

**A PROPOSED OFFERING OF AN ONLINE RESERVATION SYSTEM FOR  
DENTHUB DENTAL CLINIC**

A Thesis Project Presented to the  
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# **REQUIREMENT SPECIFICATION**

## INTRODUCTION

This document aims to provide a clear and comprehensive outline of the requirements for the Online Appointment System for Denthub Dental Clinic. This document acts as a reference for system development by outlining its functional and non-functional requirements, features, and limitations. It also serves as a foundation for system analysis, design, and implementation, ensuring consistency throughout the development process. It is intended to ensure that all stakeholders, including developers, advisers, and clinic personnel, have a common understanding of the system's objectives, scope, and expected behavior.

The software system in development is an online management system for appointments and patient information aimed at facilitating the daily operations of Denthub Dental Clinic. The platform will offer a secure, reliable, and user-friendly digital solution for booking appointments, handling patient records, and coordinating clinic data. Through automation of key processes, the system seeks to eliminate the clinic's manual and semi-digital procedures to lessen scheduling conflicts, decrease record-keeping mistakes, improve data accuracy, and enhance overall workflow effectiveness.

This requirements specification outlines the essential features of the proposed system, such as appointment scheduling, management of patient records, control of user access, and fundamental reporting capabilities. It emphasizes the requirements of authorized clinic staff such as dentists and receptionists, as well as patients who will interact with the system for appointment booking. The document also specifies how the system will function within the clinic's current operational and technical environment. Features beyond appointment and record management, such as advanced medical diagnostics, billing automation, or external system integrations, are not included in the scope of this document.

In addition, this document defines the assumptions, constraints, and operational boundaries under which the system will be developed and deployed. It identifies system limitations related to technology, security, and resource availability, while also establishing expectations for system performance, usability, and data protection. By clearly documenting these considerations, the requirements specification helps reduce development risks, supports effective decision-making, and ensures that the final system meets the needs of Denthub Dental Clinic in a practical and sustainable manner.

## FUNCTIONAL REQUIREMENT

Functional requirements describe the specific functions and features that the system must perform to support its intended users. For the Online Appointment System for Denthub Dental Clinic, these requirements define how the system will handle appointment scheduling, patient record management, data security, and clinic operations. The functional requirements listed in the following table serve as the basis for system design, development, and evaluation to ensure that the system meets the project objectives and clinic needs.

Functional Requirement	Description	Priority	Dependencies	Acceptance Criteria
User Authentication and Access Control	The system shall allow authorized clinic staff to log in using secure credentials and restrict access based on user roles.	High	User database, system security module	Users can successfully log in with valid credentials, and unauthorized users are denied access.
Appointment Scheduling Management	The system shall allow staff to create, view, update, and cancel patient appointments while preventing double bookings.	High	Dentist schedules, appointment database	Appointments can be added, modified, or cancelled, and overlapping schedules are not allowed.
Dentist Schedule Management	The system shall manage dentist availability, including working hours and assigned time slots.	High	Dentist records, appointment module	Dentist schedules are accurately reflected and used during appointment booking.

Patient Record Management	The system shall store and manage patient information in a centralized and secure digital database.	High	Patient database, authentication module	Authorized staff can add, edit, retrieve, and view patient records without data loss.
Laboratory Case Tracking	The system shall record and track patient laboratory cases such as dentures and prosthetics.	Medium	Patient records, laboratory case module	Laboratory cases can be recorded, updated, and viewed with correct patient association.
Interactive Dashboard	The system shall provide a dashboard displaying an overview of appointments, patient records, and clinic activities.	Medium	Appointment and patient databases	Dashboard correctly displays real-time and summarized clinic data.
Report Generation	The system shall generate automated reports related to appointments and patient records.	Medium	Database, reporting module	Reports can be generated, viewed, and exported accurately.
Data Storage and Protection	The system shall securely store all data and apply protection mechanisms against unauthorized access or data loss.	High	Database system, security controls	System data remains intact, secure, and accessible only to authorized users.

Multi-Branch Support	The system shall support two clinic branches using a single centralized database.	Medium	Network connectivity, centralized database	Records from both branches are accessible and properly managed without duplication.
Backup and Recovery Support	The system shall support regular data backups to allow recovery in case of system failure.	Medium	Database, backup storage	Data can be successfully restored after simulated data loss or failure.

Table 1. Functional Requirement

## **NON-FUNCTIONAL REQUIREMENT**

Non-functional requirements define the quality attributes and operational constraints of the system rather than specific features. For the Online Appointment System for Denthub Dental Clinic, these requirements focus on performance, security, usability, reliability, and scalability to ensure that the system operates efficiently, securely, and consistently within the clinic environment.

<b>Functional Requirement</b>	<b>Description</b>	<b>Priority</b>	<b>Dependencies</b>	<b>Acceptance Criteria</b>
System Performance	The system shall load pages and process user actions within an acceptable response time.	High	Server performance, internet connectivity	System pages load within 3 seconds under normal usage.
Data Security	The system shall protect patient and appointment data from unauthorized access.	High	Authentication module, database security	Only authorized users can access sensitive data.
System Availability	The system shall be available during clinic operating hours.	High	Hosting service, internet connectivity	System is accessible at least 95% of clinic operating hours.
Usability	The system shall be easy to use for staff with basic computer skills.	Medium	UI/UX design, user training	Users can perform basic tasks without external assistance.
Reliability	The system shall operate consistently without unexpected crashes or data errors.	High	System architecture, testing procedures	No critical system failures occur during normal operation.

Scalability	The system shall support two clinic branches under a single database.	Medium	Database structure, network configuration	System handles records from both branches without performance issues.
Data Backup and Recovery	The system shall allow data recovery in case of system failure or data loss.	Medium	Backup mechanism, database management	Data can be restored successfully from backups.
Compatibility	The system shall be accessible using standard web browsers on computers and laptops.	Low	Browser support, web standards	System functions correctly on modern web browsers.

Table 2. Non-Functional Requirement

## USE CASES

Our Use Case Diagram serves as a functional requirements of the Denthub Online Appointment System, showing how people like admins, doctors, and patients actually use it. By mapping out these interactions, we've pinpointed the system's core features everything from appointing and managing schedules to updating user profiles or information. It is mapping out the direct interactions between our users (the actors) and the tasks they need to complete. It gives greater emphasis to providing sufficient interface design to help enable faster and easier methods of delivering information and ensuring security. By looking at these interactions, you can see how we've prioritized a smooth, functional experience for anyone trying to book an appointment.

Our main goal for this system is to make every part of the process easy to manage and to ensure the software performs exactly what it is intended to do. We specifically want to focus on improving how patient information and records handled, making the data entry and retrieval process more organized and accurate for everyone involved. By focusing on these high-level interactions, we can ensure the system is user-friendly and meets the practical needs of a busy scheduling environment.

Use Case Diagram

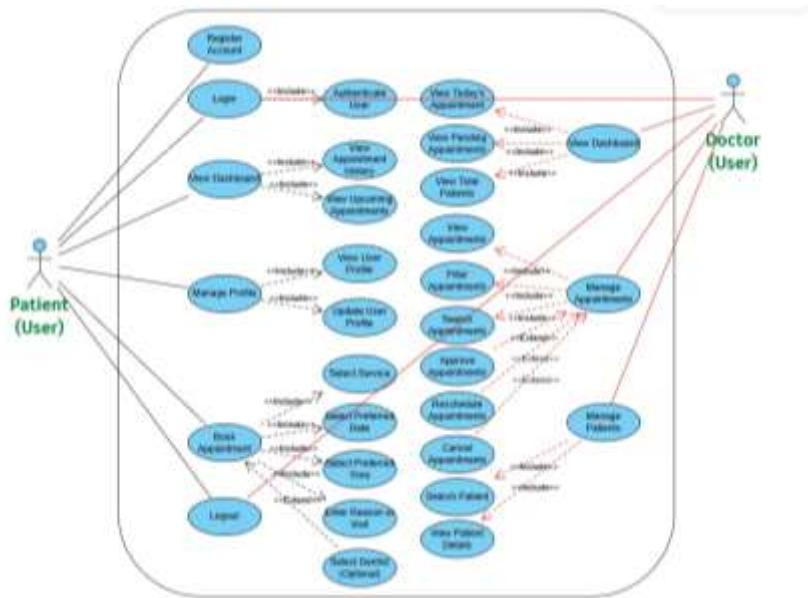


Figure 1. Use Case Diagram

The Use Case Diagram above shows the functional requirements of the Proposed Online Reservation System for Denthub Dental Clinic, and this diagram shows how different users can interact with the system and what they can do inside it. It defines the system's scope by identifying the actors, their roles, and the use case they can perform. The diagram is designed based on the system proposal and its wireframe to ensure its consistency between the system functionalities and its user interface design.

## System Actors

- **Patient (user)** - The Patient actor represents individuals who wish to book and manage dental appointments online.
- **Doctor (user)** - The Doctor actor represents dentists or authorized clinic staff responsible for managing appointments and patient records.
- **Login (actors)** - Here, it is safer and more secure to provide a user's important information.
- **View Dashboard (Doctor)** - allows users to see an overview of important information in one place and you can view bookings, appointment history, upcoming appointment and other related information.
- **Manage Profile (Patient)** - feature allows users to view, update, and maintain their personal information.
- **Manage Appointment (Doctor)** - Here that you can see how to search, add and view appointment references, filter, approve, reschedule, cancel and patient data.
- **Manage Patient (Doctor)** - feature allows doctors to add, view, update, and manage patient information. It includes access to patient records, appointment details, and medical history.
- **Book Appointment (Patient)** - This feature lets patients book an appointment with the doctor of their choice. Patients can choose from available dates and time slots, fill in the required information, and confirm their appointment. It helps make the booking process simple, well-organized, and convenient for users.
- **Logout (Both Actors)** - feature allows users to safely exit their account or session. It ensures that no one else can access their personal information or data after they leave the application, helping to maintain security and privacy.

## **DATA REQUIREMENTS**

Data requirements define the type of data that the system needs to store, process, and manage in order to function effectively. For the Online Appointment System for Denthub Dental Clinic, the data requirements focus on managing patient information, appointments, dentist schedules, laboratory cases, and system users. These data elements ensure accurate record-keeping, efficient scheduling, and secure system operations.

<b>Data Entity</b>	<b>Description</b>	<b>Key Data Fields</b>	<b>Source of Data</b>	<b>Usage/Purpose</b>
User Accounts	Stores information of authorized clinic staff who can access the system.	User ID, Full Name, Username, Password, Role, Status	Clinic administration	Used for authentication, access control, and role-based permissions.
Patient Information	Stores personal and basic medical details of patients.	Patient ID, Full Name, Age, Gender, Contact Number, Address	Clinic staff	Used for patient identification, consultations, and appointment records.
Appointments	Stores scheduled appointment details between patients and dentists.	Appointment ID, Patient ID, Dentist ID, Date, Time Slot, Status	Clinic staff	Used to manage scheduling, prevent double bookings, and track appointments.
Dentist Records	Stores information about dentists and their availability.	Dentist ID, Full Name, Specialty, Schedule, Branch	Clinic administration	Used to assign appointments and manage dentist schedules.

Laboratory Cases	Stores information about dental laboratory work such as dentures and prosthetics.	Case ID, Patient ID, Case Type, Status, Date Created	Clinic staff	Used to monitor and track laboratory cases during treatment.
Branch Information	Stores details of Denthub Dental Clinic branches.	Branch ID, Branch Name, Location	Clinic administration	Used to support multi-branch operations under a single database.
System Logs	Stores records of system activities and actions performed by users.	Log ID, User ID, Action Performed, Date and Time	System-generated	Used for monitoring, auditing, and security purposes.
Backup Data	Stores copies of system data for recovery purposes.	Backup ID, Date Created, Data Snapshot	System-generated	Used for data recovery in case of system failure or data loss.

Table 3. Data Requirements

## **ASSUMPTIONS AND CONSTRAINTS**

Assumptions and constraints define the conditions and limitations considered during the development of the system. Assumptions represent factors expected to be true throughout the project, while constraints identify restrictions that may affect system design, implementation, and performance. For the Online Appointment System for Denthub Dental Clinic, these assumptions and constraints were identified based on the project scope, available resources, and operational environment of the clinic.

### **Assumptions**

The following assumptions were considered during the development of the Online Appointment System for Denthub Dental Clinic:

- The system will be accessed only by authorized clinic staff of Denthub Dental Clinic.
- Users of the system have basic computer literacy and are capable of operating a web based system.
- All patient and appointment data entered into the system are accurate and verified by clinic staff.
- The system will support two Denthub Dental Clinic branches using a single centralized database.
- Stable internet connectivity is available during system operation within the clinic branches.
- The clinic will provide necessary information and cooperation during system development and testing.

## **Constraints**

The following constraints may affect the development and implementation of the system:

- The project is limited by the allotted academic development time.
- Budget limitations may restrict advanced system features or third-party integrations.
- The system functionalities are confined to the approved project scope.
- Hardware availability may vary between clinic branches.
- System performance and accessibility depend on internet connectivity.
- The system does not include online payments, patient self-booking, or SMS/email notifications.

## **GLOSSARY**

### **Denthub Dental Clinic**

- The dental clinic for which the online appointment system is designed.

### **Appointment Scheduling**

- The process of setting, organizing, and managing patient appointment dates and times.

### **Authorized Staff**

- Clinic workers who are allowed to use the system, such as dentists, assistants, and receptionists.

### **Clinic Operations**

- The daily activities needed to run the dental clinic, including patient care and record handling.

### **Database**

- A digital storage where patient information and appointment details are saved and organized.

### **Digital System**

- A computer-based system used to manage clinic tasks electronically instead of manually.

### **Electronic Patient Record (EPR)**

- A digital file that contains a patient's personal details and dental treatment history.

### **Manual Record-Keeping**

- The use of paper files and logbooks to store patient information.

## **Miscommunication**

- When information is not shared correctly, causing mistakes or delays.

## **Online Appointment System**

- A web-based system used to schedule appointments and manage patient records.

## **Patient Record Management**

- The process of storing, updating, and retrieving patient information using the system.

## **Secure System**

- A system that protects patient data from unauthorized access.

## **User-Friendly Interface**

- A system design that is easy to understand and use.

## **Workflow**

- The step-by-step process staff follow to complete clinic tasks.