



# MIST

Technology for  
Advancement

Military Institute of Science and Technology

## SOFTWARE ENGINEERING SESSIONAL

SUBJECT CODE: CSE-320

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### REQUIREMENT ENGINEERING DOCUMENT

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**Group 7**

# Requirement Engineering Document: On-Demand Healthcare Platform

## 1 Feasibility Study

**Project Name:** On-Demand Healthcare Platform for Bangladesh

**Client:** *ParentsCare Ltd.*

**Prepared By:** Group-7

**Date:** 01/01/2025

### Objective:

This Healthcare system is a mobile and web application designed to connect parents with trusted and qualified caregivers. This platform offers a seamless experience for booking caregiver services, managing appointments, and facilitating communication, ensuring that parents can access reliable care for their children and also to book ambulance service in emergency circumstances. The system includes features for booking, messaging, medicine reminders, availability management, and administrative oversight, all designed to enhance convenience and peace of mind.

- **Search & book services:** Allowing users to easily locate and book nearby healthcare services (caregivers, ambulances) using location-based or filtered search.
- **Enable Direct Communication:** Providing a secure, real-time in-app messaging & notification system, facilitating clear and efficient coordination between users and providers.
- **Customer assistance:** Enabling the users to get proper service through our custom-trained ML models on the data set of medicine and healthcare.
- **Medicine info & reminders** Allowing users to scan their prescription to view the medicine name & info, and set medicine reminders.
- **Service tracking:** Offer real-time tracking of service providers (e.g., ambulance arrival) and real-time notifications about the caregiver's service.

### 1.1 Feasibility Areas

#### 1.1.1 Technical Feasibility

- **Technology Stack:**
  - **Frontend:** Flutter (for cross-platform mobile apps), Flutter-web (for Admin Dashboard).
  - **Backend:** Bun (for scalability and speed), Python (for data analysis/ML integration).
  - **Database:** PostgreSQL (for relational data management)
  - **Cloud Platform:** Vercel (AWS) hosting (Frontend), Render (Backend), Supabase (Database), and potentially a VPS
  - **API Gateway:** RESTful APIs using a framework like Elysia.js or Hono.js

- **Infrastructure:** The project requires robust server infrastructure, including:
  - Load balancers to handle user traffic.
  - Secure storage for sensitive patient data.
  - Redundant servers for high availability and business continuity.
  - We will leverage cloud service providers for the scalability and resilience of this infrastructure.
- **Mobile Device Compatibility:** The user app will be compatible with both Android and iOS devices.
- **GPS Capabilities:** Integration with GPS for ambulance booking and nearby service provider discovery.
- **Payment Integration:** Secure integration with mobile wallets (bKash, Nagad, etc.) and credit/debit card gateways.
- **SMS Gateway:** Implementation of an SMS gateway for notifications, alerts, and OTP verification.
- **Technical Expertise:** The project team possesses, or can acquire, the required technical skills for platform development, maintenance, and security.

### 1.1.2 Economic Feasibility

- **Estimated Cost Breakdown:**
  - **Development:** 20,000\$ (Software Development, UI/UX Design, Project Management).
  - **Infrastructure:** 5,000\$ (Server costs, database storage, cloud services).
  - **Marketing:** 15,000\$ (Digital campaigns, community engagement).
  - **Operations:** 30,000\$ (Salaries, support, operational software).
  - **Legal and Compliance:** 4,000\$ (Legal consultation, licensing).
  - **Contingency:** 2,000\$ (Unforeseen expenses).
  - **Total Estimated Cost:** 76,000\$ (Initial estimates).
- **Revenue Streams:** Subscription fees, commissions on bookings, partnerships, premium services (see details in the financial projections section below).
- **Long-Term Savings:** Reduced costs through efficient scheduling, optimized resource allocation, and streamlined communication. We will also analyze the potential economic impact on the community through the platform.
- **Cost-Benefit Analysis:** A comprehensive analysis will be conducted to compare the costs versus the benefits of the platform.

### 1.1.3 Operational Feasibility

- **Training Programs:** Training for platform staff, service providers (caregivers, ambulance drivers), and administrative personnel on how to use the system efficiently.
- **Usability:** User-friendly UI/UX for mobile app, designed to be easily accessible for all levels of tech literacy. This will include localized language support (Bangla).
- **Customer Support:** A multi-channel customer support system (email, phone, in-app chat) to address user queries and platform-related issues.
- **Service Provider Enrollment:** A clear, structured onboarding process for healthcare professionals to join the platform.
- **Scalability and Management:** Ability to scale the platform in terms of users, features, and geographic reach. This also includes the capacity to manage a high volume of concurrent requests and transactions.

### 1.1.4 Schedule Feasibility

- **Estimated Timeline:**
  - **Requirement Elicitation & Planning:** 3 weeks
  - **Design (UI/UX) & Prototyping:** 6 weeks
  - **Backend & API Development:** 12 weeks
  - **Frontend (User & Provider App) Development:** 10 weeks
  - **Admin Dashboard Development:** 8 weeks
  - **Integration and Testing:** 6 weeks
  - **Deployment & Training:** 4 weeks
  - **Total Estimated Time:** 49 weeks (approx. 12 months)
- **Project Management Tools:** We will use project management software for task allocation, progress tracking, and communication.
- **Phased Rollout:** Initial launch with limited features and service area followed by gradual expansion.

### 1.1.5 Regulatory Feasibility

- **Compliance:** The platform will adhere to all relevant health, data privacy, and telemedicine regulations in Bangladesh.
- **Licensing:** A thorough analysis of required licenses and permits for online healthcare service operation.
- **Legal Consultations:** Engagement of legal advisors to ensure compliance and mitigate risks.

### 1.1.6 Feasibility Conclusion

The On-Demand Healthcare Platform is deemed feasible across technical, economic, operational, schedule, and regulatory perspectives. However, success hinges on a solid execution strategy, ongoing adaptation, and a continued focus on user experience and platform security.

## 2 Requirement Elicitation

### 2.1 Techniques Used

- **Stakeholder Interviews:** In-depth interviews with key stakeholders (healthcare providers, potential users, administrators, health authorities).
- **Surveys and Questionnaires:** Targeted surveys to collect user preferences, pain points, and needs.
- **Focus Group Sessions:** Facilitated group discussions to gather feedback and insights from a diverse group of stakeholders.
- **Document Analysis:** Review of existing healthcare regulations, guidelines, and service delivery models.
- **Brainstorming Sessions:** Collaborative sessions with the development team and stakeholders to generate ideas and requirements.
- **Competitive Analysis:** Studying existing on-demand healthcare platforms to identify best practices and areas of innovation.

### 2.2 Stakeholders

1. **Users/Patients:** Individuals seeking healthcare services (e.g., caregivers, ambulance booking).
2. **Service Providers:** Healthcare professionals offering services via the platform (e.g., nurses, caregivers, ambulance drivers).
3. **Administrators:** Platform managers responsible for user management, system configuration, and reporting.
4. **Healthcare Organizations:** Hospitals, clinics, and other entities that may partner with the platform.
5. **Regulatory Bodies:** Government agencies and health authorities overseeing healthcare delivery.

## 2.3 Functional Requirements

### 2.3.1 User App

- **Service Booking:** Secure and reliable booking of caregivers, ambulance services, and other healthcare services.
- **Location-Based Search:** Find service providers within the user's vicinity.
- **User Profiles:** Creation and management of user profiles, including medical history (optionally).
- **Payment Integration:** Secure payment processing with digital wallets and cards.
- **Real-Time Tracking:** Track booked service providers (e.g., ambulance arrival).
- **In-App Messaging:** Secure chat functionality for users and service providers.
- **Service History:** View past bookings and service requests.
- **Rating & Reviews:** Ability to rate and leave reviews for services.
- **Notification System:** Push notifications for updates, reminders, and critical alerts.

### 2.3.2 Service Provider App

- **Request Management:** Accepting/Rejecting booking requests and updating availability.
- **Service Updates:** Updating service progress, location, and estimated arrival time.
- **Profile Management:** Managing service provider profiles (skills, qualifications, certificates).
- **Navigation Assistance:** Integration with maps for efficient navigation.
- **In-App Messaging:** Secure chat with users.
- **Earnings Tracking:** Monitoring payments and earnings.
- **Availability Management:** Setting and updating work schedule.
- **Verification Process:** Uploading documents for service provider verification.

### 2.3.3 Admin Dashboard

- **User Management:** Monitoring user activity and account status.
- **Service Provider Management:** Verifying credentials and managing profiles.
- **Booking Management:** Oversight of all bookings, including cancellations.
- **Activity Monitoring:** Tracking user activity, service usage, and platform performance.
- **Reporting and Analytics:** Generating reports on usage patterns, service delivery, and revenue.

- **System Configuration:** Managing platform settings, pricing, and user access levels.
- **Payment Management:** Overseeing payment processing and payouts to service providers.
- **Content Management:** Updating platform content, FAQs, and support information.

## 2.4 Non-Functional Requirements

### 2.4.1 Performance

- **Response Time:** Fast response times for user requests and platform operations.
- **Scalability:** Ability to handle a growing user base and service volume.
- **System Uptime:** High availability and minimal downtime (99.9% uptime).

### 2.4.2 Security

- **Data Encryption:** Encryption of all sensitive data during transmission and storage.
- **Authentication and Authorization:** Multi-factor authentication, secure login, role-based access control.
- **Secure API Endpoints:** Security protocols to protect API access and prevent unauthorized use.

### 2.4.3 Usability

- **Intuitive Interface:** Easy-to-use interface for all user types, regardless of technical skills.
- **Accessibility:** Accessible for users with disabilities, including localized language options.
- **Clear Navigation:** Simple and intuitive navigation through the app.

### 2.4.4 Reliability

- **Data Integrity:** Ensuring data consistency and reliability.
- **Error Handling:** Robust error handling and recovery mechanisms.

### 2.4.5 Maintainability

- **Modular Design:** Design for easy maintenance, updates, and feature expansion.
- **Code Quality:** Adherence to coding standards for maintainability.

## 2.5 Tools Used

- **Interviews:** Structured interviews with healthcare professionals, caregivers and potential users.
- **Online Surveys:** Surveys using Google Forms to collect user data and feedback.
- **Whiteboard Sessions:** Collaborative brainstorming and requirements gathering using whiteboard or pen-paper.
- **Project Management Software:** Jira, and Trello for planning and tracking requirements.
- **UI/UX Prototyping Tools:** Figma for creating interactive prototypes.

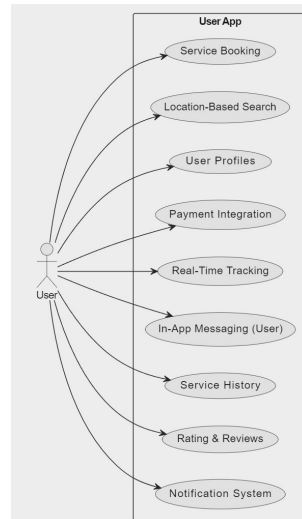
## 2.6 Elicitation Outcome

A comprehensive and well-documented set of functional and non-functional requirements that aligns with stakeholders' needs and platform objectives, setting a strong foundation for the subsequent stages of development. This documentation will be continuously reviewed and updated as needed during the development process.

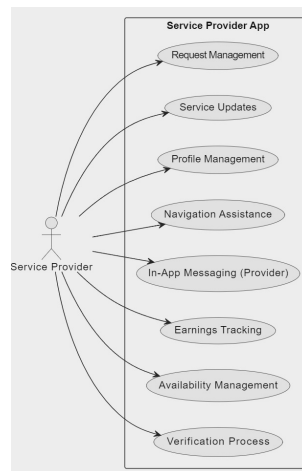


## 3 System modeling

### 3.1 Use Case model



**Figure 1: User**



**Figure 2: caregiver**

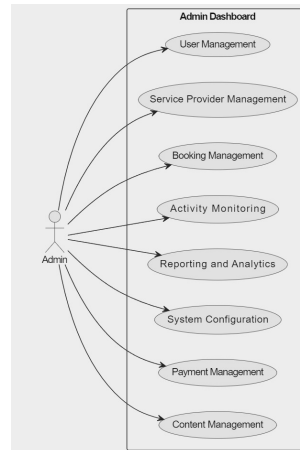


Figure 3: admin

### 3.2 Class model

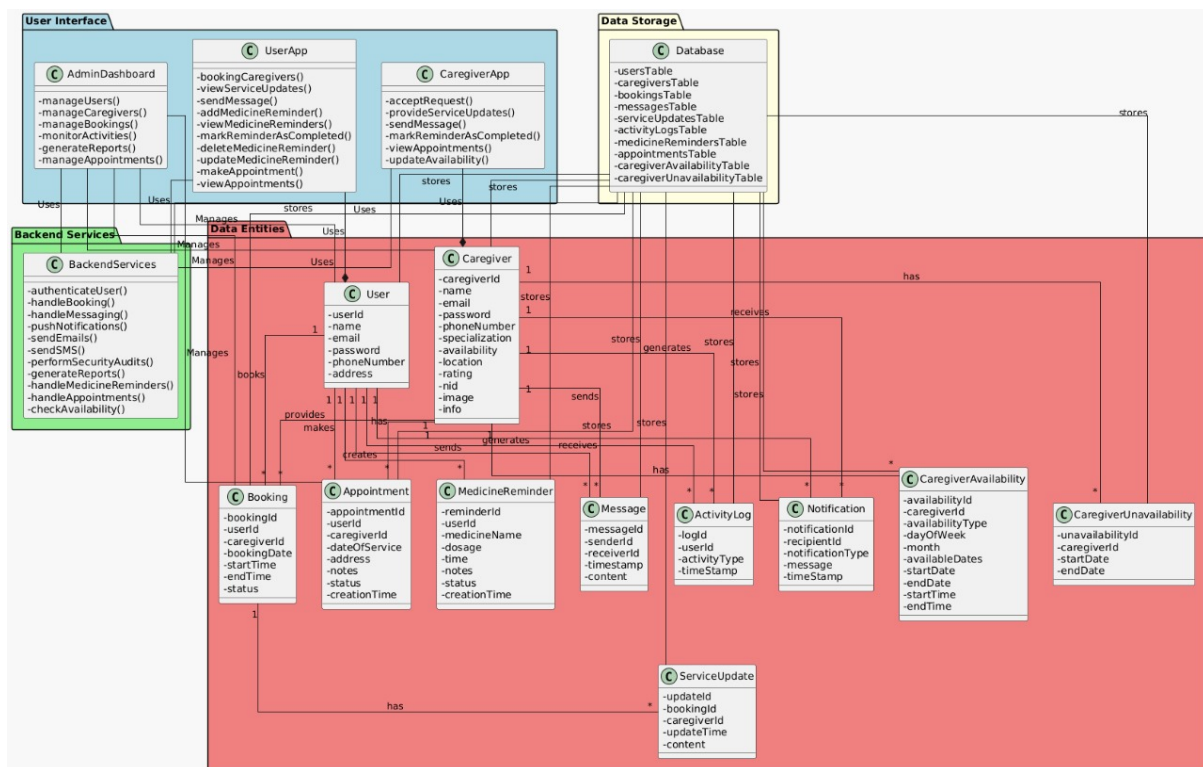
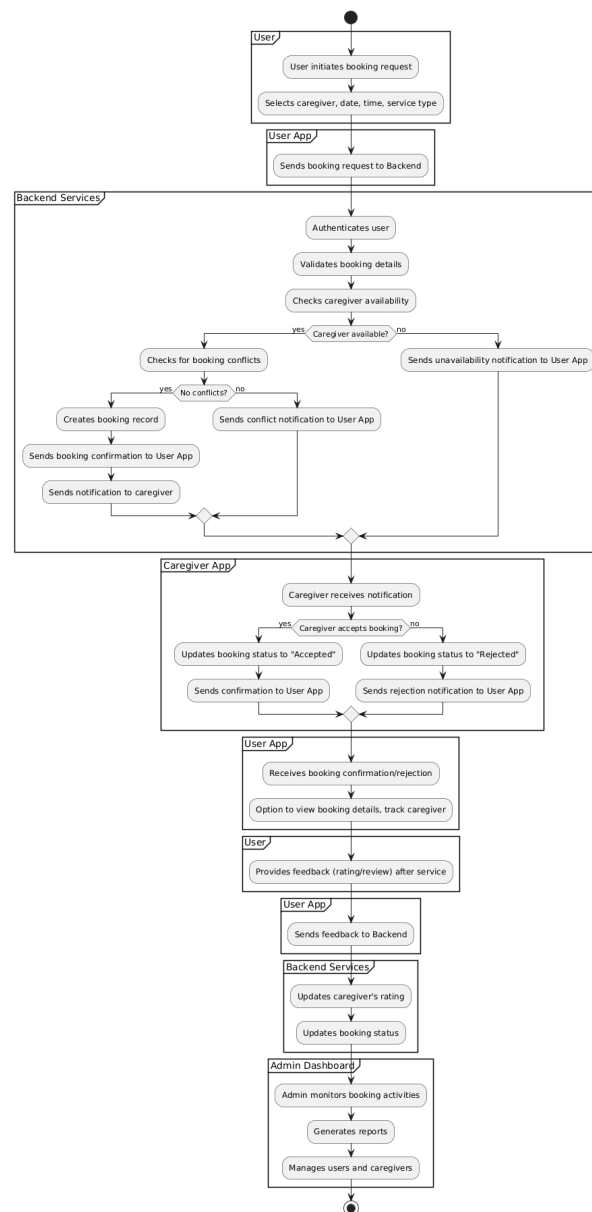


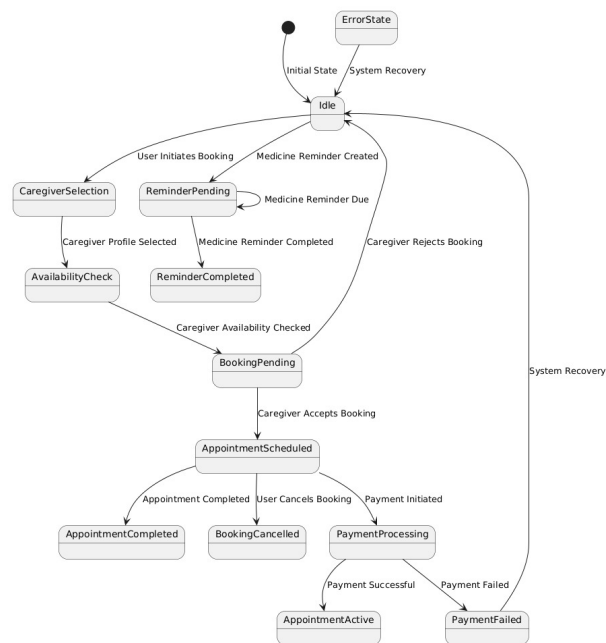
Figure 4: Class model with packages

### 3.3 Activity model



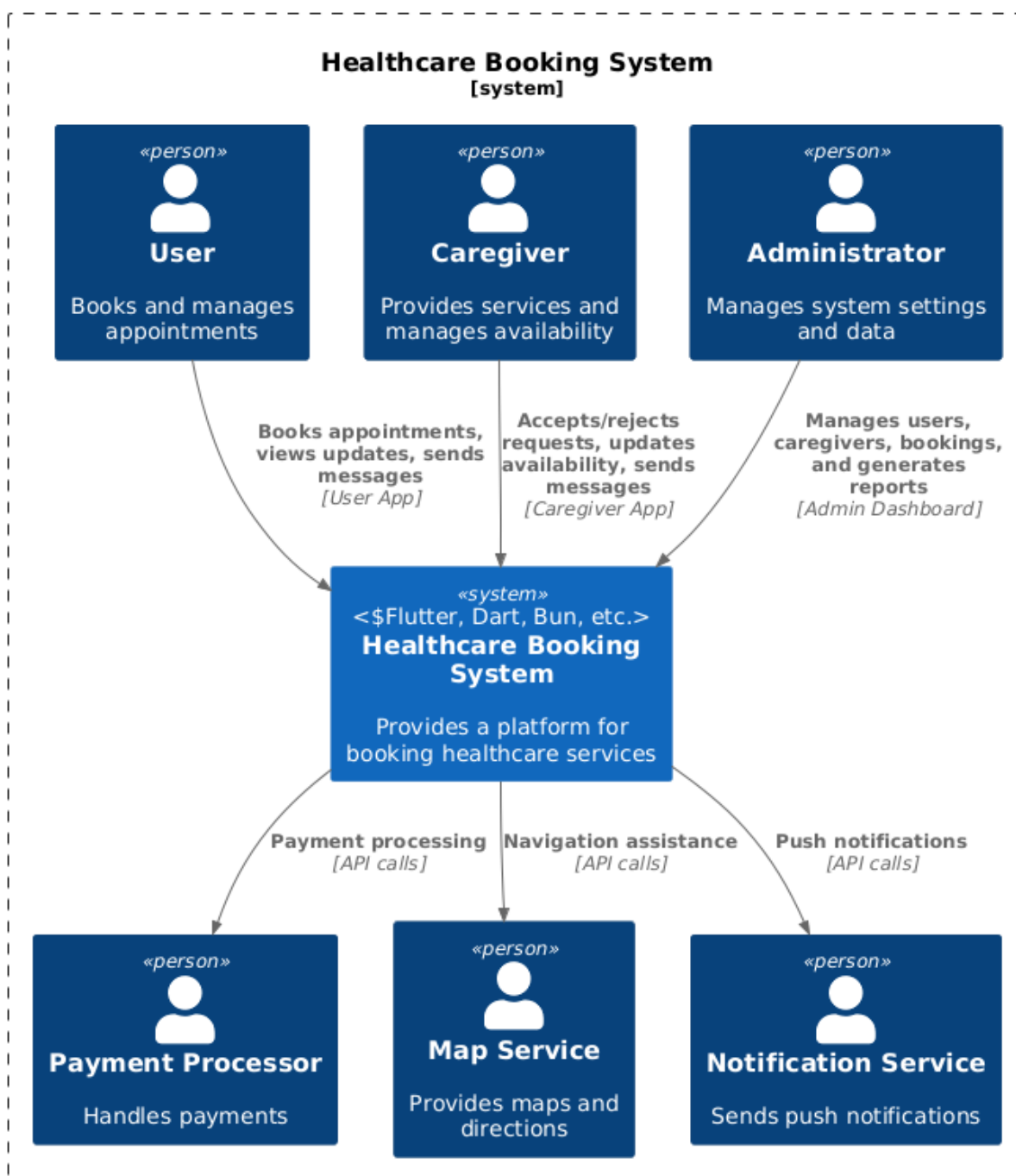
**Figure 5:** Activity

### 3.4 Behavioral model



**Figure 6:** behavioral (Event-driven)

### 3.5 Context model



**Figure 7:** context model

### 3.6 Sequence model

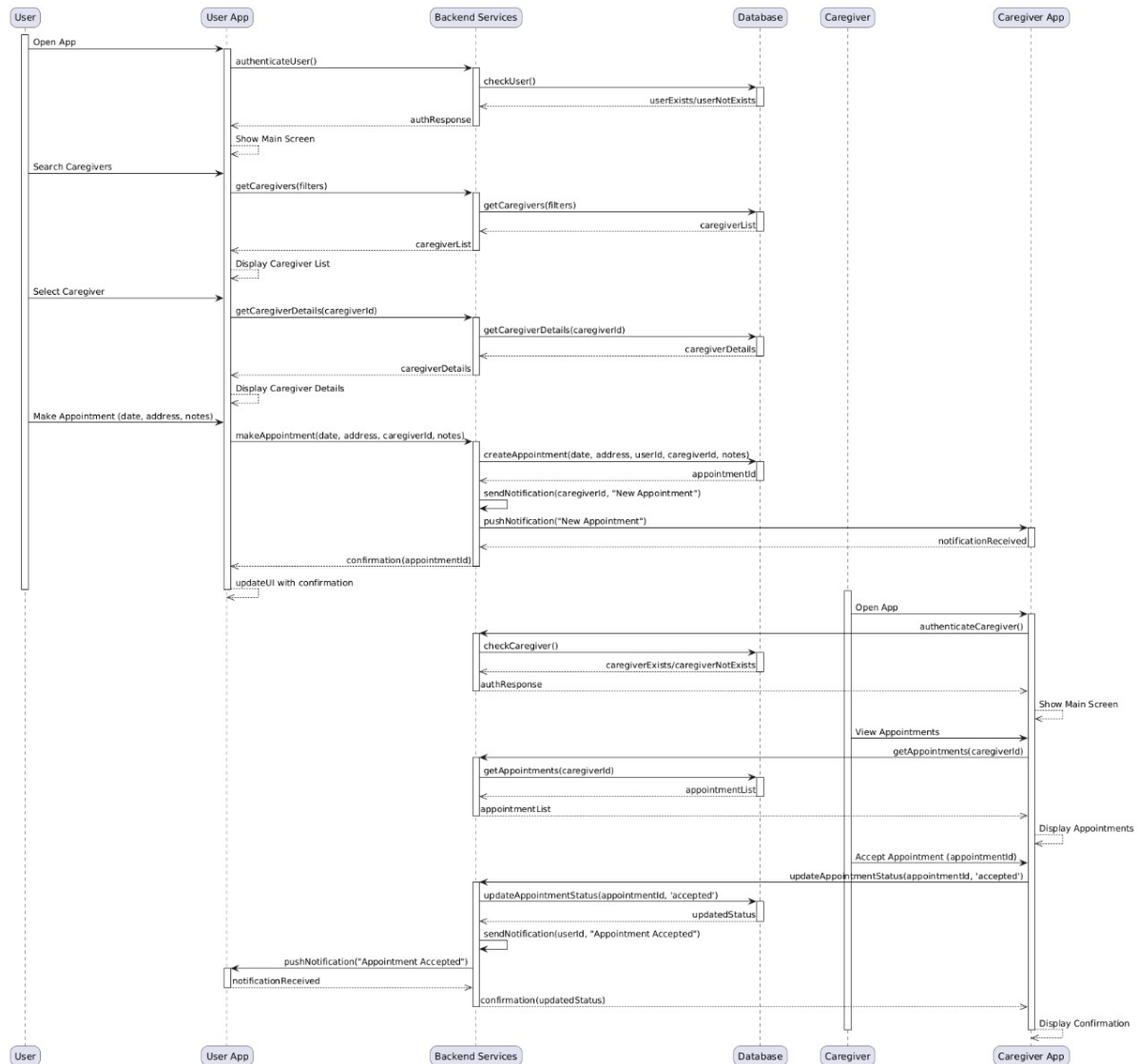
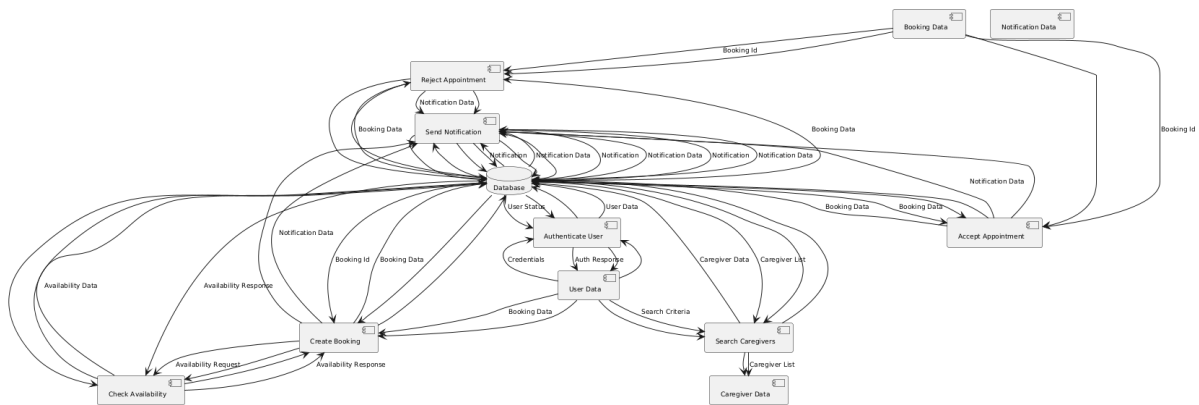


Figure 8: Sequence model

### 3.7 Data-driven (Behavioral) model



**Figure 9:** Data driven model