ALX SOFTWARE ENGINEERING

WEBSTACK PORTFOLPROJECT

PROJECT DOCUMENTATION ON HOSPITAL MANAGEMENT SYSTEM FOR UMAT

BY:

JACOB AIDOO

ABSTRACT

The Hospital Management System (HMS) Documentation serves as a comprehensive guide to the development, deployment, and utilization of a sophisticated software solution designed to streamline the operations of a university hospital. This documentation outlines the architecture and technologies employed in the system's creation, including HTML, CSS, Bootstrap, JavaScript, C#, ASP.NET, and SQL.

It provides insights into the roles and permissions of users within the system, ranging from administrators to patients, and details the extensive features and modules available. These modules include patient management, appointment scheduling, billing and payments, pharmacy and inventory management, reporting, and robust security measures.

In addition, the documentation offers a step-by-step guide to installation and deployment, ensuring a smooth implementation process for hospital administrators and IT personnel. The Hospital Management System Documentation aims to empower healthcare professionals and hospital staff with a comprehensive tool to enhance patient care, streamline administrative processes, and improve the overall efficiency of hospital operations.

INTRODUCTION

The Hospital Management System (HMS) is a comprehensive software solution designed for a university hospital to streamline and automate various tasks related to patient management, appointment scheduling, billing, and administrative functions. This documentation provides an overview of the system's architecture, front-end and back-end development technologies, user roles, features, and installation instructions

SYSTEM ARCHITECTURE

The HMS follows a three-tier architecture:

- **Presentation Layer**: The front-end of the system, responsible for user interfaces and interactions. Developed using HTML, CSS, Bootstrap, and JavaScript.

- **Application Layer**: The middle layer handling business logic and communication between the front-end and back-end. Developed using C# and ASP.NET.

- **Data Layer**: The back-end responsible for data storage and retrieval. Utilizes SQL Server for database management

FRONTEND DEVELOPMENT

HTML

HTML (Hypertext Markup Language) is used for structuring the web pages. It defines the layout and elements of the user interface.

CSS

CSS (Cascading Style Sheets) is employed for styling and formatting the web pages. It ensures a consistent and visually appealing user experience.

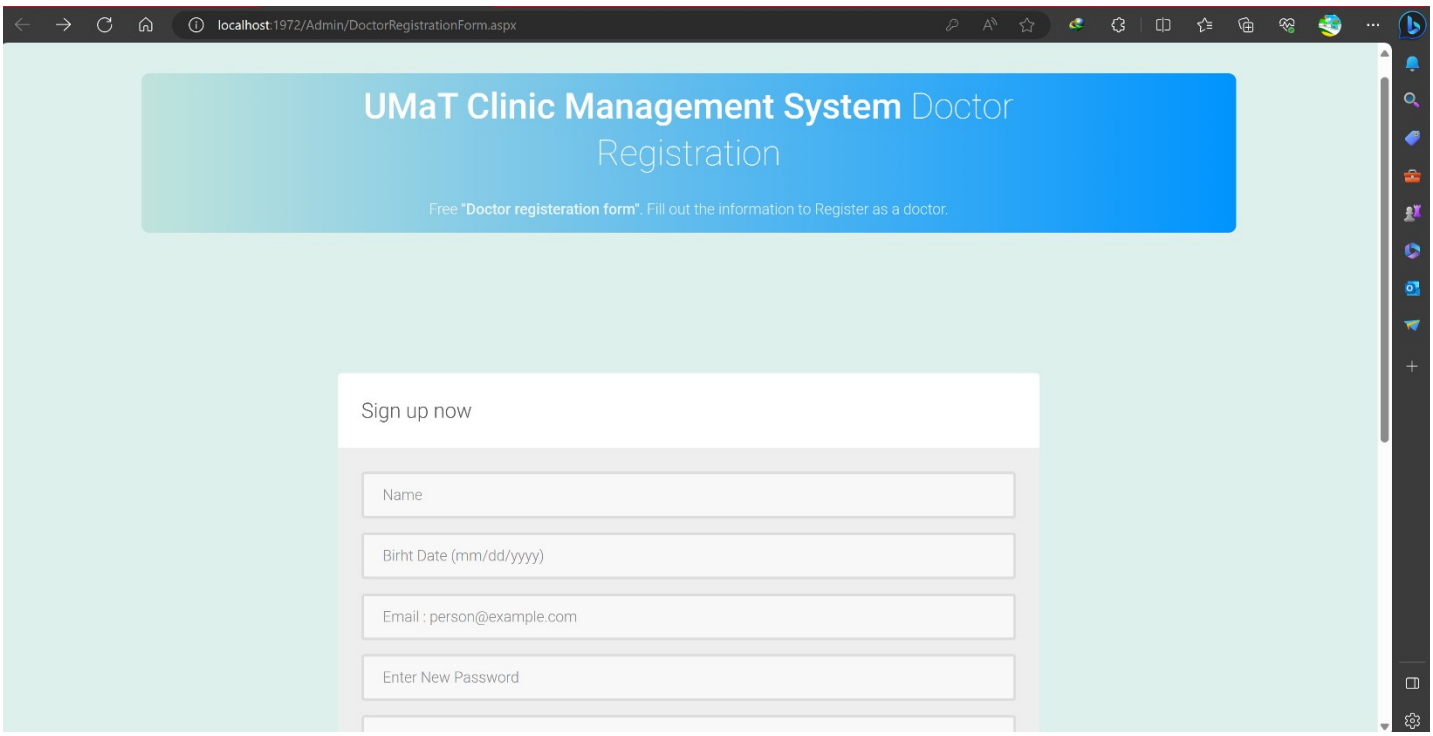
Bootstrap

Bootstrap is a CSS framework that enhances the UI with pre-built components and responsive design. It simplifies the development of a user-friendly interface.

JavaScript

JavaScript is used for adding interactivity and dynamic behavior to the web pages. It facilitates features such as form validation and real-time updates

SAMPLE UI


localhost:1972/Admin/DoctorRegistrationForm.aspx
UMaT Clinic Management System Doctor Registration
Free "Doctor registeration form". Fill out the information to Register as a doctor.
Sign up now
Name
Birht Date (mm/dd/yyyy)
Email : person@example.com
Enter New Password

BACKEND DEVELOPMENT

C#

C# is the primary programming language used for the back-end logic. It handles user requests, processes data, and communicates with the database.

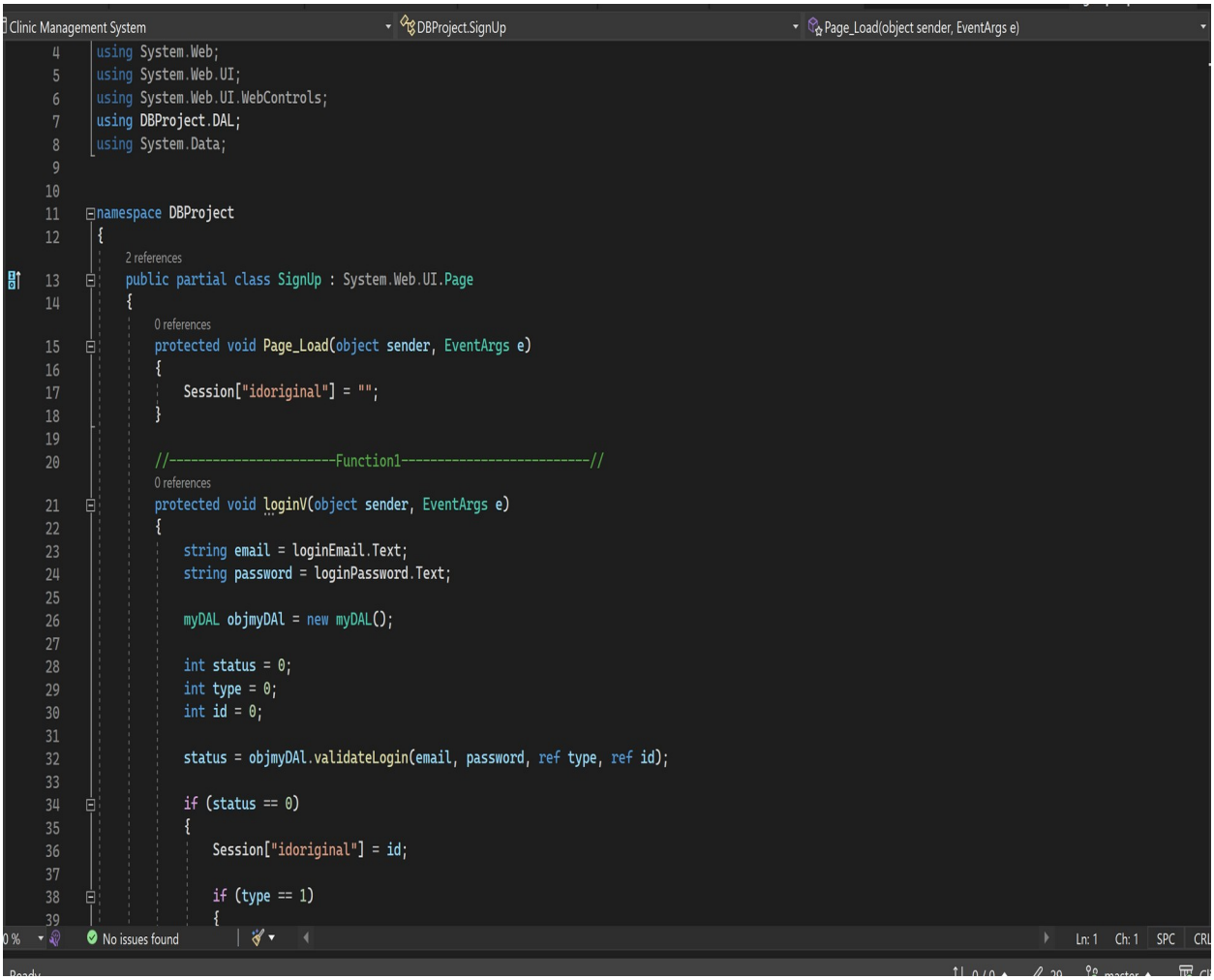
ASP.NET

ASP.NET is a web framework that supports the development of web applications using C#. It provides tools for creating APIs, routing, and managing user sessions.

SQL Database

SQL Server is employed as the relational database management system (RDBMS) to store and manage data efficiently. It stores patient records, appointment details, billing information, and more.

SAMPLE CODES



FUNCTIONALITIES IMPLEMENTED

Our project revolves around three major classes of users. Characteristics of each class are listed below

1. **Patient**:

- Patient Home – Patient can view his profile
- Current Appointment – Patient can view if he has some pending or approved appointment with a doctor
- Bills History – Patient can view the bill history of appointments that have been completed
- Treatment History – Patient can view the treatment history of appointments which have been completed
- Take Appointment – Patient can view all the departments, and then can select one dept. Then the doctors of that department are shown. Then patient selects one doctor and the doctor's profile is then shown along with a 'take appointment' button. When the button is clicked, the free slots of that particular doctor are shown. Patient selects a free slot of his choice and then sends request for that free slot to the doctor. The doctor will then approve/reject it.
- Notifications – In this tab, a notification is shown whenever the doctor accepts/rejects the requested appointment.
- Feedback – After a appointment is completed, patient can give feedback about that appointment by rating it from 1 – 5
- A patient can request for only one appointment at a time and will not be allowed to take more than one appointments until the last appointment has been completed.

2. **Doctor**:

- Doctor Profile: Doctor can see his own profile
- Pending Appointments: Doctor can see all the pending appointments against his doctor ID.
- Today's Appointment: the appointments for current day will be shown. The doctor then can select/reject any appointment of that day
- History Update: He can update prescription, disease and progress of patient
- Generate Bill: He will then generate the bill
- Patient History: Doctor will be able to see the treatment history of all his treated patients.

3. **Administrator**:

- Admin Home: Admin can view Clinic stats which includes weekly appointments, income of the Clinic. No of registered patients and doctors along with the list of departments
- View Doctors: Admin can view the list of doctors currently registered along with their departments and other information. Complete profile will be shown when clicked.

- View Patients: Admin can view the list of patients currently registered along with their phone numbers and ids. Complete profile will be shown when clicked.
- View Other Staff: Admin can view other staff members along with their designations.

5. **Search Box**: Admin can search for a specific employ within the company by name
6**. Add/Remove**: Admin can Add/remove doctors, patients and other staff members form the clinic.

FEATURES AND MODULES

The HMS includes the following modules:

1. Patient Management: Registration, medical history, and records.
2. Appointment Scheduling: Booking, rescheduling, and canceling appointments.
3. Billing and Payments: Generating invoices, accepting payments, and tracking financial records.
4. Inventory Management: Tracking hospital supplies and equipment.
5. Reporting: Generating reports on patient statistics, finances, and more.
6. User Management: Administering user accounts and roles.
7. Security: Implementing role-based access control (RBAC).

INSTALLATION AND DEPLOYMENT.

1- Install the following:

Microsoft Visual Studio

Microsoft SQL Server Express

Microsoft SQL Server Management Studio (SSMS)

2- Open SQL Server Management Studio and in the "Connect to Database Engine" window type the following:

Servername: .\SQLEXRPESS

Authentication: Windows Authentication

3- Now open Schema.sql file in Database Files folder and execute it all. This will create the database and the tables. Afterwards execute the following sql files: Admin.sql, Doctor.sql, Patient.sql, Signup.sql.

4- Now execute the Insertions.sql file in Database Files folder. This will populate the database with some test entries. Moreover, some login emails and passwords of doctors, patients and admin are placed in the Insertions.sql file. You can use them to test the functionalities of the system.

5- Everything is setup now! You can run the Visual Studio Project by opening Clinic Management System.sln and then select the SignUp.aspx page and click run button named IIS Express.

Conclusions and References

Conclusions

The Hospital Management System is a powerful software solution that enhances the efficiency and effectiveness of hospital operations. It provides a user-friendly interface, robust security, and comprehensive features for managing patient information, appointments, billing, and more. This documentation serves as a guide for developers, administrators, and end-users to understand and use the system effectively.

References

1. Hopp, W. J., & Lovejoy, W. S. (2005). Hospital Operations: Principles of High Efficiency Health Care. Nelson Education

2."Hospital and Healthcare Facility Design" by Richard L. Miller and Earl S. Swensson:

Miller, R. L., & Swensson, E. S. (2008). Hospital and Healthcare Facility Design. Wiley.