FACULTY OF INFORMATION SCIENCE
UNIVERSITI TEKNOLOGI MARA (UiTM) SELANGOR BRANCH,
PUNCAK PERDANA CAMPUS,

BACHELOR OF INFORMATION SCIENCE (HONS.) INFORMATION SYSTEMS MANAGEMENT (CDIM262)

ADVANCED WEB DESIGN DEVELOPMENT AND CONTENT MANAGEMENT (IMS566)

GROUP ASSIGNMENT:

ELARA CLINIC APPOINTMENT BOOKING SYSTEM

PREPARED BY:

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GROUP TOPIC:

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To be frank, we had never thought that we could do this task without any support from others. So, we are very thankful to our families for all the affirmation words that they gave it to us during our hard times. Besides, to our classmates that has sacrificed their time and sleep to help us and been through ups and downs together while completing this case study, we just want to let you guys know that we love you guys so much.

Also, we would like to express our gratitude to the people who have been involved in this process of making this masterpiece, intentionally or unintentionally. We have learnt a lot during this process.

TABLE OF CONTENT

1.0 INTRODUCTION

1.1 System Overview

The Elara Clinic Appointment Booking System is a web-based application developed to streamline and digitalize the appointment management process in a clinical environment. The system is designed to replace traditional manual booking methods with a centralized online platform that allows clinic staff and patients to manage appointments more efficiently and systematically.

This system supports multiple user roles, including administrators, staff, doctors, and patients. Patients are able to book their own appointments through the system, while clinic staff can also create appointments on behalf of patients. Each appointment is recorded with a clear status such as pending, approved, or cancelled to ensure proper tracking and transparency throughout the appointment process. Doctors are provided with access to view scheduled appointments, enabling them to review their daily schedules without directly modifying appointment records. In addition, the system includes a treatment management module that allows clinic staff and doctors to record treatment details and generate medical certificates (MC) in PDF format for patients.

1.2 Purposes of the system

The purpose of the Elara Clinic Appointment Booking System is to improve the efficiency of clinic operations by reducing administrative workload and minimizing errors associated with manual appointment scheduling. By utilizing a web-based system built with PHP and MySQL, the clinic is able to manage appointment data securely while ensuring role-based access for different types of users.

In addition, the system aims to enhance the overall user experience for both patients and clinic staff through features such as a dashboard interface and medical certificate (MC) PDF generation. Ultimately, the system supports better appointment coordination, improved record management, and a more organized workflow within the clinic environment.

2.0 GITHUB REPOSITORY LINK

The source code for the Elara Clinic Appointment Booking System is hosted on GitHub. The repository contains the complete project files including the PHP source code, database structure, and related resources required to run the system.

Github Link: [GitHub - izzad04/clinicelara_system: IMS 566 GROUP PROJECT]

Administrator

Email: admin@localhost.com

password: 123456

User (Patient)

Email: hakim@gmail.com

password: 12345678

3.0 ENTITY-RELATIONSHIP DIAGRAM (ERD)

3.1 Overview of Database Design

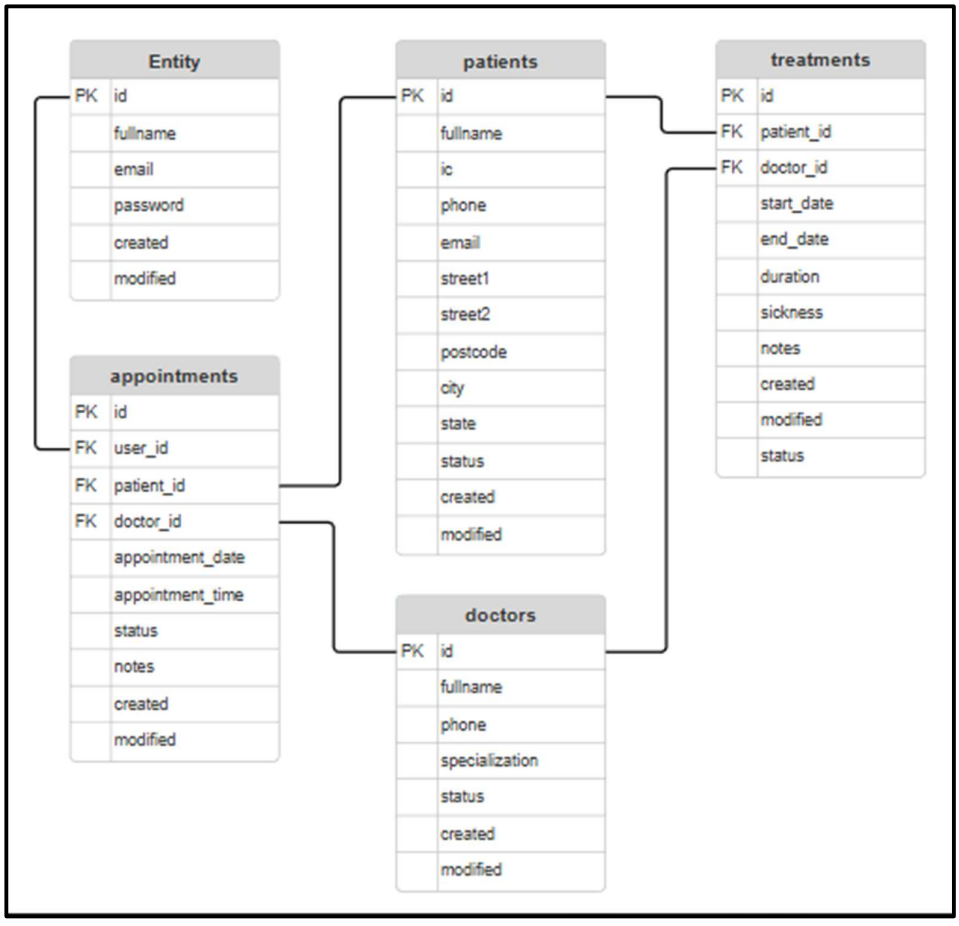

Figure 1: *ERD of Elara Clinic booking system*

3.2 ERD Description

The Entity Relationship Diagram (ERD) for the Elara Clinic Appointment Booking System illustrates the logical structure of the database and the relationships between its core entities. The ERD is designed to support efficient appointment management, ensure data integrity, and minimise redundancy through proper normalisation.

The system consists of five main entities, namely Users, Patients, Doctors, Appointments, and Treatments. Each entity represents a real-world object involved in the clinic's operational workflow.

The Users entity stores general authentication and account information such as full name, email, password, and timestamps. This entity supports role-based access control, allowing different user roles such as administrator, staff, doctor, and patient to log in to the system securely. Centralising authentication in the Users table ensures consistent login management across the system

.

The Patients entity represents individuals receiving medical services at the clinic. It stores patient-specific information including identification number (IC), contact details, address, status, and audit timestamps. Each patient record is uniquely identified and can be associated with multiple appointments, forming a one-to-many (1: N) relationship between Patients and Appointments.

The Doctors entity stores information related to medical practitioners, such as full name, phone number, medical specialization, and active status. Similar to patients, a doctor can be assigned to multiple appointments, establishing a one-to-many (1: N) relationship between Doctors and Appointments.

The Appointments entity functions as the core transactional table of the system. It records appointment details including appointment date, time, status, notes, and foreign keys referencing Users, Patients, and Doctors. This design allows the system to track who created the appointment, which patient is involved, and which doctor is assigned, ensuring clear relational mapping and accountability.

In addition, the Treatments entity stores medical treatment records associated with patients and doctors. It includes information such as treatment duration, sickness description, notes, treatment dates, and status. A one-to-many (1: N) relationship exists between Patients and Treatments, as well as between Doctors and Treatments, allowing comprehensive tracking of medical history and treatment outcomes.

Overall, the ERD demonstrates a well-structured and normalised database design that supports CRUD operations, role-based access, appointment scheduling, and medical record management. This relational structure enhances system scalability, reduces data duplication, and ensures efficient data retrieval for the Elara Clinic Appointment Booking System.

4.0 SYSTEM REQUIREMENTS

This section describes the hardware and software requirements needed to develop, deploy, and run the Elara Clinic Appointment Booking System. The system is developed using a local development environment and modern web technologies to ensure compatibility, performance, and scalability.

4.1 Local Development Environment (Laragon)

Laragon is used as the local development environment for this project. It provides an integrated platform that includes the Apache web server, MySQL database, and PHP. Laragon simplifies project setup, local hosting, virtual host configuration, and service management, making it suitable for rapid web application development and testing.

4.2 Web Server (Apache Web Server)

The Apache Web Server is used to handle HTTP requests and serve the web application to users. It is bundled within the Laragon environment and is responsible for managing client requests, routing, and server-side execution of PHP scripts.

4.3 Database (MySQL)

MySQL is used as the relational database management system (RDBMS) for storing system data such as user accounts, patient records, doctor information, appointments, and treatments. Database administration tasks, including table management and data inspection, are performed using phpMyAdmin.

4.4 Fronted Technologies

The frontend of the system is developed using the following technologies:

- HTML5 – Used to structure and organise web content
- CSS3 – Used for styling, layout design, and visual presentation
- Bootstrap – A CSS framework used to create a responsive, mobile-friendly, and user-friendly interface

These technologies ensure consistency in design and usability across different screen sizes and devices.

4.5 Backend Technologies (PHP Version 8.1 and above)

PHP is used as the server-side scripting language to implement system logic, handle database interactions, manage authentication, and process appointment-related operations. The application follows a structured MVC framework approach to improve code maintainability and scalability.

4.6 Web Browser (Google Chrome Latest version)

Google Chrome is the recommended web browser for accessing and testing the system. It provides optimal compatibility with modern web standards and ensures consistent performance during development and usage.

4.7 Operating System (Windows 11 or above)

Windows 11 or newer versions are suitable for local development and deployment of the system. The operating system supports all required development tools, including Laragon, web browsers, and database management utilities.

5.0 USER INTERFACE OVERVIEW

5.1 System Layout

- Log In Page

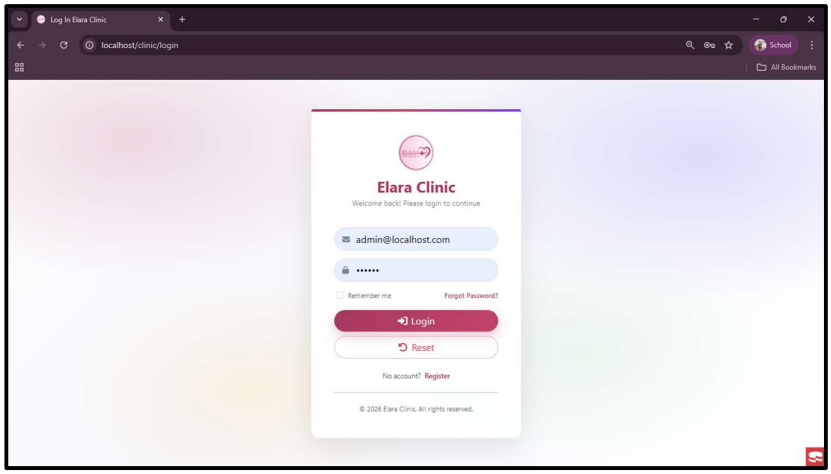

Figure 5.1: Login Page of Elara Clinic Appointment Booking System

The login page serves as the main entry point to the Elara Clinic Appointment Booking System. As shown in Figure 5.1, the interface features a clean and minimal design that focuses on usability and clarity. Users are required to enter their registered email address and password to access the system. The page includes standard authentication components such as input fields with icons, a “Remember Me” option, password recovery link, and action buttons for login and reset. A registration link is also provided for new users to create an account. The interface is styled using Bootstrap to ensure responsiveness and consistent appearance across different screen sizes.

- Dashboard

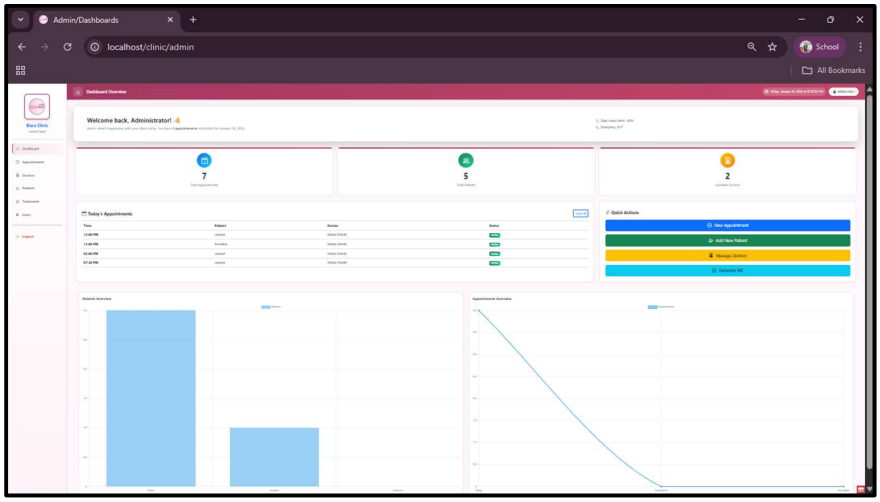

Figure 5.2: Admin Dashboard Interface of Elara Clinic Appointment Booking System

The Elara Clinic Appointment Booking System uses a dashboard-based layout to provide a clear overview of system activities. As shown in Figure 5.2, the admin dashboard is organised with a sidebar navigation menu on the left and a main content area on the right. The sidebar allows quick access to core modules such as Appointments, Patients, Doctors, Treatments, and Users. The main content area displays summary cards, appointment listings, charts, and quick action buttons to support efficient system management. The interface is developed using Bootstrap, ensuring a responsive and consistent design across different screen sizes. This layout enhances usability by presenting important information clearly and supporting smooth navigation throughout the system.

- Appoitnment Management Page (Index)

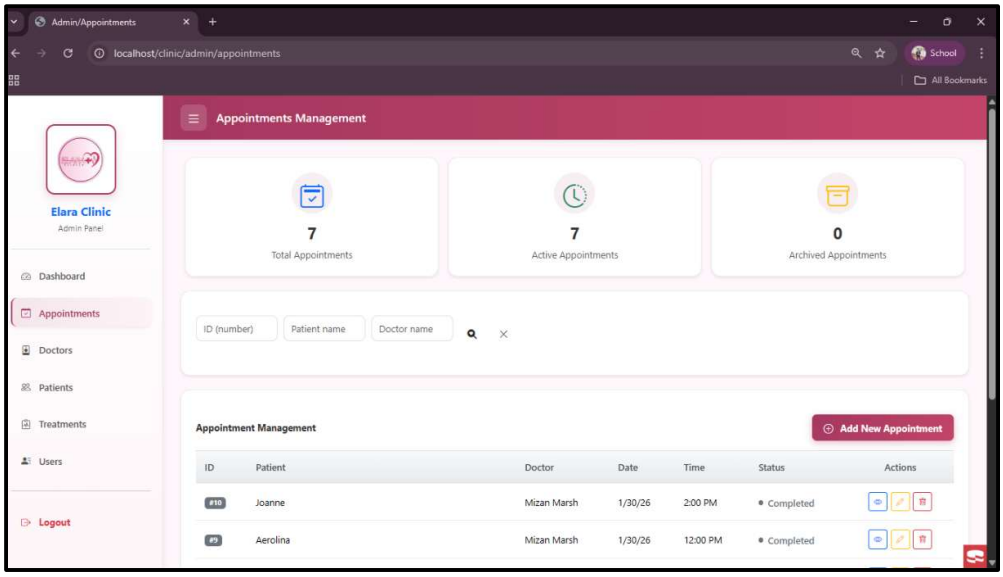

Figure 5.3: Appointment Management and Listing Page

The Appointment Management page provides a structured view of all appointment records within the system. As shown in Figure 5.3, the interface displays summary cards, a search and filter section, and a tabular listing of appointments. Users can search appointments by appointment ID, patient name, or doctor name. Action buttons are provided for viewing, editing, and deleting appointment records, supporting efficient appointment management. The layout is designed using Bootstrap to ensure clarity, consistency, and responsive behaviour

5.2 Navigation Flow

The Elara Clinic Appointment Booking System uses a clear and structured navigation flow to guide users through the system. Navigation begins at the login page, where users authenticate using their registered credentials.

After successful login, users are redirected to the dashboard, which serves as the central hub of the system. From the dashboard, users can access core modules such as Appointments, Patients, Doctors, and Treatments through the sidebar navigation menu.

Each module follows a consistent navigation pattern, allowing users to view data listings, access detailed records, and perform actions such as create, update, or delete records. Navigation controls and action buttons are placed consistently across pages to ensure ease of use.

The system also implements role-based navigation, where accessible menu items and features are adjusted according to the user's role. This ensures that users only access functions relevant to their permissions while maintaining a consistent interface layout.

5.3 User Interface Components

The Elara Clinic Appointment Booking System uses consistent and standardised user interface components to ensure clarity and ease of use. The main components include tables, forms, buttons, and icons, which are applied uniformly across all system modules.

Data tables are used to display records such as appointments, patients, doctors, and treatments. These tables are structured with clear column headers and status indicators to improve readability and data interpretation. Action buttons are provided within tables to allow users to view, edit, or delete records efficiently.

Forms are used for creating and updating records, including user registration and appointment management. Each form includes clearly labelled input fields, validation messages, and confirmation actions to guide users during data entry and reduce errors.

Buttons and icons are used consistently to represent common actions such as add, edit, view, search, and delete. Colour coding is applied to differentiate actions and statuses, enhancing visual feedback and overall user experience. Overall, the use of consistent user interface components contributes to a professional appearance and improves usability throughout the system.

6.0 FEATURES AND FUNCTIONALITIES

6.1 Authentication Module

6.1.1 User Login

The system provides a secure login feature that allows registered users to access the system using their email address and password. Successful authentication redirects users to the dashboard based on their assigned roles.

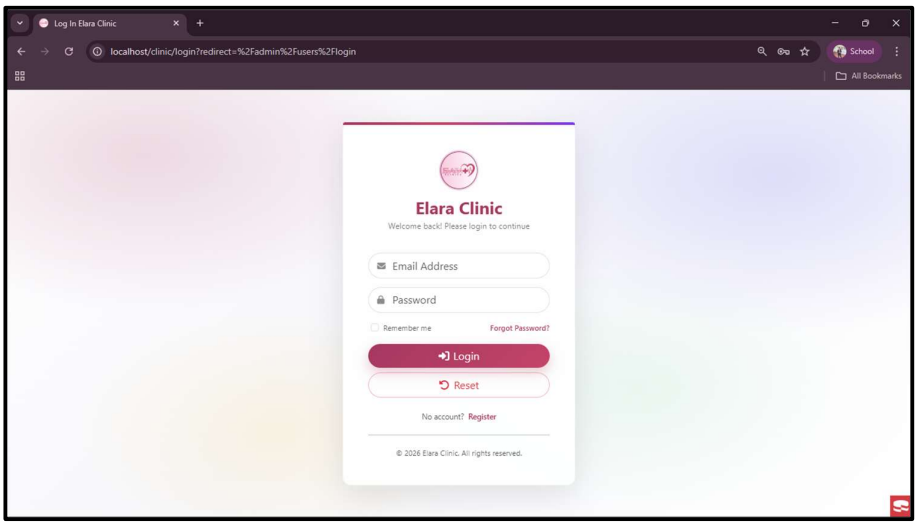

Figure 6.1: User Login Page

6.1.2 User Registration

New users can create an account through the registration page by providing personal details and setting a password with minimum value is 8. Input validation is applied to ensure data accuracy and password confirmation. Users must agree to the terms and conditions before registration is completed.

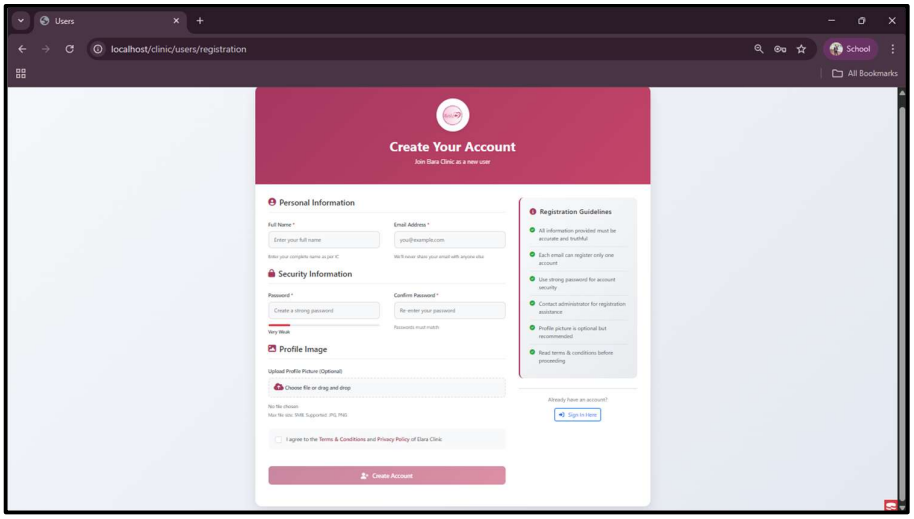

Figure 6.2: User Registration Page

6.2 Appointment Management (CRUD Operations)

6.2.1 View Appointments (Read)

The appointment listing page displays all appointment records in a structured table format. Users can view appointment details such as appointment ID, patient name, doctor name, date, time, and status. Summary cards and charts are also provided to present appointment statistics.

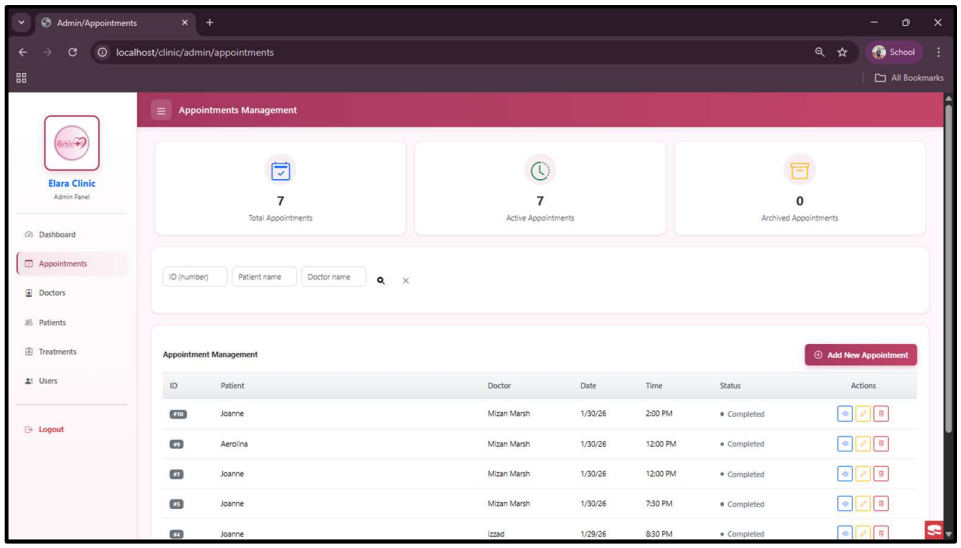

Figure 6.3: Appointment Listing and Management Page

6.2.2 Create Appointment

The system allows users to create new appointments by filling in an appointment form. Required fields include patient, doctor, appointment date, time, and additional notes. Form validation ensures that incomplete or invalid data cannot be submitted.

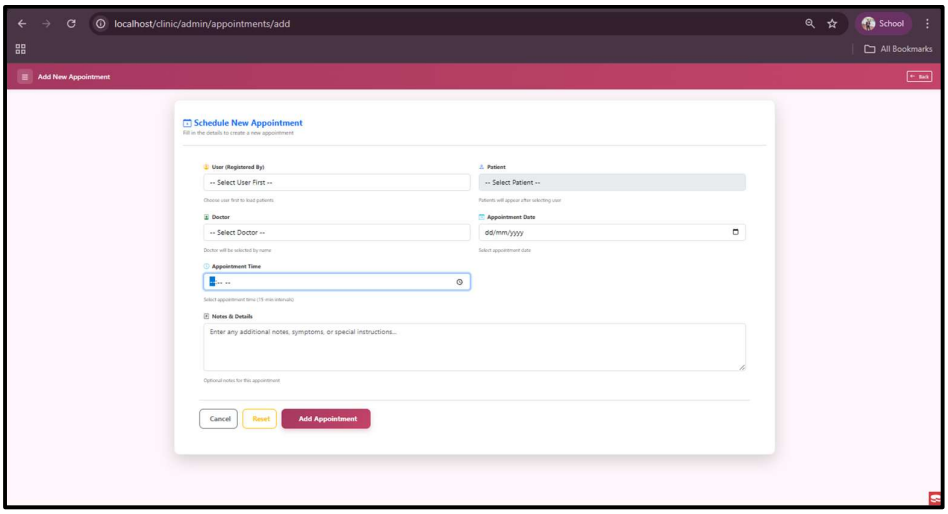

Figure 6.4: Create Appointment Form

6.2.3 Update Appointment

Users can edit existing appointment records to update appointment details such as date, time, doctor assignment, or status. This feature supports flexible appointment management and scheduling adjustments.

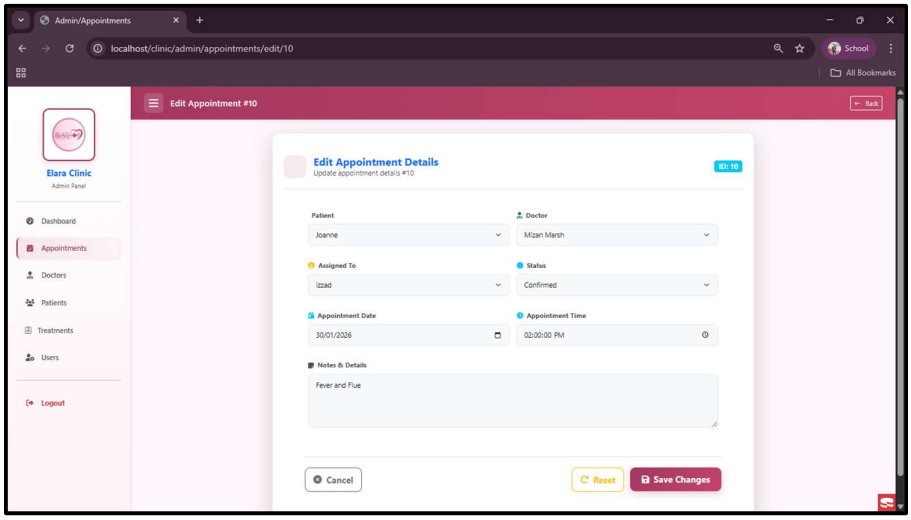

Figure 6.5: Edit Appointment Page

6.2.4 Read (ONE) Appointment

The system provides a detailed appointment view that displays complete information for a selected appointment. As shown in Figure 6.6, users can view patient details, assigned doctor, appointment date and time, appointment status, and audit information such as creation and last updated timestamps. This feature supports the Read (One) operation of the CRUD cycle and allows users to access detailed information without modifying the record.

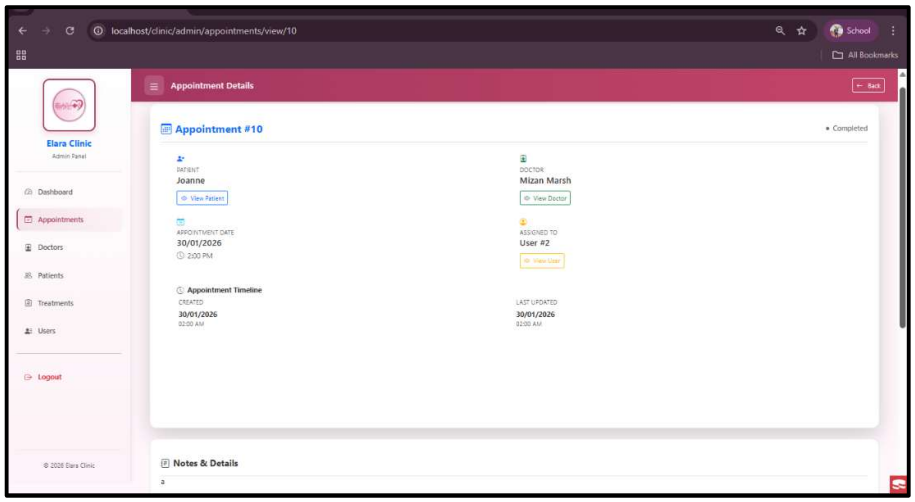

Figure 6.6: Appointment Detail View Page

6.2.5 Delete Appointment

The delete function allows authorised users to remove appointment records from the system. As shown in Figure 6.7, a confirmation prompt is displayed before deletion to prevent accidental data loss. This ensures safer data management and improves system reliability.

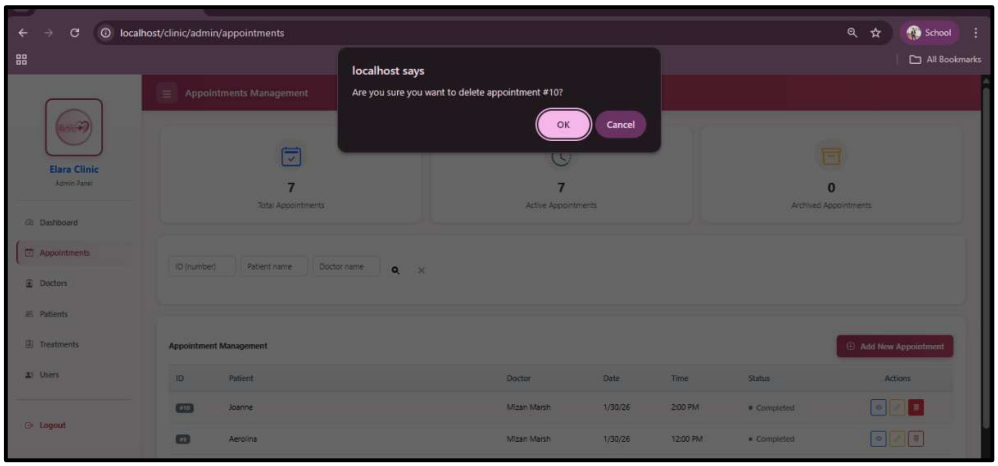

Figure 6.7: Appointment Delete Confirmation Prompt

6.3 Search and Filter Function

The system includes a search and filter feature that allows users to quickly locate appointment records within the appointment management module. Users can search appointments by appointment ID, patient name, or doctor name. This functionality improves efficiency when managing large numbers of records and reduces the time required to retrieve specific appointment information.

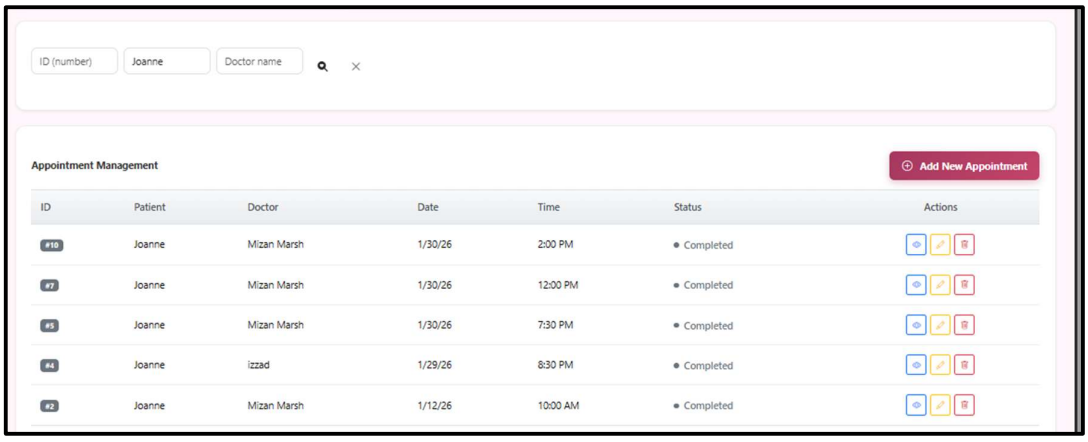

Figure 6.8: Appointment Search and Filter Function

6.4 Medical Certificate (MC) Generation / PDF Export

The Elara Clinic Appointment Booking System supports PDF export functionality for generating medical certificates (MC). This feature allows authorised users to generate and download medical certificates based on appointment or treatment records. The generated PDF follows a structured and printable format suitable for official use and record keeping. This feature fulfils the system requirement for data export.

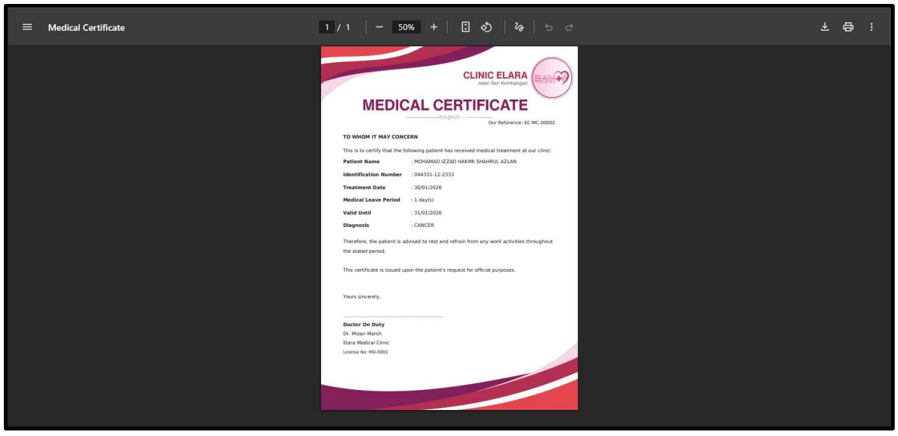

Figure 6.9: Generated Medical Certificate (PDF)

6.5 Role-Based Access Control

The system implements role-based access control to ensure secure and appropriate system usage. Access to system modules and functionalities is determined based on the user's assigned role. Administrators have full access to manage appointments, users, doctors, patients, and treatments. Other users are restricted to viewing and managing data relevant to their roles only. This approach enhances system security and prevents unauthorised access to sensitive information.

6.6 Additional Modules (Patients, Doctors, Treatments)

The system includes a Patient Management module that allows authorised users to manage patient records within the clinic system. As shown in Figure 6.10, patient information is displayed in a structured table format with clear action buttons.

This module supports full CRUD operations, enabling users to create new patient records, view patient details, update existing information, and delete records when necessary. The interface follows the same layout and design structure as other modules, ensuring consistency and ease of use. Similar management functionalities are also implemented for Doctors and Treatments, following the same CRUD workflow and validation approach.

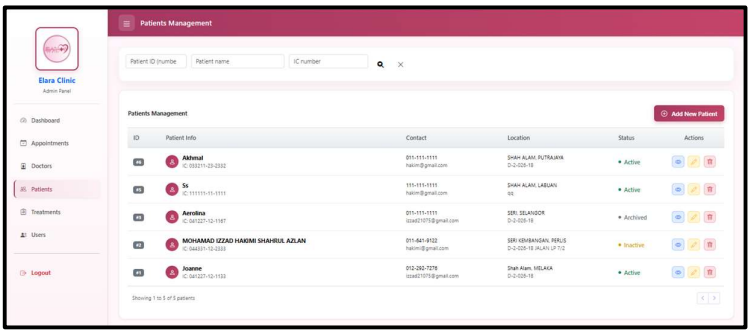

Figure 6.10: Patient Management Module (Listing Page)

7.0 WORKFLOW OF FORM (CRUD CYCLE)

This section explains the workflow of the Create, Read, Update, and Delete (CRUD) cycle implemented in the Elara Clinic Appointment Booking System, focusing on the appointment management process. The same CRUD workflow is also applied consistently across other modules such as Patients, Doctors, and Treatments.

7.1 Create

The workflow begins when an authorised user selects the Add New Appointment option from the appointment management module. The user is required to complete an appointment form by selecting the patient, doctor, appointment date, time, and additional notes. Upon submission, the system validates the input and saves the new appointment record into the database.

7.2 Read

After an appointment is created, users can view all appointment records on the appointment listing page, which displays data in a structured table format. Users may also view detailed information for a specific appointment through the appointment detail page. This supports both Read (All) and Read (One) operations.

7.3 Update

If changes are required, users can update existing appointment records by selecting the Edit option. The system retrieves the selected appointment data, allows modifications, and updates the database upon successful validation.

7.4 Delete

For record removal, authorised users can delete an appointment by selecting the Delete action. A confirmation prompt is displayed before deletion to prevent accidental data loss. Once confirmed, the appointment record is permanently removed from the system.

7.5 Flowchart Explanation

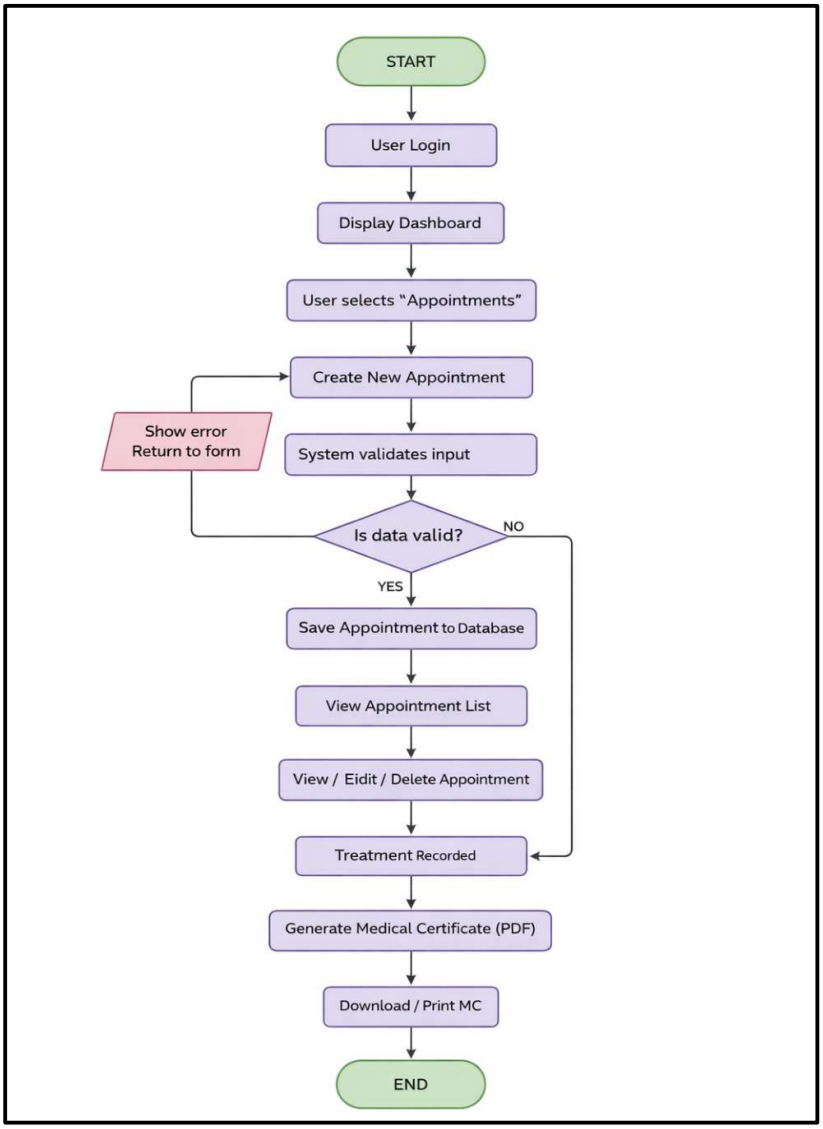

Figure 7.1: Appointment and Medical Certificate Flowchart

Figure 7.1 illustrates the workflow of the appointment management and medical certificate generation process in the Elara Clinic Appointment Booking System. The workflow begins when a user logs into the system and is redirected to the dashboard.

From the dashboard, the user accesses the appointment module and creates a new appointment by entering the required information. The system then performs input validation to ensure that all necessary data is correctly provided. If the input is invalid, an error message is displayed, and the user is returned to the appointment form for correction.

Once the data is validated, the appointment information is saved into the database. Users can then view the appointment list and perform actions such as viewing details, editing, or deleting an appointment record. After treatment details are recorded, authorised users are able to generate a Medical Certificate (MC) in PDF format.

Finally, the generated medical certificate can be downloaded or printed for official use, completing the workflow. This structured process ensures efficient data handling, accurate record management, and smooth clinic operations.

8.0 TEAM ROLES AND CONTRIBUTIONS

This project was completed collaboratively by a team of five members, with each member contributing to different aspects of the **Elara Clinic Appointment Booking System**. Effective teamwork and clear task distribution ensured the successful development of the system and completion of the project documentation. Each team member was assigned specific responsibilities based on their strengths and roles within the group, as summarised below:

- **Project Leader:** Coordinated project activities, managed task distribution, and ensured project requirements were met.
- **Backend Developer:** Implemented system logic, CRUD operations, authentication, and database interactions using PHP.
- **Database Designer:** Designed the database schema and ERD, and managed table relationships and data integrity.
- **Frontend Developer:** Developed the user interface using HTML, CSS, and Bootstrap to ensure a responsive and user-friendly design.
- **Documentation & Testing:** Conducted system testing, verified functionality, and prepared the project report and user documentation.

The report preparation and system testing were carried out collaboratively to ensure accuracy, consistency, and completeness. Overall, strong teamwork and cooperation played a key role in achieving the project objectives successfully.

9.0 CONTACT INFORMATION (SUPPORT)

For any technical issues, system-related inquiries, or support regarding the **Elara Clinic Appointment Booking System**, users may contact the project team using the information provided below.

Project Team Contacts

Name	Email Address
Afrina Adleena binti Azlan	**2025181001@student.uitm.edu.my**
Mohamad Izzad Hakimi bin Shahrul Azlan	**2025129359@student.uitm.edu.my**
Muhamad Aqif Haqeemy bin Masri	**2025167039@student.uitm.edu.my**
Nurin Alis Zaqirah binti Rohidzat	**2025178483@student.uitm.edu.my**
Sharlin Nor'Aresya Shaharol Risham	**2025190225@student.uitm.edu.my**

Alternatively, users may refer to the project's GitHub repository for system documentation, source code, and future updates related to the application.

10.0 REFLECTION

Through the development of the Elara Clinic Appointment Booking System, the project team gained valuable experience in applying web development concepts to a real-world problem. This project enhanced our understanding of how to design and implement a database-driven web application using PHP, MySQL, and a CSS framework such as Bootstrap.

One of the key lessons learned was the importance of proper planning, particularly in database design and workflow structure. Designing the Entity Relationship Diagram (ERD) early in the project helped ensure data consistency and smooth integration between appointments, patients, doctors, and treatments. Implementing CRUD operations, authentication, and role-based access control also strengthened our understanding of secure and structured system development.

The project also highlighted the importance of teamwork and communication. Effective collaboration allowed tasks to be distributed efficiently, reduced development errors, and ensured that system features aligned with project requirements. Challenges such as debugging system logic, handling validation, and generating PDF medical certificates were resolved through group discussion and problem-solving.

Overall, this project provided practical exposure to full-stack web application development and improved our technical, analytical, and collaboration skills. The knowledge and experience gained from this project will be beneficial for future academic projects and real-world system development.

11.0 CONCLUSION

In conclusion, the Elara Clinic Appointment Booking System was successfully developed to digitalize and improve the clinic appointment and treatment management process. The system effectively replaces traditional manual booking methods with a centralized web-based platform that enhances efficiency, accuracy, and accessibility for clinic staff, doctors, and patients.

The system supports multiple user roles with role-based access control, ensuring that administrators, staff, doctors, and patients are able to perform tasks according to their responsibilities. Core functionalities such as appointment scheduling, patient management, treatment recording, search and filtering, and medical certificate (MC) generation in PDF format were fully implemented and tested.

By utilizing PHP, MySQL, and Bootstrap, the system provides a responsive and user-friendly interface while maintaining data integrity and system security. Overall, the project achieved its intended objectives by reducing administrative workload, improving record management, and supporting a more organized clinical workflow. The Elara Clinic Appointment Booking System demonstrates the effective application of web-based technologies in addressing real-world problems within a clinical environment.