



CAPSTONE PROJECT

SEMESTER PROJECT

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## 1. Executive Summary

MediTrack is a web-based application developed to streamline medication management for individuals and families. The platform enables users to efficiently track their medications, receive timely reminders for intake, and manage refill notifications. MediTrack is designed to improve medication adherence by offering a convenient solution for busy professionals, caregivers, and individuals managing chronic conditions. With its automated medication reminders and refill alerts, MediTrack ensures medications are taken promptly, refills are never overlooked, and users can consistently manage their medication needs.

## 2. Introduction

The management of medications is an essential part of daily life, particularly for individuals with chronic health conditions or those caring for elderly family members. However, keeping track of dosages, medication schedules, and refill needs can often be overwhelming. MediTrack addresses this problem by providing a simple, easy-to-use web app that helps users manage their medications effectively. By setting reminders and providing alerts when refills are needed, the app ensures that users take their medications on time, avoiding potential health risks associated with missed doses.

## 3. Project Scope & Objectives

MediTrack aims to create a web app that simplifies the management of medications for individuals and families. The core functionality includes medication tracking, refill alerts, and reminders for taking medication. The app will support multiple user profiles, allowing caregivers to manage medications for different family members. It will also provide secure data storage to protect users' sensitive information.

### 3.1. Project Objectives

- **Ensure Timely Medication Intake:** Provide automatic alerts to remind users when it's time to take their medications.
- **Simplify Medication Management:** Allow users to easily track medication dosages, remaining supply, and refill schedules.
- **Enhance User Convenience:** Provide timely refill alerts .
- **Improve Health Outcomes:** Help users stick to their prescribed medication schedule, reducing the risk of adverse health events due to missed doses.

### 3.2.Core Features:

The MediTrack web app will include the following core features:

- **Medication Tracking:**  
Users can log all their medications, including dosages, remaining supply, and the frequency of intake. This feature allows users to have an organized overview of their medication regimen
- **Refill Alerts:**  
The app will notify users a week before their medications are about to run out.
- **Timely Reminders:**  
The app will send customizable reminders one hour before the scheduled time for medication intake. Users will also have the option to mark their doses as taken.
- **User Profiles:**  
The app will allow multiple profiles, making it easier for family members or caregivers to manage the medication schedules for others, especially elderly relatives or children.
- **Secure Data Storage:**  
All user data, including medication details and profiles, will be stored securely to ensure privacy and protection of sensitive health information.
- **Authentication for Users:**  
MediTrack will implement Firebase Authentication to allow users to securely log in and manage their medication schedules. Users can create accounts and log in using email and password, ensuring that personal data is protected and only accessible by authorized users.

## 4. Design & Development Process

### 4.1.Concept & Design

The design phase for MediTrack focused on creating a user-friendly and intuitive interface that allows users to navigate through the app easily while managing medications and related tasks. Below are the key pages and their features that were designed:

- **Login Page**  
Allows users to securely log in to their accounts using Firebase Authentication.

- Input fields for email and password.
- "Forgot Password" link for password recovery.
- "Sign Up" link for new users to create an account.
- Clean, simple layout with emphasis on security and ease of use.
  
- My Account Page
  - Displays the user's account details and allows them to manage their profile.
  - Display user profile (name, email, medication details).
  - Option to edit personal information and update settings.
  - Links to change password and log out of the app.
  
- Side Menu Page
  - Provides quick navigation between different sections of the app.
  - Links to main sections: Dashboard, Medication Tracker, Refills, Statistics, Billing, and Customer History.
  - Option for the user to log out or access account settings.
  
- Main Homepage
  - The dashboard where users can view their medication schedule, upcoming reminders, and statistics.
  - Display a list of medications with next doses and refill alerts.
  - Quick summary of recent reminders and alerts.
  - A prominent button to add or update medications.
  
- Statistics Analysis Page
  - Provides insights and statistics on medication adherence and health progress.
  - Graphical representation (charts or graphs) of medication adherence over time.
  - Insights into the frequency of missed doses, refill alerts, and overall adherence.
  - Option to download reports or share data with healthcare providers.
  
- Customer History Page
  - Displays the customer's medication history and past interactions.
  - List of previously logged medications, including start dates and dosage history.
  - Record of any modifications or changes made to medication schedules.
  - Option to delete or archive past records if needed.
  
- Billing Page
  - Allows users to manage billing and track expenses related to medications and refills.
  - Display upcoming or past medication purchases.
  - Option to view invoices, download receipts, or pay for refills online.

- A summary of total expenses for medication refills and related services.
- Change Password Page  
Provides users the ability to securely change their account password.
- Input fields for the current password, new password, and confirm new password.
- A strong password reminder (minimum length, use of uppercase/lowercase, numbers, etc.).
- Submit button to save the new password and display a confirmation message once updated.

## 5. Development Process

- Frontend Development: The frontend of the app was built using React.js to create an interactive and responsive user interface. This ensures that the app is accessible and functional across various devices, including desktops, tablets, and mobile browsers.
- Backend Development: The backend was developed using Firebase, a real-time database platform, to store user data securely. Firebase was chosen for its ease of use and seamless integration with frontend components. Firebase Authentication was implemented to manage secure user logins.
- Core Features Implementation: The development team implemented key features such as medication tracking, reminders, and refill alerts. Real-time notifications were set up to send alerts to users when it's time to take their medication or reorder refills.

## 6. Testing & Refinement

The app underwent extensive internal testing to identify bugs and ensure all features worked as intended. Beta testing was conducted with a small group of users to get feedback on the app's functionality and user experience. Based on testing results, the team made improvements to the user interface, fixed any bugs, and refined the app's features for a smoother user experience.

**User Needs - MediTrack is for**

- **Families:** Parents or caregivers tracking medications for kids or elderly members.
- **People with Chronic Conditions:** Those who must take medicines on time.
- **Busy Individuals:** Professionals who need reminders for their medication.

Problem Solved: MediTrack helps users take their medicine on time, avoid health risks, and easily manage multiple medications. It also makes reordering simple.

## 7. Timeline & Milestones

Phase	Milestone	Deadline
Ideation & Planning	Finalizing project scope & roles	Week 1 - 2
Research & Design	tech stack selection	Week 3 - 5
Development	Initial prototype & core feature implementation	Week 6
Refinement	Beta testing & bug fixes	Week 7
Finalization	Project completion & final adjustments	Week 8-10
Presentation	Proposal submission & demo preparation	Week 11

### Roles and Responsibility -

Arpit Gupta	User Interface
Aisha Ansari	Front End
Renju Vamadevan Devan	Back End
Hamza Siddiqui	DevOps Integration
Ankita Mahanja	Cloud

### Team Members Skill Sets

Arpit Gupta	UI Design (Learn and Implement)
Aisha Ansari	React.js
Renju Vamadevan Devan	API Development, JavaScript
Hamza Siddiqui	Docker, Automation, GitHub Actions
Ankita Mahanja	AWS Cloud, Infrastructure as Code

## 8. Roles & Responsibilities

**Project Manager:** Responsible for overseeing the project's progress, ensuring milestones are met, and managing the team's activities.

**Frontend Developer:** Responsible for designing and developing the app's user interface using React.js, ensuring that the app is responsive and user-friendly.

**Backend Developer:** Responsible for building the server-side components using Firebase, handling database management, and implementing user authentication.

**Cloud Developer:** Responsible for managing cloud infrastructure and ensuring the app is deployed and runs smoothly in the cloud environment.

## 9. Risks & Challenges

**Data Privacy & Security:** Protecting user health data is a critical concern. Ensuring compliance with health data privacy regulations (such as HIPAA) is important. The team will implement secure authentication and encryption protocols to protect sensitive data.

**Integration with Online Pharmacies:** One of the challenges is establishing partnerships with online pharmacies and ensuring seamless integration for refill alerts and ordering.

**User Adoption & Accessibility:** The app must be designed for accessibility, ensuring it's easy for users of all ages and tech skills to use. The challenge is making the app intuitive while adding features like medication tracking and refill reminders.

**Technical Complexity:** Managing cloud services, real-time notifications, and database storage is complex. The team must ensure the app's infrastructure is reliable and scalable.

## 10.Future Improvements

**Pharmacy Integration:** The app could integrate more deeply with pharmacies to allow users to place orders directly through the app. This would make it even easier for users to refill prescriptions.

**Health Monitoring Integration:** Adding the ability to track health data, such as blood pressure or glucose levels, would expand the app's functionality and make it even more valuable for individuals with chronic conditions.

**Multi-language Support:** Adding language options would make the app more accessible to a global audience, catering to users who speak different languages.

## 11.Conclusion

MediTrack is an innovative solution to a common problem faced by many people: managing medications. With its simple, user-friendly design and features like medication tracking, reminders, and refill alerts, MediTrack helps users stay on top of their medication regimen. The app not only simplifies medication management but also improves health outcomes by ensuring timely intake and preventing missed doses. With future improvements, MediTrack has the potential to be an even more valuable tool in healthcare management, benefiting users worldwide.