Online Medical Service Providing System (OMS System) For Medical Service

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APPROVAL

The project titled "**Online Medical Service Providing System (OMS System)**" was submitted by Sahal Bin Masud Eifte (CSE2201025182), Jahanara Akter (CSE2201025127), Md. Meheraj Uddin (CSE2001019248) and Md. Mojammel Hoque (CSE2102023110) to the Department of Computer Science and Engineering, Sonargaon University (SU), has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of Bachelor of Science in Computer Science and Engineering and approved as to its style and contents.

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DECLARATION

We hereby declare that the work presented in this report is the outcome of the investigation performed by us under the supervision of **Salma Tabashum, Lecturer & Asst. Coordinator,** Department of Computer Science and Engineering, Sonargaon University, Dhaka, Bangladesh. We reaffirm that no part of this project has been or is being submitted elsewhere for the award of any degree or diploma.

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ABSTRACT

The Online Medical Service Providing System (OMS System) is a web-based healthcare solution developed to enhance the accessibility and efficiency and quality of medical services through the use of information technology. The primary objective of this system is to facilitate online interaction between patients and registered medical professionals, thereby reducing the need for physical hospital visits. The system allows patients to register, prescriptions, schedule appointments, and receive medical consultations through an online platform. Additionally, medical practitioners can manage patient information, consultation records, and prescriptions in a structured and secure environment. The OMS System incorporates essential features such as electronic medical records, online payments, appointment management, and automated notifications, which contribute to improved service delivery and administrative efficiency. By offering a reliable and user-friendly interface, the system aims to support timely medical assistance, particularly for individuals in remote or underserved areas. Overall, the OMS System represents an effective, reliable, cost-efficient, user-friendly solution for both patients and medical professionals approach to modern healthcare service delivery.

ACKNOWLEDGMENT

At the very beginning, we would like to express our deepest gratitude to the Almighty Allah for giving us the ability and the strength to finish the task successfully within the schedule time.

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We are also thankful to all our teachers during our whole education, for exposing us to the beauty of learning.

LIST OF ABBREVIATIONS

AI	Artificial Intelligence
API	Application Programming Interface
CPU	Central Processing Unit
CSS	Cascading Style Sheets (in Tailwind CSS)
DFD	Data Flow Diagram
HTML	Hypertext Markup Language
JS	JavaScript (implied in React.js, Node.js, Express.js)
MYSQL	My Structured Query Language
PHP	Hypertext Preprocessor
RAM	Random Access Memory
ROM	Read Only Memory
SQL	Structured Query Language
VS Code	Visual Studio Code
XMPP	Extensible Messaging and Presence Protocol

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CHAPTER 1

INTRODUCTION OF ONLINE MEDICAL SERVICE

1.1 Introduction

With the advancement of information and communication technology, the healthcare sector is increasingly adopting digital solutions to improve service delivery. Traditional healthcare systems often require patients to visit hospitals physically, leading to long waiting times, inefficient record management, and limited access to medical professionals. These challenges are more severe in developing countries like Bangladesh.

The **Online Medical Service System** is a web-based application designed to provide remote healthcare services through the internet. It allows patients to register, book appointments, consult doctors, and store medical information digitally. From a Computer Science and Engineering perspective, this project integrates database management systems, web programming, system modeling, and software development methodologies. The system aims to enhance healthcare accessibility while ensuring data accuracy, security, and scalability.

1.2 Problem Statement

The existing healthcare service system in Bangladesh is largely dependent on traditional, manual processes that require patients to physically visit hospitals or clinics for consultation and appointment scheduling. This conventional approach often results in long waiting times, overcrowded medical facilities, inefficient appointment management, and limited access to qualified medical professionals, particularly for patients residing in rural and remote areas:

- Manual appointment scheduling
- Inefficient patient record management
- Overcrowded hospitals
- Limited access to doctors in rural areas
- Lack of centralized medical databases

A computerized and web-based solution is required to overcome these limitations.

1.3.1 General Objective

The general objective of this project is to design and develop a secure, reliable, and efficient **Online Medical Service System** using modern web technologies, with the aim of improving healthcare accessibility, automating medical service processes, and ensuring effective management of patient and doctor information.

1.3.2 Specific Objectives

The specific objectives of this project are as follows:

- To apply standard software engineering principles and methodologies throughout the system development process to ensure system scalability, reliability, and maintainability.
- To design and implement a structured relational database for managing patient medical records, doctor information, appointment schedules, and prescriptions.
- To develop user-friendly and intuitive interfaces for patients, doctors, and administrators to enhance usability and overall user experience.
- To implement secure authentication and authorization mechanisms to ensure data confidentiality, integrity, and controlled access to sensitive medical information.

1.4 Scope of the Project

The scope of this project is limited to the design and development of a web-based Online Medical Service System. The system focuses on enabling online patient registration, appointment booking, doctor consultation, and digital medical record management. It supports three main user roles: patient, doctor, and administrator.

This project does not include advanced features such as real-time video consultation, online payment gateways, or mobile application development. However, the system architecture is designed in a scalable manner so that such features can be incorporated in future enhancements.

1.5 Significance of the Project

This project is significant as it demonstrates the practical application of Computer Science and Engineering concepts in solving real-world healthcare problems. The system helps reduce manual workload, improves data accuracy, and enhances communication between patients and doctors. It also provides a foundation for future research and development in digital healthcare systems.

Additionally, the project contributes to improving healthcare accessibility in underserved areas and promotes the adoption of e-health solutions in Bangladesh.

1.6 Organization of the Thesis Project

The remainder of this thesis is organized as follows:

- **Chapter 1**: Introduction, including problem statement, objectives, and scope, Significance.
- **Chapter 2**: Presents the literature review related to online medical services and existing healthcare systems.
- **Chapter 3:** Describes the system analysis and methodology used in developing the proposed system.
- **Chapter 4**: Discusses the system design, including UML and database design.
- **Chapter 5**: Explains the system implementation and testing results.
- **Chapter 6**: Explains the system testing.
- **Chapter 7**: Concludes the thesis and provides recommendations for future work.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The literature review provides an overview of existing research, technologies, and systems related to online medical services and digital healthcare solutions. The purpose of this chapter is to analyze previous studies and existing systems in order to identify their strengths, limitations, and research gaps. Understanding existing work helps justify the necessity of the proposed Online Medical Service System and guides the design and implementation process.

2.2 Traditional Healthcare Systems

Traditional healthcare systems are primarily based on face-to-face interactions between patients and medical professionals. In such systems, patients must physically visit hospitals or clinics to register, book appointments, and receive consultations. Several studies have reported that these systems often lead to long waiting times, inefficient appointment management, and poor handling of patient records. Manual record-keeping increases the risk of data loss, duplication, and inconsistency, which negatively impacts the quality of healthcare services.

Researchers have also identified that traditional healthcare systems struggle to meet the demands of growing populations, especially in developing countries. Limited healthcare infrastructure and uneven distribution of medical professionals further intensify these challenges.

2.3 Telemedicine and Online Medical Services

Telemedicine refers to the use of information and communication technology to deliver healthcare services remotely. Previous studies indicate that telemedicine improves healthcare accessibility by enabling patients to consult doctors without physical visits. Online medical service systems are a form of telemedicine that provide features such as online appointment booking, digital prescriptions, and remote consultations.

According to several researchers, online medical services reduce operational costs, minimize travel expenses for patients, and improve service efficiency. These systems are particularly beneficial for rural populations, elderly patients, and individuals with mobility limitations. However, some studies highlight challenges such as lack of technical infrastructure, data privacy concerns, and user resistance to adopting digital healthcare platforms.

2.4 Web-Based Healthcare Management Systems

Web-based healthcare management systems integrate medical services with web technologies to provide centralized and automated solutions. Existing systems allow users to register, manage appointments, and store medical records digitally. Research shows that such systems improve data accuracy, enable quick information retrieval, and support better decision-making by healthcare professionals.

From a Computer Science and Engineering perspective, these systems utilize database management systems, client-server architecture, and web programming frameworks. Despite their advantages, some existing systems suffer from complex user interfaces, limited scalability, and inadequate security mechanisms.

2.5 Security and Privacy in Online Medical Systems

Security and privacy are critical aspects of online medical service systems due to the sensitive nature of medical data. Previous research emphasizes the importance of secure authentication, authorization, and data encryption to protect patient information. Studies also suggest that improper security implementation can lead to data breaches, unauthorized access, and loss of patient trust.

Researchers recommend implementing role-based access control, secure login mechanisms, and proper database security techniques to ensure confidentiality, integrity, and availability of medical data. Addressing these concerns is essential for the successful adoption of online medical service systems.

2.6 Limitations of Existing Systems

Although many online medical service systems have been developed, several limitations still exist. Some systems focus only on appointment booking and lack comprehensive medical record management. Others are not designed to meet the specific needs of developing countries, where internet connectivity and digital literacy may be limited. Additionally, many existing platforms are costly and difficult to customize.

These limitations highlight the need for a simple, cost-effective, and user-friendly online medical service system that can be adapted to local healthcare environments.

2.7 Research Gap and Motivation

Based on the reviewed literature, it is evident that existing online medical service systems provide valuable solutions but fail to fully address issues such as usability, scalability, and localized healthcare requirements. There is a need for a web-based system that integrates appointment management, digital medical records, and secure user authentication in a single platform.

The motivation of this project is to design and develop an Online Medical Service System that overcomes the limitations of existing solutions by applying standard software engineering practices and modern web technologies. The proposed system aims to improve healthcare accessibility, efficiency, and data management while maintaining simplicity and security.

2.8 Summary

This chapter reviewed existing literature related to traditional healthcare systems, telemedicine, web-based healthcare platforms, and security issues in online medical services. The review highlights the necessity of developing an efficient, secure, and user-friendly online medical service system. The findings from this chapter provide a strong foundation for the system analysis and design presented in the subsequent chapters.

CHAPTER 3

SYSTEM ANALYSIS & METHODOLOGY

3.1 Introduction

This chapter presents the system analysis and methodology used in the development of the proposed **Online Medical Service System**. System analysis is conducted to understand user requirements, identify functional and non-functional needs, and evaluate the feasibility of the proposed system. The methodology section explains the systematic approach followed to design, develop, and implement the system using software engineering principles.

3.2 System Analysis

System analysis involves a detailed study of the existing system and the identification of problems and requirements for the proposed solution. This process ensures that the developed system meets user expectations and organizational objectives.

3.2.1 Analysis of the Existing System

The existing healthcare service system is largely manual and paper-based. Patients are required to visit hospitals or clinics to register, book appointments, and consult doctors. Medical records are often stored in physical files or isolated digital systems, making data retrieval time-consuming and inefficient.

Major limitations of the existing system include:

- Manual appointment scheduling leading to long waiting times
- Poor management of patient medical records
- Lack of centralized data storage
- Limited communication between patients and doctors
- High operational workload for healthcare staff

These issues reduce service efficiency and negatively affect patient satisfaction.

3.2.2 Proposed System Overview

The proposed **Online Medical Service System** is a web-based application designed to automate and improve healthcare service delivery. The system allows patients to register online, book appointments, consult doctors, and maintain digital medical records. Doctors can view appointments, access patient histories, and provide prescriptions through the system, while administrators manage users and system data.

The proposed system aims to provide a centralized, secure, and user-friendly platform that addresses the limitations of the existing system.

3.2.3 Functional Requirements

The functional requirements of the system define the specific operations that the system must perform.

Patient Functions:

- User registration and login
- Appointment booking and cancellation
- Viewing prescriptions and medical history

Doctor Functions:

- Secure login
- Viewing patient appointments
- Accessing patient medical records
- Providing prescriptions

Admin Functions:

- Managing user accounts
- Managing doctor information
- Monitoring system activities

3.2.4 Non-Functional Requirements

Non-functional requirements describe the quality attributes of the system.

- **Security:** Secure authentication and data protection
- **Usability:** Simple and user-friendly interface
- **Performance:** Fast response time and efficient data processing
- **Reliability:** Consistent system availability
- **Scalability:** Ability to handle increasing users and data

3.2.5 Feasibility Study

A feasibility study was conducted to assess the practicality of the proposed system.

- **Technical Feasibility:** The system can be developed using existing web technologies such as HTML, CSS, JavaScript, PHP, and MySQL.
- **Economic Feasibility:** The system is cost-effective as it uses open-source technologies.
- **Operational Feasibility:** The system is easy to use and does not require extensive training.

3.3 Methodology

The development of the Online Medical Service System follows the **Software Development Life Cycle (SDLC)** methodology. This structured approach ensures systematic development and quality assurance.

3.3.1 Requirement Analysis

In this phase, system requirements were gathered through observation, analysis of existing healthcare processes, and review of related literature. Both functional and non-functional requirements were identified to ensure completeness.

3.3.2 System Design

The system design phase focuses on creating the architectural framework of the system. UML diagrams such as Use Case Diagram, Class Diagram, ER Diagram, and Flowcharts are used to model system behavior and data relationships.

3.3.3 Implementation

The system is implemented using a web-based architecture. Front-end components are developed using HTML, CSS, and JavaScript, while back-end logic is handled using PHP. MySQL is used as the database management system to store user data, appointments, and medical records.

3.3.4 Testing

Testing is performed to ensure system correctness and reliability. Different testing methods are applied, including:

- Unit Testing
- Integration Testing
- System Testing
- User Acceptance Testing

Errors identified during testing are corrected to improve system performance.

3.3.5 Deployment

After successful testing, the system is deployed on a local or web server. The deployed system allows real users to access and utilize the online medical services.

3.4 System Development Tools and Technologies

The following tools and technologies are used in system development:

- **Front-end:** HTML, CSS, JavaScript
- **Back-end:** PHP
- **Database:** MySQL
- **Web Server:** Apache
- **Development Tools:** VS Code, XAMPP

3.5 Summary

This chapter discussed the system analysis and methodology used for developing the Online Medical Service System. It examined the existing system, identified requirements, and explained the SDLC-based development approach. The analysis and methodology presented in this chapter provide a foundation for the system design and implementation discussed in the subsequent chapters.

CHAPTER 4

SYSTEM DESIGN

4.1 Introduction

System design is a critical phase in the software development life cycle (SDLC), where the architecture and components of the system are planned and modeled before implementation. The purpose of system design is to ensure that the system meets the identified functional and non-functional requirements, is scalable, secure, and user-friendly. This chapter presents the **architectural design, UML modeling, database design (ER diagram), and data flow of the proposed Online Medical Service System**.

4.2 Architectural Design

The proposed system follows a **three-tier architecture** consisting of:

1. **Presentation Layer (Front-End):**
    - Provides user interfaces for patients, doctors, and administrators.
    - Developed using **HTML, CSS, and JavaScript**.
2. **Business Logic Layer (Back-End):**
    - Handles system operations, validations, and processing.
    - Implemented using **PHP**.
3. **Data Layer (Database):**
    - Stores user information, appointments, prescriptions, and medical records.
    - Implemented using **MySQL**.

This architecture separates concerns, improves maintainability, and ensures modularity.

4.3 UML Diagrams

UML diagrams help visualize system structure and behavior. The key diagrams for this project are:

4.3.1 Use Case Diagram

The use case diagram represents interactions between users (actors) and the system. The primary actors are **Patient**, **Doctor**, and **Administrator**.

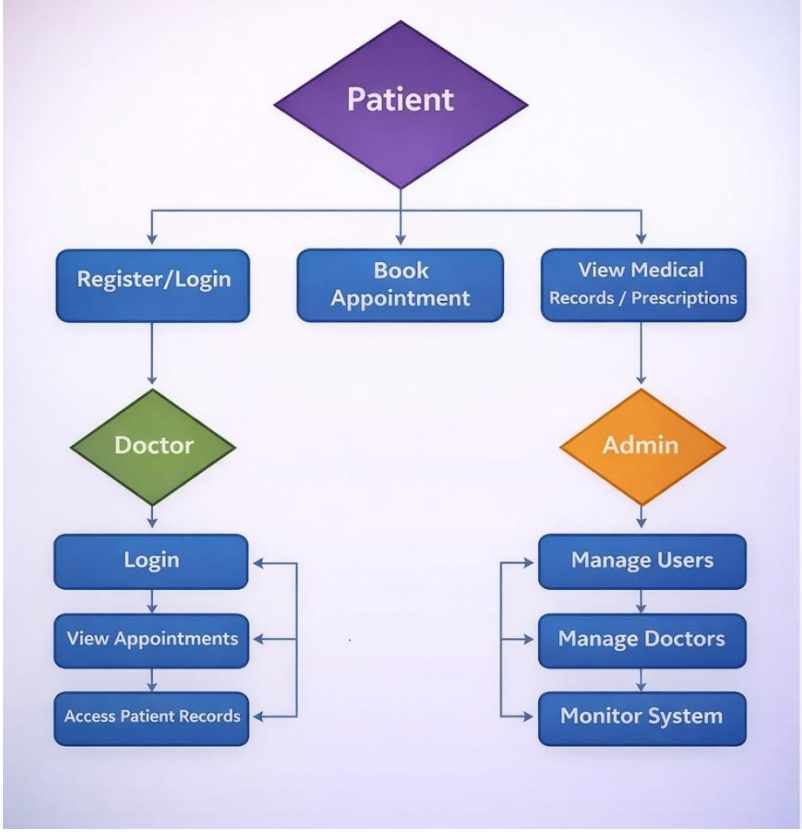


Fig:4.3.1

Explanation:

- **Patient:** Can register, login, book appointments, and view medical history.
- **Doctor:** Can access appointment schedules, view patient records, and provide prescriptions.
- **Admin:** Manages system data, users, and doctor information.

4.3.2 Class Diagram

The class diagram shows the main classes, attributes, and relationships.

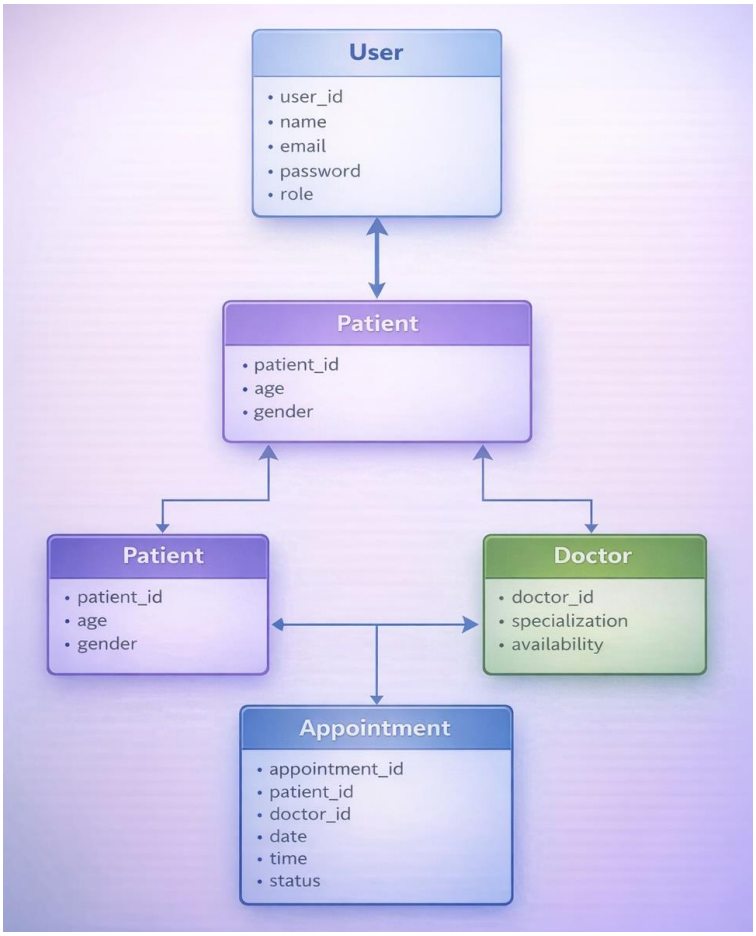


Fig:4.3.2

Explanation:

- **User:** Base class for all users with login credentials.
- **Patient & Doctor:** Inherit from User.
- **Appointment:** Links patients and doctors.
- **Prescription:** Linked to appointments and stores medical advice.

4.3.3 Entity-Relationship (ER) Diagram

The ER diagram represents the logical database design of the system.

Entities and Relationships:

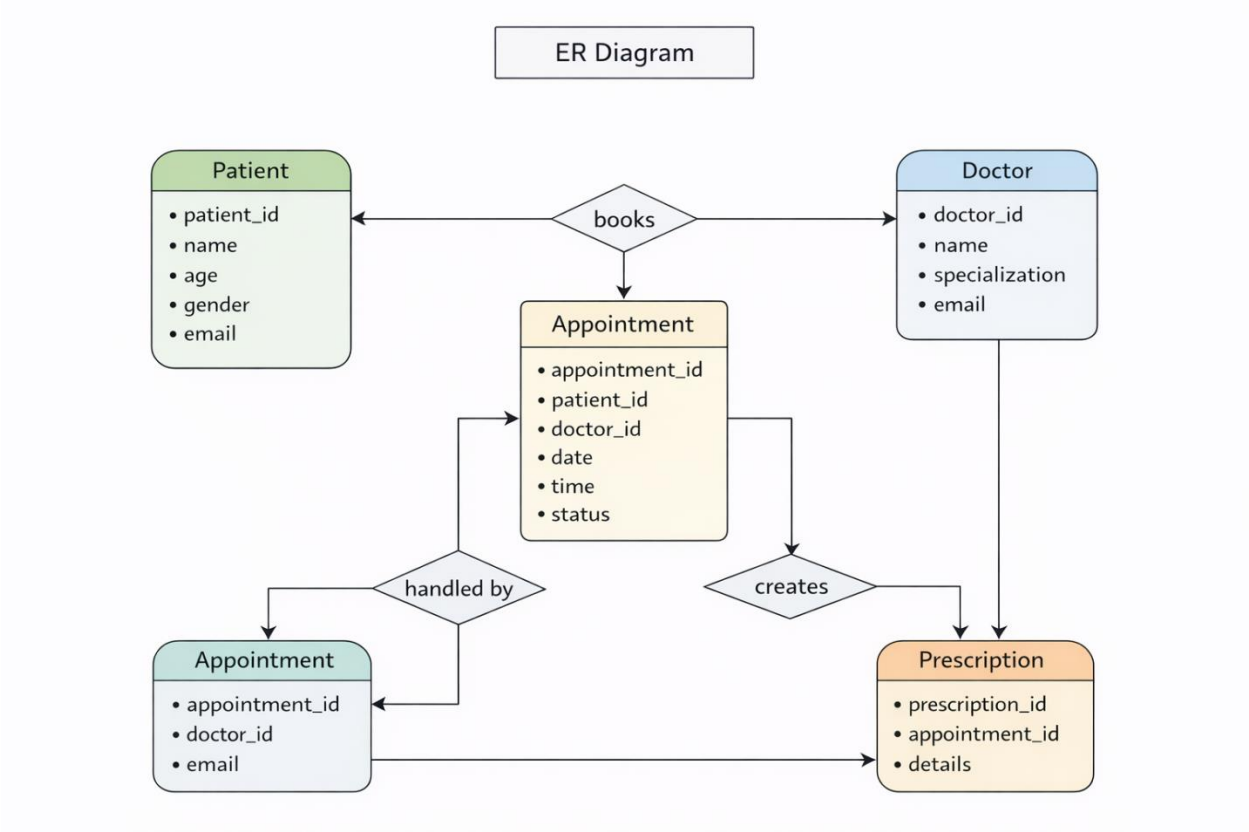


Fig:4.3.3

Explanation:

- **Patient:** Stores patient information.
- **Doctor:** Stores doctor information.
- **Appointment:** Links patients and doctors, stores schedule information.
- **Prescription:** Stores treatment details linked to appointments.

This ER design ensures proper relational database structure and avoids data redundancy.

4.4 Data Flow Diagram (DFD)

The DFD illustrates the flow of information within the system.

High-Level Data Flow :

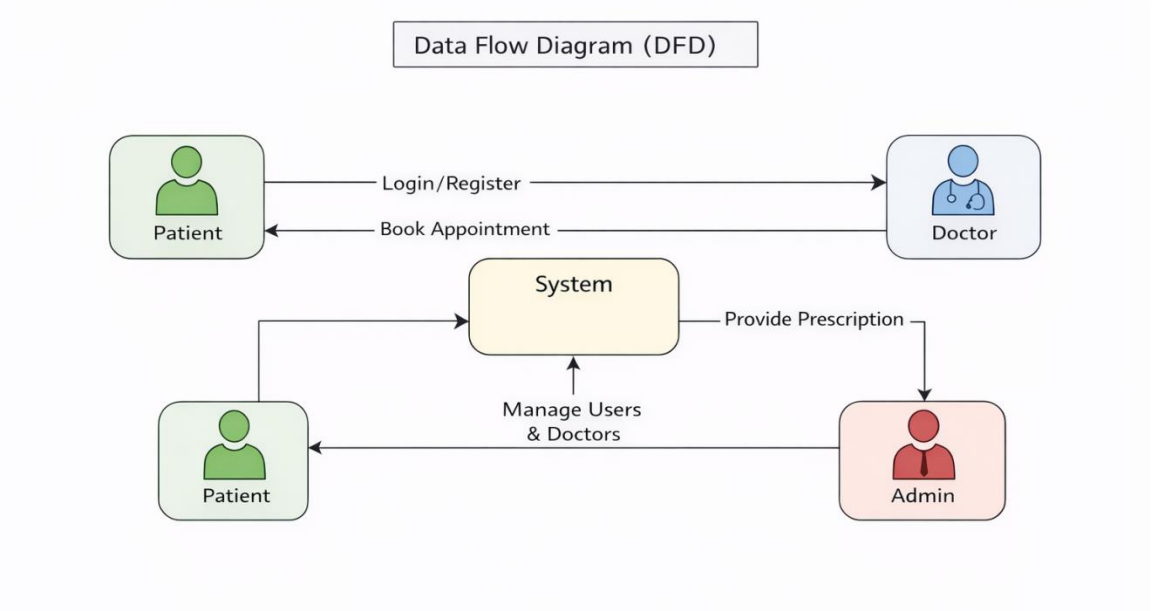


Fig:4.4

Explanation:

- Patients interact with the system to register, book appointments, and view prescriptions.
- Doctors access appointments and submit prescriptions.
- Admin manages users and system operations.

4.5 Database Design

The database is **relational**, implemented in **MySQL**, and follows the ER diagram structure. The main tables include:

1. **Users Table:** Stores login credentials and user roles.
2. **Patients Table:** Stores patient-specific data.
3. **Doctors Table:** Stores doctor details.
4. **Appointments Table:** Links patients and doctors and stores schedule information.
5. **Prescriptions Table:** Stores medical advice for each appointment.

Design Considerations:

- Primary and foreign keys are used to maintain referential integrity.
- Normalization is applied to reduce data redundancy.
- Role-based access ensures data security.

4.6 System Flowchart

The flowchart illustrates the overall system workflow:

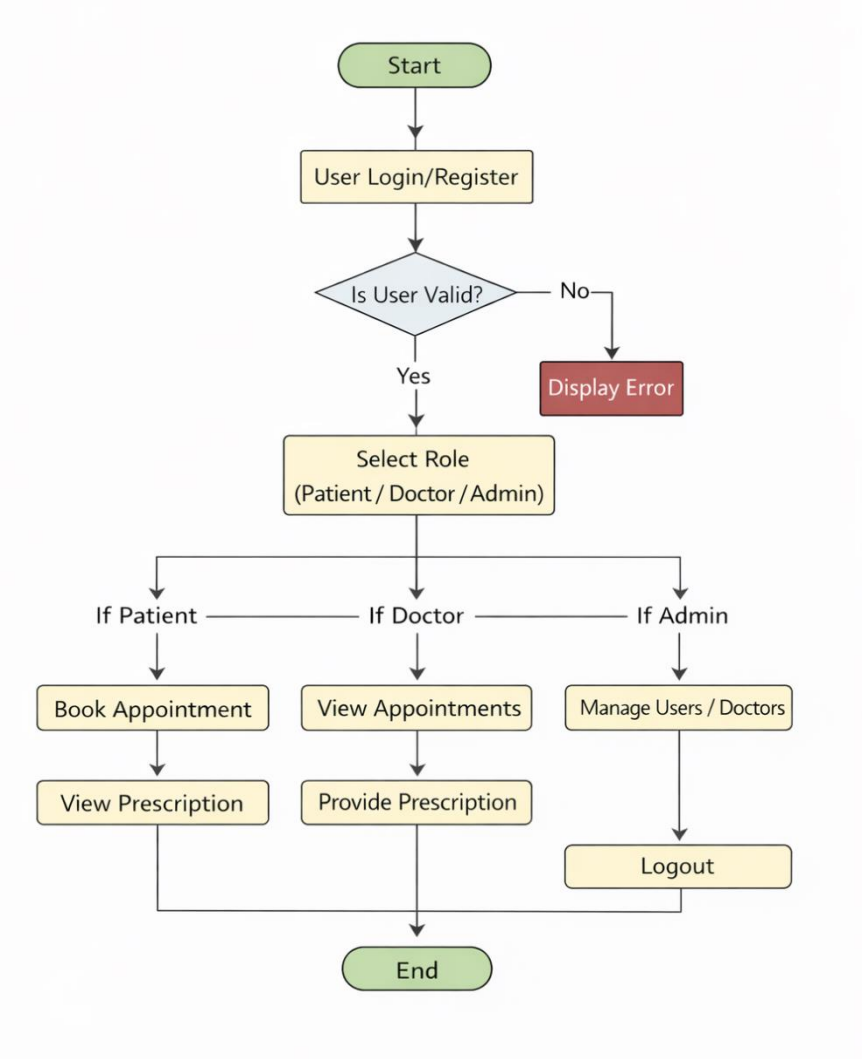


Fig:4.6

Explanation:

- The flowchart shows decision points and processes for all system roles.
- Ensures clarity in system operation and guides implementation.

4.7 Summary

This chapter presented the **system design** of the Online Medical Service System. It included:

- **Architectural design:** Three-tier web-based architecture.
- **UML diagrams:** Use Case, Class Diagram.
- **Database design:** ER diagram for relational structure.
- **Data flow and system flowcharts:** Visualizing information movement.

The design ensures a **scalable, secure, and user-friendly system** that meets the functional and non-functional requirements identified in Chapter 3. The next chapter will discuss **system implementation and testing** based on this design.

CHAPTER 5
SYSTEM IMPLEMENTATION AND TESTING

5.1 Introduction

This chapter discusses the implementation and testing of the proposed **Online Medical Service System**. Implementation refers to the translation of the system design into a working software application using the chosen technologies. Testing ensures that the system meets the functional and non-functional requirements and is reliable, secure, and user-friendly. The implementation phase also includes the development of user interfaces, database integration, and business logic.

5.2 Implementation Tools and Environment

The system is implemented using the following technologies:

Component	Technology
Front-End	HTML, CSS, JavaScript
Back-End	PHP
Database	MySQL
Server	Apache (XAMPP)
Development IDE	Visual Studio Code

Rationale:

- Open-source technologies were chosen for cost-effectiveness.
- PHP and MySQL provide robust server-side processing and database management.
- HTML, CSS, and JavaScript ensure a responsive and user-friendly interface.

5.3 Module-Wise Implementation

The system is divided into **three main modules**: Patient, Doctor, and Administrator.

5.3.1 Patient Module

Features Implemented:

- **Registration and Login:** Patients can create accounts, login securely, and recover passwords.
- **Appointment Booking:** Patients can select available doctors and schedule appointments.
- **View Medical Records and Prescriptions:** Patients can access their previous prescriptions and medical history.

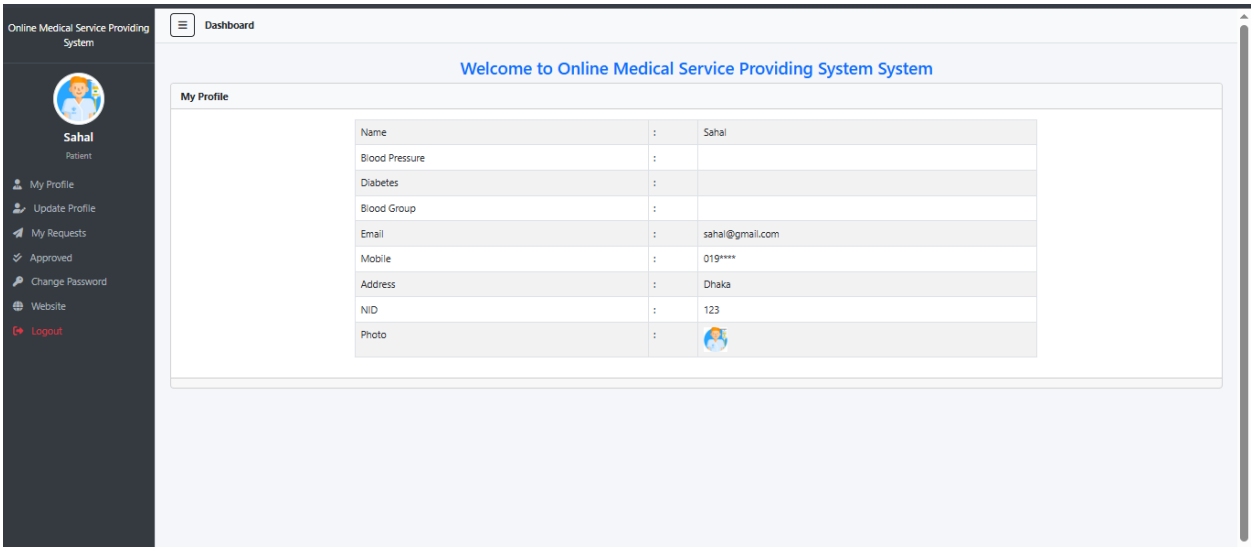


Fig:5.3.1

Interface Explanation:

- The **dashboard** provides options for booking appointments and viewing records.
- The **appointment form** validates date, time, and doctor availability.

5.3.2 Doctor Module

Features Implemented:

- **Secure Login:** Doctors authenticate using unique credentials.
- **View Appointments:** Displays upcoming patient appointments.
- **Provide Prescriptions:** Doctors can enter and save treatment details for patients.

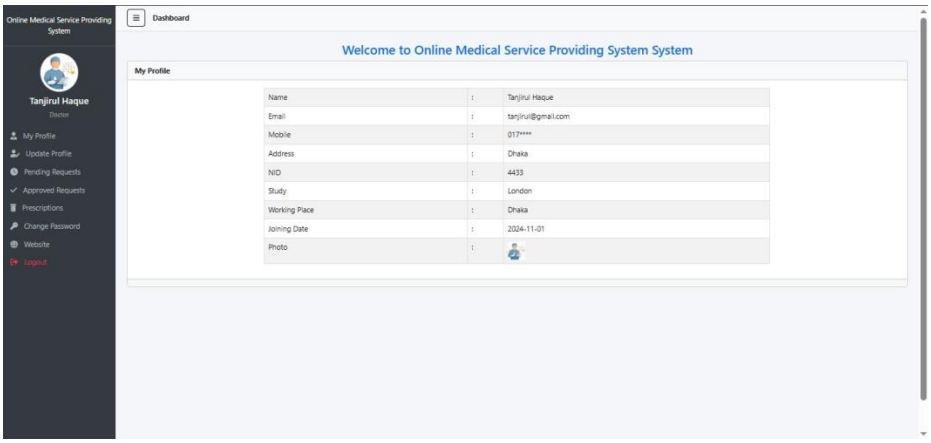


Fig:5.3.3

Interface Explanation:

- **Appointment list view:** Sortable by date and patient name.
- **Prescription form:** Linked to a specific appointment and stored in the database.

5.3.3 Administrator Module

Features Implemented:

- **Manage Users:** Create, update, and delete patient and doctor accounts.
- **System Monitoring:** Track appointments and prescription records.

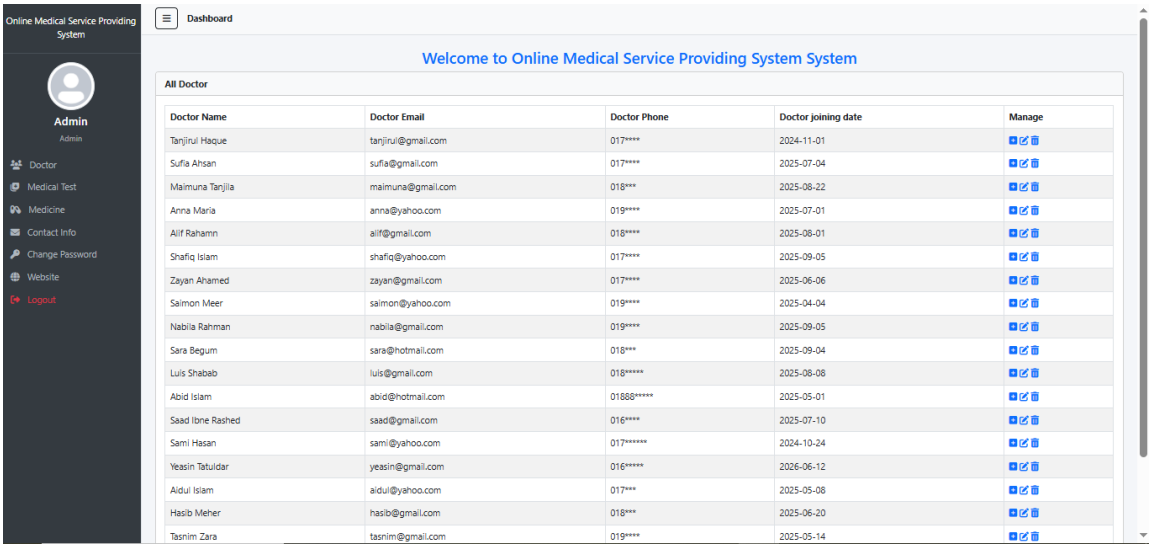


Fig:5.4.3

Interface Explanation:

- Admin dashboard shows summary statistics and user management options.
- Role-based access ensures that only the administrator can perform sensitive actions.

5.4 Database Implementation

The system database is implemented in **MySQL** and follows the ER design from Chapter 4. The key tables are:

- **Users Table:** Stores credentials and roles for patients, doctors, and admin.
- **Patients Table:** Stores patient personal information.
- **Doctors Table:** Stores doctor specialization and availability.
- **Appointments Table:** Links patients and doctors, stores date, time, and status.
- **Prescriptions Table:** Stores treatment details linked to appointments.

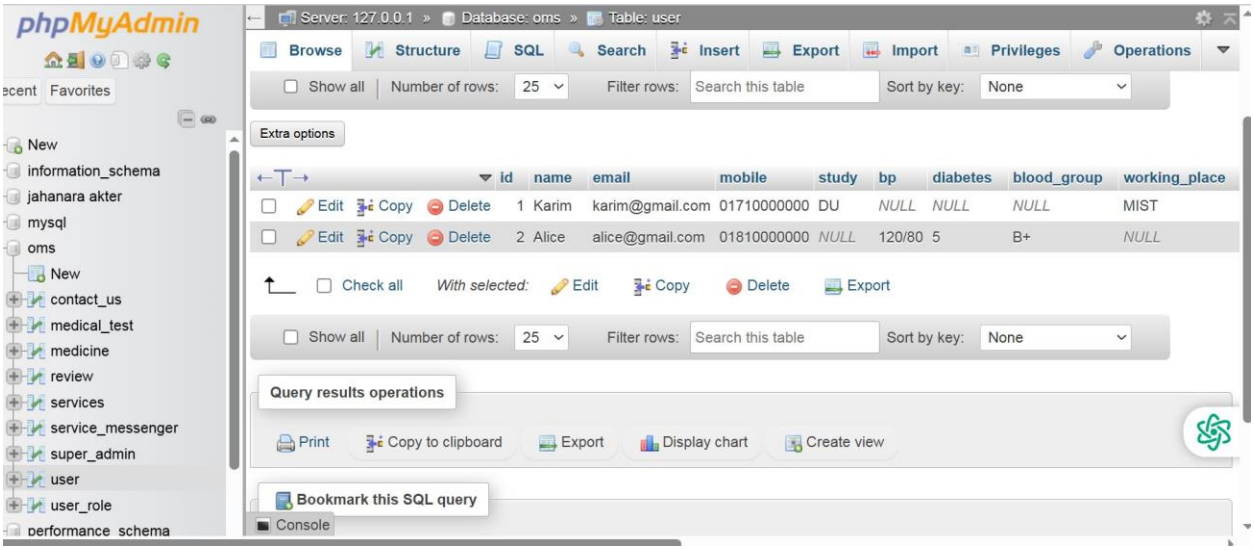


Fig:5.4

Database Security:

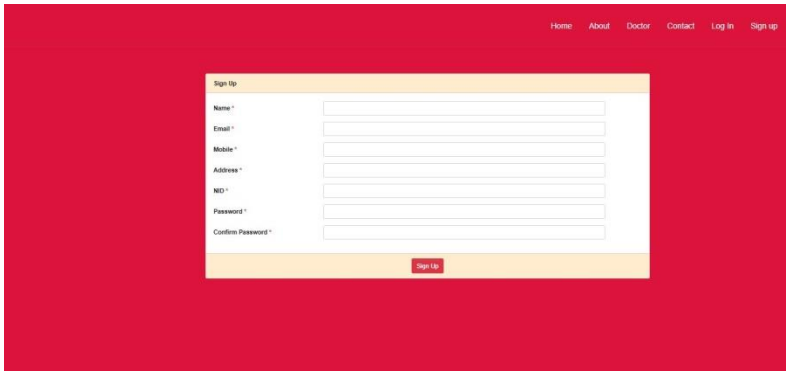
- Passwords are encrypted using hashing techniques.
- Foreign keys enforce referential integrity.

5.5 System Interface Screenshots

Note: Replace with actual screenshots in your thesis submission.

1. **Patient Registration/Login Page** – Secure form with validations.

2. **Appointment Booking Page** – Drop-down list of doctors and available time slots.
3. **Doctor Dashboard** – Displays patient appointments with prescription form.
4. **Admin Dashboard** – Manage users, view statistics, and monitor system.



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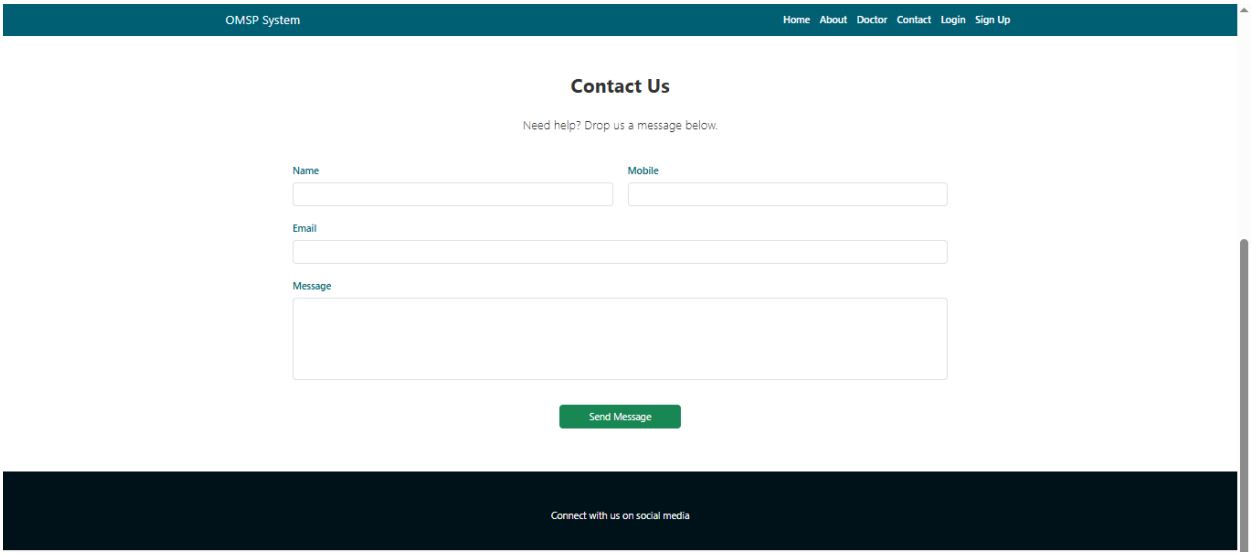

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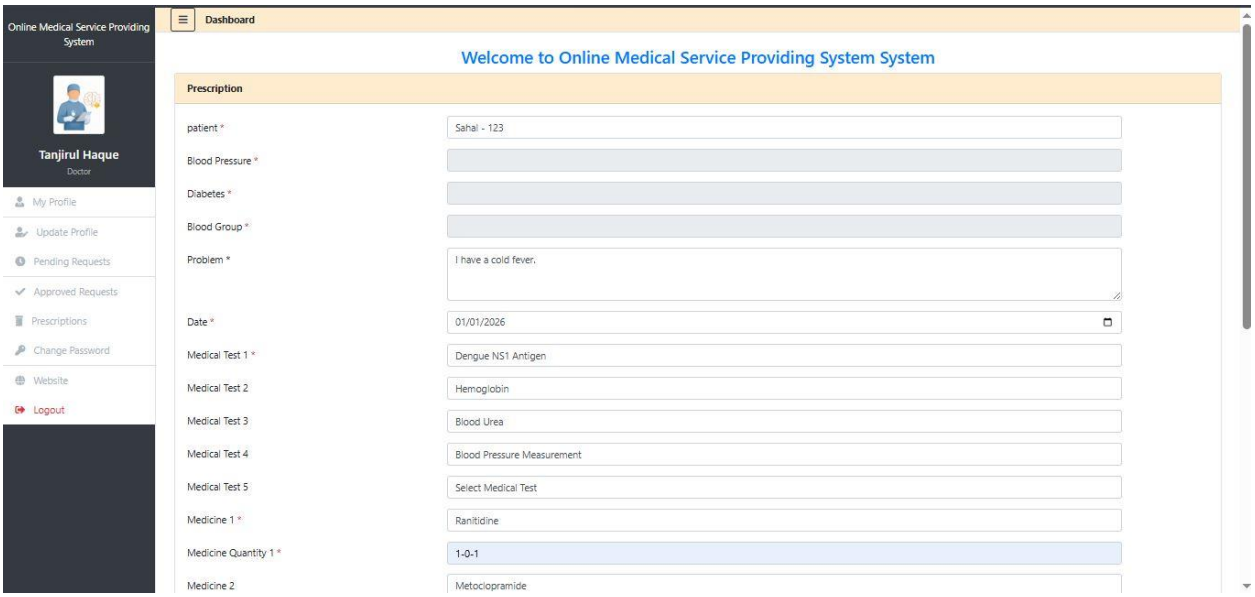

Fig:5.5.2

Explanation:

- Interfaces are simple, intuitive, and responsive.
- Navigation is consistent across all modules.

5.6 System Testing

Testing ensures the system works correctly and reliably. Both **functional** and **non-functional** testing were conducted.

5.6.1 Testing Methods

1. **Unit Testing:**
    - Each module (Patient, Doctor, Admin) was tested individually for functionality.
    - Example: Appointment booking correctly stores data in the database.
2. **Integration Testing:**
    - Tested combined modules to ensure smooth interaction.
    - Example: Patient booking triggers correct notifications for doctor module.
3. **System Testing:**
    - End-to-end testing to verify overall functionality.
    - Example: Login → Book Appointment → Doctor provides prescription → Patient views record.
4. **User Acceptance Testing (UAT):**

- Conducted with sample users to verify usability, navigation, and responsiveness.
- Feedback used to correct minor interface issues.

5.6.2 Test Results

Test Case	Expected Result	Actual Result	Status
Patient Registration	Patient account created	Successful	Pass
Patient Login	User can log in	Successful	Pass
Appointment Booking	Appointment saved in DB	Successful	Pass
Doctor Prescription	Prescription linked to appointment	Successful	Pass
Admin Add User	User added successfully	Successful	Pass

Observation:
All modules performed as expected with no critical errors. The system meets the functional and non-functional requirements defined in Chapter 3.

5.7 Challenges Faced During Implementation

- Ensuring **secure authentication** for multiple user roles.
- Implementing **dynamic appointment scheduling** to prevent conflicts.
- Designing **user-friendly interfaces** suitable for patients with minimal technical skills.
- Maintaining **data integrity** across multiple related tables in MySQL.

These challenges were addressed using proper software engineering techniques, validation rules, and database constraints.

5.8 Summary

This chapter presented the **implementation and testing** of the Online Medical Service System. It discussed:

- Tools and technologies used for development.
- Module-wise implementation for Patients, Doctors, and Admin.
- Database implementation and security measures.
- Interface descriptions and screenshots.
- Testing methodologies, test cases, and results.

The testing confirmed that the system is **functional, reliable, secure, and user-friendly**, fulfilling the objectives outlined in Chapter 1. The next chapter will summarize the project, discuss conclusions, and provide recommendations for future work.

CHAPTER 6
SYSTEM TESTING

6.1 Introduction

System testing is a crucial phase in the Software Development Life Cycle (SDLC), aimed at ensuring that the developed system fulfills all specified functional and non-functional requirements. The purpose of testing in this project is to verify that the **Online Medical Service System** operates accurately, securely, and efficiently under various conditions. This phase focuses on identifying errors, validating system behavior, and confirming that all system components work together as intended.

6.2 Testing Strategy

The testing strategy for the Online Medical Service System was designed to ensure reliability, usability, and security. Multiple testing techniques were applied to validate individual modules as well as the complete system.

The following testing approaches were used:

- Unit Testing
- Integration Testing
- System Testing
- User Acceptance Testing

Each testing method played a vital role in ensuring the overall quality of the system.

6.3 Unit Testing

Unit testing was performed to verify the functionality of individual modules independently. Each module was tested to ensure that it performs its designated tasks correctly without dependency on other components.

Modules Tested:

- Patient Registration and Login Module
- Appointment Booking Module
- Doctor Prescription Management Module
- Administrator Management Module

Example:
The appointment booking module was tested to verify that appointment details such as patient ID, doctor ID, date, and time are correctly stored in the database and that duplicate appointments are restricted.

Result:
All individual modules passed unit testing without critical errors.

6.4 Integration Testing

Integration testing was conducted to ensure proper interaction and data flow between different modules of the system. This testing verified that combined components function correctly when integrated.

Integration Scenarios:

- Patient appointment requests viewed by doctors
- Doctor prescriptions accessed by patients
- Administrator user creation followed by successful login

Result:
All integrated modules communicated effectively, and data consistency was maintained throughout the system.

6.5 System Testing

System testing evaluated the complete Online Medical Service System as a whole. This phase ensured that the system meets all specified requirements and functions correctly in a real-world environment.

Key Areas Tested:

- User authentication and authorization
- Appointment scheduling workflow
- Medical record management
- Role-based access control
- Error handling and system responses

Result:
The system functioned correctly under normal operating conditions, and all core features were successfully executed.

6.6 User Acceptance Testing (UAT)

User Acceptance Testing was performed to validate whether the system meets user expectations and usability standards. A group of sample users interacted with the system and provided feedback.

Evaluation Criteria:

- Ease of use
- Interface clarity
- System responsiveness
- User satisfaction

Result:
Users found the system intuitive and effective for managing online medical services. Minor interface improvements were implemented based on user feedback.

6.7 Test Case Summary

Test Case ID	Test Description	Expected Result	Actual Result	Status
TC-01	Patient Registration	Account created successfully	Successful	Pass
TC-02	Patient Login	Login successful	Successful	Pass
TC-03	Appointment Booking	Appointment saved	Successful	Pass
TC-04	Doctor Views Appointment	Appointment displayed	Successful	Pass
TC-05	Doctor Adds Prescription	Prescription stored	Successful	Pass
TC-06	Patient Views Prescription	Prescription displayed	Successful	Pass
TC-07	Admin Adds Doctor	Doctor added successfully	Successful	Pass

6.8 Security Testing

Security testing was conducted to ensure protection of sensitive medical data and prevention of unauthorized access.

Security Measures Tested:

- Encrypted password-based login authentication
- Role-based authorization
- Restricted access to confidential medical records

Result:
The system successfully enforced access control policies and protected sensitive information.

6.9 Performance Testing

Basic performance testing was carried out to evaluate system response time and stability under normal user load.

Observation:
The system demonstrated acceptable performance for login, appointment booking, and data retrieval operations, making it suitable for small to medium-scale deployment.

6.10 Summary

This chapter presented a detailed testing process for the **Online Medical Service System**. All major modules and functionalities were tested using appropriate testing techniques. The testing results confirm that the system is reliable, secure, and meets the project requirements. The successful completion of this phase validates the system's readiness for real-world use and academic submission.

CHAPTER 7

CONCLUSION AND FUTURE WORK

7.1 Conclusion

The development of the **Online Medical Service System** successfully demonstrates the application of Computer Science and Engineering principles to address the limitations of traditional healthcare services. The proposed system provides a **web-based platform** for patients, doctors, and administrators to manage healthcare services efficiently.

Key achievements of this project include:

1. **Enhanced Accessibility:** Patients can register, book appointments, and access medical records online, eliminating the need for frequent physical visits.
2. **Efficient Appointment Management:** Doctors can view and manage patient appointments systematically, reducing scheduling conflicts and waiting times.
3. **Digital Medical Record Management:** All patient data, including medical history and prescriptions, are stored digitally, improving accuracy and facilitating quick retrieval.
4. **Security and Role-Based Access:** The system ensures secure authentication and authorization for all users, maintaining confidentiality and integrity of sensitive medical information.
5. **User-Friendly Interface:** The system provides simple and intuitive interfaces for patients, doctors, and administrators, ensuring usability even for users with minimal technical knowledge.

Overall, the system fulfills the objectives outlined in Chapter 1 by providing a **reliable, secure, and scalable healthcare solution** that addresses existing inefficiencies in the healthcare sector. Testing and validation confirm that the system operates correctly, meets user requirements, and offers practical benefits for healthcare service delivery.

7.2 Limitations of the System

While the system achieves its primary objectives, certain limitations exist:

- The system does not currently support **real-time video consultations** between patients and doctors.
- There is no integration with **online payment gateways** for paid consultations.
- Mobile application support has not been implemented, limiting access on smartphones.

- Some advanced analytics, such as AI-based medical suggestions, are not included.

These limitations provide opportunities for future enhancements.

7.3 Future Work

The Online Medical Service System can be extended in several ways to improve functionality and usability:

1. **Video Consultation Integration:** Implementing real-time video calling for virtual doctor-patient consultations.
2. **Mobile Application Development:** Developing Android and iOS apps to allow patients and doctors to access the system on mobile devices.
3. **Payment Gateway Integration:** Adding secure online payment options for consultations and services.
4. **AI-Based Assistance:** Incorporating AI algorithms to provide automated suggestions for preliminary diagnosis or health monitoring.
5. **Enhanced Reporting and Analytics:** Adding dashboards for administrators and doctors to monitor trends, generate reports, and optimize resource allocation.
6. **Notification System:** Implementing SMS or email reminders for appointments, prescriptions, and follow-ups.

By implementing these enhancements, the system can evolve into a **comprehensive telemedicine platform** suitable for broader adoption in Bangladesh and similar developing countries.

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