

# AMMAN ARAB UNIVERSITY

جامعة عمان العربية

College of Information Technology

كلية تكنولوجيا المعلومات



## Dental clinic

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## **Abstract**

The system in the project is a digital solution that helps the clinic manage its work more easily and efficiently. It allows patients to book appointments online by choosing a suitable time from the available slots. Once the appointment is confirmed, it is automatically added to the clinic's schedule, and the system sends reminders to patients through SMS or email to make sure they don't forget their appointments. This makes the process faster and reduces the workload on the clinic staff.

When a patient visits the clinic, the dentist can quickly access their medical records through the system. These records include information like previous treatments, allergies, and current medications, which helps the dentist decide on the best treatment. During the visit, the dentist can also document the treatment details in real-time, either by typing or using voice-to-text. This ensures that all information is saved accurately and updated immediately.

The system also helps patients and the clinic in other ways. Dentists can create a treatment plan and show the patient an estimated cost before starting, so they can make decisions based on their budget. After treatment, patients can log in to a secure portal to see their medical history and upcoming appointments. Additionally, the clinic manager can use the system to create reports that show the clinic's performance, like how many appointments were made or the revenue earned, to improve the overall service.

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# CHAPTER 1

## THE SYSTEM

### 1.1 Overview

The system is a clinic management platform designed to simplify and enhance the clinic's daily operations. It focuses on improving patient experience, optimizing staff workflow, and ensuring accurate record-keeping. By integrating features like online booking, automated reminders, and real-time documentation, the system ensures efficiency and better healthcare delivery.

### 1.2 System Description

The system allows patients to book appointments online, while the clinic staff can access schedules and patient records instantly. Dentists use the system to view medical histories, document treatments, and provide cost estimates for procedures. The platform also includes a secure portal for patients to review their medical records and reports, along with tools for clinic managers to generate performance insights and reports.

### 1.3 Functional Requirements

- **Appointment Scheduling:** Patients can book appointments through an online portal, and the system integrates them into the clinic's schedule.
- **Patient Records Management:** Dentists can access and update medical records, including past treatments and allergies.
- **Treatment Documentation:** Real-time documentation of procedures using manual or voice-to-text entry.
- **Cost Estimation:** Generate and display estimated costs for treatments.
- **Notification System:** Automatic reminders sent to patients via SMS or email.
- **Reporting and Analytics:** Generate reports on appointments, treatments, and revenue.
- **Patient Portal:** Provide patients access to their records and appointment history through a secure platform.

## 1.4 Non-Functional Requirements

- **Usability:** The system must be easy to use for patients and clinic staff with minimal training.
- **Security:** Patient data must be encrypted and protected against unauthorized access.
- **Scalability:** The system should handle an increasing number of patients and appointments as the clinic grows.
- **Performance:** The system should respond quickly, with minimal delays during booking, data retrieval, or report generation.
- **Availability:** The platform must be available 24/7 to ensure continuous access for patients and staff.

# CHAPTER 2

## SYSTEM ANALYSIS

### 2.1 Overview

This section focuses on the design and modeling of the clinic management system, detailing how the system interacts with users and represents its components. It includes use case modeling to illustrate system functionality, as well as domain class modeling to represent the structure and relationships of system elements.

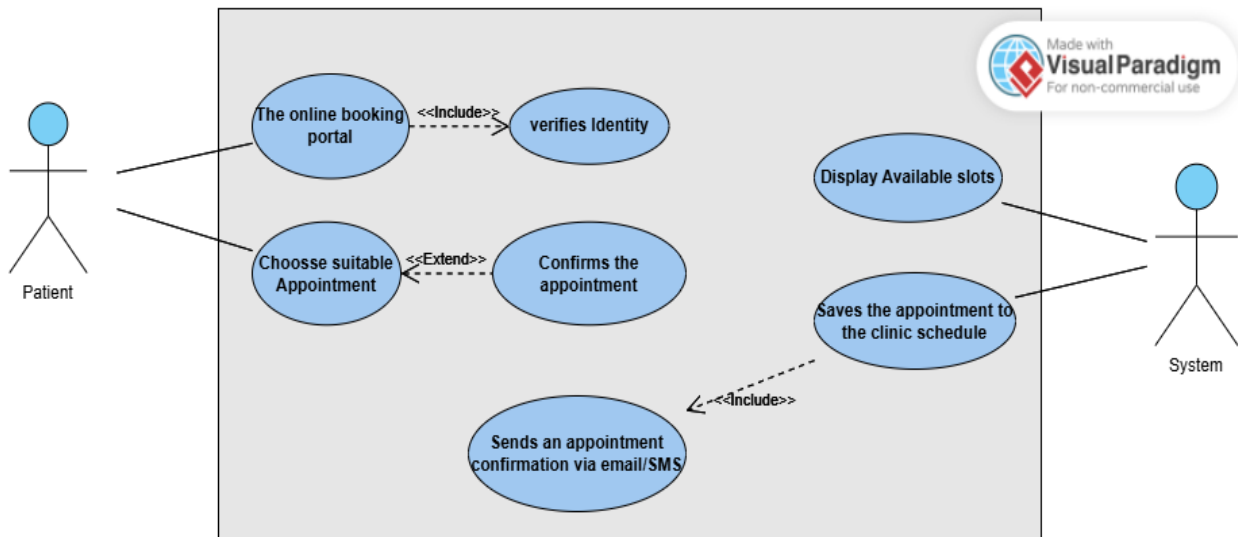
### 2.2 Use Case Modelling

#### 1. Online Appointment Booking

**Actor:** Patient

**System:** Appointment Scheduling System

Actor Actions	System Actions
1. Patient accesses the online booking portal	2. System verifies the patient's identity
3. Patient chooses a suitable appointment	4. System displays available slots
5. Patient confirms the appointment	6. System saves the appointment to the clinic's schedule
7. Patient receives confirmation notification	8. System sends an appointment confirmation via email/SMS



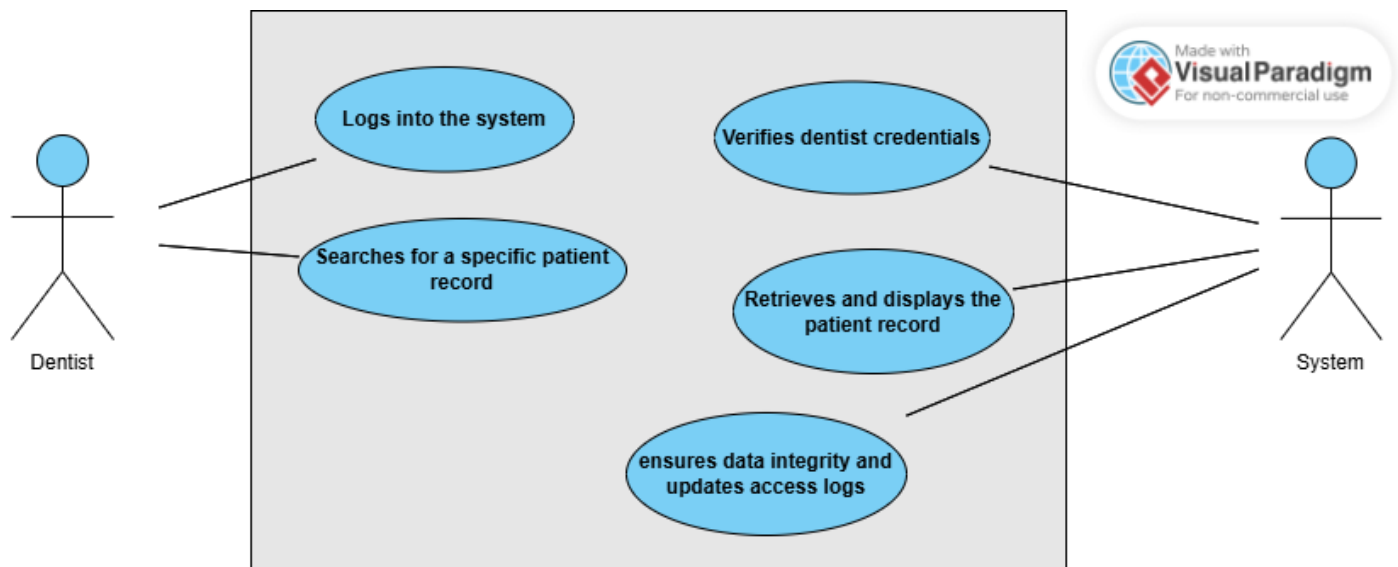
**Description:** The patient uses the online booking portal to schedule an appointment. The system displays available time slots based on the clinic's schedule. The patient selects a suitable slot, confirms the booking, and receives a confirmation notification via email or SMS.

## 2. Patient Records Access for Dentist

**Actor:** Dentist

**System:** Patient Records Management System

Actor Actions	System Actions
1. Dentist logs into the system 3. Dentist searches for a specific patient record 5. Dentist reviews medical history and allergies	2. System verifies dentist credentials 4. System retrieves and displays the patient record 6. System ensures data integrity and updates access logs



**Description:** The dentist uses the system to access a patient's medical records. The system retrieves and displays details such as previous treatments, allergies, and current medications, enabling the dentist to make informed decisions about treatment.

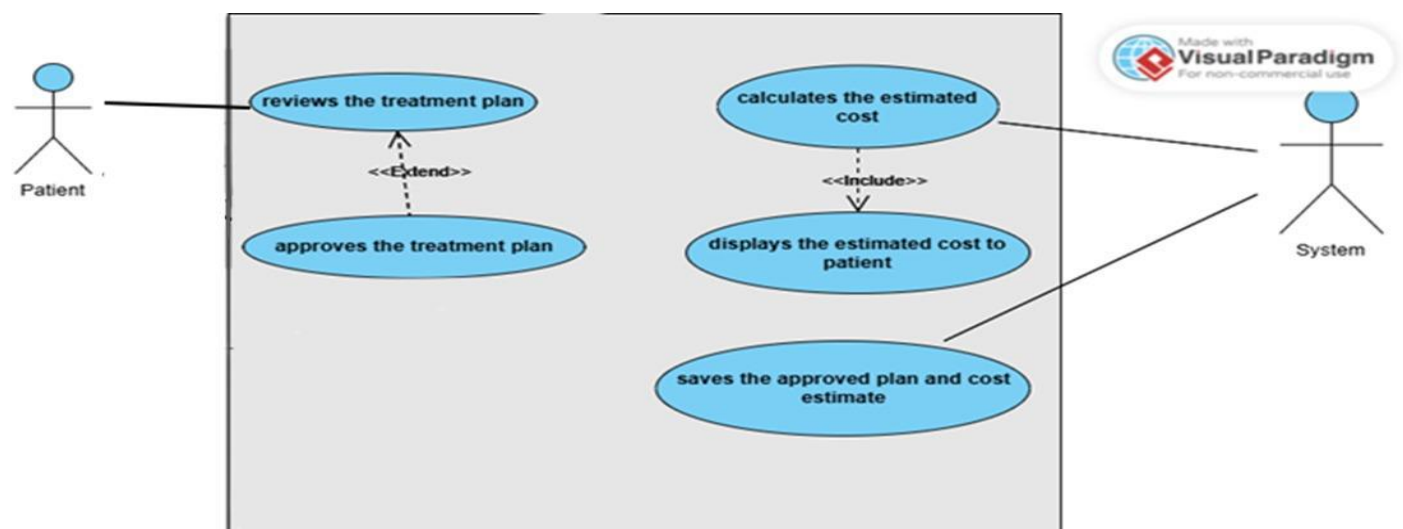
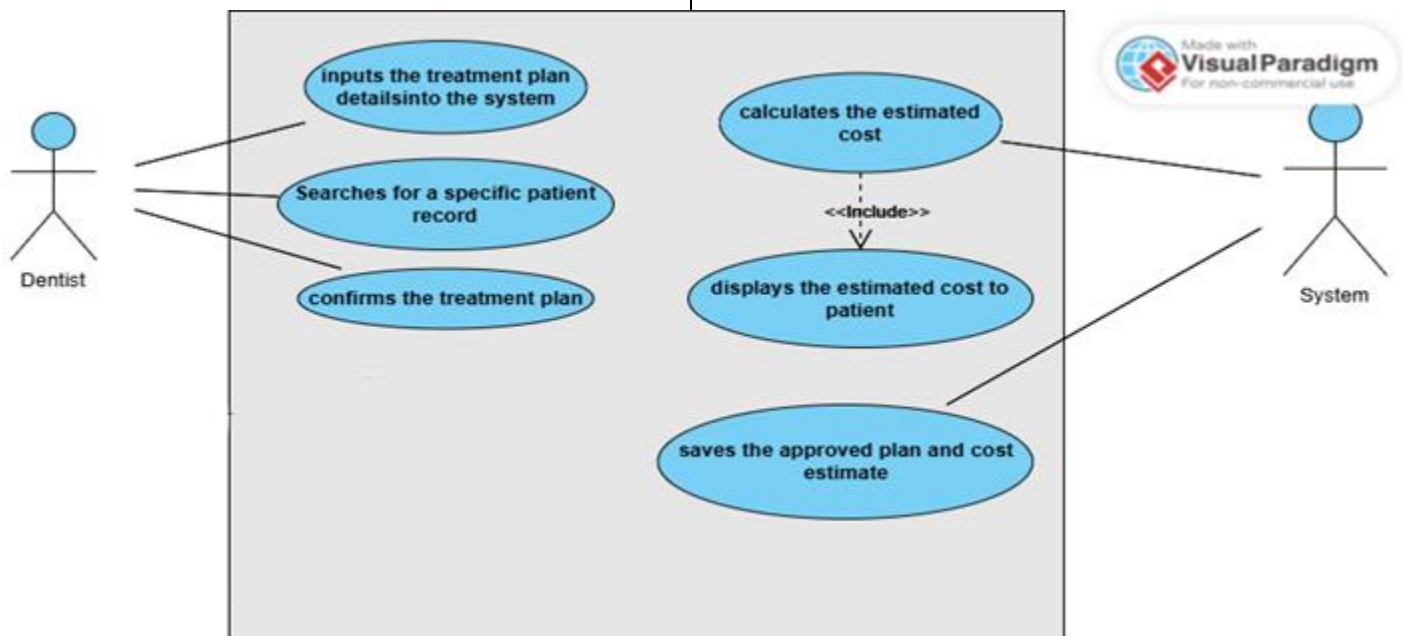


### 3. Treatment Cost Estimation

**Actor:** Dentist, Patient

**System:** Billing and Treatment Estimation System

Actor Actions	System Actions
1. Dentist inputs the treatment plan details 3. System displays the estimated cost to patient 5. Dentist confirms the treatment plan	2. System calculates the estimated cost 4. Patient reviews and approves the treatment plan 6. System saves the approved plan and cost estimate



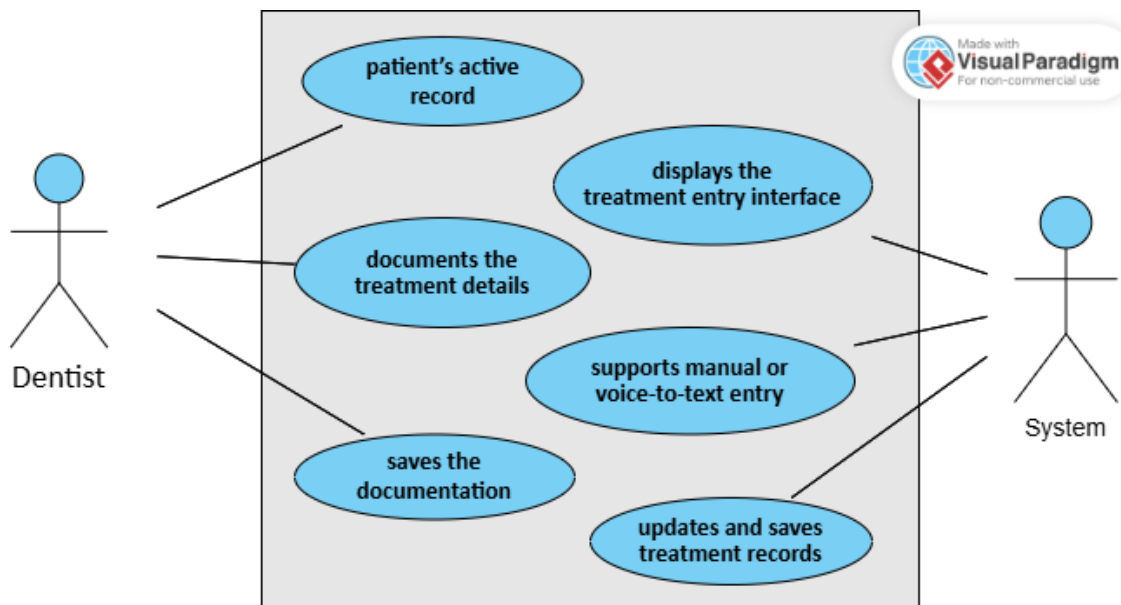
**Description:** The dentist inputs the treatment plan into the system, which calculates and displays an estimated cost. The patient reviews the estimate to make an informed decision about proceeding with the treatment.

#### 4. Treatment Documentation

**Actor:** Dentist

**System:** Treatment Documentation System

Actor Actions	System Actions
1. Dentist opens patient's active record	2. System displays the treatment entry interface
3. Dentist documents the treatment details	4. System supports manual or voice-to-text entry
5. Dentist saves the documentation	6. System updates and saves treatment records



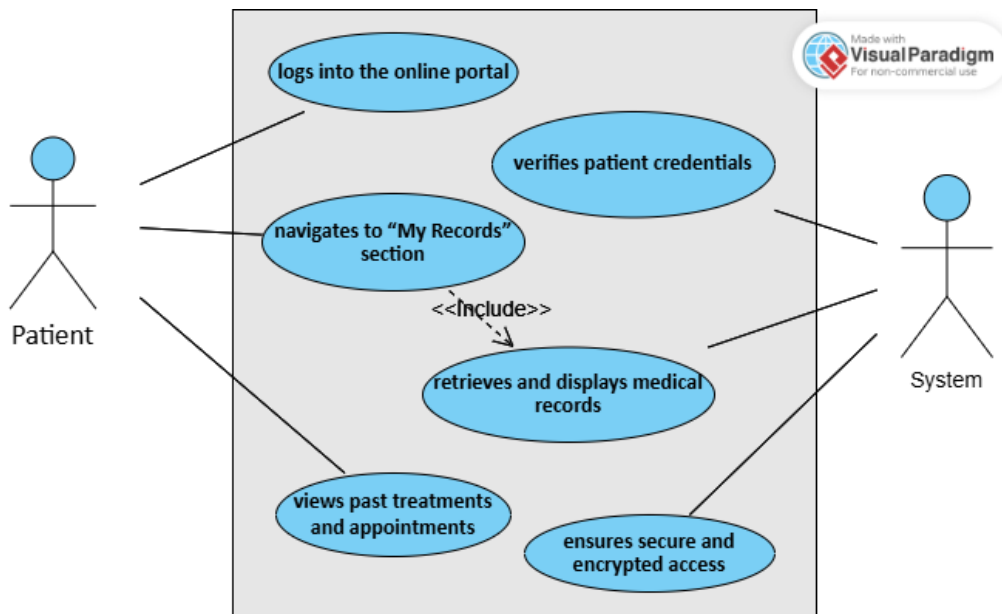
**Description:** During a patient's visit, the dentist documents the treatment details in the system in real-time. The system allows the dentist to enter data manually or use voice-to-text functionality, ensuring accurate and efficient record-keeping.

## 5. Access Patient Portal

**Actor:** Patient

**System:** Patient Portal System

Actor Actions	System Actions
1. Patient logs into the online portal 3. Patient navigates to “My Records” section 5. Patient views past treatments and appointments	2. System verifies patient credentials 4. System retrieves and displays medical records 6. System ensures secure and encrypted access



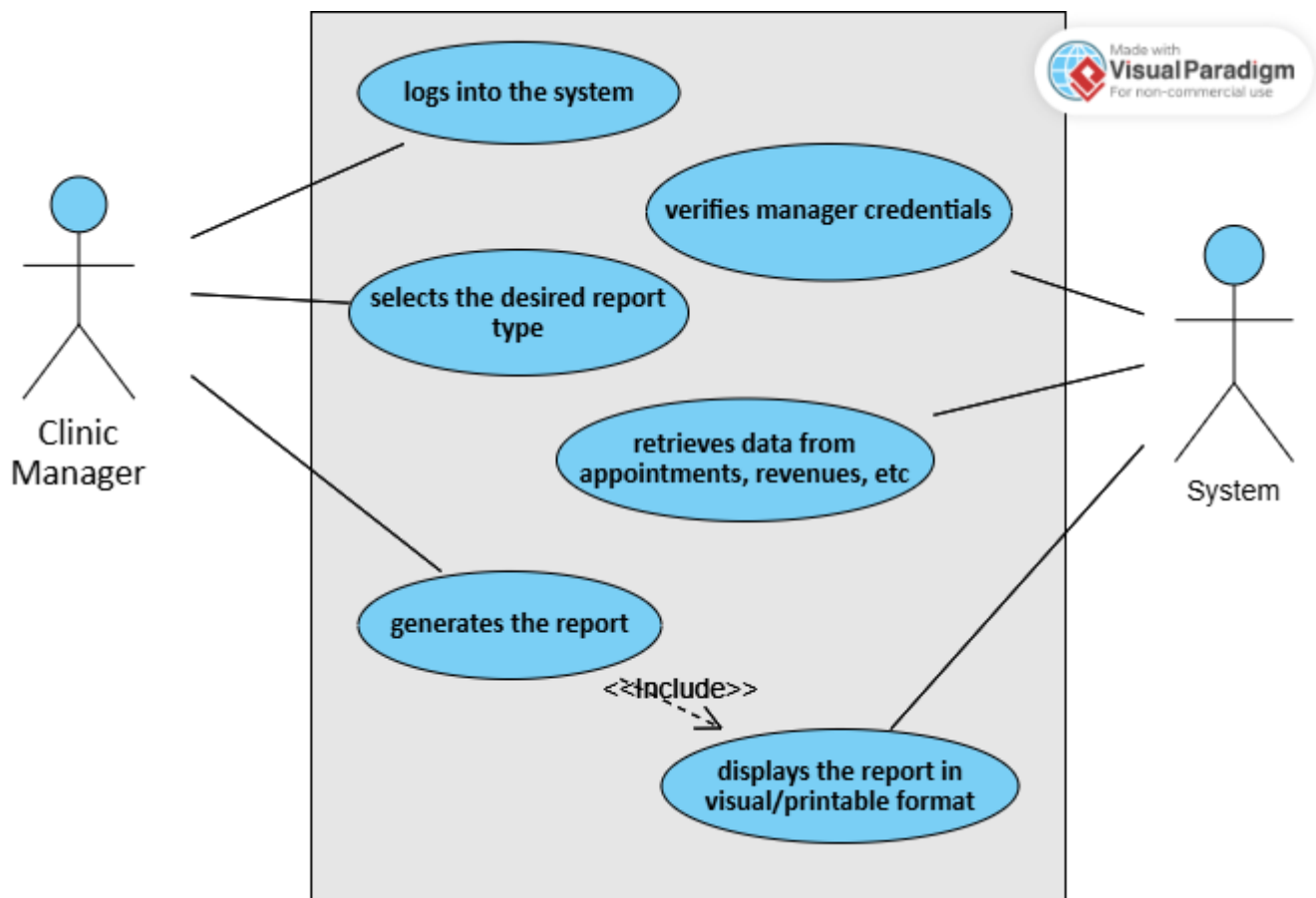
**Description:** After treatment, the patient logs into a secure online portal to view their medical records, upcoming appointments, and treatment history. The system ensures secure access and provides an easy-to-navigate interface for patients to monitor their health.

## 6. Generate Reports on Clinic Performance

**Actor:** Clinic Manager

**System:** Reporting and Analytics System

Actor Actions	System Actions
1. Clinic manager logs into the system 3. Manager selects the desired report type 5. Manager generates the report	2. System verifies manager credentials 4. System retrieves data from appointments, revenues, etc. 6. System displays the report in visual/printable format



**Description:** The clinic manager uses the system to generate reports on clinic performance, including appointment statistics, revenue, and treatment types. The reports help in analyzing operations and making strategic decisions to improve efficiency.

## 2.3 Domain Class Modeling

### 2.3.1 Classes, Attributes, and Associations

### 2.3.2 Domain Class Diagram

#### **Patient**

##### **Attributes:**

patientID

name

contactInfo

medicalHistory

#### **Appointment**

##### **Attributes:**

appointmentID

date

time

status

#### **Dentist**

##### **Attributes:**

dentistID

name

specialization

availability

#### **Clinic**

##### **Attributes:**

clinicID

name

location

contactInfo

#### **ClinicManager**

##### **Attributes:**

managerID  
name  
contactInfo  
role

## **Report**

### **Attributes:**

reportID  
type  
generationDate  
content  
Associations

### **Clinic → Patient:**

A clinic can have multiple patients (1..\*).

Each patient belongs to one clinic (1).

### **Clinic → Dentist:**

A clinic can have multiple dentists (1..\*).

Each dentist works in one clinic (1).

### **Clinic → ClinicManager:**

Each clinic has one clinic manager (1).

Each clinic manager is responsible for one clinic (1).

### **Patient → Appointment:**

A patient can have multiple appointments (1..\*).

Each appointment is linked to one patient (1).

### **Appointment → Dentist:**

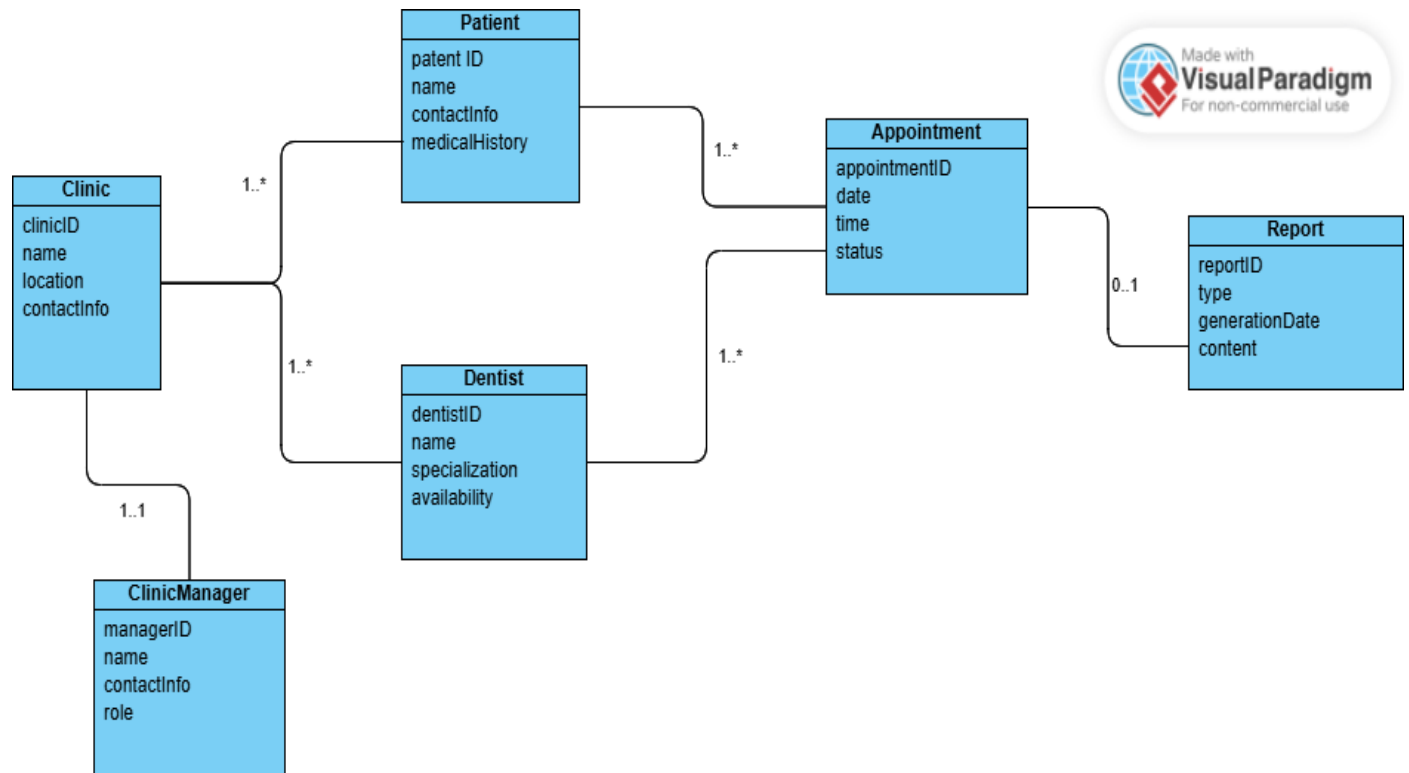
Each appointment is associated with one dentist (1).

A dentist can have multiple appointments (1..\*).

### **Appointment → Report:**

A report is optionally generated for an appointment (0..1).

Each report is linked to one appointment.

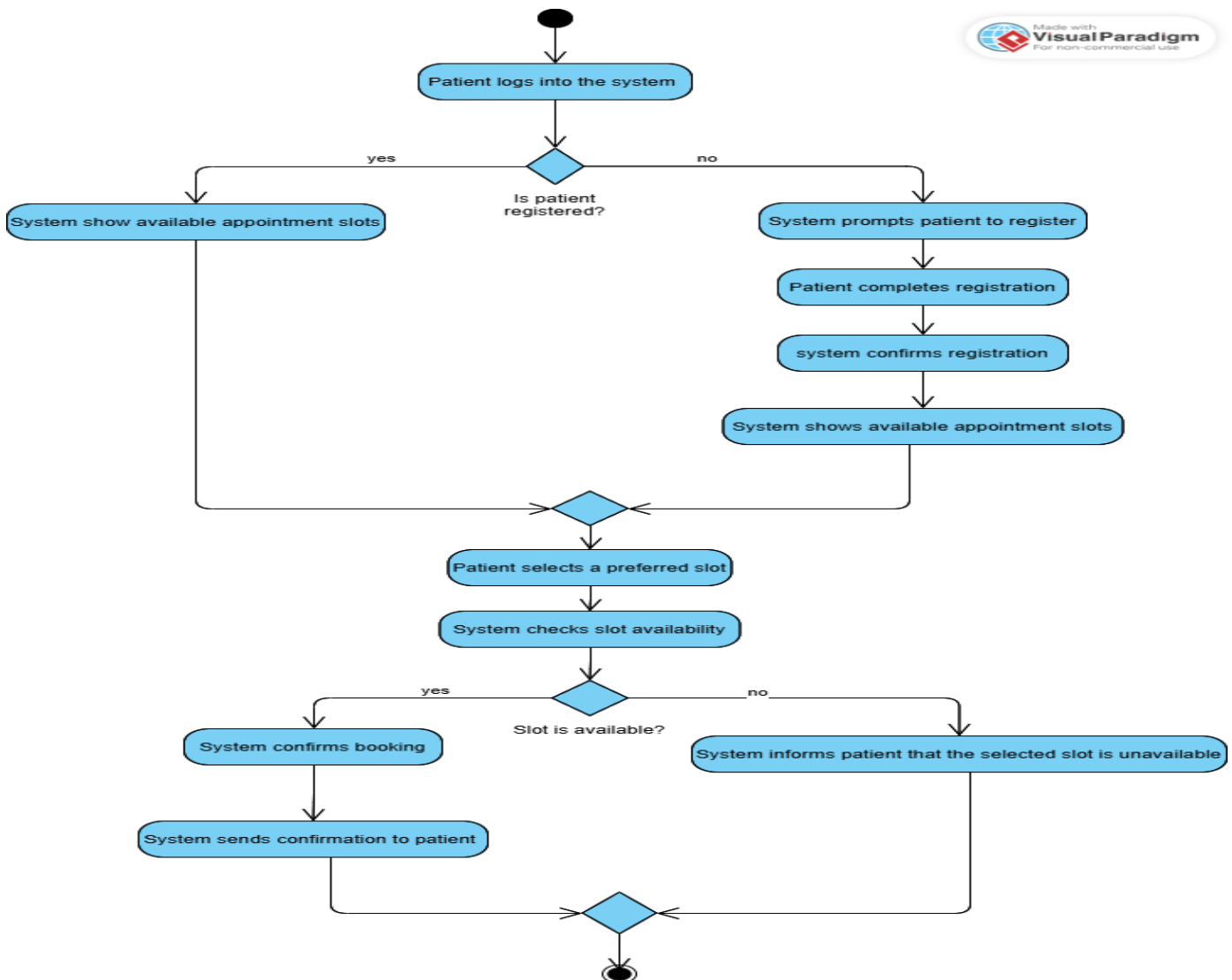


# CHAPTER 3

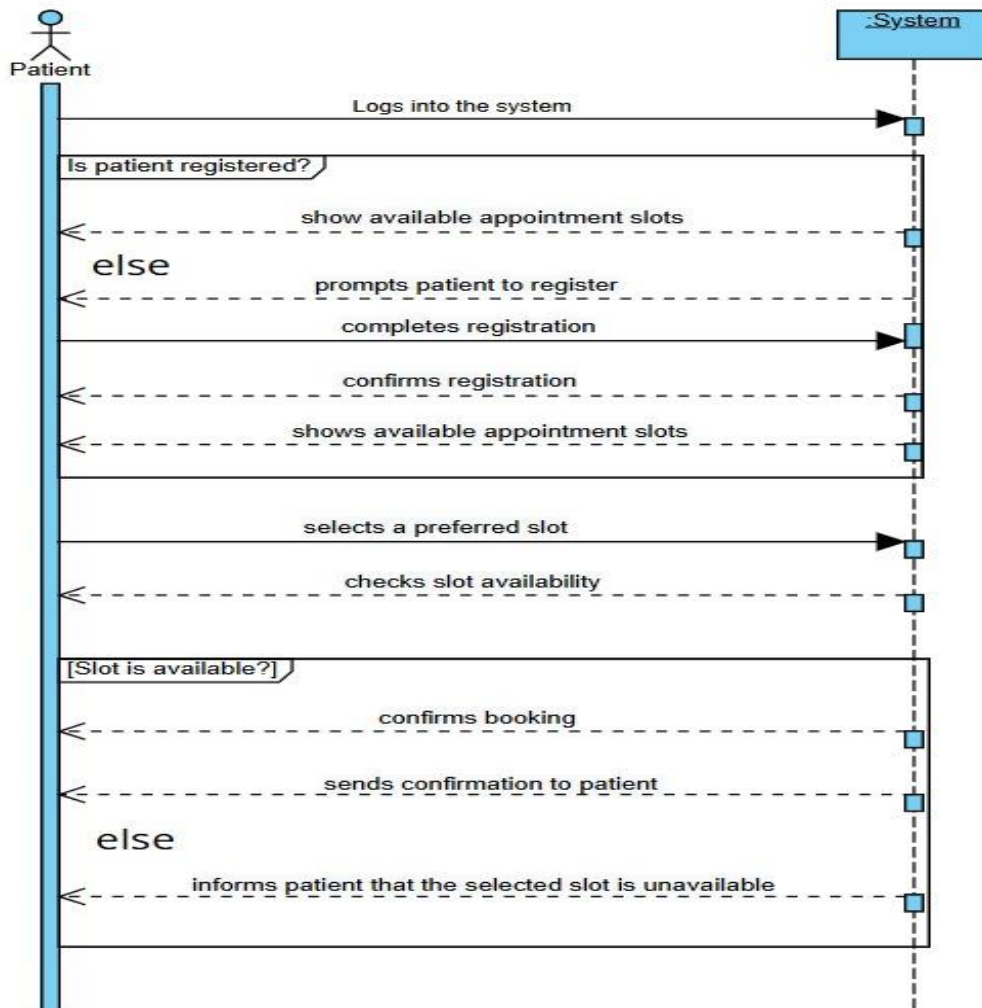
## SYSTEM DESIGN

- 3.1 Activity Diagrams
- 3.2 System Sequence Diagrams
- 3.3 Design Class Diagram

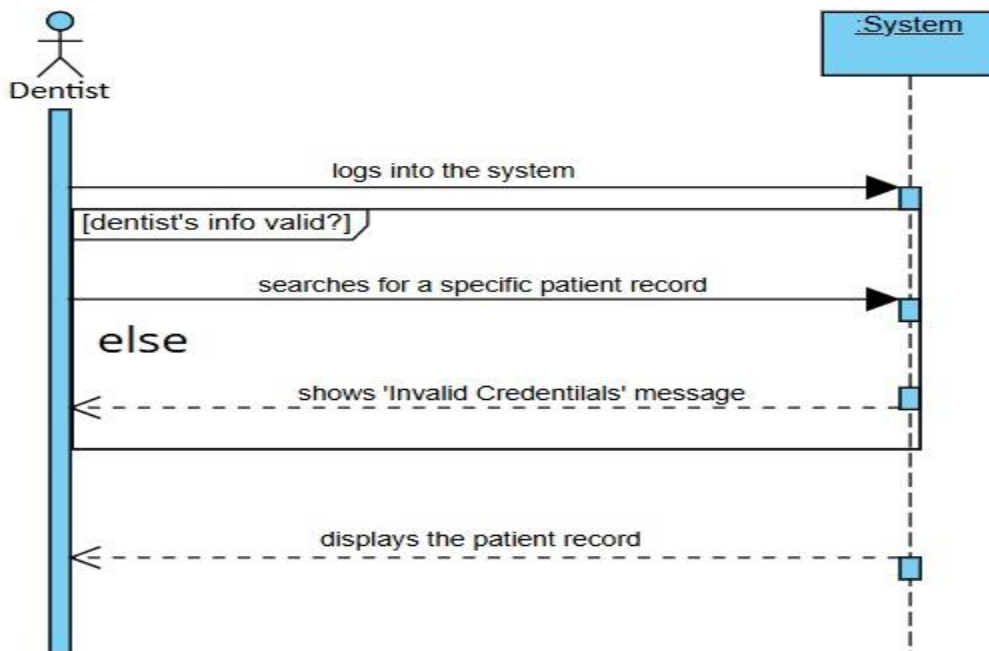
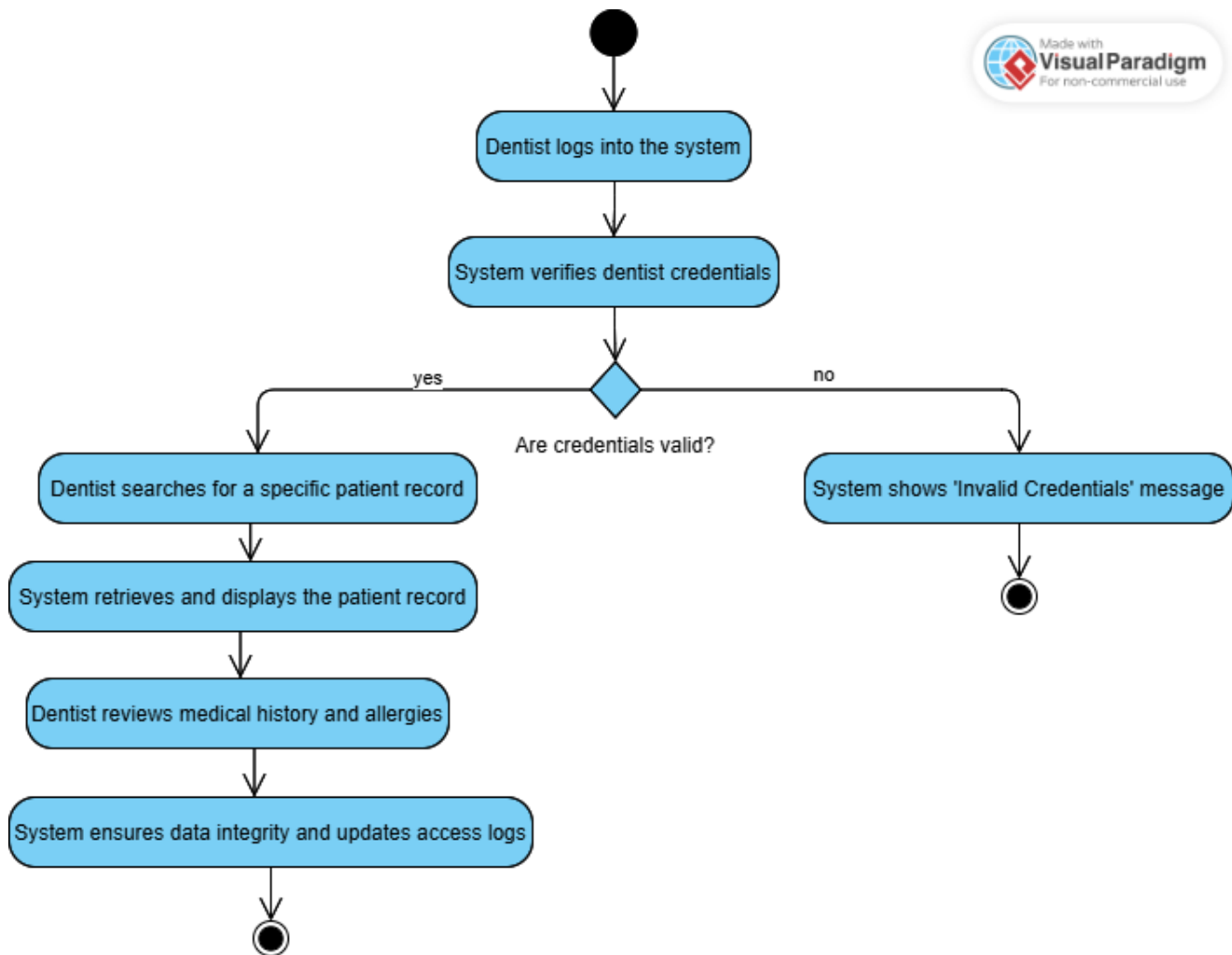
### 1. Online Appointment Booking



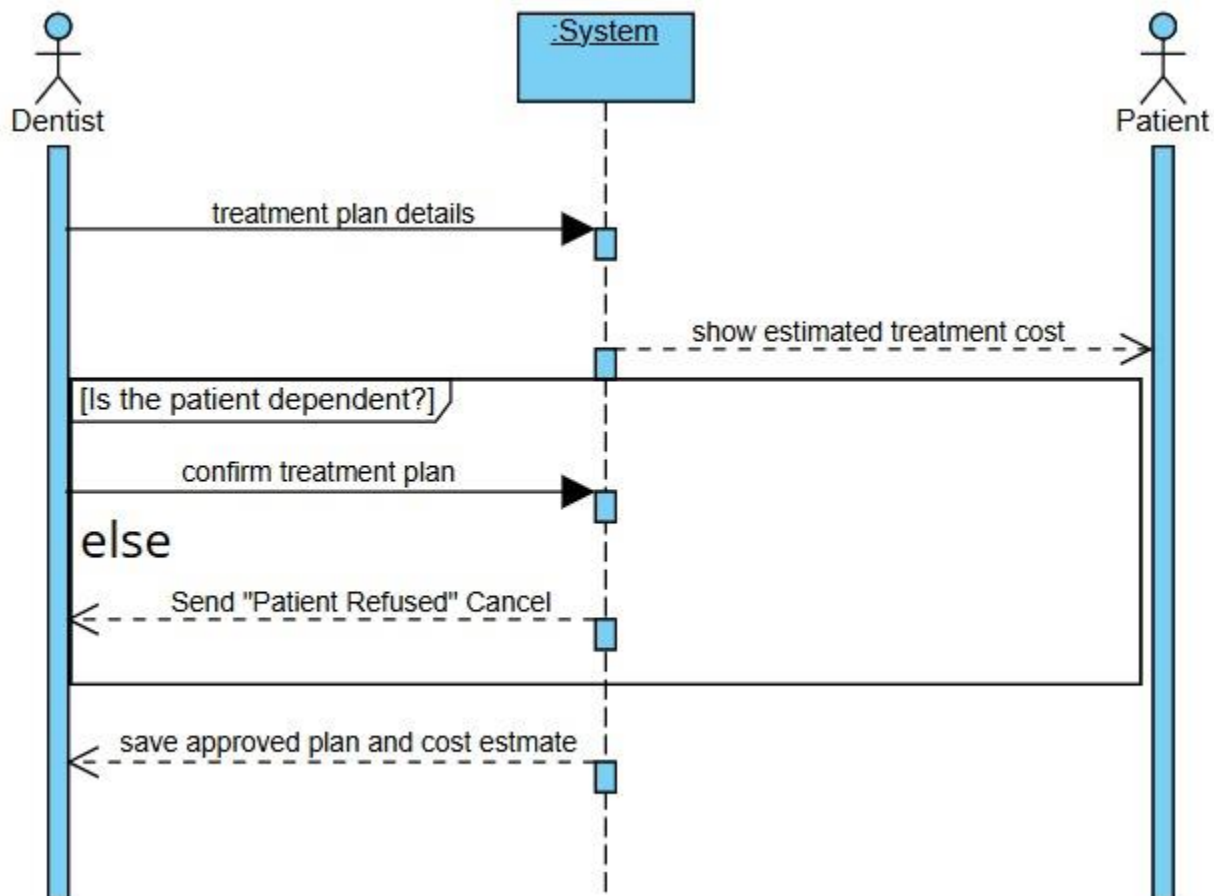
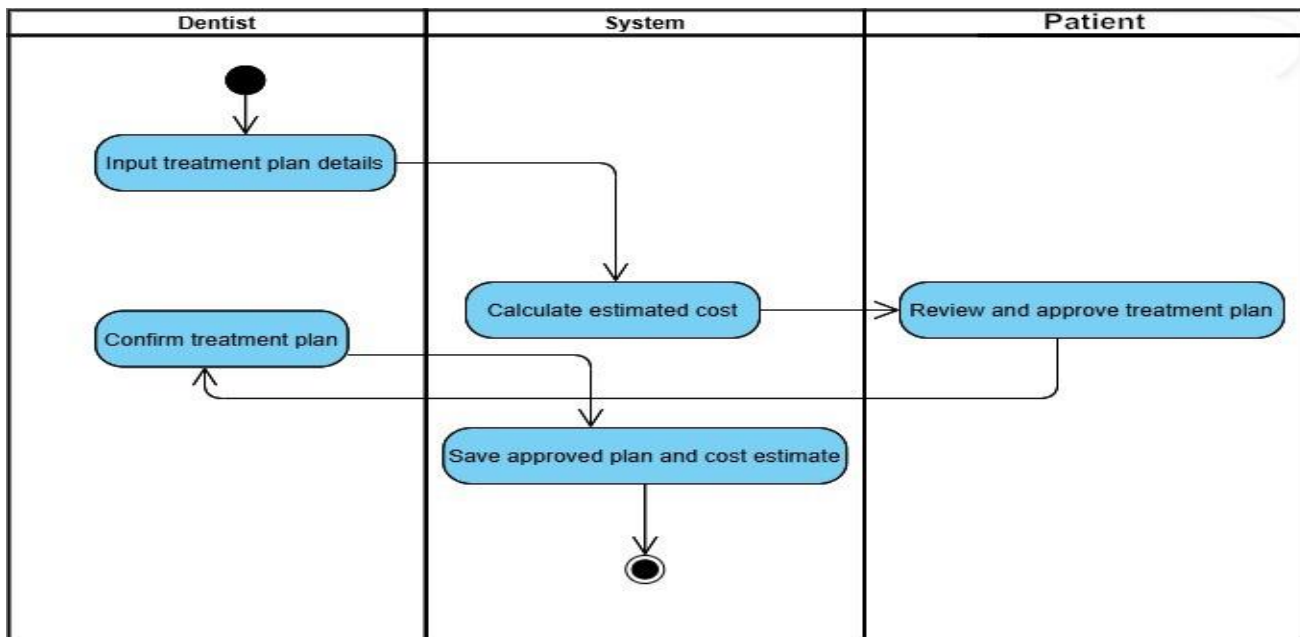




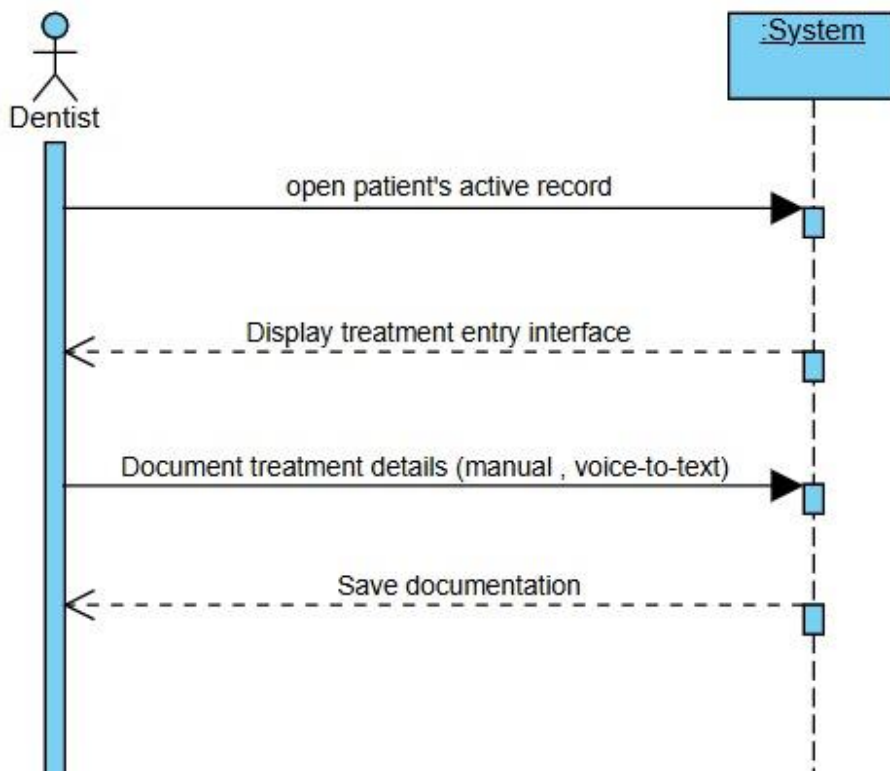
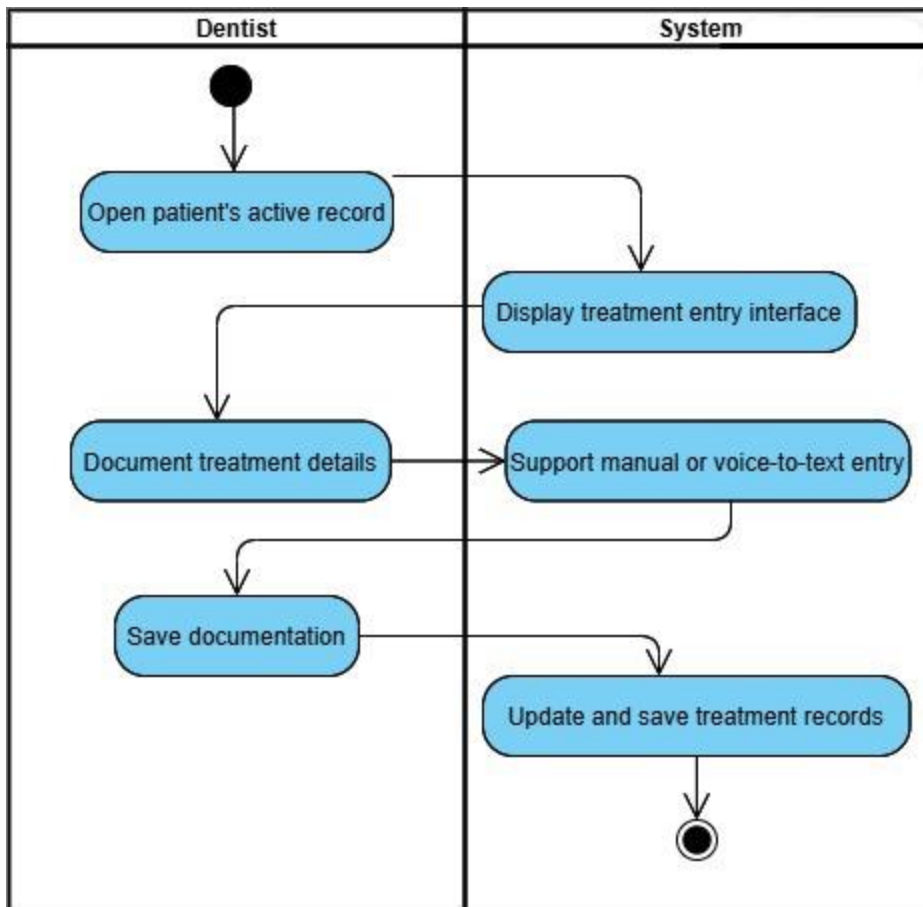
## 2. Patient Records Access for Dentist



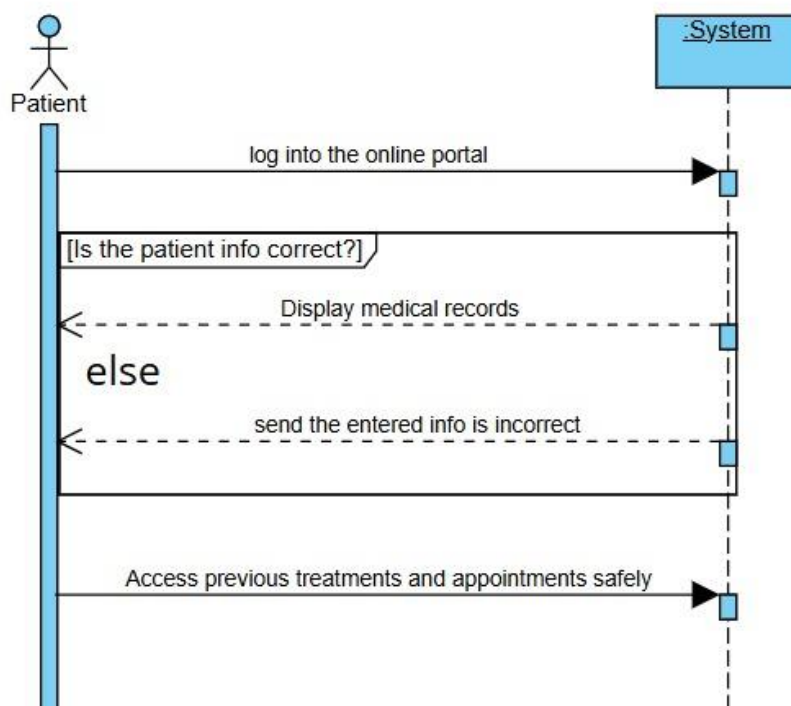
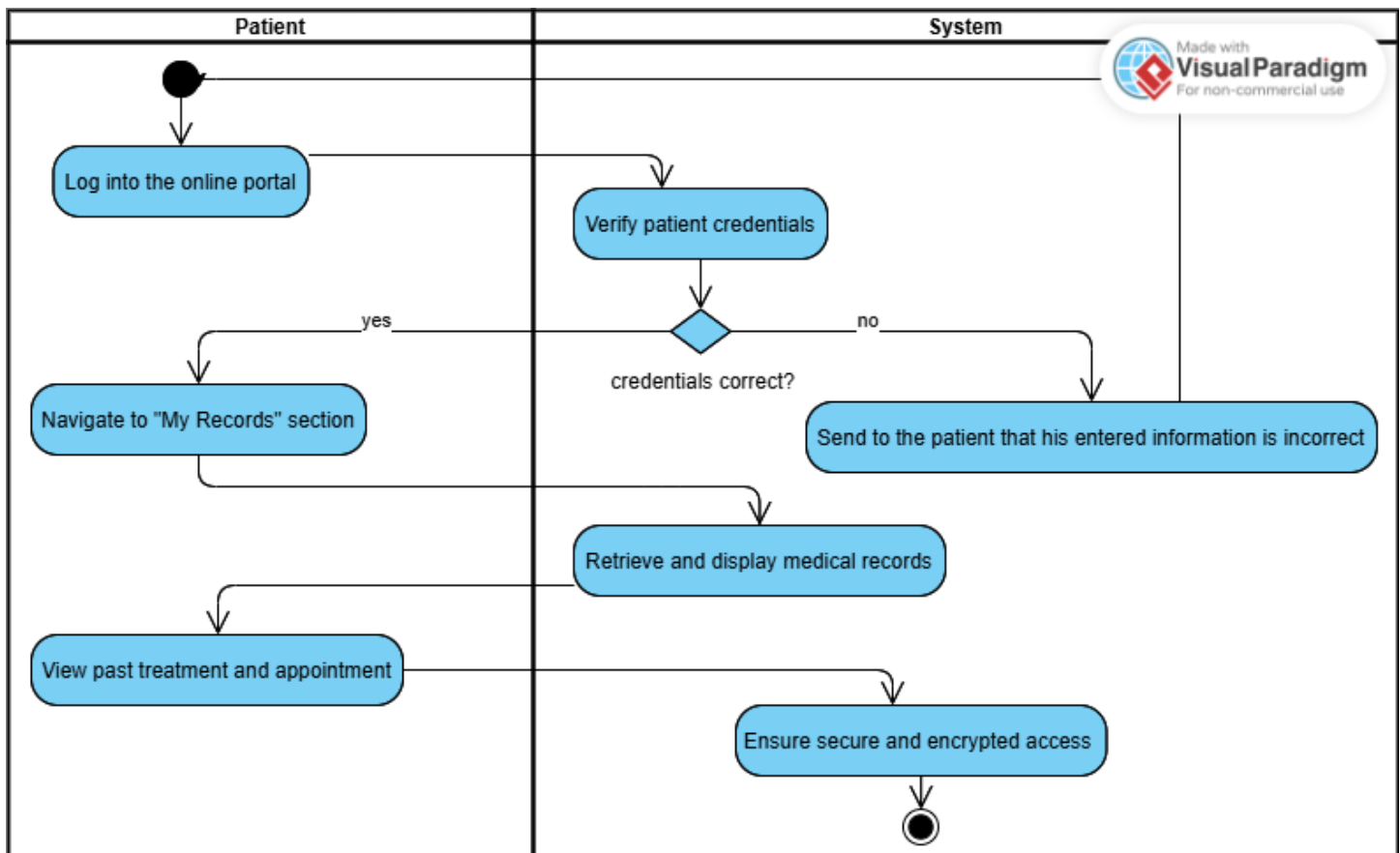
### 3. Treatment Cost Estimation



#### 4. Treatment Documentation



## 5. Access Patient Portal



## 6. Generate Reports on Clinic Performance

