MBARARA UNIVERSITY OFSCIENCE AND TECHNOLOGY

P.O. Box 1410, MBARARA-UGANDA

Telephone: +256-485-6605, Fax: +256-485-20782

Email: ar@must.ac.ug

Web: www.must.ac.ug

INFORMATION TECHNOLOGY 2024

Name: NIWAHEREZA CISSY

REG NO: 2024/BIT/142/PS

COURSE CODE: BIT 1203

Online Appointment Booking System for Local Clinics - Project

1. Introduction

Healthcare services require efficient appointment booking systems to manage patient visits and reduce waiting times. Many local clinics still rely on **manual appointment scheduling**, leading to **overcrowded waiting rooms, scheduling conflicts, and inefficiencies.**

The **Online Appointment Booking System** will allow **patients to schedule medical appointments remotely, reducing congestion, improving time management, and ensuring seamless doctor-patient interactions.**

Key Benefits of the System:

- **Reduces long waiting times** by allowing patients to book and manage appointments online.
- **Minimizes errors in scheduling** by automating appointment tracking.
- **Provides real-time availability updates** for doctors and clinic staff.
- **Enhances patient experience** by offering reminders and notifications.

This web-based solution will improve **efficiency, accessibility, and overall patient satisfaction.**

---

2. Problem Identification

Challenges in Traditional Appointment Booking Systems

Many local clinics use **manual scheduling methods**, such as phone calls or walk-in book ings. This leads to:

1. Inefficient Scheduling & Overcrowding

- Patients often arrive at the clinic without knowing if a doctor is available.
- Long queues cause frustration and delay medical services.

2. Miscommunication & Errors

- Receptionists manually record appointments, increasing the risk of double-booking.
- Canceled appointments are not updated in real time.

3. Limited Accessibility

- Patients must physically visit or call the clinic to book an appointment.
- Working professionals and elderly patients struggle with scheduling flexibility.

4. Poor Time Management for Doctors

- Unstructured appointment slots lead to unbalanced workloads.
- Doctors waste time managing appointments instead of focusing on patient care.

The **Online Appointment Booking System** will resolve these challenges by **digitizing appointment management**, reducing errors, and improving doctor-patient interactions.

---

3. Proposed Web-Based Solution

The **Online Appointment Booking System** will allow **patients, doctors, and clinic administrators** to manage appointments efficiently.

Key Features of the System

User Authentication: Secure login for administrators, doctors, and patients.

Appointment Scheduling: Patients can book, reschedule, or cancel appointments.

Doctor Availability Management: Doctors can set working hours and available slots.

Notifications & Reminders: Email/SMS alerts for appointment confirmations and reminders.

Search & Filtering: Find available doctors based on specialization, location, and time slots.

Mobile Responsiveness: Accessible on desktops, tablets, and mobile devices.

Reports & Analytics: Generate appointment reports and track patient visits.

Integration with Google Calendar: Sync appointments with doctors' calendars.

By automating the appointment process, this system will ensure **efficient clinic operations, reduced waiting times, and improved patient experience.**

---

4. System Architecture & Wireframe

System Architecture Overview

The **Online Appointment Booking System** will be built using a **three-tier architecture:**

1. **Frontend (Client Side):** React.js, HTML, CSS, JavaScript
2. **Backend (Server Side):** PHP (Laravel Framework)
3. **Database:** MySQL

Database Schema

Table Name	Columns	Description
Users	user_id, name, email, role, password	Stores user credentials
Appointments	appointment_id, patient_id, doctor_id, date, time, status	Tracks appointment bookings
Doctors	doctor_id, name, specialty, available_hours	Stores doctor details

Table Name	Columns	Description
Notifications	notification_id, user_id, message, timestamp	Manages alerts and reminders

Wireframe Overview

- **Patient Dashboard:** View upcoming appointments and book new ones.
- **Doctor Panel:** Manage availability and view appointment schedules.
- **Admin Dashboard:** Oversee system operations and generate reports.

```
________________________

|          PATIENT DASHBOARD |

________________________

| [Upcoming Appointments]  [Book New]     |

| [Notifications]                    |

________________________



________________________

|          DOCTOR PANEL     |

________________________

| [Manage Availability] [View Schedule]  |

| [Patient Details]   |

________________________



_______________________
```

```
|          ADMIN DASHBOARD |
_________________________
| [Manage Users] [Manage Doctors]      |
| [View Reports]                       |
_______________________
```

1. Patient Dashboard

Header:

Title: "Patient Dashboard"

Navigation Menu: Links to Home, Appointments, Profile, and Logout.

- Main Sections:
  - Upcoming Appointments:
    - List of appointments with:
      - Date
      - Time
      - Doctor's Name
      - Status (Confirmed/Canceled)
  - Book Appointment Button:
    - Prominent button labeled "Book Appointment".
  - Notifications Section:
    - Alerts for upcoming appointments and reminders.

2. Doctor Panel

- Header:
  - Title: "Doctor Panel"
  - Navigation Menu: Links to Home, Schedule, Patients, and Logout.

- Main Sections:
  - Manage Availability:
    - Input fields to set:
      - Working days
      - Available time slots
    - Button to "Save Changes".
  - View Appointment Schedule:
    - Calendar view or list format showing daily/weekly appointments.

3. Admin Dashboard

- Header:
  - Title: "Admin Dashboard"
  - Navigation Menu: Links to Home, User Management, Reports, and Logout.

- Main Sections:
  - User Management:
    - Options to add, edit, or delete users (patients and doctors).

  - Generate Reports Button:

    - Button labeled "Generate Reports" for statistics on appointments.

  - System Operations Overview:

    - Summary area displaying:

      - Total number of appointments

      - Cancellations

      - Active users

Additional Features

- Search Bar:

  - Located at the top of each dashboard for easy access to search for doctors or a appointments

---

5. Technology Stack

Frontend

HTML, CSS, JavaScript – Structuring and styling the interface.
React.js – Ensuring a dynamic and interactive user experience.

Backend

PHP (Laravel Framework) – Handling server requests and business logic.

Database

MySQL – Storing patient records and appointments.

Hosting

GitHub Pages, Netlify, Heroku, or AWS – Deployment options.

API Integration

Google Calendar API – Syncing doctor appointments.

Twilio API – Sending SMS reminders.

---

6. User Roles & Features

User Role	Responsibilities
Administrator	Manage users, doctors, and reports.
Doctor	Set availability, manage appointments.
Patient	Book, reschedule, and cancel appointments.

---

7. Research & References

Sources Used

- **MDN Web Docs & W3C** – Web development best practices.
- **IEEE Research Papers** – Digital appointment booking case studies.
- **GitHub & Stack Overflow** – Coding solutions and frameworks.

---

8. Implementation Plan

Phase	Task	Timeline
1	Research & Planning	1 Week

Phase	Task	Timeline
2	Database & Backend Development	2 Weeks
3	Frontend Development	2 Weeks
4	Testing & Debugging	1 Week
5	Deployment & Documentation	1 Week
6	Submission & Final Presentation	Last Week

---

9. Conclusion & Reflection

The **Online Appointment Booking System** will **streamline clinic operations** by providing **an easy-to-use platform for patients, doctors, and administrators.**

Reduces waiting times & improves efficiency.

Enhances communication between patients & doctors.

Minimizes scheduling errors & double bookings.