

# Requirements

## Functional Requirements

- The system should allow patients to book an appointment after selecting one of the available times prompted to them.
- The system should allow all Staff to be able to register to the system.
- Doctors should be able to determine their individual available times at which they can take patient's appointments.
- Doctors should be able to view and manage the existent appointments and reschedule them if need be.
- Doctors should be able to notify/alert the patients in case they are able to evaluate their appointment sooner than the appointment's time.
- The system should allow Administrative Staff to access the website and change any information.
- The system should allow administrative staff as well as the doctors to communicate with the dev team.

## Non-Functional Requirements

- The database should retrieve data in at most 3 seconds for any query.
- In case any editing is done in the appointments and a system failure occurs, the appointments should revert to the old state and stay intact.
- The system should be available to patients 24/7 to book an appointment, and should have high availability during peak usage times.
- The payment process should be secure and should protect the user's sensitive information.
- The system should provide channels for doctors, administrative staff, and dev team to communicate effectively and efficiently.
- The system should be compatible with different web browsers and devices to ensure that it can be accessed by a wide range of users.

## Use case Diagram



## Use case Specification

Use Case UC-1	Access Website
Initiating Actor	Administrative Staff
Actor's Goal	Access the doctor appointment system's website.
Participating Actors	Administrative Staff, Database
Preconditions	<ul style="list-style-type: none"> <li>The system is operational.</li> <li>The administrative staff member has a device with internet connectivity.</li> </ul>
Postcondition	<ul style="list-style-type: none"> <li>The administrative staff member has accessed the doctor appointment system's website.</li> </ul>
Normal Flow	<ol style="list-style-type: none"> <li>The administrative staff member opens a web browser on their device.</li> <li>The administrative staff member enters the URL of the doctor appointment system's website.</li> <li>The system displays the login page.</li> <li>The administrative staff member enters their username and password and clicks the "Login" button.</li> </ol>

	<ol style="list-style-type: none"> <li>5. The system authenticates the administrative staff member's credentials and displays the homepage of the doctor appointment system.</li> <li>6. The administrative staff member can access all relevant functions of the system, including updating information, managing appointments, and communicating with other users of the system.</li> </ol>
Alternative Flow	<ul style="list-style-type: none"> <li>• If the administrative staff member enters an incorrect username or password in step 4, the system displays an error message and prompts them to enter their credentials again.</li> <li>• If the system is unavailable or the website is not accessible, the administrative staff members will be unable to access the doctor appointment system's website. In this case, the administrative staff member should contact the dev team for assistance.</li> </ul>

Use Case UC-2	Change Information on the Website
Initiating Actor	Administrative Staff
Actor's Goal	Update information on the doctor appointment system's website.
Participating Actors	Administrative Staff, Database
Preconditions	<ul style="list-style-type: none"> <li>• The administrative staff members must have appropriate access rights to the system.</li> </ul>
Postcondition	<ul style="list-style-type: none"> <li>• The administrative staff member successfully updates the information on the website.</li> </ul>
Normal Flow	<ol style="list-style-type: none"> <li>1. The administrative staff member logs into the system.</li> <li>2. The administrative staff member navigates to the appropriate section of the website to update information.</li> <li>3. The administrative staff member selects the information to be updated.</li> <li>4. The administrative staff member updates the information.</li> <li>5. The system validates the new information and saves the changes.</li> <li>6. The system displays a confirmation message to the administrative staff member.</li> </ol>
Alternative Flows	<p>3a. If the administrative staff member selects an invalid or non-existent information to be updated:</p> <ol style="list-style-type: none"> <li>1. The system displays an error message and prompts the administrative staff member to select valid information.</li> <li>2. The administrative staff member selects valid information and continues with the basic flow.</li> </ol>

Use Case UC-3	Communicate with Dev Team
Initiating Actor	Administrative Staff or Doctor
Actor's Goal	To report system issues or request system enhancements.
Participating Actors	<ul style="list-style-type: none"> <li>Administrative Staff</li> <li>Doctor</li> </ul>
Preconditions	<ul style="list-style-type: none"> <li>The administrative staff or doctor actor must have appropriate access rights to the system.</li> </ul>
Postcondition	<ul style="list-style-type: none"> <li>The administrative staff or doctor actor successfully communicates with the development team.</li> </ul>
Normal Flow	<ol style="list-style-type: none"> <li>The administrative staff or doctor actor logs into the system.</li> <li>The actor navigates to the appropriate section of the website to communicate with the development team.</li> <li>The actor creates a new message to the development team, including any relevant details about the issue or enhancement request.</li> <li>The actor sends the message to the development team.</li> <li>The development team receives the message and reviews it.</li> <li>The development team responds to the message with a resolution or plan for addressing the issue, or with information about the status of the enhancement request.</li> <li>The actor receives the response from the development team.</li> </ol>
Alternative Flows	<p>3a. If the actor encounters an issue while creating the message:</p> <ol style="list-style-type: none"> <li>The system displays an error message and prompts the actor to try again later.</li> </ol>

Use Case UC-4	Register
Initiating Actor	Staff
Actor's Goal	To report system issues or request system enhancements.
Participating Actors	<ul style="list-style-type: none"> <li>Staff</li> <li>Database</li> </ul>
Preconditions	<ul style="list-style-type: none"> <li>The staff actor has appropriate access rights to the system.</li> </ul>
Postcondition	<ul style="list-style-type: none"> <li>A new user is successfully registered in the system.</li> </ul>
Normal Flow	<ol style="list-style-type: none"> <li>The staff actor logs into the system.</li> <li>The actor navigates to the "Register" section of the website.</li> <li>The actor enters the new user's information, including name, email address, and password.</li> <li>The actor submits the registration form.</li> <li>The system creates a new user account for the registered user.</li> <li>The system sends a confirmation email to the registered user.</li> <li>The staff actor notifies the registered user that their account has been created.</li> </ol>

Alternative Flows	<p>3a. If the actor encounters an error while entering the new user's information:</p> <ol style="list-style-type: none"> <li>1. The system displays an error message and prompts the actor to correct the information.</li> </ol>
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Use Case UC-5	View Appointments
Initiating Actor	Doctor
Actor's Goal	To view their scheduled appointments.
Participating Actors	<ul style="list-style-type: none"> <li>• Doctor</li> <li>• Database</li> </ul>
Preconditions	<ul style="list-style-type: none"> <li>• The doctor actor has appropriate access rights to the system.</li> <li>• The doctor actor is currently logged into the system.</li> </ul>
Postcondition	<ul style="list-style-type: none"> <li>• The doctor actor can view their scheduled appointments.</li> </ul>
Normal Flow	<ol style="list-style-type: none"> <li>1. The doctor actor logs into the system.</li> <li>2. The actor navigates to the "View Appointments" section of the website.</li> <li>3. The system displays a list of the doctor's scheduled appointments, including the patient's name, appointment time, and reason for the appointment.</li> <li>4. The doctor actor can view the details of each appointment by clicking on it in the list.</li> </ol>
Alternative Flows	<p>4a. If the doctor actor encounters a technical issue while trying to view their appointments:</p> <ol style="list-style-type: none"> <li>1. The system displays an error message notifying the actor of the issue and apologizing for the inconvenience.</li> <li>2. The system suggests the actor try again later and provides a contact form for the actor to submit a support request if the issue persists.</li> <li>3. The system logs the error for review by the development team, so they can identify and fix the underlying issue causing the error.</li> </ol>

Use Case UC-6	Manage Appointments
Extension Use case	Reschedule Appointment
Initiating Actor	Doctor
Actor's Goal	To manage appointments for their patients.
Participating Actors	<ul style="list-style-type: none"> <li>• Doctor</li> </ul>
Preconditions	<ul style="list-style-type: none"> <li>• The doctor actor is logged into the system.</li> </ul>

	<ul style="list-style-type: none"> <li>• The doctor actor has already accessed the "View Appointments" section of the website.</li> <li>• The doctor actor has appointments scheduled with one or more patients.</li> </ul>
Postcondition	<ul style="list-style-type: none"> <li>• The doctor actor has successfully managed their appointments as needed.</li> </ul>
Normal Flow	<ol style="list-style-type: none"> <li>1. The doctor actor navigates to the "View Appointments" section of the website.</li> <li>2. The system displays a list of all scheduled appointments for the doctor actor.</li> <li>3. The doctor actor selects the appointment they want to manage.</li> <li>4. The system displays the appointment details, including the patient's name, date, and time of the appointment.</li> <li>5. The doctor actor can perform any of the following actions on the appointment: <ul style="list-style-type: none"> <li>a. Reschedule the appointment: The doctor actor can select a new date and/or time for the appointment and save the changes.</li> <li>b. Cancel the appointment: The doctor actor can cancel the appointment and provide a reason for the cancellation.</li> <li>c. Mark the appointment as completed: The doctor actor can mark the appointment as completed, which will remove it from the active appointments list.</li> </ul> </li> <li>6. The system updates the appointment details and notifies the patient of any changes made to the appointment.</li> </ol>
Alternative Flows	<p>5a. If the doctor actor wants to reschedule the appointment to a date and time that conflicts with another scheduled appointment:</p> <ol style="list-style-type: none"> <li>1. The system displays an error message notifying the actor that there is a conflict with the new appointment date and time.</li> <li>2. The system prompts the actor to select a different date and/or time that does not conflict with the existing appointments.</li> </ol>

Use Case UC-7	Reschedule an Appointment
Initiating Actor	Doctor
Actor's Goal	To reschedule an appointment with a patient.
Participating Actors	<ul style="list-style-type: none"> <li>• Doctor</li> <li>• Database</li> </ul>
Preconditions	<ul style="list-style-type: none"> <li>• The Doctor must be logged in to the system.</li> <li>• The Doctor must have an existing appointment that needs to be rescheduled.</li> </ul>

Postcondition	<ul style="list-style-type: none"> <li>• The appointment is successfully rescheduled.</li> <li>• The Doctor's availability is updated in the system.</li> </ul>
Normal Flow	<ol style="list-style-type: none"> <li>1. The Doctor logs into the system.</li> <li>2. The Doctor selects the "Manage Appointments" option.</li> <li>3. The Doctor selects the appointment that needs to be rescheduled.</li> <li>4. The Doctor selects the "Reschedule" option.</li> <li>5. The Doctor selects a new available time slot.</li> <li>6. The system confirms the new appointment time with the Doctor.</li> <li>7. The Doctor's availability is updated in the system.</li> </ol>
Alternative Flows	

Use Case UC-8	Coordinate Schedule Calendar
Initiating Actor	Doctor
Actor's Goal	To coordinate their schedule calendar with the system's appointment scheduling feature.
Participating Actors	<ul style="list-style-type: none"> <li>• Doctor</li> </ul>
Preconditions	<ul style="list-style-type: none"> <li>• The Doctor is logged in to their account.</li> <li>• The Doctor has access to their personal schedule calendar.</li> </ul>
Postcondition	<ul style="list-style-type: none"> <li>• The Doctor's schedule calendar is synchronized with the system's appointment scheduling feature.</li> </ul>
Normal Flow	<ol style="list-style-type: none"> <li>1. The Doctor navigates to the "Coordinate Schedule Calendar" feature on the system.</li> <li>2. The system displays the Doctor's personal schedule calendar.</li> <li>3. The Doctor selects the date range they want to synchronize with the system's appointment scheduling feature.</li> <li>4. The Doctor confirms their selection.</li> <li>5. The system synchronizes the selected dates with the available appointment slots.</li> <li>6. The Doctor reviews the synchronized appointments and confirms that the appointments are accurate and match their personal schedule.</li> </ol>
Alternative Flows	If the Doctor encounters an error while synchronizing their calendar with the system, the system will display an error message with steps to resolve the issue. The Doctor will follow the steps provided by the system to resolve the issue and repeat the Normal Flow.

Use Case UC-9	Determine available times for appointments
Initiating Actor	Doctor
Actor's Goal	To determine available times for appointments.
Participating Actors	<ul style="list-style-type: none"> <li>• Doctor</li> </ul>
Preconditions	<ul style="list-style-type: none"> <li>• The Doctor actor must be logged into the system.</li> <li>• The Doctor actor must have access to their schedule.</li> </ul>
Postcondition	<ul style="list-style-type: none"> <li>• The Doctor actor has determined their available times for appointments and these times have been updated in the system.</li> </ul>
Normal Flow	<ol style="list-style-type: none"> <li>1. The Doctor actor navigates to their schedule.</li> <li>2. The Doctor actor reviews their existing appointments and commitments.</li> <li>3. The Doctor actor blocks off any times they are unavailable for appointments.</li> <li>4. The Doctor actor identifies the times they are available for appointments.</li> <li>5. The Doctor actor adds these available times to the appointment scheduling system.</li> <li>6. The system updates with the new available times for appointments.</li> </ol>
Alternative Flows	<p>3a. If the Doctor actor has existing commitments that can't be rescheduled:</p> <ol style="list-style-type: none"> <li>1. The Doctor actor identifies the unavailable time slot for the appointments.</li> <li>2. The Doctor actor blocks off that time slot for appointments.</li> <li>3. The Doctor actor continues to identify available time slots for appointments. 4a. If the Doctor actor does not have any available times for appointments:</li> <li>4. The Doctor actor chooses to cancel any existing appointments or commitments to create available times.</li> <li>5. The Doctor actor blocks off any other unavailable time slots.</li> <li>6. The Doctor actor identifies available times for appointments.</li> <li>7. The Doctor actor adds these available times to the appointment scheduling system.</li> </ol>

Use Case UC-10	Reserve Equipment and Rooms
Initiating Actor	Doctor
Actor's Goal	The goal of the Doctor actor is to reserve a room and/or equipment for a specific medical procedure or examination.



Participating Actors	<ul style="list-style-type: none"> <li>• Doctor</li> </ul>
Preconditions	<ul style="list-style-type: none"> <li>• The Doctor actor must be authenticated and authorized to access the system.</li> <li>• The Doctor actor must have identified the specific medical procedure or examination that requires a room and/or equipment reservation.</li> </ul>
Postcondition	<ul style="list-style-type: none"> <li>• A room and/or equipment is reserved for the specified medical procedure or examination.</li> <li>• The system updates the availability status of the reserved room and/or equipment.</li> </ul>
Normal Flow	<ol style="list-style-type: none"> <li>1. The Doctor actor accesses the "Reserve Equipment and Rooms" use case in the appointment system.</li> <li>2. The system presents the Doctor actor with a list of available rooms and equipment.</li> <li>3. The Doctor actor selects the required room and/or equipment.</li> <li>4. The Doctor actor specifies the date and time for the reservation.</li> <li>5. The Doctor actor confirms the reservation.</li> <li>6. The system updates the availability status of the reserved room and/or equipment.</li> </ol>
Alternative Flows	<ol style="list-style-type: none"> <li>1. If the required room and/or equipment is not available for the specified date and time, the system notifies the Doctor actor and presents alternative options.</li> <li>2. If the Doctor actor decides to change the reservation, the system allows the Doctor actor to modify or cancel the reservation.</li> <li>3. If the Doctor actor cancels the reservation, the system updates the availability status of the room and/or equipment.</li> </ol>

Use Case UC-11	Alert Patient in case of an earlier time slot
Initiating Actor	Doctor
Actor's Goal	The goal of the Doctor actor is to notify the patient of an earlier available time slot for their scheduled appointment.
Participating Actors	<ul style="list-style-type: none"> <li>• Doctor</li> <li>• Patient</li> </ul>
Preconditions	<ul style="list-style-type: none"> <li>• The Doctor actor must be authenticated and authorized to access the system.</li> <li>• The Patient actor must have an existing appointment scheduled in the system.</li> </ul>

	<ul style="list-style-type: none"> <li>There must be an available earlier time slot for the Patient actor's appointment.</li> </ul>
Postcondition	<ul style="list-style-type: none"> <li>The Patient actor is notified of the available earlier time slot.</li> <li>The Patient actor confirms or declines the new appointment time.</li> </ul>
Normal Flow	<ol style="list-style-type: none"> <li>The Doctor actor accesses the "Alert Patient in case of an earlier time slot" use case in the appointment system.</li> <li>The system displays a list of appointments with available earlier time slots.</li> <li>The Doctor actor selects the Patient actor's appointment from the list.</li> <li>The system displays the available earlier time slot(s) for the appointment.</li> <li>The Doctor actor selects the preferred earlier time slot.</li> <li>The system sends an alert to the Patient actor notifying them of the available earlier time slot and providing them with the option to confirm or decline the new appointment time.</li> <li>The Patient actor confirms or declines the new appointment time.</li> <li>The system updates the appointment schedule accordingly.</li> </ol>
Alternative Flows	<ol style="list-style-type: none"> <li>If there are no available earlier time slots for the Patient actor's appointment, the system notifies the Doctor actor, and no action is taken.</li> <li>If the Patient actor declines the new appointment time, the system retains the original appointment schedule.</li> <li>If the Patient actor does not respond to the alert within a specified time frame, the system assumes that they declined the new appointment time and retains the original appointment schedule.</li> </ol>

Use Case UC-12	Book Appointment
Extension Use Case	Choose Alternative Payment Method
Initiating Actor	Patient
Actor's Goal	To book an appointment with a doctor.
Participating Actors	<ul style="list-style-type: none"> <li>Patient</li> </ul>
Preconditions	<ul style="list-style-type: none"> <li>The Patient actor must be authenticated and authorized to access the system.</li> <li>The Patient actor must have selected a doctor they wish to make an appointment with.</li> <li>The doctor must have availability at the requested date and time.</li> </ul>

Postcondition	<ul style="list-style-type: none"> <li>• The appointment is booked with the selected doctor.</li> <li>• The system updates the doctor's schedule with the new appointment.</li> </ul>
Normal Flow	<ol style="list-style-type: none"> <li>1. The Patient actor accesses the "Book Appointment" use case in the appointment system.</li> <li>2. The system displays a list of available doctors.</li> <li>3. The Patient actor selects the desired doctor.</li> <li>4. The system displays the doctor's availability schedule.</li> <li>5. The Patient actor selects a preferred date and time from the available options.</li> <li>6. The system displays a confirmation of the selected appointment details.</li> <li>7. The Patient actor confirms the appointment.</li> <li>8. The system books the appointment with the selected doctor and updates the doctor's schedule with the new appointment.</li> </ol>
Alternative Flows	<ol style="list-style-type: none"> <li>1. If the Patient actor is booking the appointment over the phone or in person with a Receptionist, the Receptionist inputs the appointment details into the system.</li> <li>2. If the selected doctor is not available at the requested date and time, the system presents alternative options to the Patient actor.</li> <li>3. If the Patient actor decides to cancel the appointment, the system cancels the appointment and updates the doctor's schedule accordingly.</li> </ol>

Use Case UC-13	Choose Alternative Payment Method
Initiating Actor	Patient
Actor's Goal	To choose an alternative payment method for appointment booking.
Participating Actors	<ul style="list-style-type: none"> <li>• Patient</li> </ul>
Preconditions	<ul style="list-style-type: none"> <li>• The Patient actor has initiated the "Book Appointment" use case.</li> <li>• The Patient actor has selected an appointment date and time with a doctor.</li> <li>• The Patient actor has previously provided payment information or selected a default payment method in their account.</li> </ul>
Postcondition	<ul style="list-style-type: none"> <li>• The selected alternative payment method is processed and confirmed.</li> <li>• The appointment booking is confirmed and updated in the system.</li> </ul>

Normal Flow	<ol style="list-style-type: none"> <li>1. After selecting an appointment date and time with a doctor in the "Book Appointment" use case, the Patient actor chooses the "Choose Alternative Payment Method" extension point.</li> <li>2. The system presents a list of available alternative payment methods, such as PayPal or Google Pay.</li> <li>3. The Patient actor selects a preferred alternative payment method.</li> <li>4. The system redirects the Patient actor to the selected payment gateway's website or app.</li> <li>5. The Patient actor logs into their account on the payment gateway or provides necessary payment information.</li> <li>6. The payment is processed and confirmed by the payment gateway.</li> <li>7. The system confirms the appointment booking and updates the appointment schedule in the system.</li> <li>8. The Patient actor receives a confirmation of their appointment and payment.</li> </ol>
Alternative Flows	<ol style="list-style-type: none"> <li>1. If the selected alternative payment method is not valid or accepted by the system or payment gateway, the system notifies the Patient actor and allows them to choose a different alternative payment method or default payment method.</li> <li>2. If the payment is not confirmed or there is an error during the payment process, the system allows the Patient actor to try again or choose a different payment method.</li> <li>3. If the Patient actor cancels the payment or appointment booking, the system cancels the appointment booking and updates the appointment schedule in the system.</li> </ol>