
Software Requirements Specification

for

MyDentist

Version 1.0.3.0 Approved

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Revision History

Name	Date	Reason for Changes	Version
Varun Rohit Mudunuri	31/01/2023	Original	1.0.0.0
Varun Rohit Mudunuri	17/03/2023	Addition of PART-B deliverables	1.0.2.0
Varun Rohit Mudunuri	12/04/2023	Addition of PART-C deliverables (section-7 Diagrams)	1.0.3.0

1. Introduction

1.1 Purpose

The purpose of this document is to build an online system that will help patients with dental problems to book in-person appointments and to help doctors and/or patients to have their appointment and other records available instantly.

1.2 Document Conventions

This Document will use the following conventions.

DB	Database
SQL	Structured Query Language
ER	Entity Relation

1.3 Intended Audience and Reading Suggestions

This project is a prototype for booking Dental Care appointments and other related services and it is restricted within the college premises. This has been implemented under the guidance of college professors. This project is useful for doctors, patients, Chemists and/or Delivery people.

1.4 Product Scope

People have to stand in long queues to book an appointment with dentists, MyDentist is a mobile as well as web application that will allow users to book an appointment with the dentists near their area. In addition to this, Customers can also have their prescription's copy and/or soft-copy of their lab tests instantly available. Lastly, Customers can share their prescription to the chemist for pick-up/delivery. We will set up a database system covering several cities all over the world, Most reputed Dentists of an area, and Drug stores in different areas. We will strive to provide a smooth and excellent user experience.

1.5 References

- https://willowdale dentalgroup.com/?gclid=CjwKCAiAleOeBhBdEiwAfgmXf_q-rwytxzr5eJOE_1cVeXqTOvRoHW_s3du0isGlmv390BQw20A_qlxoCYf0QAvD_BwE
- <https://www.quora.com/p/13615/what-are-the-characteristics-of-a-system-describe-/>
- [https://www.scaledagileframework.com/nonfunctional-requirements/#:~:text=Nonfunctional%20Requirements%20\(NFRs\)%20define%20system.system%20across%20the%20different%20backlogs.](https://www.scaledagileframework.com/nonfunctional-requirements/#:~:text=Nonfunctional%20Requirements%20(NFRs)%20define%20system.system%20across%20the%20different%20backlogs.)
- <https://www.perforce.com/blog/alm/how-write-software-requirements-specification-srs-document>
- <https://www.hhs.gov/hipaa/for-professionals/privacy/index.html#:~:text=The%20HIPAA%20Privacy%20Rule&text=The%20Rule%20requires%20appropriate%20safeguards,information%20without%20an%20individual's%20authorization.>
- <https://krazytech.com/projects/sample-software-requirements-specificationsrs-report-airline-database>

2. Overall Description

2.1 Product Perspective

The database system for MyDentist will store the following information.

- **Doctor Details**

It will include the Doctor's name, code, contact, address, Level of Education, and Experience. This system will also store Doctor's schedule and may allow users to book appointments by choosing a time slot whenever a **dentist** is available.

- **Customer Details**

This will include customer number, name, contact, email address, address(for delivery purposes). This will also include payments made by customers, their lab tests and their prescriptions.

- **Pharmacy Details**

This will include pharmacy number, pharmacy address, license number, information of employees working in that pharmacy.

- **Medication Courier Details**

This will include the delivery person's name, age, address, contact, his/her vehicle details, location history and orders completed.

2.2 Product Functions:

- Track and manage dental appointments, medication schedules, and lab results
- Facilitate doctor-patient communication.
- Connect to nearby doctors, clinics, and pharmacies.
- Locate clinical trials for experimental treatments
- Automate refrigerated medicine inventory management for hospitals and clinics.
- Assists surgeons with preoperative planning and reduces procedure times.
- Help patients manage their chronic illnesses via digital care plans from their doctors.
- Enable insurance companies to verify eligibility and claims faster and more efficiently.
- Allowing the patients to check the availability of the medicines.
- Delivery of medicines for those who cannot collect
- Two factor authentications to maintain the details of the patient securely.

2.3 User Classes and Characteristics:

- Users: They are the people who use the application to book appointments or use the application
- Clinics: They are the dental clinics that are interested to be added to the application for users to locate and utilize them when needed.
- Pharmacies: They are the pharmacies which give drugs based on the doctor's prescription.
- Delivery agents: They are the people who deliver the drugs to the users.
- Administrators: They are responsible for monitoring the functions and procedures that are going on in the application

2.4 Operating Environment

The Software:

- Uses MongoDB to store data
- It is supported on web browsers: Chrome, Firefox and Safari (for mobile)
- It is coded on c++
- Mobile versions are supported on android and ios

Operating System

- Windows/Linux/Android/IOS

Hard Disk

- Intel 7 or higher
- AMD Ryzen 5 or higher

2.5 Design and Implementation Constraints

The "Design and Implementation Constraints" section of the SRS lists any items or issues that will limit the options available to developers during the design and implementation phases of the project. This section is used to provide clear and specific guidelines that must be followed during the development process.

Examples of design and implementation constraints that might be included are:

- Corporate policies: Describing any company policies that must be followed during the development process.
- Hardware limitations: Describing any hardware limitations that must be taken into account during the development process, such as memory and timing requirements.
- Interfaces to other applications: Describing any interfaces that must be established with other applications, such as databases or other systems.
- Specific technologies, tools, and databases: Describing the specific technologies, tools, and databases that must be used during the development process.
- Parallel operations: Describing any requirements for parallel operations, such as processing multiple requests at the same time.

2.6 User Documentation

This app will include an interactive in-built tutorial system which will show users how to create an account, find clinics nearby, find best doctors, book an appointment, make payments and how to order medicines from a drugstore. In addition to this, there will be 24x7 customer support where users can message or call to know how to operate the application or any other queries.

2.7 Assumptions and Dependencies

- Having a reliable internet connection
- Must have an electronic device to access the application
- Each user must have an account i.e. a user and password
- The user must have basic knowledge on how to use an electronic device or computer to use the application

3. External Interface Requirements

3.1 User Interfaces

- Login and signup page.
- Supports both mobile and Web interfaces
- Compatible with Android, IOS, Windows, Mac operating systems
- Homepage containing dental clinics locations according to recipient's choice.
- After all transactions the system makes the selling report as a portable document file (pdf) and sent to the customers registered email address.

3.2 Hardware Interfaces

- Camera (for users to upload pics through chat with doctor)
- Barcode reader
- MySQL and MongoDB (a database to store data of the users, employees as well as the app data)
- Dual Core Processor
- 2 GB RAM

3.3 Software Interfaces

- A Payment gateway - Secure Pay and PayPal (for secure transactions)
- Calendar- to schedule appointments and display the date to the users
- WorldTimeAPI - to display the local time
- Google Maps API- To locate nearest clinics.
- EmailAPI - to open the default email for communication.
- API call - to talk directly to the clinics or customer care agents.
- ZoomAPI - for short and non - serious virtual consultations

3.4 Communications Interfaces

The MyDentist application requires e-mails (Outlook), web browsers (Chrome and Safari), electronicforms (for bills, transactions and reports), uses http protocol for secure communication over the internet and for the intranet connection it will be through TCP/IP protocol.

4. System Features

The "System Features" section of the SRS is used to describe the functional requirements for the product, organized by the major services or features provided by the system. This section typically *includes a description of each feature, its purpose, and the specific requirements it must fulfill.*

4.1 System Feature 1

User Authentication:

4.1.1 Description and Priority:

This feature allows users to log into the system using a unique username and password. The user authentication process will ensure secure access to sensitive data within the system.

Priority: High

Priority Component Ratings:

- Benefit: 9
- Penalty: 9
- Cost: 7
- Risk: 8

4.1.2 Stimulus/Response Sequences

1. User enters their username and password into the login form.
2. System validates the username and password.
3. If the validation is successful, the system redirects the user to their dashboard.
4. If the validation is unsuccessful, the system displays an error message indicating that the username or password is incorrect.
5. Users have the option to reset their password or try again.

By providing clear and detailed stimulus/response sequences, stakeholders can understand how the system will behave and interact with the user. This information can also serve as a valuable reference for developers during the implementation phase.

Functional Requirements

<u>Functional Requirements list</u>				
Requirement ID	Requirement title	Short Description	Priority	Requester
FR01	Alerts	The system should give the user a mobile notification/alert when the appointment is coming up	High	Customer, Clinics
FR02	Zoom	The system should allow the integration of zoom application for non-serious online consultations	Medium	Customer, Investor, Marketing Manager
FR03	Profiles	The system should allow the users to update their profiles. Any critical information should be reflected on the main system through integration.	High	Customer
FR04	E-mails	The system should compose automatic emails and send them to users indicating service request status.	Medium	Clinics, Customer Support
FR05	Service Requests	The new app should allow the users to manage service requests (Create, update, check and cancel appointments)	High	Customer
FR06	Calendar	The system should give the user and the employees a calendar to keep track of their upcoming appointments.	High	Customer, Employees
FR07	Login/log out	The system should give the users option to login and logout if the user is inactive for more than 15 mins.	High	Developer

FR08	E-forms generator	The system should allow the user to generate an electronic pdf of their transactions and reports.	Medium	Customer, Investor
FR09	Secure Payments	The system should allow the users to make payments via a secure portal in order to maintain the details secure.	High	Developer
FR10	Frequently asked questions FAQ	The system should have the capability to allow the administrator to setup and manage frequently asked questions to users for queries that are asked by many users to avoid wasting the users time	Medium	Administrator
FR11	Language accessibility	The system should provide different language options based on the region.	Low	Customer
FR12	Account creation and password	The system should allow the user to create an account and avoid assigning same user names to multiple users and should set certain guidelines and deny the user's password until a strong password requirement is met for user security.	High	IT security Officer
FR13	HIPAA	Each database should meet The HIPAA Privacy Rule	High	IT security head

5.0 Other Nonfunctional Requirements

5.1 Performance Requirements

A) E-R Diagram:

The E-R Diagram is a method for visually illustrating the logical organization of a database. After that, a relation database is created by normalizing the relation and organizing the data as a relation.

ENTITIES: which identify specific real-world elements in a program

PROPERTIES/ATTRIBUTES: which define relationships and the attributes of an

entity. RELATIONSHIPS: can link items and depict significant dependencies among them

B) Communications:

We offer various forms of customer help, including:

- Live chat with doctors (during working hours)
- Chatbot for 24/7.
- Email
- Contact Center (Phone)
- Technical support

5.2 Safety Requirements

If there is extensive damage to a wide portion of the database due to catastrophic failure, such as a disk crash, the recovery method restores a past copy of the database that was backed up to archival storage (typically tape) and reconstructs the current state by reapplying or redoing the operations of committed transactions from the backed up log, up to the time of failure.

5.3 Security Requirements

Security systems need database storage just like many other applications. However, the special requirements of the security market mean that Doctors and chemists should choose their database partner carefully.

Hippa rule should be followed at every step. It is a federal law that requires the creation of national standards to protect sensitive patient health information from being disclosed without the patient's consent or knowledge.

Two step verification followed by OTP measures should allow access to the application so that no

one else can review reports and personal data of the patient.

5.4 Software Quality Attributes

AVAILABILITY: The Reservations should be available on the specified date and specified time as many customers are doing advance reservations.

CORRECTNESS: The map should pick the accurate location of the patient and should drop him at the correct destination.

MAINTAINABILITY: The administrators, Doctors, Chemist, Delivery persons in charge should maintain correct schedules of appointments.

USABILITY: The App schedules should satisfy a maximum number of customers' needs.

5.5 Business Rules

Subscription Services: Application should provide services to a particular client if payment is not made within a predetermined period of time. This guarantees that the Application won't waste resources on a client who isn't bringing in money.

Purchase Orders and Returns: The customer can only return unused or expired drugs within a 30 day period to the supplier. For instance, if a customer requests to return a drug outside the deadline, the organization may refuse the request.

5.6 Nonfunctional Requirements

Nonfunctional Requirements list				
Requirement ID	Requirement title	Short Description	Priority	Requester
NFR01	Performance	Performance Capacity: takes 400 waitlist queue server resource requests per second	High	IT administrator
NFR02	Security - Cyber	The system should pass the following tests: DDoS testing, penetration testing and malicious script testing.	High	IT security officer
NFR03	Mobile compatibility	The new system should be compatible with the following mobiles: to run on iOS, Android	High	IT administrator
NFR04	Web browser compatibility	The new system should be compatible with the following browsers: Chrome, Firefox	Medium	IT administrator

NFR05	Account Security	The system should automatically lock the account after 8 incorrect attempts, also provide an option for users to enter security incase a user forgets their password	High	IT security head
NFR06	Usability	Each page should load 1-2seconds for the user to enjoy fast and usable product	Medium	Developer

6. Analysis Modelling

6.1 Use Case Table

Use Cases				
No	Use Case Name	List of related Requirement s ID	Actor (s)	Brief Description
1	Place an order	FR05	User, Developer	The actor will choose the medicines they require and add it to the shopping cart.
2.	Update User Profile	FR03	User, Developer	The actor should be able to check and change their profile.
3	Create an order and pay	FR09	User, IT Security head	The actor will choose their required medicines and add it to the cart and pay by their preferred mode of payment.

4.	Send notifications / email.	FR04	Clinics, IT administrator	The users should be able to receive any new offers and reminders for their upcoming appointments.
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5	Request Prescription	FR05	User, Clinics, Pharmacy Prescription System	The actor should be able to request the prescriptions from the clinics.
6	Generate E-forms	FR08	User, IT security officer	The actor should be able to generate an electronic form of their previous transactions / reports.
7	Manage their appointments using the calendar	FR06	User, Employees	The actor should be able to view, cancel or change appointments using the calendar option in the application.
8	Account creation and Password	FR12	User, IT security officer	When there is a new user, they should be able to create a new account and make sure that the password they create matches the strong password requirements.
9	Frequently asked questions (FAQ)	FR10	Developer, Employees	A collection of frequently asked questions for user's help so that users do not have to wait to connect with customer support for help.
10	Multiple Language Accessibility	FR11	User, Developer	For users who are not well educated, the application gives the option to the user to use the application in their native language
11	Delivery management	FR05	User, Pharmacies, Developer	The user should be able to choose their mode of delivery (pick up or delivery) from their preferred pharmacies
12,	Manage history	FR05	User, Clinics	The actor should be able to revisit the history of their previous appointments and purchases

13	Log in to the mobile app	FR07	Developer, IT administrator	The actor will type the username and password to log into the mobile application. In response, the software will lead the actor to the home page of the mobile application
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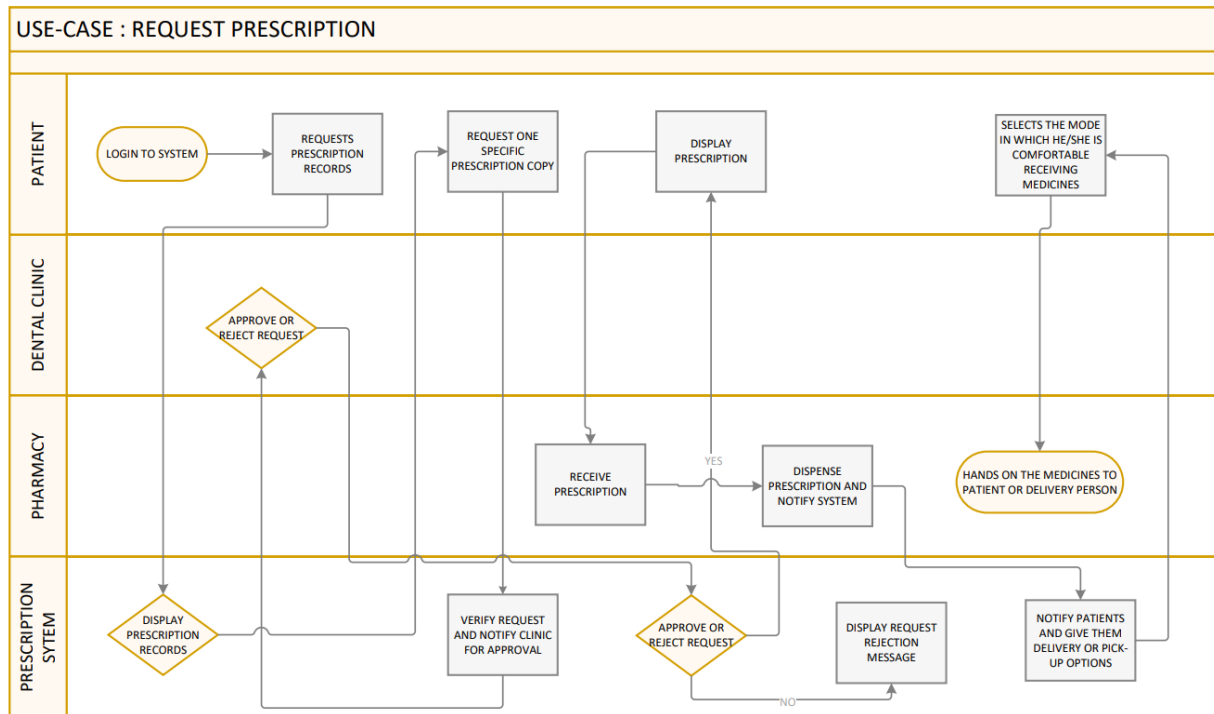
6.2 Use Case Description: Request Prescription

In the swim lane diagram below, there are four lanes representing the actors involved in the use case: Patient, Dental Clinic, Pharmacy, and Prescription System. The activities involved in the use case are listed below:

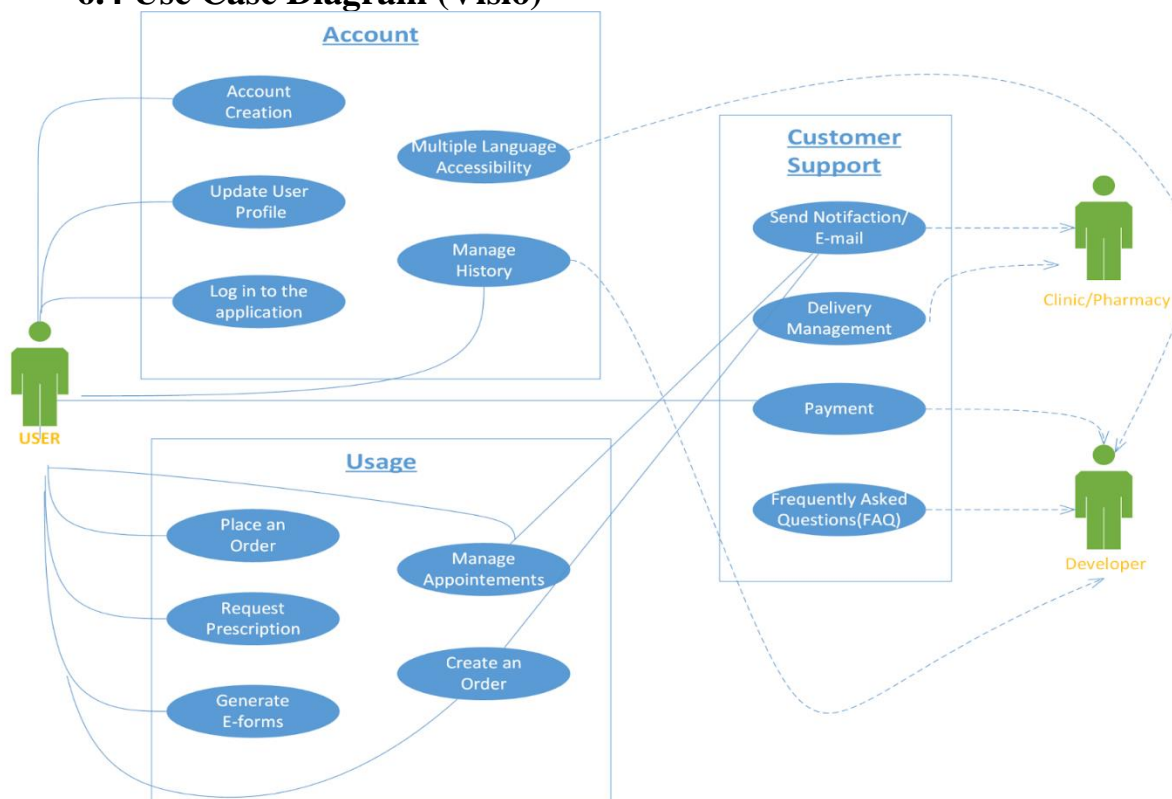
1. Patient: Log in to the application and select the "Request Prescription" option.
2. Prescription System: Retrieve patient's prescription records and display them to the Patient.
3. Patient: Select the prescription they need and submit the request through the application.
4. Prescription System: Verify the prescription request and notify the Dental Clinic of the request.
5. Dental Clinic: Approve or reject the prescription request and notify the Prescription System of the decision.
6. Prescription System: Notify the Patient of the approval or rejection decision, and provide instructions for obtaining the prescription.
7. Pharmacy: Receive prescription request and verify it with the Prescription System.
8. Prescription System: Provide prescription details to the Pharmacy and authorize prescription dispensing.
9. Pharmacy: Dispense the prescription and notify the Prescription System of the dispensing.
10. Prescription System: Notify the Patient of the prescription dispensing and provide delivery options if available.

This swim lane diagram shows the flow of activities in the use case, starting from the Patient requesting a prescription and ending with the Pharmacy dispensing the prescription and notifying the Prescription System. The Prescription System acts as an intermediary between the Patient, Dental Clinic, and Pharmacy, and ensures that prescription requests are properly verified and authorized.

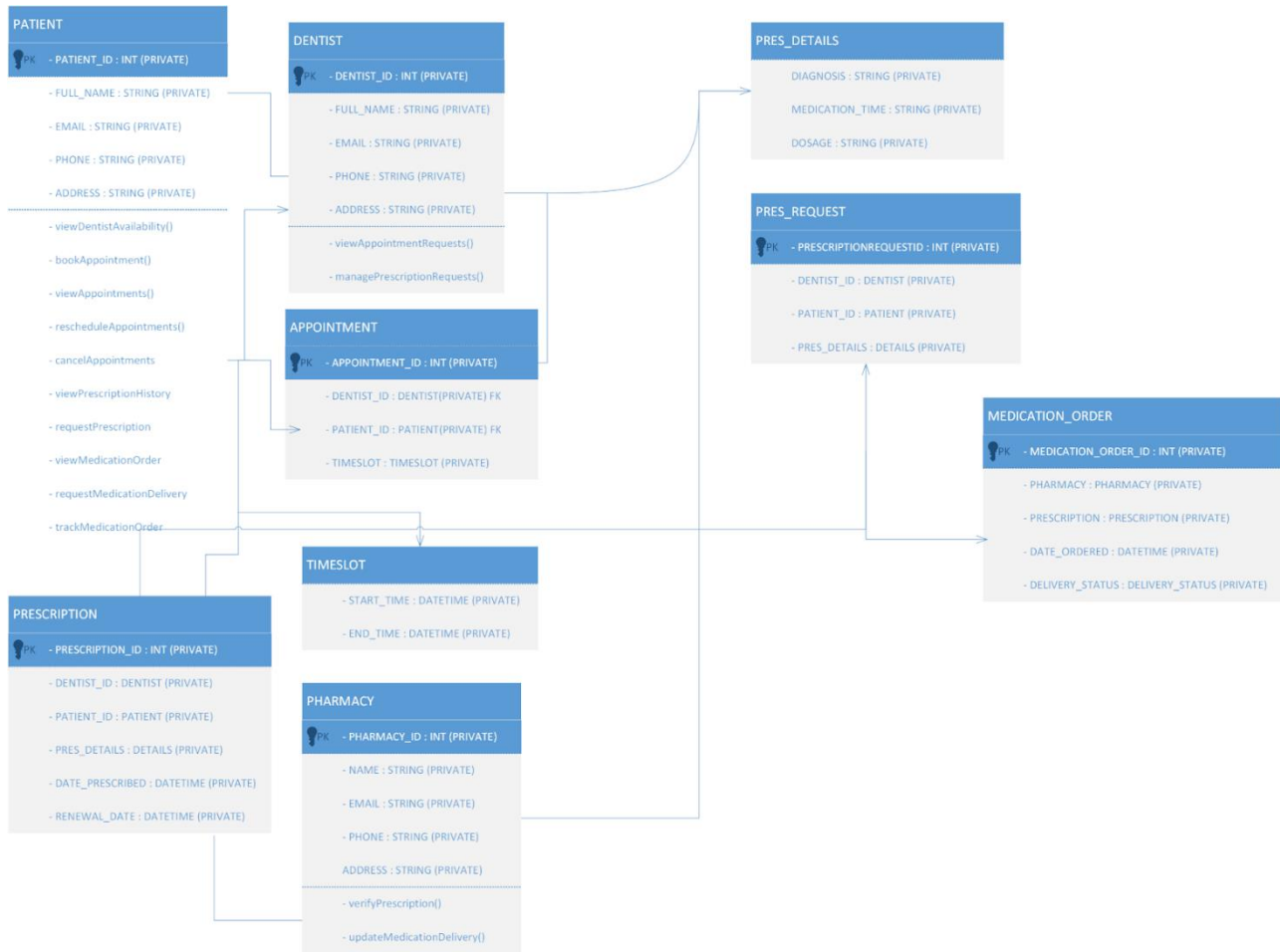
6.3 Swim Lane Diagram (Visio)



6.4 Use Case Diagram (Visio)



6.5 Domain Class Diagram (Visio)



6.6 CRC Index Cards

User (Patient)	
Responsibilities	Collaborator
Create account using personal info	
Manage Appointments	Appointment

Receive reminders/ emails	Notification
Access to user's History	Dentist

Appointment	
Responsibilities	Collaborator
Book and cancel appointments	Dentist
Details of an appointment	User (Patient)
Notify users/ patients about upcoming appointments	Notification
Dentist and users to view their appointments	
History of previous appointments	

Dentist	
Responsibilities	Collaborator
Record dentist's personal info	
Manage Appointments	Appointment
Access patient info and medical history	Patient
Update patient info if required	

Payment	
Responsibilities	Collaborator
Process Payments	Dentist
Keep Track of payment history	User (Patient)

Notification	
Responsibilities	Collaborator

Send reminders to users (patients) about upcoming appointments	Appointment
Receive notification based on user's choice	Patient
Store info about users' preference	

In-App Communication	
Responsibilities	Collaborator
Communication between patient and dentist via chat	Chat/ video consultation
Online consultation via Zoom	

Administrator	
Responsibilities	Collaborator
Manage user accounts	Dentist

Handle system configurations	User (Patient)
Approve and track new user registrations	

Chat/ video consultation	
Responsibilities	Collaborator
Handles chat responsibilities Between doctor and patient	Patient
Zoom video conference	Dentist

Delivery	
Responsibilities	Collaborator
Get Prescription from dentist	Dentist

Pickup Prescriptions from Pharmacy	Pharmacy, Delivery Agent
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PRES_Details	
Responsibilities	Collaborator
Get Prescription details from dentist	Dentist

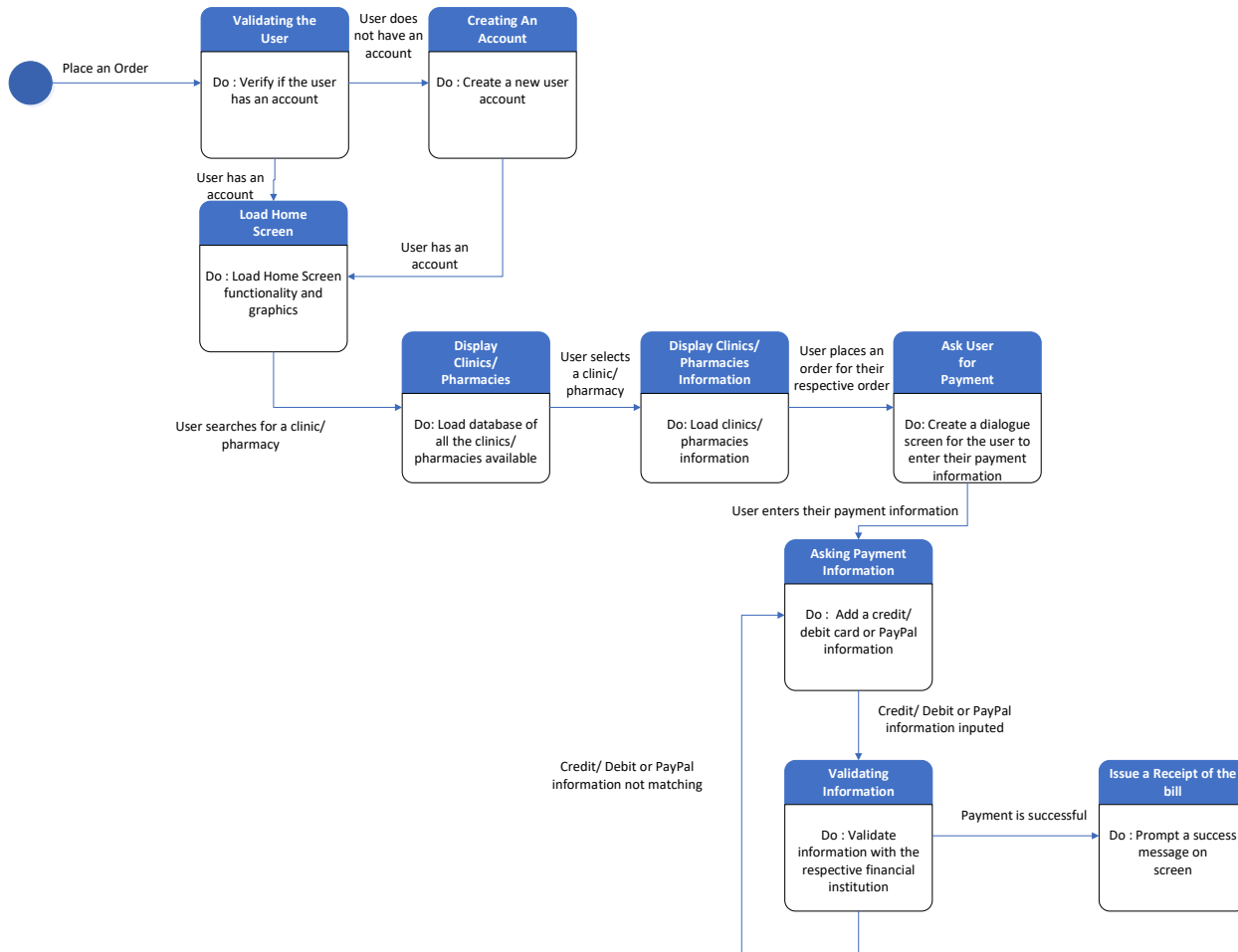
Pharmacy	
Responsibilities	Collaborator
Get details of drugs	PRES_Details

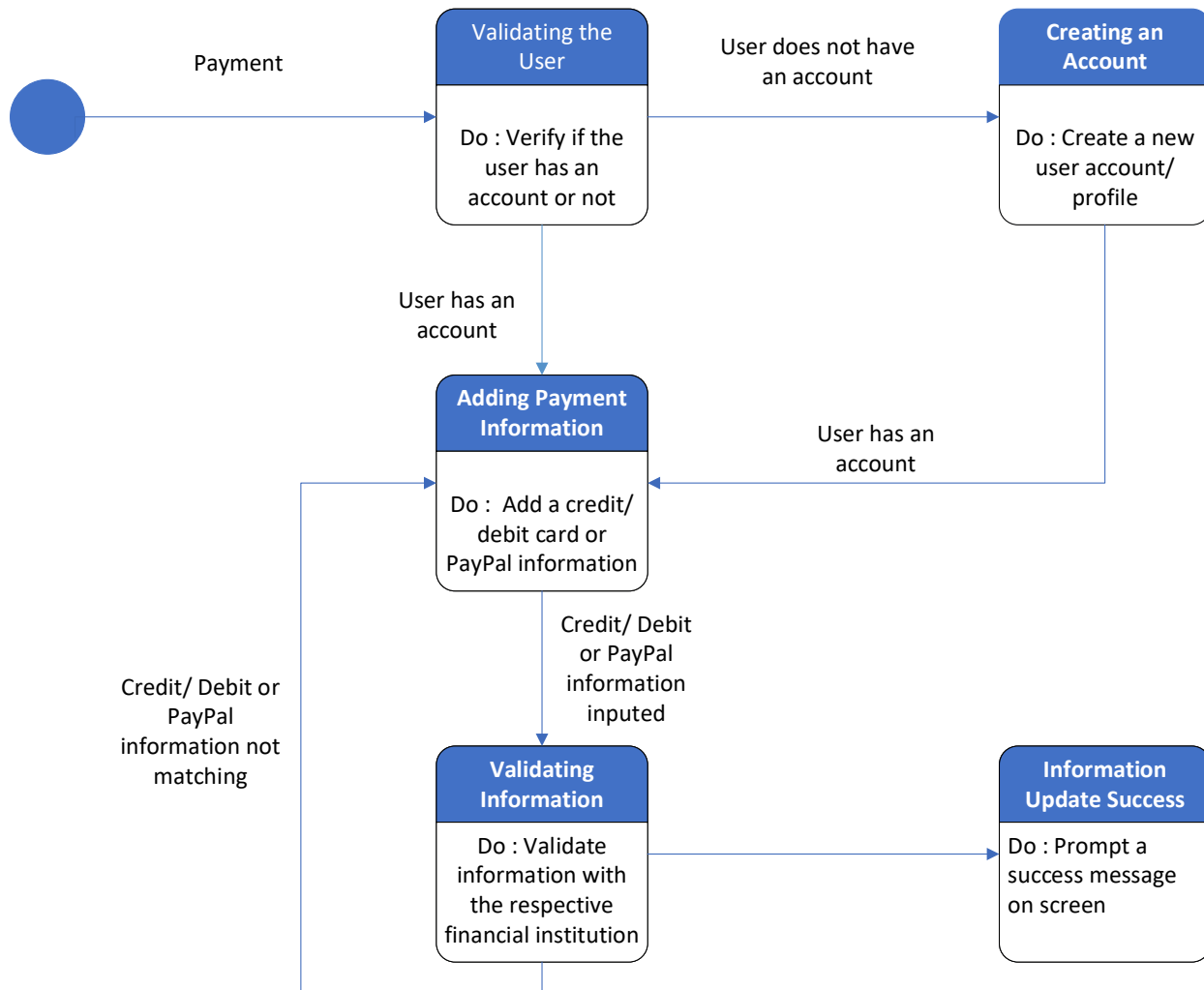
6.7 First Cut Domain Class Diagram



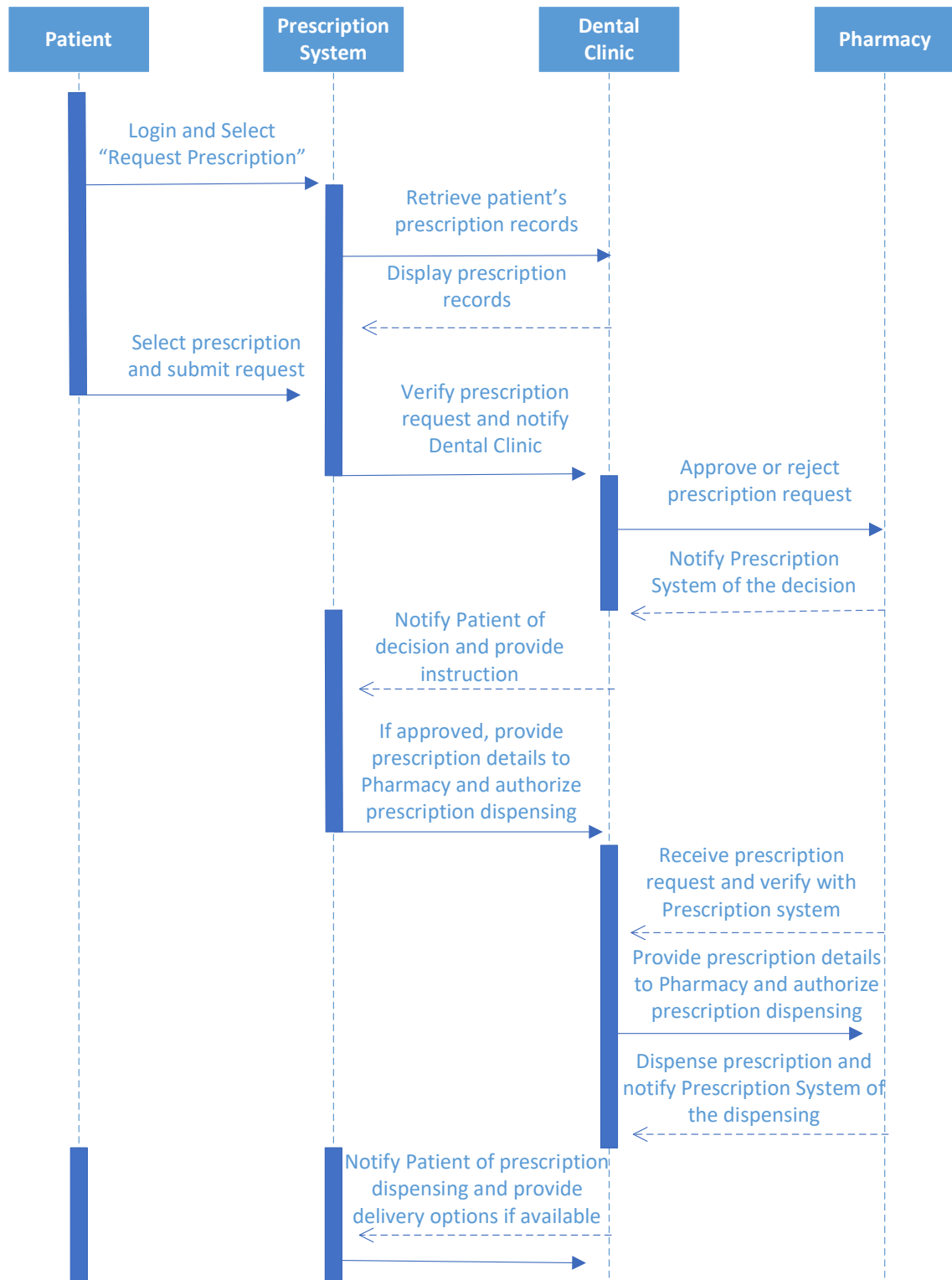
7. Behavioral Analysis Modelling

7.1 State Diagram





7.2 Sequence Diagram



Other Requirements

It is important to carefully consider all relevant requirements and document them in the SRS to ensure that the final product meets the needs and expectations of stakeholders.

- ✓ Performance requirements, such as response time, scalability, and resource utilization.
- ✓ User experience requirements, such as ease of use, intuitive navigation, and accessibility for users with disabilities.
- ✓ Maintenance requirements, such as software updates, bug fixing, and documentation.
- ✓ Compliance requirements, such as industry regulations, standards, and certifications.

Appendix A: Glossary

An appendix for glossary in the SRS is a helpful tool for defining and clarifying the meaning of specific terms, acronyms, and abbreviations used in the document. This can help ensure consistent interpretation of the requirements by all stakeholders involved in the project. The glossary should include clear and concise definitions for each term, and may also specify their usage within the context of the project.

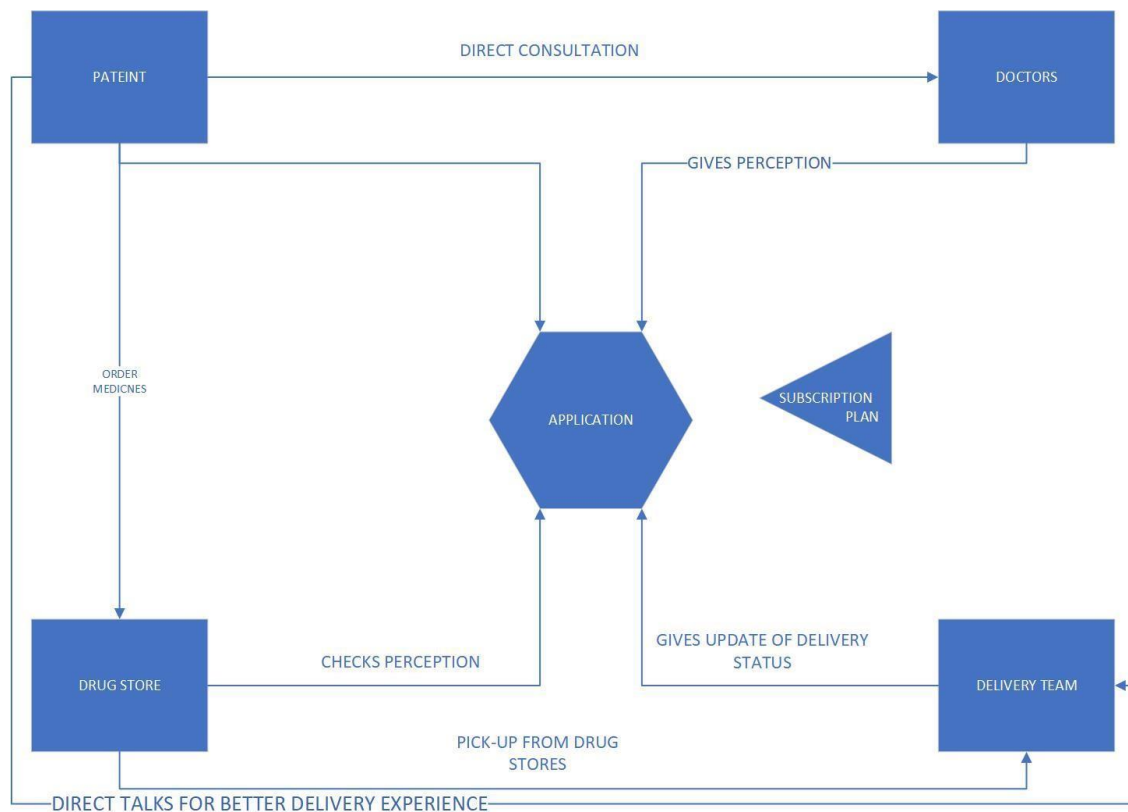
Examples of terms that could be included in the glossary are:

- ✓ Domain-specific terms: Terms specific to the project domain, such as technical jargon, industry-specific terms, etc.
- ✓ Project-specific terms: Terms that are unique to the project and used throughout the SRS, such as functional requirements, performance

Appendix B: Analysis Models

Analysis models can provide a visual representation of the system's structure and behavior, making it easier for stakeholders to understand the requirements and design of the software system. Some common types of analysis models that might be included in the SRS are:

- Data flow diagrams (DFDs): Show the flow of data through the system and the relationships between the different components and processes.
- Class diagrams: Illustrate the classes and objects used in the system and their relationships, including inheritance, association, and aggregation.
- State-transition diagrams: Describe the various states a system can be in and the events that cause it to transition from one state to another.
- Entity-relationship diagrams (ERDs): Represent the relationships between entities and the attributes that describe them in a database or information system.



Appendix C: To Be Determined List

Stakeholder Register					
Stakeholder Name	Stakeholder Position	External /Internal	Stakeholder contact details	Operational / Executive	Interest (high, medium,low)
Jake Paul	Customer	External	jakepaul@gmail.com	Operational	High
Edward Williams	ITSecurity Head	Internal	edwardwilliams11@outlook.com	Executive	Medium
Louis Hill	Investor	External	louishill35@outlook.com	Executive	High
Elliot Tucker	Database Administrator	External	elliotttucker67@yahoo.com	Operational	High

Peter Roy	Senior Marketing Manager	Internal	peterroy15@gmail.com	Executive	High
Owen Thomas	Programmer	Internal	owenthomas23@outlook.com	Executive	Low

Appendix D: Interview Questions

Interview Questions		
Question	Stakeholder position	Answer
<ul style="list-style-type: none">• To which continents/countries do you want this application to be available?• Who is the target audience for this application?• What is your revenue model for this project?	Senior Marketing Manager	<ul style="list-style-type: none">• North America and Asia only• The target audience is the older age group and working group.• Subscriptions plan like gold, silver, platinum and monthly, quarterly or annual subscriptions.

<ul style="list-style-type: none"> • Why do you think this project is important? • Why do you think this project would work out or be profitable? • How much are you willing to invest? 	Investor	<ul style="list-style-type: none"> • It would help having access to dental services more faster and easier • With advancements in technology everyone wants everything faster and quicker. So this would be a great opportunity to • attract the users. The budget they are willing to spend is \$2-\$3 million
<ul style="list-style-type: none"> • What type of Database is used in your company? 	Database Administrator	<ul style="list-style-type: none"> • MongoDB
<ul style="list-style-type: none"> • What type of security software are you going to use for the application? • For which OS do you want to run the program in? 	IT Department	<ul style="list-style-type: none"> • I will use <u>Veracode</u>, it is an application security software. • Apple iOS, Google Android and Microsoft's Windows Phone OS
<ul style="list-style-type: none"> • How long do you intend to take to write the code for making this application? 	Programmer	It would take an estimate of 5-7 months

<ul style="list-style-type: none">• How will this application benefit you?• What do you expect from the application?• Would you prefer to have a virtual assistant to navigate through the app?• Would you prefer for the app to change languages based on the region?• Would you prefer to be sent appointment reminders via email or sms or both?	Customer	<ul style="list-style-type: none">• It would make the appointments faster and help avoid long wait time.• Expect the reports, prescriptions to be updated regularly and also ensure that their data is secure.• Yes, it would be a good guide to get to know the app better.• Yes, it would help users to access the app in their native language.• Sending appointment reminders via both email and sms would be better in case the email goes to the junk folder, so the user can get a reminder via sms.
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