



**UNIVERSITETI<sup>®</sup>  
METROPOLITAN  
TIRANA**

**REPUBLIC OF ALBANIA**

**FACULTY OF COMPUTER SCIENCES AND IT  
SOFTWARE ENGINEERING PROGRAM  
SOFTWARE ANALYSIS AND DESIGN COURSE**

**ALKET SULA  
ALBAN HYSAJ  
ALBA GJINI**

**DENTO MANAGEMENT SYSTEM**

**TIRANA 03.02.2023**

**Copyright © 2023 [DENTO MANAGEMET SYSTEM]. All rights reserved. This management dentistry system and its contents are protected by copyright and other intellectual property laws. The system may only be used for personal and non-commercial purposes. Reproduction, distribution, modification, public display, or creation of derivative works from the system is strictly prohibited without the prior written consent of [DENTO MANAGEMENT SYSTEM].**

## **Table of Contents**

1. Product Description.....	Pg.6
2. Product Features.....	Pg.6-7

### **FUNCTIONAL REQUIREMENTS**

3. User Requirements.....	Pg.7-8
4. Use Cases .....	Pg. 10-11
5. Constrains.....	Pg. 12
6. Dependencies .....	Pg.13
7. Functional Requirements.....	Pg.13-14

### **NON-FUNCTIONAL REUQUIREMENTS**

8. Non-functional Requirements for User Interface.....	Pg. 16
9. Security Non-Functional Requirements.....	Pg. 16
10.Organizational Non-Functional Requirements.....	Pg. 16
11.Domain Requirements .....	Pg.17
12.Legislative Requirement .....	Pg.17
13.Extended User Cases/Stories .....	Pg. 17-21

### **DIAGRAMS**

14.User Case Diagram .....	Pg.23
15.Behavioral Diagrams .....	Pg. 25 - 48
1. Activity Diagrams .....	Pg. 25-39
2. State Diagrams.....	Pg. 41-48
16.Sequence Diagrams .....	Pg. 50-53
17.Collaboration Diagrams.....	Pg. 55-59
18.Data Flow Diagrams .....	Pg. 61-63
19.Entity Relation Diagrams .....	Pg. 65-66
1. Entity Relations .....	Pg. 65
2. Database Schema .....	Pg. 66
20.Structural Diagrams .....	Pg. 68-90
1. Class Diagrams .....	Pg. 68- 70
2. Object Diagrams .....	Pg. 72-73
3. Component Diagrams .....	Pg. 75-78
4. Deployment Diagrams.....	Pg. 80-84
5. Package Diagrams.....	Pg. 86-87
6. Timing Diagrams.....	Pg. 89- 90

**21. BPMN Diagrams ..... Pg.92-93**

**22.Implementation Technology ..... Pg. 95**

**SCREENSHOTS AND SKETCHES ..... Pg. 97-99**

# Functional Requirements

## 1.0 Product Description

A dentistry management system is a software solution designed to help dentists and dental clinics streamline their operations and manage their patients more efficiently.

The functional requirements of a typical dentistry management system are:

1. **Patient Management:** The system should allow the creation and maintenance of patient records, including personal and dental history, treatment plans, and appointments.
2. **Appointment Scheduling:** The system should have a calendar feature that allows for scheduling and rescheduling of appointments, with real-time updates and automatic reminders for patients.
3. **Treatment Planning:** The system should have tools for creating and managing treatment plans, including estimated costs, appointments, and patient information.
4. **Billing and Invoicing:** The system should allow for the creation and management of invoices, payments, and insurance claims, with support for different payment methods.
5. **Clinical Documentation:** The system should provide a secure and efficient way to store and access clinical notes, X-rays, and other patient-related documents.
6. **Reporting and Analytics:** The system should have reporting and analytics capabilities that allow dentists to monitor patient activity, treatment outcomes, and financial performance.
7. **User Management:** The system should allow administrators to create and manage user accounts, set permissions, and control access to sensitive information.

### 1.1 Product Features

- **User-friendly interface:** The system should have an intuitive and easy-to-use interface that streamlines workflow and minimizes the need for training.
- **Mobile Accessibility:** The system should have a mobile app or mobile-responsive website that allows dentists and staff to access patient information and manage appointments on-the-go.
- **Secure Data Storage:** The system should have robust security measures in place to protect patient data and ensure data privacy and HIPAA compliance.

- **Integration with Other Tools:** The system should have the ability to integrate with other tools and software used in the dental practice, such as digital X-ray systems, insurance providers, and payment processors.
- **Automated Reminders:** The system should have automated appointment and treatment reminders for patients, reducing no-shows and increasing patient engagement.
- **Customizable Templates:** The system should allow for the creation and use of customizable templates for appointment scheduling, treatment plans, and invoicing.
- **Real-time Reporting:** The system should provide real-time reporting and analytics, allowing dentists and staff to monitor practice performance and make informed decisions.
- **Multi-location Support:** The system should be able to support multiple locations, allowing for the centralized management of patient data and appointment schedules across multiple clinics.

## 1.2 User Requirements

### 1.2.1 Patients:

- Easy and secure access to their personal information and appointment history.
- Ability to schedule and reschedule appointments online
- Automated appointment reminders via email or text
- Option to pay bills and insurance claims online

### 1.2.2 Dental Assistants:

- Easy access to patient information and appointment schedules
- Ability to update patient information and create clinical notes
- Ability to schedule and reschedule appointments
- Option to manage billing and insurance claims

### 1.2.3 Dentists:

- Secure and centralized access to patient records and treatment plans
- Ability to create and manage treatment plans and clinical notes
- Option to review and approve billing and insurance claims
- Real-time reporting and analytics to monitor practice performance

**1.2.4 Management/Admin:**

- Centralized management of user accounts and permissions
- Ability to monitor practice performance and patient activity
- Option to manage billing and insurance claims
- Option to create and manage appointment schedules and treatment plans



## 2.0 Use Cases

Use cases for our system would be:

<ul style="list-style-type: none"> <li>• <b>Patient Scheduling:</b> A patient logs into the system to schedule an appointment with their dentist. They can view available appointment times, choose a preferred time, and confirm the appointment.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Treatment Planning:</b> A dentist creates a comprehensive treatment plan for a patient, including estimated costs, appointment schedules, and necessary procedures. The treatment plan is stored in the patient's record and can be reviewed and updated as needed.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Billing and Invoicing:</b> A dental assistant creates an invoice for a patient based on their treatment plan. The invoice is automatically sent to the patient and can be paid online. Insurance claims can also be submitted and tracked through the system.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Clinical Documentation:</b> A dentist updates a patient's clinical notes and X-rays during a visit. The updated information is stored in the patient's record and is accessible to other members of the dental team.</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Reporting and Analytics:</b> A management team or dentist reviews real-time reports on practice performance, including patient activity, financial performance, and appointment schedules. This information can be used to make informed decisions and improve the overall efficiency of the practice.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>User Management:</b> An administrator creates and manages user accounts for the dental team, setting permissions and controlling access to sensitive information.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Appointment Reminders:</b> The system sends automated appointment reminders to patients via email or text message. Patients can confirm, reschedule, or cancel their appointments through the system, reducing no-shows and increasing patient engagement.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Real-time Appointment Scheduling:</b> Dentists and assistants can view the appointment schedule in real-time and make changes as needed, reducing wait times and improving patient experiences. Patients can also see their appointment time and any changes made in real-time.</li> </ul>

**SOFTWARE MODELING AND DESIGN DOCUMENTATION**  
**DENTO MANAGEMENT SYSTEM**

<ul style="list-style-type: none"> <li>• <b>Drag-and-Drop Scheduling:</b> The system's interface allows for quick and easy appointment scheduling through a drag-and-drop interface. Dentists and assistants can easily move appointments and view the updated schedule in real-time.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Virtual Consultations:</b> The system allows patients to schedule virtual consultations with their dentists. Patients can participate in virtual appointments through the system, reducing the need for in-person visits and improving accessibility.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Quick Access to Patient Information:</b> The system's interface provides quick and easy access to patient information, including appointment history, treatment plans, and clinical notes. Dentists and assistants can view this information at a glance, improving communication and decision-making.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Automated Procedure Tracking:</b> The system tracks the progress of procedures for each patient, providing real-time updates and alerts to dentists and assistants. This helps to ensure that procedures are completed on time and to a high standard.</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Secure Messaging:</b> The system provides a secure messaging platform for dentists, assistants, and patients to communicate. Patients can send messages to their dentists and receive updates on their treatment plans, while dentists and assistants can communicate with each other to coordinate care.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>User Permission Management:</b> Administrators can manage user permissions and access to sensitive information, such as patient records, through the system. This ensures that only authorized users can access sensitive information and helps to protect patient privacy.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Payment Processing:</b> The system provides a secure platform for patients to make payments, including payments for treatment plans and insurance claims. Patients can pay online, and the system provides real-time updates on payment status and balances owed.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Insurance Claim Management:</b> The system provides tools for managing insurance claims, including submitting claims, tracking claims status, and receiving payment for approved claims. This streamlines the claims process and reduces administrative burden for dental practices.</li> </ul>

<ul style="list-style-type: none"><li>• <b>User Onboarding:</b> The system provides tools for onboarding new users, including setting up user accounts, defining user roles and permissions, and providing training materials and support. This ensures that new users are able to effectively use the system and participate in patient care.</li></ul>	<ul style="list-style-type: none"><li>• <b>Patient Surveys:</b> The system provides tools for collecting patient feedback, including patient satisfaction surveys and reviews. This information can be used to improve the quality of care and the overall patient experience.</li></ul>	<ul style="list-style-type: none"><li>• <b>Secure Login:</b> The system provides secure login for patients and members of the dental team, including multi-factor authentication and encrypted data storage. This helps to protect sensitive information and ensure that only authorized users can access the system.</li></ul>	<ul style="list-style-type: none"><li>• <b>Patient Data Security:</b> The system provides robust data security for patient information, including encrypted storage and strict access controls. This helps to protect patient privacy and comply with relevant data protection regulations.</li></ul>
--	--	---	---

### 3.0 Constrains

<ul style="list-style-type: none"> <li>• <b>Data Privacy and Security:</b> The system must comply with relevant data privacy regulations, such as the General Data Protection Regulation (GDPR) and the Health Insurance Portability and Accountability Act (HIPAA). This requires strict data security measures and secure storage of sensitive information.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Interoperability with Other Systems:</b> The system must be able to interact with other systems used by the dental practice, such as electronic health record (EHR) systems, payment processing systems, and insurance claim management systems. This requires seamless integration with other systems and the ability to exchange data in a secure and consistent manner.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>User Adoption:</b> The system must be easy to use and accessible for patients and members of the dental team. This requires a user-friendly interface and clear, intuitive navigation.</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Data Accuracy:</b> The system must maintain accurate and up-to-date information about patients and their treatment plans. This requires robust data validation and verification processes, and the ability to easily update patient information as needed.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Cost:</b> The system must be cost-effective and provide value for money. This may involve choosing between commercial off-the-shelf (COTS) solutions and custom-built solutions, as well as careful consideration of the system's features and functionalities.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Technical Support:</b> The system must have reliable and responsive technical support, including training and help documentation, to ensure that users can effectively use the system and resolve any technical issues that may arise.</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Dependence on Internet:</b> The system may be designed as a web-based or cloud-based solution, which requires a reliable and stable internet connection. This may pose a challenge in areas with limited or unreliable internet access, and may affect the ability of patients and dental team members to access the system and perform necessary tasks.</li> </ul>		

## 4.0 Dependencies

<b>4.1 Technical Infrastructure:</b> The system requires a strong technical setup, including servers, storage, and network, to work efficiently. It needs to be reliable, flexible, and secure and may require internal IT management or external support.	<b>4.2 Integration with Other Systems:</b> The system must work seamlessly with other systems used by the dental practice, such as EHR systems, payment systems, and insurance claim systems. This requires a secure and smooth exchange of data.	<b>4.3 Dependence on Internet:</b> The system may be designed as a web-based or cloud-based solution, which requires a reliable and stable internet connection. This may pose a challenge in areas with limited or unreliable internet access, and may affect the ability of patients and dental team members to access the system and perform necessary tasks.
--	---	---

## 5.0 Requirements

No.	Main	Explanation
1.	User Management	The system must allow for the creation, management, and authentication of users, including patients, dental team members, and administrators.
2.	Appointment Scheduling	The system must provide a calendar-based interface for scheduling appointments, including the ability to book, modify, and cancel appointments.
3.	Patient Management	The system must store and manage patient information, including demographic information, medical history, and treatment plans.
4.	Treatment Planning	The system must provide a tool for creating and managing treatment plans for patients, including the ability to document procedures and outcomes.
5.	Billing and Payment	The system must provide a mechanism for processing payments, including credit card and insurance payments, and generating invoices and receipts.
6.	Insurance Management	The system must provide a tool for managing insurance claims, including the ability to track claim status and payment.
7.	Messaging and Communication	The system must provide a platform for secure messaging between patients and dental team members, including appointment reminders and follow-up messages.
8.	Reporting and Analytics	The system must provide reports and analytics on patient and practice-level data, including appointment schedules, billing, and treatment outcomes.

**SOFTWARE MODELING AND DESIGN DOCUMENTATION**  
**DENTO MANAGEMENT SYSTEM**

<b>9.</b>	Data Security and Privacy	The system must ensure the secure storage of patient information, including medical records and personal information, and comply with relevant data privacy regulations.
<b>10.</b>	User Experience	The system must provide a user-friendly interface and clear, intuitive navigation, with the goal of improving patient engagement and the overall experience of using the system.
<b>11.</b>	Document Management	The system must allow for the storage and retrieval of patient documents, including X-rays, images, and treatment plans.
<b>12.</b>	Task Management	The system must provide a task management tool for dental team members, including the ability to assign and track tasks, set deadlines, and generate reminders.
<b>13.</b>	Treatment Notes	The system must provide a tool for capturing and storing treatment notes, including the ability to document patient symptoms, diagnoses, and treatments.
<b>14.</b>	Referral Management	The system must provide a tool for managing patient referrals, including the ability to generate referral letters, track referral status, and communicate with referring providers.
<b>15.</b>	Digital Forms	The system must provide digital forms for patients to complete, including medical history, consent forms, and patient feedback surveys.
<b>16.</b>	Remote Access	The system must provide secure remote access for patients and dental team members, including the ability to access patient information and perform tasks from remote locations.

## Non-Functional Requirements

## 1.0 Non-functional Requirements for User Interface

<ul style="list-style-type: none"> <li>• <b>Accessibility:</b> The user interface must be accessible to all users, including those with disabilities, and comply with relevant accessibility standards.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Responsiveness:</b> The user interface must be responsive, adapting to different screen sizes and devices, and providing an optimal experience for all users.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Performance:</b> The user interface must be fast and efficient, providing smooth navigation, rapid load times, and minimal lag.</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Customization:</b> The user interface must allow for customization, including the ability to change themes, color schemes, and layout, to meet the needs of individual users.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Error Handling:</b> The user interface must provide clear error messages and handling mechanisms, including the ability to recover from errors and avoid data loss.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Localization:</b> The user interface must be capable of localization, including support for multiple languages and regional settings.</li> </ul>

## 2.0 Security Non-Functional Requirements

<ul style="list-style-type: none"> <li>• <b>Data Encryption:</b> The system must use strong encryption algorithms to protect sensitive data, including patient information, payment details, and other confidential information.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Access Controls:</b> The system must implement access controls to restrict user access to sensitive data, including the ability to set permissions, establish roles, and monitor user activity.</li> </ul>
---	--

## 3.0 Organizational Non-Functional Requirements

<ul style="list-style-type: none"> <li>• <b>Scalability:</b> The system must be scalable to accommodate growth in the number of patients, dental team members, and transactions, without sacrificing performance or functionality.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Interoperability:</b> The system must be able to integrate with other systems, including electronic health records (EHRs), practice management systems, and payment processing platforms, to support seamless information exchange.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Reliability:</b> The system must be reliable, providing consistent and uninterrupted service, with a high availability and low downtime.</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Compliance:</b> The system must comply with relevant laws, regulations, and industry standards, including HIPAA, HITECH, and other healthcare regulations.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Support:</b> The system must provide ongoing support and maintenance, including the ability to address technical issues, provide updates, and respond to user needs and feedback.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Customizability:</b> The system must allow for customization, including the ability to configure settings, add new features and functionality.</li> </ul>



## Domain Requirements

- **Record Keeping:** The system must provide a secure and centralized database for storing and managing patient information, including demographic data, medical history, and treatment records.
- **Scheduling:** The system must provide a calendar-based scheduling system for managing appointments, with the ability to book, reschedule, and cancel appointments as needed.
- **Billing:** The system must provide an automated billing system for processing patient payments, including co-payments, deductibles, and insurance claims.
- **Communication:** The system must provide a secure messaging platform for communicating with patients and other stakeholders, including reminders for appointments and follow-up messages.

## Legislative Requirement

*This project should not break the laws of the Ministry of Health in Albania and Dentist's Order.*

### 1.0 Extended User Cases/Stories:

- **Appointment Scheduling:**
  - Patient logs into the dentistry management system
  - Patient selects the option to schedule an appointment
  - The system displays available appointment slots
  - Patient selects a preferred time and date
  - Patient confirms the appointment
  - System sends a confirmation message to the patient's registered email or phone number.

- **Payment Processing:**

- Patient logs into the dentistry management system
- Patient selects the option to make a payment
- System displays available payment options
- Patient selects a preferred payment method
- Patient enters payment information and confirms the transaction
- System confirms receipt of payment and updates the patient's account balance.

- **Message Management:**

- Dentist or assistant logs into the dentistry management system
- Dentist or assistant selects the option to send a message
- System displays a list of patients
- Dentist or assistant selects a patient
- Dentist or assistant composes a message and sends it
- System records the sent message and sends a notification to the recipient

- **User Management:**

- Admin logs into the dentistry management system
- Admin selects the option to manage users
- System displays a list of users
- Admin selects a user
- Admin updates user information, such as role, name, or contact information
- System updates the user's profile and sends a notification to the user

- **Login Security:**

- User enters the dentistry management system URL in a web browser
- System prompts the user to enter their login credentials
- User enters their username and password
- System authenticates the user's credentials
- System grants or denies access to the system based on the authentication result

- **Personal Information Security:**

- Patient logs into the dentistry management system
- Patient selects the option to view or update their personal information
- System displays the patient's profile
- Patient updates their personal information

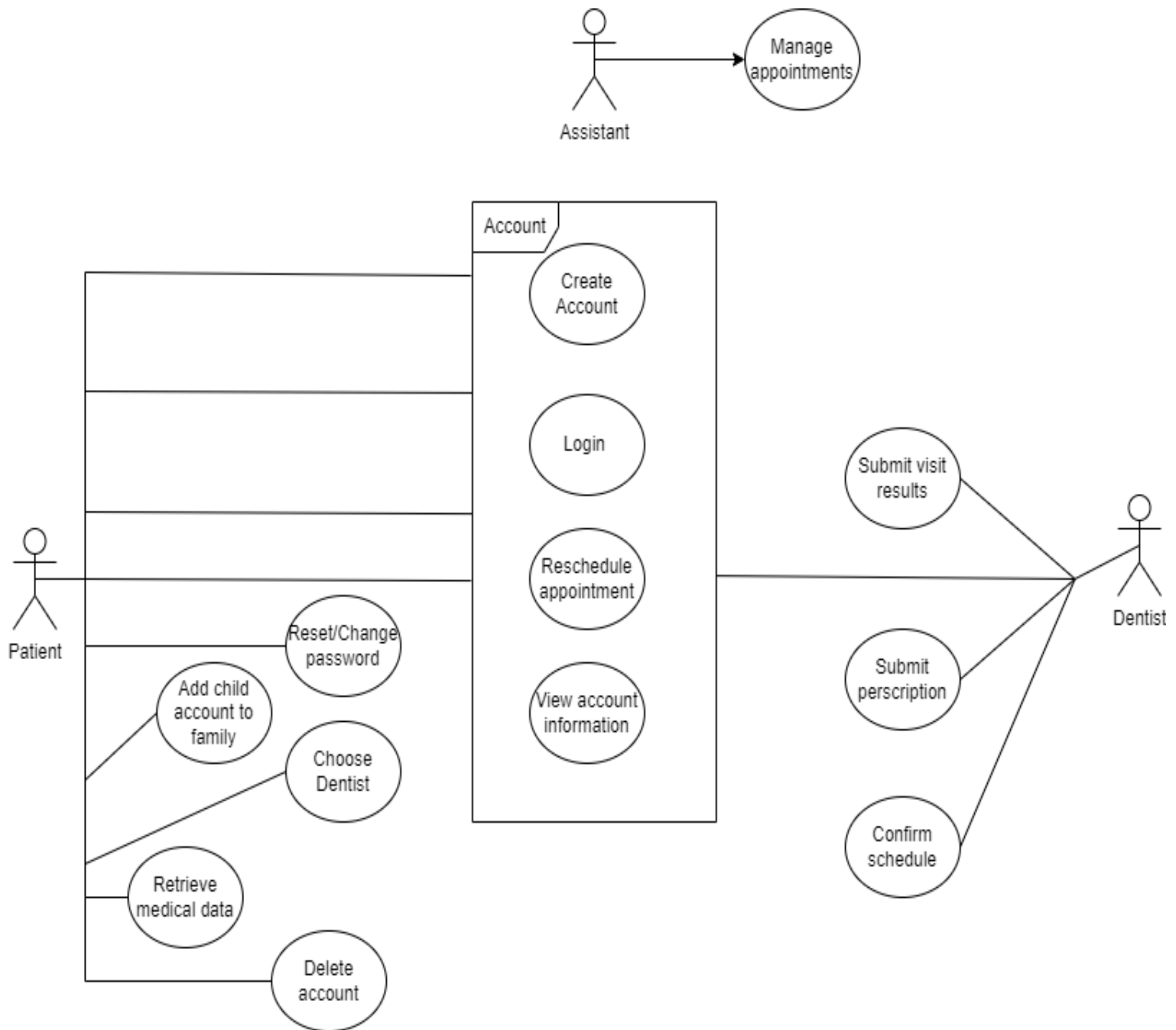
- System confirms the update and stores the updated information in a secure database
- **Treatment Management:**
  - Dentist logs into the dentistry management system
  - Dentist selects the option to manage treatments
  - System displays a list of treatments
  - Dentist selects a treatment
  - Dentist updates treatment information, such as cost, description, or duration
  - System confirms the update and stores the updated information in the system database
- **Record Management:**
  - Dentist logs into the dentistry management system
  - Dentist selects the option to view patient records
  - System displays a list of patients
  - Dentist selects a patient
  - System displays the patient's medical and dental history, treatment history, and current medications
  - Dentist updates the patient's record with new information, such as recent test results or treatment notes
- **Inventory Management:**
  - Assistant logs into the dentistry management system
  - Assistant selects the option to manage inventory
  - System displays a list of inventory items
  - Assistant selects an item
  - Assistant updates the item information, such as stock level, price, or reorder threshold
  - System confirms the update and stores the updated information in the system database
- **Reporting:**
  - Admin logs into the dentistry management system
  - Admin selects the option to generate reports
  - System displays available report options
  - Admin selects a report type
  - System generates the report and displays it on the screen
  - Admin can download or print the report for further analysis

- **Appointment Reminders:**
  - System automatically sends appointment reminders to patients via email or SMS
  - Patients can confirm, reschedule, or cancel the appointment directly from the reminder message
  - System updates the appointment status based on the patient's response
  
- **Task Management:**
  - Assistant logs into the dentistry management system
  - Assistant selects the option to manage tasks
  - System displays a list of tasks
  - Assistant selects a task
  - Assistant updates the task information, such as status, priority, or due date
  - System confirms the update and stores the updated information in the system database
  
- **Billing Management:**
  - Assistant logs into the dentistry management system
  - Assistant selects the option to manage billing
  - System displays a list of patients with outstanding bills
  - Assistant selects a patient
  - System displays the patient's bill and billing history
  - Assistant updates the bill with new charges or payment information
  - System confirms the update and stores the updated information in the system database
  
- **Patient Self-Service:**
  - Patient logs into the dentistry management system
  - Patient selects the option to view their personal information
  - System displays the patient's personal and medical information
  - Patient updates their personal information, such as address, phone number, or emergency contact
  - System confirms the update and stores the updated information in the system database
  
- **Scheduling:**
  - Assistant logs into the dentistry management system
  - Assistant selects the option to manage appointments

- System displays a calendar view of the clinic's schedule
  - Assistant selects an available time slot
  - Assistant creates a new appointment and assigns it to a dentist
  - System confirms the appointment and stores the information in the system database
- 
- **Secure Communication:**
    - Patients and dentists can securely communicate through the dentistry management system, exchanging messages and attachments related to appointments, treatments, and billing
    - System automatically archives all communication for future reference and compliance purposes
    - System implements appropriate security measures, such as encryption, to protect the confidentiality and privacy of patient information.

## Diagrams

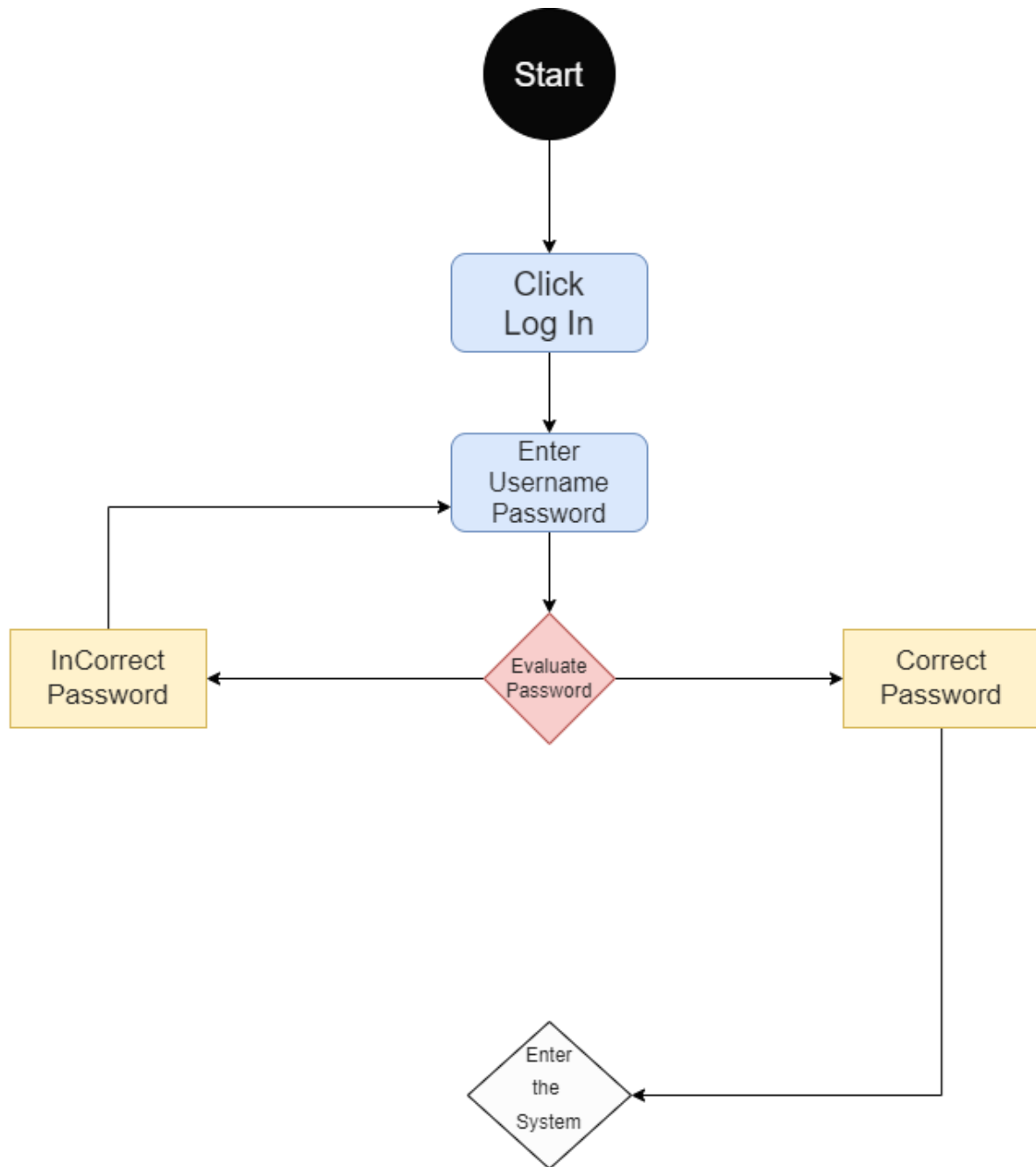
## 1. User Case Diagram



## Activity Diagrams

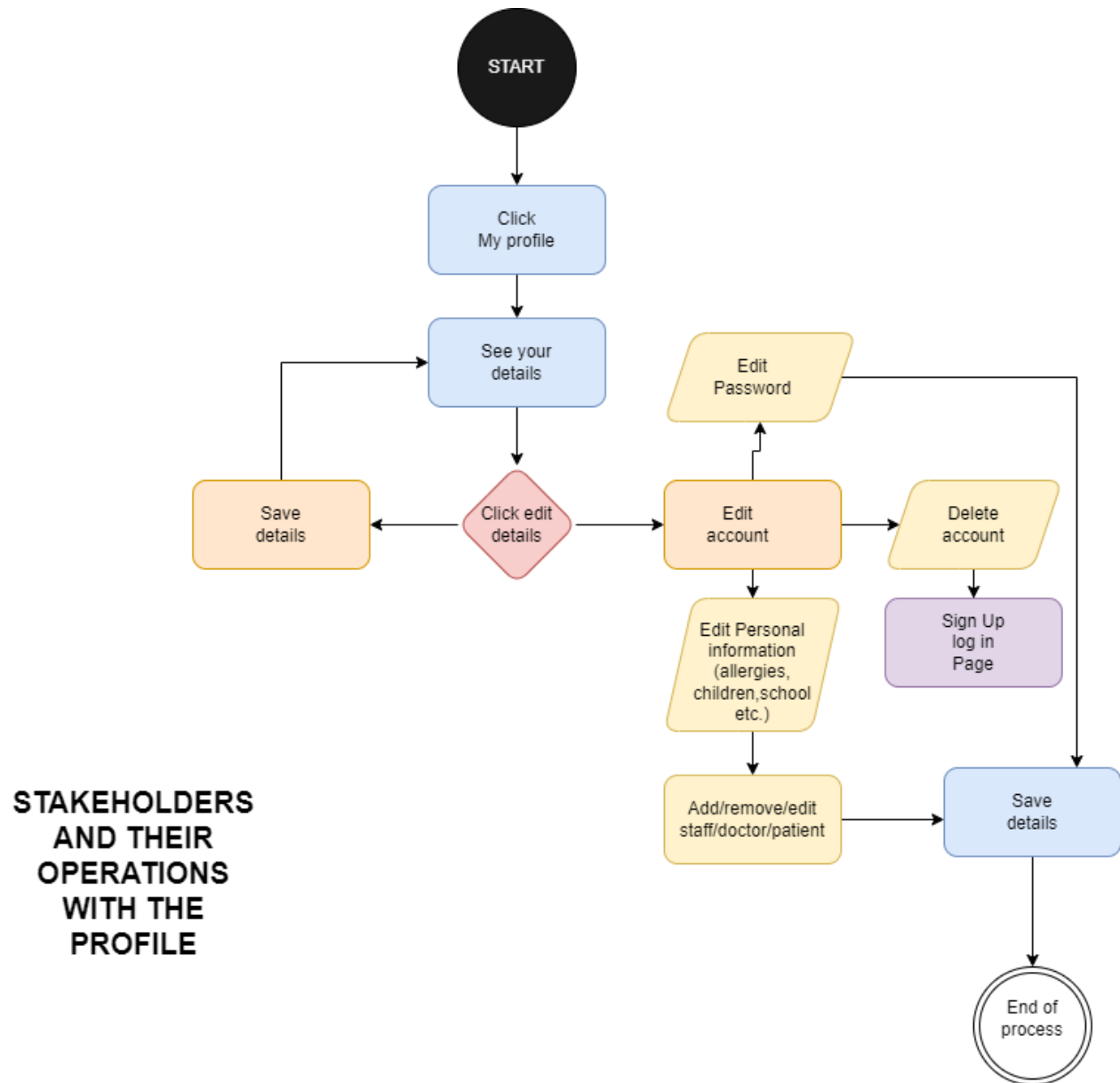


## 1. Log In Activity Diagram

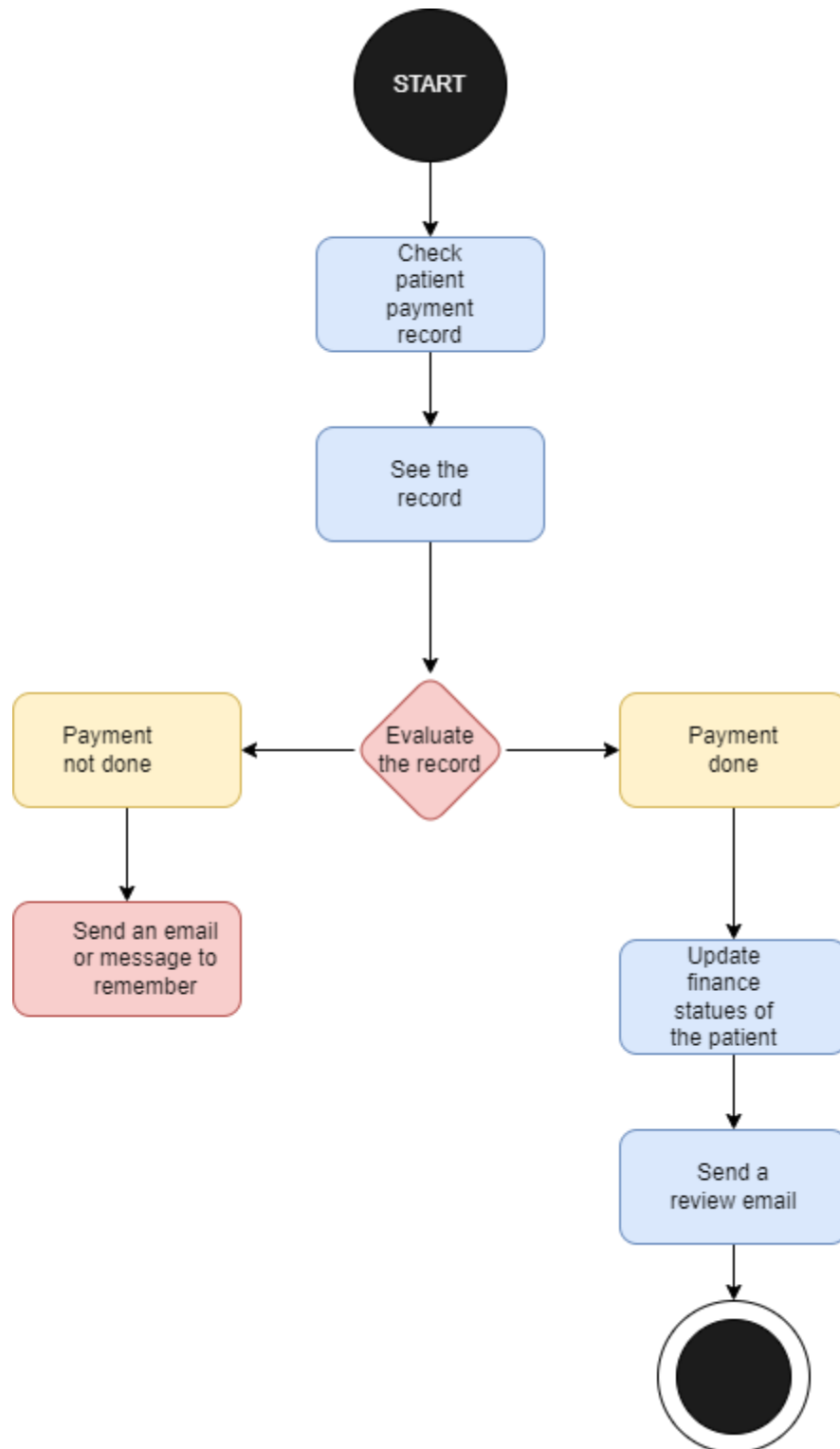


**LOG IN  
ACTIVITY  
DIAGRAM**

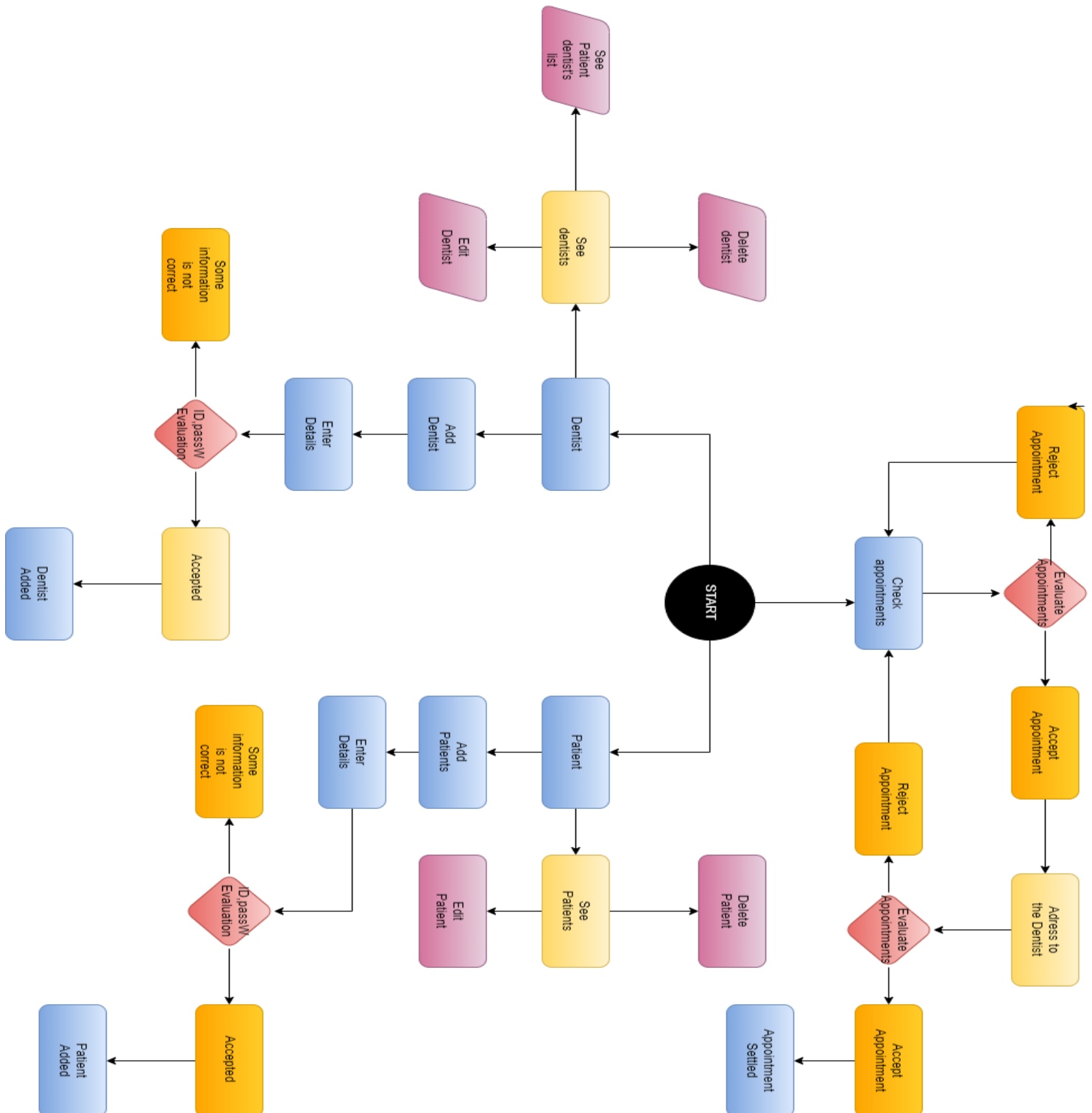
## 2. Stakeholders and their Operations with the Profile



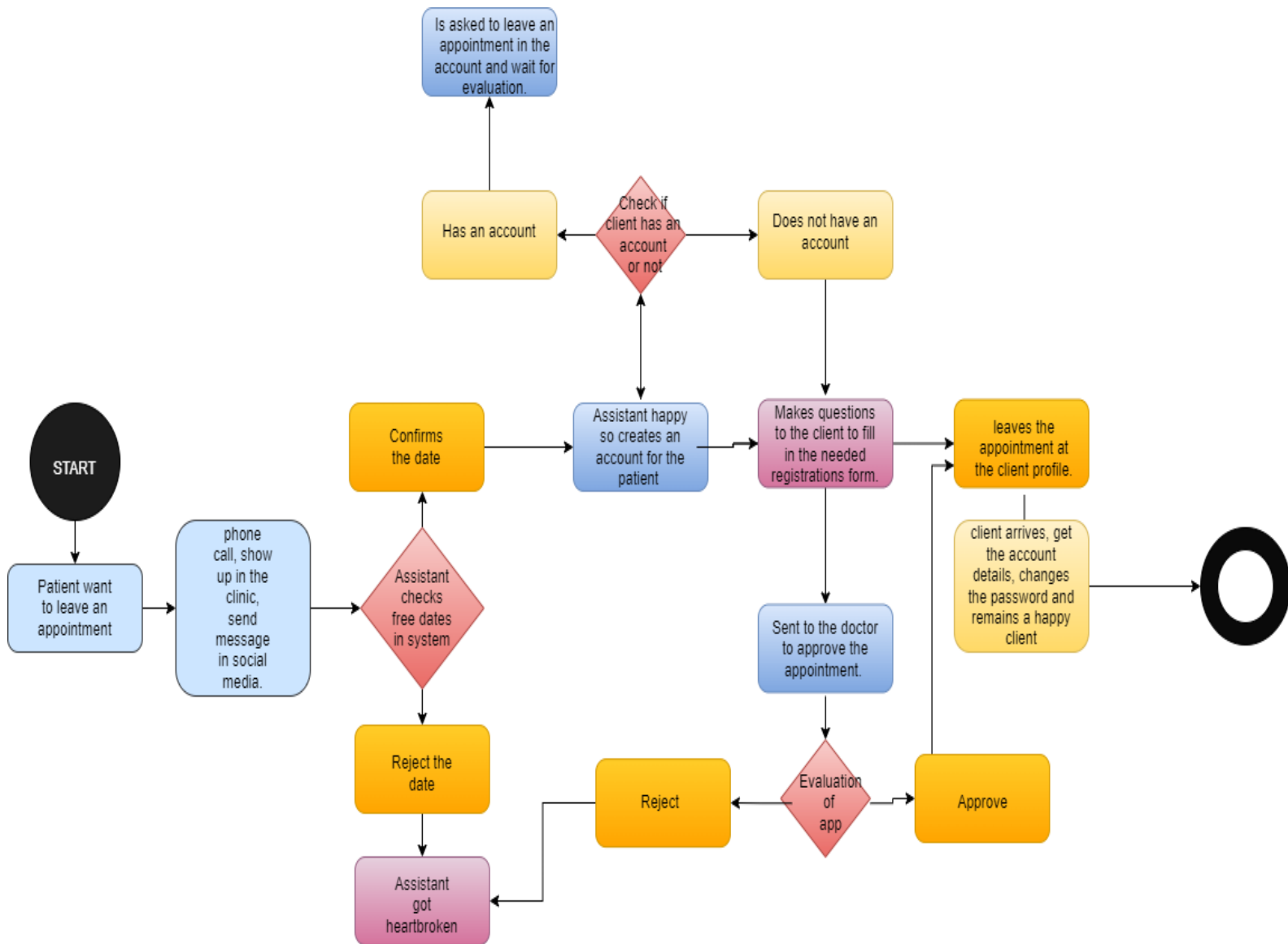
### 3. Payment Record Activity Diagram



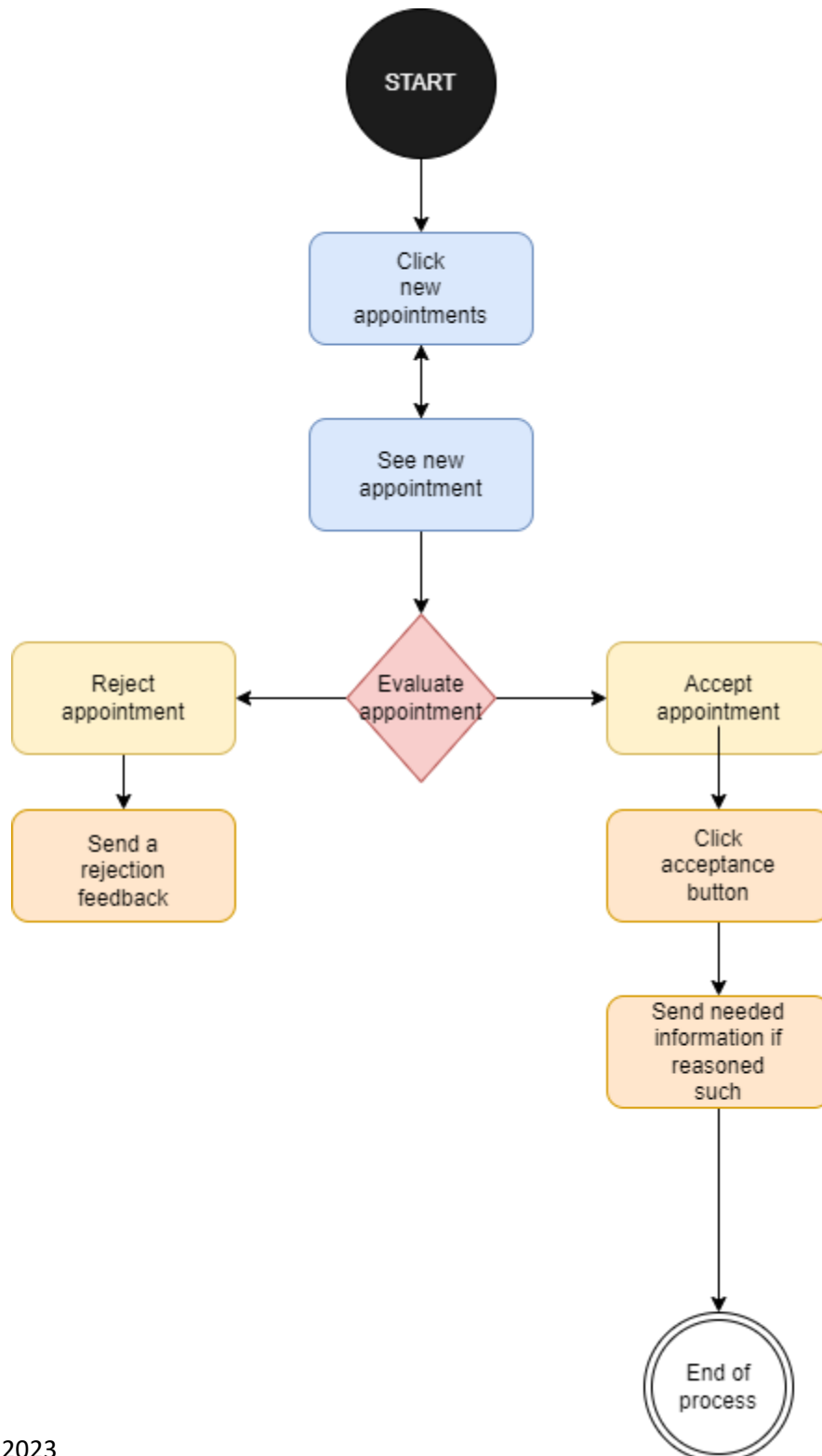
## 4. Assistant Manages Dentist and Patient Activity Diagram



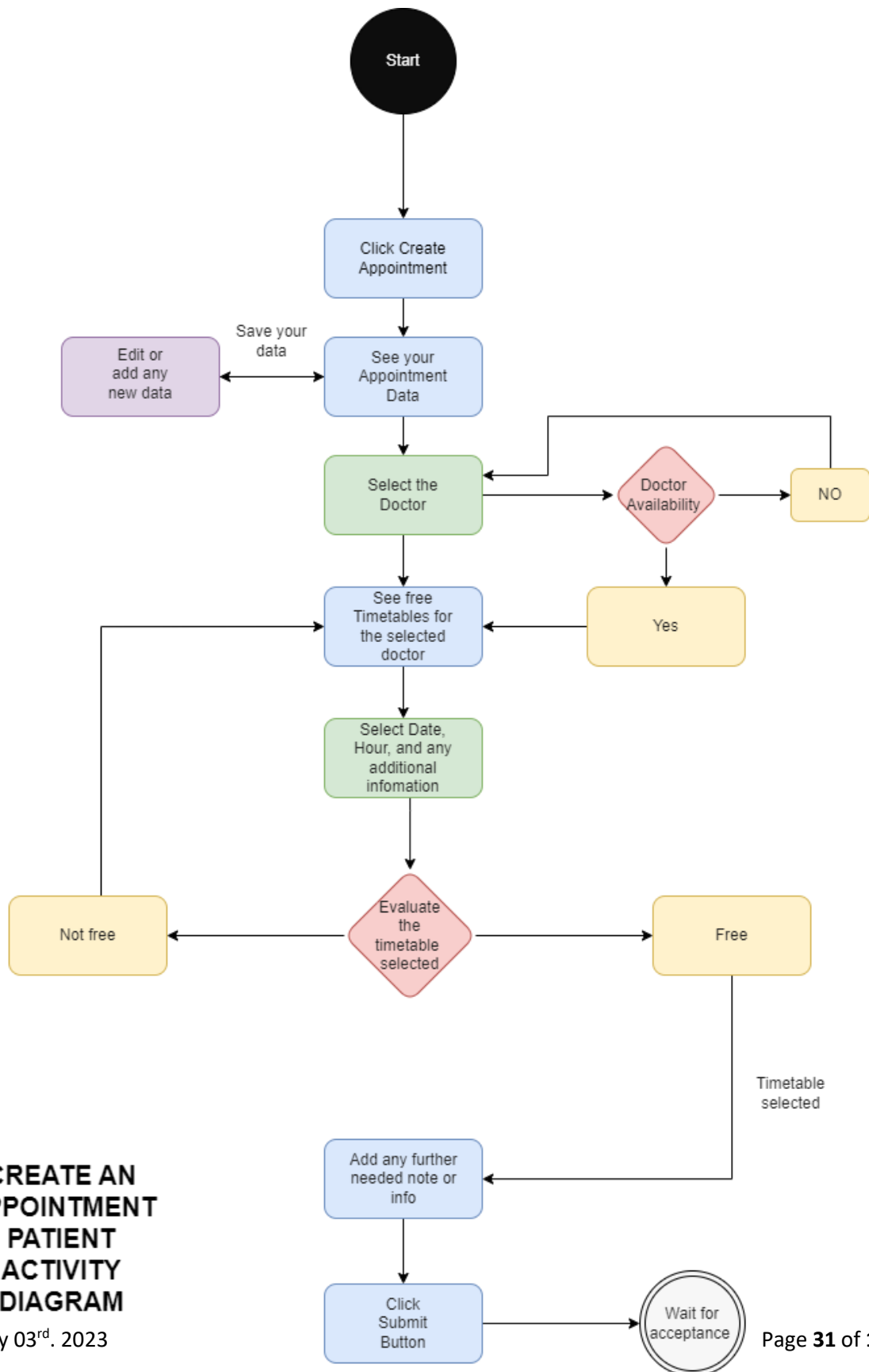
## 5. Assistant Doctor and Patient Appointment Activity Diagram



## 6. Check Appointments Activity Diagram Doctor

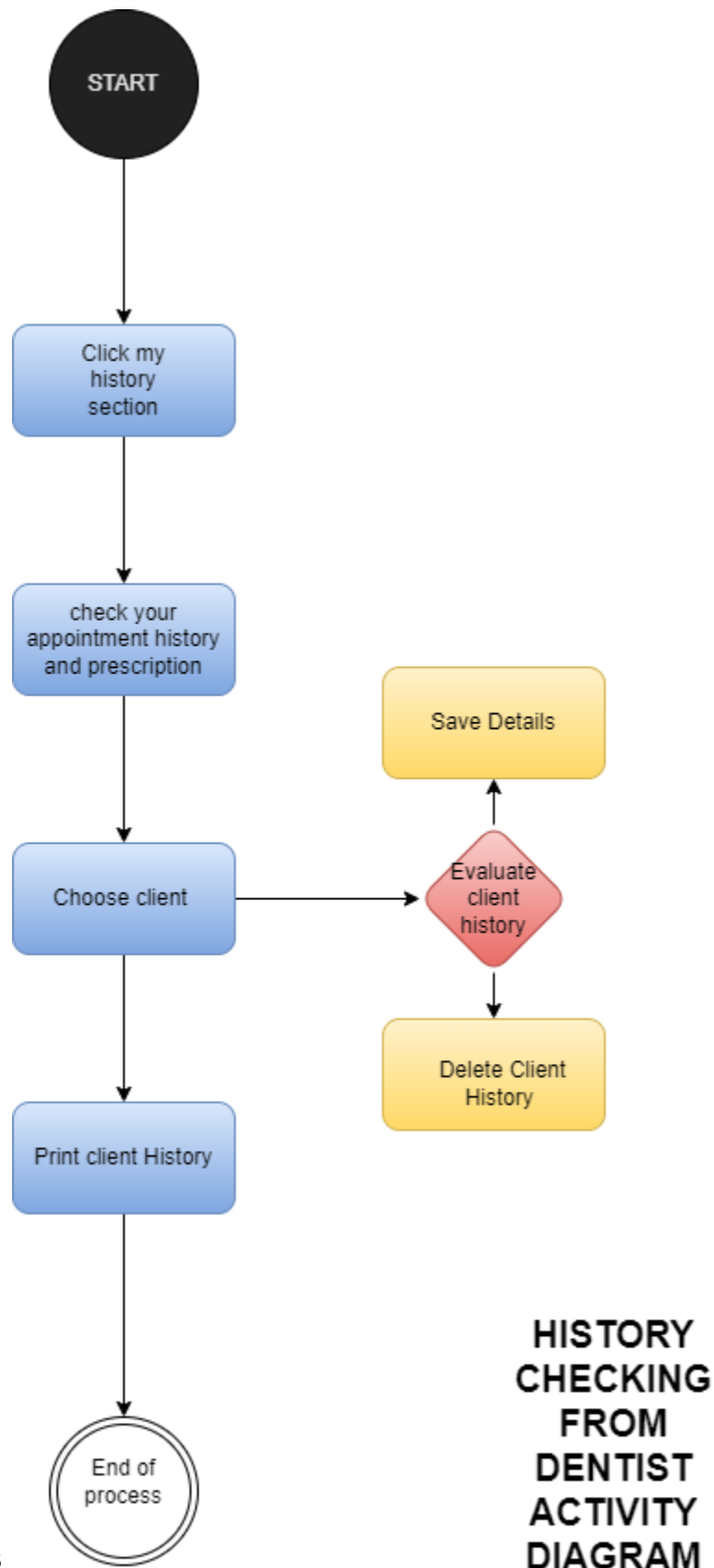


## 7. Create Appointment Activity Diagram



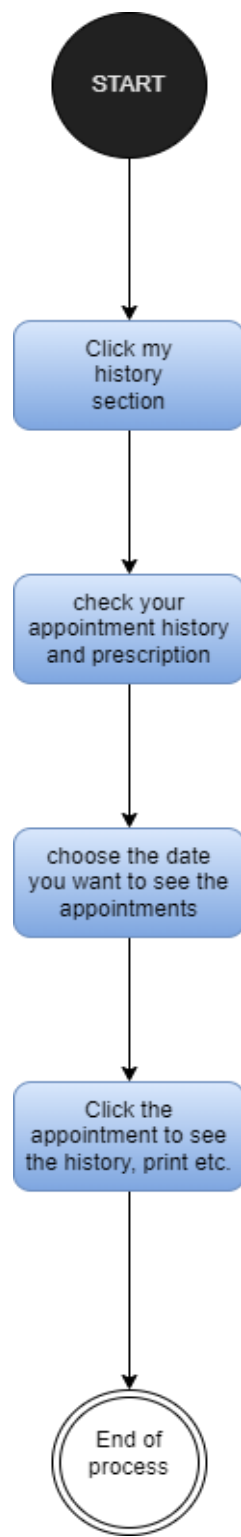
**CREATE AN  
APPOINTMENT  
PATIENT  
ACTIVITY  
DIAGRAM**

## 8. History Check Dentist



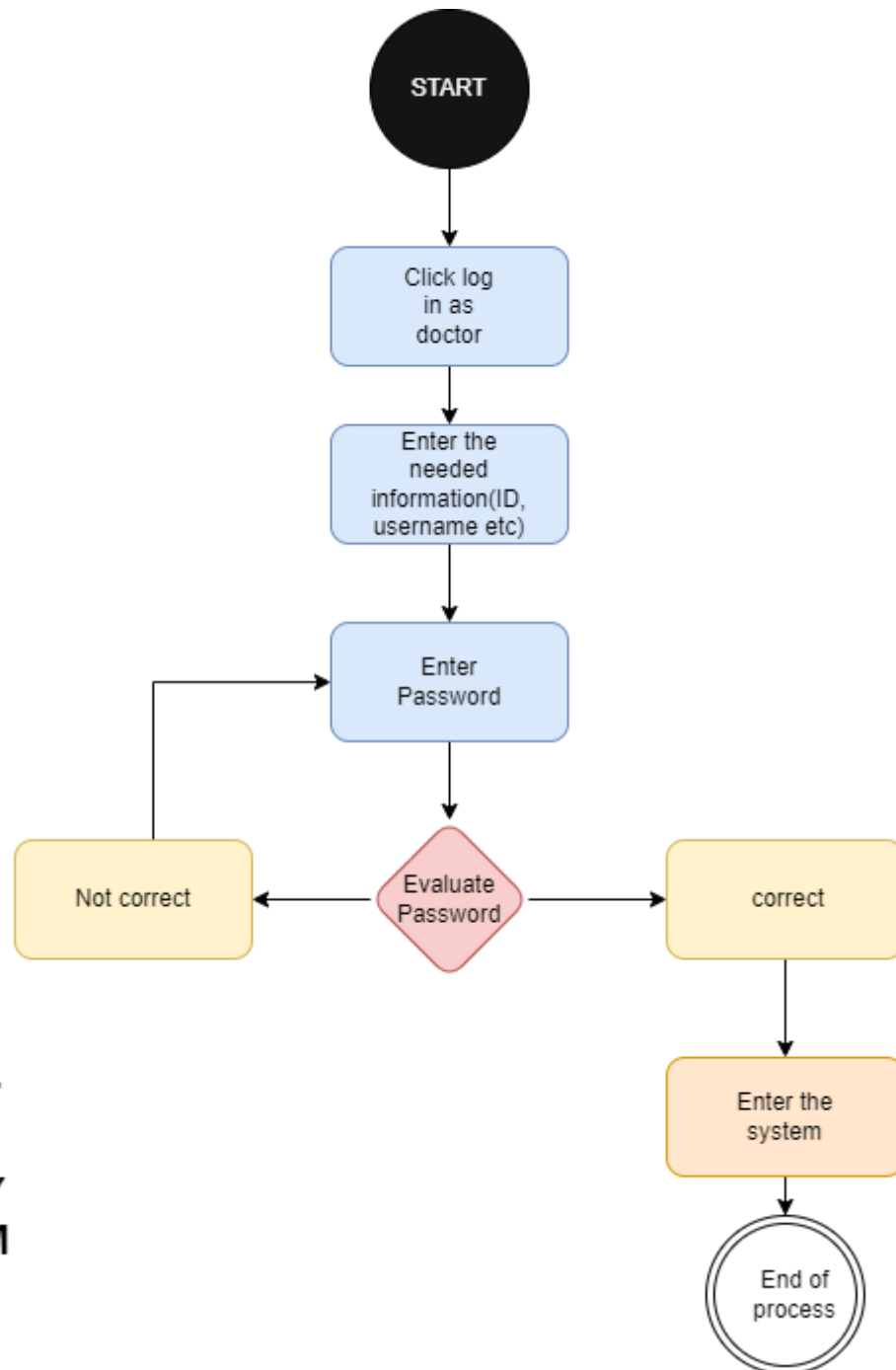


## 9. History Check Patient AD



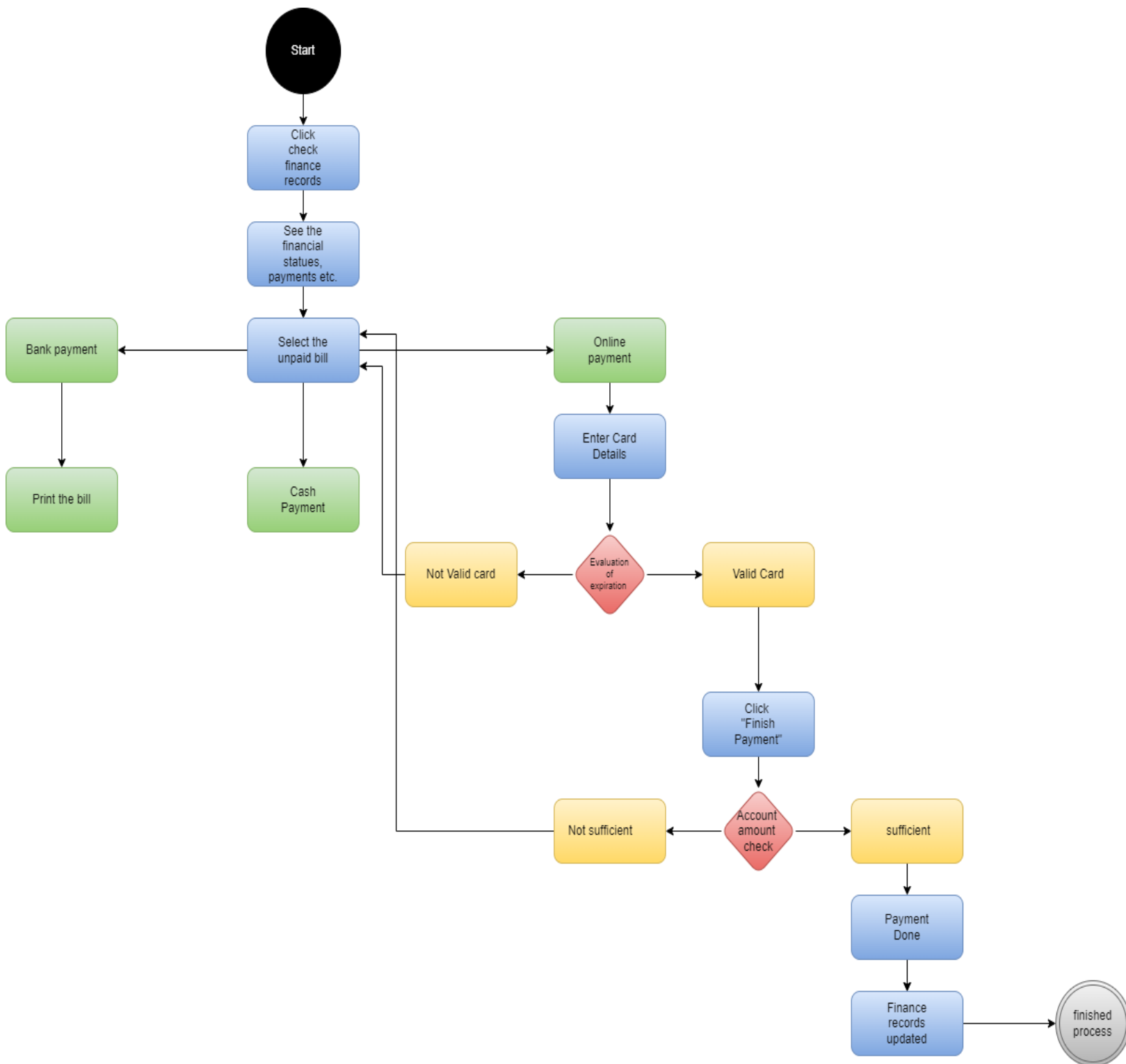
**HISTORY  
CHECKING  
FROM  
CLIENT  
ACTIVITY  
DIAGRAM**

## 10. Dentist Log In Activity Diagram

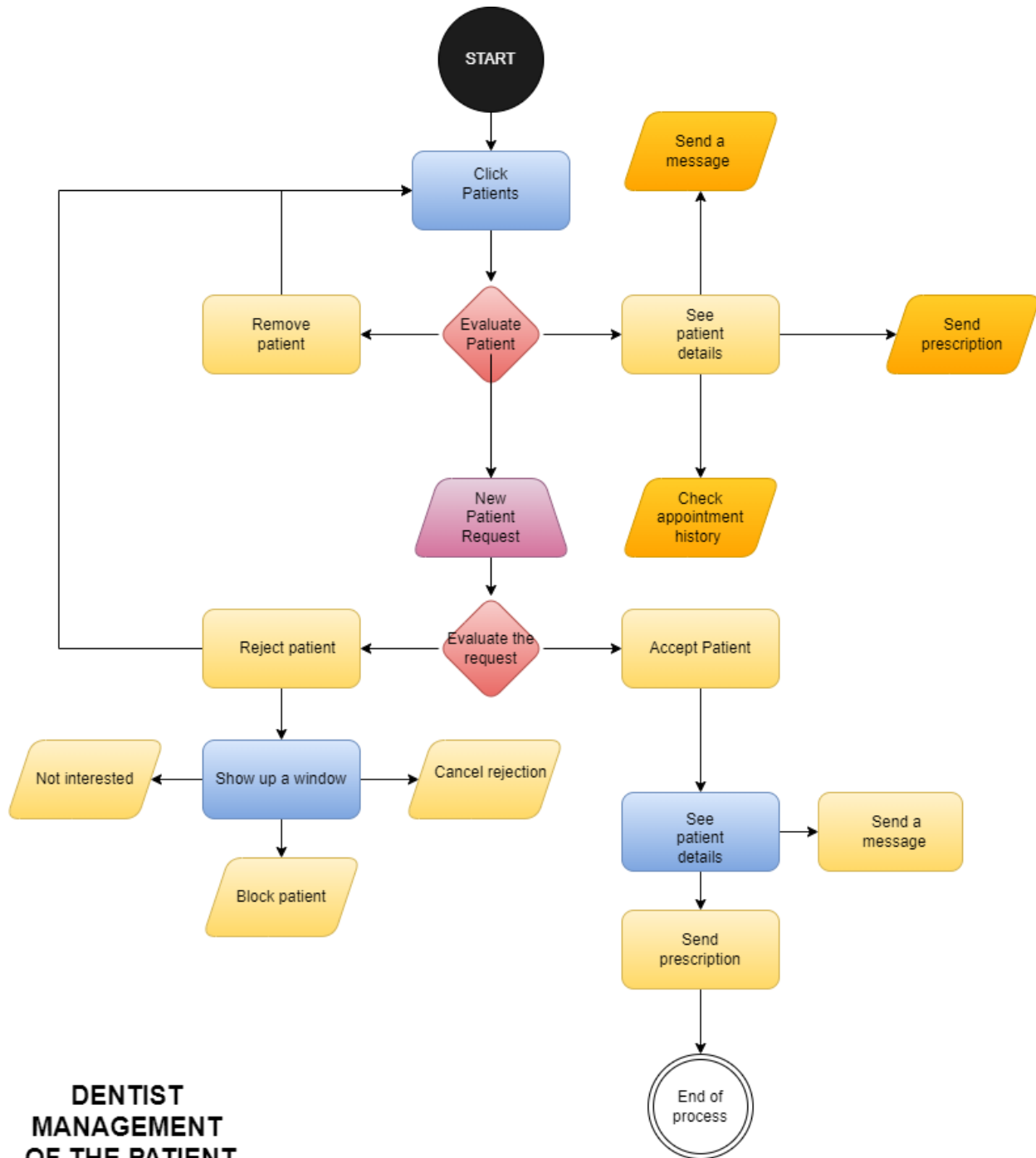


**DENTIST  
LOG IN  
ACTIVITY  
DIAGRAM**

## 11. Make Payments Activity Diagram Patient

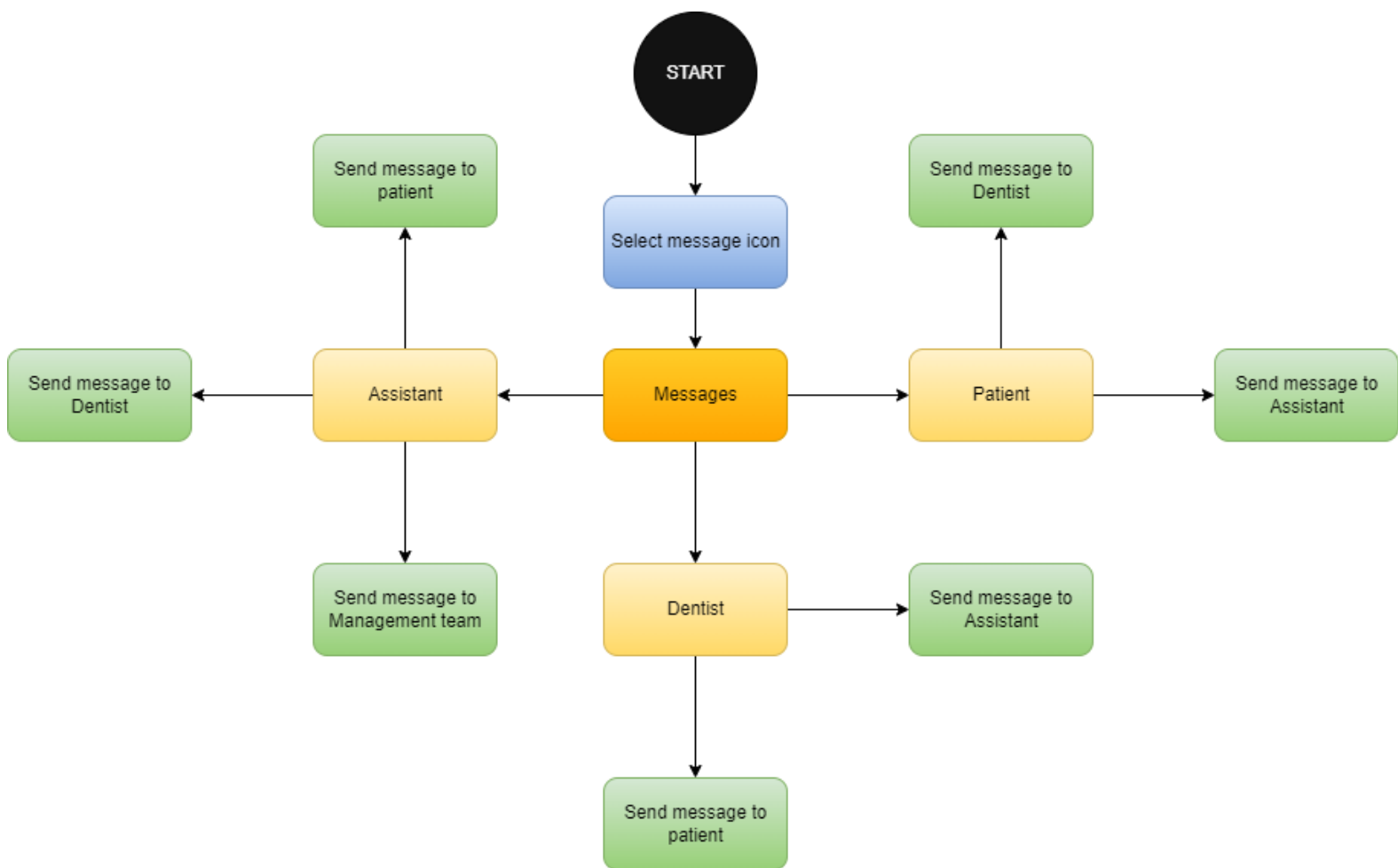


## 12. Manage Patient Problems Dentist Activity Diagram

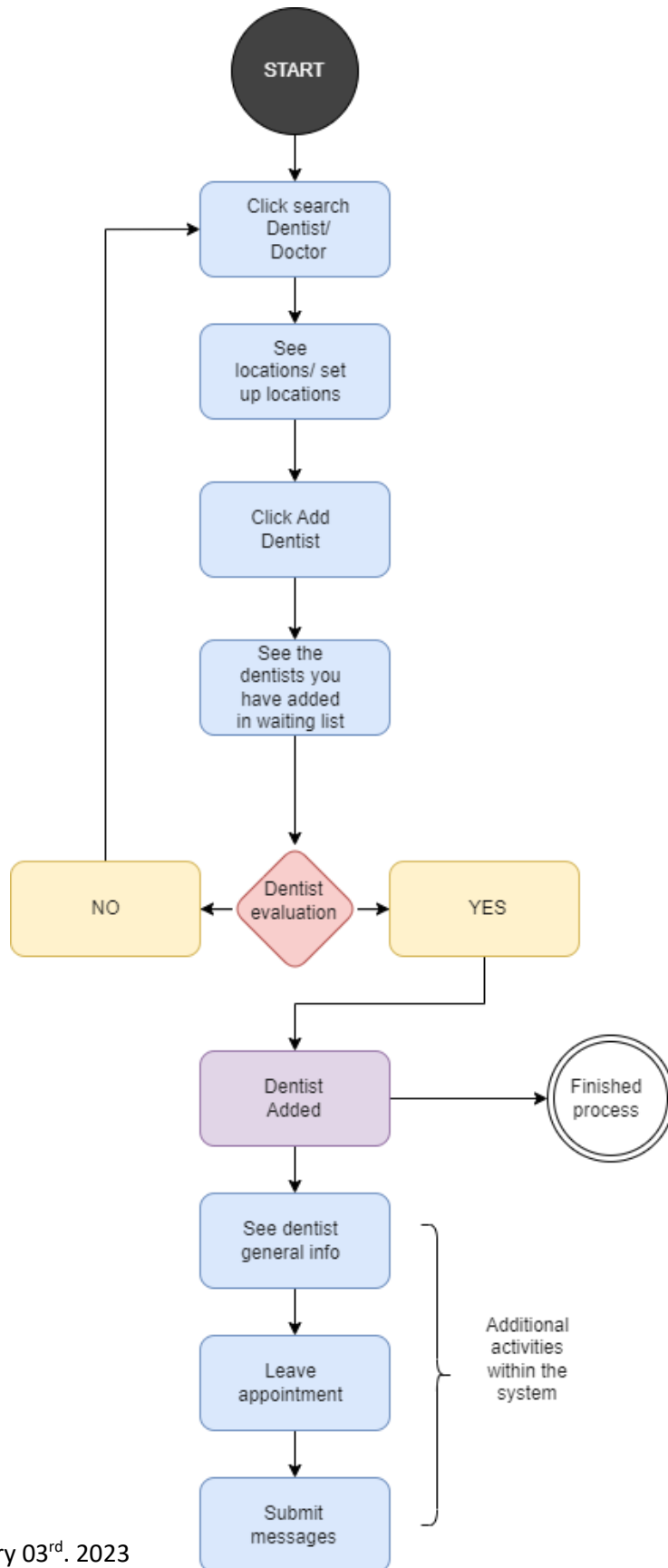


**DENTIST  
MANAGEMENT  
OF THE PATIENT  
ACTIVITY  
DIAGRAM**

### 13. Patient Dentist And Assistant Chat Communication

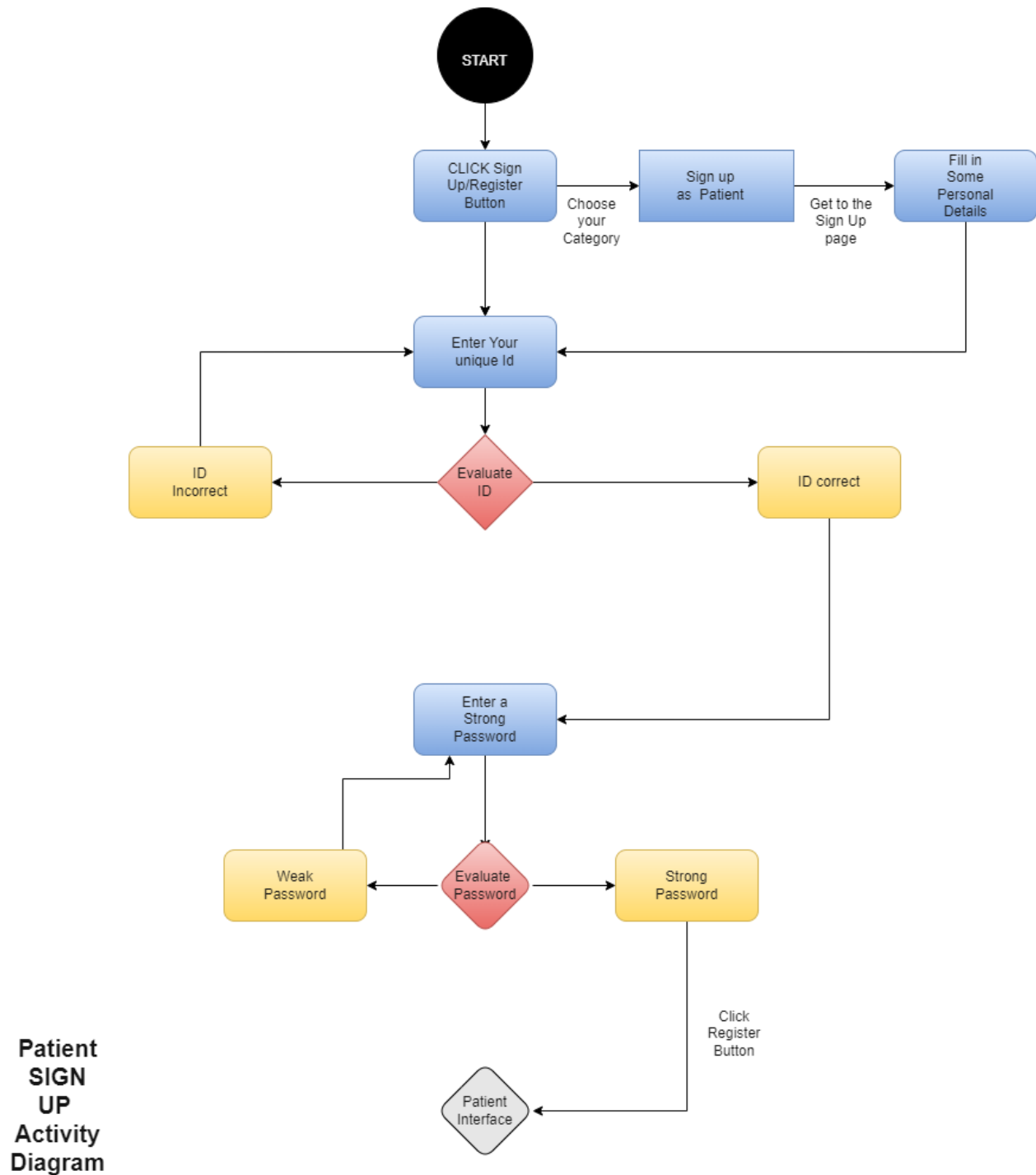


## 14. Search Doctors Activity Diagram Patient



**ADDING  
AND  
SEARCHING  
DOCTOR  
FROM THE  
PATIENT  
ACTIVITY  
DIAGRAM**

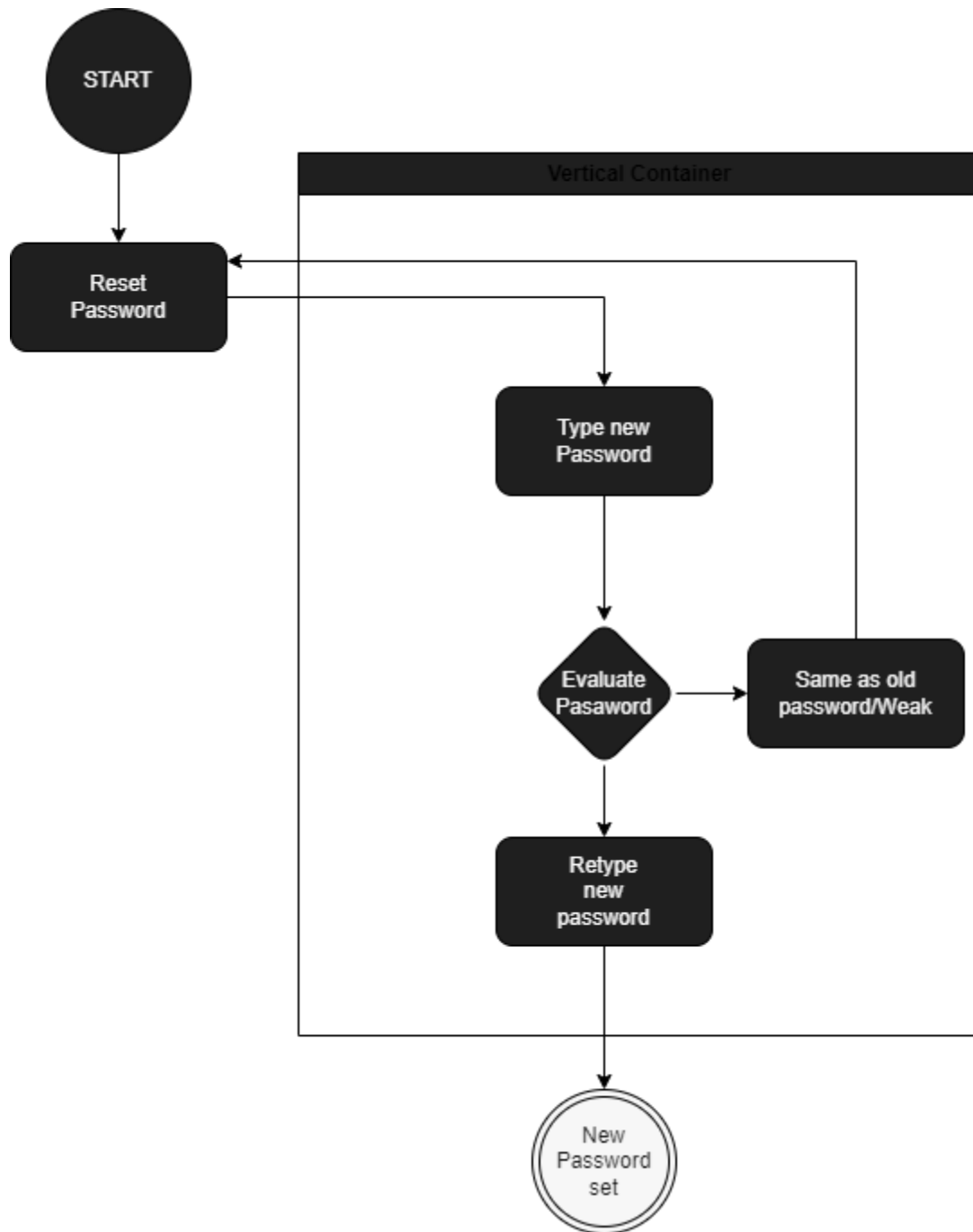
## 15. Sign Up Register Activity Diagram



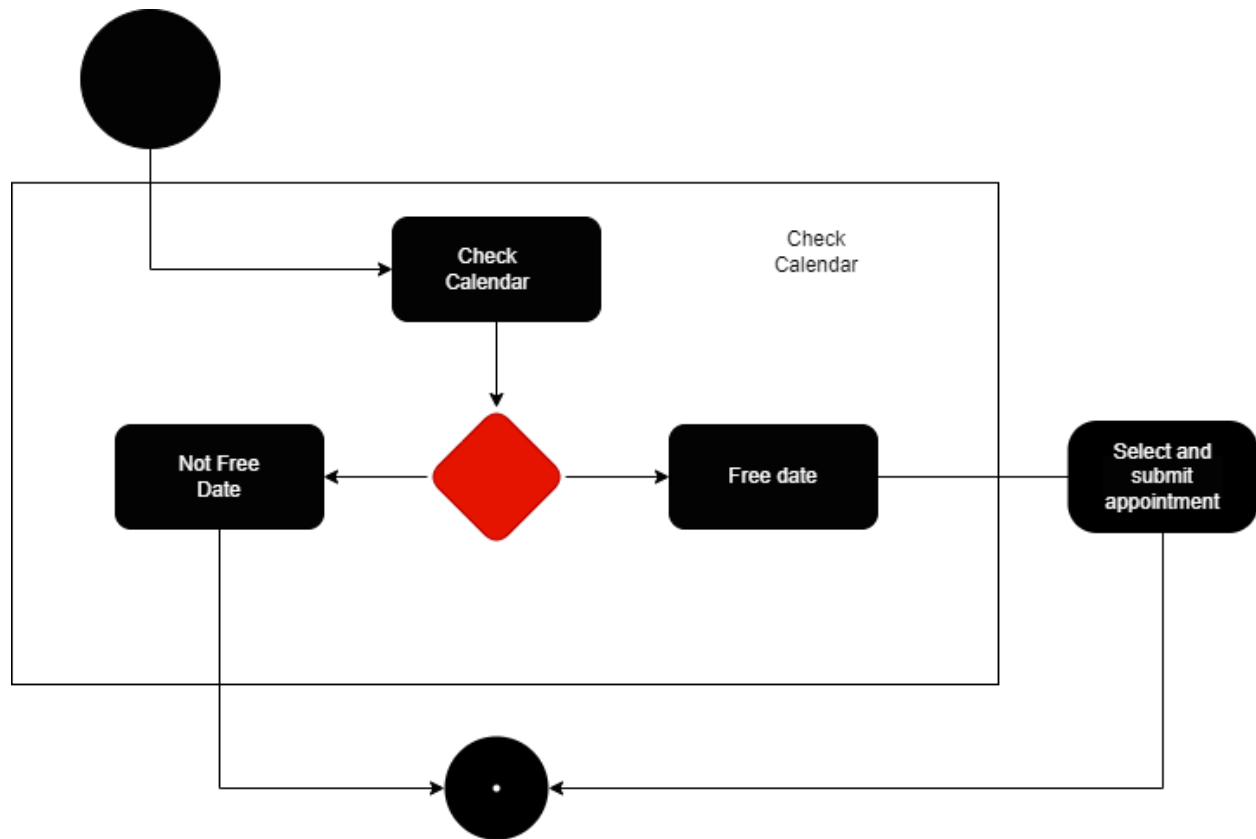
## State Diagrams



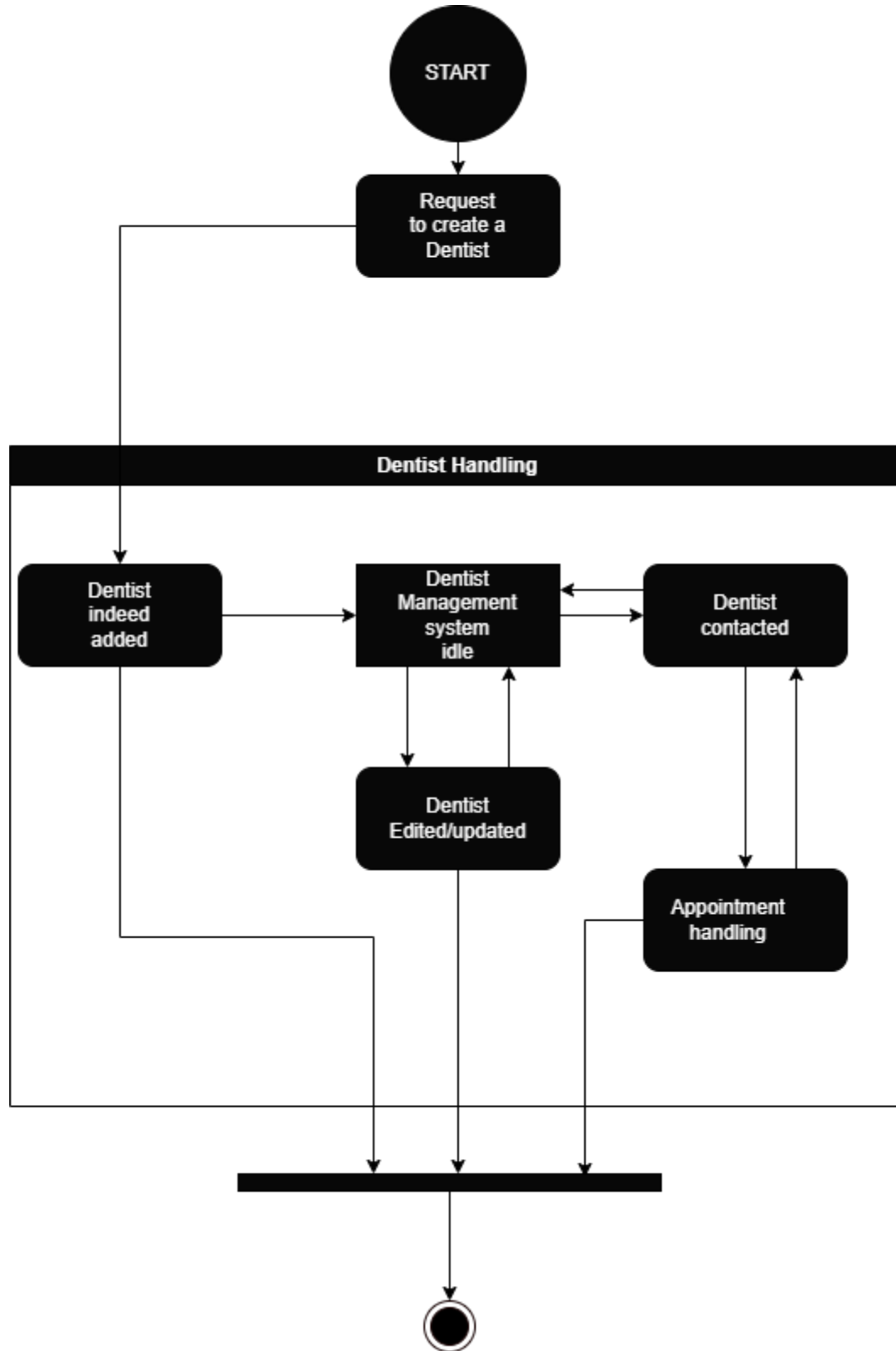
## 1.0 Change Password State Diagram



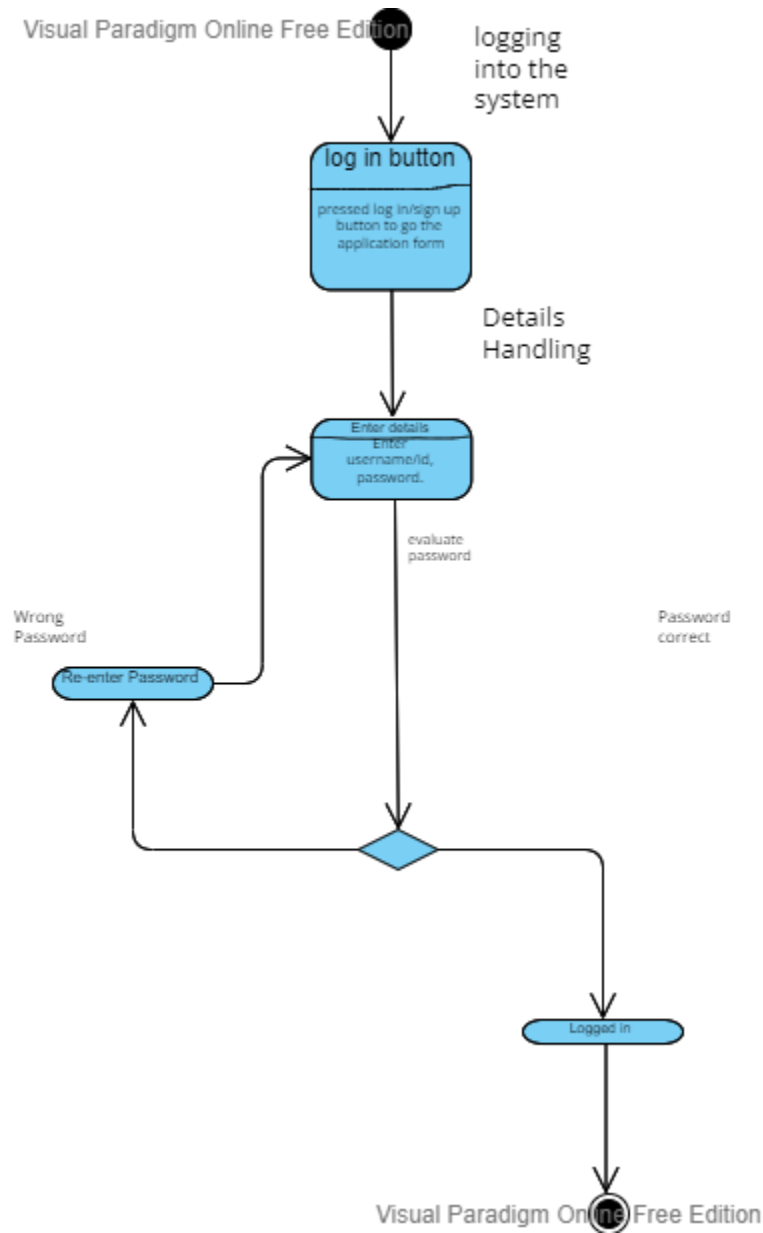
## 2.0 Check Calendar State Diagrams



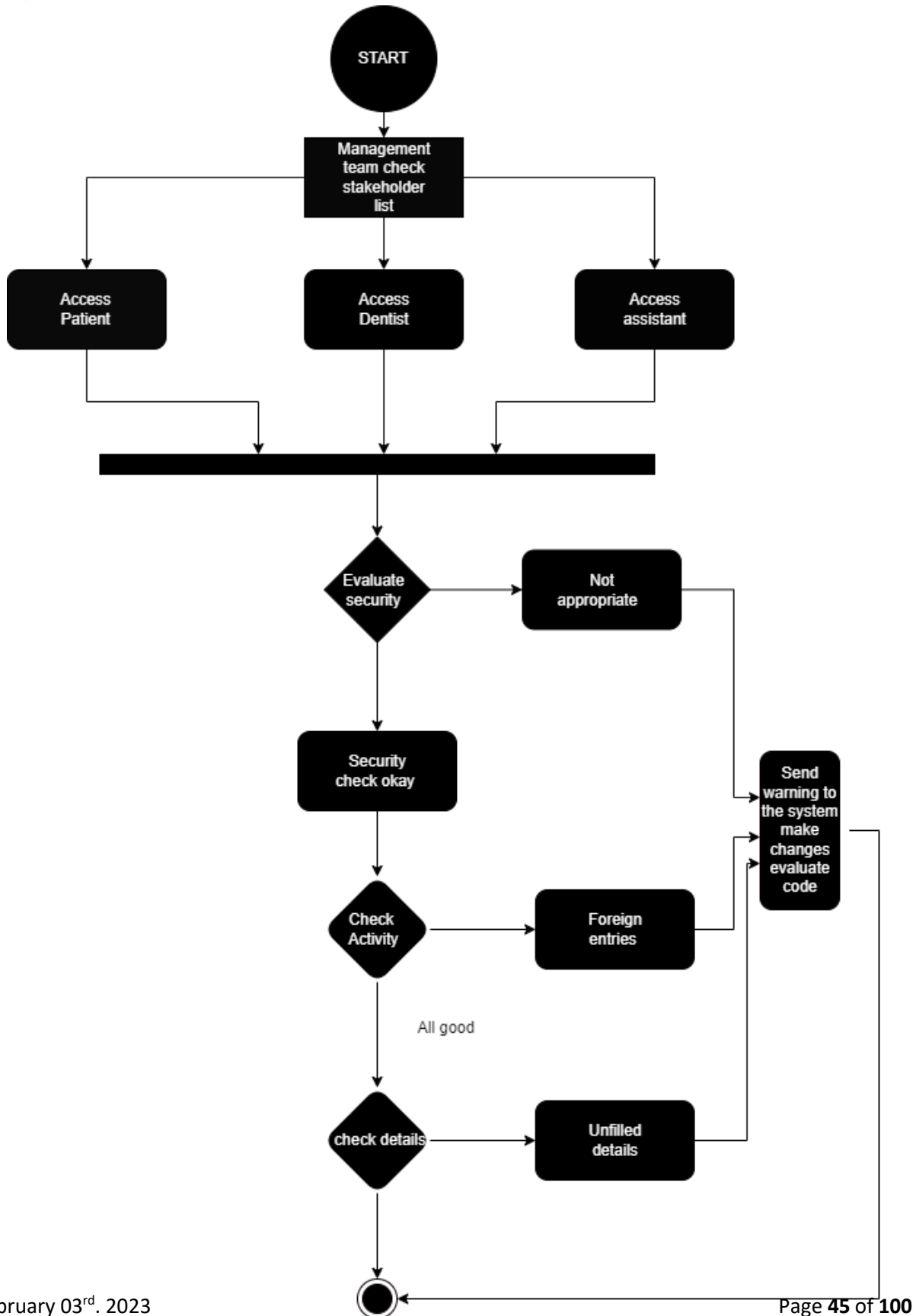
### 3.0 Dentist Handling



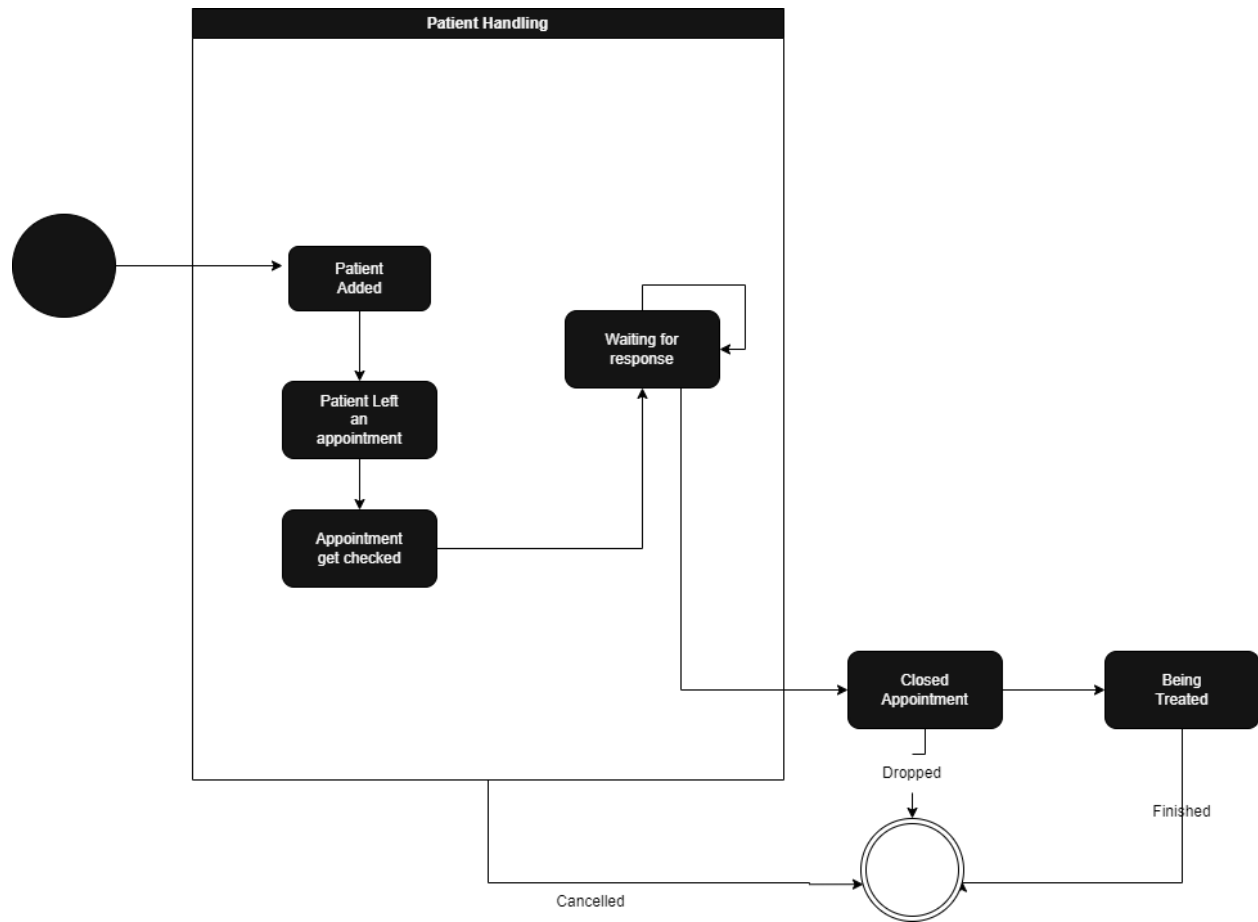
## 4.0 Logging Into The System State Diagram



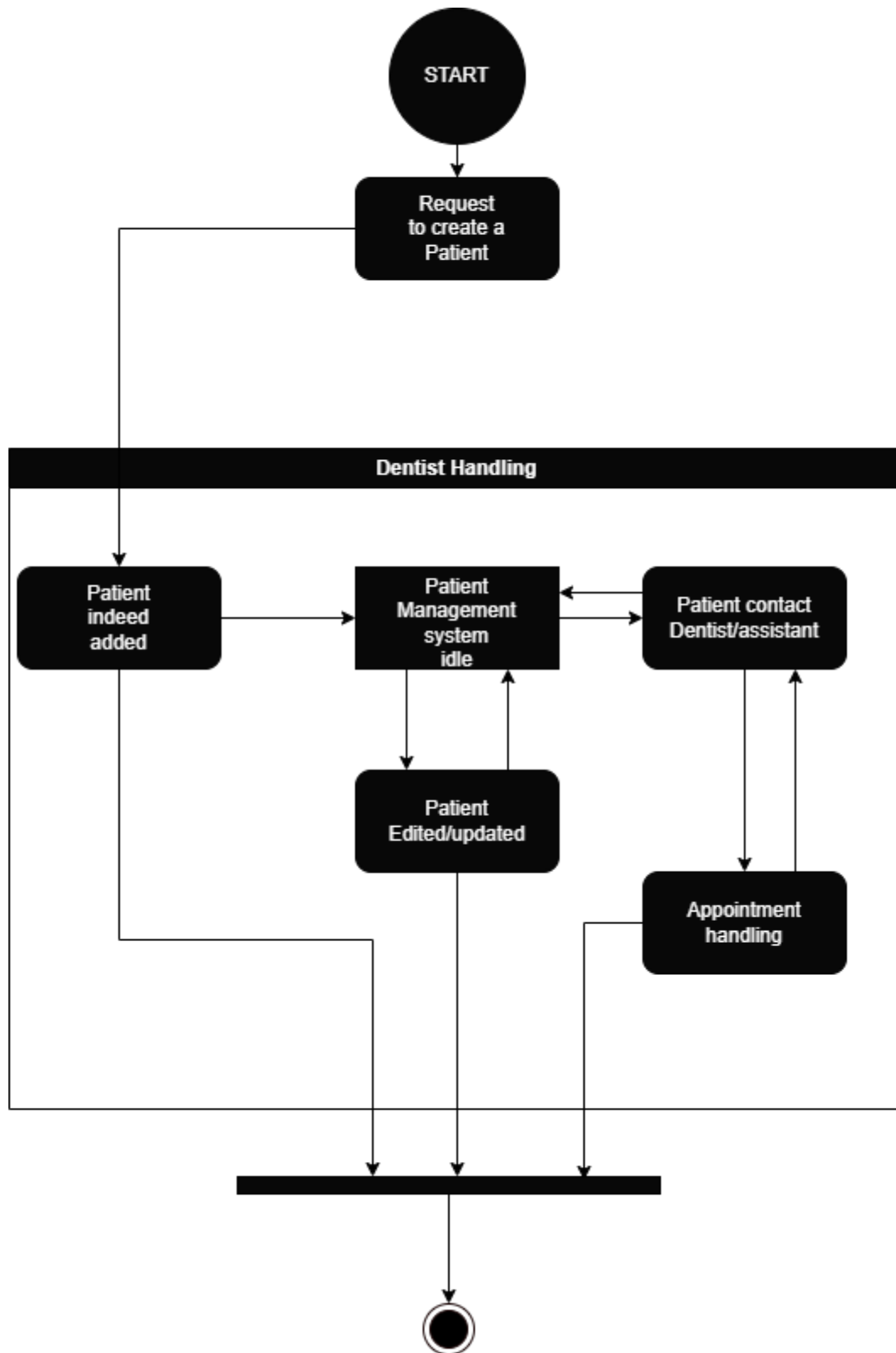
## 5.0 Management System Managing All The Other Stakeholders State Diagram



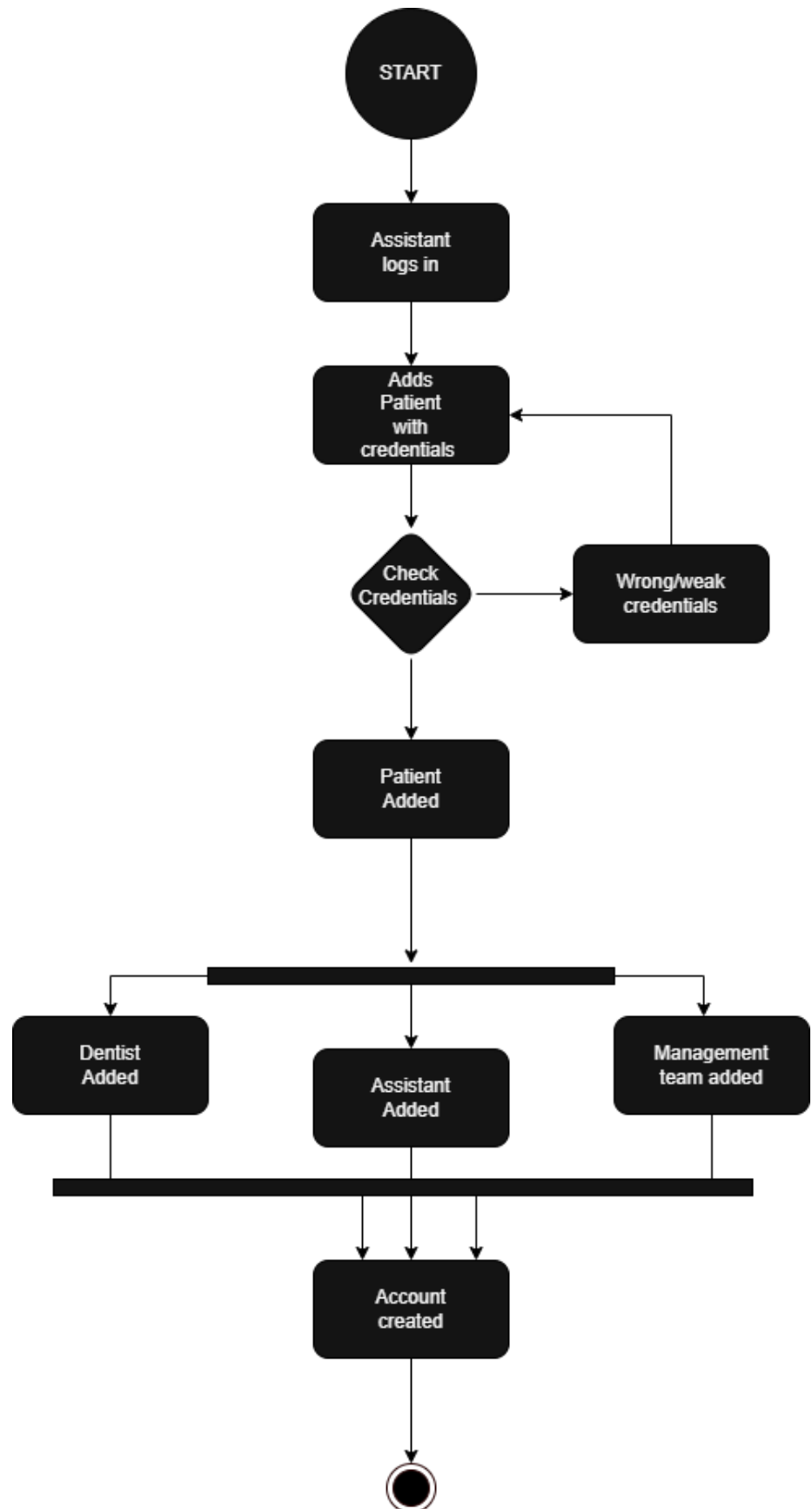
## 6.0 Patient Handling State Diagram



## 7.0 Patient Handling



## 8.0 Assistant Manages Patients

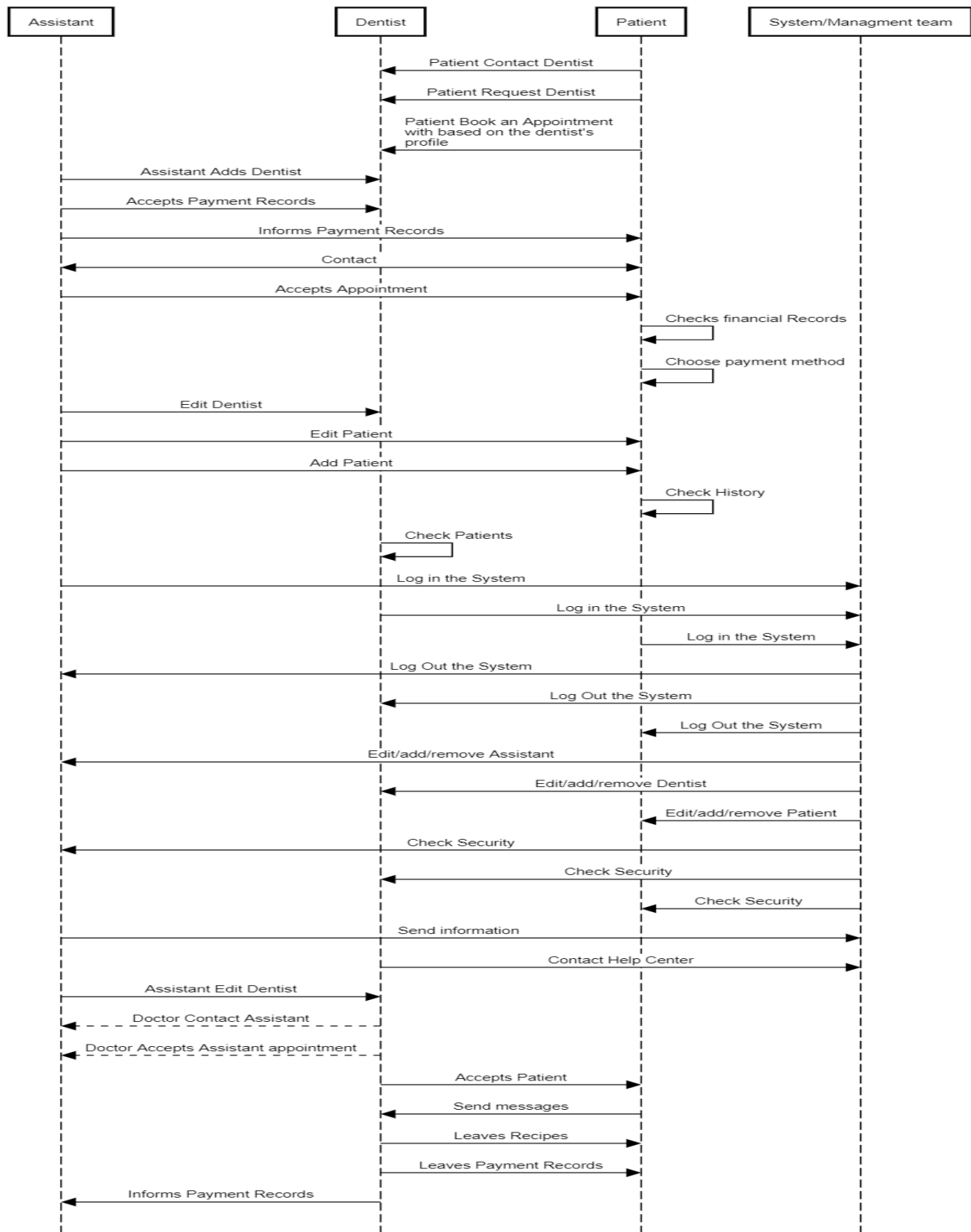




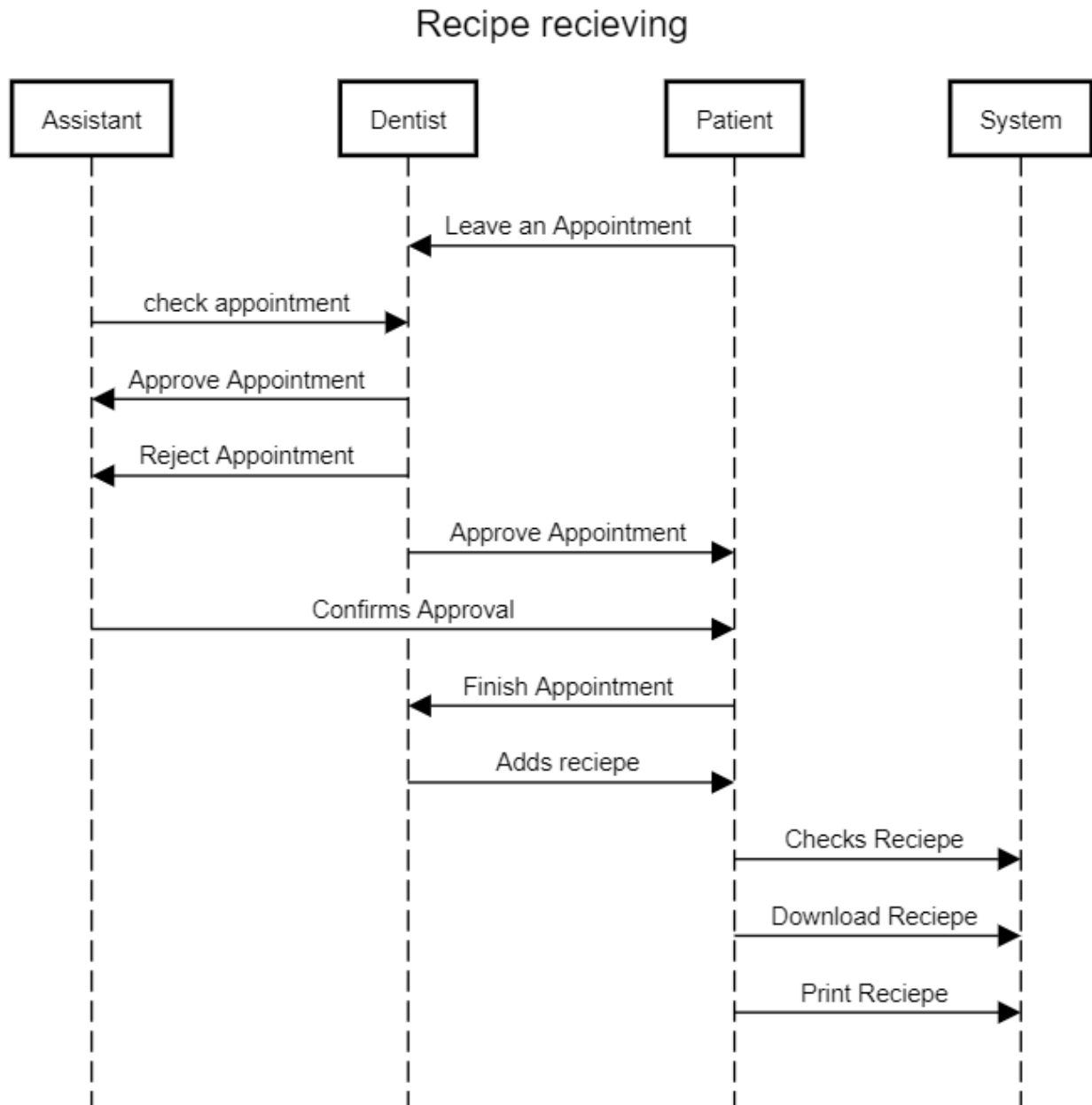
## Sequence Diagrams

## 1.0 Sequence diagram

Sequence Diagram of Activities

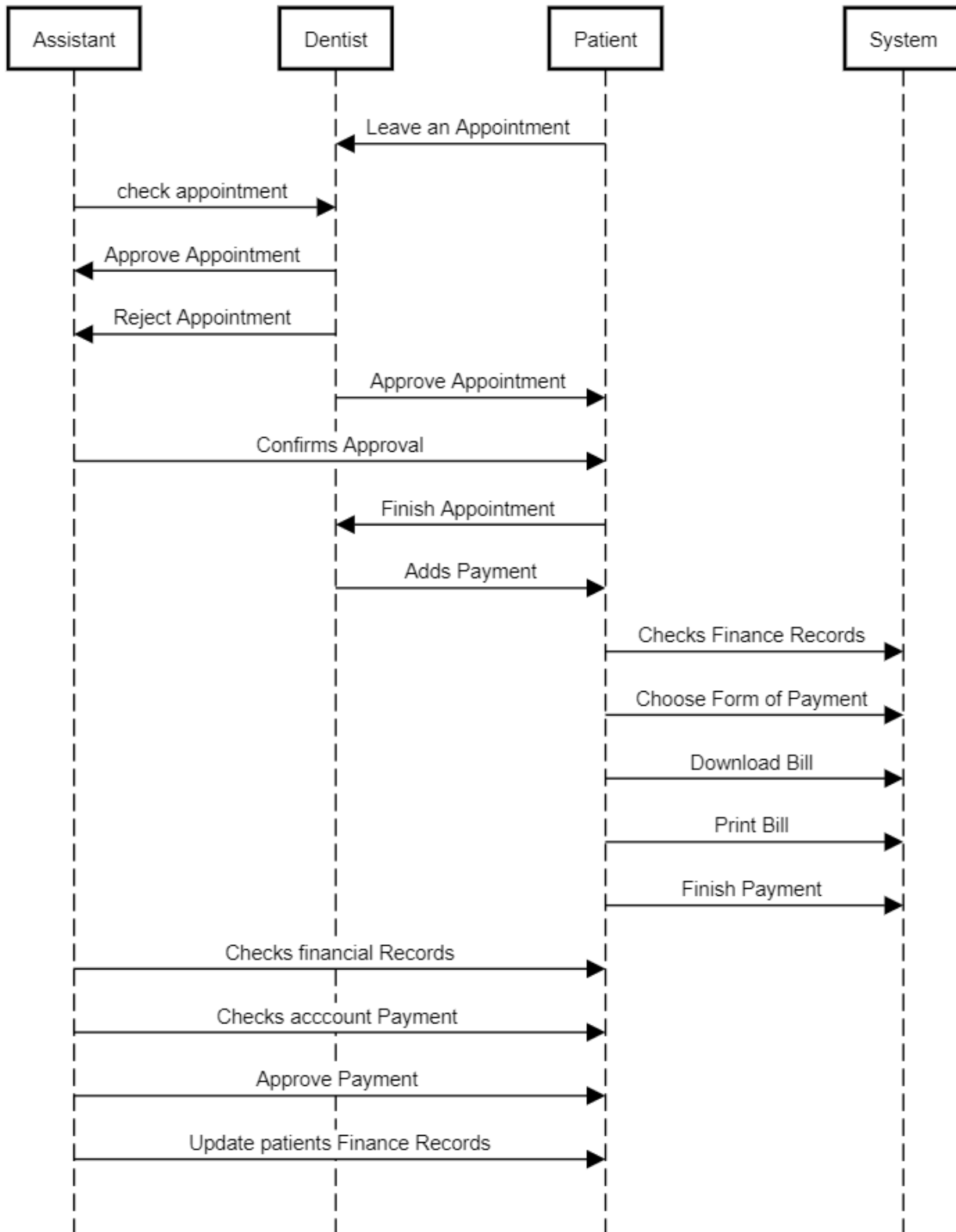


## 2.0 Bill Receiving Sequence DIAGRAM

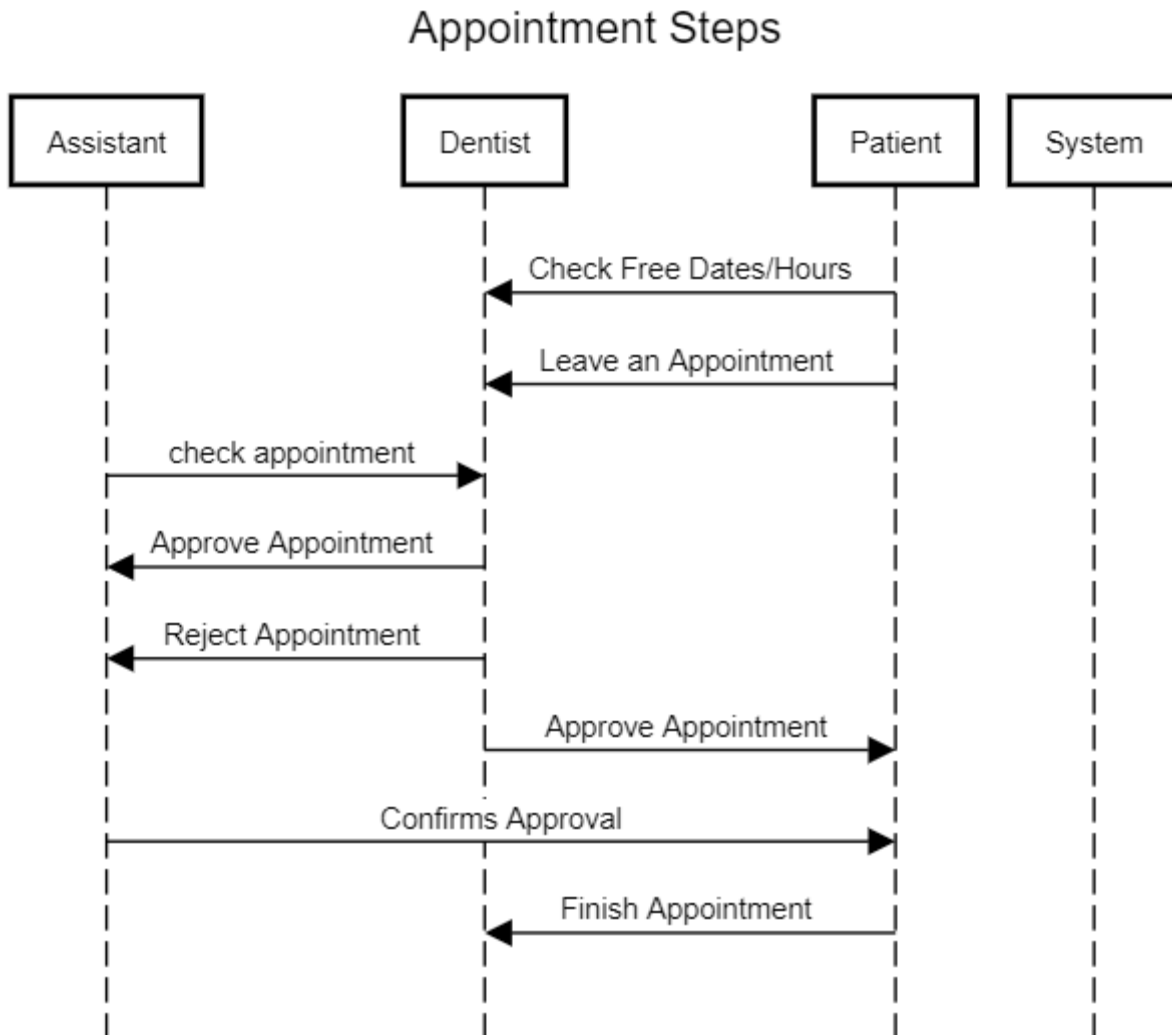


### 3.0 Payment Receiving

#### Payment receiving

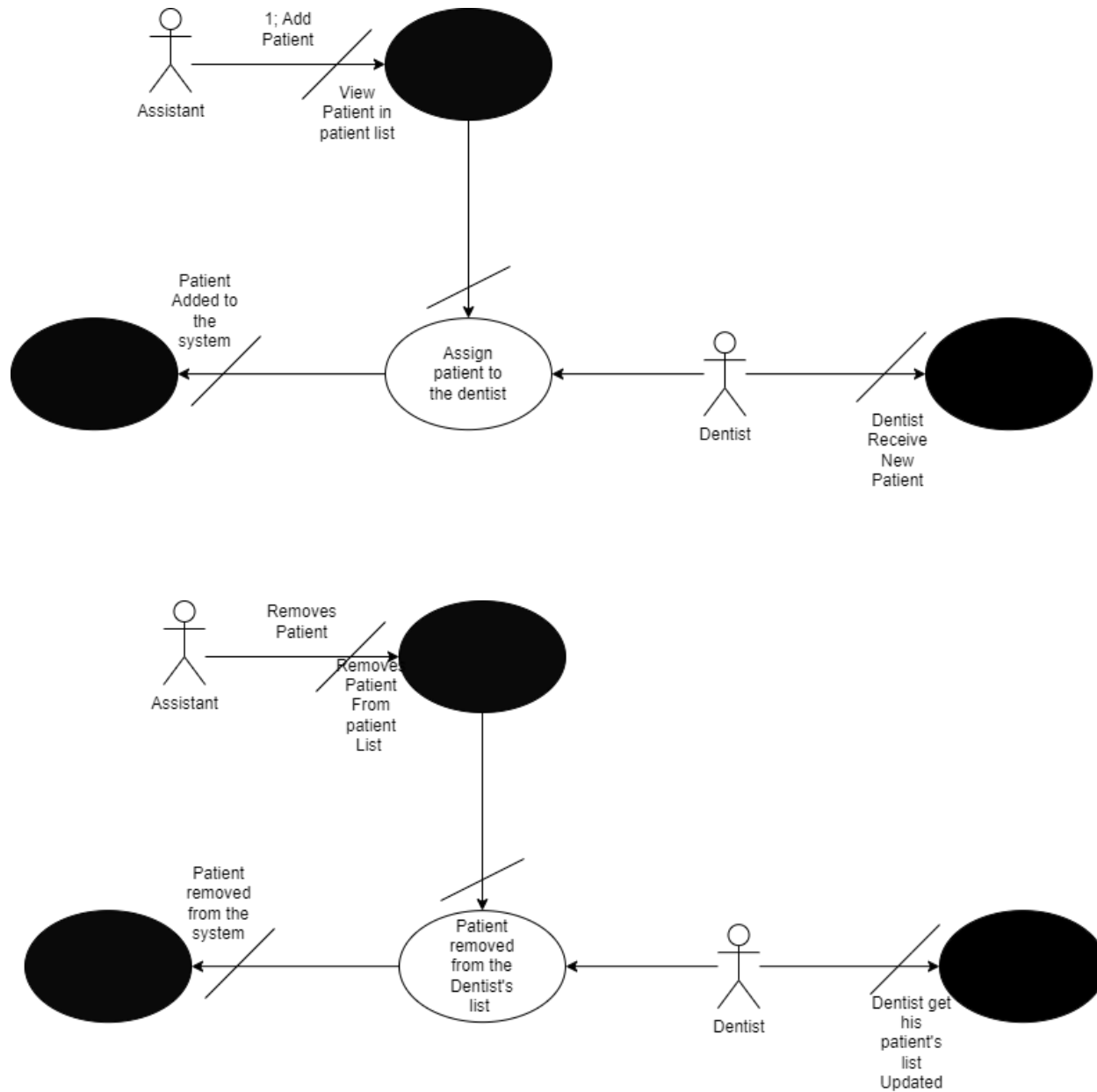


## 4.0 Appointment Steps Sequence Diagrams

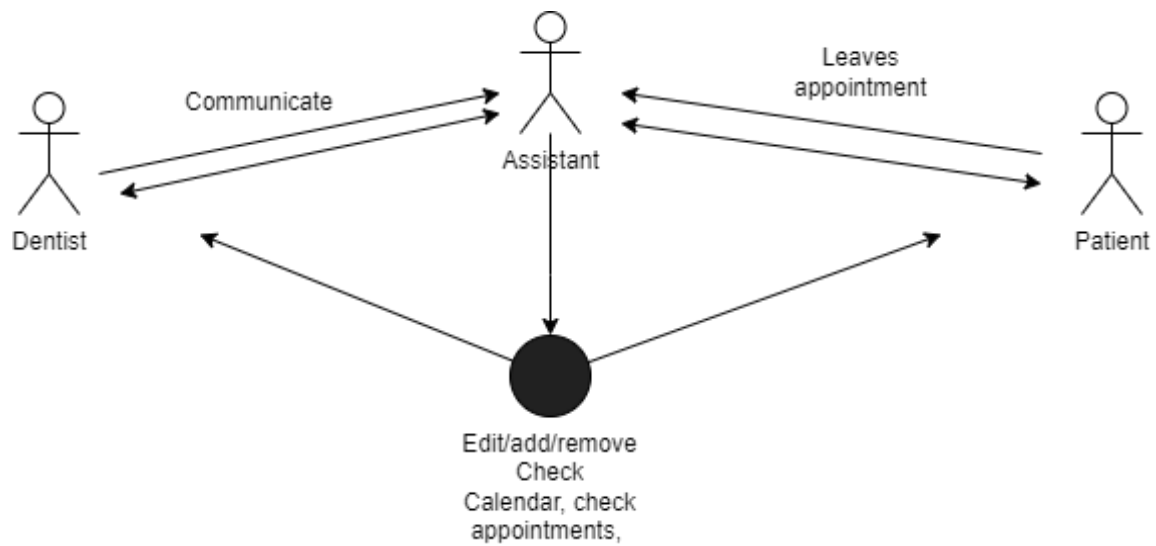


## Collaboration Diagrams

## 1.0 Assistant And Its Collaboration

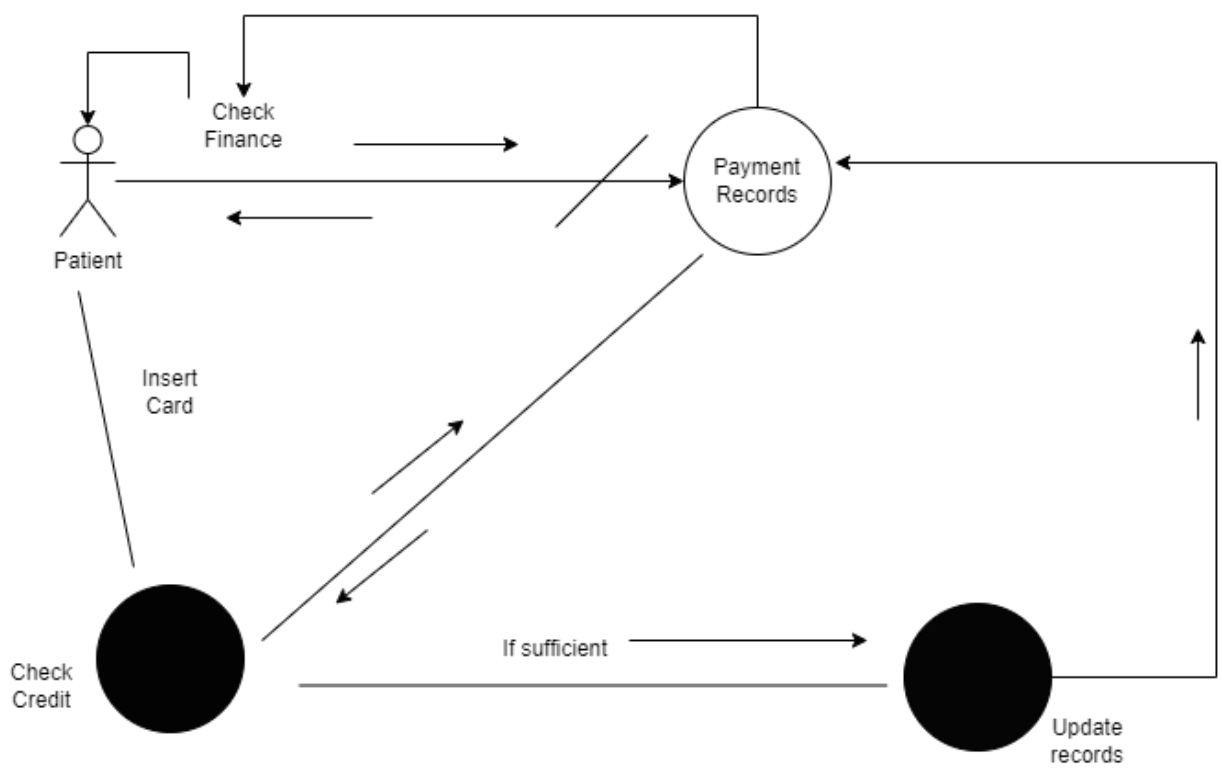


## 2.0 Dentist Patient Collaboration Diagram

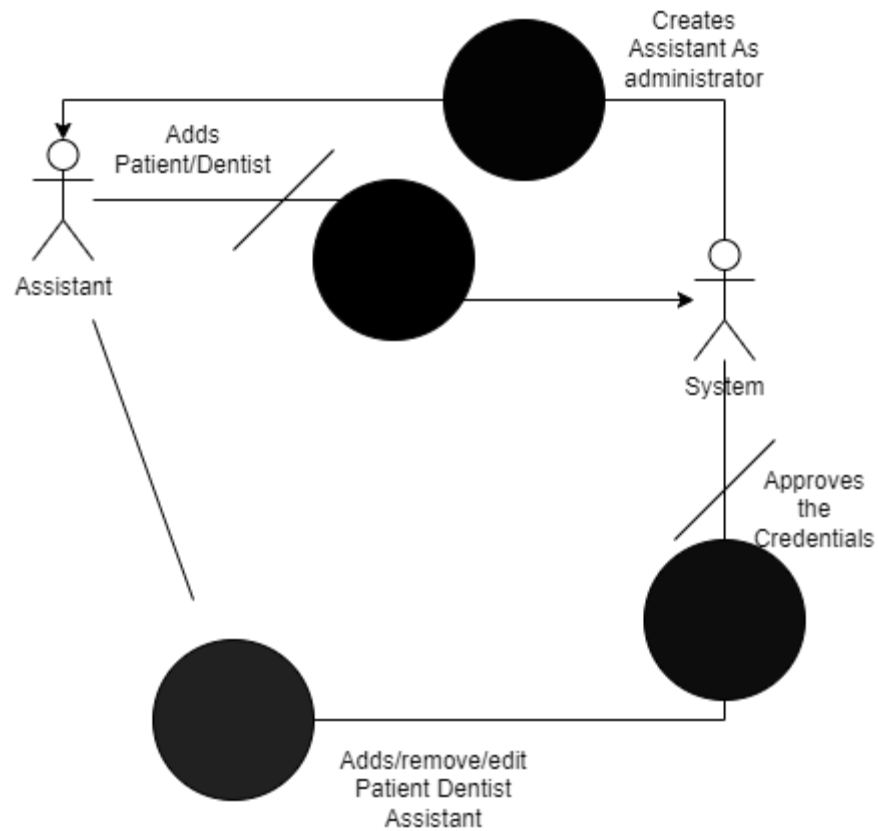


## 3.0 Patient Payments Collaboration Diagram

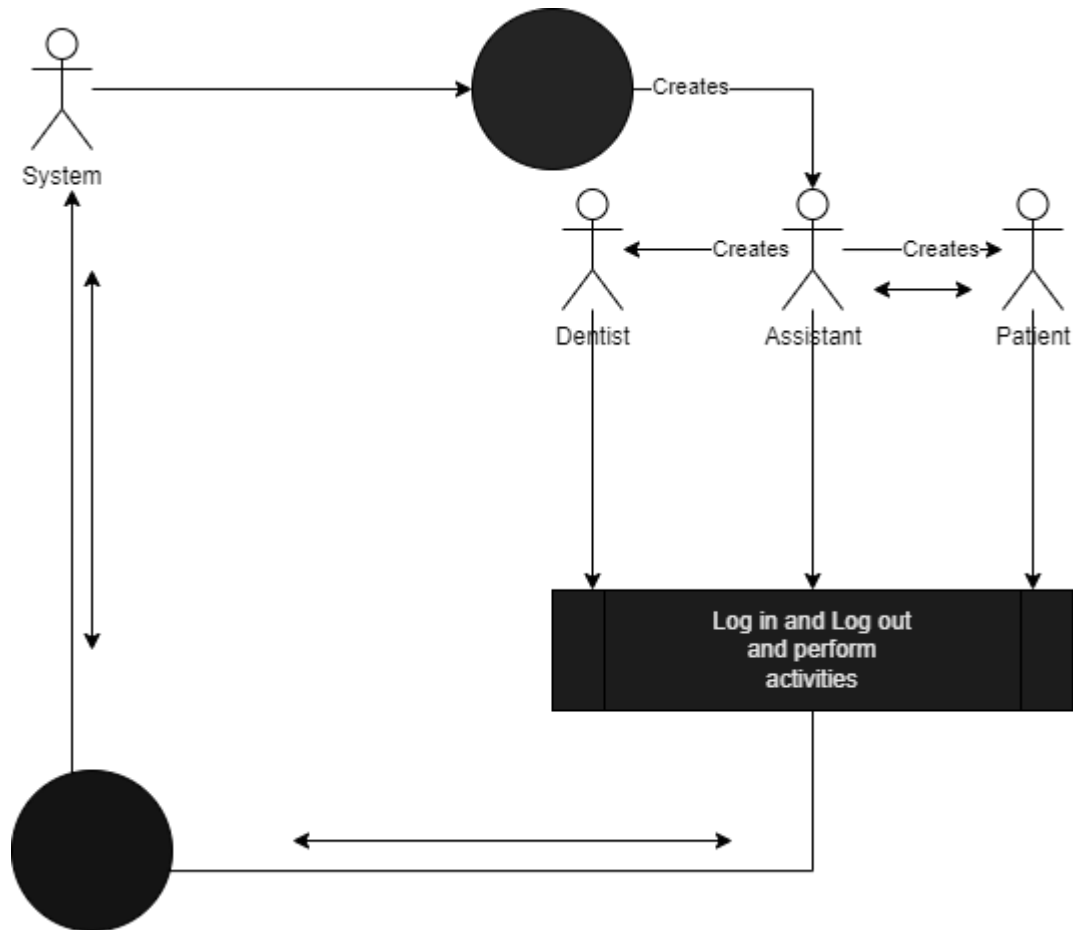




## 4.0 System And Assistant Collaboration Diagram

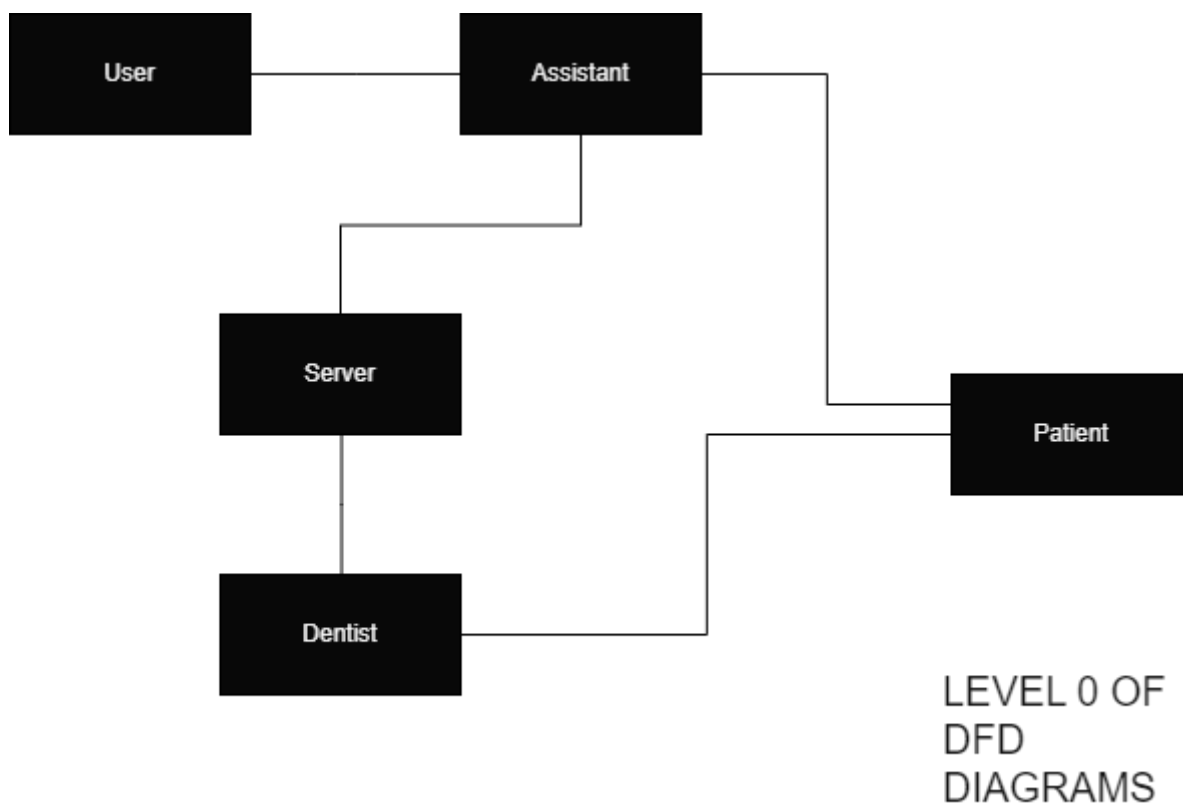


## 5.0 System Collaboration Diagram

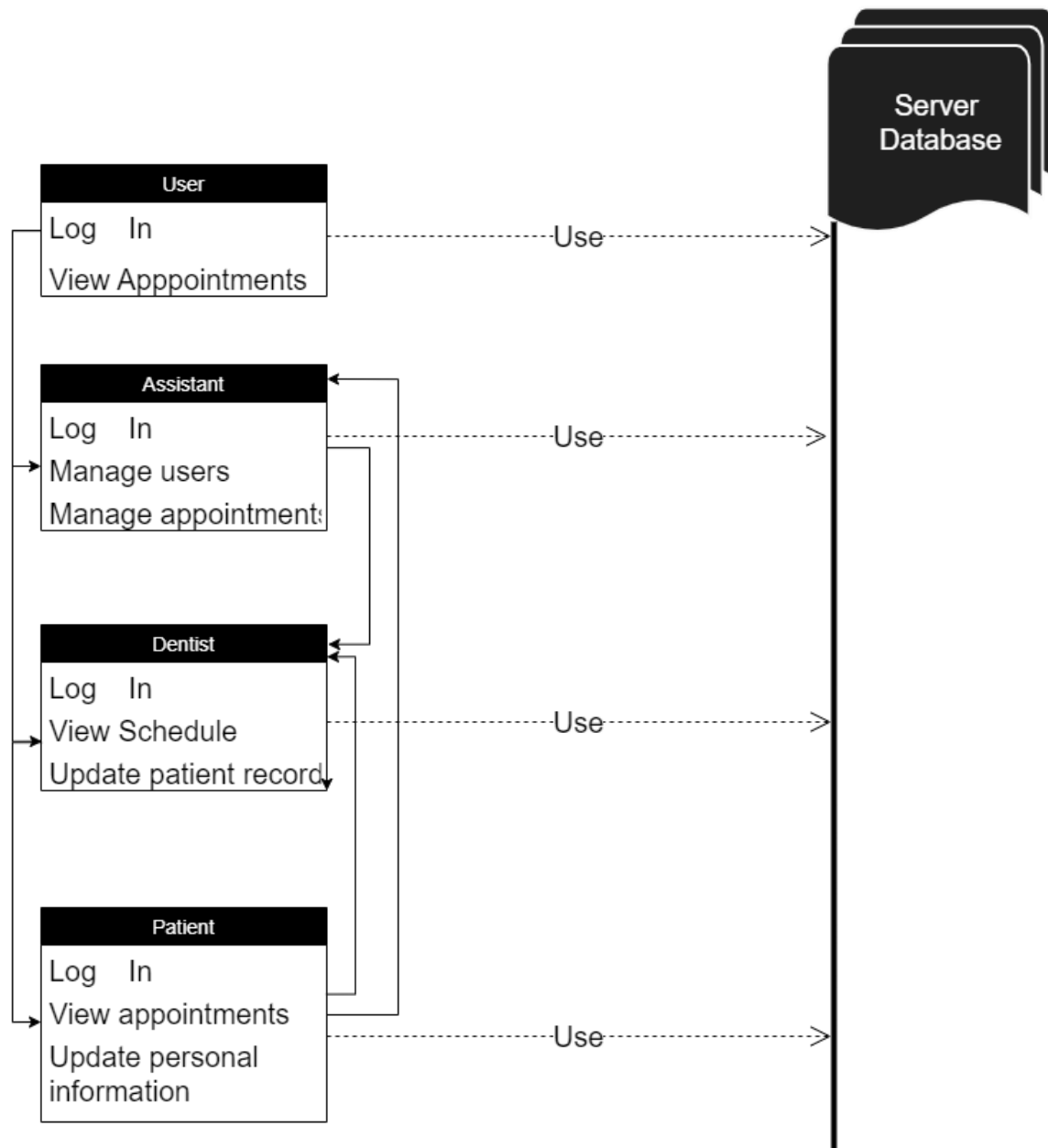


## Data Flow Diagrams (DFDs)

## 1.0 Level 0 Of DFD

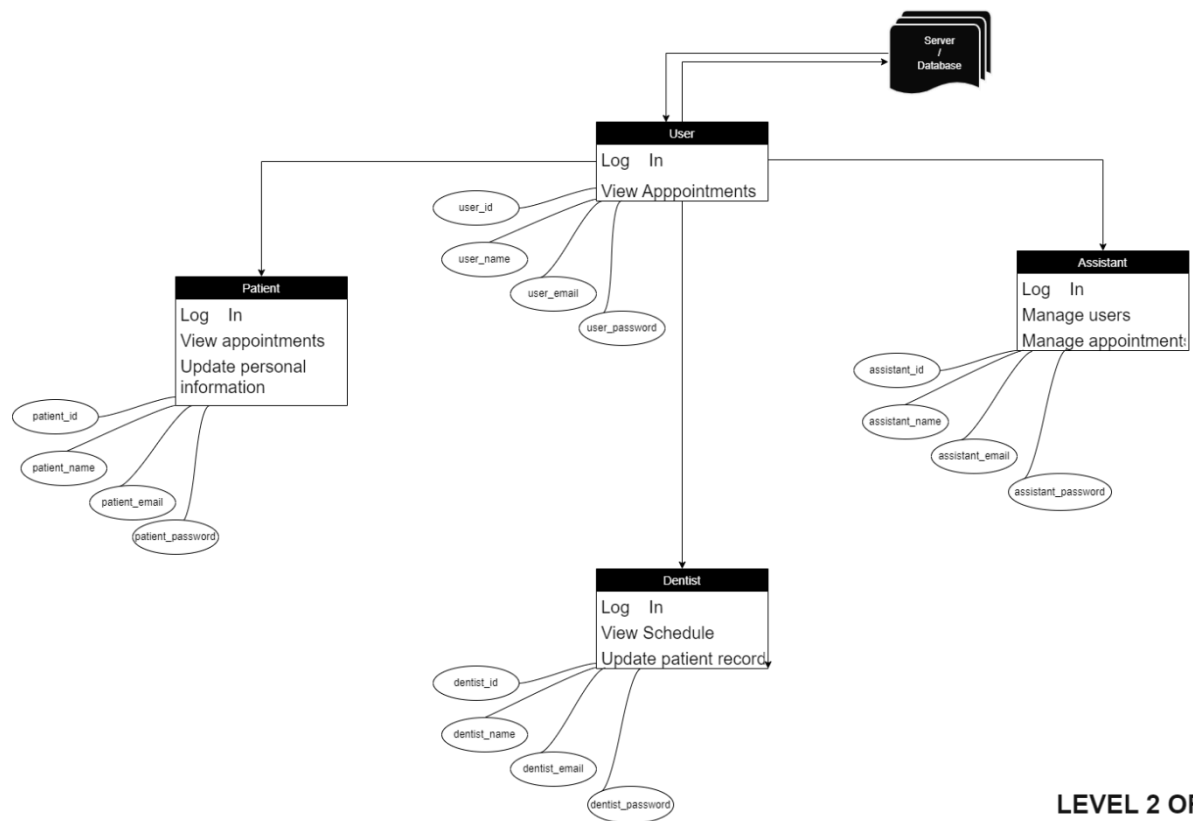


## 2.0 1<sup>st</sup> Level of DFD



LEVEL 1 OF  
DFD  
DIAGRAMS

### 3.0 2<sup>nd</sup> Level of DFD

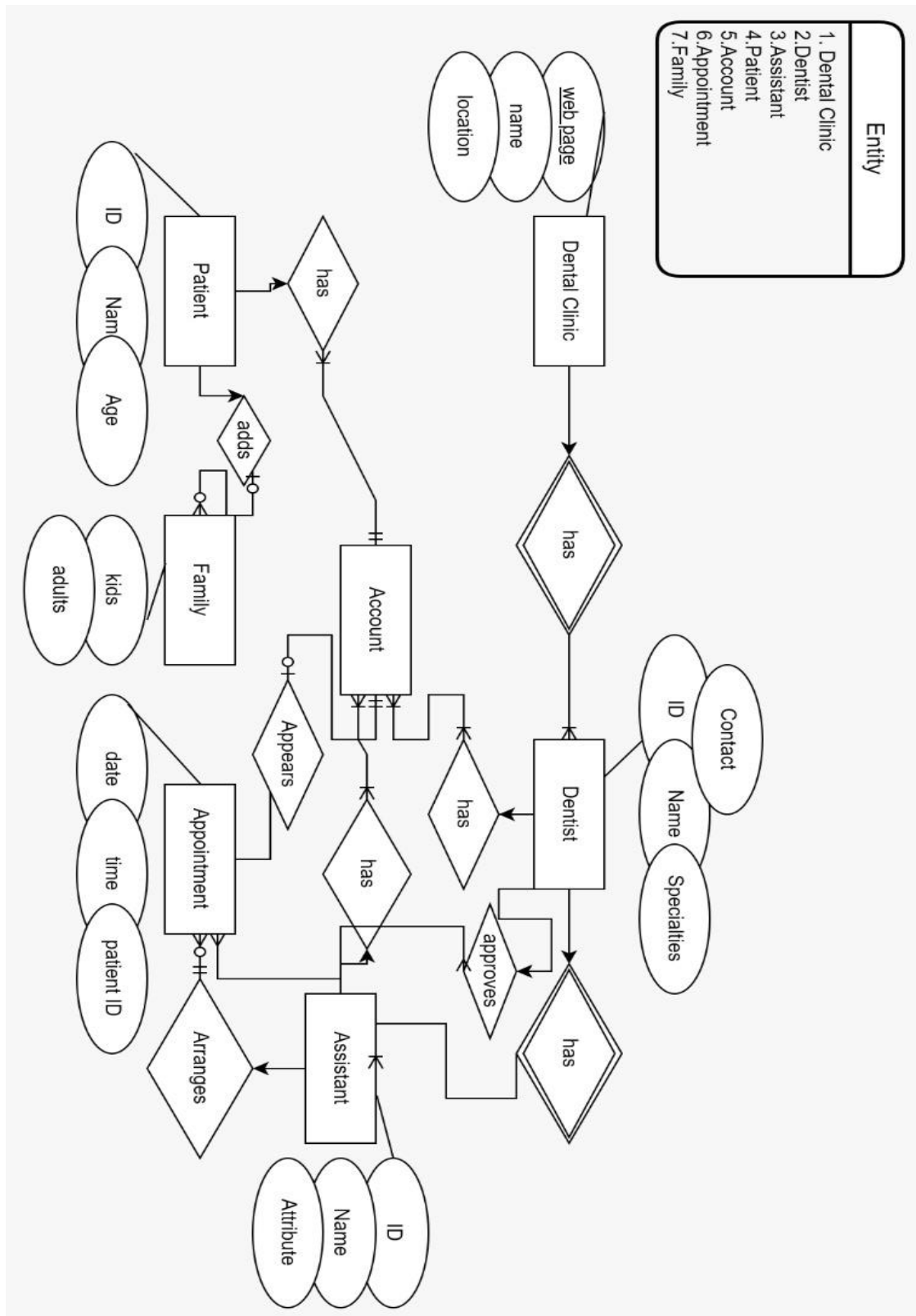


**LEVEL 2 OF  
DFD  
DIAGRAMS**

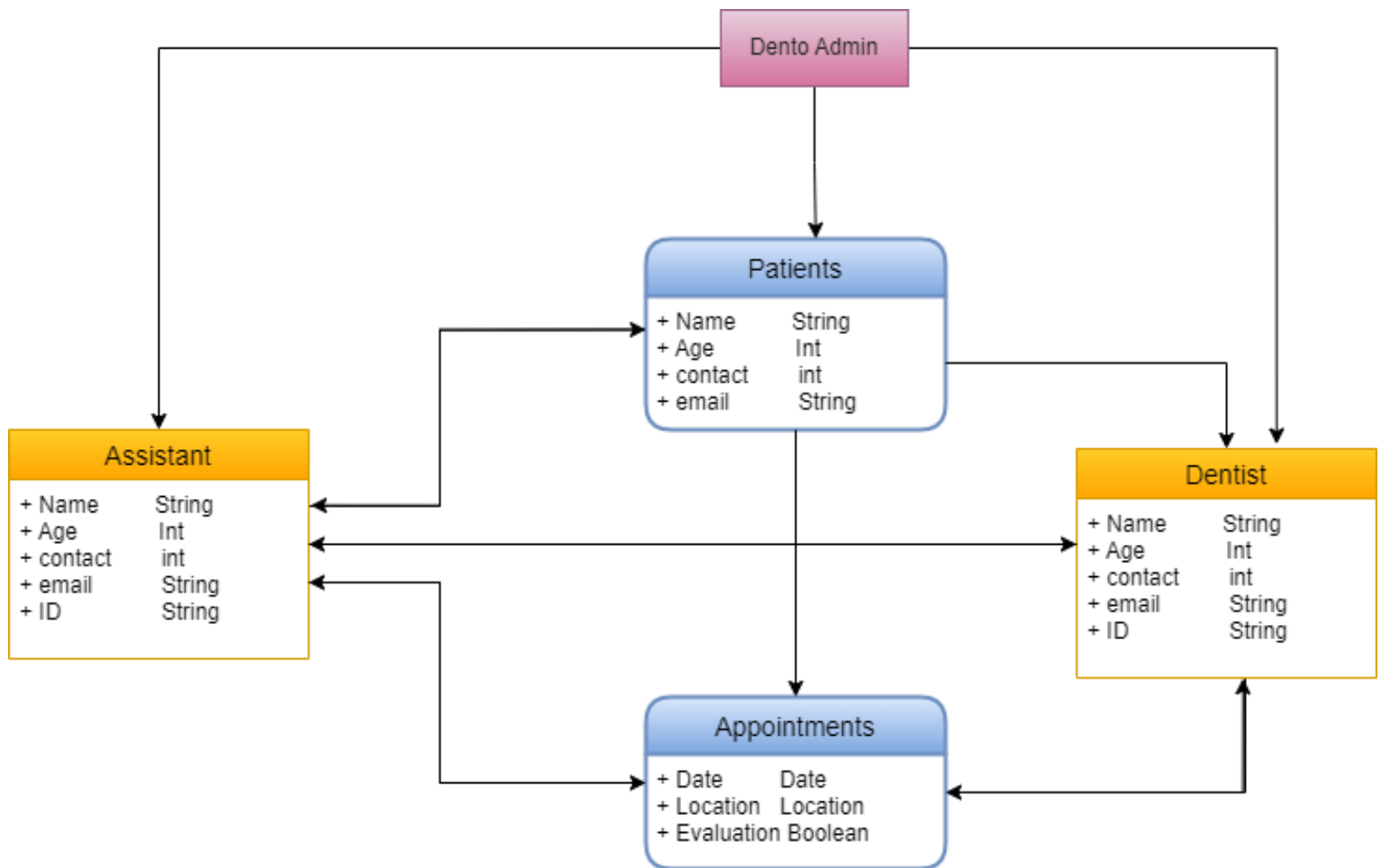
## Entity Relation Diagram



## 1.0 Entities Relations



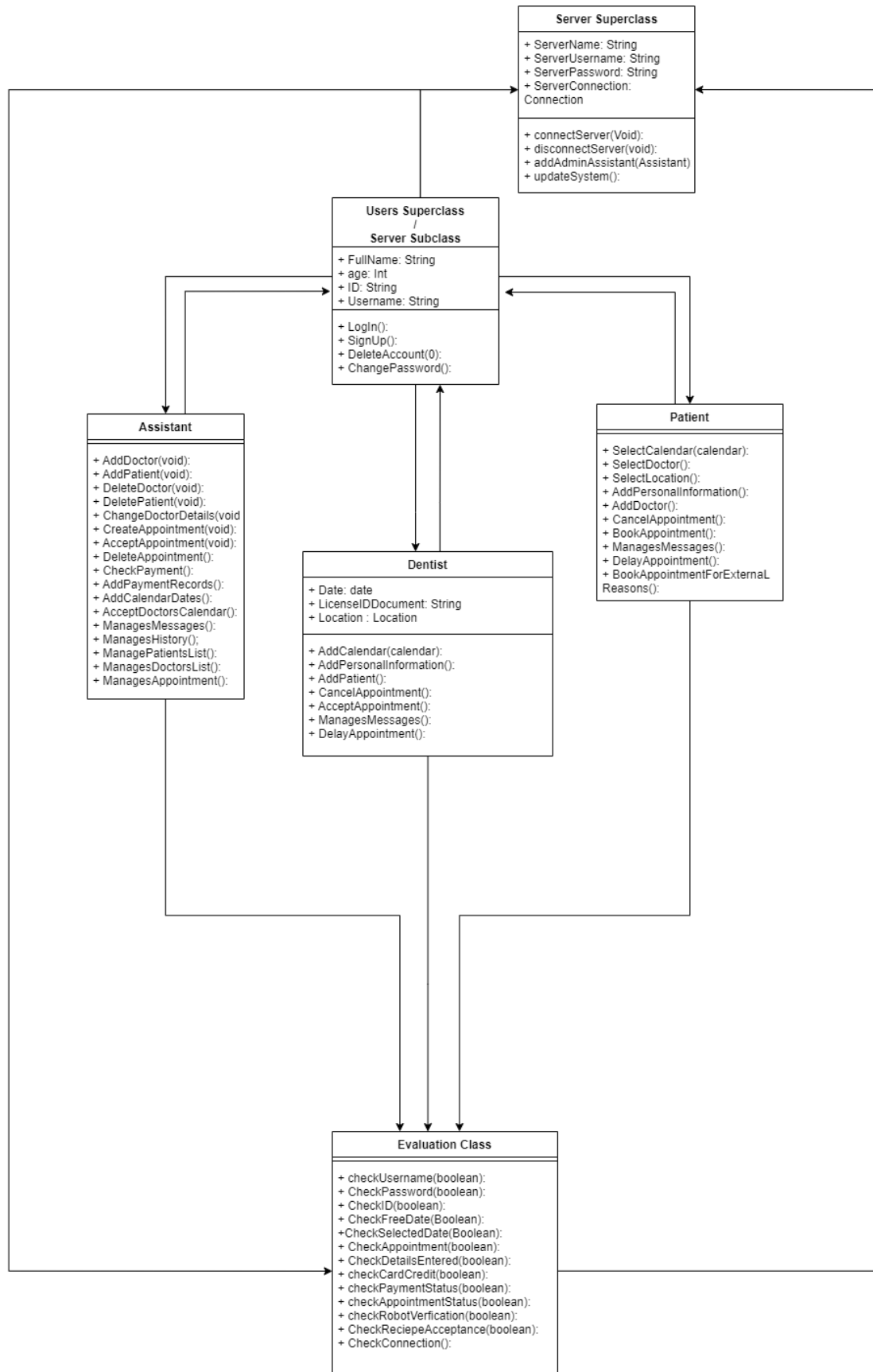
## 2.0 Database Schema



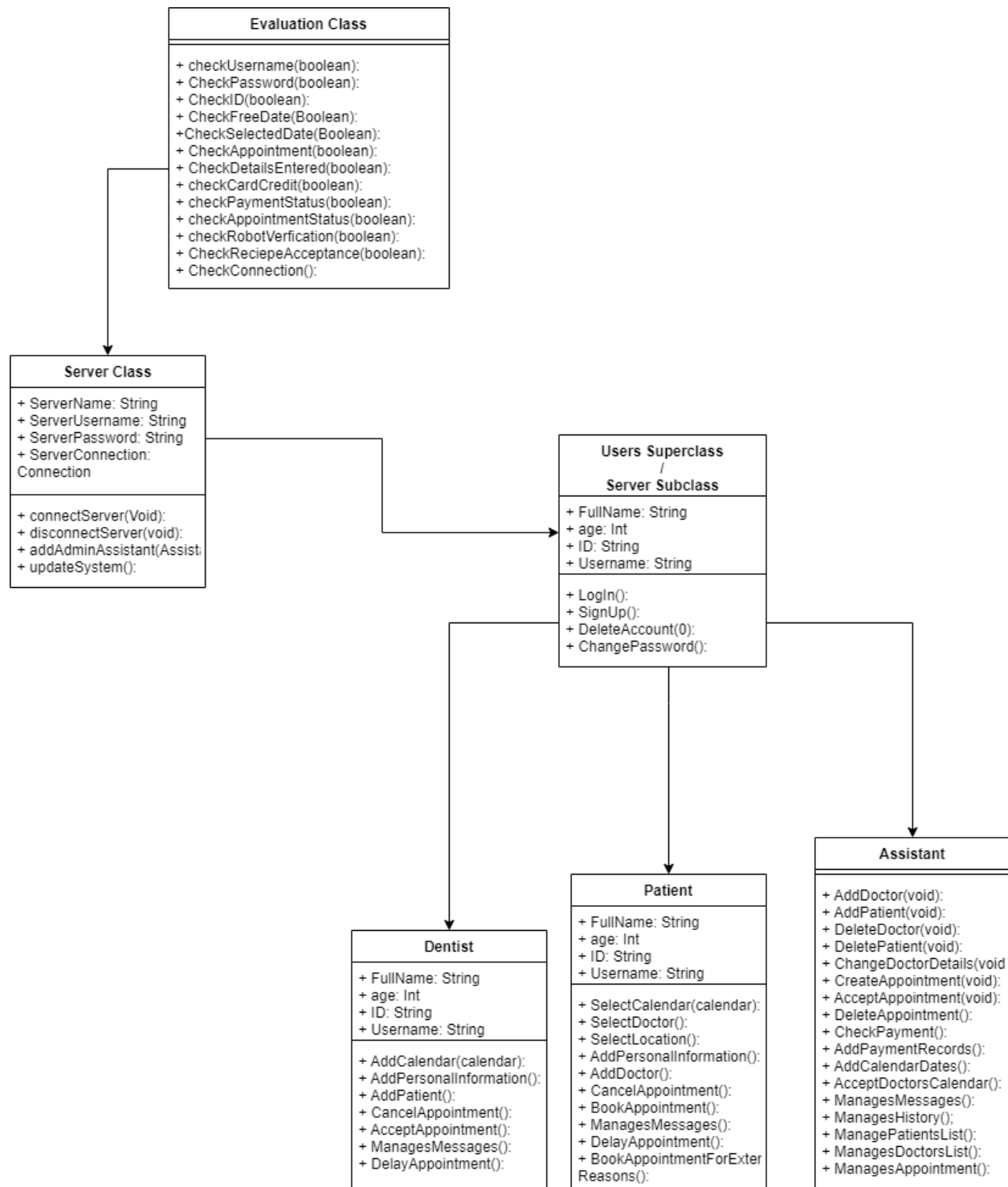
## STRUCTURAL DIAGRAMS

### Class Diagrams

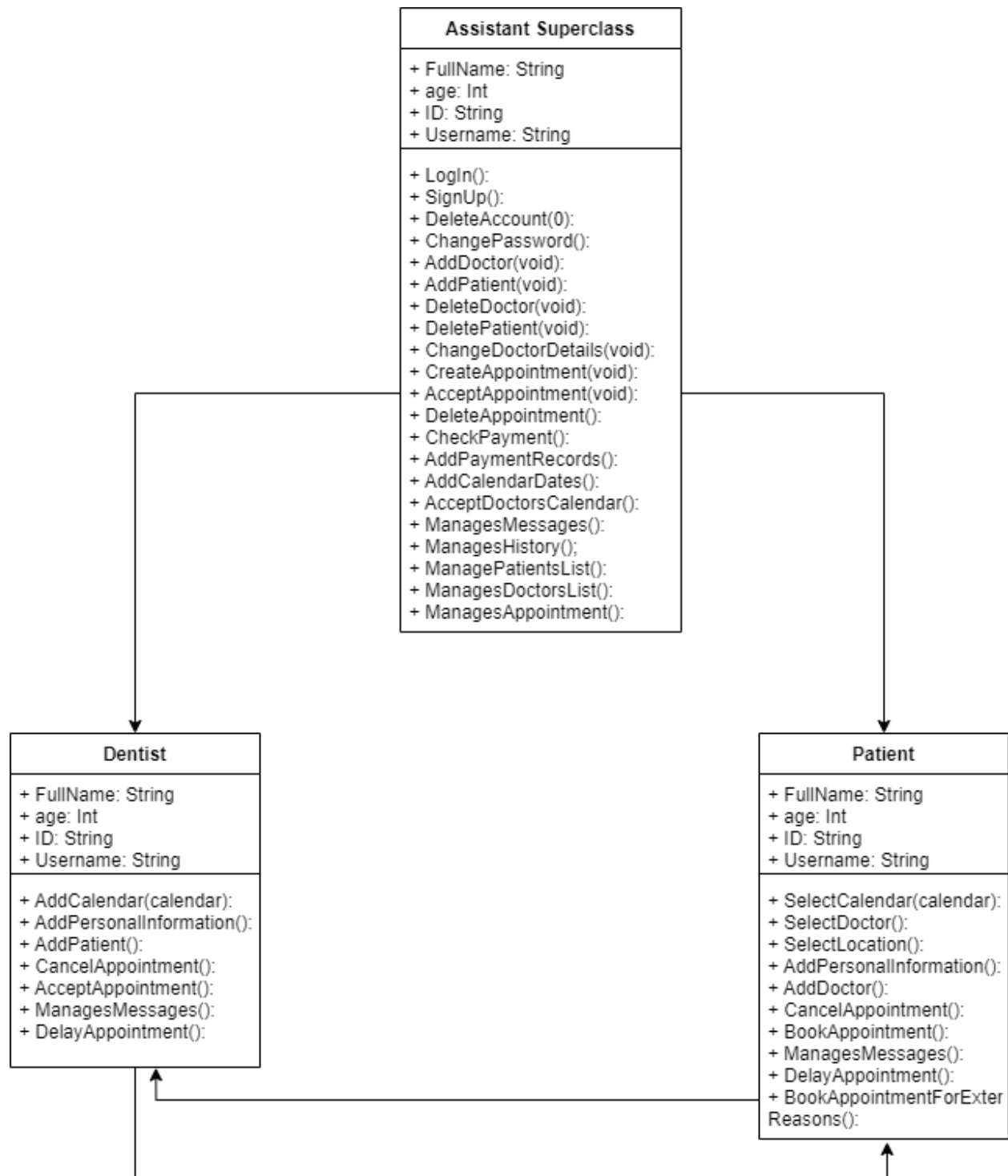
## 1.0 Generalized Class Diagram



## 2.0 Evaluation Diagram And The Dependencies Coming From It

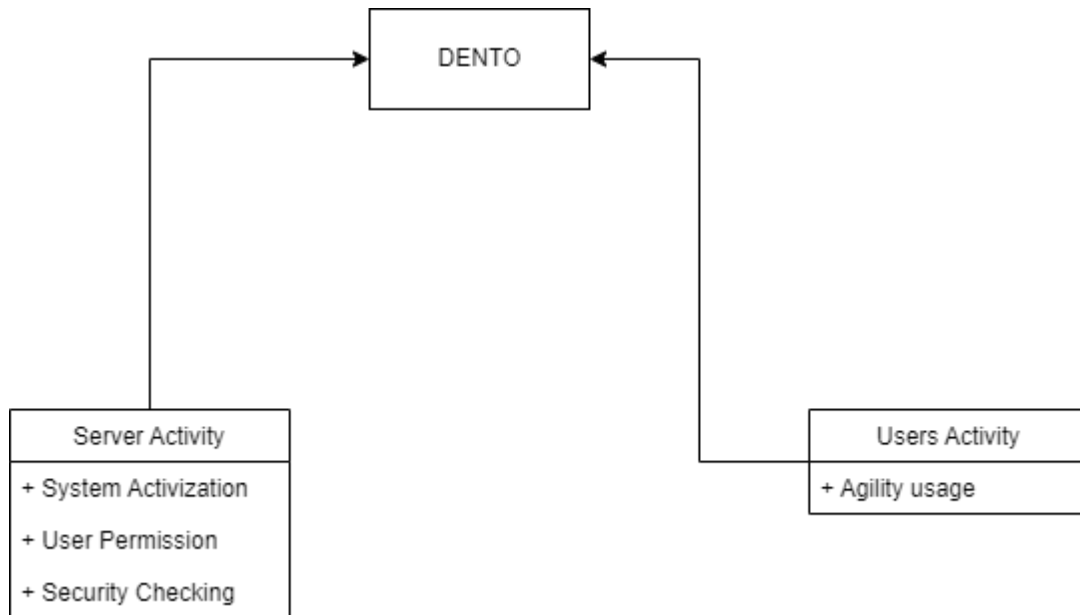


### 3.0 Assistant class And the Dependencies Coming out of it



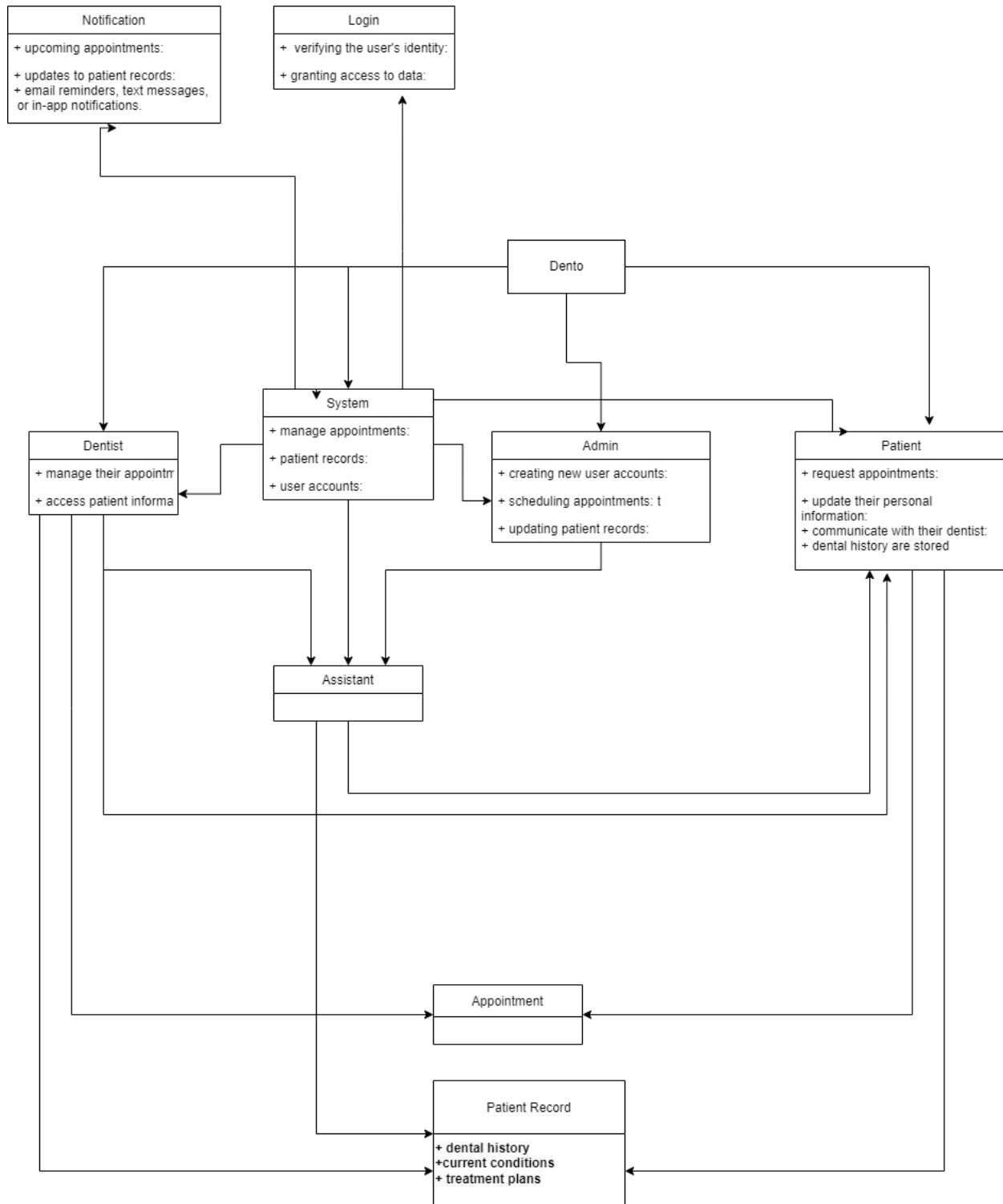
## Object Diagrams

## 1.0 Generalized Object Diagram Level 0



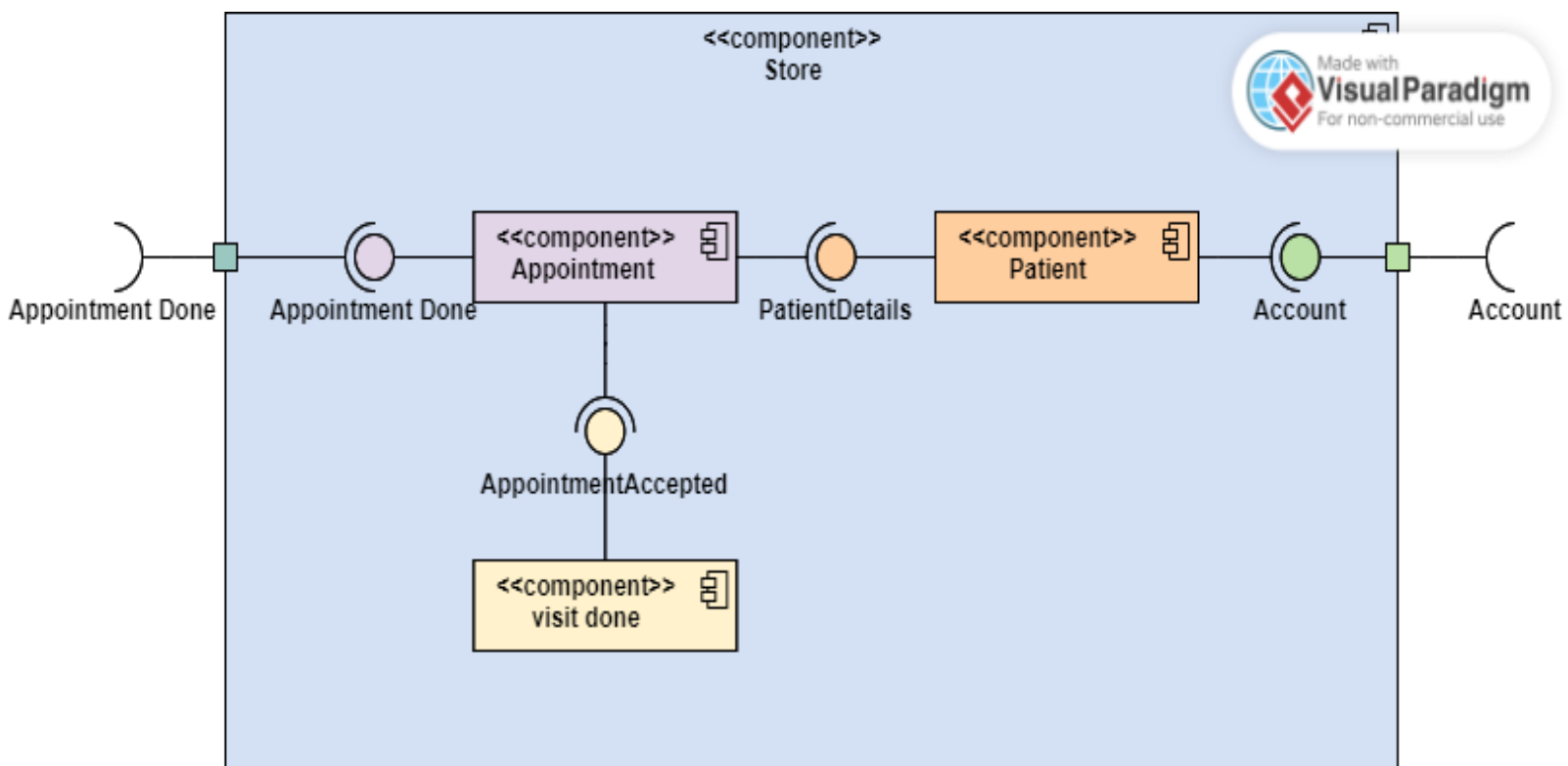


## 2.0 Detailed Object Diagram 1<sup>st</sup> Level.

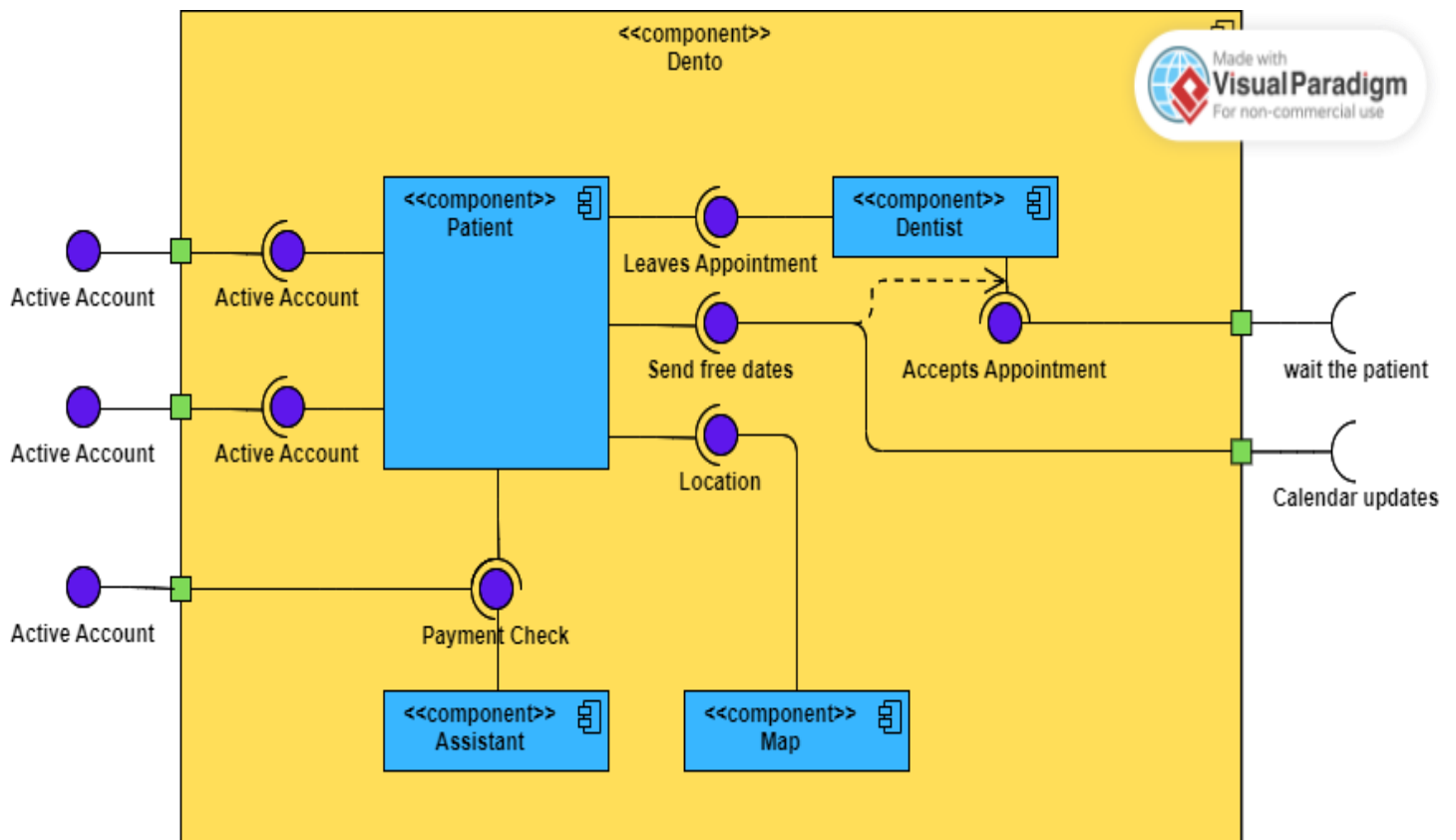


## Component Diagrams

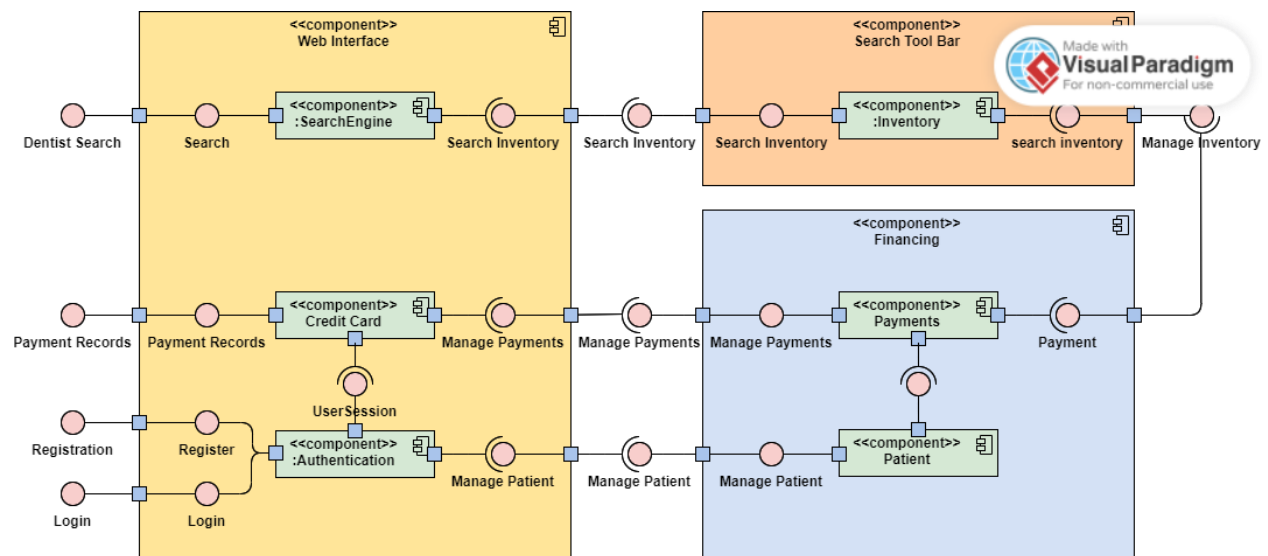
## 1.0 Appointment Component Diagram



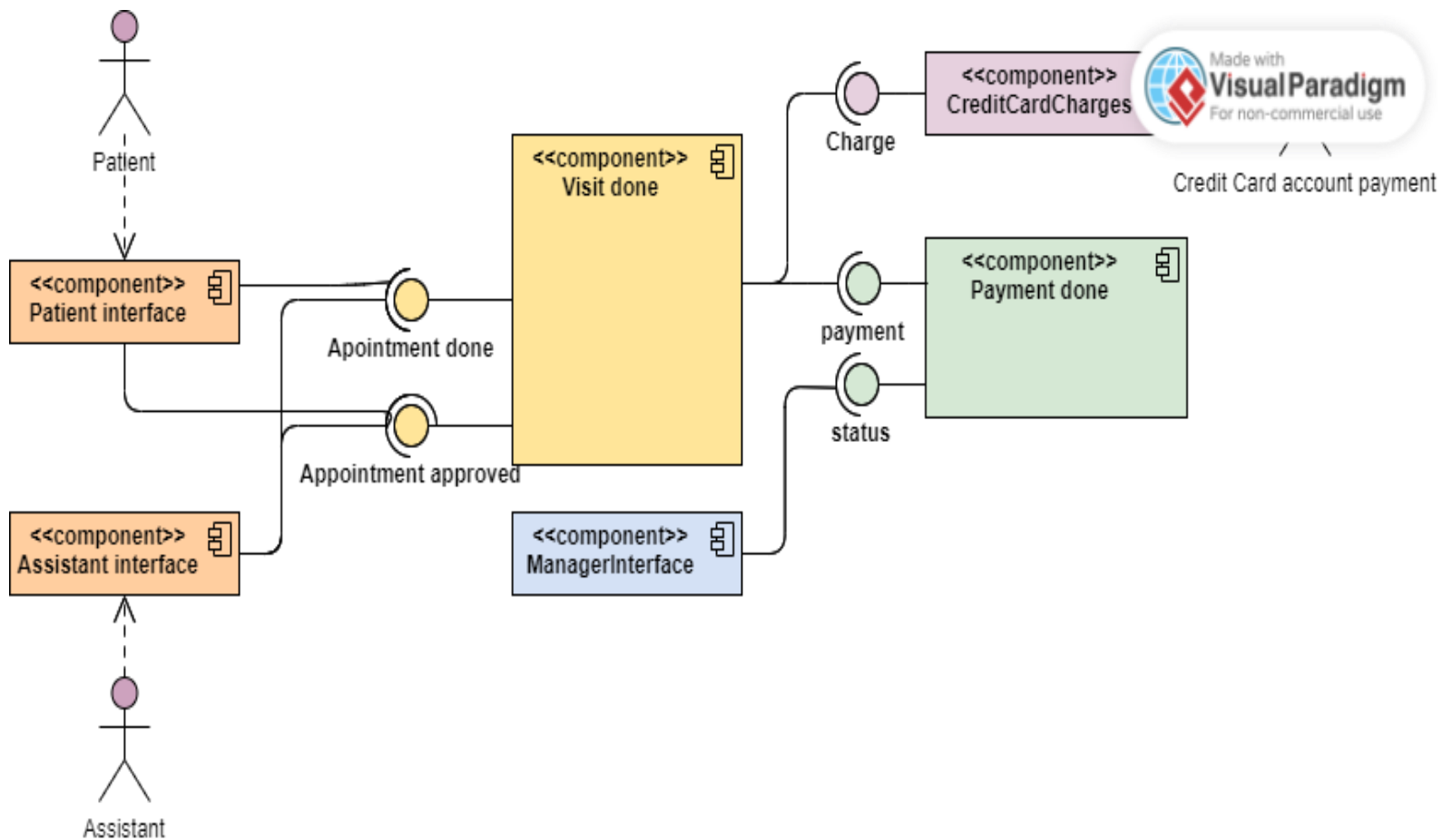
## 2.0 Dento's Account Component Diagram



### 3.0 Finance and Registration, Search Component

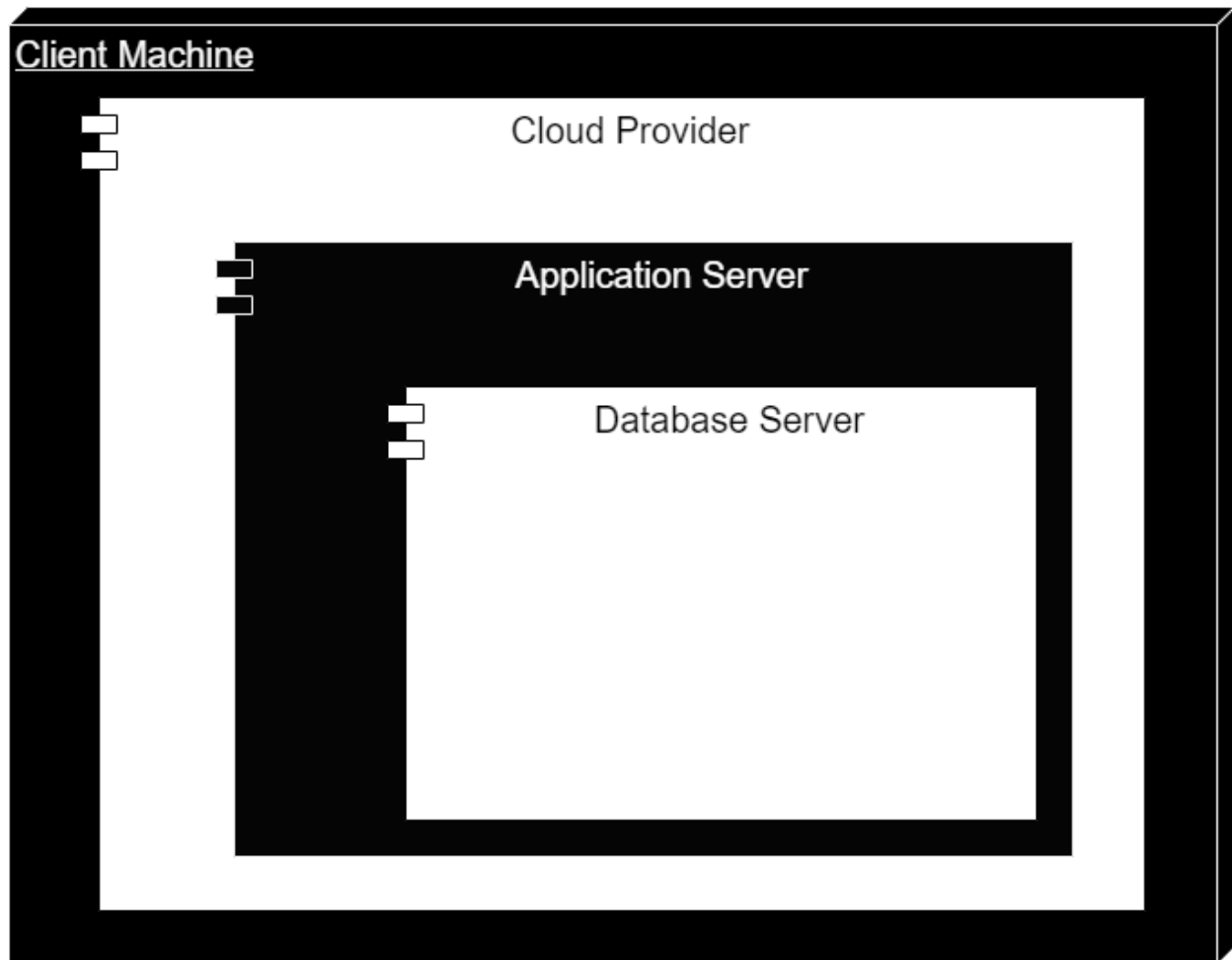


## 4.0 Payment and Recovery Component Diagram



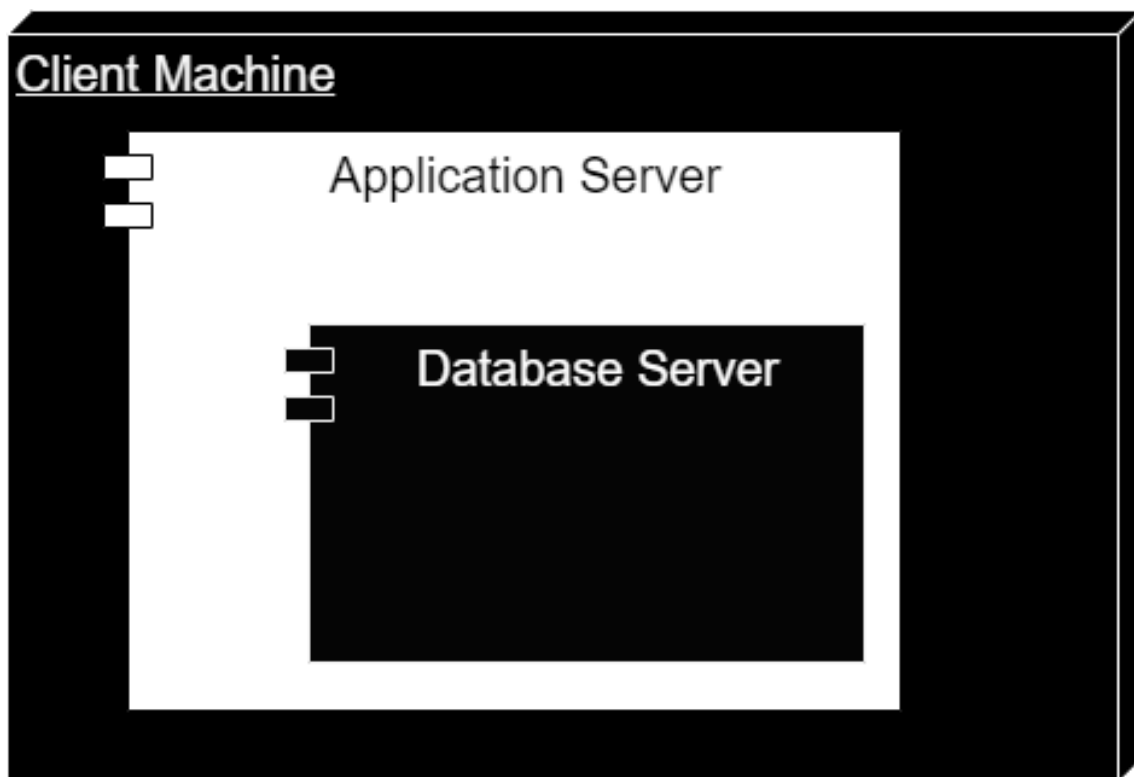
## Deployment Diagram

## 1.0 Cloud Deployment

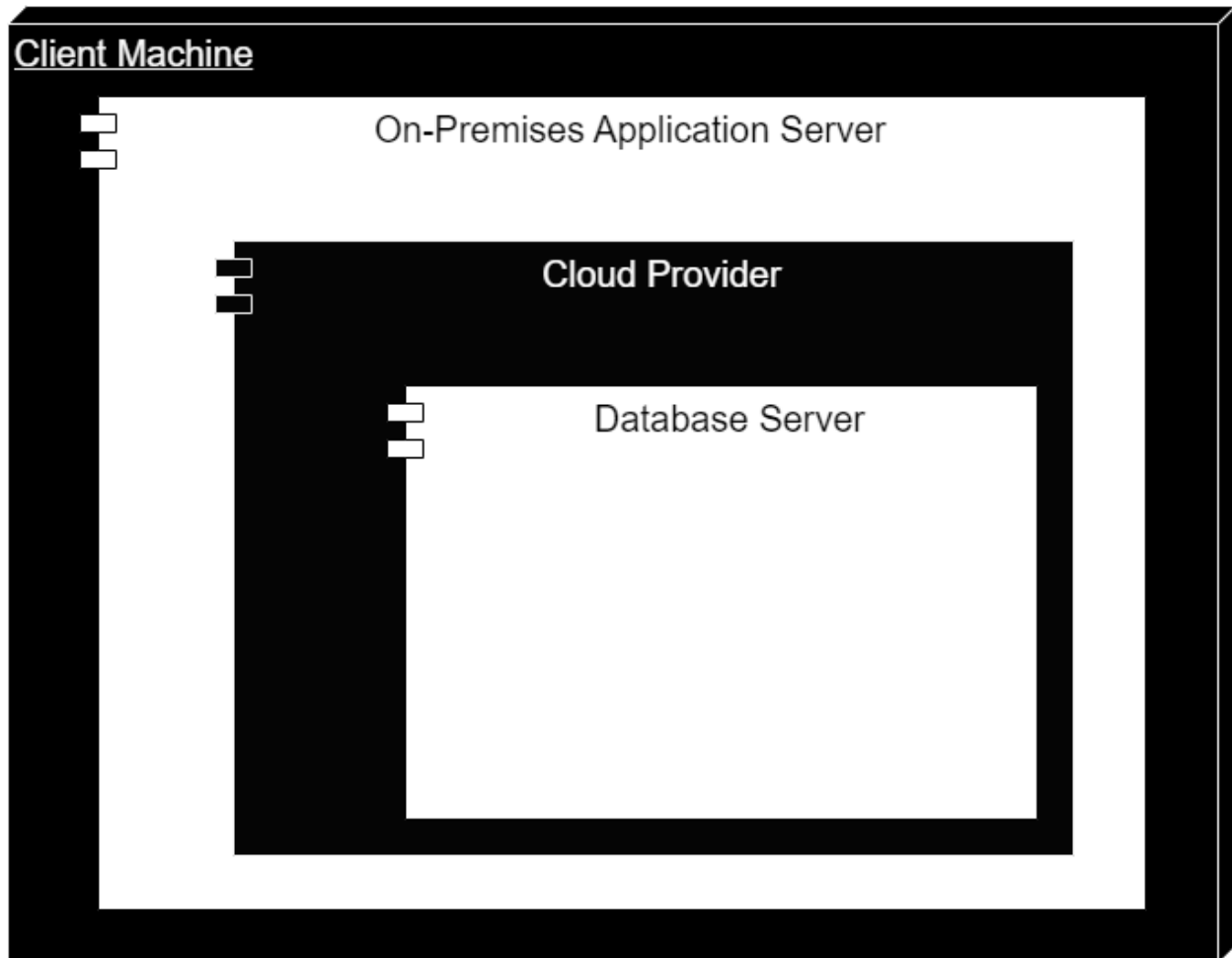




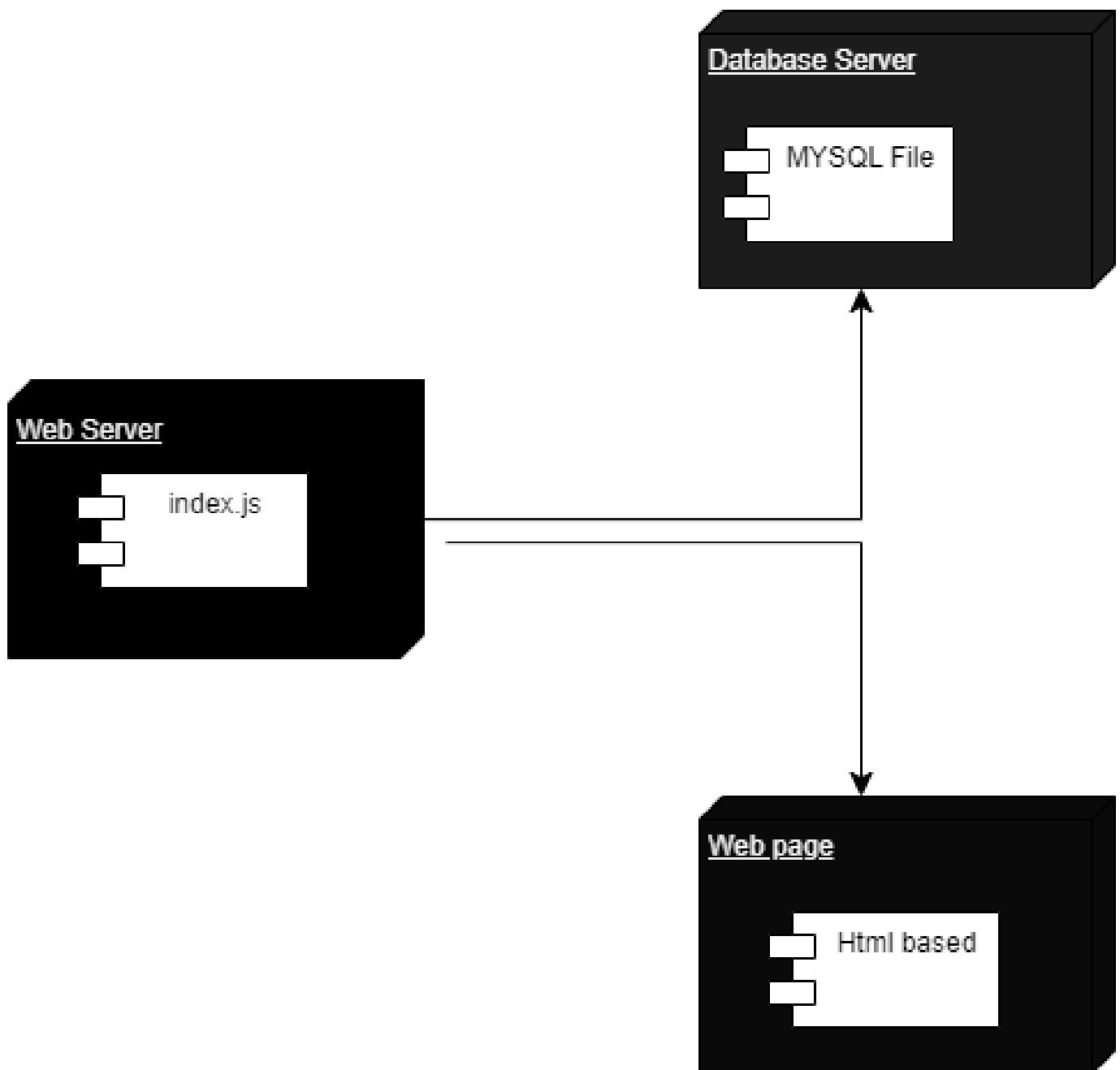
## 2.0 Three-tier Architecture



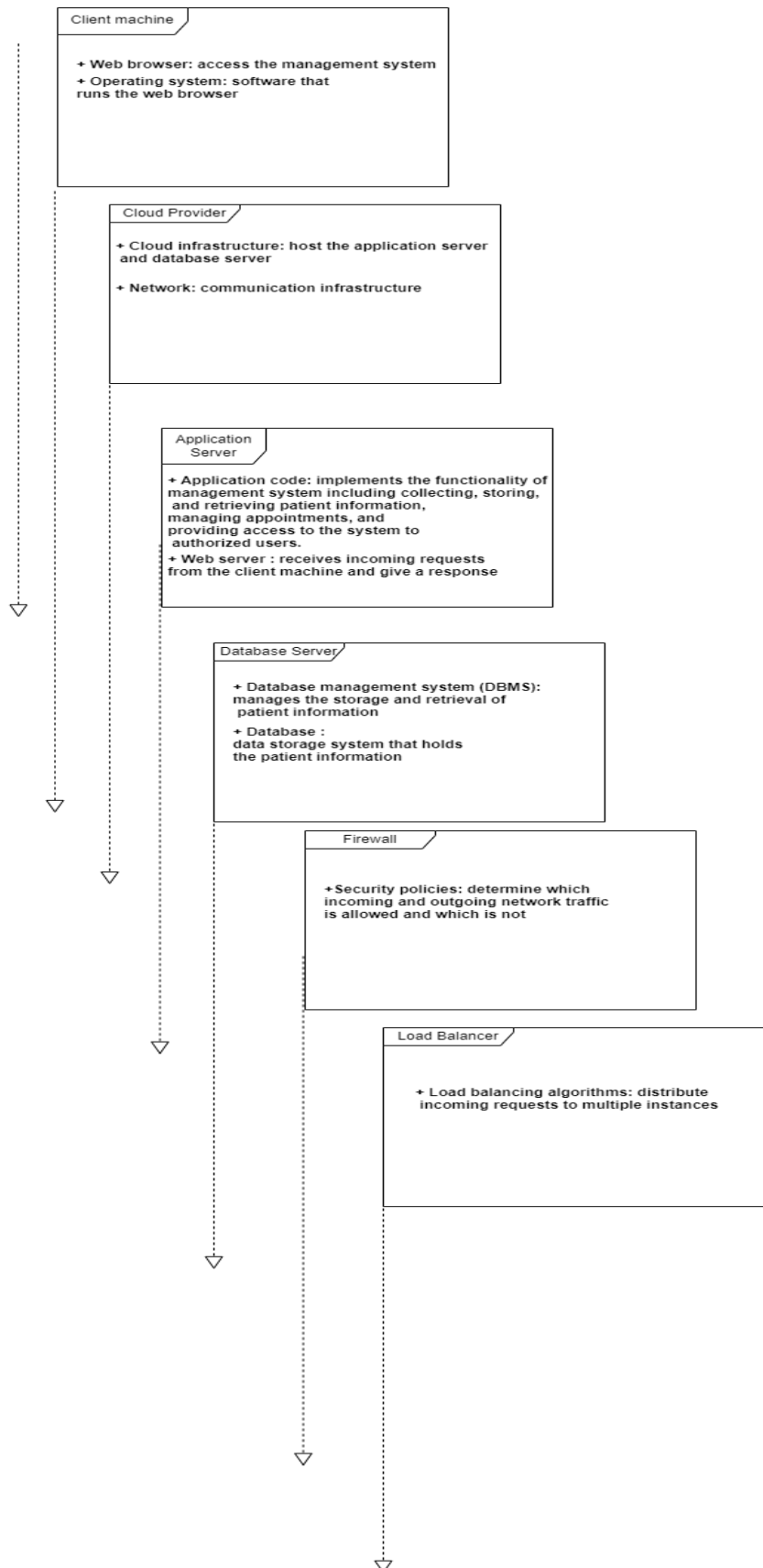
### 3.0 Hybrid Deployment



## 4.0 Server, Web, Database, User Deployment Diagram

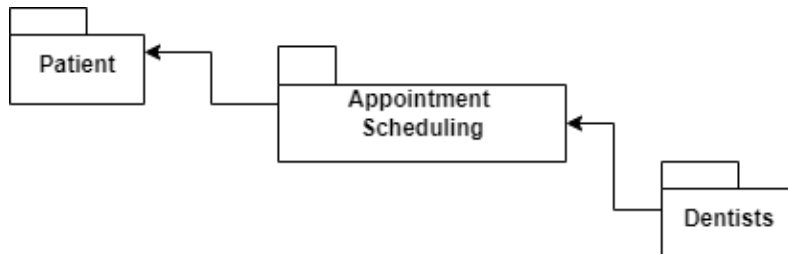


## 5.0 Deployment Diagram That Shows Both Device Nodes And Execution Environment Nodes



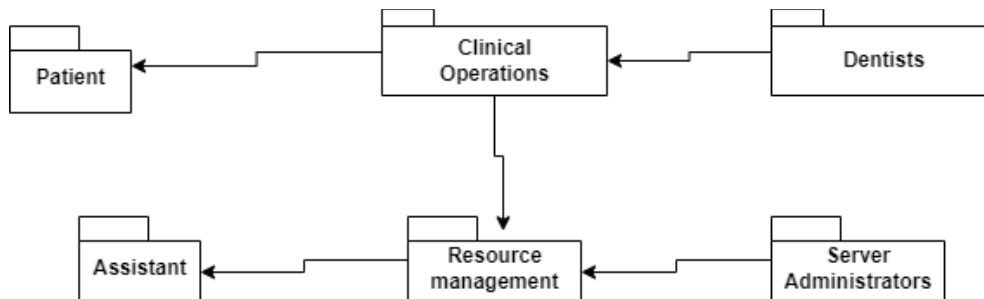
## Package Diagram

## 1.0 Appointment Scheduling Package Diagram



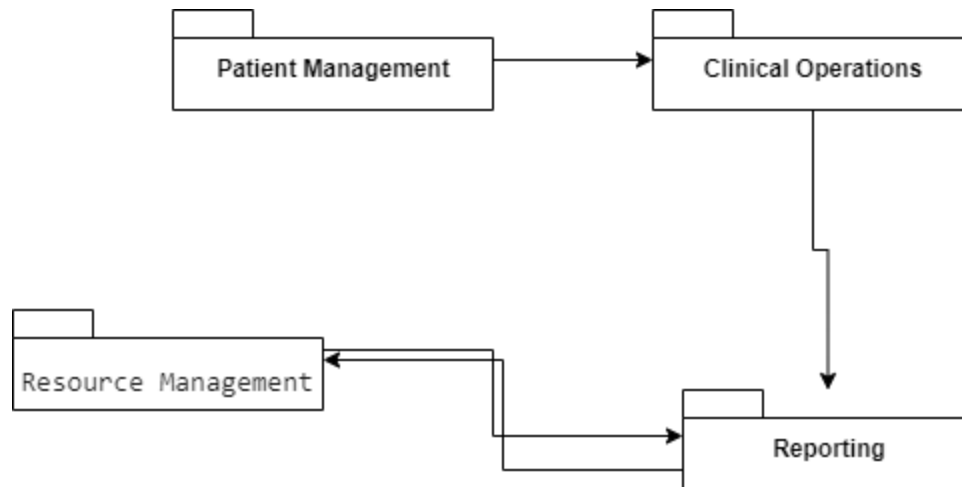
## Appointment scheduling Package Diagram

## 2.0 Package Diagram 2



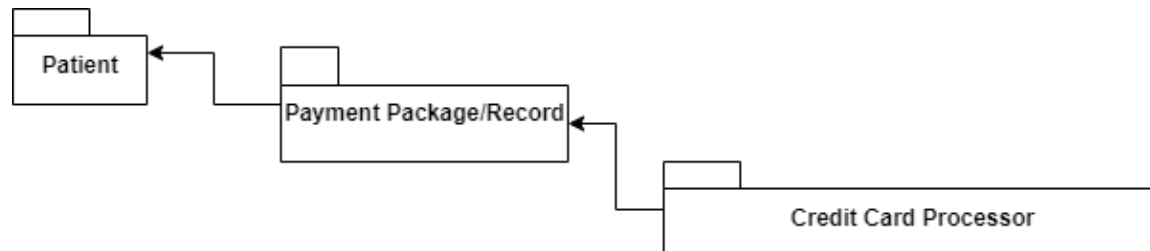
**Users can be represented in a package diagram by showing the different roles or user types and the packages they interact with.**

### 3.0 Package Diagram



PACKAGE DIAGRAM 1

### 4.0 Payment Records Package Diagram



### Payment Records Package Diagram

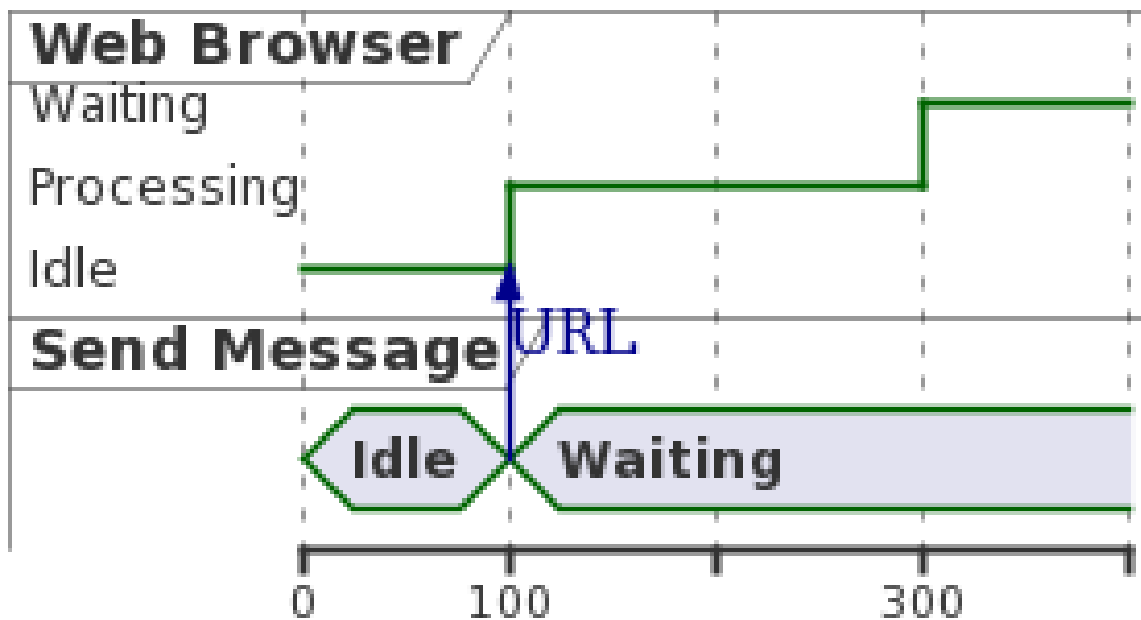
## Timing Diagrams



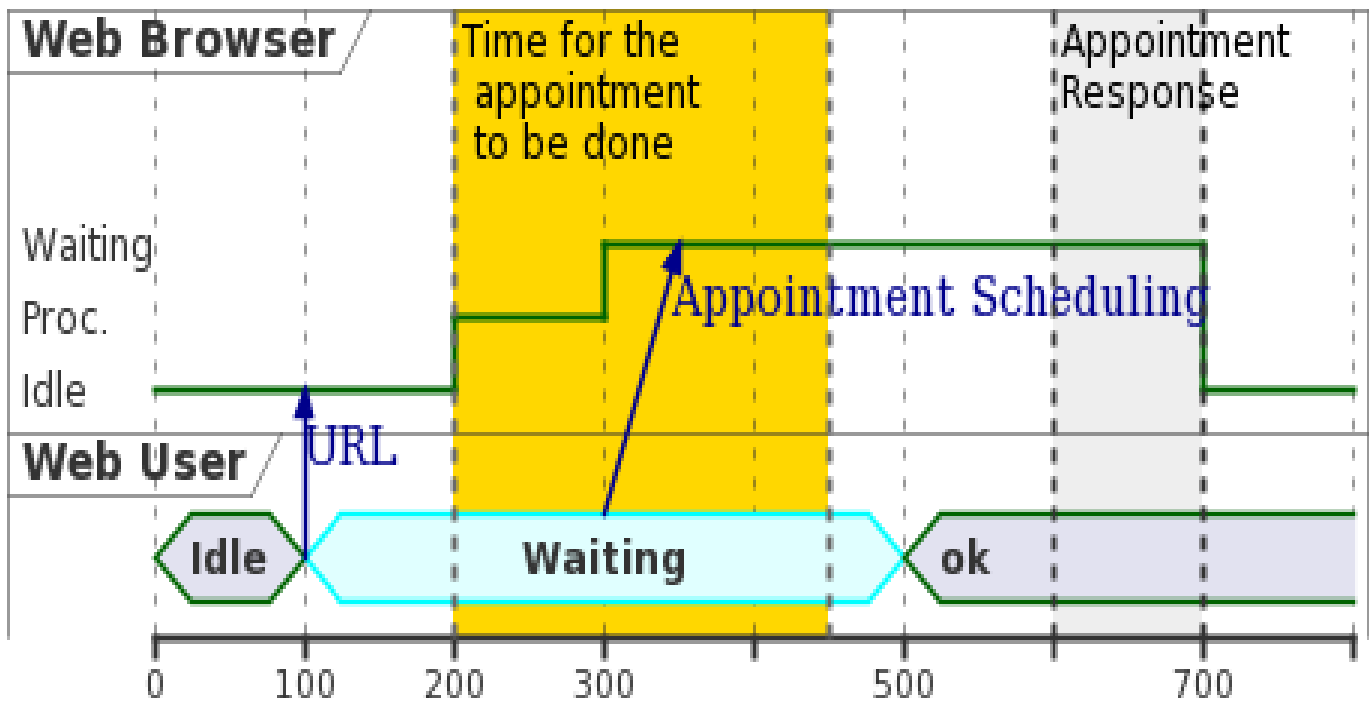
## 1.0 Connection Network Timing Diagram



## 2.0 Sending Message Timing Diagram

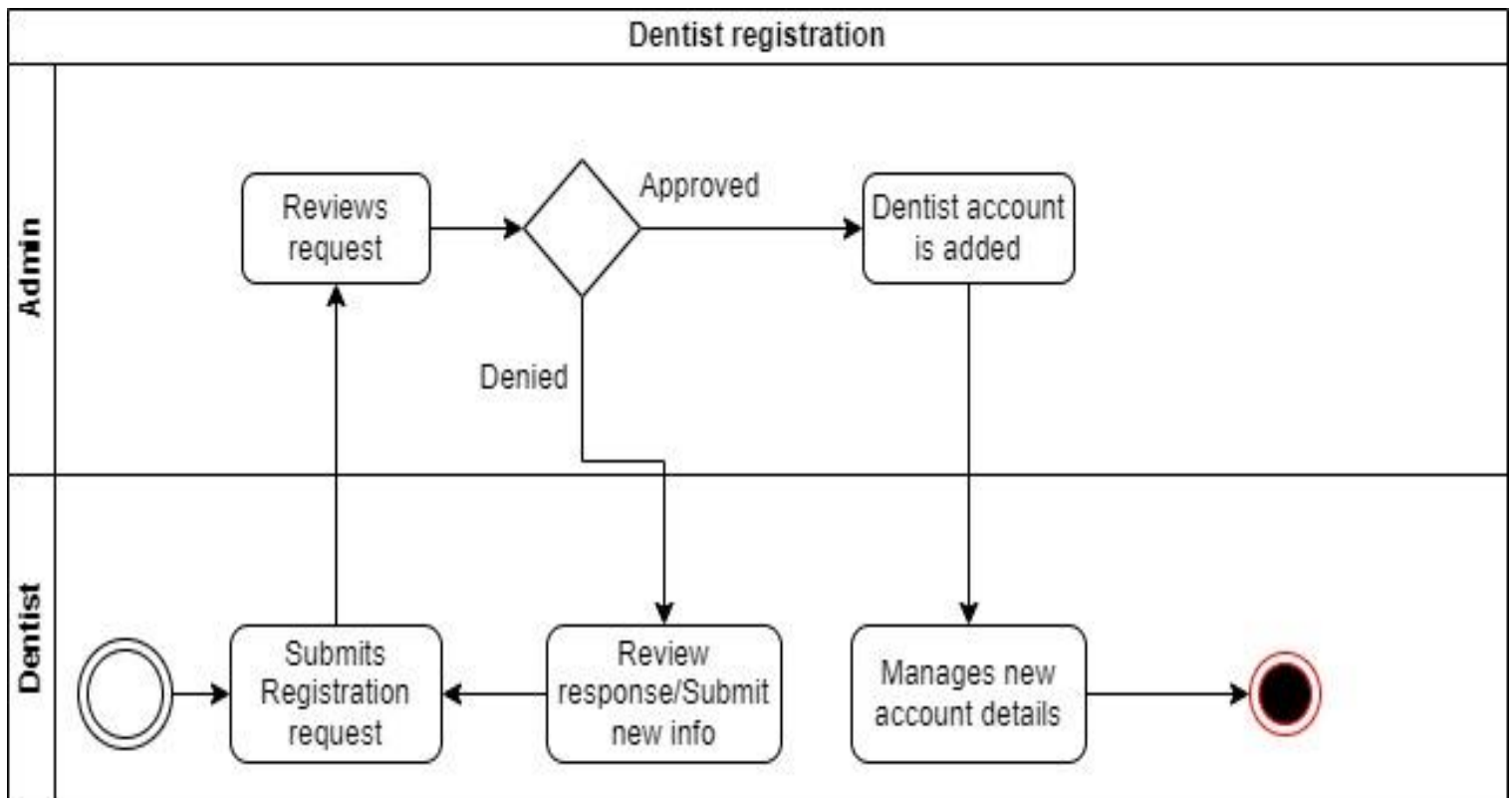


### 3.0 Timing Diagram for Appointment Scheduling

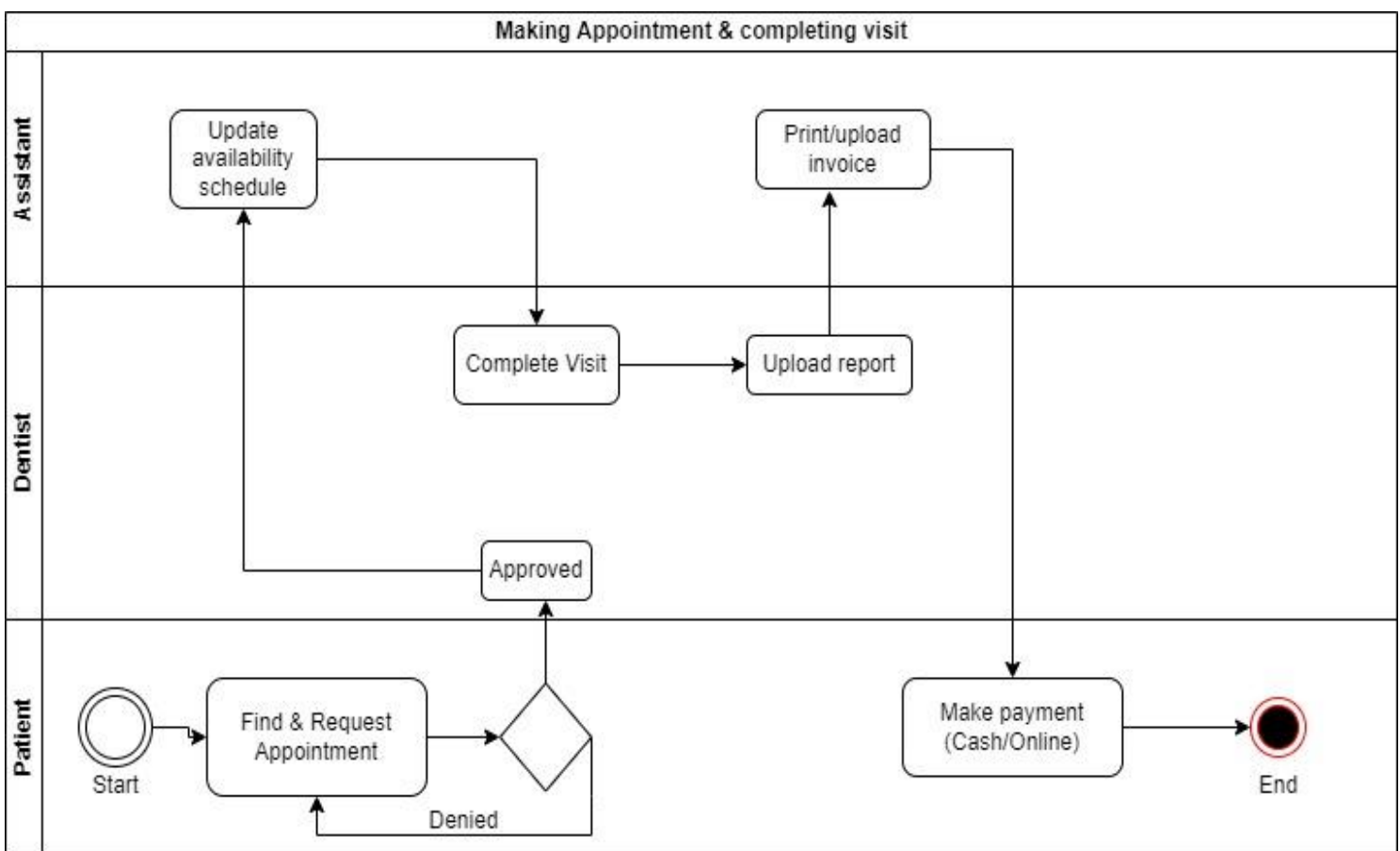


## BPMN Diagrams

## 1.0 Dentist Registration BPMN



## 2.0 Leaving Appointment BPMN



## Implementation Technology

## - **Web-Based Technologies:**

Developing a dentistry system using web-based technologies involves using languages such as HTML, CSS, and JavaScript to create a user interface (UI) and a web framework such as Ruby on Rails or Django to handle server-side processing and data storage. The system can be accessed through a web browser, making it easy to use from anywhere with an internet connection.

**HTML** (HyperText Markup Language) is used to create the structure and content of web pages. **CSS** (Cascading Style Sheets) is used to add style and formatting to the web pages. **JavaScript** is used to add interactivity and dynamic behavior to the pages.

**Ruby** on Rails is a popular web framework for building web applications that uses the Ruby programming language. **Django** is a high-level Python web framework that helps developers take applications from concept to completion as quickly as possible.

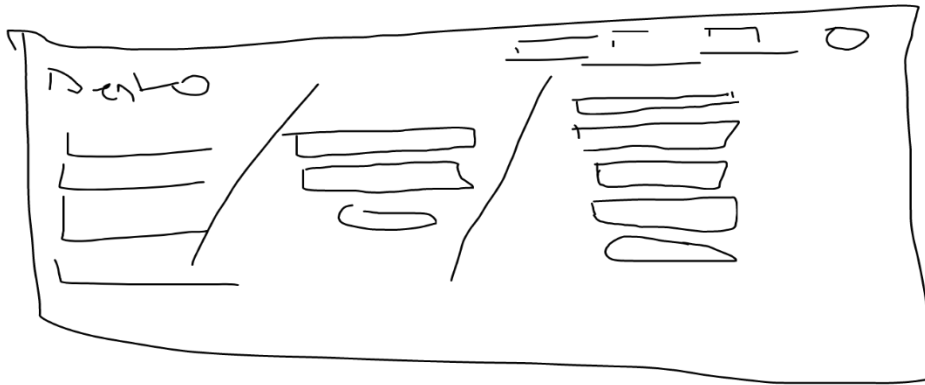
Using web technologies for a dentistry system provides several benefits such as:

- **Accessibility:** The system can be accessed from any device with a web browser and internet connection, making it easy for dentists, staff, and patients to use.
- **Scalability:** The system can be easily scaled to accommodate more users and data as needed.
- **Maintenance:** Web-based systems are easier to maintain and update compared to desktop applications.

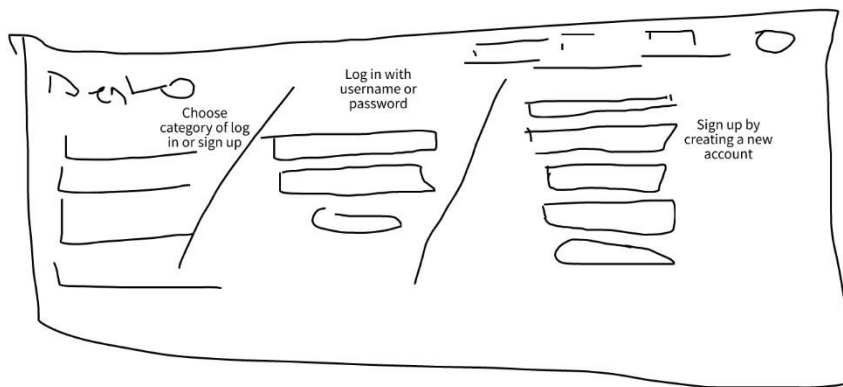
Overall, web-based technologies offer a flexible and scalable solution for developing a dentistry system that can be easily accessible and maintained.

## Screenshots and Sketches





### First Sketch



### Detailed Information of First Sketch

# Dento

**Our system will be represented by this Logo**

---

# Dento

- simply smile -

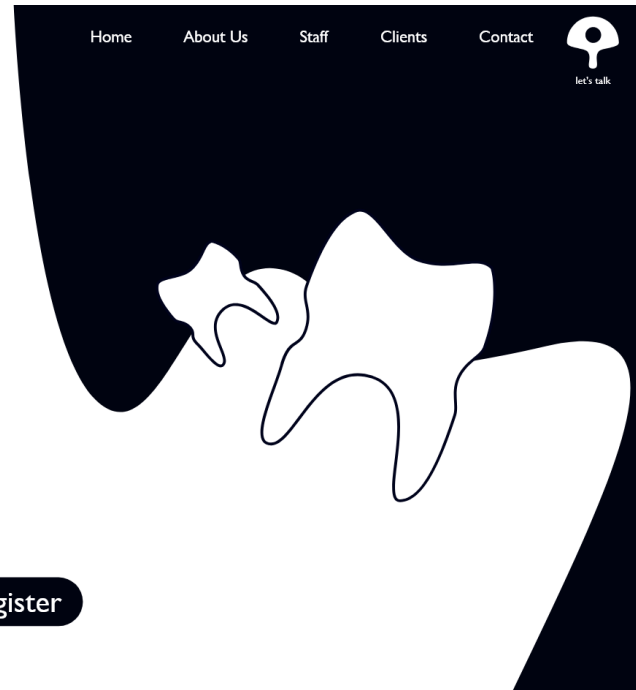
---

**This is going to be our slogan**

# WELCOME TO DENTO

Dento is it. Find your dentist and book the appointment. In Dento we care about you. Simply Smile!

Register



**This Could Be Some Design Of Our Main Page**

THANK YOU FOR ATTENDING  
DENTO PRESENTATION

