

Software Requirements Analysis and Design

T27 - Brilliant Dentistry CRM Web App

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1. Introduction

The Introduction section provides an overview of the system using software requirements analysis and design for the scope of the system.

1.1 Purpose

The purpose of this document is to present a detailed description of the Brilliant Dentistry CRM System. It will explain the purpose and features of the system, the interfaces of the system, what the system will do, the constraints under which it must operate and how the system will react to external stimuli. This document is intended for both the stakeholders and the developers of the system and will be proposed to the client, Dr. Shiva for approval.

1.2 Scope

Brilliant Dentistry is using an open-source software called Open Dental for data handling and daily operations at the clinic. Brilliant Dentistry is seeking to develop a patient portal to serve as a customer facing interface.

The goal of this project is to create a website where patients can easily access clinic information, contact the clinic, register, book appointment as well as retrieve information about their past visits.

1.2.1 In Scope

- Create a react frontend with responsive design that will have core functionality for the primary stakeholder, employees, and customers.
- Design and deploy a MySQL database using industry best practices on a cloud provider.
- Create a restful flask API to host backend services and allow the frontend to access core business processes, the flask backend would also provide access to the database and authentication.
- Execute different types of testing (unit test, integration test, function test, user acceptance test) to ensure the functions work as per requirements.

1.2.2 Out of Scope

- Marketing and dental specialized content shall be provided by the clinic
- The clinic shall be responsible for maintaining and ensure that the current website domain (<http://www.brilliantdentistry.ca/>) is accessible 24/7. Failure to maintain the website domain that results in service corruption will be out-of-scope for development.
- Clinic staff is responsible for maintain data integrity between Open Dental and Brilliant Dentistry CRM until integration with Open Dental is implemented which will might be discussed in later phase of the project. The proposal for integration between Brilliant Dentistry CRM and Open Dental shall be a separate project which requires extensive effort analysis, design and study the existing Open Dental Software.

2.0 System Overview

The System Overview section introduces the system context and design.

2.1 Project Perspective

The goal of this project is to replace the existing Brilliant Dentistry Website by designing a new CRM web-based system called Brilliant Dentistry CRM.

2.2 System Context

Following are issues with the existing Brilliant Dentistry website:

- No https
- Entire sections are duplicated
- References another unrelated clinic in another country
- Low effort
- Inconsistent styling
- Broken layout
- Random icons
- Booking form doesn't work

The new Brilliant Dentistry CRM system will not only ensure that there are no such issues as the existing website but will also provide design flexibility for future extension, improvement in brand recognition and site experience, increase user traffic and conversion rate.

2.3 General Constraints

- A user familiar with basic browser navigation skills should be able to understand all functionality provided by the system.
- The system should work on most home desktop and laptop computers which support JavaScript and HTML5.
- The system shall be implemented using React front-end, Flask API and MySQL Database.
- Limited access to Open Dental data which is the current software used to manage the clinic which contains confidential information and records about patients.
- No access to confidential medical records of patients due to the Personal Health Information Protection Act which protects the information of clients and mandates that patients consent to have their information disclosed.
- Due to the fact we have no budget, we need to be careful about the services to try and procure so that we don't go over our budget of zero.

2.4 Assumptions and Dependencies

2.4.1 Assumptions

This project makes the following assumptions.

- Development team will have permissions to inspect current database tables without accessing any data.
- Development team will have access to existing documentation that describes business processes.
- Development team have the skills to build a website that is better than the current Brilliant Dentistry website.
- Front desk person will make sure that the schedule on the website is aligned with the schedule in Open Dental and maintain an update-to-date time slot availability
- The clinic will provide the content (text, images, media) to be displayed on the website.
- The website will be provided to the clinic for free of charge and our budget will be approximately zero.
- The new website will be replacing the existing website and hosting on the same domain.

- The clinic is willing to increase the amount they pay for hosting by a small amount due to the nature of creating a web application which tends to cost more than static sites.

2.4.2 Dependencies

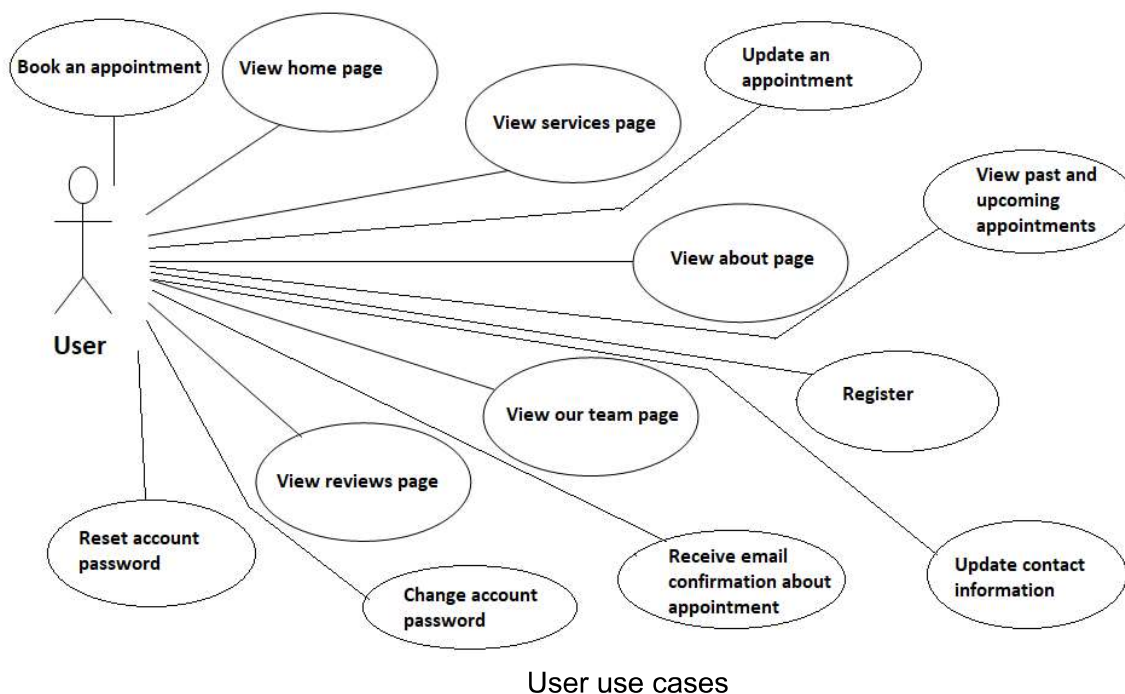
The following are the internal and external dependencies that will have to be acknowledged and addressed.

- Access to the brilliant dentistry domain and hosting services.
- Access to mock patient data that represents actual patient data.
- Access to existing Open Dental installation endpoints.
- Business will provide us with information about the services they provide and other relevant content to post on the new web application.

3.0 Functional Requirements Specifications

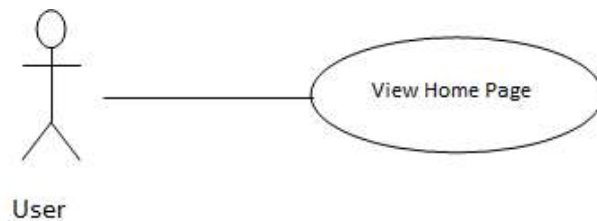
This section describes specific features of the software project. If desired, some requirements may be specified in the use-case format and listed in the Use Cases Section.

3.0.1 User Use Cases



3.0.1.1 Use case: View Home Page

Diagram:

**Brief Description**

The User accesses the Website, and it loads the Home page automatically which will display a small introduction about the dental clinic as well as descriptive pictures and text fields.

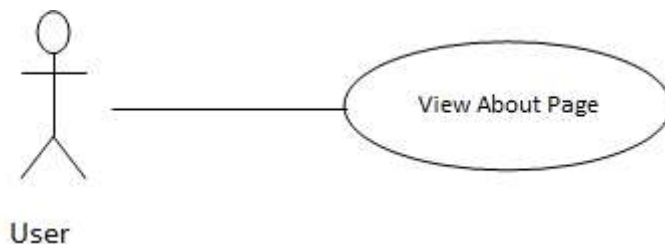
Initial Step-By-Step Description

1. The user accesses the webpage link from an external source

Xref: Section 3.1.1.1, View Home Page

3.0.1.2 Use case: View About Page

Diagram:

**Brief Description**

The User accesses the About page of the website which contains information about the clinic (for example location) and pictures of the different areas of the clinic. It also has a contact us field that displays the phone number and email address of the clinic.

Initial Step-By-Step Description

Before this use case can be initiated, the user has already accessed the Website.

1. The user accesses the main page of the website
2. The user clicks on the About tab on the menu
3. The user is redirected to the About page

Xref: Section 3.1.1.2, View About Page

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3. The staff member can search by patient and view each patient's information on the website

Xref: Section 3.1.2.5, View the information of the registered patients

3.1 Use Cases

3.1.1 User use case

3.1.1.1 View Home page

Use Case Name	Users must be able to view Home Page
XRef	Section 3.0.1.1, View Home page
Trigger	The user accesses the website
Precondition	The user is accessing the website from an external source
Basic Path	User clicks on the external link that redirects them to the home page of the dental clinic
Alternative Paths	If the user prefers, they can click on the website's icon or the home tab
Postcondition	The user is redirected to the home page
Exception Paths	The attempt may be abandoned at any time.

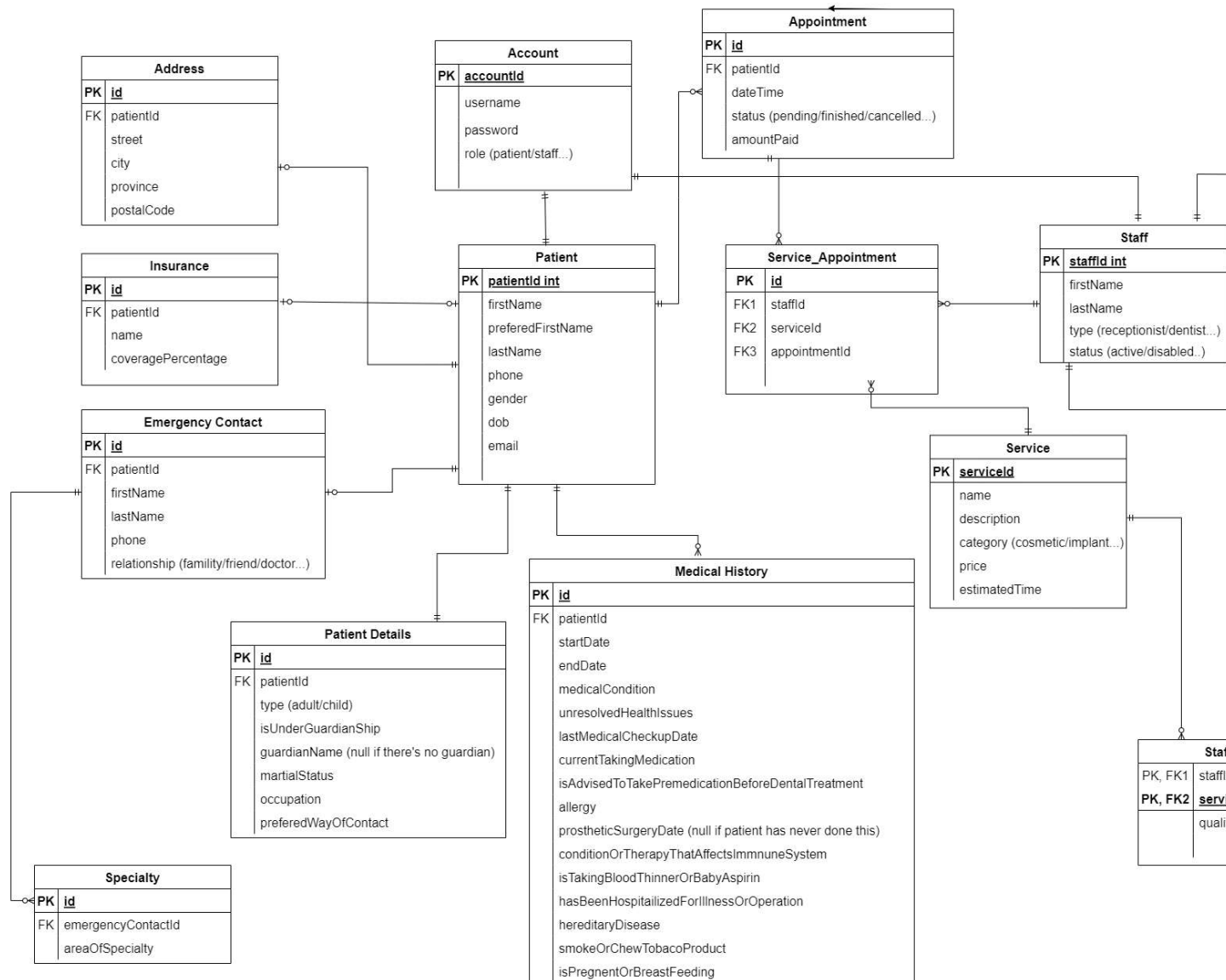
3.1.1.2 View About page

Use Case Name	Users must be able to view About Page
XRef	Section 3.0.1.2, View About Page
Trigger	The user clicks on the About tab
Precondition	The user is on the website already
Basic Path	1. The user accesses the main page of the website 2. The user clicks on the About tab on the menu 3. The user is redirected to the About page
Alternative Paths	None
Postcondition	The user is redirected to the About page
Exception Paths	The attempt may be abandoned at any time.

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3.2 Data Modelling and Analysis

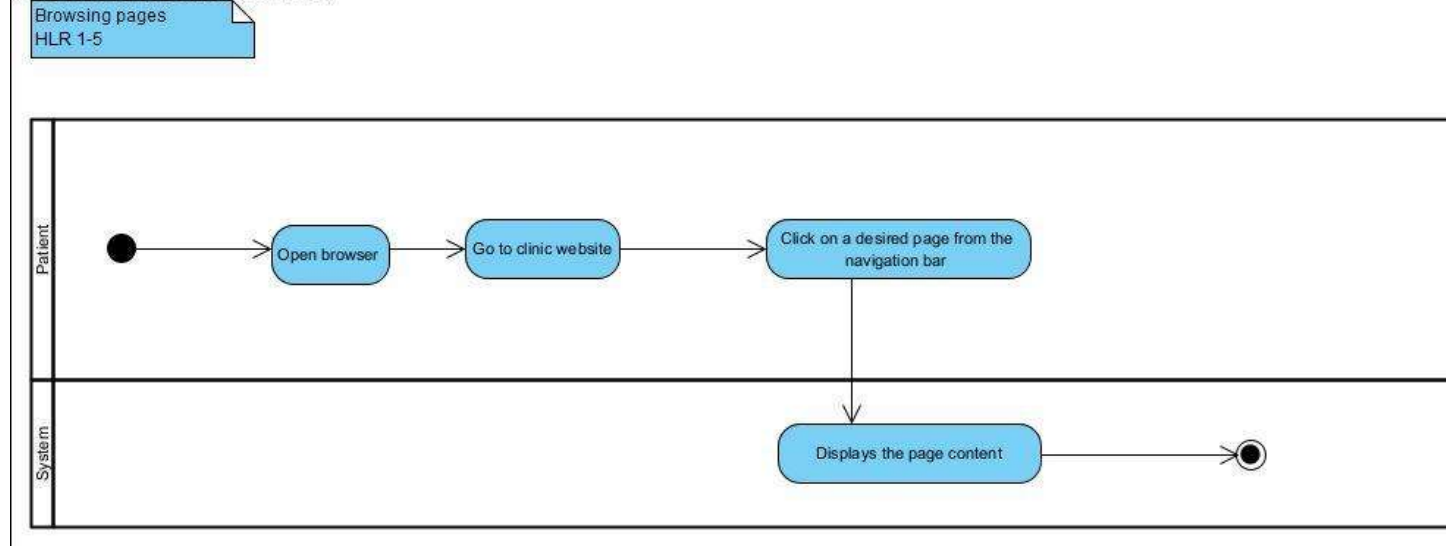
3.2.1 Normalized Data Model Diagram (see next page)



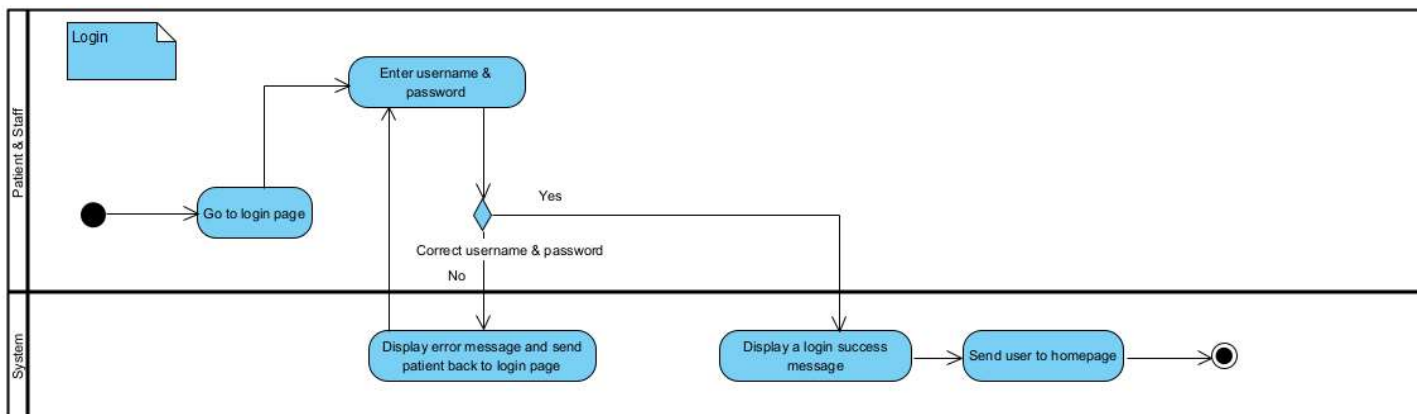
3.2.2 Activity Diagrams

3.2.2.1 Browse Website

Visual Paradigm Standard (Box Group) (George Brown College)

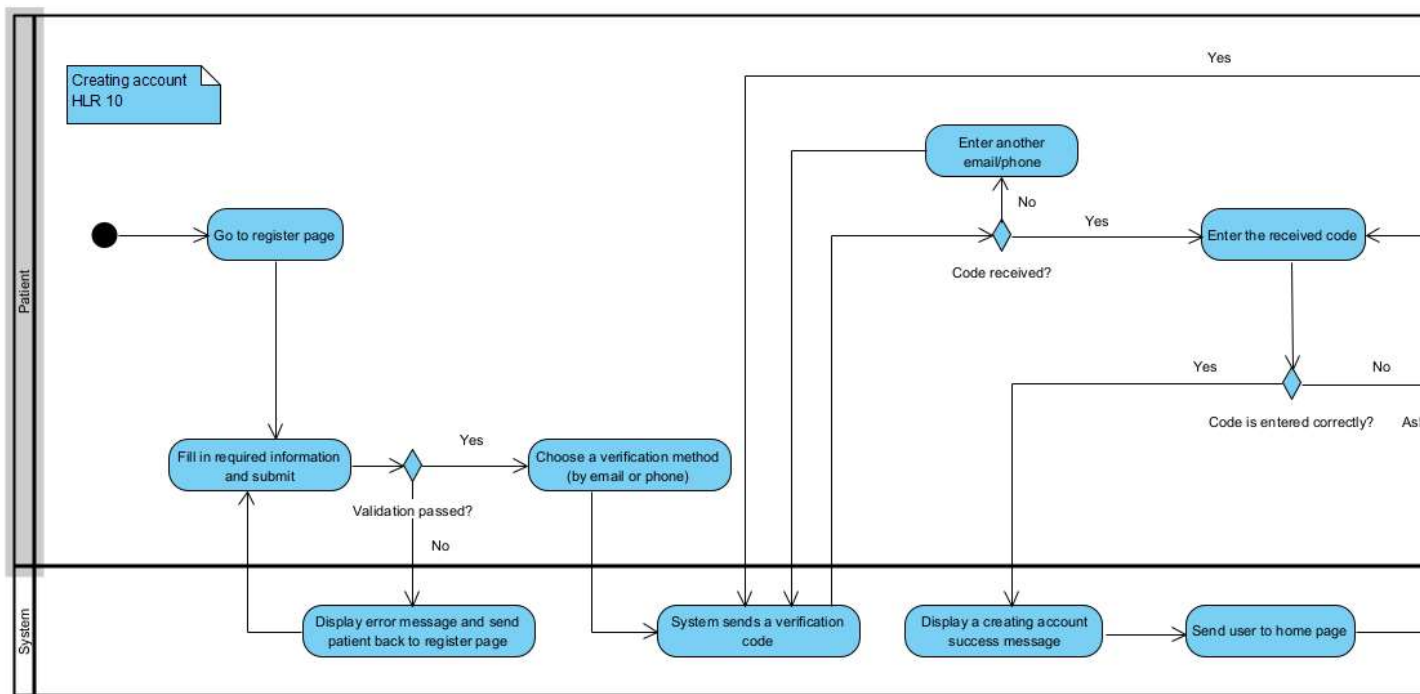


3.2.2.2 Login

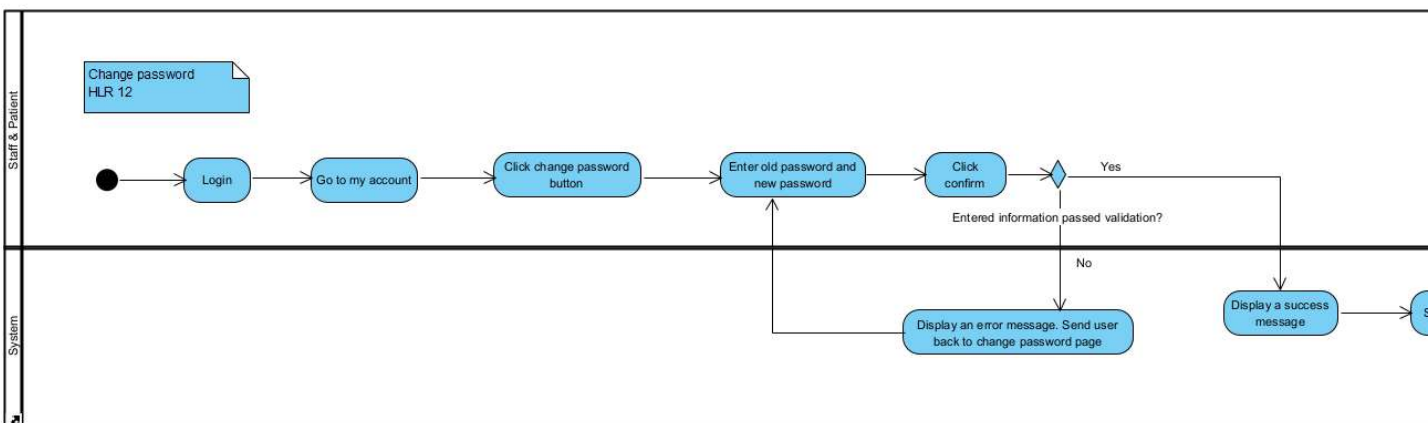


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3.2.2.3 Registration

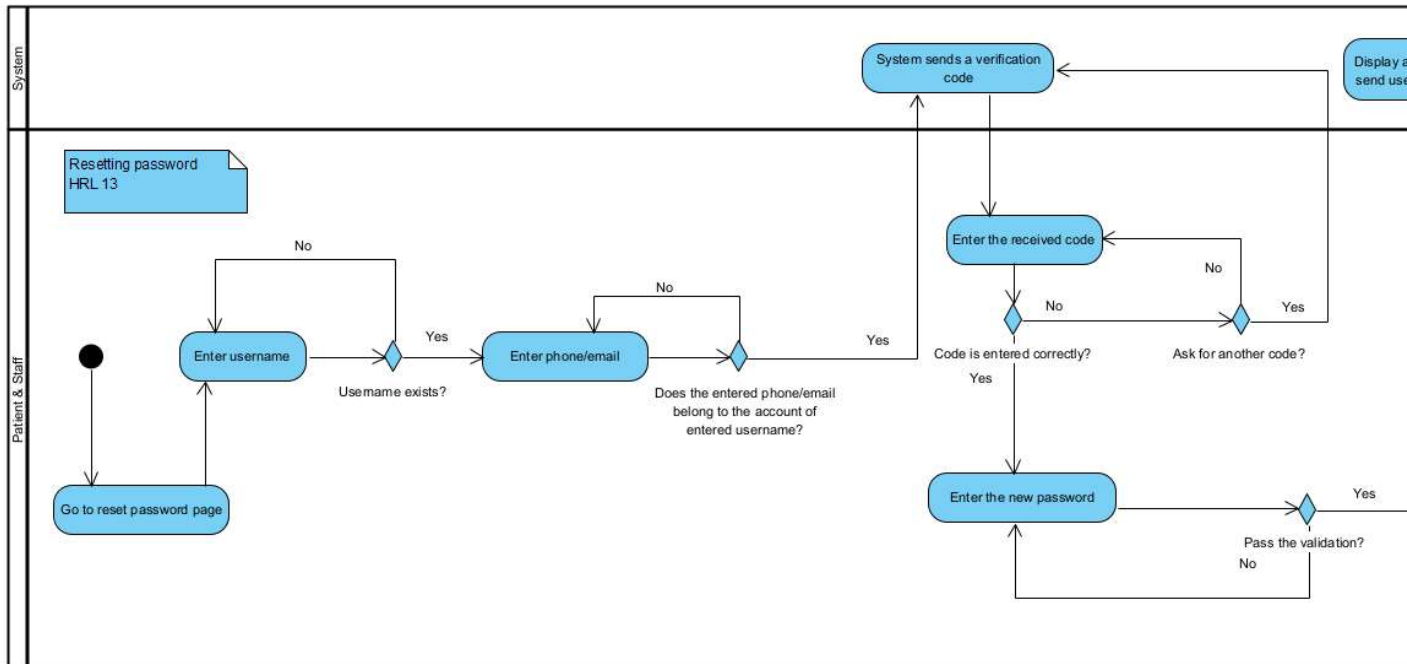


3.2.2.4 Change Password

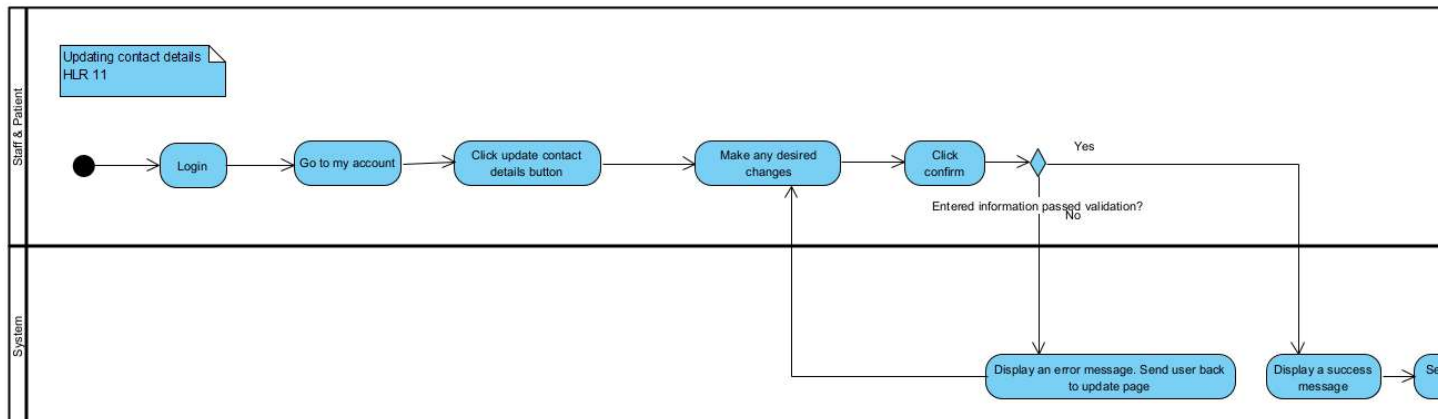


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3.2.2.5 Reset Password



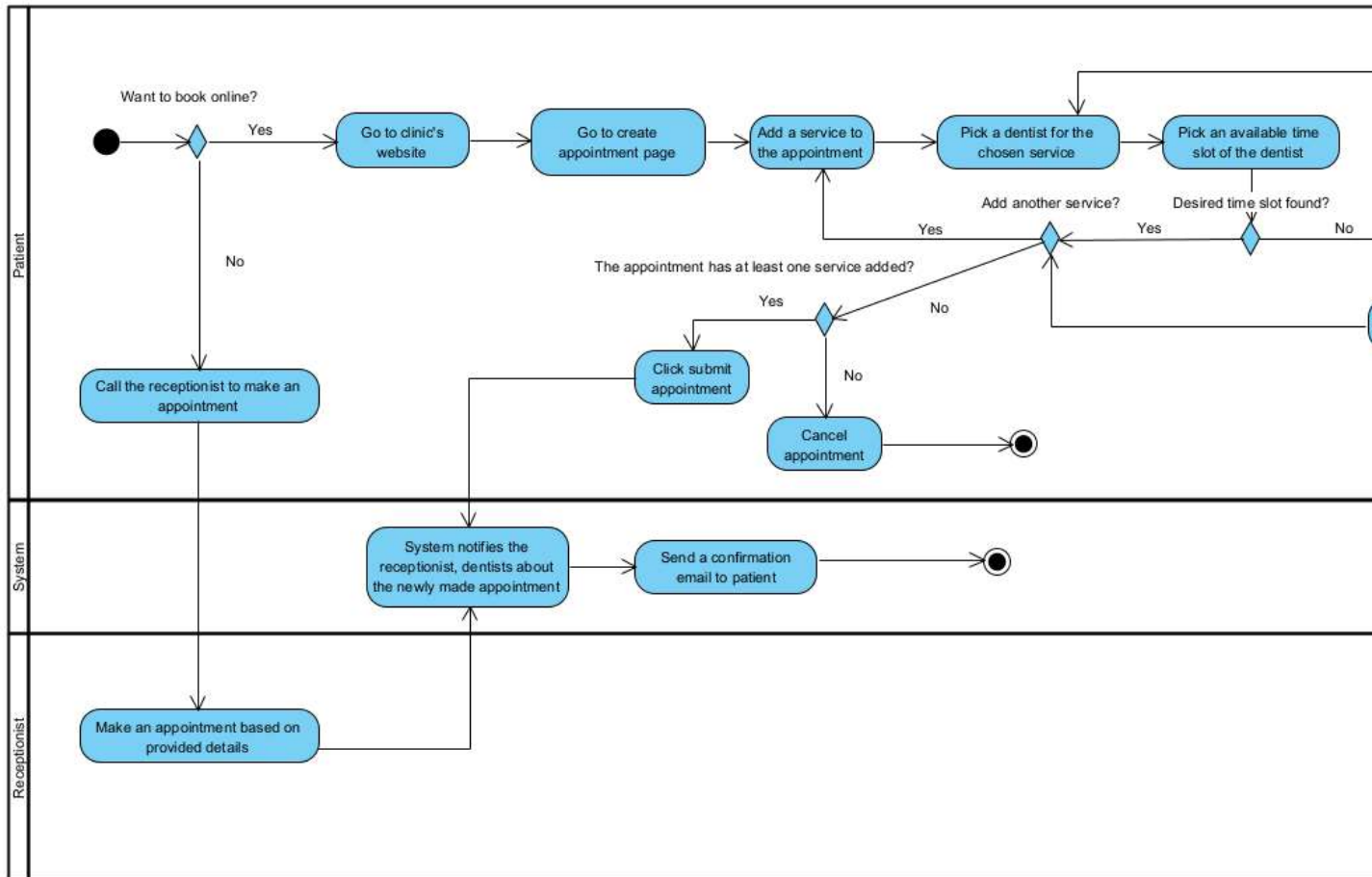
3.2.2.6 Update Profile



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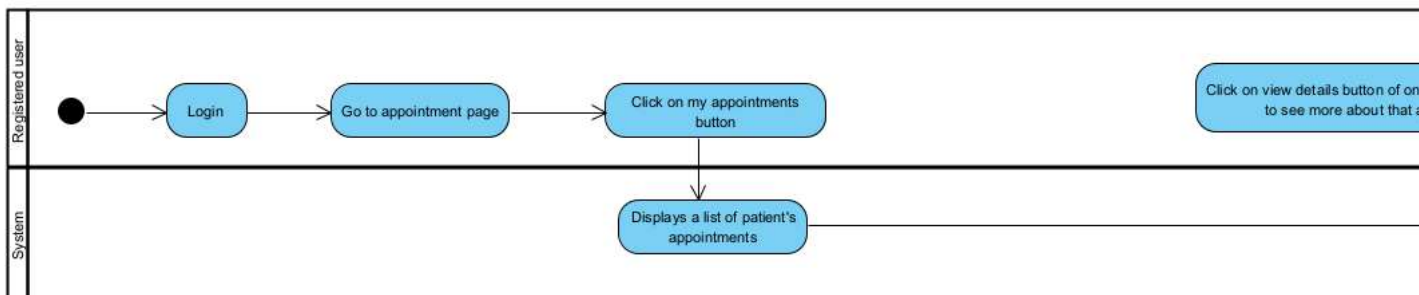
3.2.2.7 Patient Creates Appointment

Making appointment
HLR 06, 09, 17



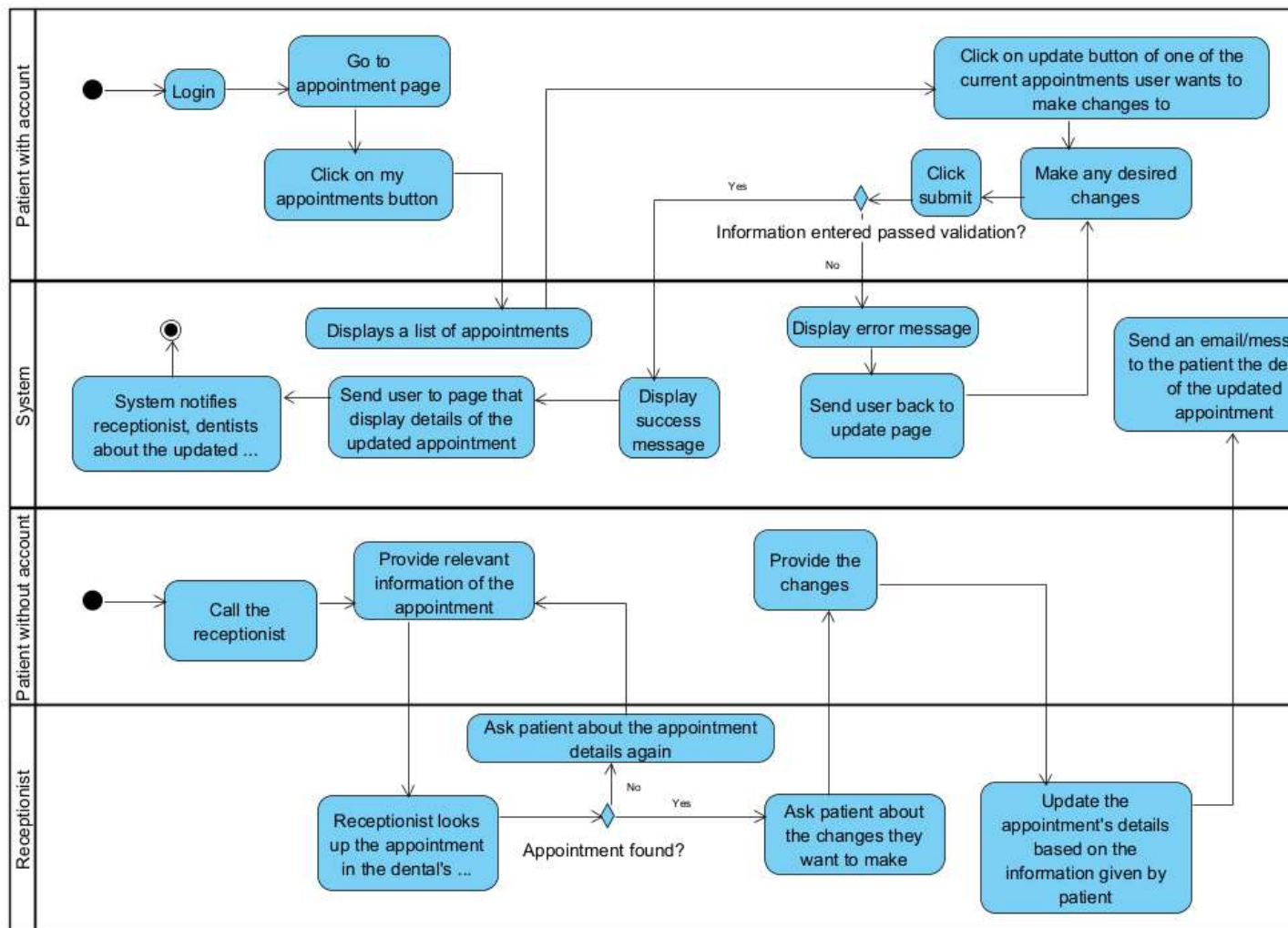
3.2.2.8 Patient Views Appointment

Registered patients view their appointment
HLR 08



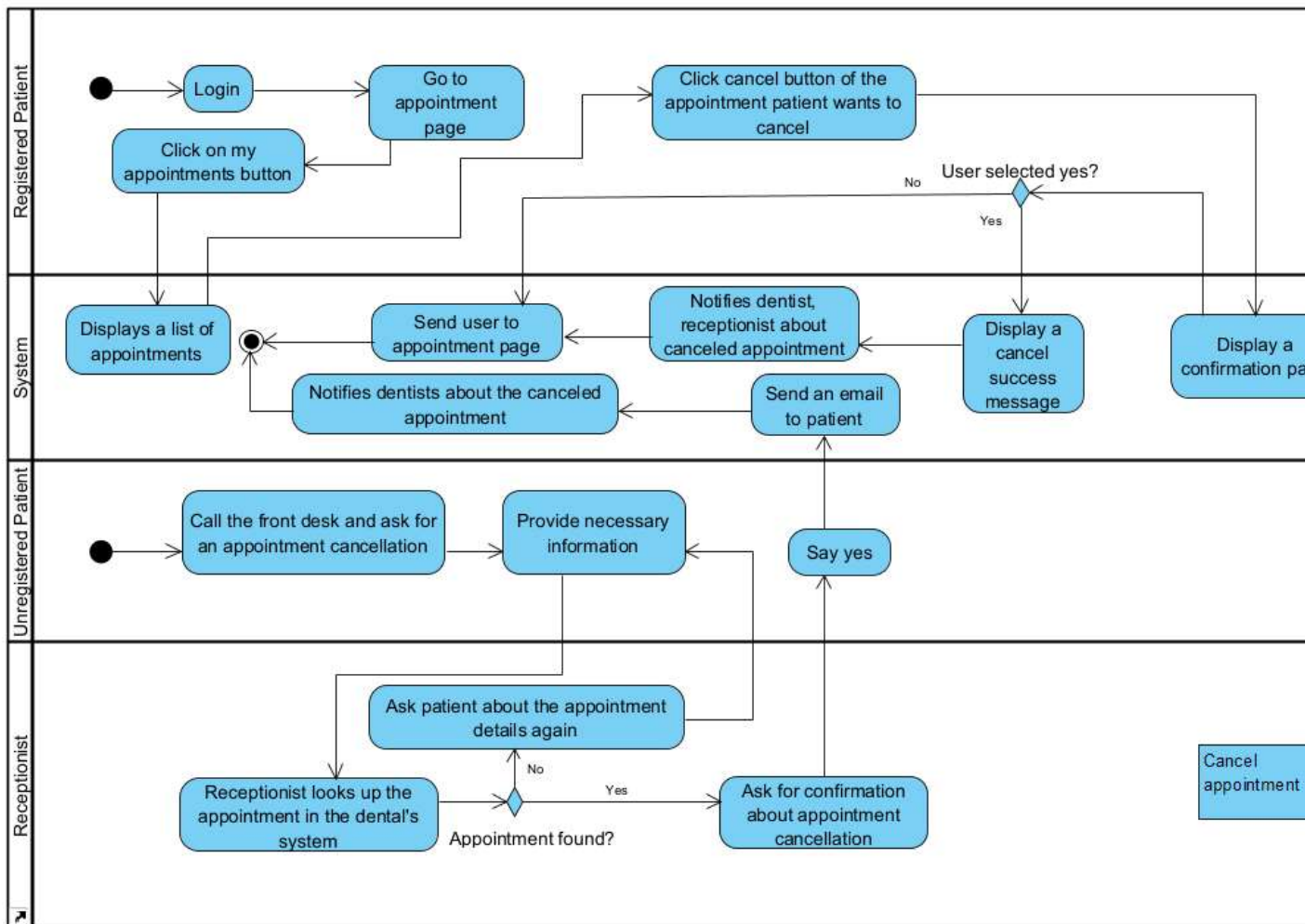
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3.2.2.9 Patient Updates Appointment



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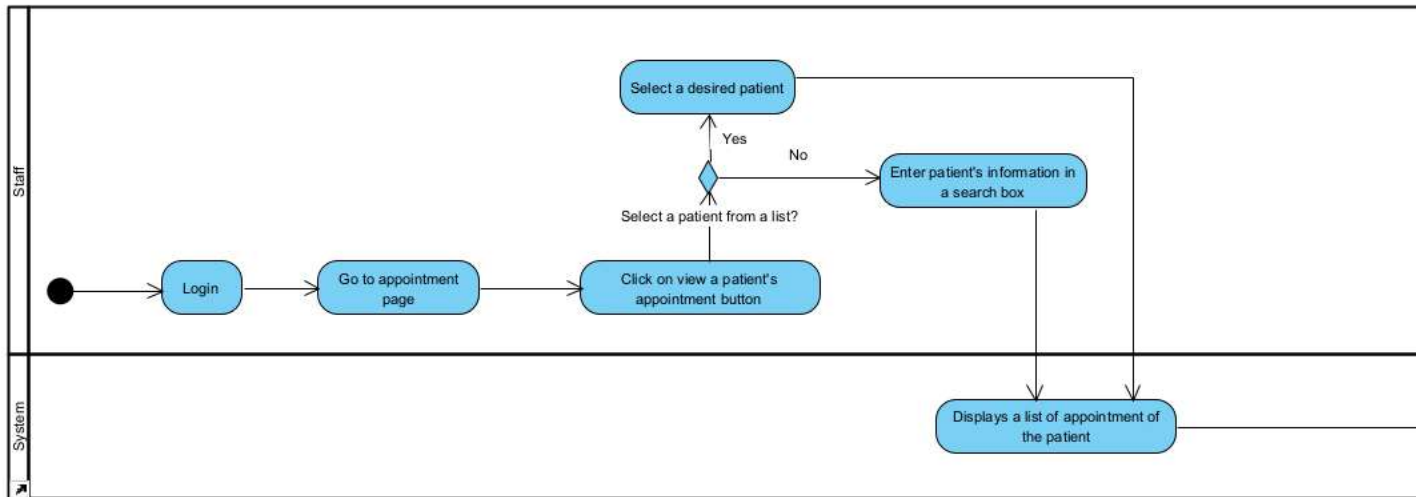
3.2.2.10 Patient Cancels Appointment



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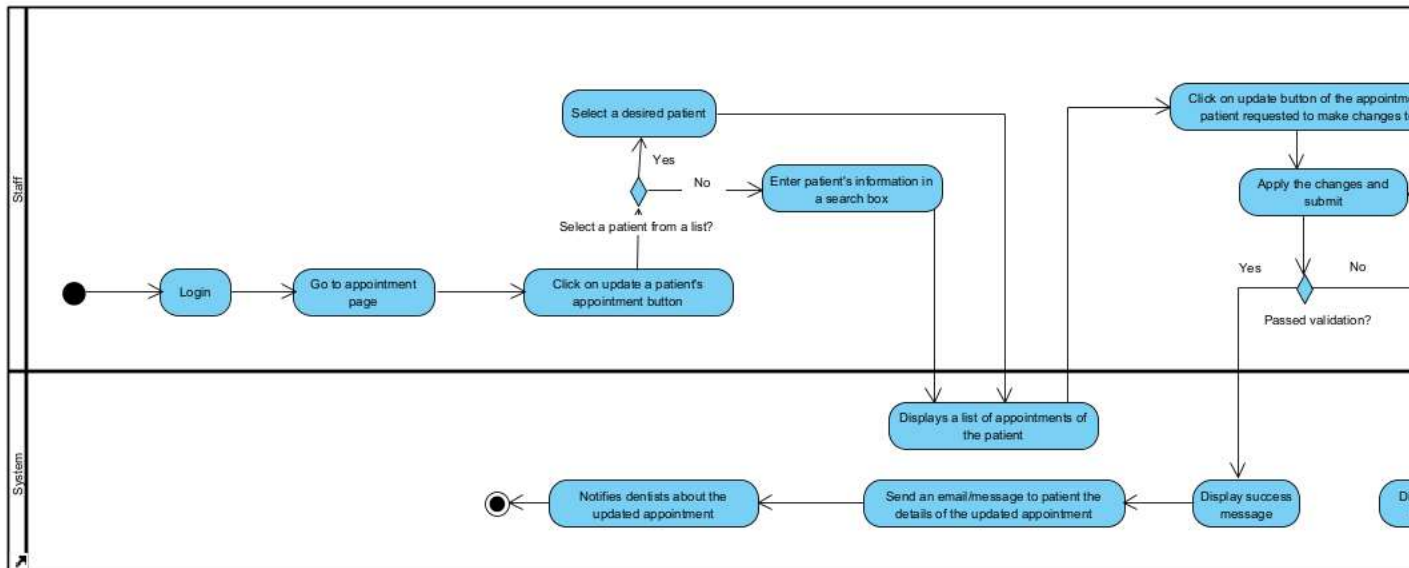
3.2.2.11 Staff Views Patients' Appointments

Staff viewing patient's
appointment
HLR 15



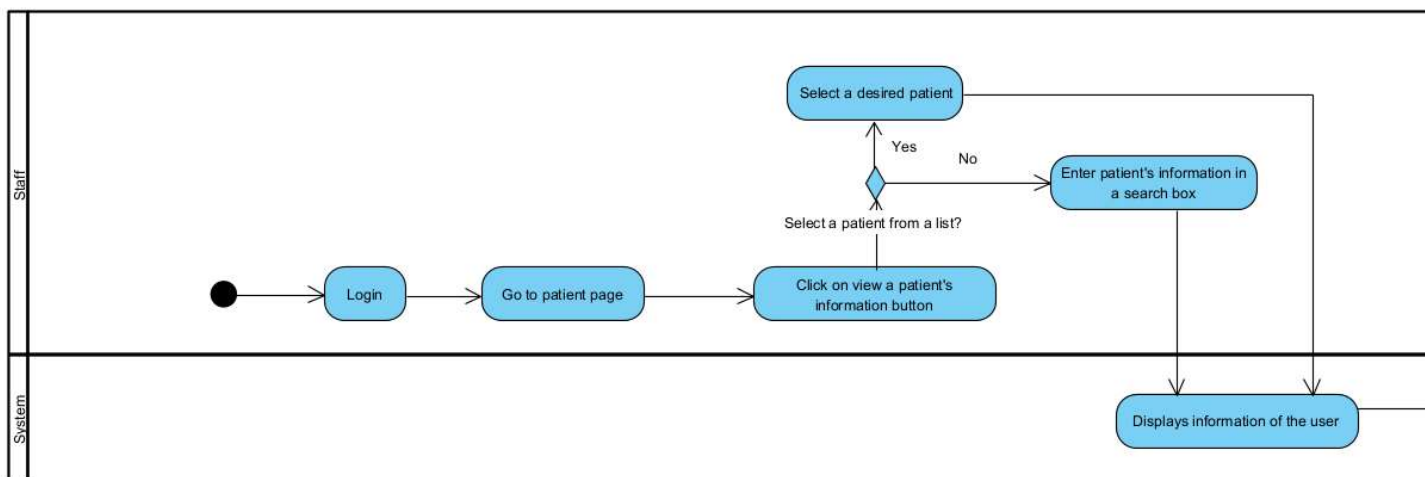
3.2.2.12 Staff Updates Patients' Appointment

Staff update a patient's appointment
HLR 16



3.2.2.13 Staff Views Patient Information

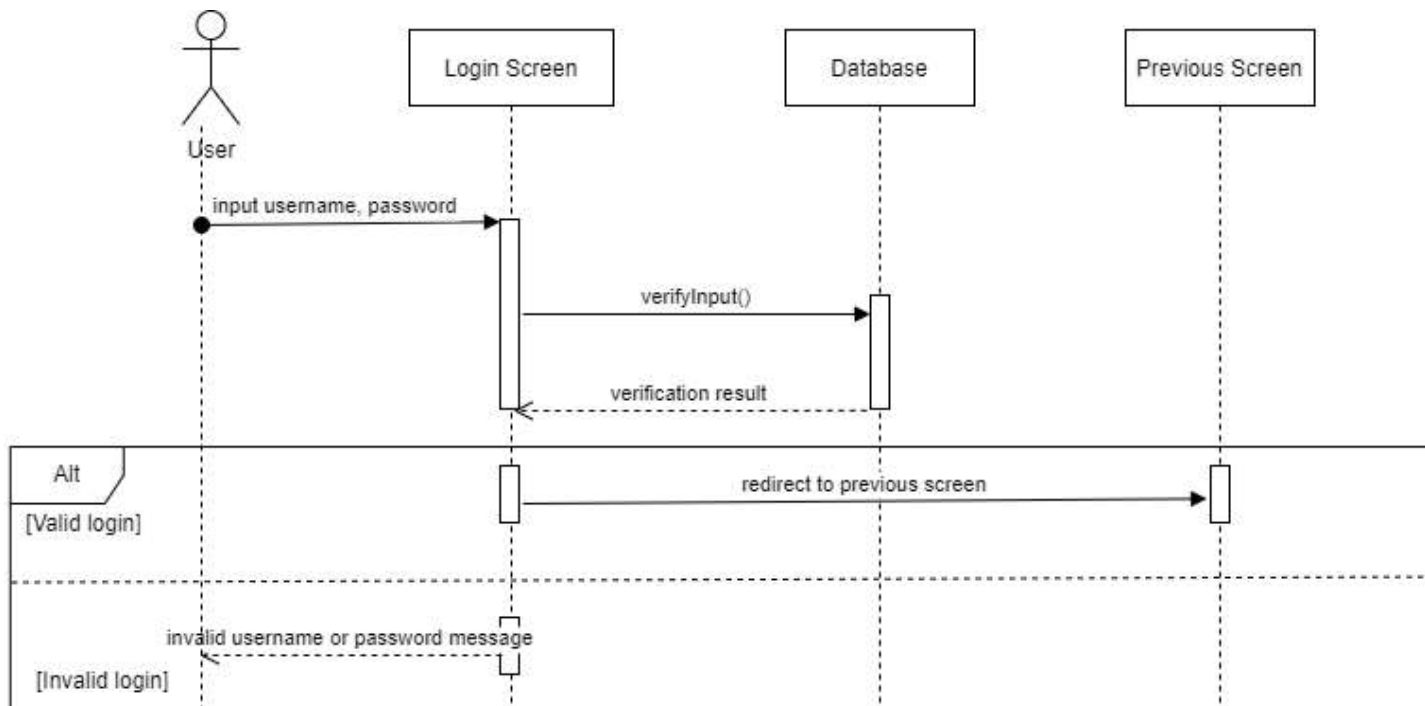
Staff viewing registered patient's info
HLR 18



3.2.3 Sequence Diagrams

3.2.3.1 Login

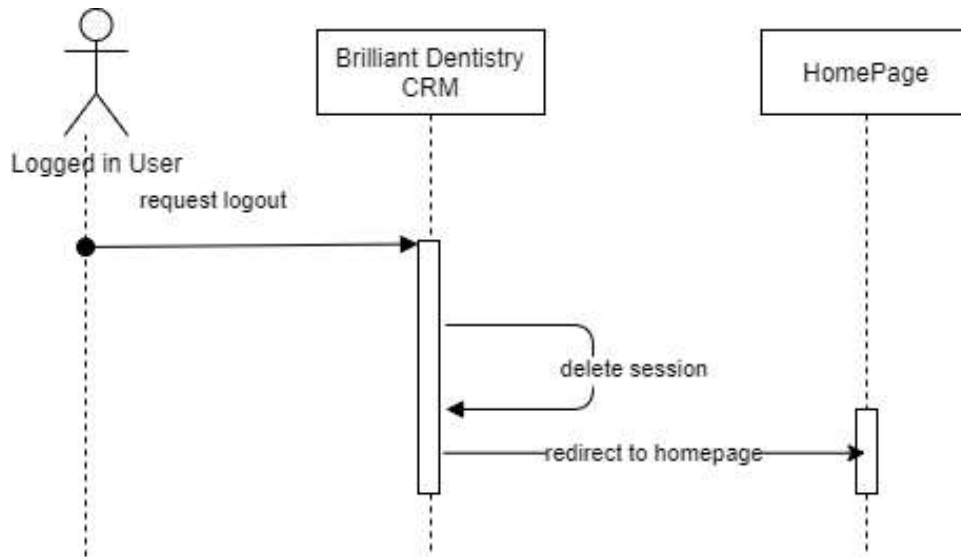
Actor: Registered Patients, Staff



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3.2.3.2 Logout

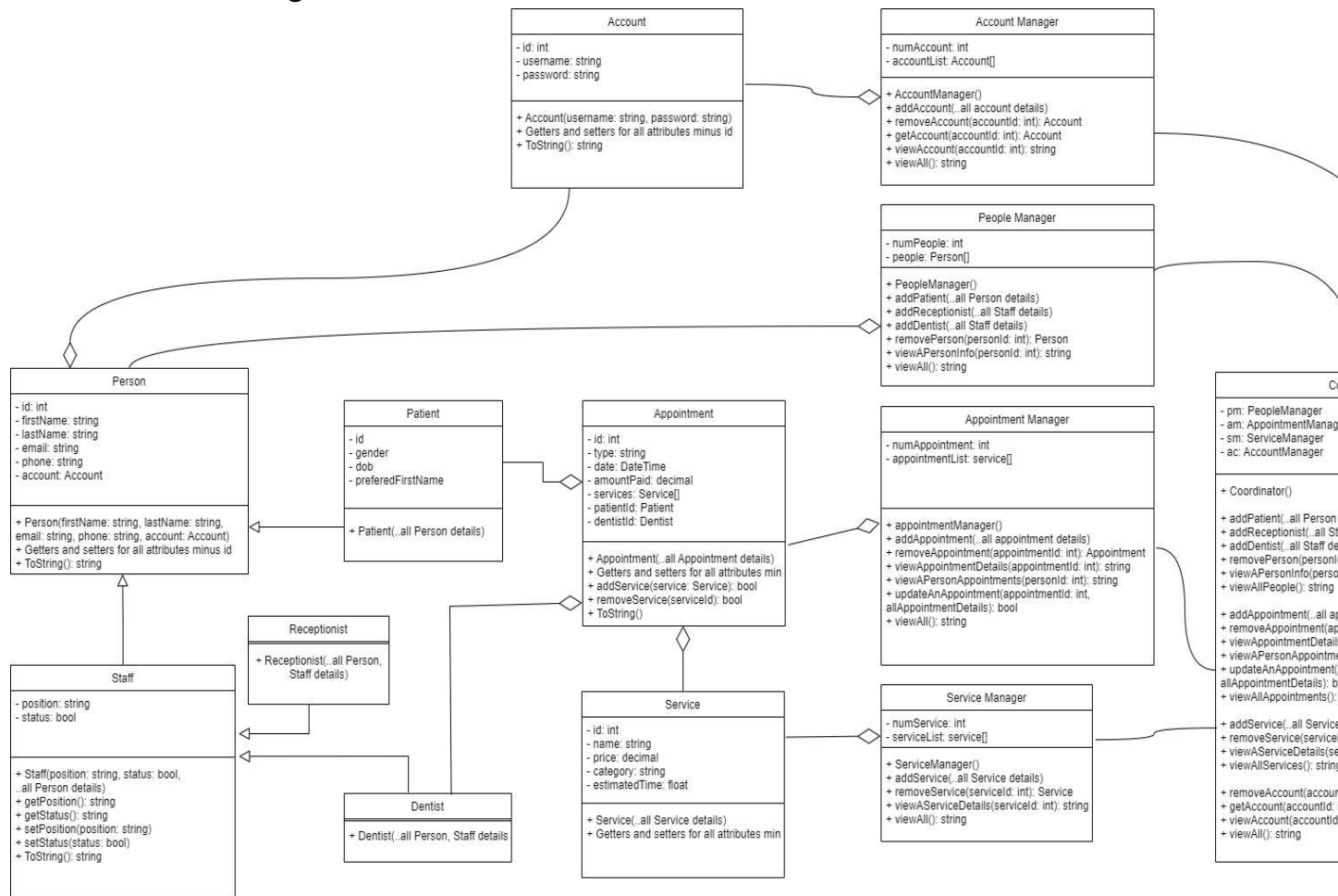
Actor: Logged In Patients, Logged In Staff



3.2.3.3 Change Password

Actor: Registered Patients, Staff

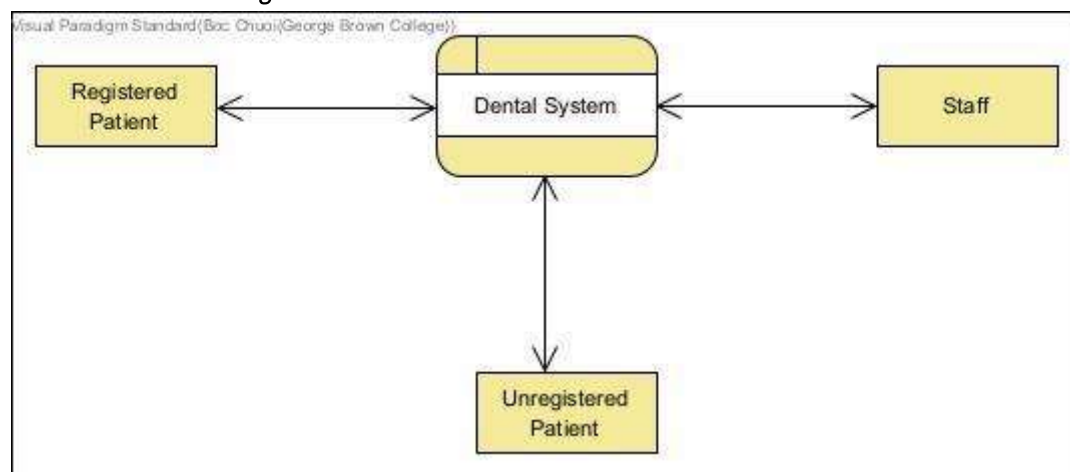
3.2.4 UML Class Diagram



3.3 Process Modelling

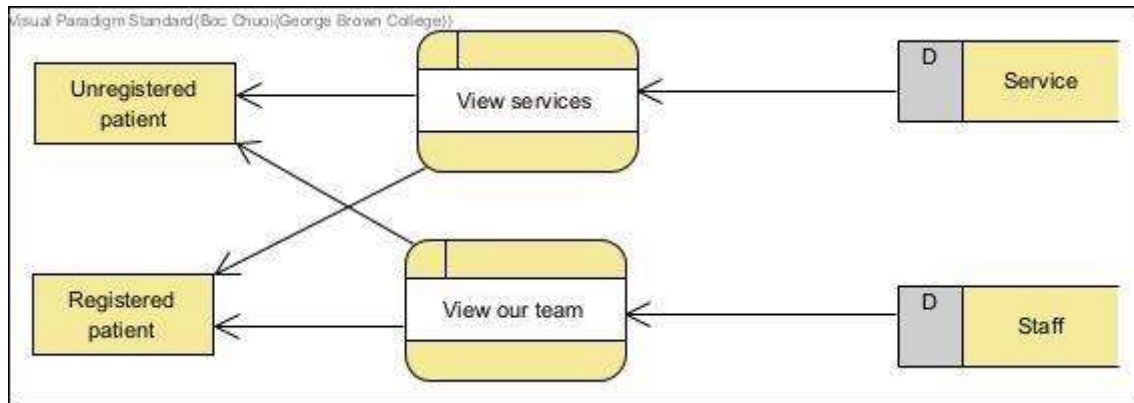
3.3.1 Data Flow Diagram

3.3.1.1 Context Diagram



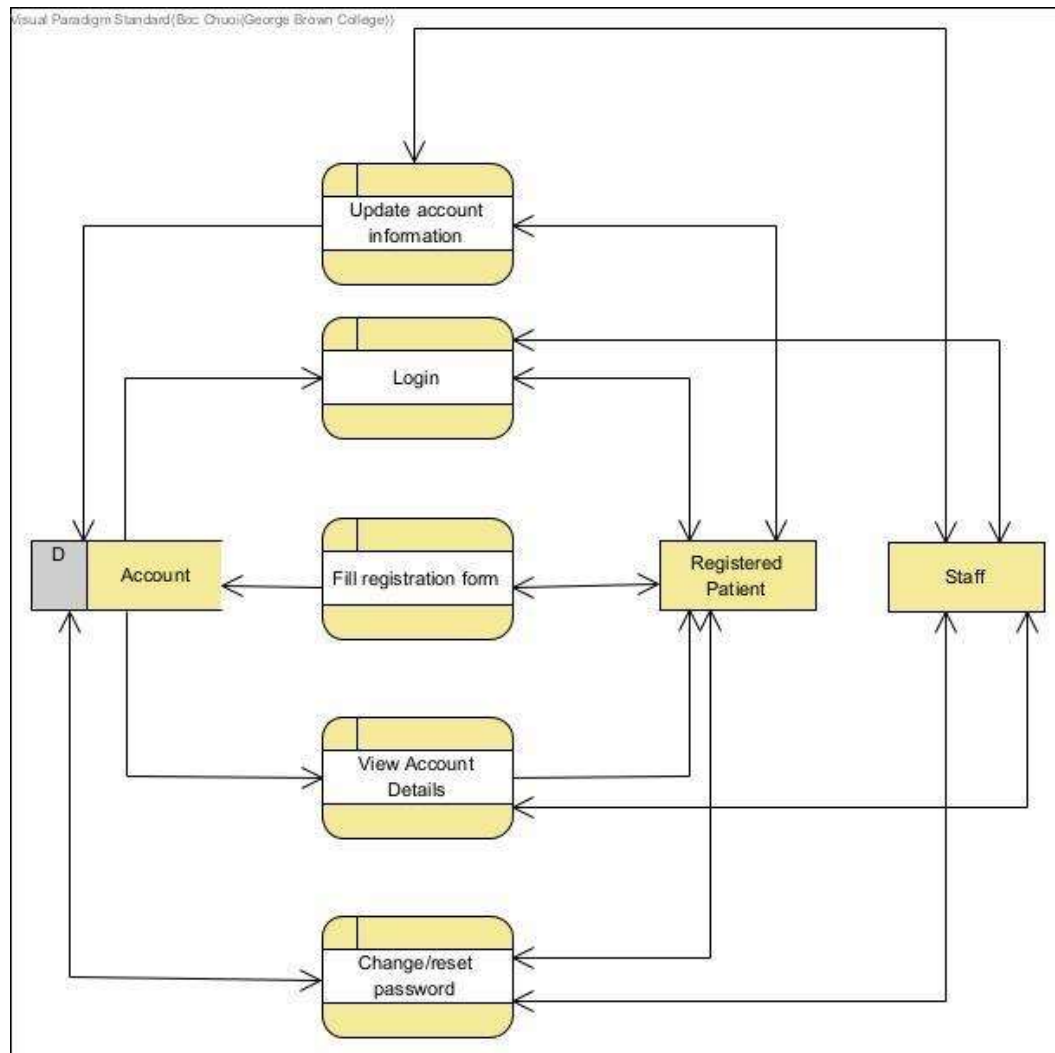
3.3.1.2 DFD

Page Contents



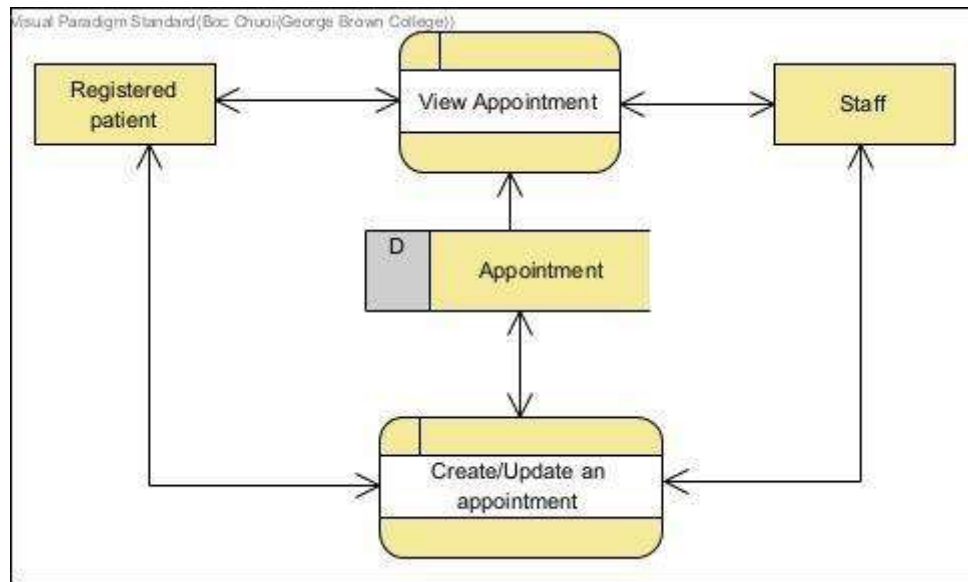
User Accounts

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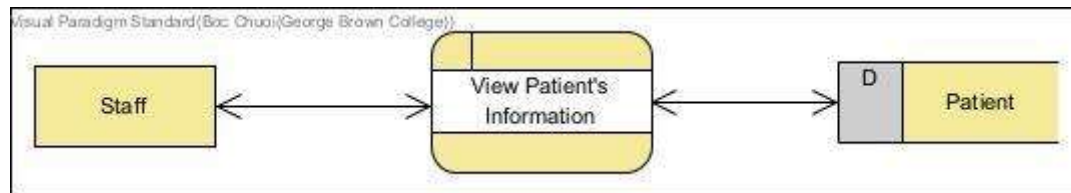


Appointments

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Patient Information



4.0 Non-Functional Requirements

4.1 Performance

- The system should return the results within 10 seconds for any queries requested from client side.

4.2 Reliability

- The search results must follow the parameters entered in the filters of the search; no single search result can be not relevant / outside of the parameters specified in the filters.

4.3 Availability

- The system should be available at least 98% of the time.
- Any scheduled downtime or maintenance must be informed to client 5 business days in advance.
- Any unexpected downtime or service corruption must be resolved within 1 business day.

4.4 Security

- User credentials must be stored safely and encrypted in our system.
- Unauthorized users shall have no access to features that are restricted to registered users.
- Data inside the system or its part will be protected against malware attacks or unauthorized access
- Staff users must change their password every 90 days to reduce the risk of password compromise and exposure of patient confidential information.
- Staff access must be reviewed regularly. As soon as a staff resigned from her position, the development team must be informed and take action to ensure that the resigned staff has no access to the system.
- System must maintain a log of user activities for further investigation in case of incidents.

4.5 Maintainability

- The application will be implemented with React, Flask and MySQL.
- The application must comprise well-defined and independent components/modules for better maintainability and scalability.
- New features can be added to the application without major changes to the underlying architecture.

4.6 Portability

- Brilliant Dentistry CRM is a web application that any user with reliable access to internet and web browser can easily access to.
- With responsive design, the web application can be accessed using different type of devices including but not limited to desktop, laptop, Chromebook, tablet, phone, etc.

4.7 Usability

- The user interface must be intuitive, simple, easy to navigate and require the minimum amounts of click.
- Default values if available must be selected so that they are a good choice for most of the users.
- If default values are not available, there should be hints to help end users understand the expected input
- In case of validations or errors, the message must be informative, specific, concise, and easy to interpret.

5.0 Logical Database Requirements

- The Database Manager should be MySQL
- All data will be saved in the database: user accounts and profiles, booking information (except files which are stored on the disk.)
- Information data and files must be accessible from a single source (endpoint)
- The database allows concurrent access and will be always kept consistent, requiring a good database design
- All data must be retained with a minimum period of 2 years. Data that is more than 2 years must be archived and accessible using MySQL management tools.
- Data backup must be scheduled weekly
- Security protocols and data encryption must be implemented to protect sensitive information

6.0 Approval

The signatures below indicate their approval of the contents of this document.

Project Role	Name	Signature	Date
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Counselor/Liaison	Reza Dibaj	Reza Dibaj	2022/11/08
Client	Shiva Aghaha	Shiva Aghaha	2022/11/08
Professor	Anjana Shah		