Software Requirements Specification

Name of Project: SmileScheduler

Project Leader: Justin Alaan-Nguyen

Start Date: Jan 7, 2025

Last updated: Mar 24, 2025

Team Members:

1. **Justin Alaan-Nguyen**

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1.1 Document Authors

1. Justin Alaan-Nguyen

1.2 Document Conventions

For example:

Any text in red indicates an exception or error.

Any text in blue is in-progress.

Any text highlighted in yellow is an important point.

Any text in green was recently added.

Any text *italicized* represents definitions.

Any text with ~~strike-through~~ is deleted.

1.3 Document Purpose

The purpose of this document is to provide a comprehensive overview of the proposed project, including its background, problem statement, product vision, stakeholders, functional and nonfunctional requirements, project scope, system risks, operating environment, and UI/UX interface mock-ups. It serves as a blueprint for the development team and stakeholders, outlining the goals, objectives, functionalities, constraints, and risks associated with the project.

1.4 Intended Audience

Current and potential users of the SmileScheduler platform include dental reception, dental hygienist, new grads of dental hygiene.

1.6 Group Agreement

TEAM AGREEMENT

Project Title: SmileScheduler

Project Time Frame:

- 4 months of development

Team Members:

1. Justin Alaan-Nguyen

Team Leadership:

Justin Alaan-Nguyen

Team Functions:

- We will share information through MS Teams, OneDrive, WhatsApp, e-mail and meetings.
- Information will be shared through a private Discord server created exclusively for this project
- Meetings and discussions will also be held through discord or in person
- Collaboration and version control will be done through GitHub
- Regular meetings will be conducted weekly and participate in project discussions
- Complete all weekly deliverables as required
- Inform team members if he/she cannot attend a scheduled meeting or inability to complete a task and provide reasoning
- Inform team members if assistance is required for a given task

Team Meetings: Every Tuesday and Thursday

Team Problems: Online meetings are more often than in-person meetings due to travel distance

Team Commitment: All members must be present during team meetings and all members must submit their work before the deadline

The undersigned members agree to work together on the project until the end of the PRJ666 next Semester. They recognize that as a team and individually they are responsible for the quality of all deliverables.

Name	**Date**
Justin Alaan-Nguyen	1/7/2025

2 - Project Overview

2.1 Project Proposal

Project Background

The dental industry, including dentists and hygienists, is built on providing high-quality patient care. However, dental professionals often face challenges in managing their schedules efficiently. Balancing patient appointments, cancellations, follow-ups, and office organization can be overwhelming, leaving little room for focusing on their primary responsibility: patient care.

Currently, many dental offices rely on traditional scheduling systems or fragmented digital tools that are not tailored to their specific needs. This lack of an intuitive, centralized platform can lead to inefficiencies, missed appointments, and scheduling conflicts, ultimately impacting the patient experience and practice productivity.

This project aims to address these challenges by developing SmileScheduler, a user-friendly online platform designed specifically for dental hygienists and dental professionals. SmileScheduler will empower users to seamlessly create, organize, and book client appointments while maintaining an organized and efficient workflow.

By integrating features like automated reminders, appointment tracking, and rescheduling capabilities, SmileScheduler will not only streamline daily operations but also enhance patient communication and satisfaction. This platform will act as a one-stop solution, reducing administrative burdens and enabling dental professionals to focus on delivering exceptional care.

Problem Statement

The Problem of:	Dental hygienists and dental offices face challenges in efficiently managing their schedules, appointments, and patient communications due to a lack of a dedicated, user-friendly platform tailored to their specific needs.
Affects:	This affects dental hygienists, office staff, and patients. Hygienists and staff struggle with organizing busy schedules, handling last-minute changes, and maintaining patient communication. Patients may experience delays, scheduling conflicts, or missed reminders, leading to dissatisfaction and reduced trust in dental services.
The impact of which is:	Inefficient scheduling systems lead to time wasted on administrative tasks, increased stress for dental professionals, and reduced productivity for the practice. Patients may experience less reliable service, while dental offices miss opportunities to optimize their operations and grow their client base.
A successful solution would:	SmileScheduler would be established as the go-to platform for dental hygienists and offices, providing a centralized, user-friendly tool for managing appointments, sending automated reminders, tracking client histories, and handling cancellations or rescheduling seamlessly. This solution would reduce administrative burden, enhance patient communication, and improve overall productivity, creating a smoother and more professional experience for both dental professionals and their clients.

Product Vision

For	The target users are dental hygienists, dentists, and office staff who need an efficient and reliable solution to manage their schedules and appointments.
Who	The product aims to solve the organizational challenges faced by dental professionals who struggle with fragmented, outdated, or generic scheduling tools. These users require a streamlined, dental-specific platform that enhances their workflow and improves patient communication.
The Product Name	SmileScheduler
That	The key benefits of SmileScheduler include: ● A centralized platform for managing dental appointments. ● Automated reminders of upcoming appointments for clients ● Easy-to-use interface for creating, organizing, and rescheduling appointments. ● Comprehensive client history tracking for better patient care. ● Customizable features tailored to the unique needs of dental practices. ● Time-saving tools that reduce administrative burden and allow professionals to focus on patient care.

Unlike	General-purpose scheduling tools or paper-based systems, SmileScheduler is specifically designed for the dental industry. Existing tools often lack the flexibility, automation, and specialized features required to address the nuances of dental practice scheduling, resulting in inefficiencies and missed opportunities.
Our product	SmileScheduler is unique because it combines the functionality of a robust scheduling system with tools tailored to the dental profession. It offers an intuitive, user-friendly experience that minimizes administrative tasks, maximizes productivity, and enhances patient satisfaction. By focusing on the specific needs of dental hygienists and their practices, SmileScheduler ensures a seamless and professional scheduling process that improves overall efficiency and patient care.

2.2 Stakeholders and Users

Business Stakeholders:

- Team Members
- Administration
- Functional Departments
    - Accounting
    - Human Resources
    - Engineering
    - Marketing
- Sponsors
    - Investors
    - Shareholders
- Owners
-
    - CEO
    - Board of Directors

Users

- Dental Hygienists
- Dentists
- Dental Office Managers/Staff
- Small to Medium Dental Practices

Stakeholder Interest and Impact Table

Stakeholder	Interests	Estimated Project Impact	Estimated Priority
Owner	Achieving target goals/milestones Project Liability Increasing sales margin	**Medium** **High** **Medium**	**1**
Sponsors	Providing market to expand Competence of project	**Medium**	**2**
Team Members	Retain and expand skilled members Strikes Product excitement	**Medium** **High** **Low**	**3**
Functional Departments	Accurate book keeping Functional HR department Skillful engineers Active and competent Public Relations	**Medium** **Low** **High** **Medium**	**4**

2.3 Functional Requirements

1. Manage Client Profiles
    - A) User creates new client profile
    - B) User views existing client profile
    - C) User edits client profile
    - D) User deletes client profile
2. Manage Client Appointments
    - A) User creates new client appointment
    - B) User views existing client appointment
    - C) User edits client appointment
    - D) User deletes client appointment
3. ~~Manage Client Treatments Records~~
    - ~~A) User creates new client treatment record~~
    - ~~B) User views existing client treatment record~~
    - ~~C) User edits client treatment record~~
    - ~~D) User deletes client treatment record~~
4. Manage User's Account
    - A) User makes new account
    - B) User changes account
    - C) User deletes account
5. Search Functionality
    - A) User searches for client's profile
    - B) User searches for clients appointment(s)
    - ~~C) User searches for clients's treatment record(s)~~

2.4 Nonfunctional Requirements

1. Operational

A) Website should be available for 99.9% uptime

B) The website should be able to handle increasing loads and user demands without degradation in performance.

C) The website should continue to operate with minimal disruption in the event of hardware failures, software bugs, or other unexpected incidents

2. Performance

A) Interaction time between User and the system should not exceed 3 seconds

B) The database of appointments should be updated every time a new appointment is made or existing appointment was updated

C) The database of client profiles should be updated every time a new client profile is made, or a existing client profile is updated

3. Security

A) User can see their own created client profiles

B) Users can see their own created client appointments

~~C) Users can see their own created client treatments~~

D) Only direct developers can see the personnel records of all Users

4. Cultural & Political

A) System should be able to distinguish between different types of currency

B) The system shall comply with User Privacy industry standards

2.5 Project Scope

Project Scope: SmileScheduler

Project Objectives:

- Develop SmileScheduler, a centralized and user-friendly platform for dental hygienists and dental office staff to efficiently organize and manage appointments.
- Enhance scheduling efficiency, and reduce administrative overhead for dental practices.

Deliverables:

- Development of the SmileScheduler platform with specified features, including appointment booking, automated reminders, and rescheduling tools.
- Comprehensive documentation, including system architecture, technical specifications, and user guides.
- Thorough testing and quality assurance to ensure the reliability, performance, and security of the platform.
- Deployment of the platform and ongoing maintenance to address bugs, updates, and user feedback.

Inclusions

- Features enabling appointment creation, organization, and tracking.
- Automated notifications for client's appointments (e.g., appointment reminders, ~~client's treatment history reminders~~, and cancellations).
- Secure client data management that is compliant with industry standards.
- Customizable features tailored to dental practices.

Exclusions

- Integration with external financial systems for billing or payment processing.
- Marketing or promotional campaigns for the platform.

Constraints

- Budgetary limitations for the design, development, testing, and deployment phases.
- Time constraints for project completion and achieving milestones.

Assumptions

- Assumes a demand for a specialized scheduling tool among dental professionals.
- Assumes that users will actively adopt and utilize the platform's features to enhance productivity.
-

Dependencies

- Availability of team members and technical resources for successful execution.
- Reliability of third-party services or APIs (e.g., email and SMS notification services).

Acceptance Criteria

- Successful deployment of the SmileScheduler platform with all specified features and functionalities.
- Positive feedback from dental professionals regarding usability and efficiency.
- Adherence to the defined project timeline and budget constraints.

Scope Management

- Implementation of change control procedures to manage any scope changes during the project lifecycle.
- Regular scope verification and validation to align with stakeholder expectations.

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Risk Management

- Identification of potential risks such as technical challenges, resource constraints, and low user adoption.
- Development of mitigation strategies to address these risks and ensure project success.

Out of Scope:

- Integration with Electronic Health Record (EHR) systems.
- Patient-facing mobile apps or additional portals.
- Long-term scalability features for larger dental networks or corporate practices.
- Handling of sensitive patient health data beyond appointment details.

2.6 System Risks

Risk	Response
Data Security Breaches: Unauthorized access to patient data, or appointment records leading to privacy violations and potential legal issues.	Implement robust security measures such as data encryption, secure authentication (e.g., multi-factor authentication)
Platform Downtime: Technical issues or server failures causing platform unavailability, disrupting appointment management and causing user dissatisfaction.	Ensure high availability and fault tolerance by using reliable cloud hosting providers and proactive monitoring tools. Establish a rapid incident response and recovery plan.
Performance Degradation: Increasing user load causing slow response times, negatively impacting usability and user satisfaction.	Conduct stress and load testing to identify potential bottlenecks. Optimize system architecture and implement scalable solutions to accommodate growth.
Compatibility Issues: Inconsistent behavior across different devices, browsers, or operating systems, resulting in a poor user experience.	Perform comprehensive compatibility testing across a wide range of devices, browsers, and operating systems to ensure a consistent experience. Use responsive design principles for a seamless interface.
Regulatory Compliance: Failure to comply with data protection laws (e.g., HIPAA, GDPR) and regulations, leading to legal penalties and loss of user trust.	Stay updated with relevant legal and regulatory requirements. Implement strict privacy policies, terms of use.
User Adoption Challenges: Low adoption rates due to insufficient user training or perceived complexity of the platform.	Provide comprehensive user guides, tutorials, and customer support. Conduct usability testing to ensure the platform is intuitive and user-friendly

2.7 Operating Environment

Hardware and Software:

- Laptop or desktop computer for development.
- Development tools such as a text editor
- Web browser for testing and previewing the website
- Potentially, a mobile device for testing the mobile responsiveness of the website.

Database:

- May use a lightweight database system like SQLite for development and testing purposes.

Development Environment:

- Web development frameworks like Bootstrap or simple HTML/CSS may be used for front-end development.
- Backend development could be done using simple server-side scripting languages along with basic database management.

Testing and Maintenance:

- Regular testing of the website's functionality and appearance across different devices and web browsers.

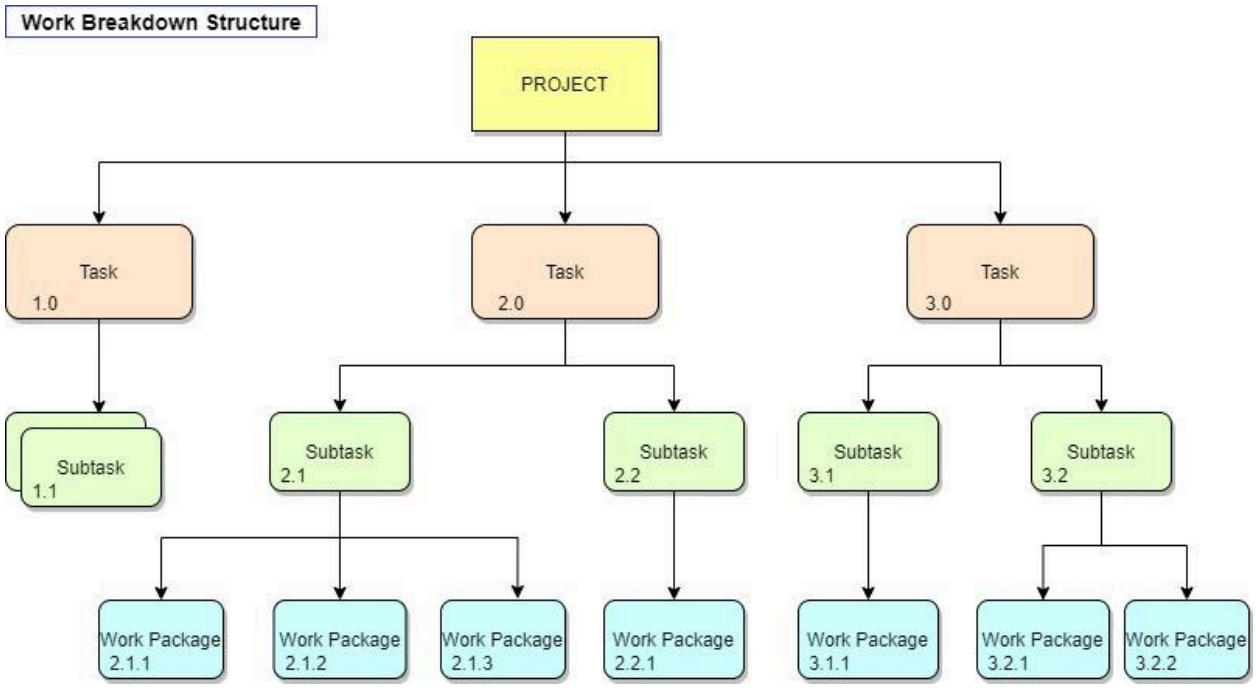
Internet Connectivity:

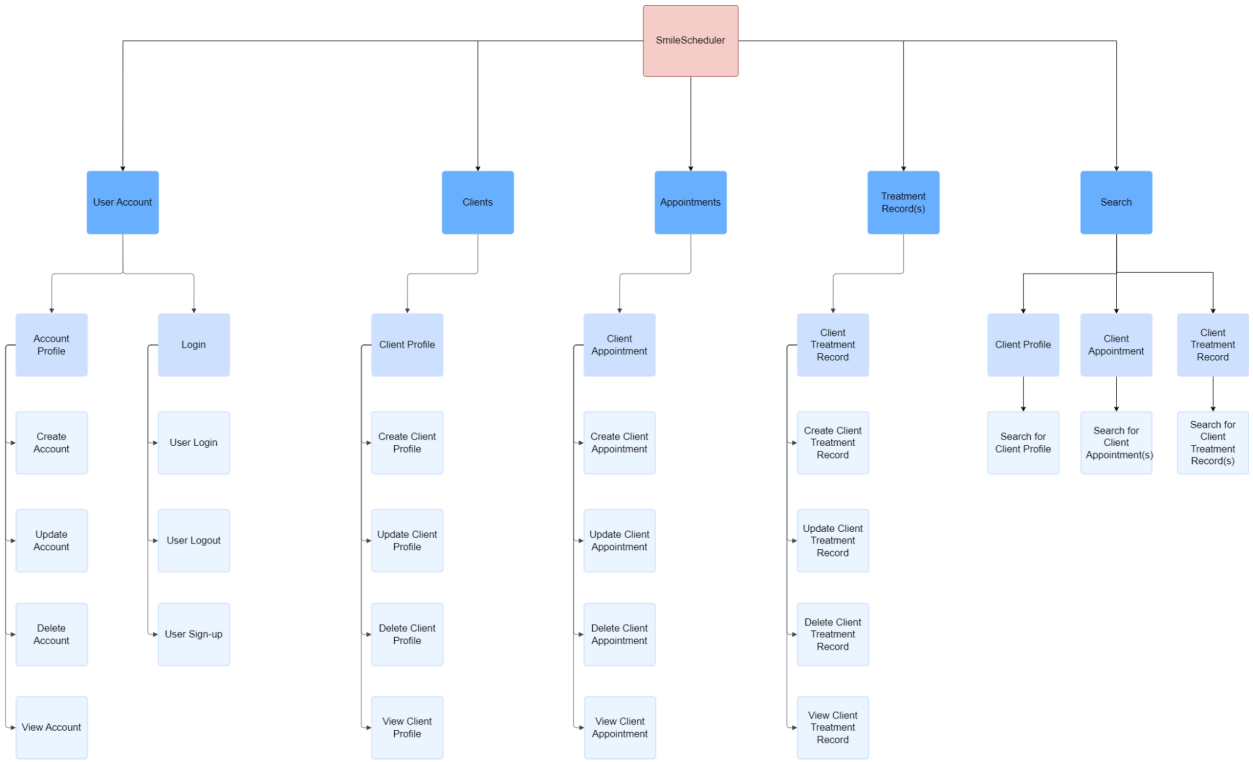
- Access to the internet for research, testing, and deployment.

3.0 - Work Breakdown Structure (WBS)

Work Breakdown Structure

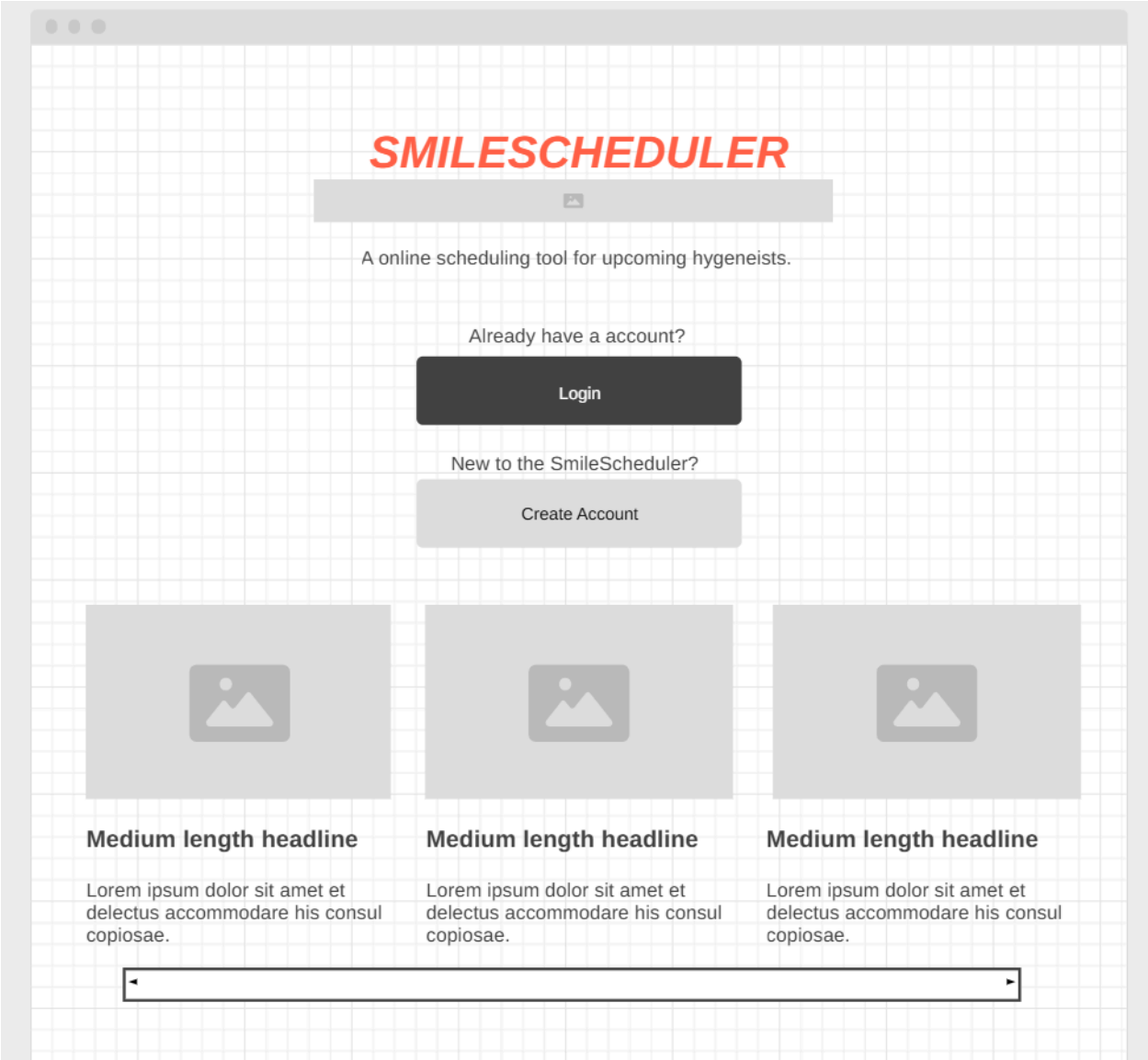
Sample WBS:



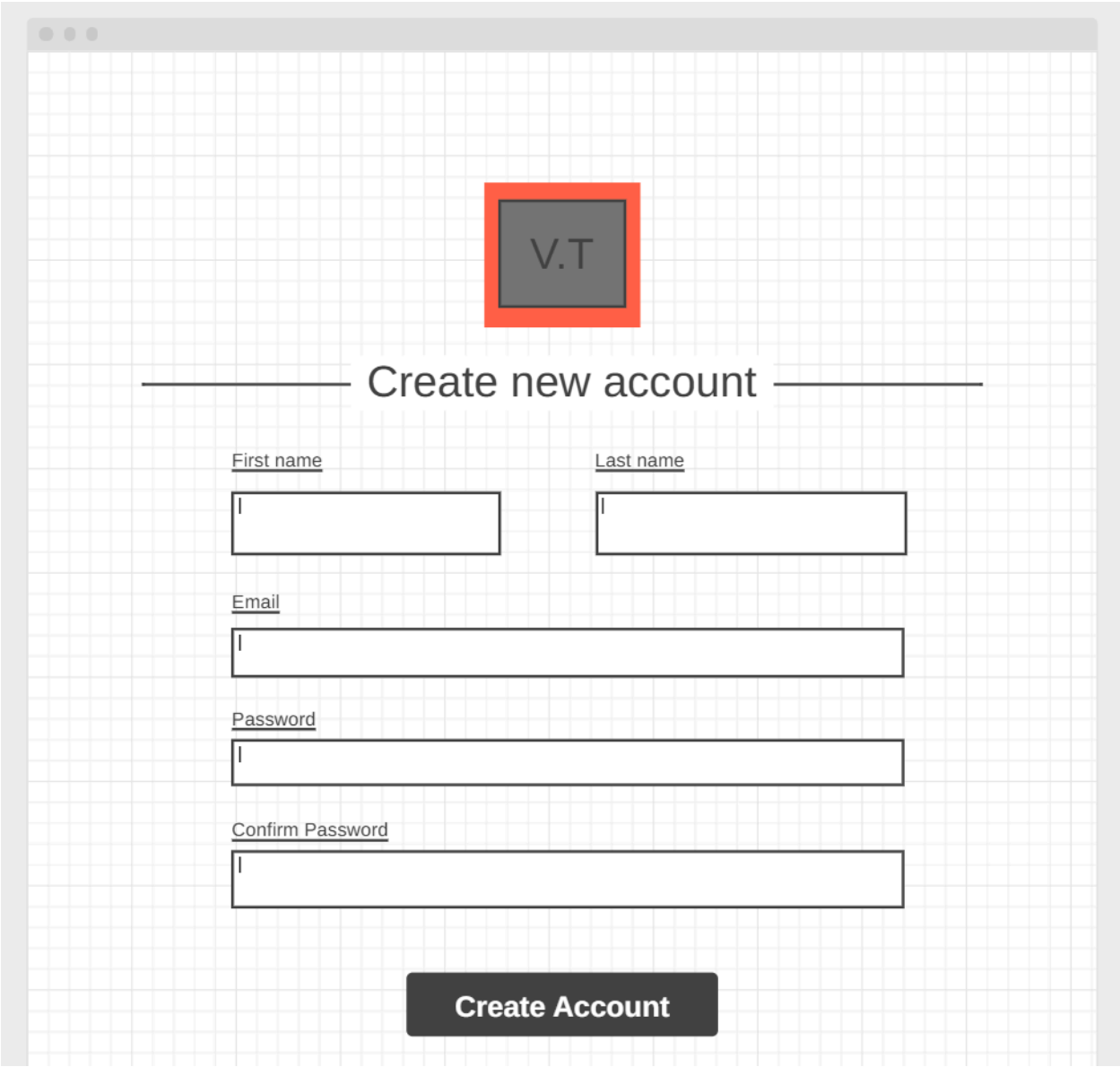

SmileScheduler
User Account
Clients
Appointments
Treatment Record(s)
Search
Account Profile
Login
Client Profile
Client Appointment
Client Treatment Record
Client Profile
Client Appointment
Client Treatment Record
Create Account
Update Account
Delete Account
View Account
User Login
User Logout
User Sign-up
Create Client Profile
Update Client Profile
Delete Client Profile
View Client Profile
Create Client Appointment
Update Client Appointment
Delete Client Appointment
View Client Appointment
Create Client Treatment Record
Update Client Treatment Record
Delete Client Treatment Record
View Client Treatment Record
Search for Client Profile
Search for Client Appointment(s)
Search for Client Treatment Record(s)

4.0 UI/UXD Interface Mock-ups

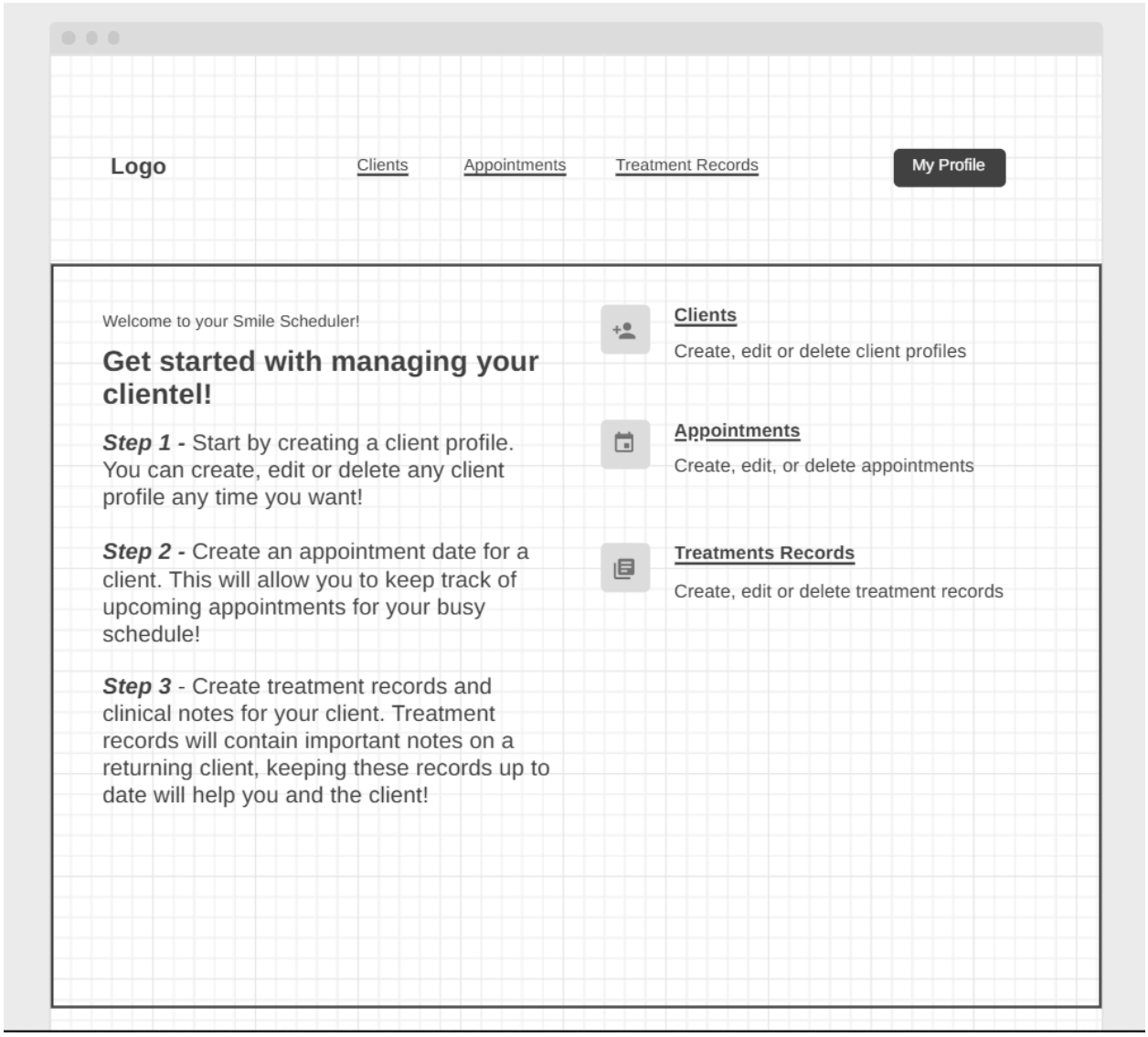
SmileScheduler Login Home Page



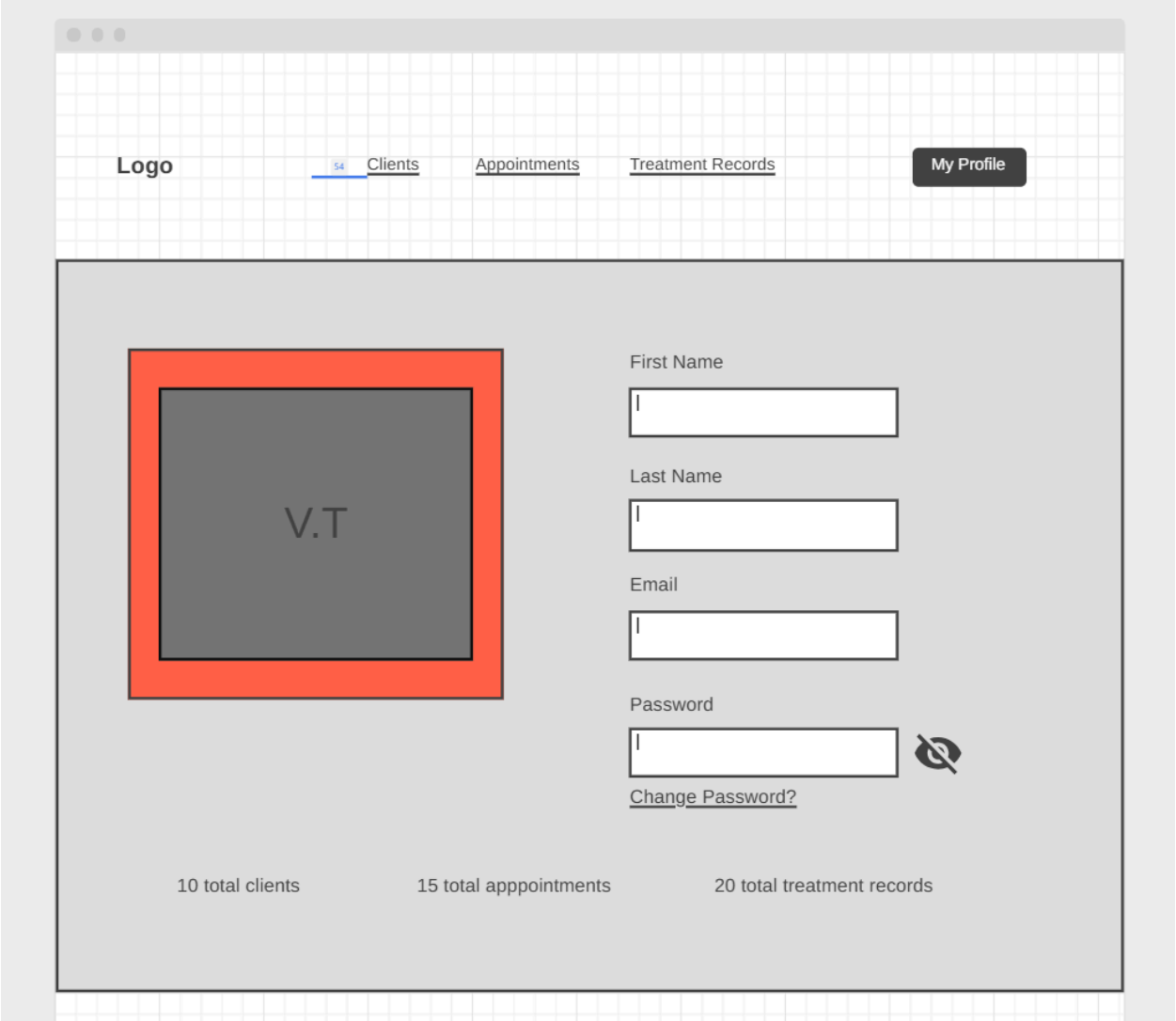
SmileScheduler Account Creation Page



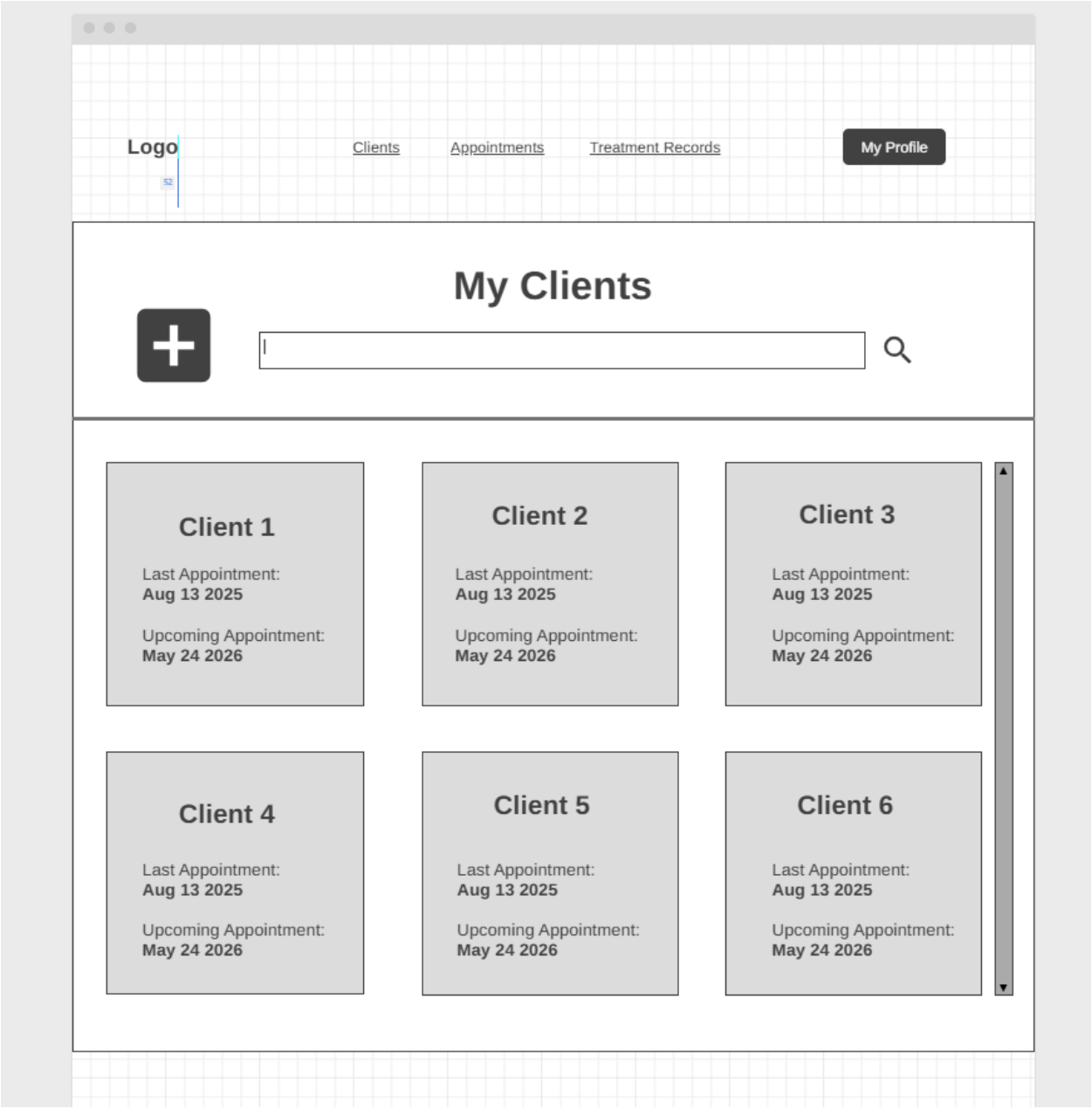
Home Page


Logo
Clients
Appointments
Treatment Records
My Profile
Welcome to your Smile Scheduler!
Get started with managing your clientel!
Step 1 - Start by creating a client profile. You can create, edit or delete any client profile any time you want!
Step 2 - Create an appointment date for a client. This will allow you to keep track of upcoming appointments for your busy schedule!
Step 3 - Create treatment records and clinical notes for your client. Treatment records will contain important notes on a returning client, keeping these records up to date will help you and the client!
Clients
Create, edit or delete client profiles
Appointments
Create, edit, or delete appointments
Treatments Records
Create, edit or delete treatment records

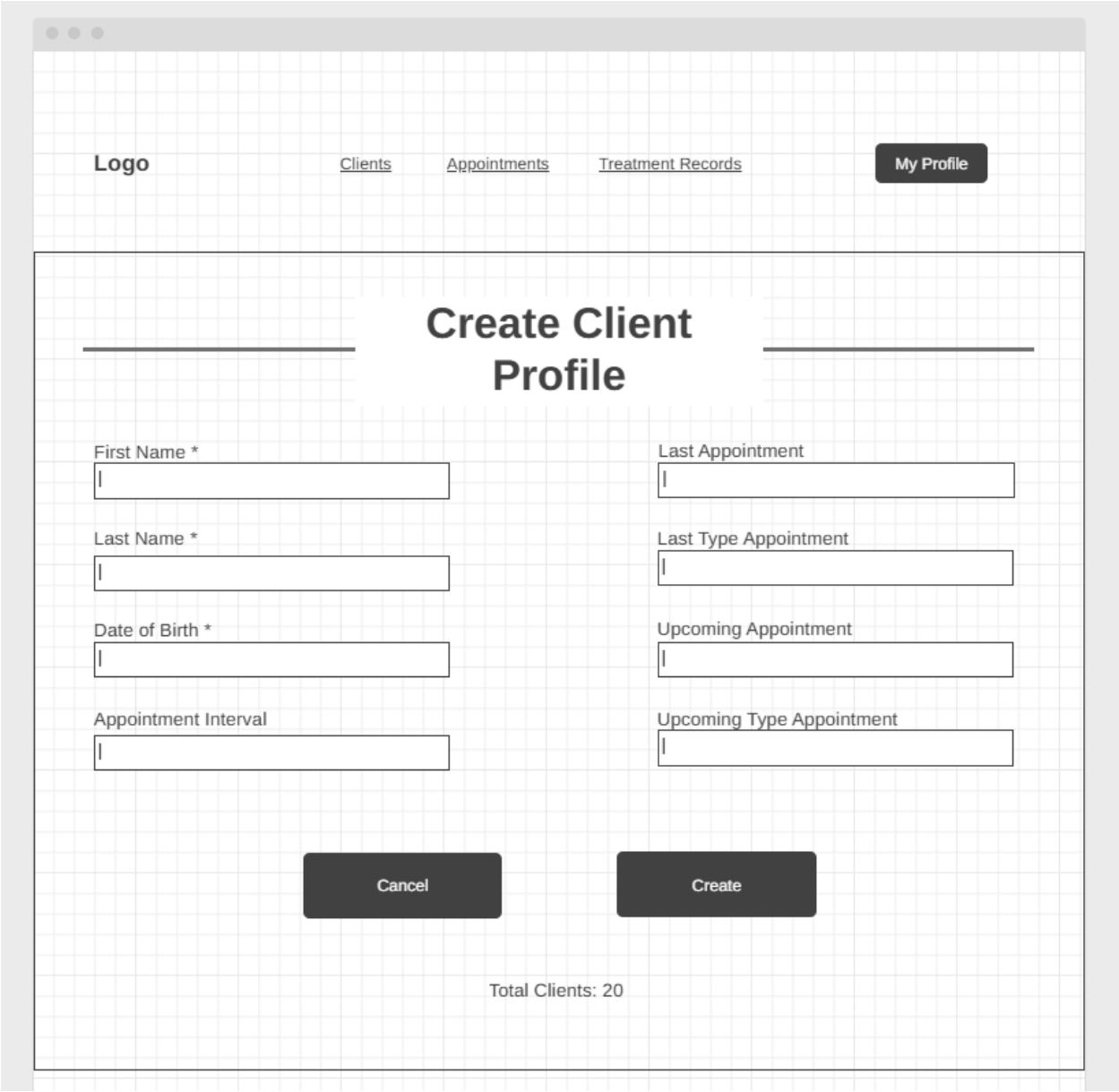
Profile page



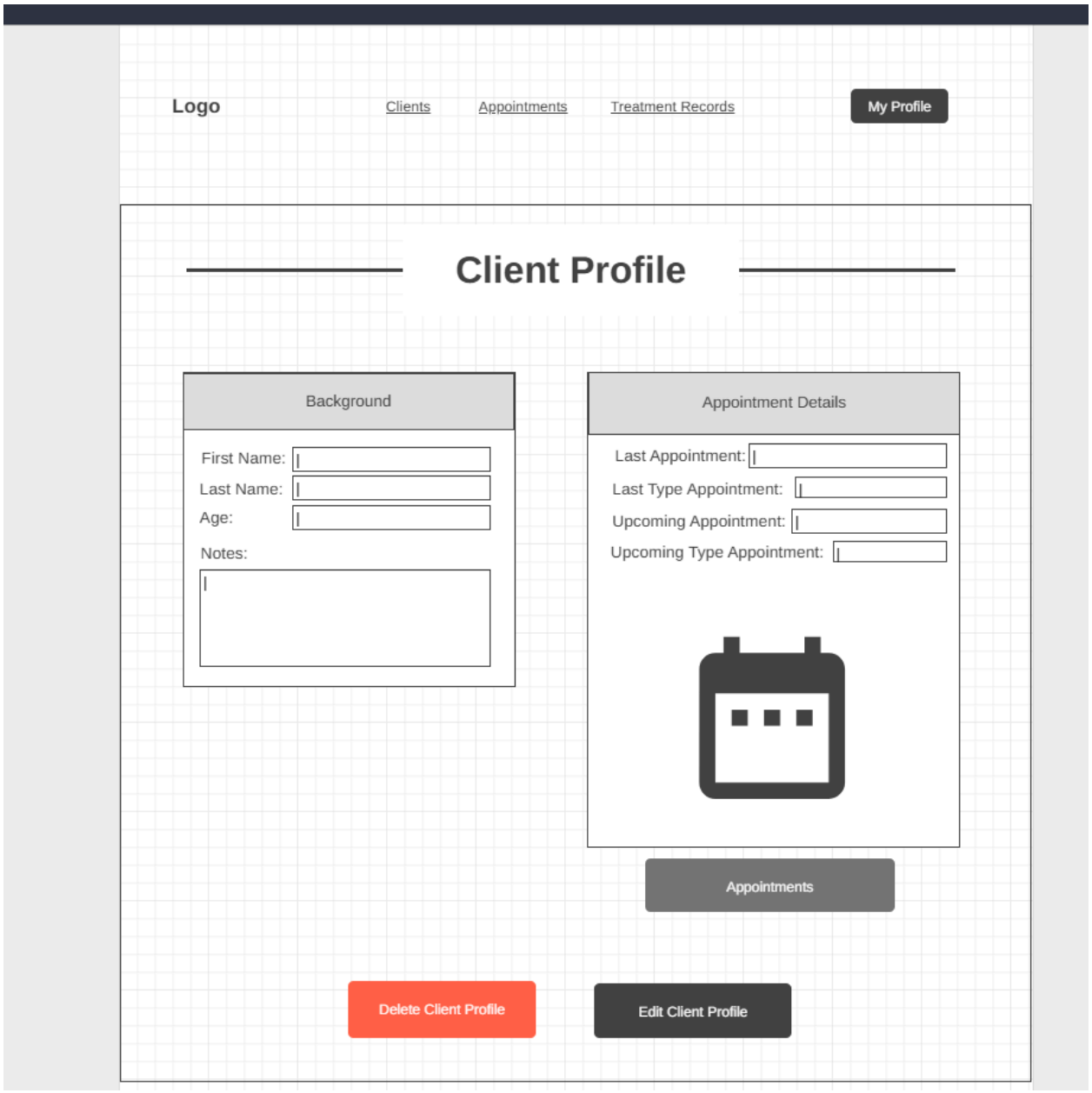
My Clients Page



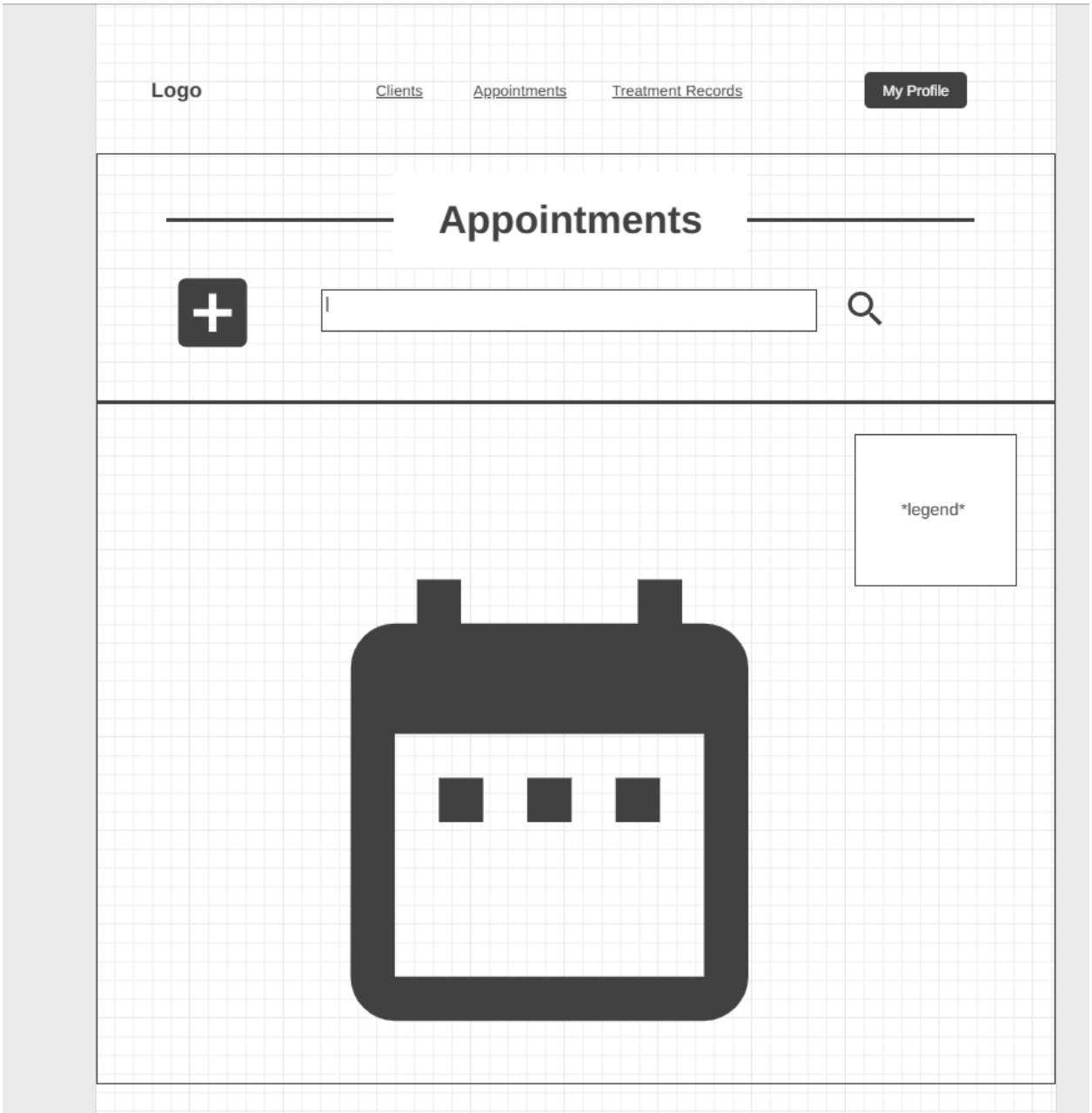
Add new Client Profile page



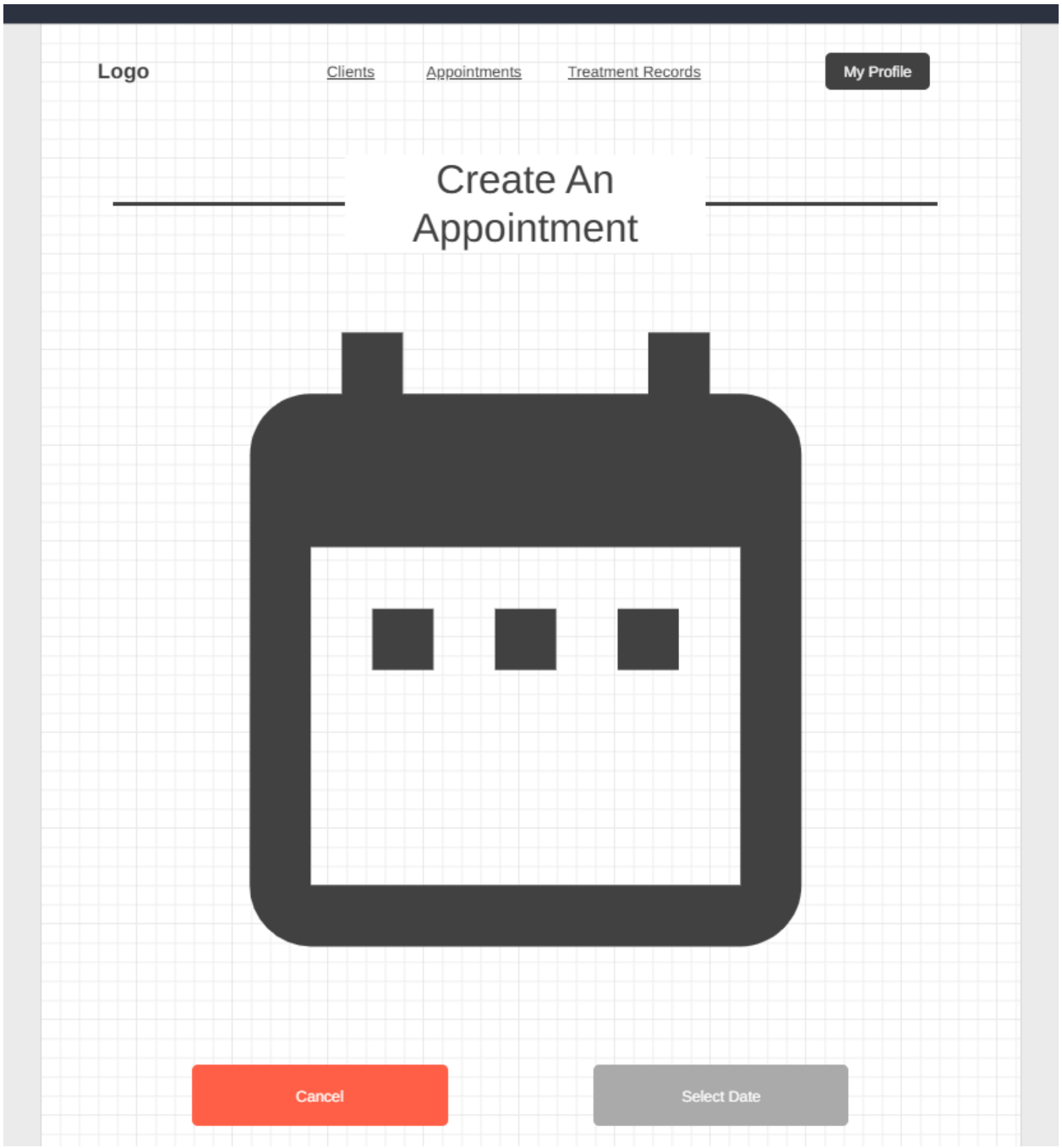
Client Profile details page



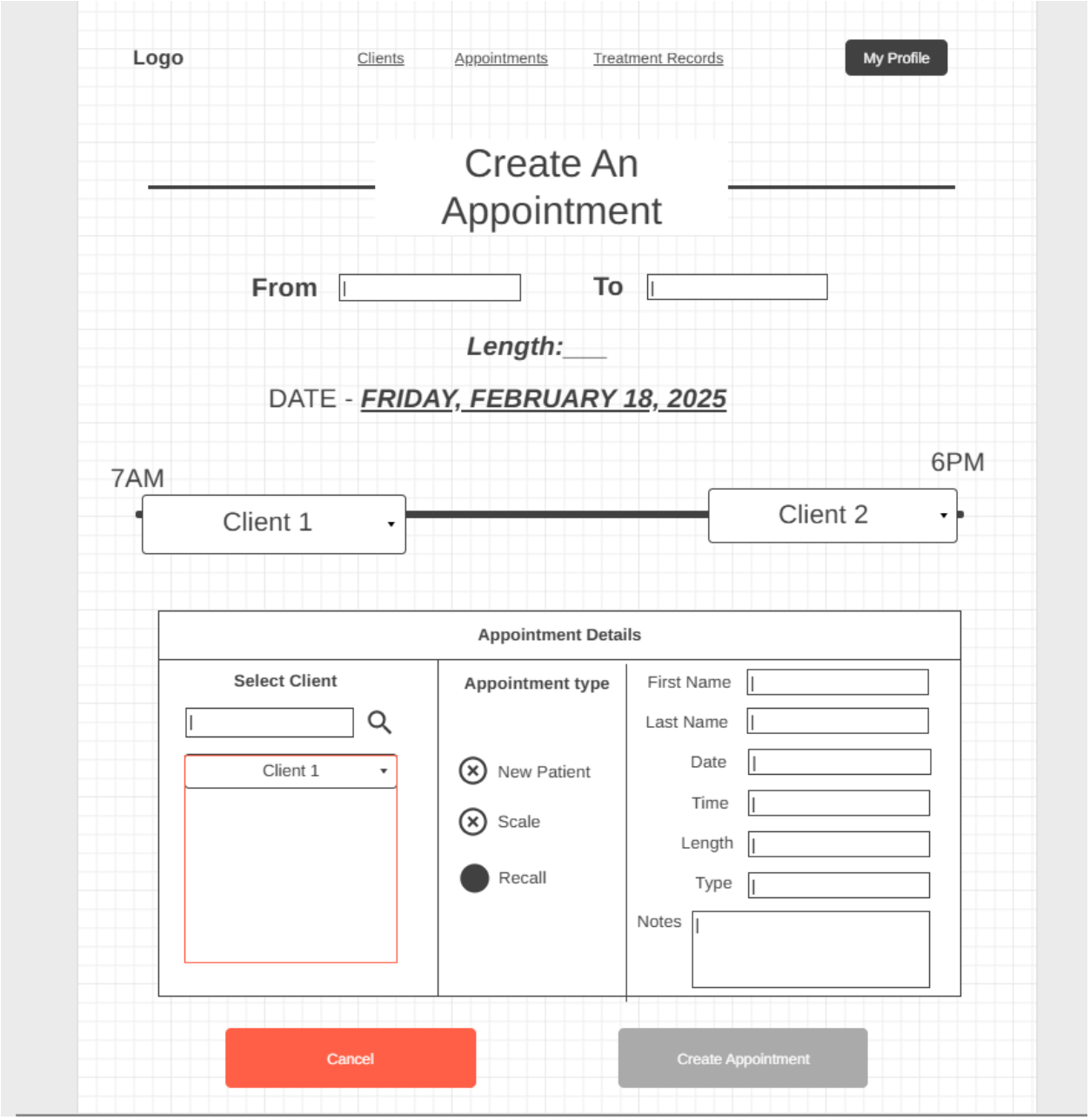
Appointment page



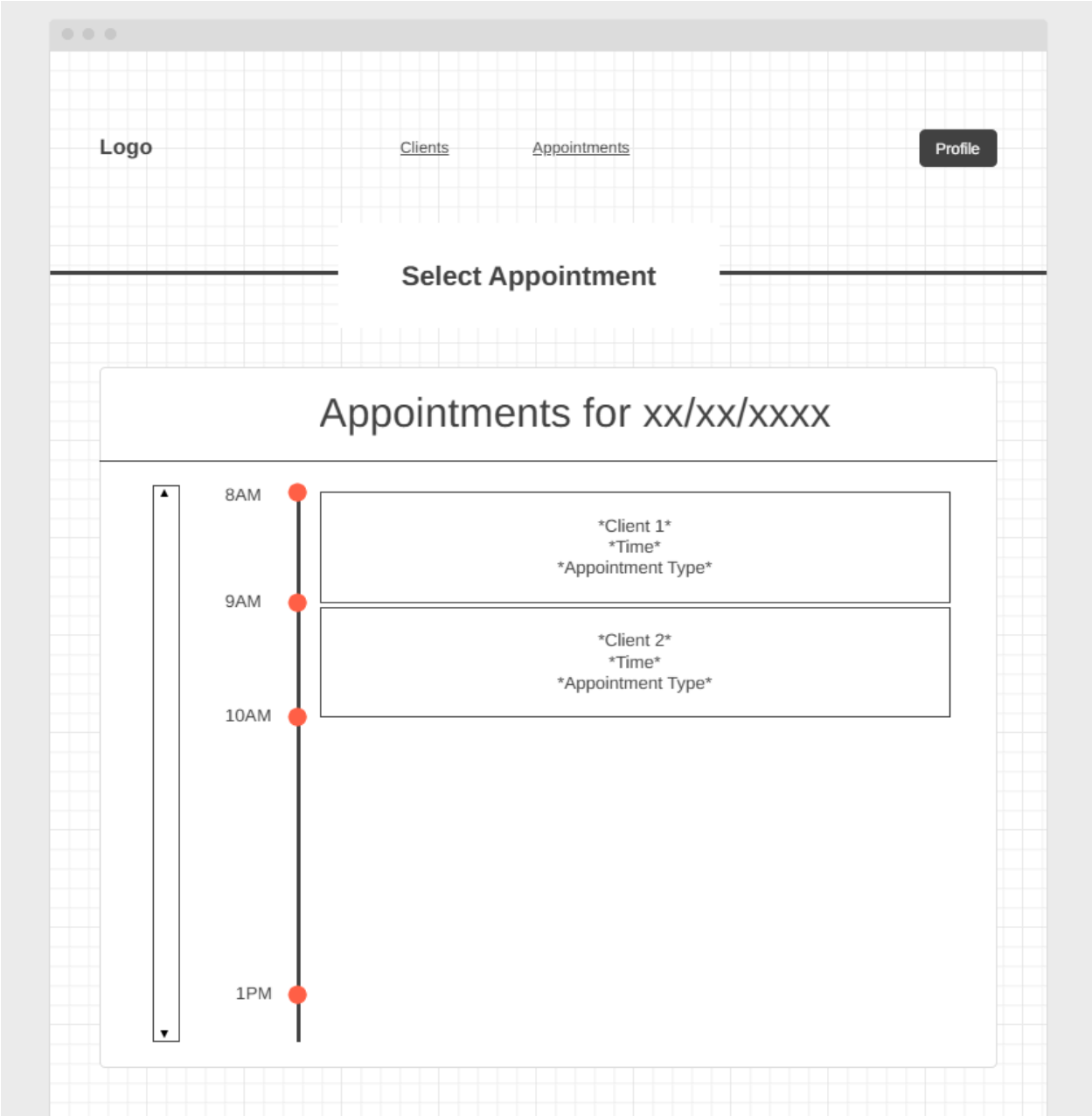
Create Appointment page (part 1)



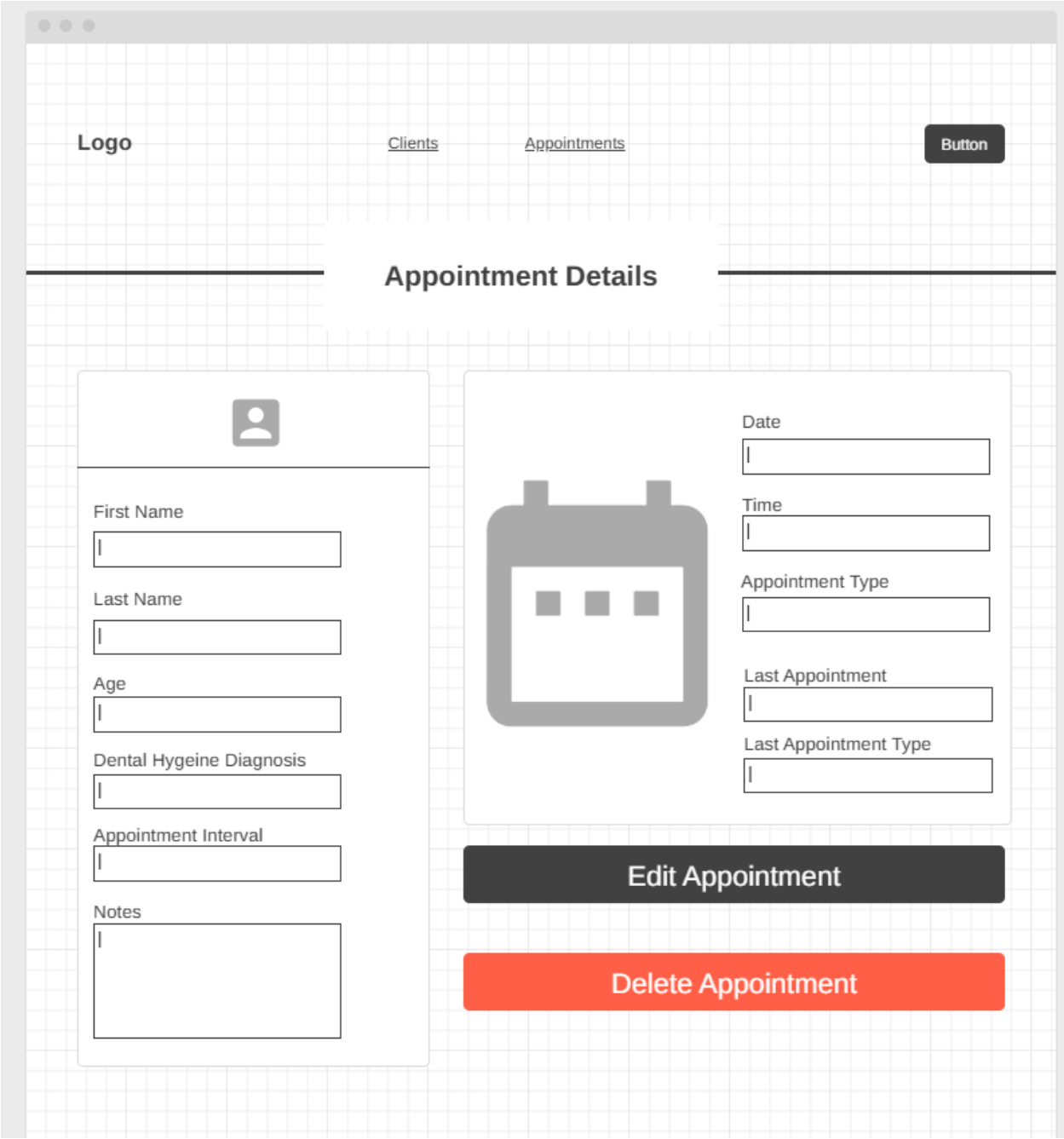
Create Appointment page (part 2)



Select Appointment Page



Appointment Details page (no treatment records change)

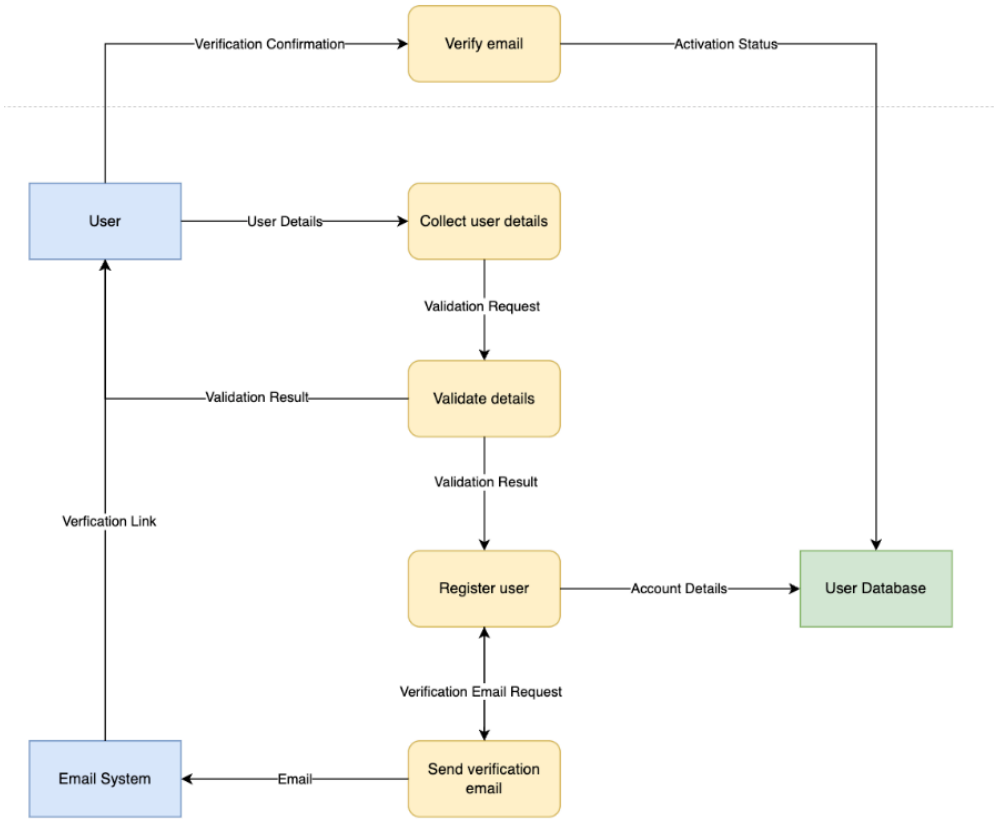


3. **Process and Data Modeling**

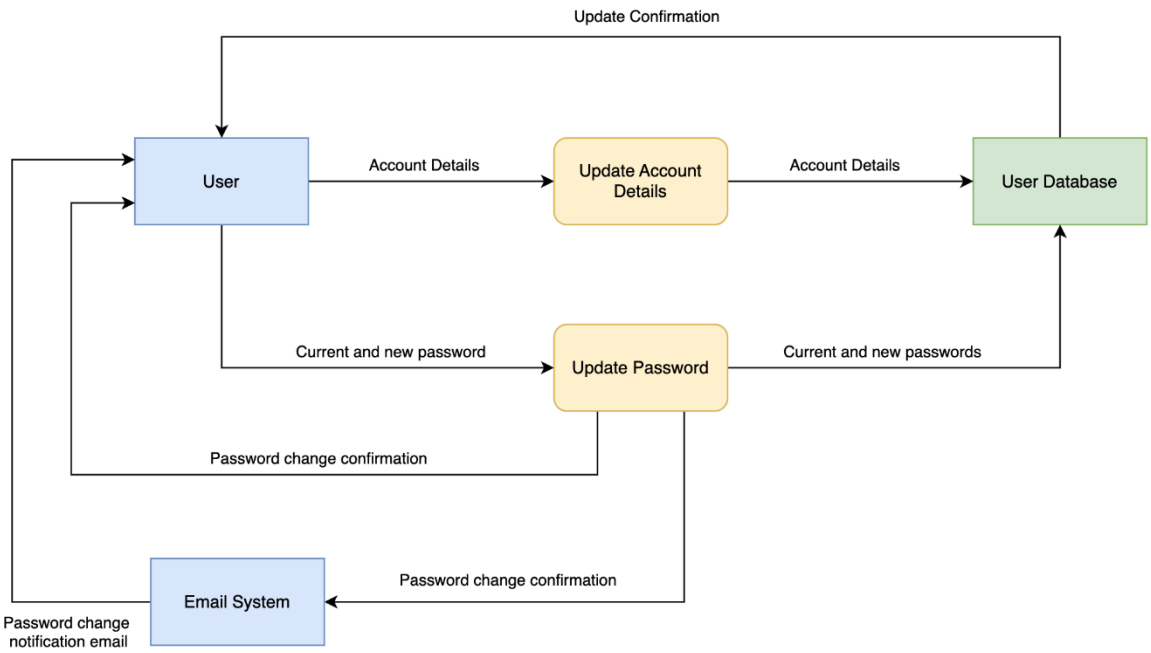
4.1 UML/DFD Modeling and Data Modeling

Activity Diagrams and Data Flow diagram

CREATE USER ACCOUNT DATA FLOW DIAGRAM:



UPDATE USER ACCOUNT DATA FLOW DIAGRAM:



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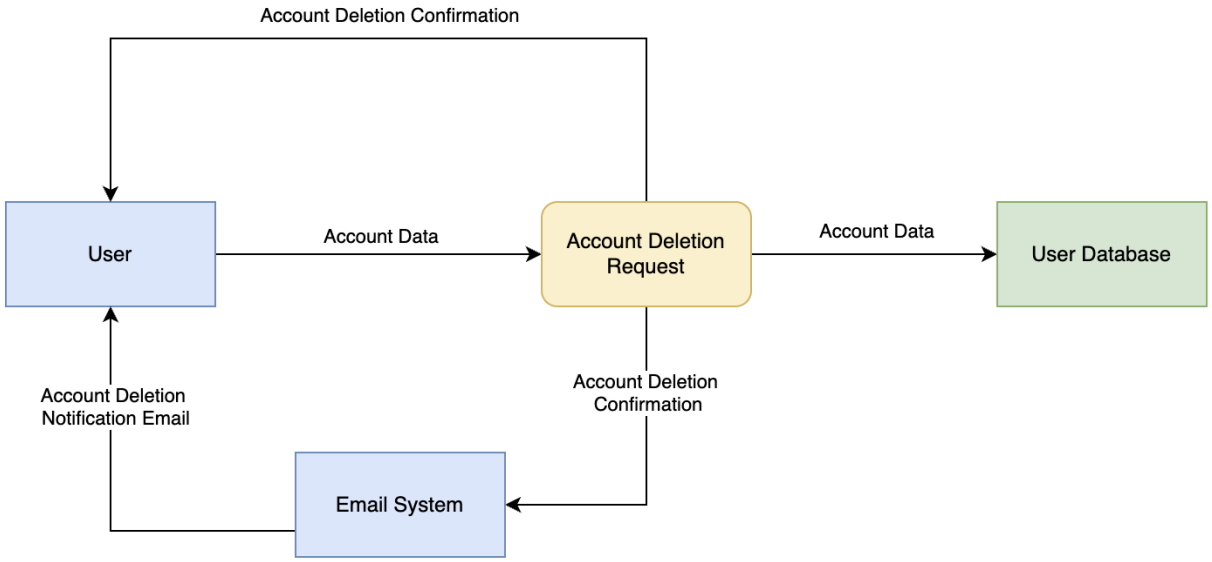
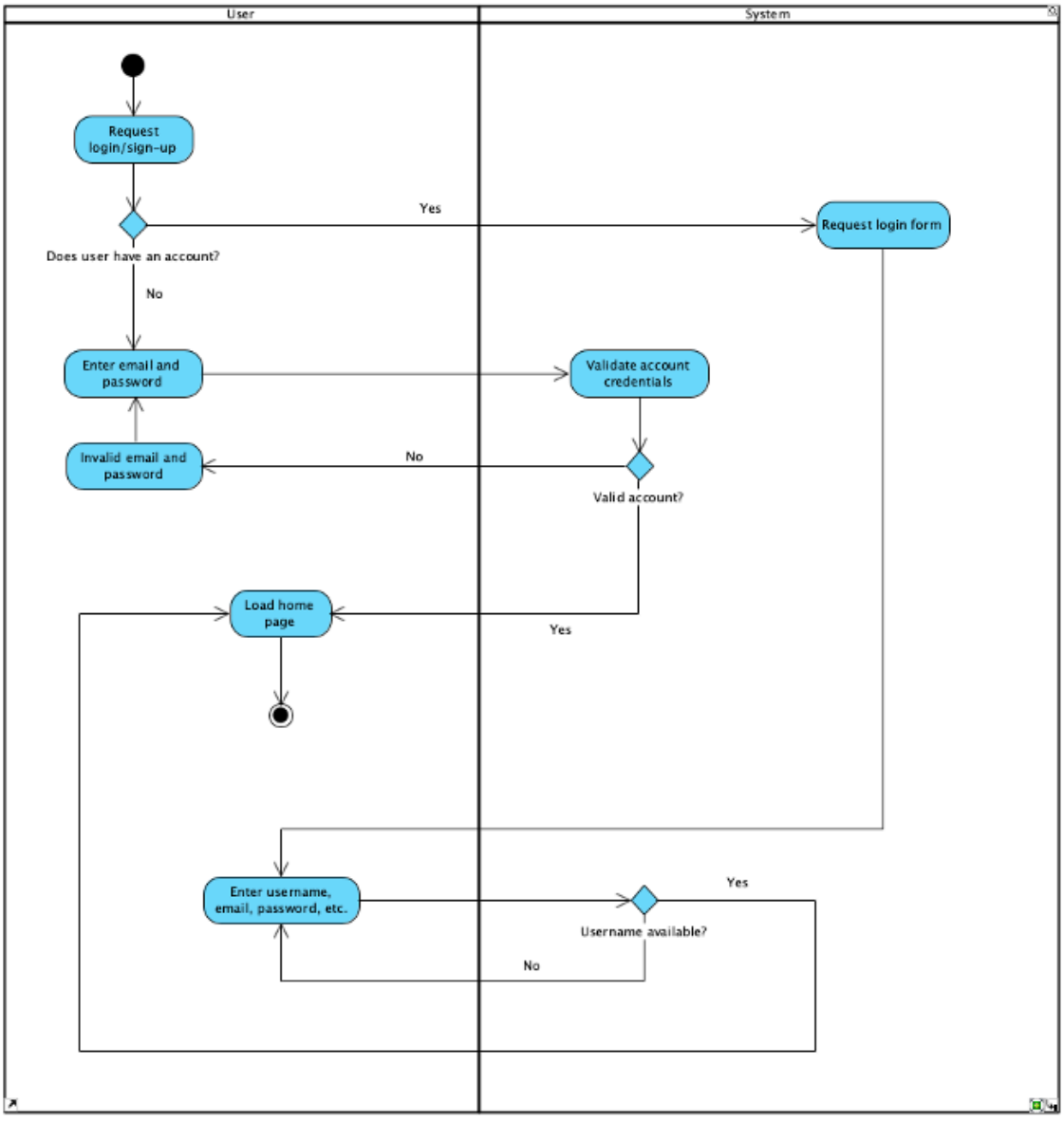
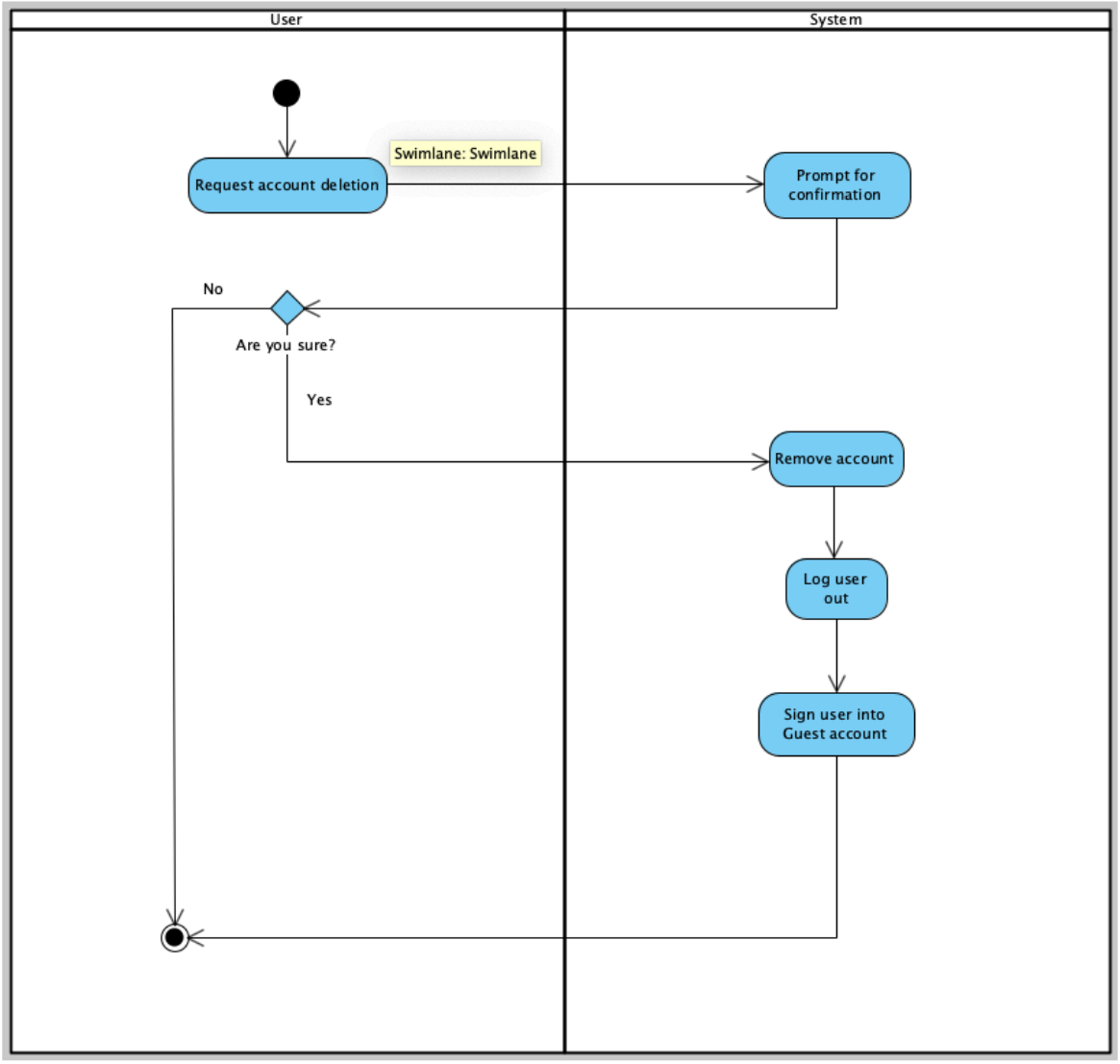


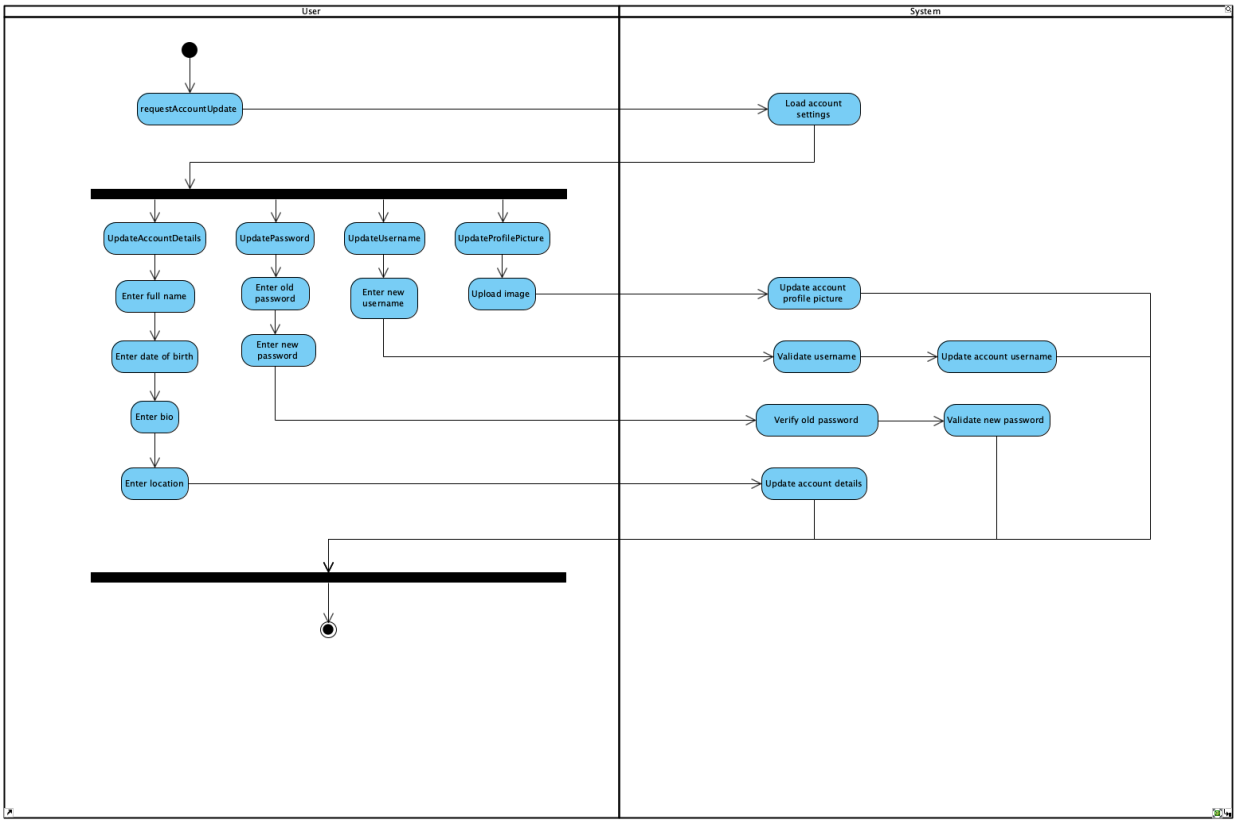
USER ACCOUNT CREATION ACTIVITY DIAGRAM:



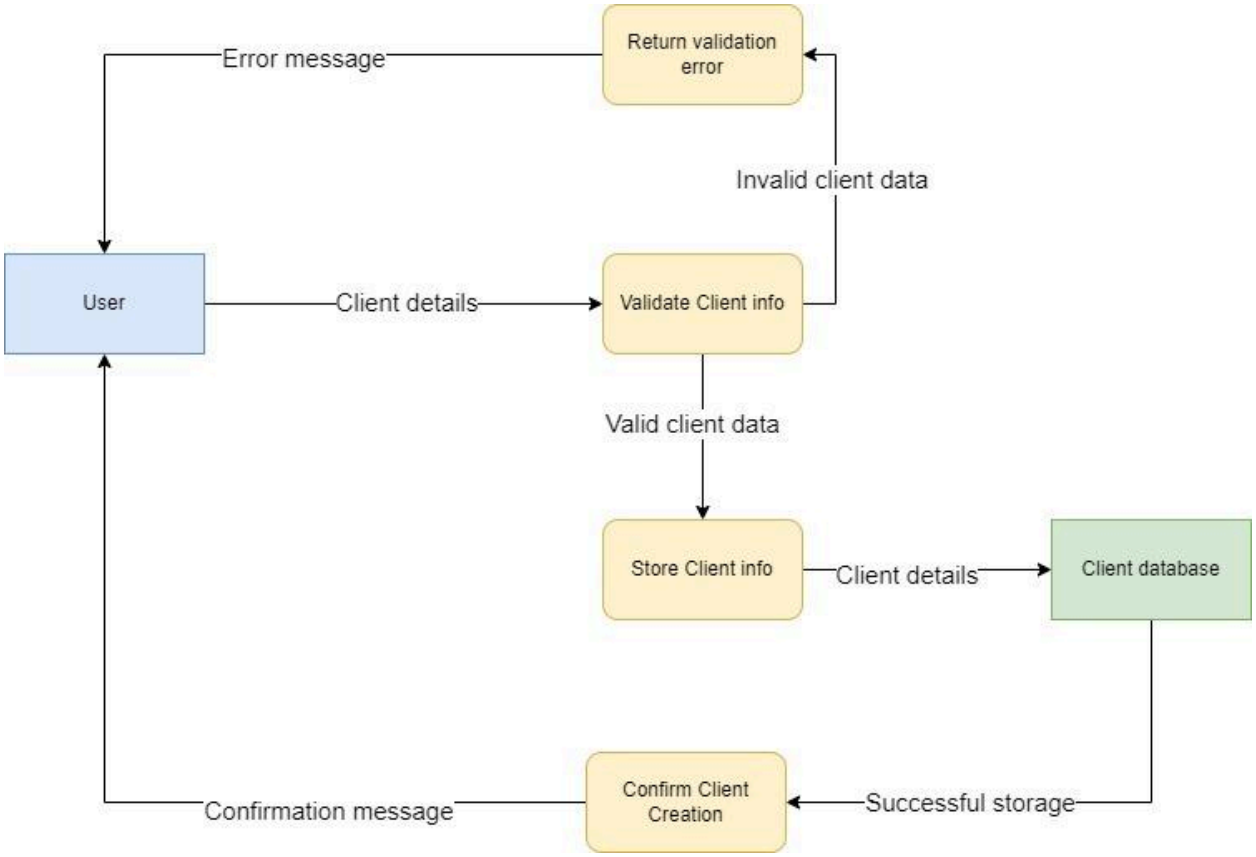
USER ACCOUNT DELETION ACTIVITY DIAGRAM:



USER ACCOUNT UPDATE ACTIVITY DIAGRAM:



CREATE CLIENT DATA FLOW DIAGRAM:



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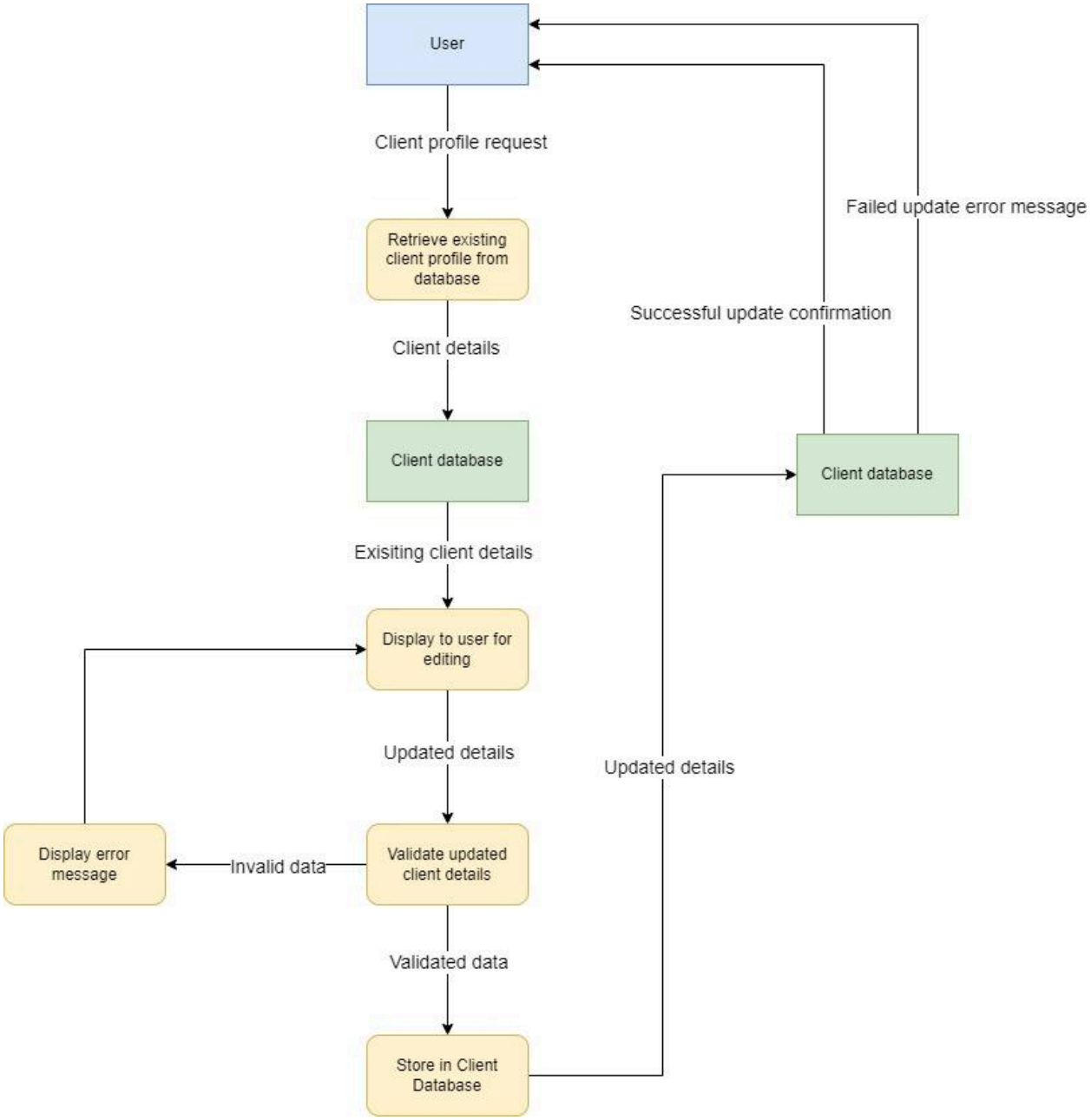

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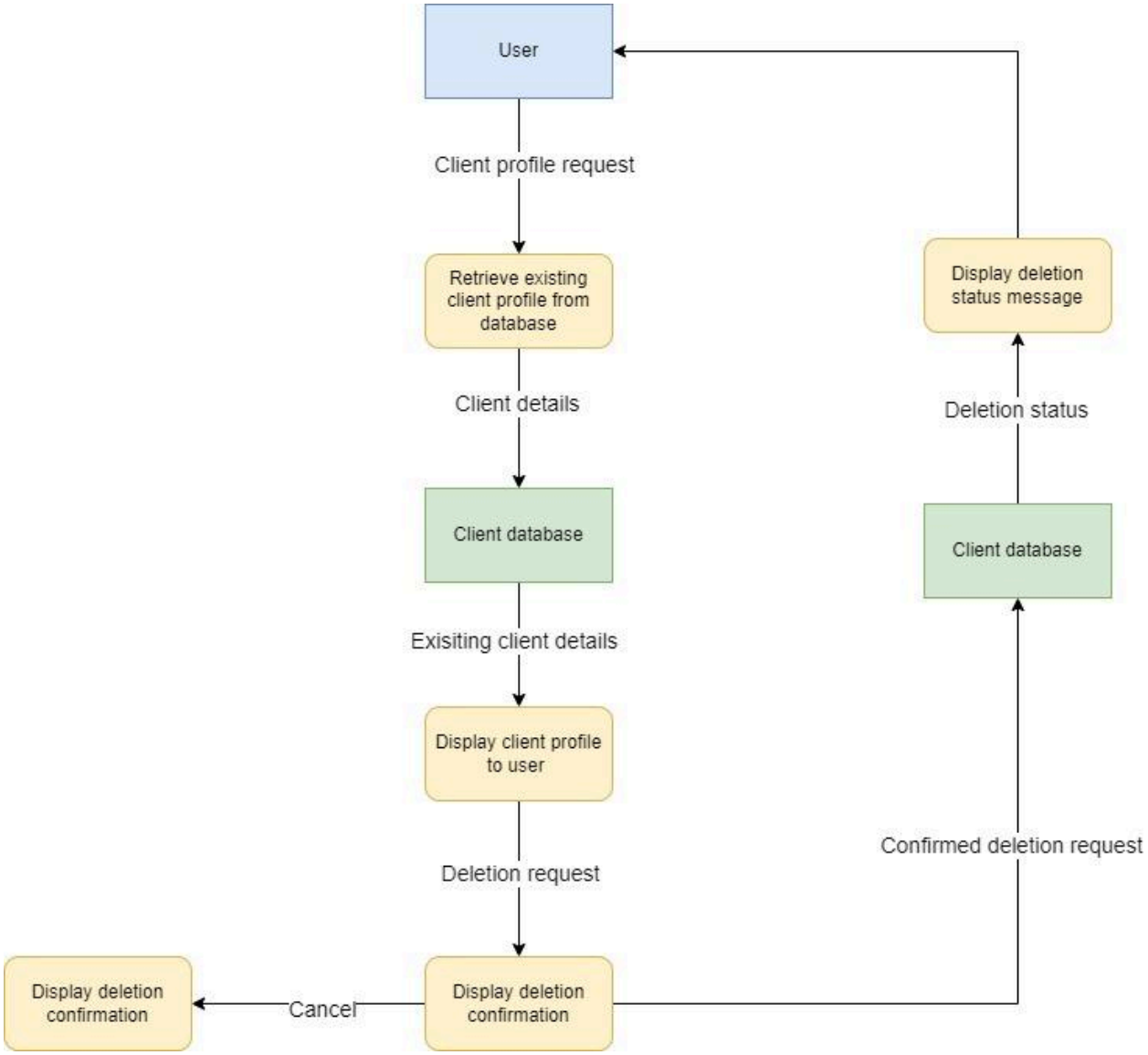
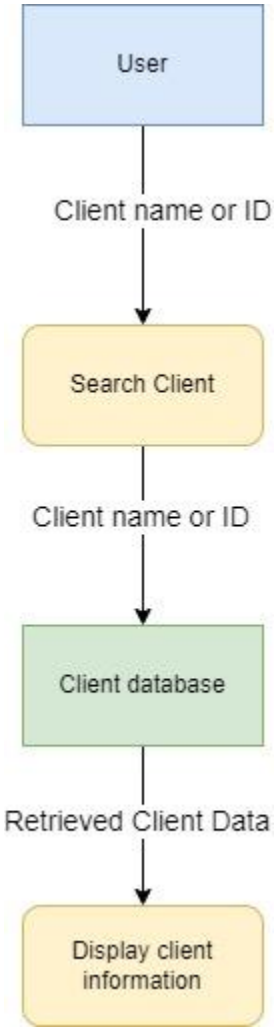


SEARCH FOR CLIENT DATA FLOW DIAGRAM:



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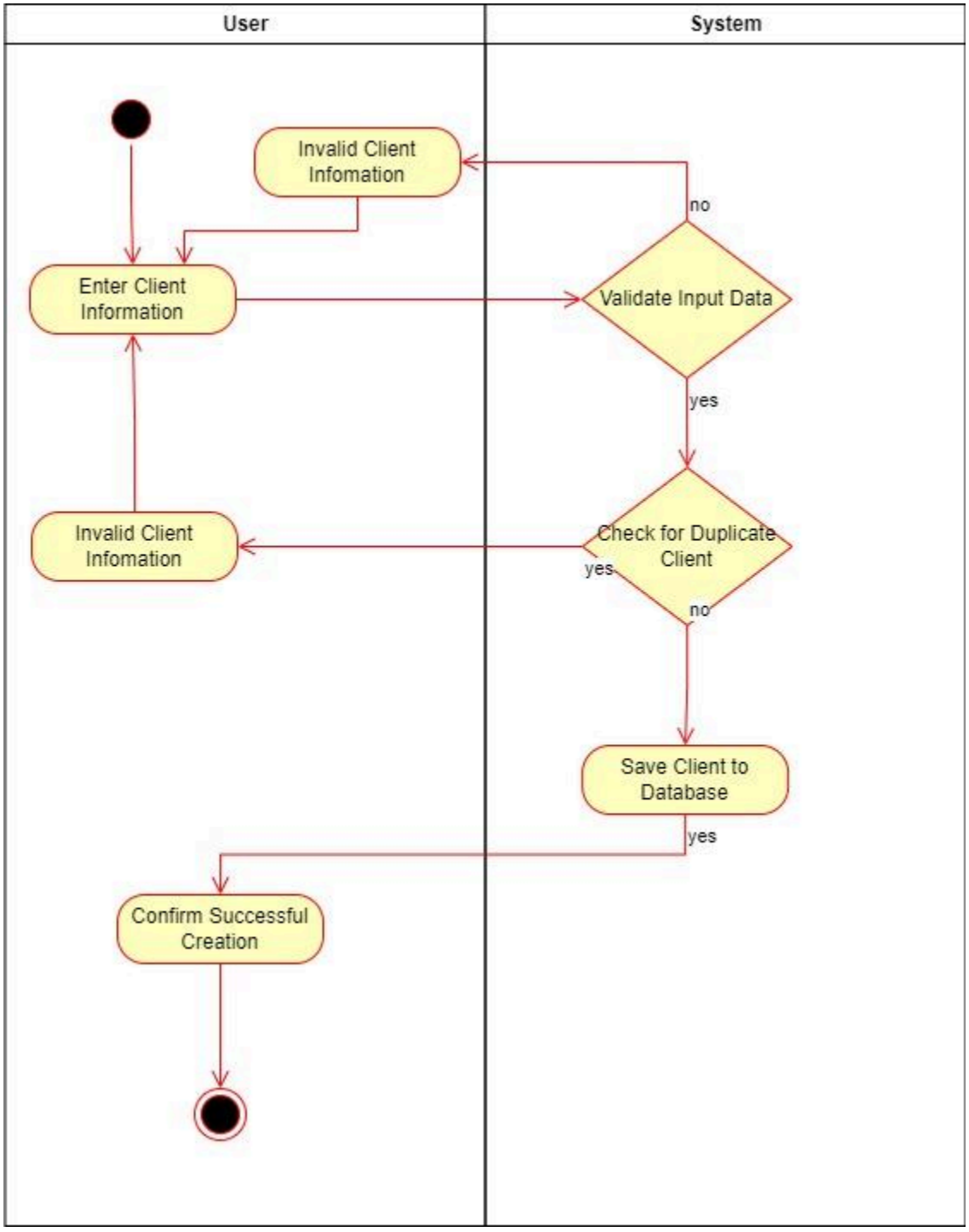

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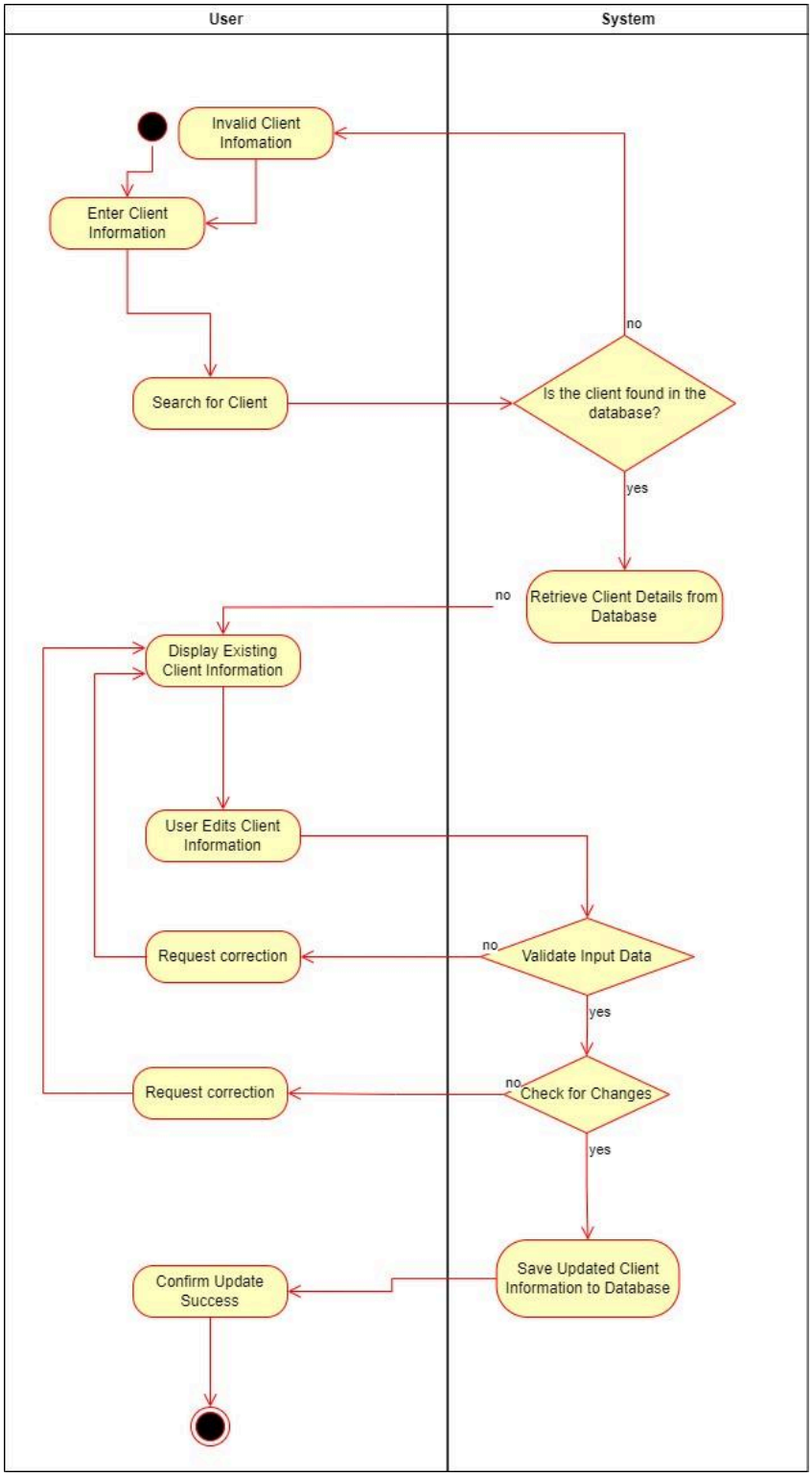

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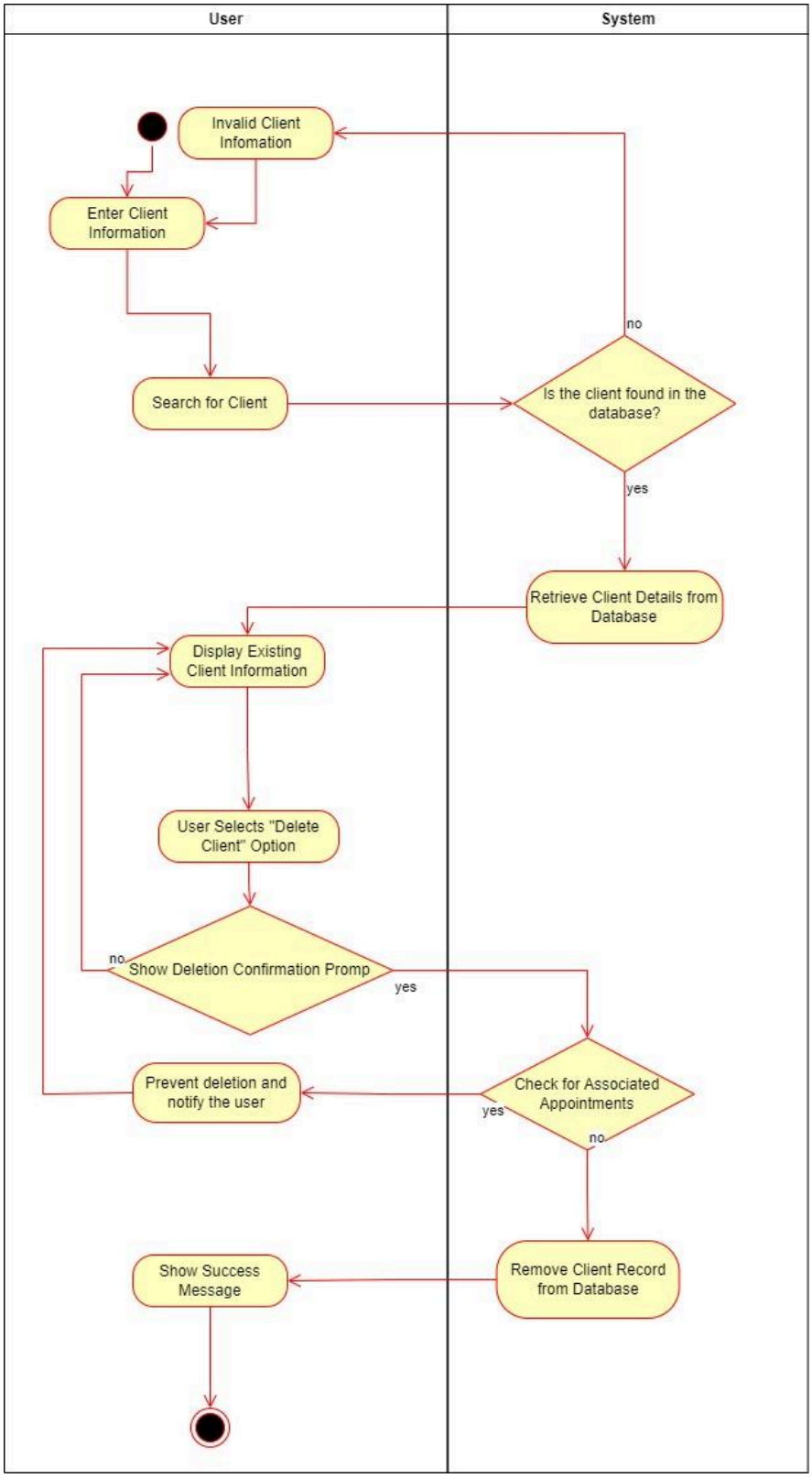
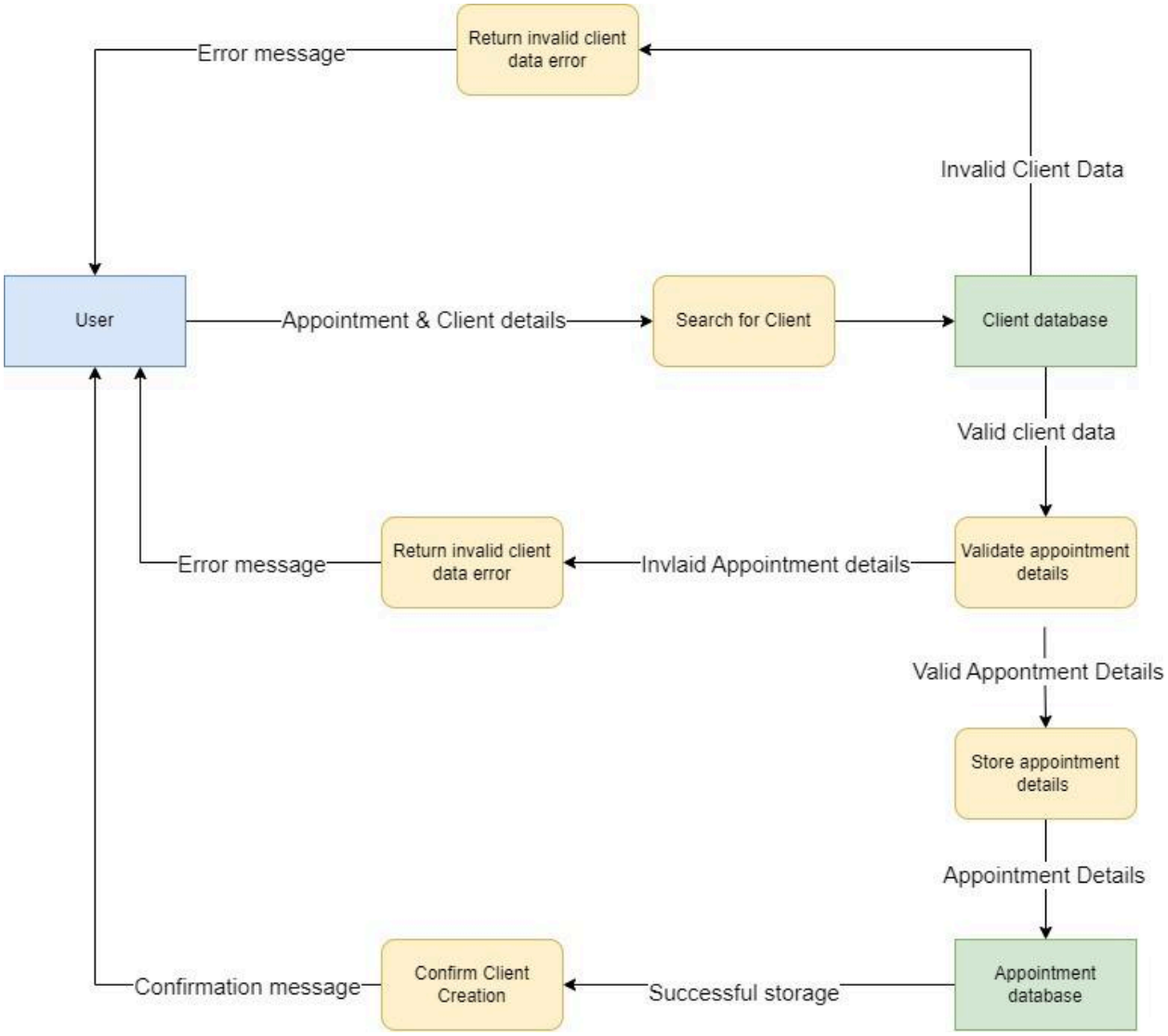


CREATE APPOINTMENT DATA FLOW DIAGRAM:



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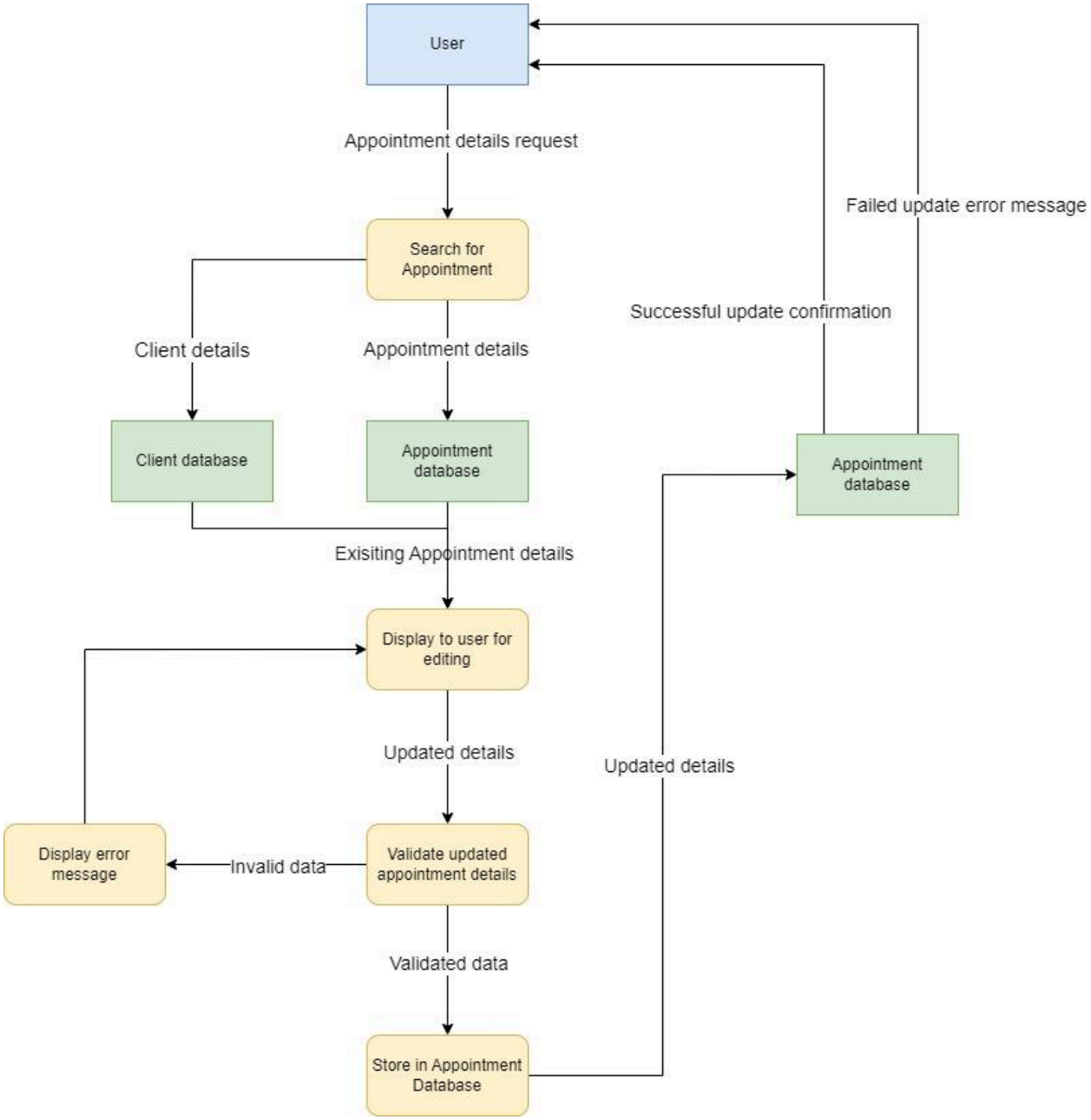
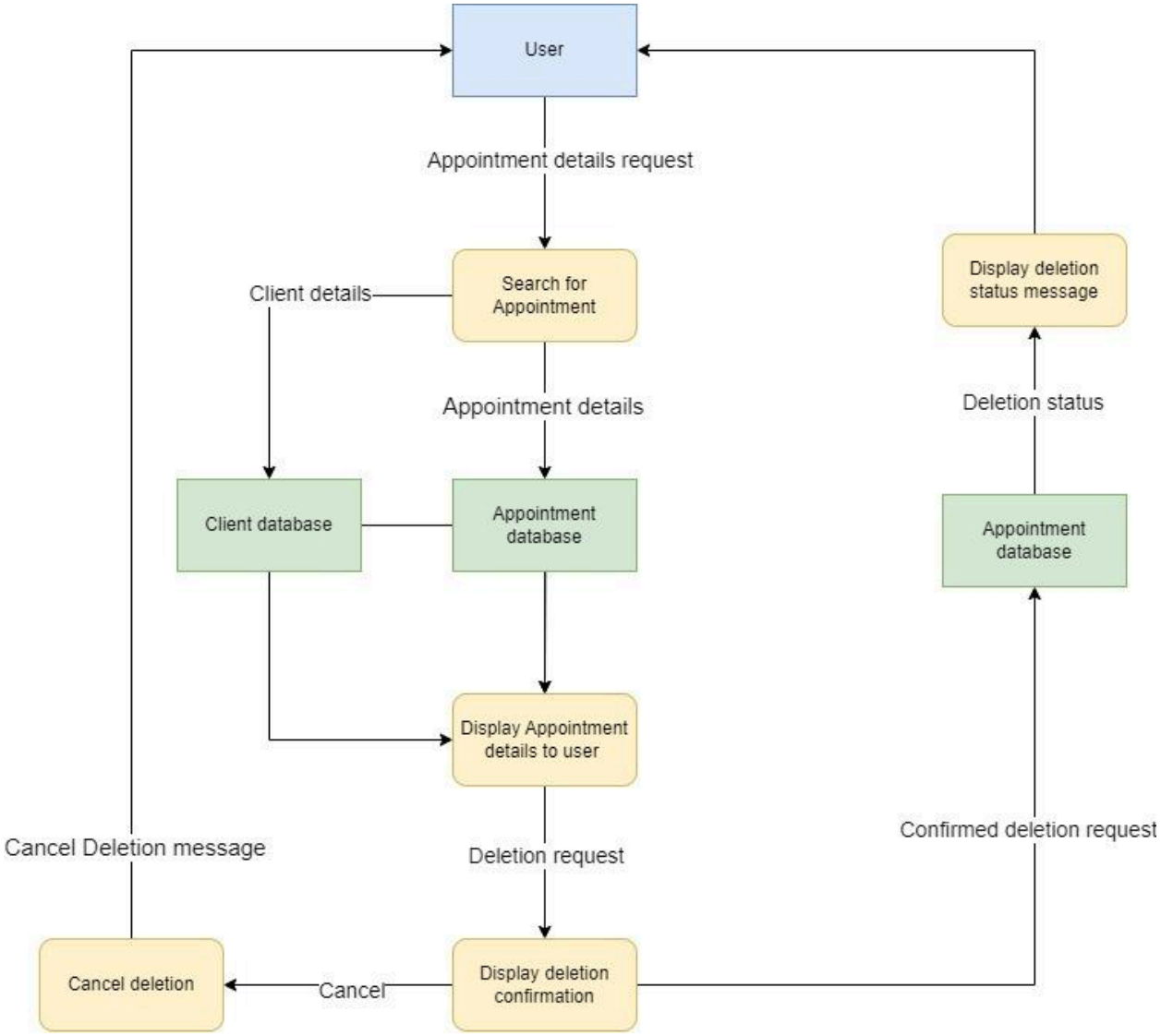
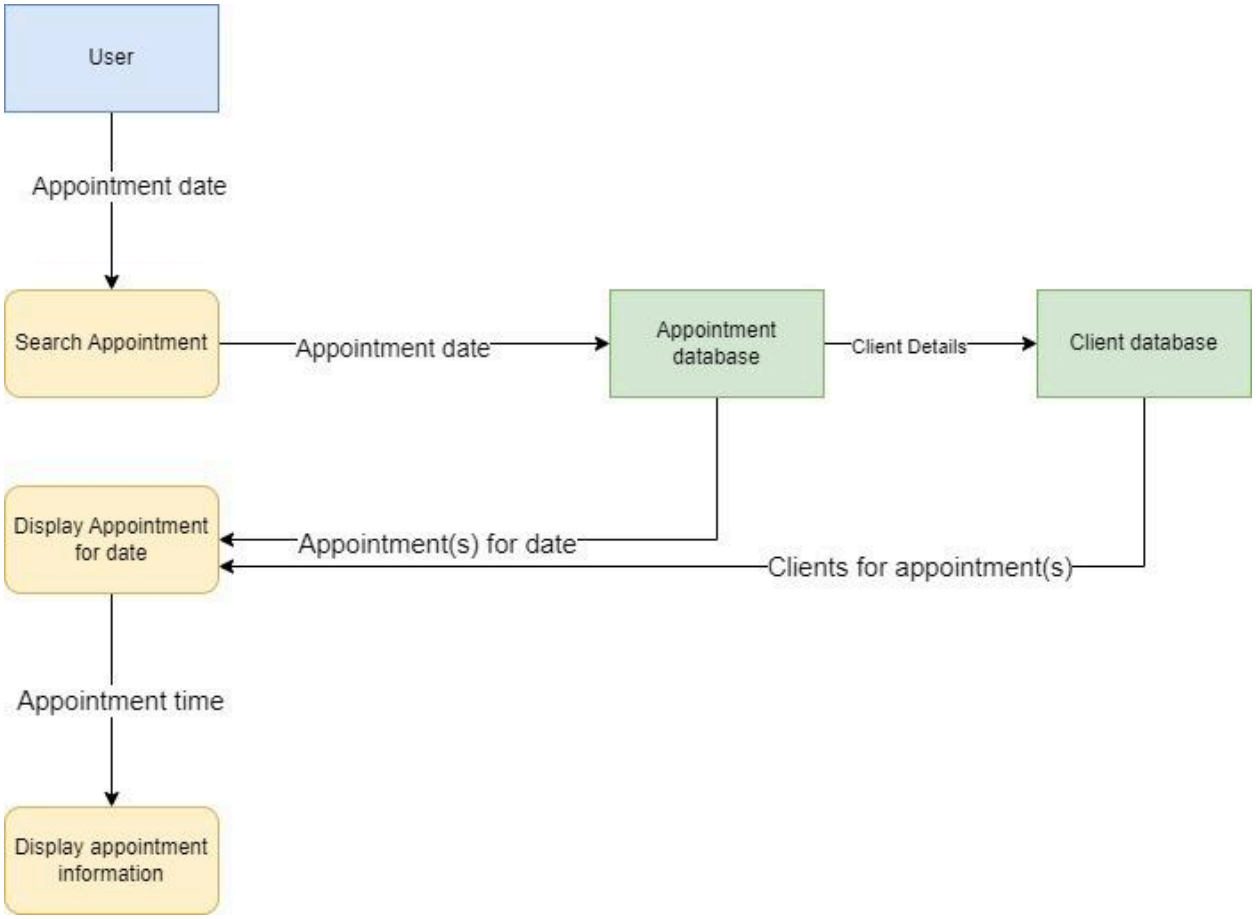


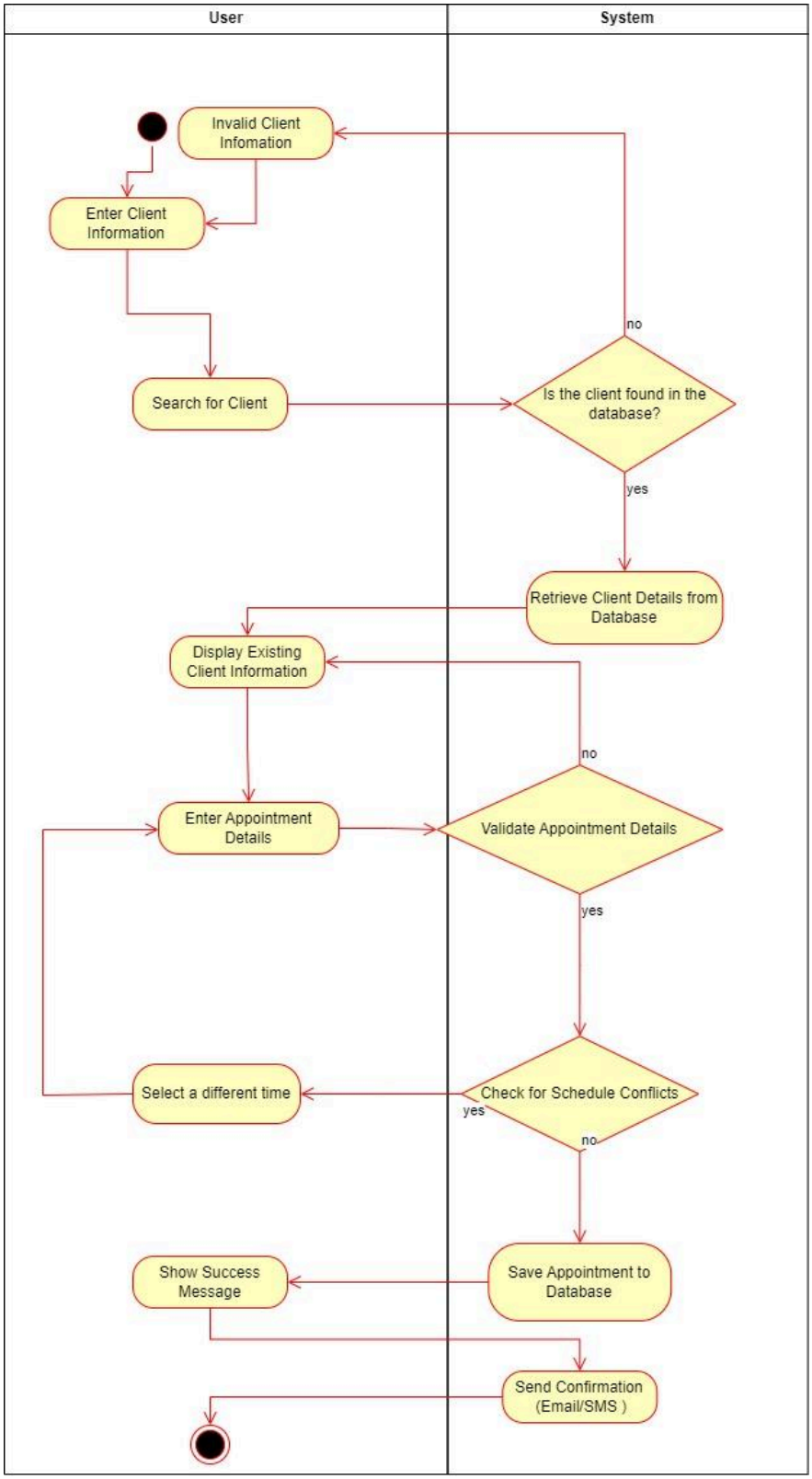
DELETE APPOINTMENT DATA FLOW DIAGRAM:



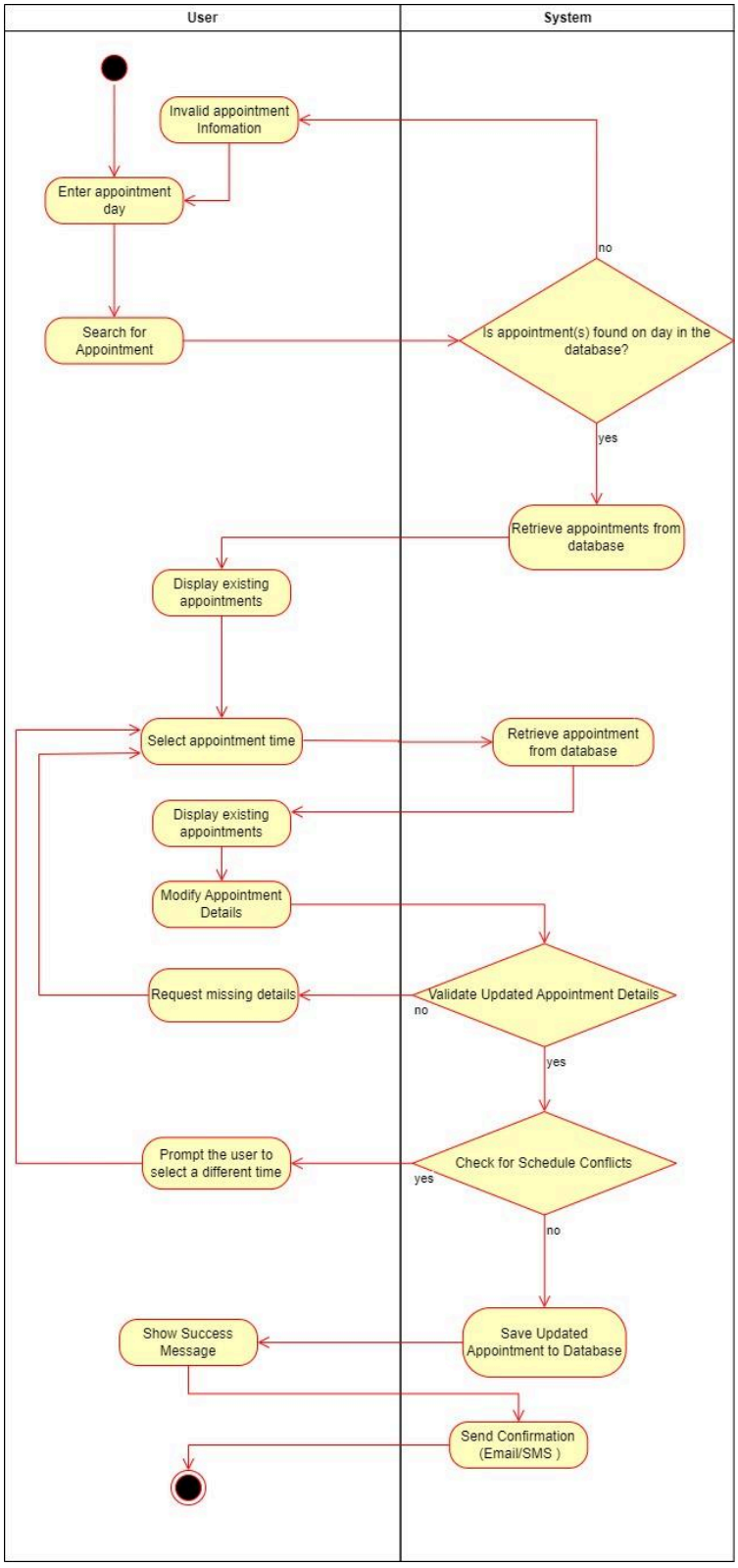
SEARCH APPOINTMENT DATA FLOW DIAGRAM:



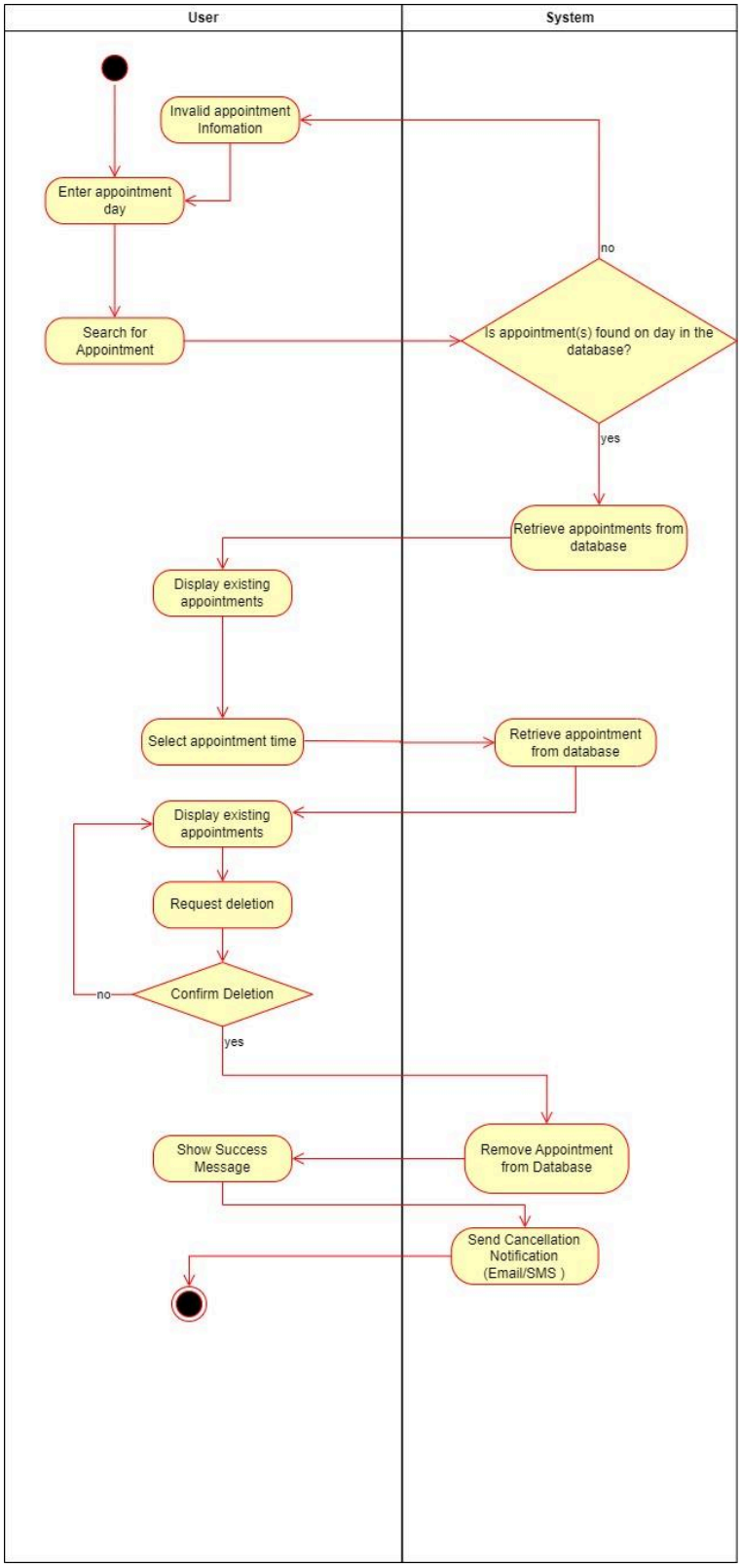
CREATE APPOINTMENT ACTIVITY DIAGRAM:



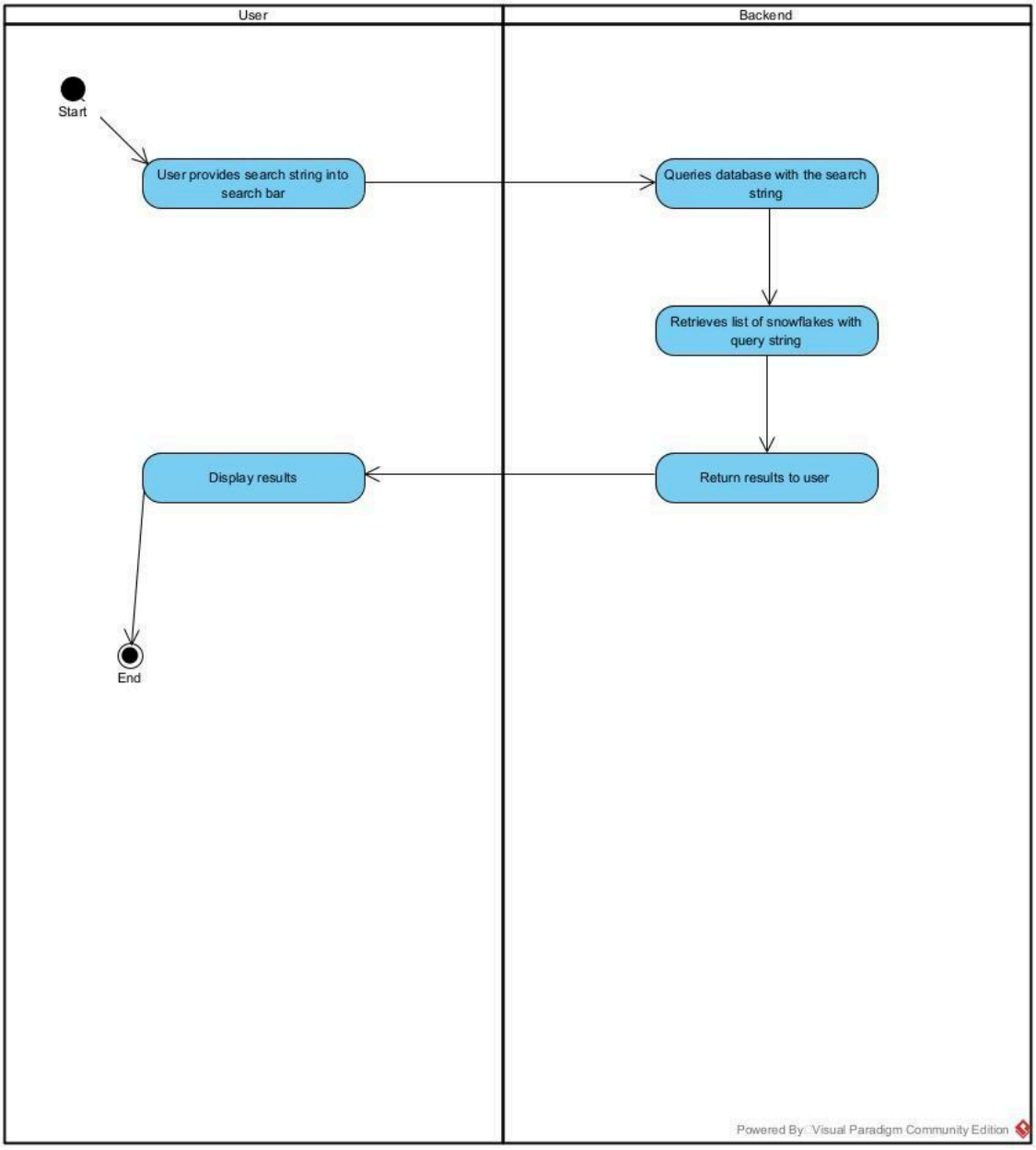
UPDATE APPOINTMENT ACTIVITY DIAGRAM:



DELETE APPOINTMENT ACTIVITY DIAGRAM:



SEARCH ACTIVITY DIAGRAM:



4.2 Business Rules

BR#	Business Rule Description	Use Case association
BR 1	Users must provide a valid email and password to register for an account.	
BR 2	Users must confirm account deletion before the process is executed.	
BR 3	If an account has active appointments, the user must cancel or reassign them before deletion.	
BR 4	Account deletion is permanent and irreversible.	
BR 5	Users will receive a confirmation email after account deletion.	
BR 6	The system must comply with data protection regulations (e.g., HIPAA, GDPR).	
BR 7	Administrators cannot delete their account unless another admin exists.	
BR 8	Users must be authenticated to access SmileScheduler features (excluding public pages).	
BR 9	Users must enter valid information when creating or updating a client (name, contact, etc.).	
BR 10	Duplicate client profiles are not allowed.	
BR 11	Only authorized users can update client profiles.	
BR 12	Clients cannot be deleted if they have future scheduled appointments.	
BR 13	Appointments must be assigned to an existing client.	
BR 14	Appointments cannot be scheduled in the past.	
BR 15	Overlapping appointments for the same client are not allowed.	
BR 16	Users must confirm before deleting an appointment. Users can only update or delete their own created appointments (unless admin access is granted).	
BR 17	The system must send appointment reminders to clients before scheduled appointments.	

BR 18		

4.3 Use Case Specifications with corresponding interface mockups:

Each use case needs to have the following:

1 - **Business Rules.**

2- Use Case Descriptions.

3- Corresponding Mockups

ACCOUNT SIGNUP/IN USE CASE:

Business Rules: BR1, BR8

Use case Name: Account Sign-up/In	**ID:** 1	**Importance Level:** High
Primary Actor: Visitor/Registered User	**Use case Type:** Detail, Essential	
Stakeholders and Interests: Visitor – Wants to create an account to manage clients and schedule appointments. Registered User – Wants to log in/log out to manage appointments and client records. Administrator – Wants to ensure only authorized personnel can access the system. Developer – Wants to ensure the sign-up/sign-in process is functional and secure.		
Brief Description: This use case describes how visitors can sign up for an account on the SmileScheduler platform and how registered users can log in to manage their schedules, appointments, and clients.		

Trigger:

A visitor decides to register for an account.

A registered user decides to log into their account.

Relationships:

Association: User, Visitor

Include: Forgot Password, Email Verification

Extend: Update User Information

Generalization: Manage Appointments

Normal Flow of Events:

1. The Visitor/User accesses the SmileScheduler login page.
2. If the Visitor wishes to sign up:
- The **S-1**: Register Account subflow is performed.
3. If the User wishes to sign in:
- The **S-2**: Sign-In subflow is performed.

Sub flows:

S-1: Register Account

1. The user enters a **valid email address**.
2. The user creates a **secure password**.
3. The user enters their **full name**.
4. The user selects their **role (e.g., Dentist, Hygienist, Administrator)**.
5. The user confirms the **email verification** sent to their inbox.
6. The application **saves the account** and redirects the user to the dashboard.

S-2: Sign-in

1. The user enters their email or username.
2. The user enters their password.
3. The system verifies the credentials:
    a. If valid, the user is logged in and redirected to their appointment dashboard.
    b. If invalid, the system displays an error message and prompts retry.
4. If the user forgot their password, the "Forgot Password" process is initiated.
5. The user successfully logs in and can manage their appointments and clients.

Extensions:

- If the user selects Forgot Password, they receive a password reset link.
- If the user fails multiple login attempts, the system locks the account temporarily.
- Administrators can manually create accounts for staff if needed.

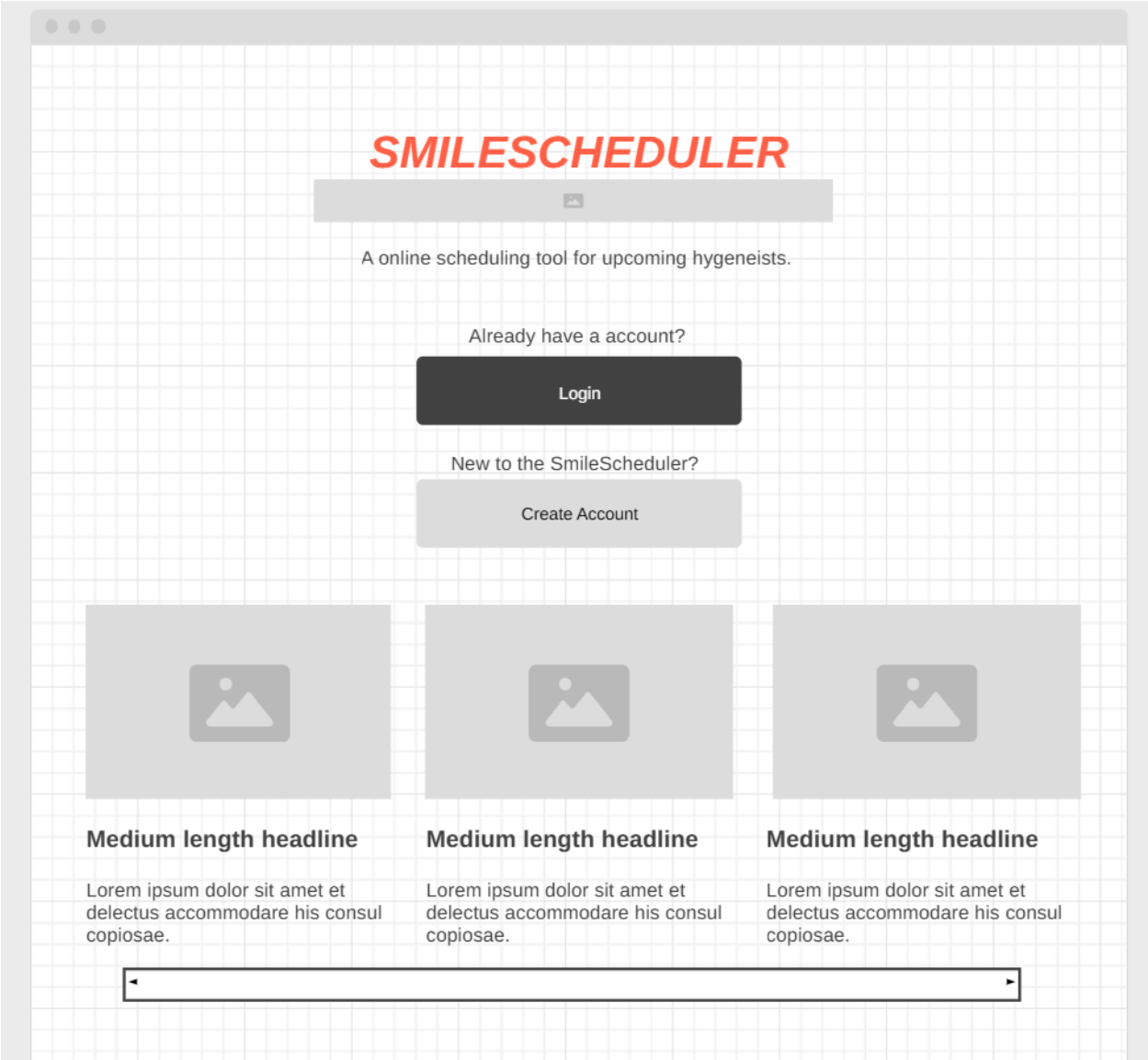
Alternative Flows:

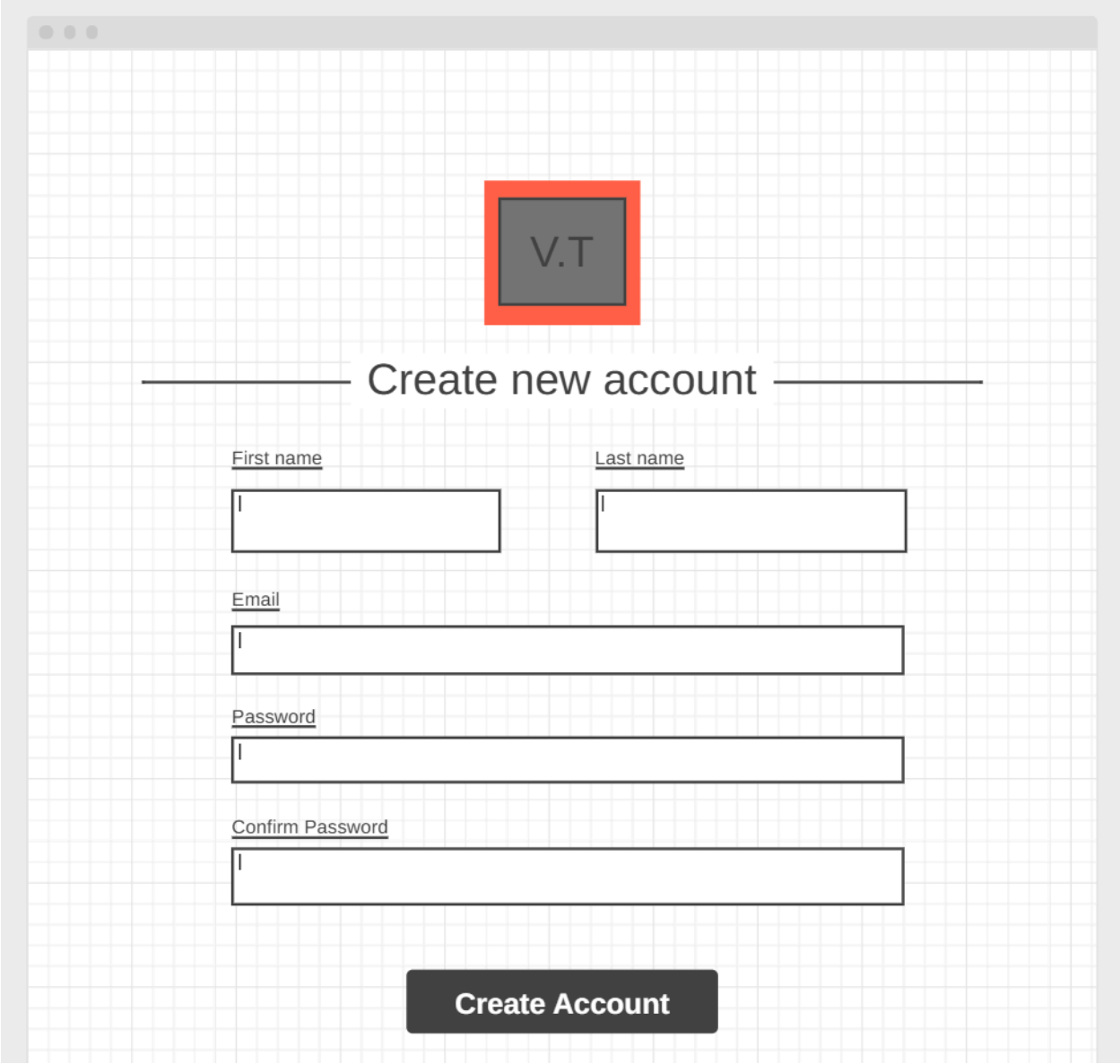
- If the email is already registered, the user is notified and prompted to log in.
- If the password is incorrect multiple times, an account lockout may occur for security.
- If email verification is not completed, the user cannot log in.

Postconditions:

- Success: The user is logged in and redirected to the main dashboard.
- Failure: The user is shown an error message and asked to retry.

Mockups:


SMILESCHEDULER
A online scheduling tool for upcoming hygeneists.
Already have a account?
Login
New to the SmileScheduler?
Create Account
Medium length headline
Lorem ipsum dolor sit amet et delectus accommodare his consul copiosae.
Medium length headline
Lorem ipsum dolor sit amet et delectus accommodare his consul copiosae.
Medium length headline
Lorem ipsum dolor sit amet et delectus accommodare his consul copiosae.


V.T
Create new account
First name
Last name
Email
Password
Confirm Password
Create Account

DELETE USER ACCOUNT USE CASE:

Business Rules: BR2,BR3,BR4,BR5,BR6,BR7,

Use Case Description:

Use Case Name: Account Deletion	**ID**: 2	**Importance Level**: High
Primary Actor: Registered User	**Use Case Type:** Detail, Essential	
Stakeholders and Interests: User (Dentist/Hygienist/Receptionist): Wants to delete their SmileScheduler account along with all associated data. Administrator: Ensures user account deletion is handled securely and complies with data protection policies. Developer: Ensures that the account deletion process works correctly and follows business rules and legal requirements.		
Brief Description: This use case describes how a registered SmileScheduler user can delete their account and all associated data from the platform.		
Trigger: A registered user decides to permanently delete their account and personal data from SmileScheduler.		
Relationships: Association: Registered User Include: Email Confirmation		
Normal Flow of Events: 1. User accesses account settings in the SmileScheduler application. 2. User selects the "Delete Account" option.		

3. System prompts the user to confirm account deletion.
4. System notifies the user that all appointments, client records, and data associated with their account will be permanently deleted (if applicable).
5. User confirms deletion.
6. System deletes the account and its associated data from the database.
7. System sends a confirmation email to the user, notifying them of successful deletion.

Alternative Flow:

A1: If the user changes their mind, they can cancel the deletion process at step 3.

Exceptions:

E1: If the user has pending appointments, they may be required to reassign or cancel them before account deletion.

E2: If an administrator account is being deleted, the system may prevent deletion unless another admin is assigned.

E3: If the system experiences server issues, the deletion request may be temporarily delayed.

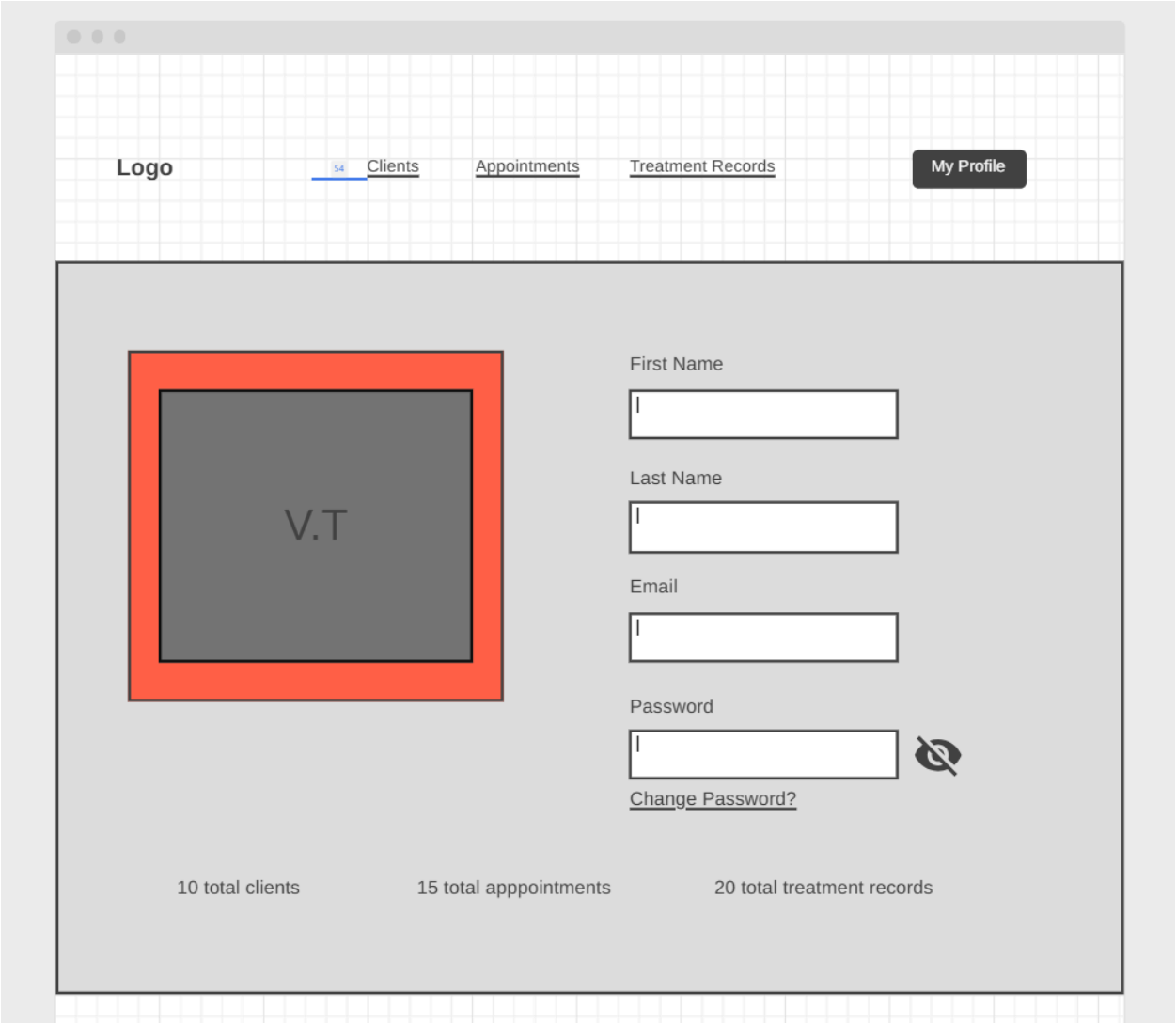
Postconditions:

The user’s account and data are completely removed from the SmileScheduler database.

The user receives a confirmation email stating their account has been deleted.

Mockups:

Deleting an account



UPDATE USER ACCOUNT USE CASE:

Business Rules: BR19

Use Case Description:

Use Case Name: Update Account Information	**ID**: 3	**Importance Level**: High
Primary Actor: Registered User	**Use Case Type:** Detail, Essential	
Stakeholders and Interests: User – wants to update their account details (e.g., name, email, password). Administrator – wants to ensure users can update their details securely. Developer – wants to ensure updates are properly validated and stored.		
Brief Description: This use case describes how a registered user can update their account details, such as name, email, password, and contact information.		
Trigger: The user decides to update their account details.		
Relationships: Association - Registered User		
Normal Flow of Events: 1. User navigates to the account settings page. 2. User selects the option to update their account details. 3. User modifies the required fields (e.g., name, email, password). 4. System validates the entered information. 5. System updates the account details in the database. 6. System sends a confirmation notification to the user.		
Alternative Flow: A1: User enters invalid information (e.g., invalid email format, weak password). → System displays an error message and requests valid input.		

A2: User cancels the update before saving.

→ System discards changes and retains the previous account details.

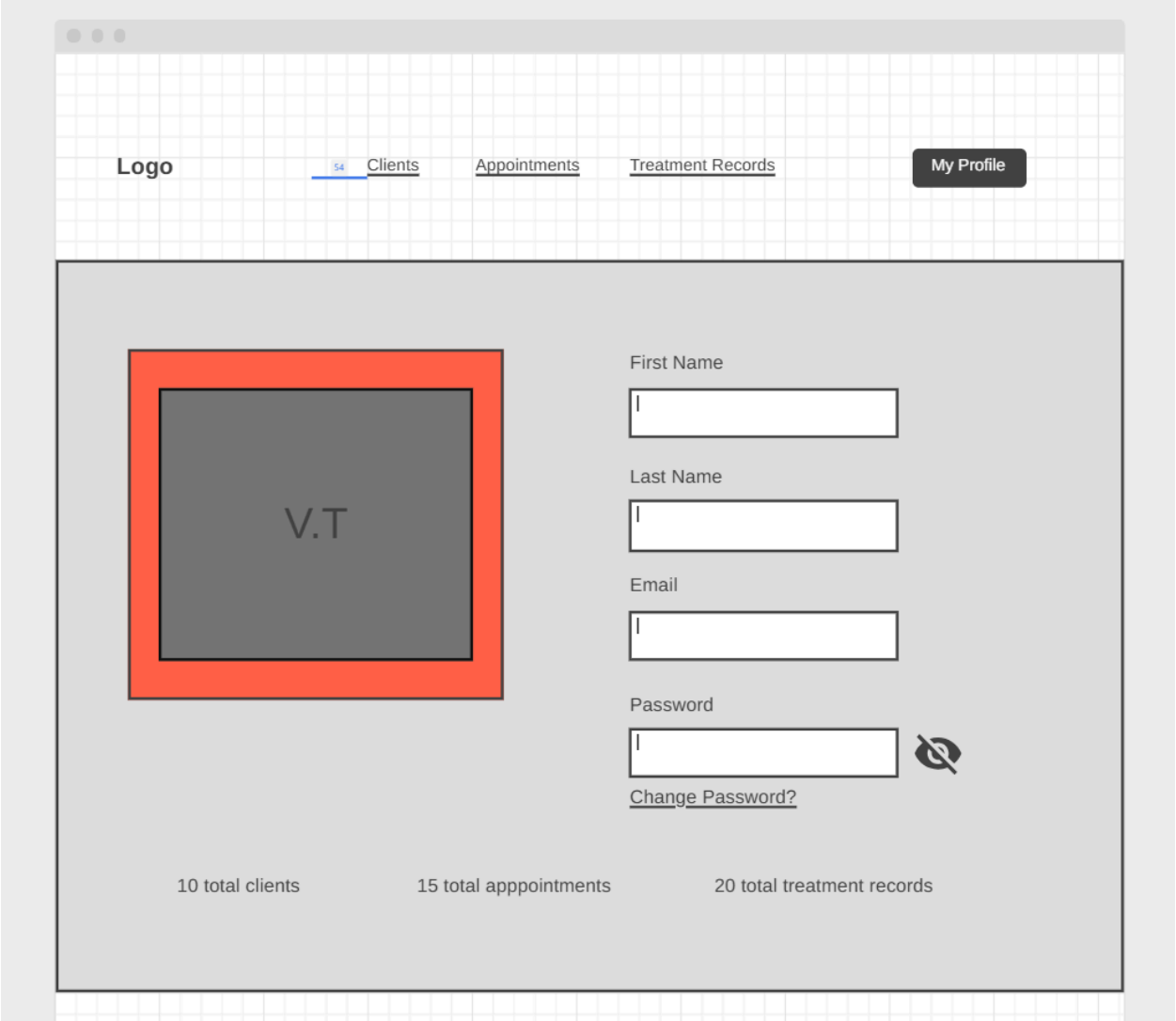
Exceptions:

- If the user provides an email that is already registered, the system prevents the update.
- If the system fails to update the account due to an internal error, an error message is displayed.

Postconditions:

- The account details are successfully updated.
- A confirmation email is sent to the user.

Mockups:


Logo
Clients
Appointments
Treatment Records
My Profile
V.T
First Name
Last Name
Email
Password
Change Password?
10 total clients
15 total apppointments
20 total treatment records

Create New Client Profile

Business Rules: BR10, BR11, BR12, BR13,

Use Case Description:

Use Case Name: Create New Client Profile	**ID**: 4	**Importance Level**: High
Primary Actor: Registered User	**Use Case Type:** Detail, Essential	
Stakeholders and Interests: Dentist/Hygienist – wants to add a new client profile to manage appointments and track client history. Administrator – wants to ensure data integrity and security for client information. Developer – wants to ensure the process is efficient and user-friendly.		
Brief Description: This use case describes how a registered user (dentist/hygienist) creates a new client profile by entering essential client details such as name, contact information, and medical history.		
Trigger: The user decides to add a new client to the system.		
Relationships: Association - Registered User		
Normal Flow of Events: 1. User navigates to the "Clients" section. 2. User selects "Add New Client." 3. System presents a form for entering client details (name, phone number, email, medical notes, etc.). 4. User fills in the required fields and submits the form. 5. System validates the entered data. 6. System creates the new client profile and stores it in the database. 7. System confirms successful creation and redirects the user to the client profile page.		
Alternative Flow: A1: User enters invalid or missing required information. → System displays an error message and requests valid input.		

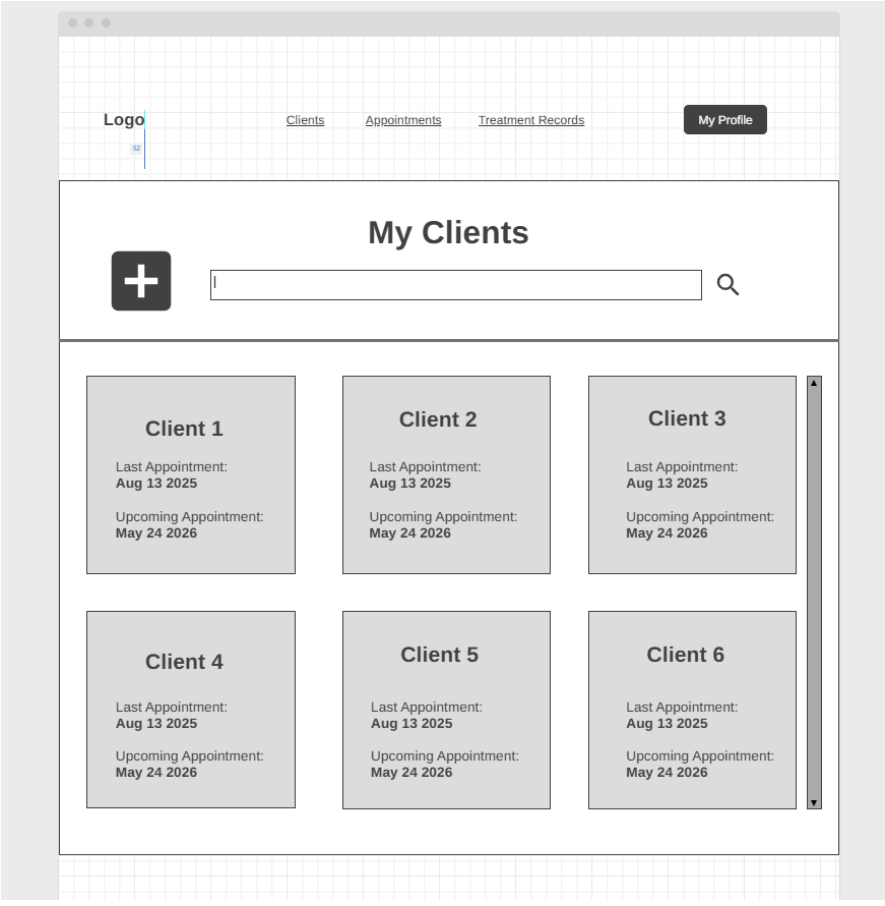
A2: User cancels the process before submission.
→ System discards the entered data and returns to the client list.

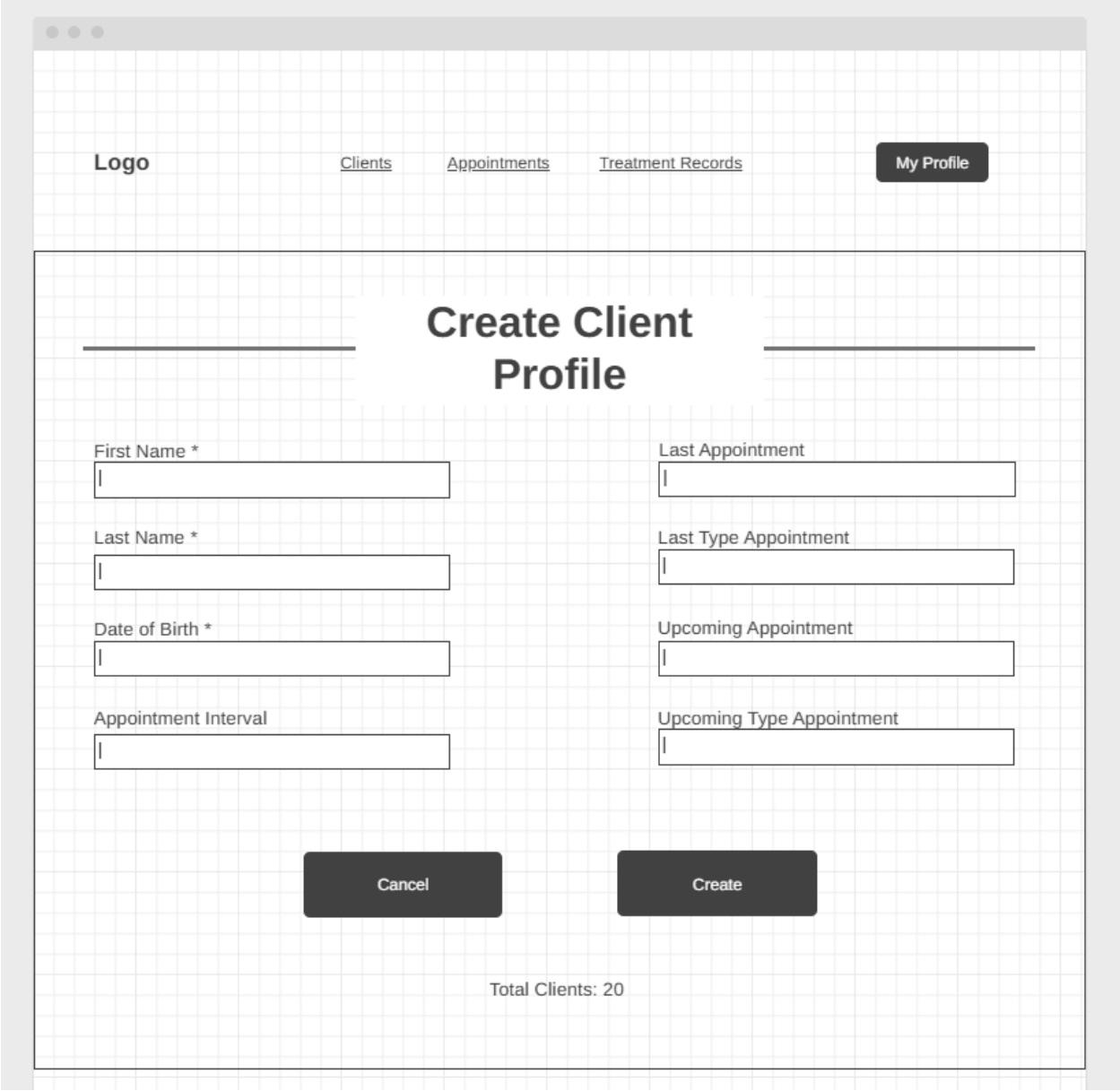
Exceptions:

- If the system fails to save the client due to an internal error, an error message is displayed.
- If duplicate client information is detected (same email/phone number), the system notifies the user and suggests updating an existing profile instead.

Postconditions:

- A new client profile is successfully added to the database.
- The client is now available in the system for appointment scheduling.




Logo
Clients
Appointments
Treatment Records
My Profile
Create Client Profile
First Name *
Last Name *
Date of Birth *
Appointment Interval
Last Appointment
Last Type Appointment
Upcoming Appointment
Upcoming Type Appointment
Cancel
Create
Total Clients: 20

Update Client Profile

Business Rules: BR10, BR11, BR14, BR6,

Use Case Description:

Use Case Name: Create New Client Profile	**ID**: 4	**Importance Level**: High
Primary Actor: Registered User	**Use Case Type:** Detail, Essential	
Stakeholders and Interests: Dentist/Hygienist – wants to update client information such as contact details, medical history, or preferences. Administrator – wants to ensure data consistency and prevent unauthorized modifications. Developer – wants to ensure a seamless and secure update process.		
Brief Description: This use case describes how a registered user updates an existing client profile by modifying details such as name, phone number, email, medical history, or preferences.		
Trigger: The user decides to update a client's information.		
Relationships: Association - Registered User		
Normal Flow of Events: 1. User navigates to the "Clients" section. 2. User selects an existing client from the client list. 3. System displays the current client details. 4. User clicks "Edit" to modify the details. 5. System enables fields for editing. 6. User updates necessary fields (e.g., name, contact info, medical notes). 7. User submits the changes. 8. System validates the new information. 9. System updates the client profile in the database. 10. System confirms successful update and redirects the user to the client's updated profile.		

Alternative Flow:

A1: User enters invalid or missing required information.
→ System displays an error message and requests valid input.

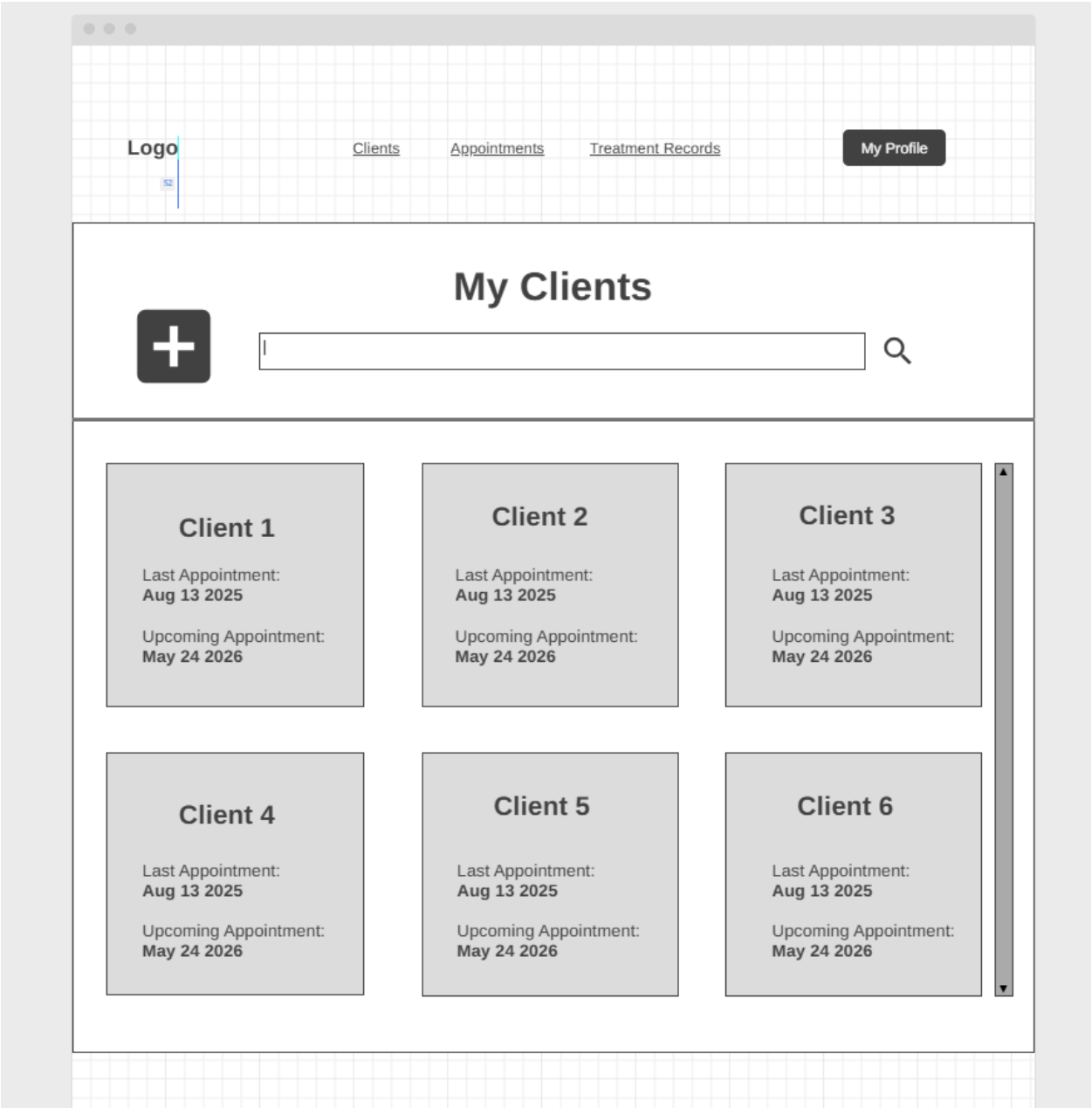
A2: User cancels the process before submission.
→ System discards any changes and returns to the client profile.

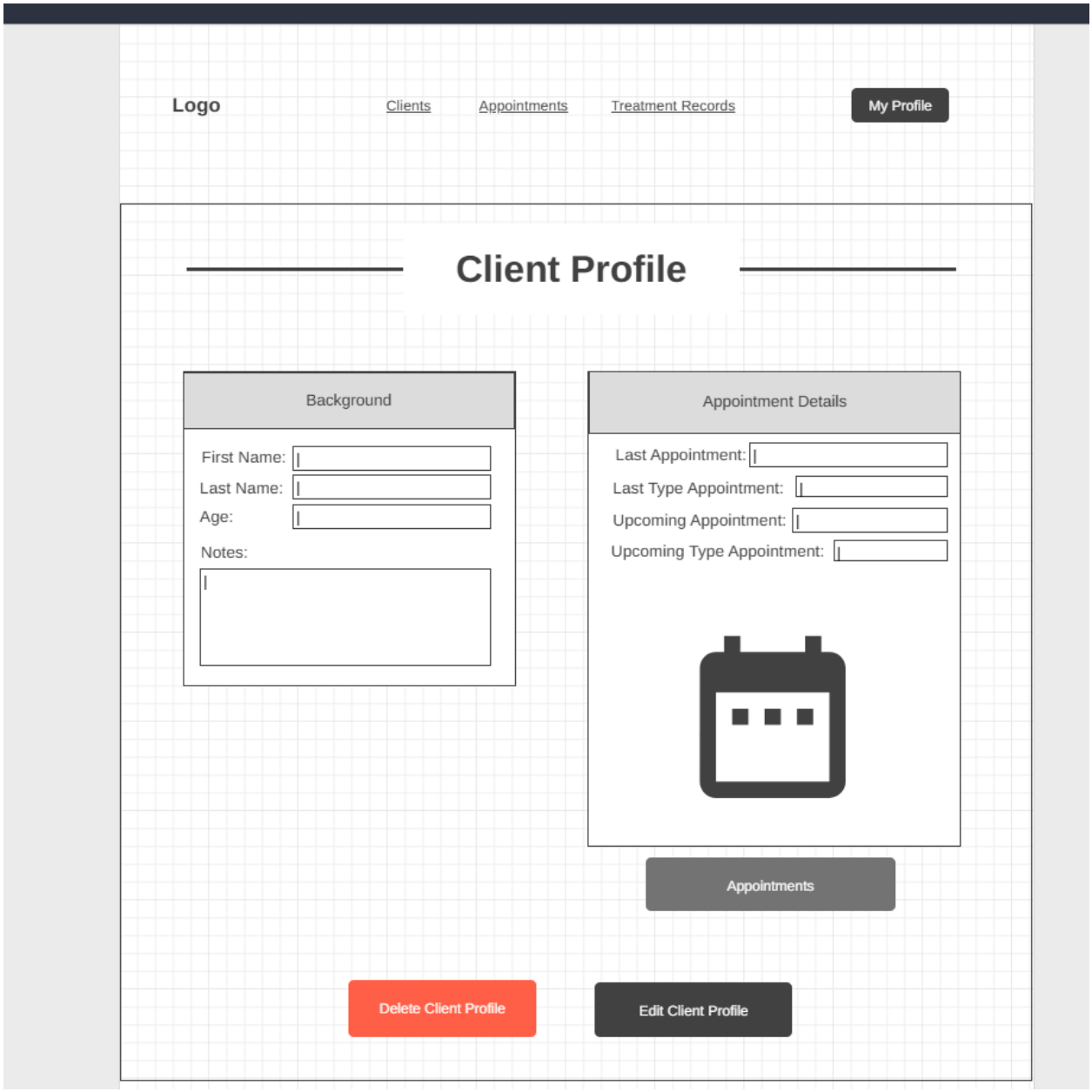
Exceptions:

- If the system fails to save the changes due to an internal error, an error message is displayed.
- If duplicate client information is detected (same email/phone number as another client), the system notifies the user and requests corrections.

Postconditions:

- - The client profile is successfully updated in the database.
- - The updated information is available for future reference and appointment scheduling.


Logo
Clients
Appointments
Treatment Records
My Profile
My Clients
Client 1
Last Appointment:
Aug 13 2025
Upcoming Appointment:
May 24 2026
Client 2
Last Appointment:
Aug 13 2025
Upcoming Appointment:
May 24 2026
Client 3
Last Appointment:
Aug 13 2025
Upcoming Appointment:
May 24 2026
Client 4
Last Appointment:
Aug 13 2025
Upcoming Appointment:
May 24 2026
Client 5
Last Appointment:
Aug 13 2025
Upcoming Appointment:
May 24 2026
Client 6
Last Appointment:
Aug 13 2025
Upcoming Appointment:
May 24 2026


Logo
Clients
Appointments
Treatment Records
My Profile
Client Profile
Background
First Name:
Last Name:
Age:
Notes:
Appointment Details
Last Appointment:
Last Type Appointment:
Upcoming Appointment:
Upcoming Type Appointment:
Appointments
Delete Client Profile
Edit Client Profile

Delete Client Profile

Business Rules: BR15, BR16, BR17, BR18,

Use Case Description:

Use Case Name: Delete Client Profile	**ID**: 5	**Importance Level**: High
Primary Actor: Registered User	**Use Case Type:** Detail, Essential	
Stakeholders and Interests: Dentist/Hygienist – wants to remove a client from the system if they are no longer a patient. Administrator – wants to ensure data is deleted securely and only by authorized users. Developer – wants to ensure a smooth and secure deletion process while maintaining data integrity.		
Brief Description: This use case describes how a registered user deletes an existing client profile from the system, removing all related data.		
Trigger: The user decides to delete a client's profile.		
Relationships: Association - Registered User		
Normal Flow of Events: 1. User navigates to the "Clients" section. 2. User selects an existing client from the client list. 3. System displays the client's details. 4. User clicks "Delete Client" option. 5. System prompts for confirmation (e.g., "Are you sure you want to delete this client?"). 6. User confirms deletion. 7. System checks if there are any scheduled or past appointments linked to the client. 8. System deletes the client profile and any associated records. 9. System confirms successful deletion and updates the client list.		

Alternative Flow:

A1: User cancels the deletion confirmation.
→ System does not delete the client profile and returns to the client details page.

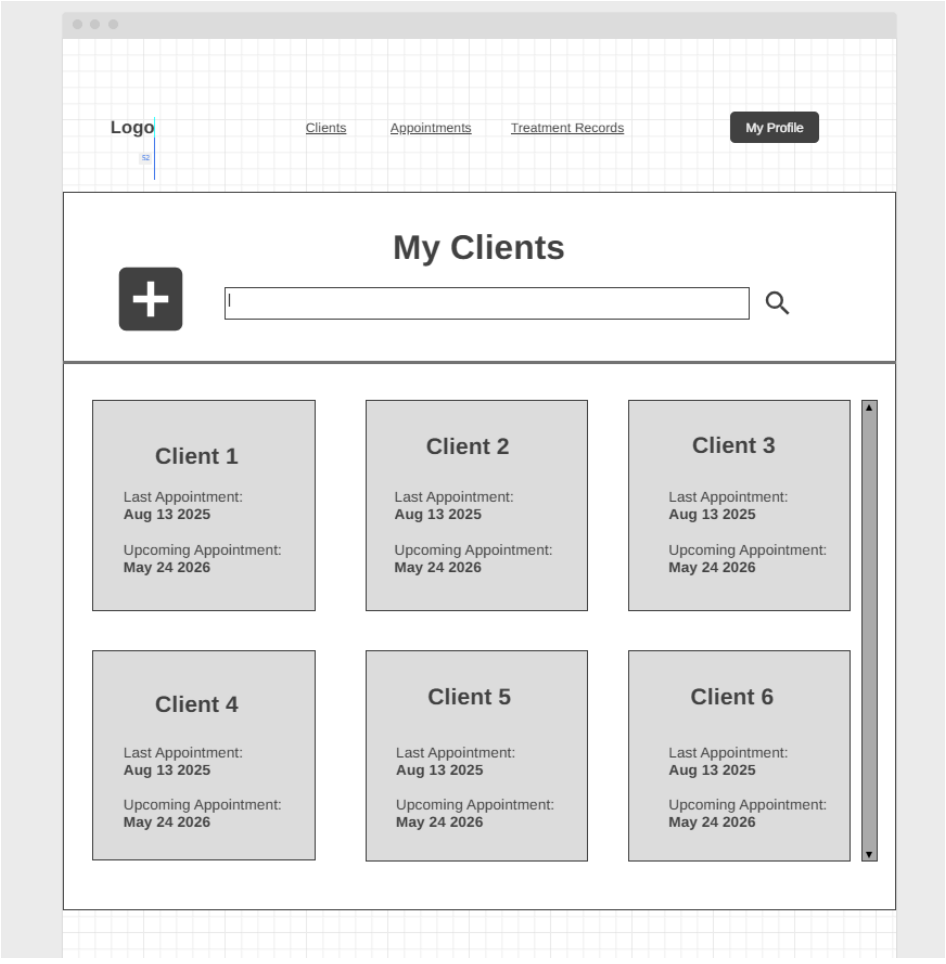
A2: Client has upcoming appointments.
→ System prevents deletion and informs the user to cancel or reassign appointments first.

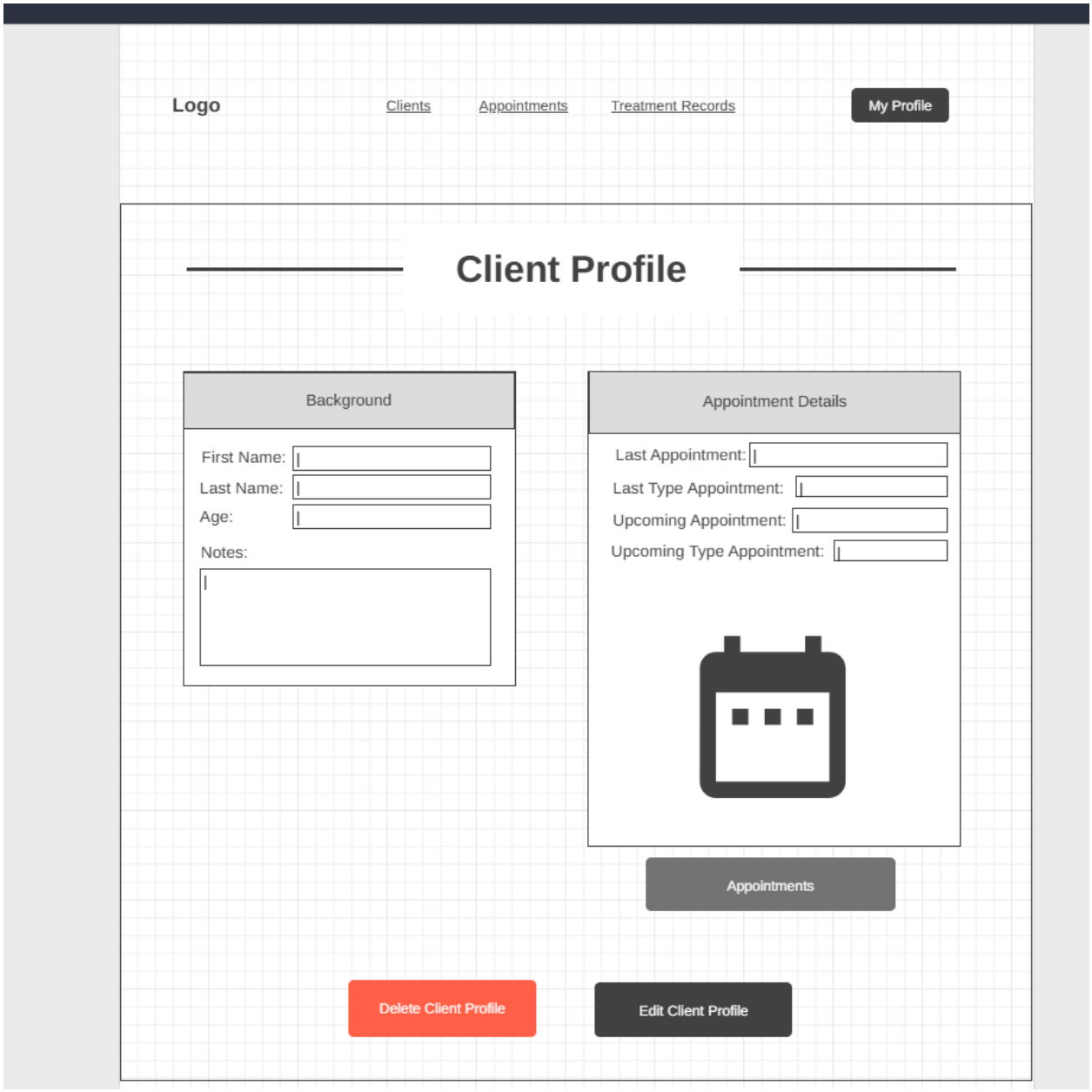
Exceptions:

- If the system fails to delete the profile due to an internal error, an error message is displayed.
- - If the client has scheduled appointments, the system prevents deletion until those are handled.

Postconditions:

- - The client profile is permanently removed from the database.
- - Any associated records (e.g., past appointments, notes) are also deleted.




Logo
Clients
Appointments
Treatment Records
My Profile
Client Profile
Background
First Name:
Last Name:
Age:
Notes:
Appointment Details
Last Appointment:
Last Type Appointment:
Upcoming Appointment:
Upcoming Type Appointment:
Appointments
Delete Client Profile
Edit Client Profile

Create Client Appointment

Business Rules: BR15, BR16, BR17, BR18,

Use Case Description:

Use Case Name: Create Client Appointment	**ID**: 6	**Importance Level**: High
Primary Actor: Registered User	**Use Case Type:** Detail, Essential	
Stakeholders and Interests: Dentist/Hygienist – wants to schedule an appointment for a client. Client – wants to have a confirmed appointment with accurate details. Administrator – wants to ensure the appointment is correctly logged and conflicts are avoided.		
Brief Description: This use case describes how a registered user creates a new appointment for a client in the SmileScheduler system.		
Trigger: The user decides to schedule an appointment for a client.		
Relationships: **Association** - Registered User (Dentist/Hygienist), Client		
Normal Flow of Events: 1. User navigates to the "Appointments" section. 2. User selects "Create New Appointment." 3. System prompts user to enter appointment details (client name, date, time, service type, notes). 4. System checks for scheduling conflicts. 5. If no conflicts exist, the system confirms the appointment. 6. System updates the client's record with the new appointment. 7. System notifies the user and client of the scheduled appointment (if enabled).		

Alternative Flow:

A1: Scheduling conflict detected.
→ System prevents the appointment from being created and suggests alternative time slots.

A2: Required fields (date, time, client) are missing.
→ System displays an error message and prompts user to complete the missing fields.

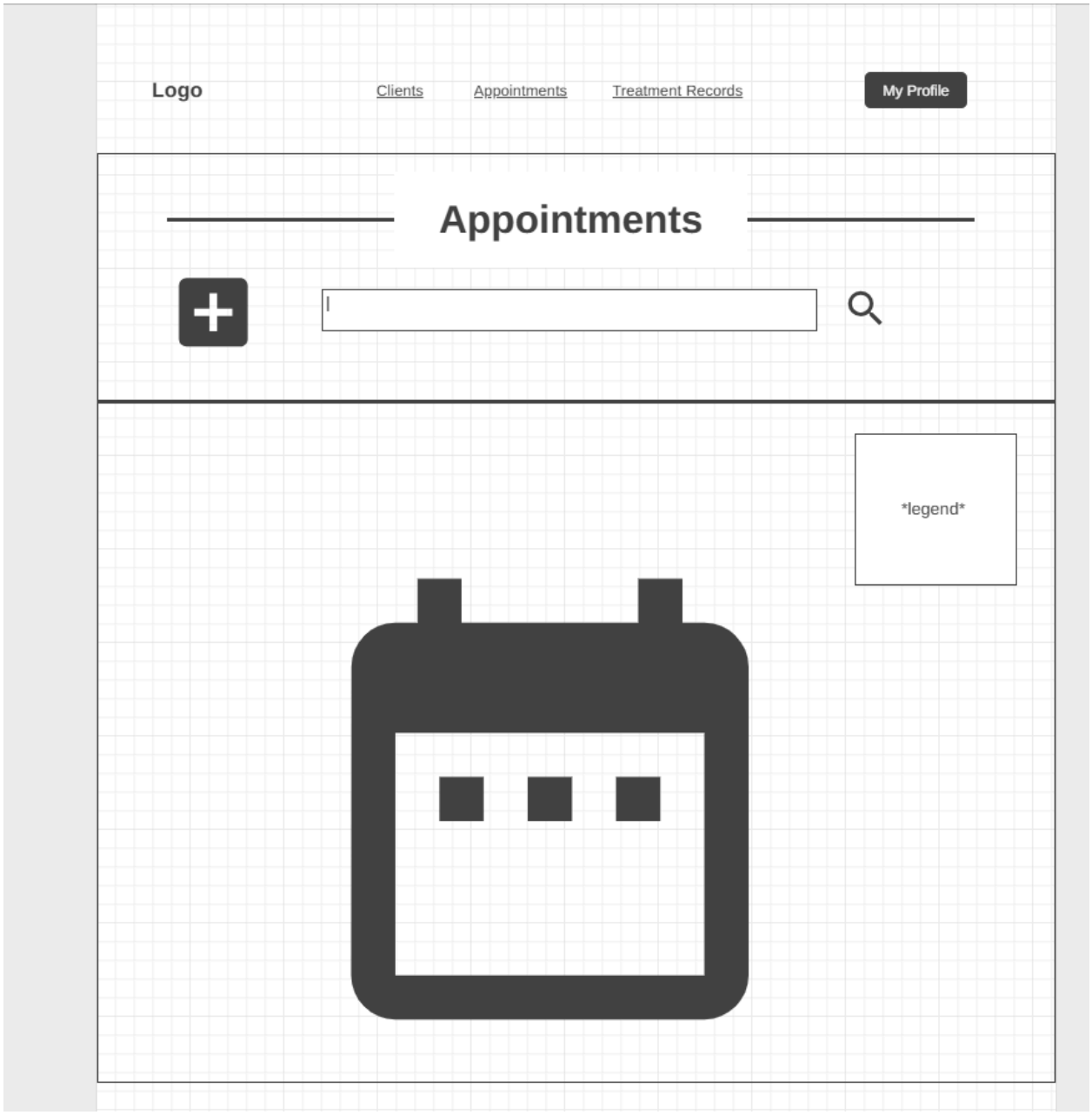
A3: User cancels the appointment creation.
→ System discards the entered information and returns to the previous screen.

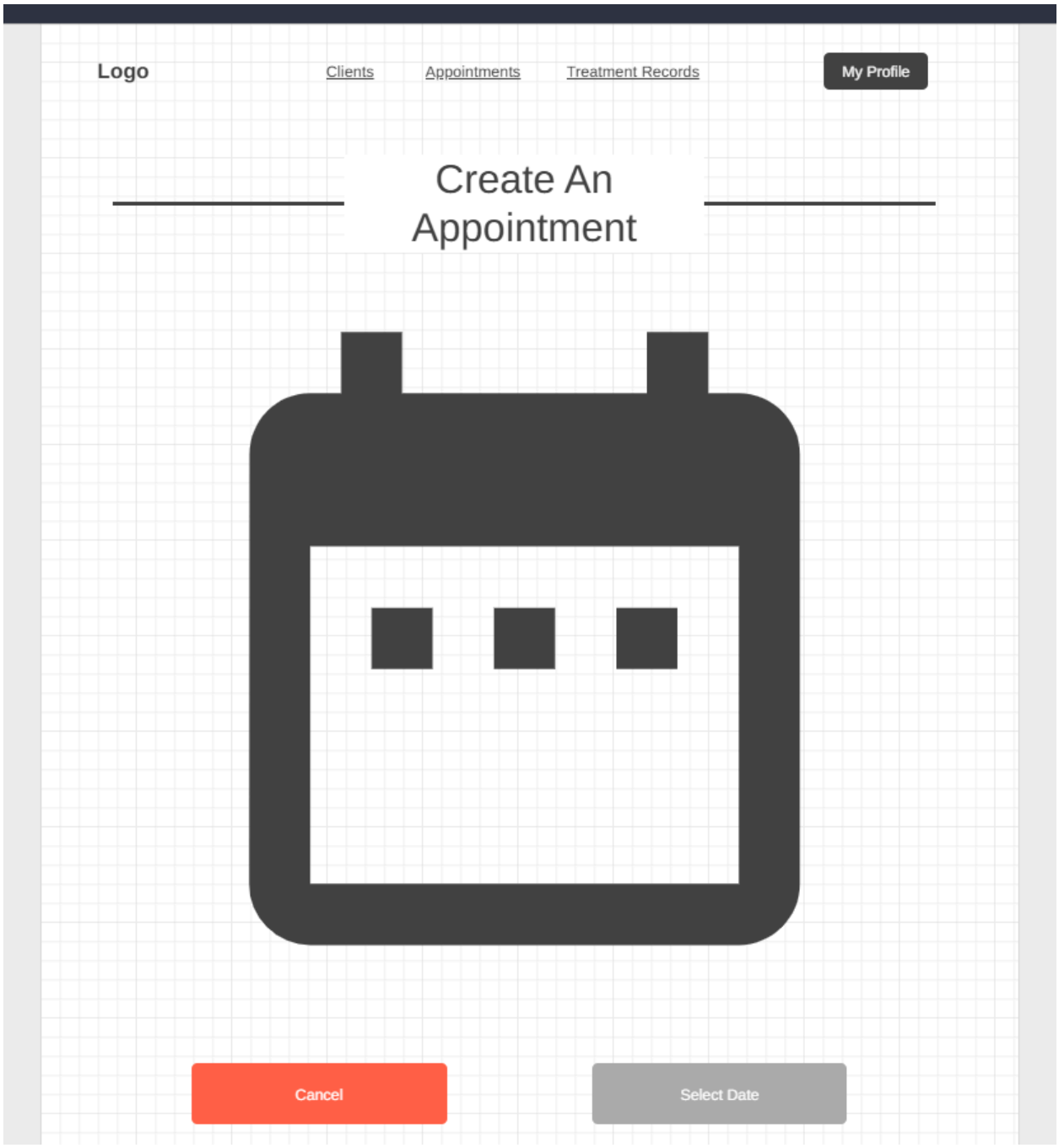
Exceptions:

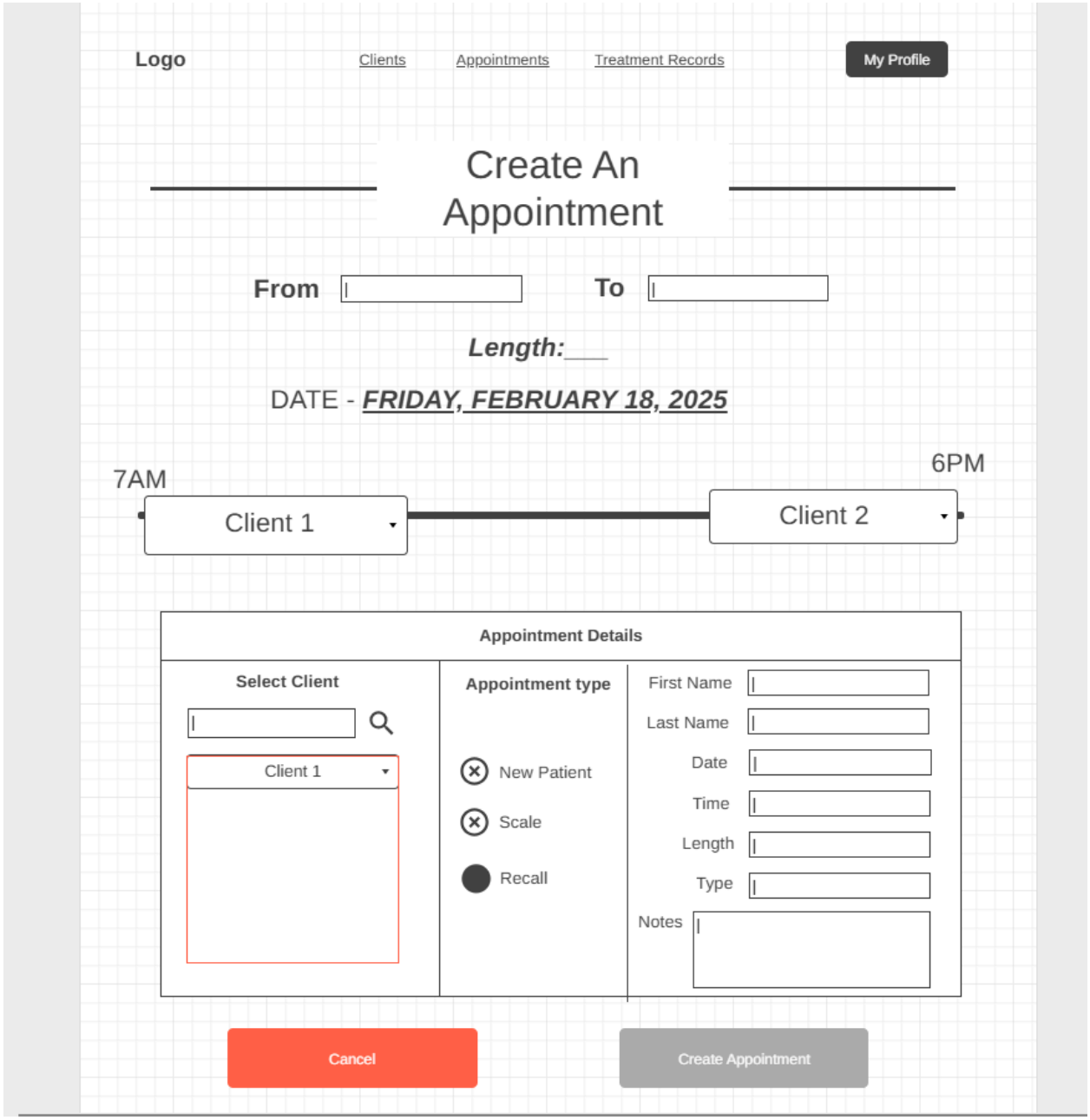
- If the system encounters an error (e.g., database issue), the appointment is not saved, and an error message is displayed.

Postconditions:

- - The appointment is saved in the system.
- - The client's profile is updated with the new appointment.
- - The system may send notifications or reminders if enabled.


Logo
Clients
Appointments
Treatment Records
My Profile
Appointments
legend


Logo
Clients
Appointments
Treatment Records
My Profile
Create An Appointment
Cancel
Select Date


Logo
Clients
Appointments
Treatment Records
My Profile
Create An Appointment
From
To
Length:___
DATE - FRIDAY, FEBRUARY 18, 2025
7AM
6PM
Client 1
Client 2
Appointment Details
Select Client
Client 1
Appointment type
New Patient
Scale
Recall
First Name
Last Name
Date
Time
Length
Type
Notes
Cancel
Create Appointment

Update Client Appointment

Business Rules: BR15, BR16, BR17, BR18,

Use Case Description:

Use Case Name: Update Client Appointment	**ID**: 8	**Importance Level**: High
Primary Actor: Registered User	**Use Case Type:** Detail, Essential	
Stakeholders and Interests: Dentist/Hygienist – wants to modify an existing appointment. Client – wants accurate and up-to-date appointment details. Administrator – wants to maintain a well-organized and conflict-free scheduling system.		
Brief Description: This use case describes how a registered user updates an existing client appointment in the SmileScheduler system.		
Trigger: The user decides to update a scheduled appointment.		
Relationships: **Association** - Registered User (Dentist/Hygienist), Client		
Normal Flow of Events: 1. User navigates to the "Appointments" section. 2. User selects an existing appointment to edit. 3. System retrieves the appointment details. 4. User modifies the necessary fields (date, time, service type, notes, etc.). 5. System checks for scheduling conflicts. 6. If no conflicts exist, the system saves the updated appointment. 7. System updates the client's record with the new appointment details. 8. System notifies the user and client of the updated appointment (if enabled).		

Alternative Flow:

A1: Scheduling conflict detected.
→ System prevents the appointment from being updated and suggests alternative time slots.

A2: Required fields (date, time, client) are missing.
→ System displays an error message and prompts user to complete the missing fields.

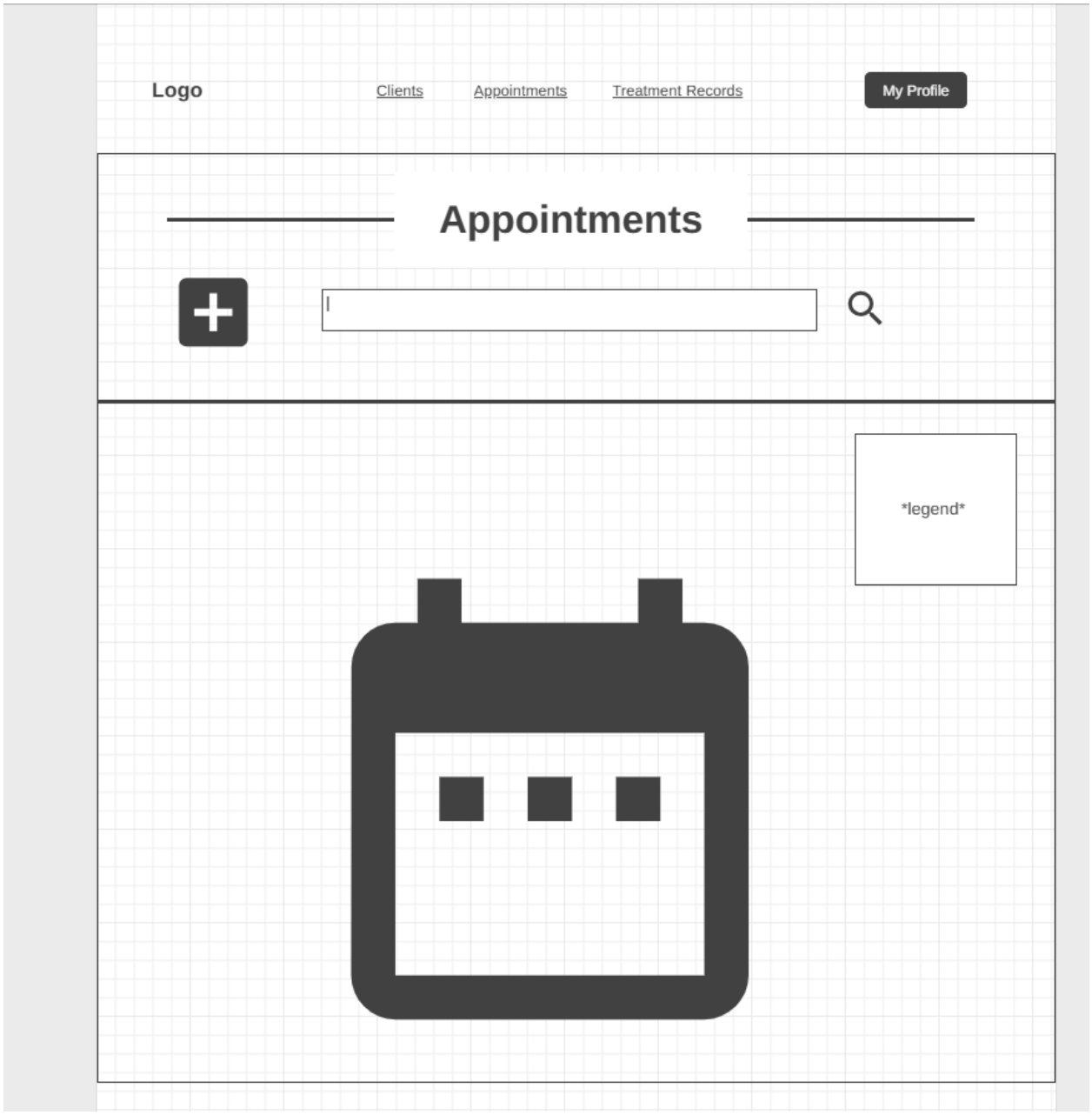
A3: User cancels the update process.
→ System retains the original appointment details.

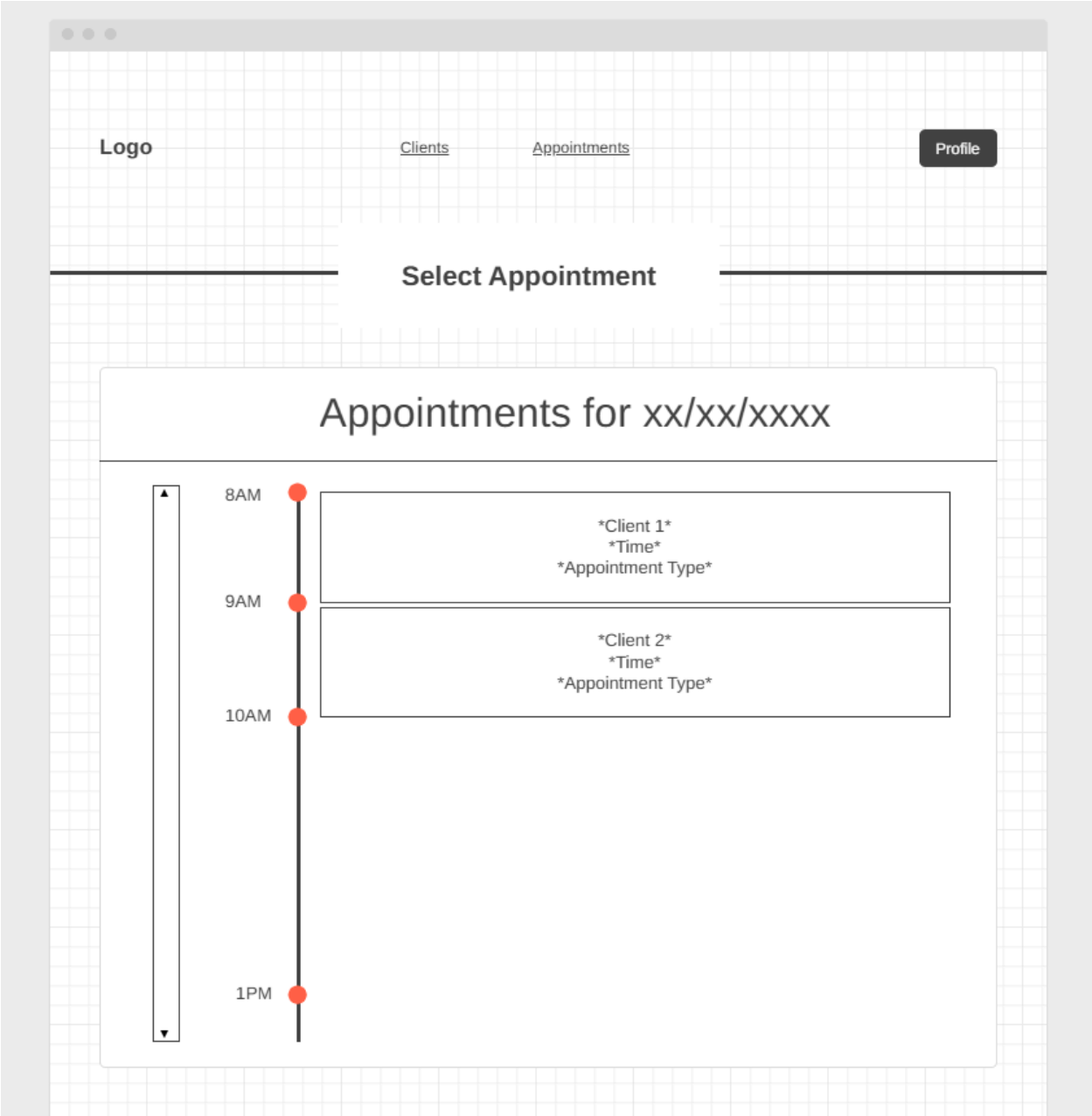
Exceptions:

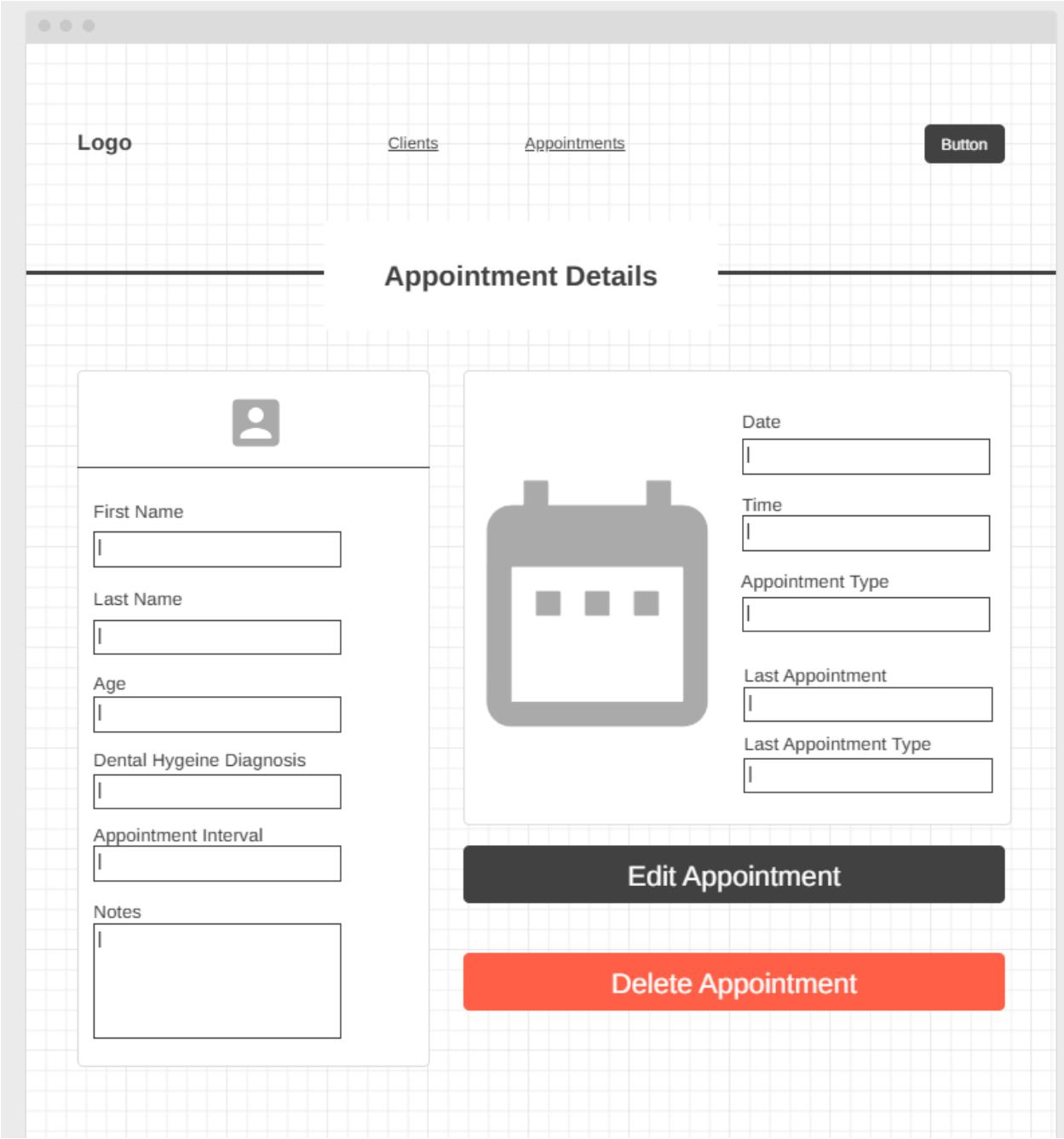
- If the system encounters an error (e.g., database issue), the appointment update is not saved, and an error message is displayed.

Postconditions:

- The updated appointment details are saved in the system.
- The client's profile reflects the new appointment information.
- The system may send updated notifications or reminders if enabled.


Logo
Clients
Appointments
Treatment Records
My Profile
Appointments
legend


Logo
Clients
Appointments
Profile
Select Appointment
Appointments for xx/xx/xxxx
8AM
9AM
10AM
1PM
Client 1
Time
Appointment Type
Client 2
Time
Appointment Type


Logo
Clients
Appointments
Button
Appointment Details
First Name
Last Name
Age
Dental Hygeine Diagnosis
Appointment Interval
Notes
Date
Time
Appointment Type
Last Appointment
Last Appointment Type
Edit Appointment
Delete Appointment

Delete Client Appointment

Business Rules: BR15, BR16, BR17, BR18,

Use Case Description:

Use Case Name: Update Client Appointment	**ID**: 8	**Importance Level**: High
Primary Actor: Registered User	**Use Case Type:** Detail, Essential	
Stakeholders and Interests: Dentist/Hygienist – wants to remove a scheduled appointment. Client – wants to be informed if their appointment is canceled. Administrator – wants to maintain a clear and accurate appointment schedule.		
Brief Description: This use case describes how a registered user removes an existing client appointment from the SmileScheduler system.		
Trigger: The user decides to cancel or delete an existing appointment.he user decides to cancel or delete an existing appointment.		
Relationships: **Association** - Registered User (Dentist/Hygienist), Client		
Normal Flow of Events: 1. User navigates to the "Appointments" section. 2. User selects an existing appointment to delete. 3. System retrieves the appointment details. 4. System prompts the user for confirmation before deletion. 5. User confirms the deletion. 6. System removes the appointment from the database. 7. System updates the client's profile and appointment records. 8. System notifies the client and user about the deleted appointment (if enabled).		

Alternative Flow:

A1: User cancels the deletion process.
→ System retains the original appointment.

A2: The appointment is already past or ongoing.
→ System prevents deletion and suggests marking it as "Completed" or "No-Show" instead.

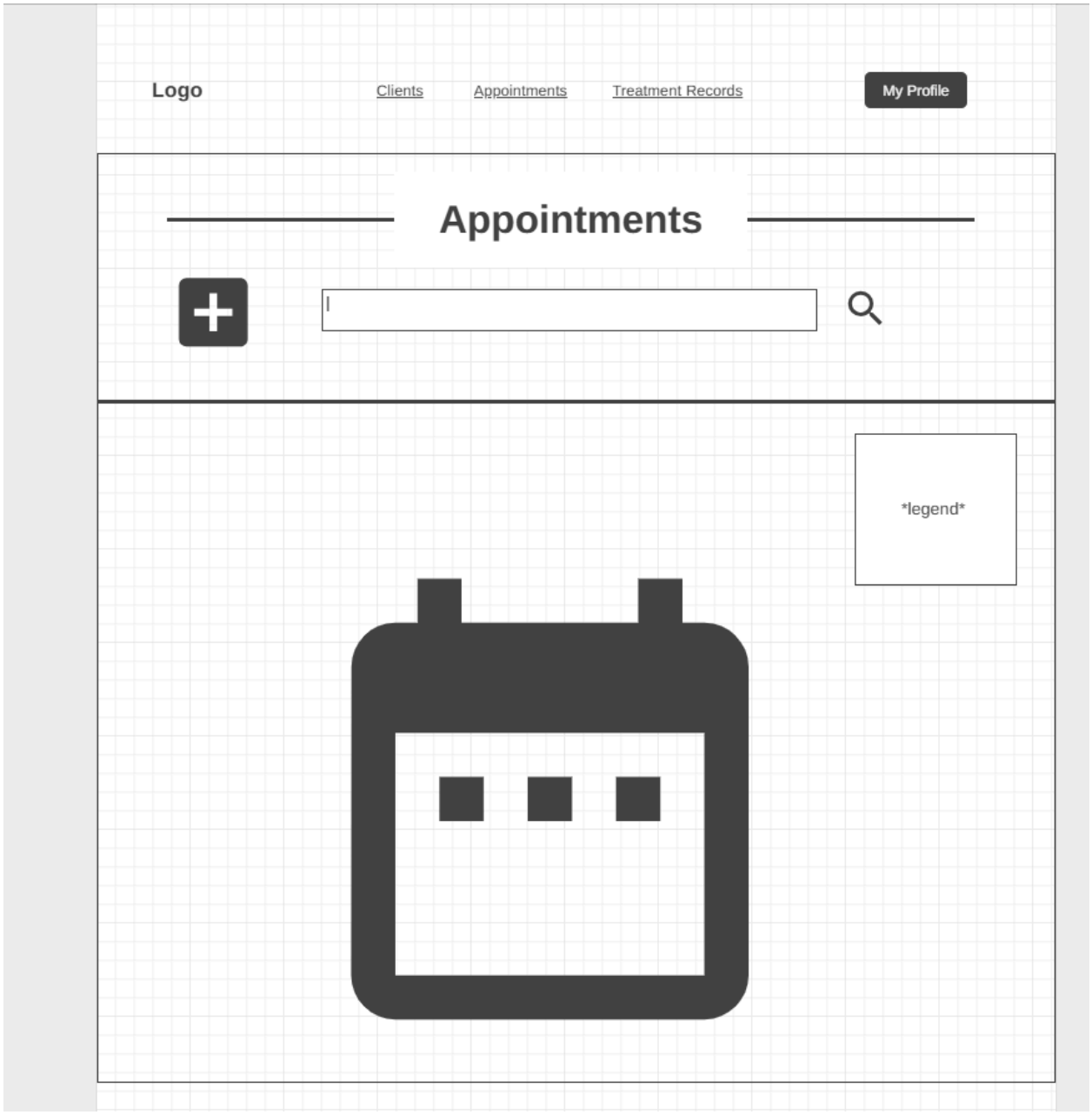
A3: System encounters an error (e.g., database issue).
→ System displays an error message, and the appointment remains unchanged.

Exceptions:

- If the appointment is linked to billing records or other dependencies, the system may prevent deletion.

Postconditions:

- The appointment is removed from the system.
- The client's record no longer shows the deleted appointment.
- If notifications are enabled, a cancellation message is sent to the client.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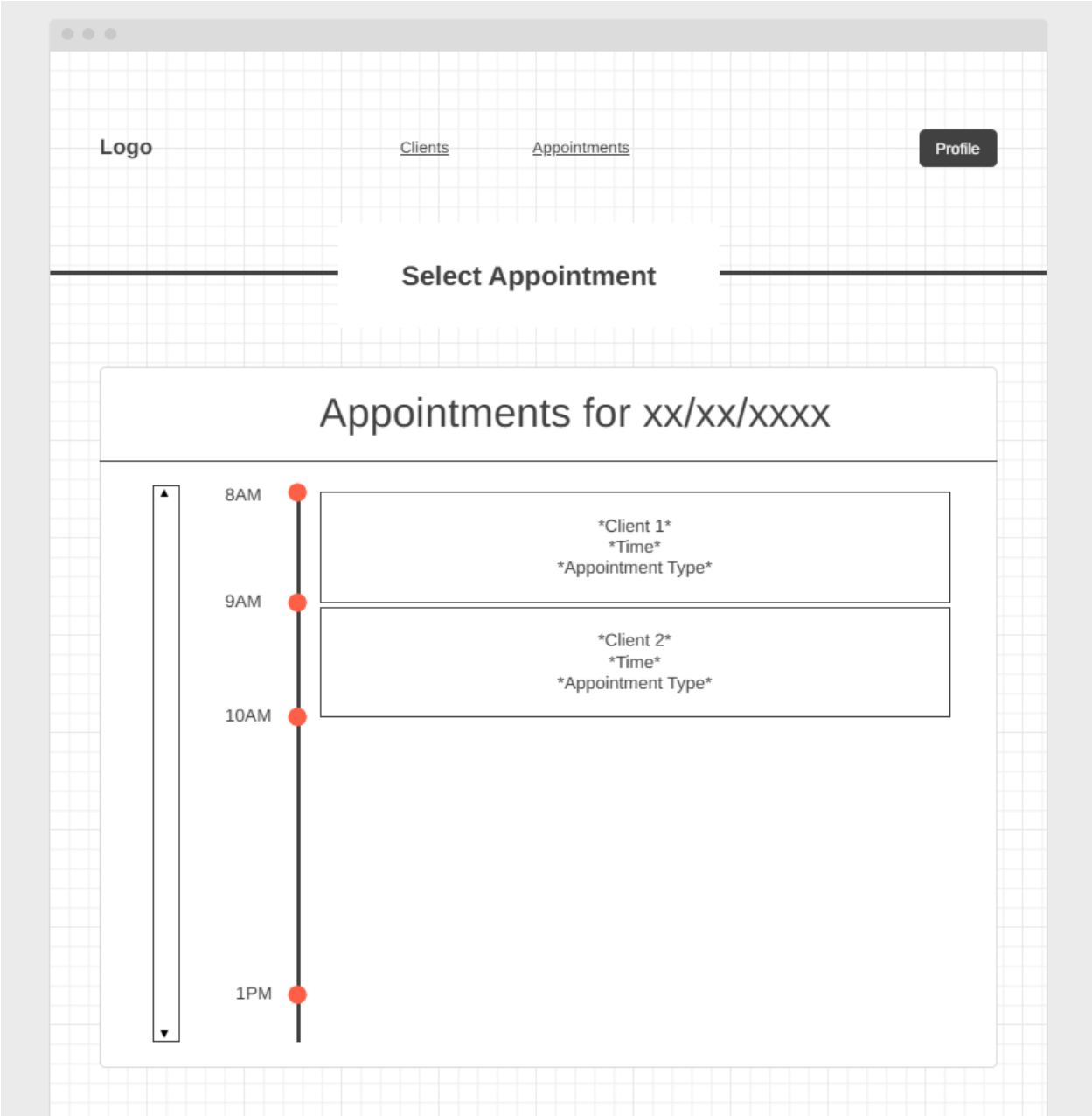
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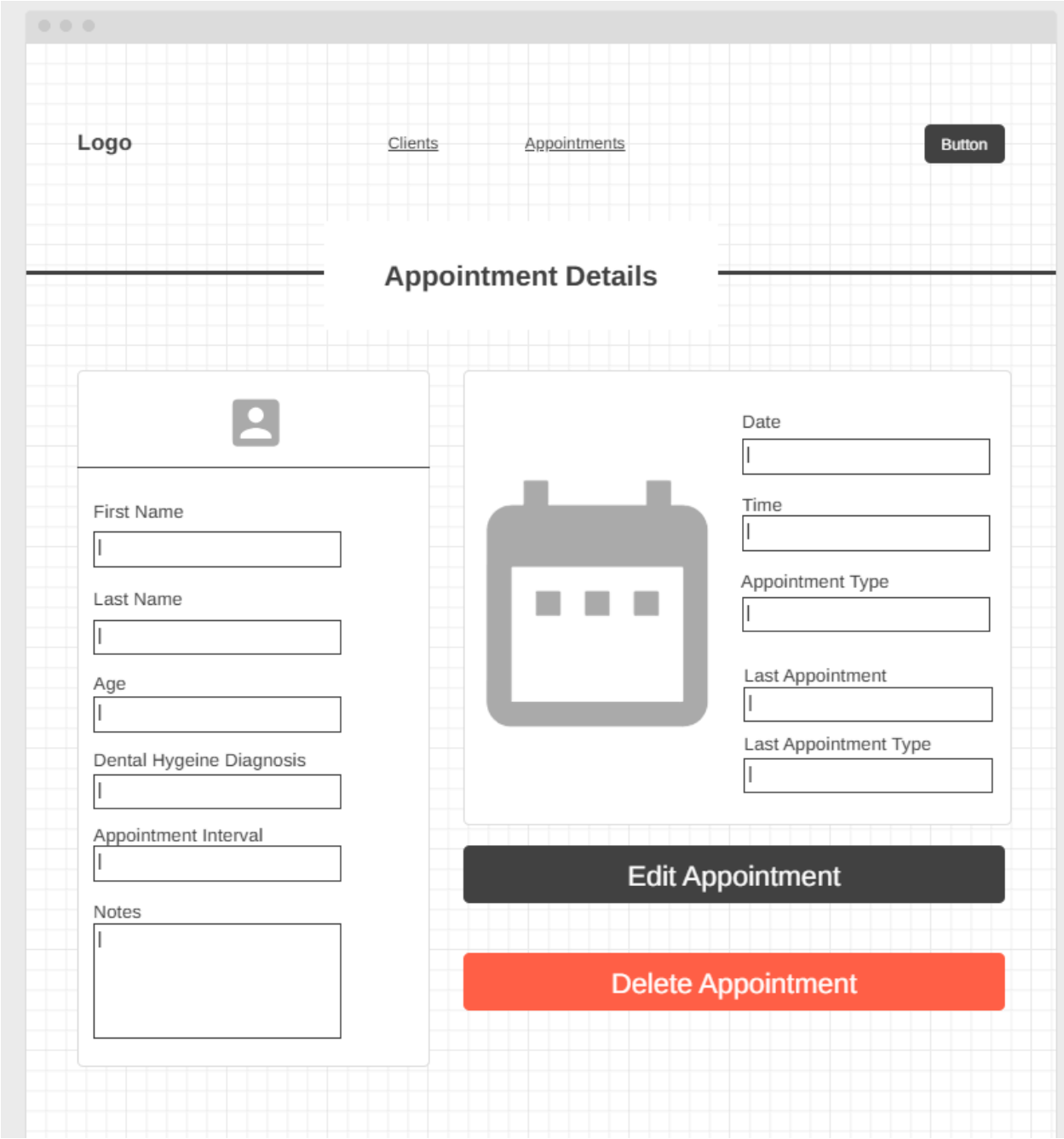
Time
Appointment Type
Client 2
Time
Appointment Type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Appointment Interval
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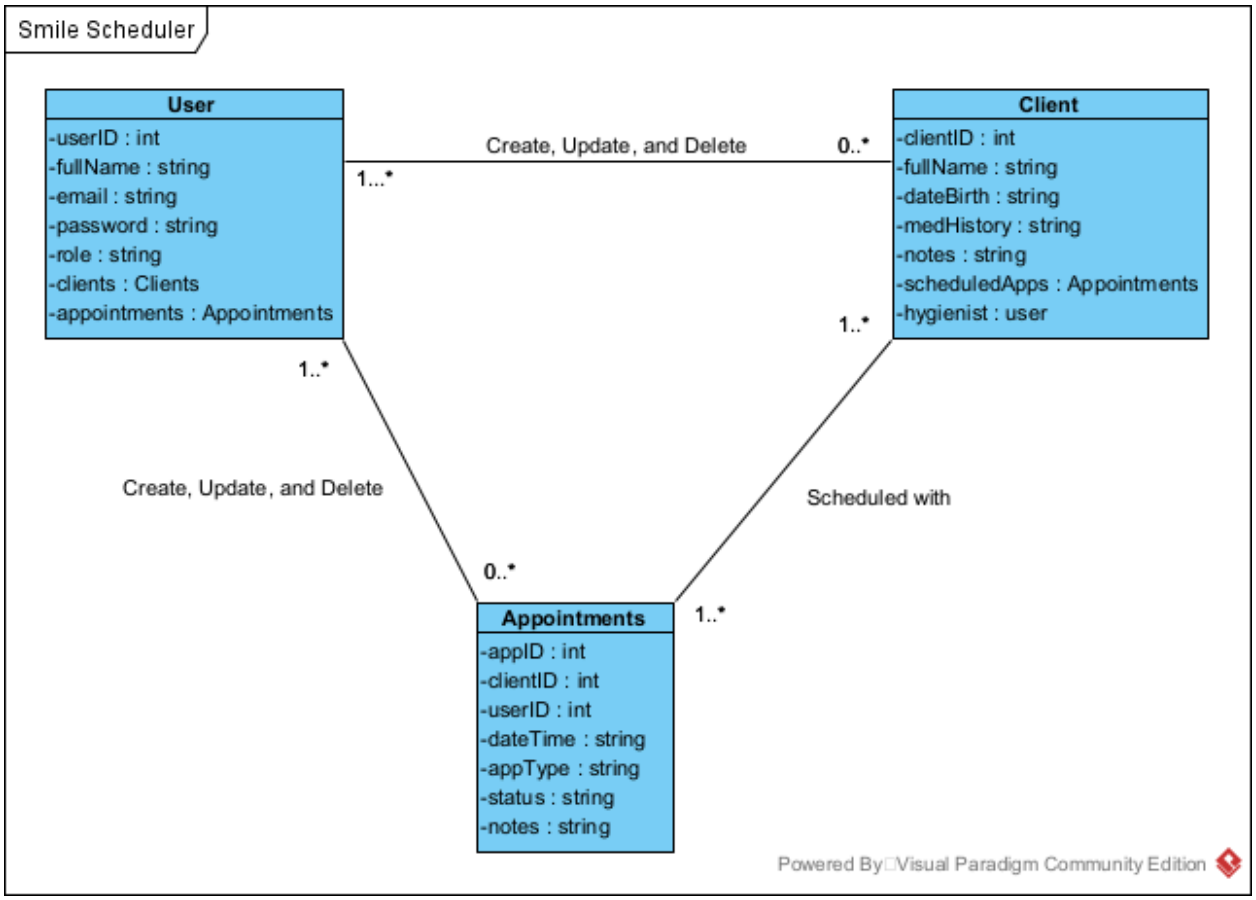
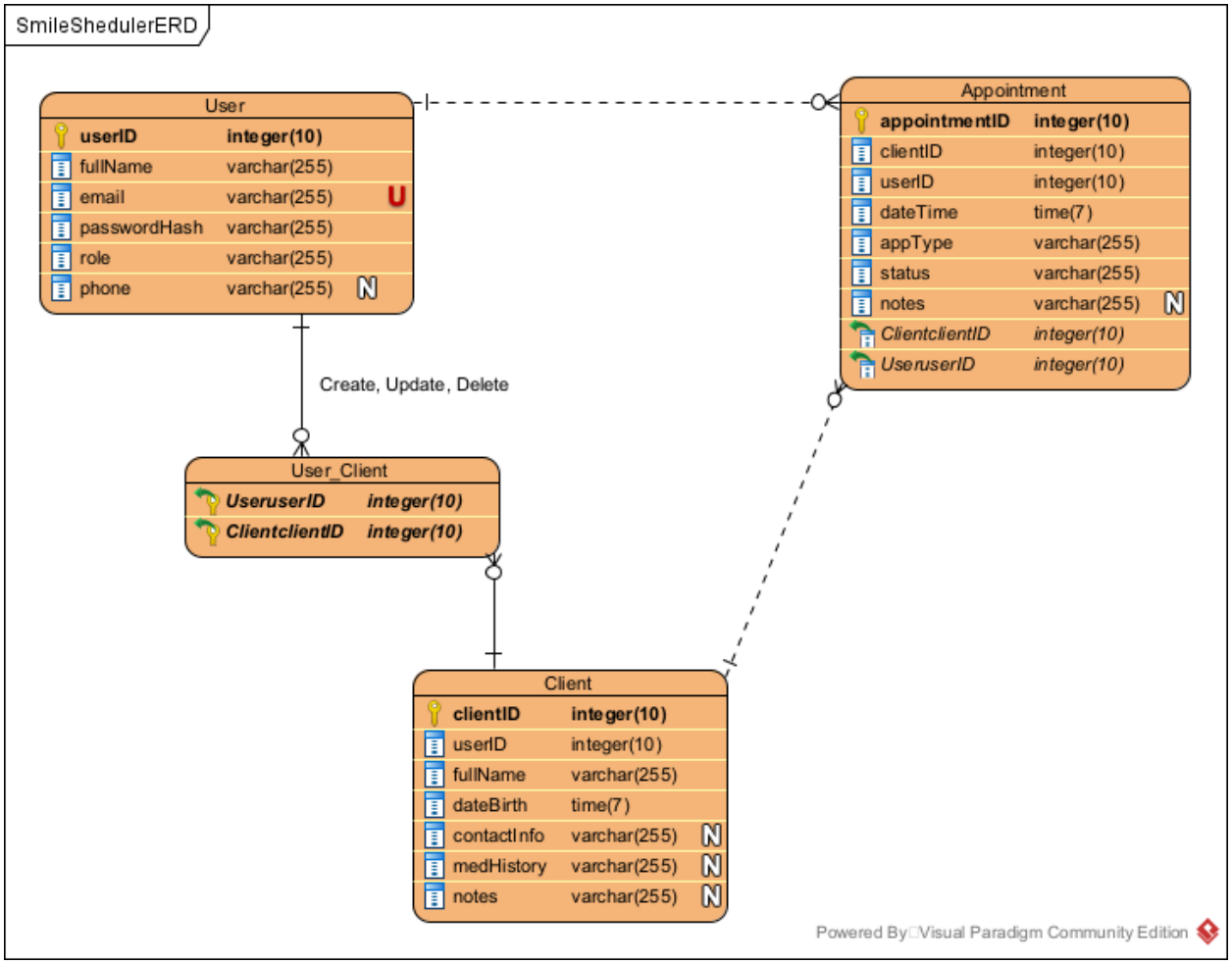
Time
Appointment Type
Last Appointment
Last Appointment Type
Edit Appointment
Delete Appointment

5.0 Domain Class diagram



5. **Database**

i. **ERD**



ii. **Access Points**

- Get User Profile
- Get Client Profile
- Get Client List
- Get Appointments
- Get Appointment Details

iii. **Primary Keys and Secondary Indexes**

User Table

PK	SK	Full Name	Email	Password Hash	Role	Phone Number	Created At
USER#00000001	RESOURCE#000000001	"Dr. Jane Doe"	janedoe@clinic.com	(hashed)	Hygienist	555-1234	01-01-2024

- Role: Enum (Dentist, Hygienist, Admin)
- Can manage multiple Clients
- Can create, update, delete Appointments

Client Table

PK	SK	Full Name	Date of BIrthj	Contact Info	Medical History	Phone Number	Notes
CLIENT#00000002	RESOURCE#000000002	"John Smith"	06-15-1980	john.smith@email.com	"Allergic to anesthesia"	555-1234	"Prefers morning appointments"

- Each Client is assigned to one User (Dentist/Hygienist)
- Can have multiple Appointments

Appointment Table

PK	SK	Client ID	User ID	Date & Time	Appointment Type	Status	Notes
APPOINTMENT#00000003	RESOURCE#000000003	CLIENT#00000002	USER#00000001	02-15-2024 10:30 AM	"Routine Cleaning"	Scheduled	"Needs extra numbing gel"

- Status: Enum (Scheduled, Completed, Canceled, No-Show)
- Linked to a specific Client and User

iv. **Entity Charts**

Entity	PK	SK
User	USER#<user_id>	RESOURCE#<user_id>
Client	CLIENT#<client_id>	RESOURCE#<client_id>
Appointment	APPOINTMENT#<appointment_id>	**RESOURCE#<appointment_id>**

v. **One-to-many Relationships**

Entity	PK	SK
User	**USER#<user_id>**	**#RESOURCE#<uesr_id>**
Follow	**FOLLOW#<resource_id>**	**#POST#<post_id>**
Like	**N/A**	**N/A**
Post	**POST#<post_id>**	**#USER_ID<user_id>**
Comment	**COMMENT#<comment_id>**	**#USER_ID<user_id>**
KeyCap Design	**DESIGN#<resource_id>**	**#USER_ID#<user_id>**
KeyCap Product	**PRODUCT#<resource_id>**	**#DESIGN#<resource_id>**
Vendor	**N/A**	**N/A**
Manufacturer	**N/A**	**N/A**

7. **Milestones and Acceptance Criteria**

1. Milestone one
   Definition
   Acceptance Criteria
   - …
   - ….
   - ….
2. Milestone Two
3. Milestone Three
4. ..
5. …
6. …
7. ..
8. ..
9. ...etc.
10.

Smile Scheduler Project Milestones & Acceptance Criteria

Project Milestone 1: Concept Approval

Completion Date: [Insert Date]
Stakeholder Judge: Project Manager, CEO, Stakeholders
Acceptance Criteria:

- Approval of project concept and scope
- Confirmed budget and resource allocation

Project Milestone 2: System Design and Architecture Finalization

Completion Date: [Insert Date]
Stakeholder Judge: Engineering Team, UX/UI Designers
Acceptance Criteria:

- Completed wireframes/mockups for UI
- Approved database schema and technical architecture

Project Milestone 3: Development Phase I – Core Features Implementation

Completion Date: [Insert Date]
Stakeholder Judge: Development Lead, QA Team
Acceptance Criteria:

- User authentication system functional (sign-up, login)
- Client profile creation, update, and deletion implemented
- Appointment creation, update, and deletion functional
- Core data stored and retrieved from the database

Project Milestone 4: Internal Testing and Bug Fixes

Completion Date: [Insert Date]
Stakeholder Judge: QA Team, Internal Testers
Acceptance Criteria:

- System testing completed with no critical issues
- User workflows validated (creating clients, managing appointments)
- Security and data validation tests passed

Project Milestone 5: Beta Release and User Acceptance Testing (UAT)

Completion Date: [Insert Date]
Stakeholder Judge: Select Dental Clinics, End Users
Acceptance Criteria:

- Positive feedback from test users
- All reported usability concerns addressed
- Performance meets the expected response times

Project Milestone 6: Full System Deployment

Completion Date: [Insert Date]
Stakeholder Judge: Business Owner, End Users
Acceptance Criteria:

- Live deployment of Smile Scheduler
- All essential features operational without major issues
- User onboarding and support documentation finalized

Project Milestone 7: Post-Launch Review & Refinements

Completion Date: [Insert Date]
Stakeholder Judge: Customer Support, Analytics Team
Acceptance Criteria:

- Analysis of initial user feedback completed
- Critical post-launch issues addressed
- System stability confirmed

Project Milestone 8: Expansion Phase – Additional Features

Completion Date: [Insert Date]
Stakeholder Judge: Product Manager, Stakeholders
Acceptance Criteria:

- Feature improvements based on feedback implemented
- Performance optimizations completed
- New feature rollout without affecting existing functionality

Project Milestone 9: User Engagement and Performance Evaluation

Completion Date: [Insert Date]
Stakeholder Judge: Business Owner, Marketing Team
Acceptance Criteria:

- Expected user adoption rate achieved
- Appointment scheduling efficiency improved for users
- System performance benchmarks met

Project Milestone 10: Project Closure & Handover

Completion Date: [Insert Date]
Stakeholder Judge: CEO, Project Manager
Acceptance Criteria:

- All milestones successfully completed
- Maintenance and documentation handed over to support team
- Final project review and future roadmap discussion
-

Smile Scheduler Product Acceptance Criteria

Criteria	Product Acceptance Criteria
Schedule Dates	The application should be fully operational and publicly accessible by the agreed-upon launch date.
Functionality	All essential functionalities (account management, client profile management, appointment scheduling, etc.) must be fully operational.
Appearance	The platform must adhere to approved UX/UI standards for an intuitive and efficient user experience.
Performance Levels	The application should support concurrent usage by dental offices without performance degradation.
Practicality	The platform must provide practical utility for dentists and hygienists, ensuring efficient patient scheduling and organization.
Clarity	All platform features should be clearly labeled and easy to navigate for both administrators and staff.
Capacity	The system must handle a high number of client records, appointments, and updates without performance issues.
Accuracy	All stored and displayed client and appointment data should be accurate and update in real-time as needed.
Availability	The platform should have an uptime of 99.9%, ensuring availability for scheduling and client management at all times.
Maintainability	The platform should be easily maintainable, allowing for updates and bug fixes with minimal downtime.
Reliability	Users should be able to consistently rely on the platform for managing appointments and client records without encountering critical errors.
Flexibility	The platform should be adaptable for future enhancements, including potential integrations with external calendar systems or CRM tools.

8. **Implementation Schedule**

Implementation Schedule using MS Project (Waterfall)
OR
Product Backlog (Agile-Scrum)

https://github.com/users/JustinAlaanNguyen/projects/4/views/1

9. **Client / Faculty Sign-off**

Date: _____

X _____.

Name of Client/Rep/Professor