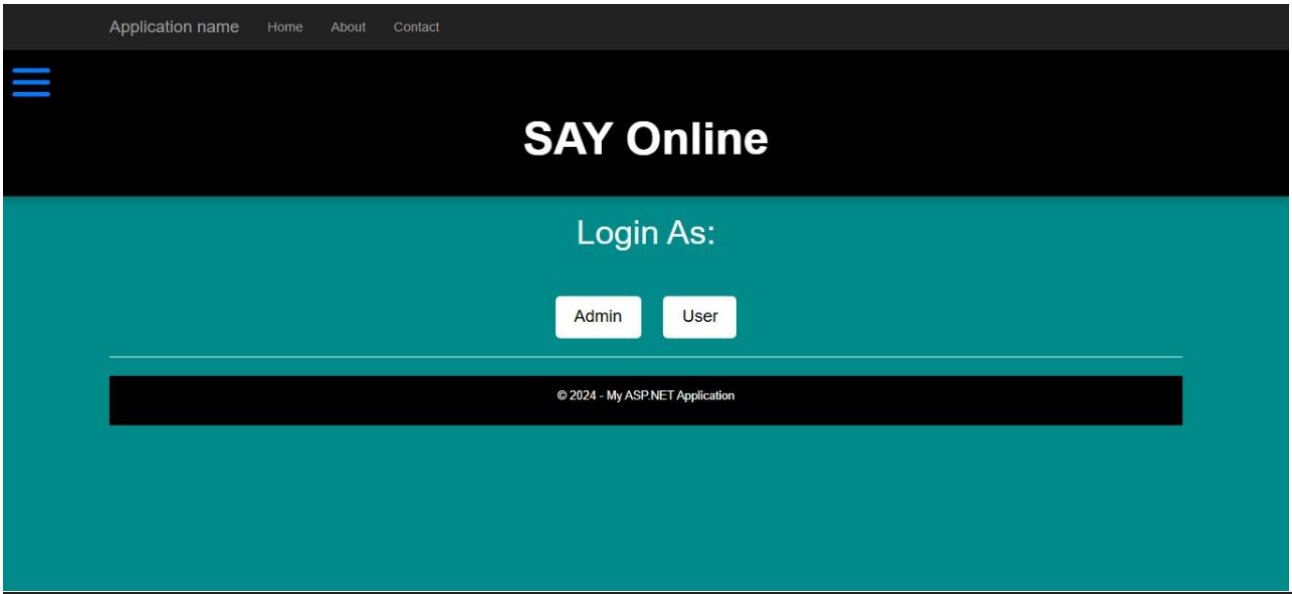
- Visualizes workflows for common activities such as user login, product management, and reporting.

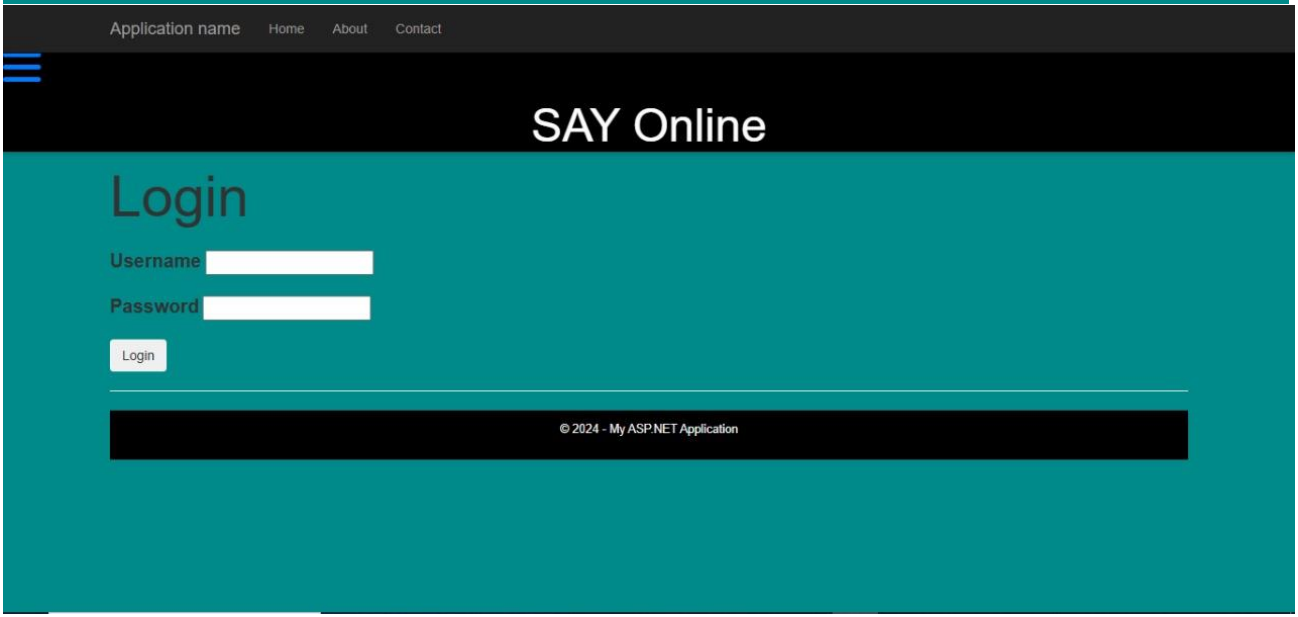
5.3 Database Diagram

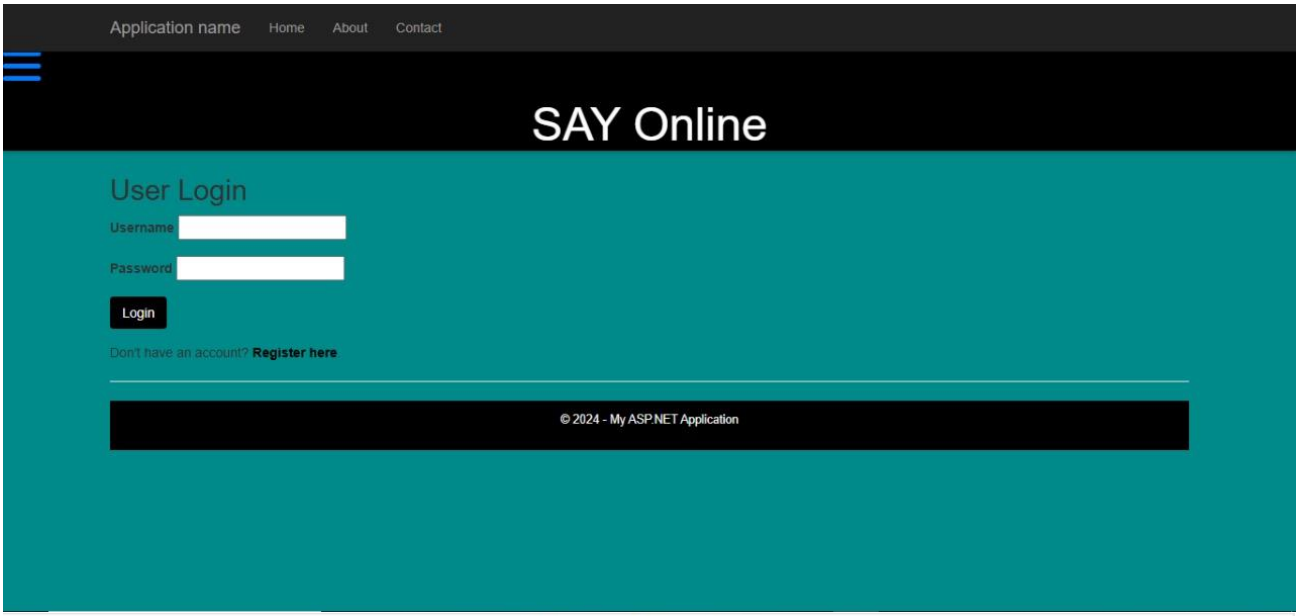
- Defines relationships between SQL tables, including:
    - **Users**: Stores user information such as roles and credentials.
    - **Products**: Contains details about products such as names, descriptions, images, and prices.

- **Sales**: Tracks sales transactions and related data.
- **Reports**: Maintains report data for sellers and admins.
-

6. Visuals:







Manage Products

Name

Price

Category

Select a Category

Description

Image

Choose File No file chosen

Save

Your Products

Name	Price	Category	Description	Image	Actions

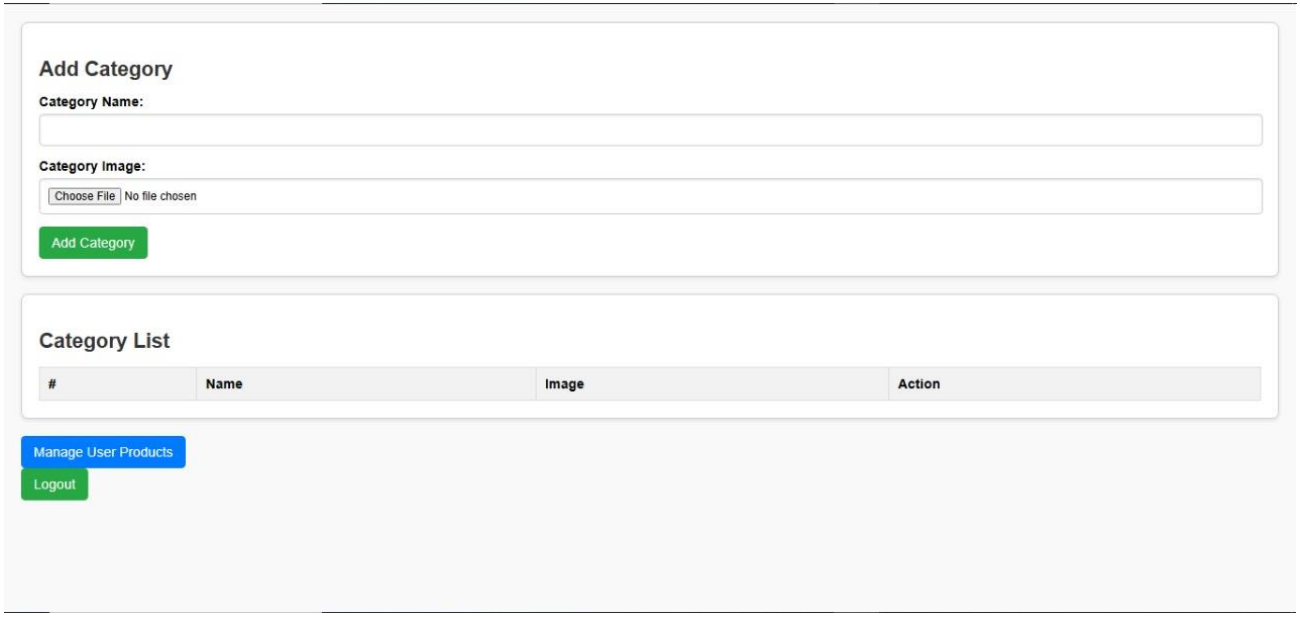
Edit User Profile

Logout

EDIT DETAILS

Name:
Email:
Contact:
Password:

Save Changes
Logout



Conclusion:

The SAY Online E-Marketing System is designed to simplify e-commerce operations for sellers and administrators by leveraging the power of the MVC architecture, SQL, and modern web technologies like HTML and CSS. This platform ensures scalability, usability, and robust performance, making it a comprehensive solution for small to medium-sized e-commerce businesses. By addressing both functional and non-functional requirements, this system provides a secure, efficient, and user-friendly environment for managing online marketing and sales.