

EverCare
BACHELOR OF TECHNOLOGY
IN
COMPUTER SCIENCE AND ENGINEERING
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Kanuru, Vijayawada - 520007

(2024-2025)

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CERTIFICATE

This is to certify that the project report titled “**EverCare**” is the bonafide work of G. Venkata Sai Ram (22501A0557), C.S.V.S. Subrahmanyam (22501A0533), Abdul Azeez (22501A0502), and NithyaNanda Reddy (22501A0566) in partial fulfilment of completing the Academic Project in Mobile Application Development Lab during the academic year 2024–2025.

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INDEX

S.No.	Content	Page No. (s)
1	Abstract	4
2	Introduction	5
3	Objectives and Scope of the Project	6 – 7
4	Software used	8
5	Backend	9 – 11
6	Activities	12 – 14
7	Sample Code	15 - 21
8	Result/Output Screen shots	22 – 23
9	Conclusion	24
10	SDG Justification Report	25 – 27
11	References (Website URLs)	28

1. Abstract

Aging brings challenges such as health issues, mobility limitations, and emergencies that affect the well-being of elderly individuals. **EverCare** aims to address these challenges by offering a remote monitoring and emergency assistance system that promotes independent living while ensuring timely support. The system provides continuous health tracking, emergency alerts, and real-time updates to caregivers and family members, allowing them to stay informed and react swiftly when needed. By leveraging simple and accessible technology, **EverCare** seeks to enhance the quality of life for the elderly and offer peace of mind to their loved ones.

The key features of **EverCare** include health monitoring of vital signs such as pulse and blood pressure, fall detection, and medication reminders. In case of emergencies, it sends instant SOS alerts to caregivers or emergency services, ensuring quick intervention. The system also allows family members and caregivers to track the elderly person's location and receive regular well-being updates. This integrated approach not only ensures the safety of elderly individuals but also reduces the stress for caregivers by providing them with necessary support and information.

The **EverCare** system is particularly beneficial in modern society, where family members may find it difficult to provide constant care due to busy schedules. By offering faster emergency responses, promoting elderly independence, and creating a reliable support network, it improves the lives of both the elderly and their caregivers. With future enhancements like voice-assisted interactions and AI-powered health predictions, **EverCare** aims to further integrate technology to anticipate and prevent health risks, ensuring a safer and more connected environment for the aging population.

2. Introduction

As individuals age, they face numerous challenges related to health, mobility, and safety, often requiring extra care and support. Many elderly individuals wish to maintain their independence but struggle with issues like health emergencies, limited mobility, and isolation. Recognizing the need for a solution, **EverCare** was designed to provide elderly individuals with the tools and support necessary to live safely and independently. This system integrates real-time health monitoring, emergency alerts, and communication features that ensure elderly people can receive timely assistance when needed, all while maintaining their autonomy.

The **EverCare** system aims to offer peace of mind to both the elderly and their families. By leveraging accessible technology, it allows caregivers and family members to stay updated on their loved one's health and respond promptly in emergencies. This innovative solution uses a simple yet effective approach to elderly care, empowering individuals to live with greater confidence, knowing that support is just a click away. Through **EverCare**, we envision a future where elderly people can continue living in their homes independently, with the necessary safeguards in place for their health and safety.

3. Objectives and Scope of the Project

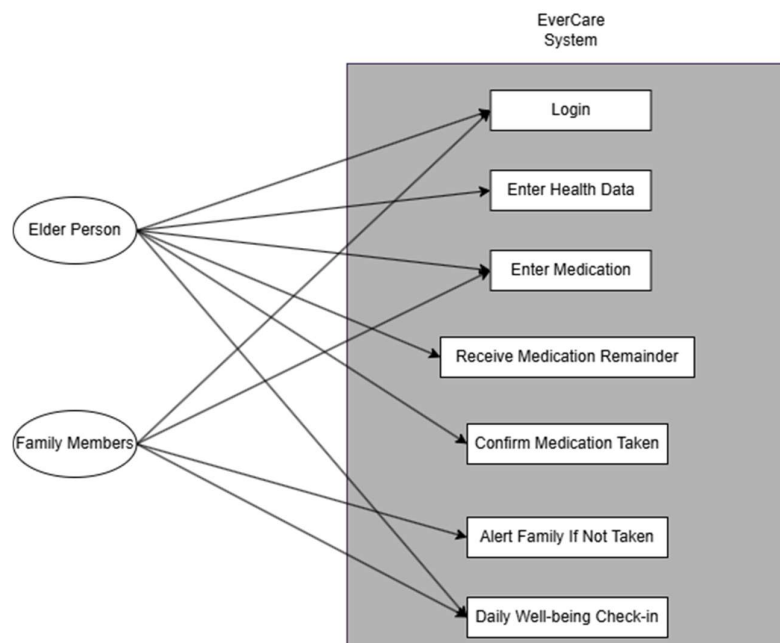
With an aging global population, ensuring the safety and well-being of elderly individuals has become a critical concern. Many elderly individuals desire to live independently but face challenges such as health issues, mobility restrictions, and the risk of emergencies. **EverCare** aims to bridge these gaps by providing an intuitive mobile solution that offers real-time health monitoring and emergency alerts. This system empowers elderly individuals to live safely, while offering peace of mind to their families and caregivers. By leveraging technology, **EverCare** ensures continuous support and prompt responses in emergencies, helping users maintain their independence.

Objectives:

1. **Mobile Health Monitoring:** Provide real-time tracking of health metrics such as pulse, blood pressure, and activity levels to ensure the well-being of elderly individuals.
2. **Emergency Assistance:** Enable immediate SOS alerts to caregivers or emergency services, ensuring timely intervention in case of health emergencies such as falls or sudden medical conditions.
3. **Caregiver and Family Support:** Allow family members and caregivers to receive regular updates on the elderly individual's health, enabling them to stay informed and respond quickly to emergencies.
4. **User-Friendly Mobile Interface:** Develop an intuitive, easy-to-use mobile application using **Android Studio** and **Java**, ensuring elderly users can easily interact with the app.
5. **Firebase-Backed Communication:** Use **Firebase** to enable real-time communication and notifications, ensuring caregivers and family members are promptly informed of any health-related issues.
6. **Scalable and Adaptable Backend:** Leverage **Firebase** for secure data storage, authentication, and real-time notifications, ensuring the system is scalable and can evolve with future needs.

Scope of the Project:

1. **First Mobile Solution for Elderly Care: EverCare** is a pioneering mobile application designed to improve elderly care by providing real-time health monitoring and emergency response, addressing the lack of such digital solutions in elderly care.
2. **Comprehensive Health Monitoring:** The app will continuously monitor critical health parameters and send alerts for any deviations, helping ensure the safety of elderly individuals.
3. **Real-Time Alerts and Notifications:** **Firebase** integration will ensure that caregivers and family members receive instant updates about the elderly person's health, especially in emergencies.
4. **User-Centric Design:** The app will be designed with elderly users in mind, featuring simple, easy-to-navigate interfaces to ensure accessibility and ease of use.
5. **Backend Support with Firebase:** **Firebase** will handle secure data storage, real-time updates, and authentication, providing the system with a reliable and scalable backend infrastructure.
6. **Future Expansion:** The system is designed to be scalable, with plans to integrate AI-based health predictions, voice-assisted interactions, and smart home device connectivity in future versions.



4. Software Used

This section typically lists the tools, frameworks, libraries, and platforms used in the development of the project. In this case, the software used includes:

- **Android Studio:** The primary Integrated Development Environment (IDE) for developing Android applications.
- **Firebase:** A platform for building mobile and web applications, which provides services like authentication, real-time database, cloud messaging, and notifications.
- **Java:** The programming language used for developing the Android app's backend and frontend logic.
- **XML:** Used for designing the user interface of the Android app.
- **Google Cloud:** Provides services for hosting and running Firebase services.

These tools and technologies together help build the mobile app and manage its backend services.

5. Backend

The **EverCare** system uses Firebase Realtime Database to store and manage user, health, medication, and other related data. The database schema is designed to efficiently organize the data, ensuring easy access and real-time synchronization.

Below is the structure of the Firebase database:

Users Collection:

This collection contains individual user records. Each user has the following data:

users/

└─ {userId}/

└─ id: String (unique user ID)

└─ fullName: String (user's full name)

└─ email: String (user's email)

└─ age: Integer (user's age)

└─ gender: String (user's gender)

└─ isElderly: Boolean (indicates if the user is elderly)

└─ linkedUserId: String (used for family members linking to elderly

users)

└─ phoneNumber: String (user's phone number)

Medications Collection:

This collection stores the medication details for elderly users. Each medication record includes the following:

medications/

└─ {medicationId}/

└─ id: String (unique medication ID)

└─ name: String (name of the medication)

└─ dosage: String (dosage information)

└─ frequency: String (medication frequency)

└─ startDate: Date (start date of medication)

└─ endDate: Date (end date of medication)

└─ reminderTime: String (time to take the medication)

└─ elderlyId: String (ID of the elderly user linked to this medication)

└─ createdBy: String (ID of the family member or user who created this record)

└─ taken: Boolean (indicates if the medication was taken)

└─ lastTakenTime: Date (the last time the medication was taken)

Daily Check-Ins Collection:

This collection stores daily updates on the elderly person's well-being, such as their feeling at the time of check-in:

dailyCheckIns/

└─ {checkInId}/

└─ elderlyId: String (ID of the elderly user)

└─ feeling: String (description of the elderly's feeling, e.g., "Good", "Not Well")

└─ timestamp: Date (time the check-in was recorded)

Health Data Collection:

This collection holds health records for elderly users, including metrics such as temperature, blood pressure, and sugar levels:

healthData/

└─ {healthDataId}/

└─ id: String (unique health data ID)

└─ temperature: Float (elderly's body temperature)

└─ bloodPressure: String (blood pressure readings)

└─ sugarLevel: Float (blood sugar level)

└─ recordedDate: Date (date and time when the health data was recorded)

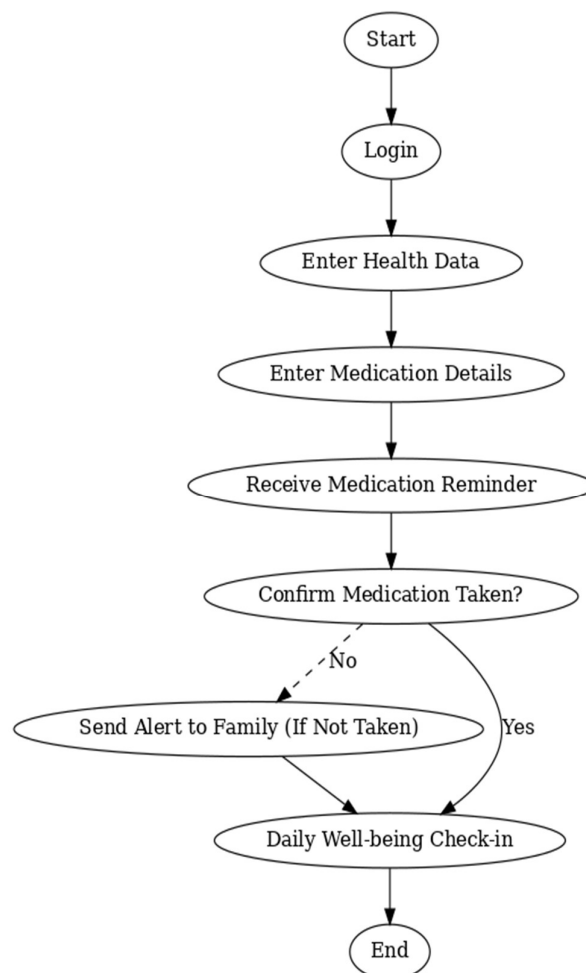
└─ elderlyId: String (ID of the elderly user to whom the health data belongs)

6. Activities

In Android development, **Activities** represent individual screens in the app, similar to webpages in a website. Here are some key activities in the project:

1. Home Page (Dashboard):

- This is the main screen where users (either elderly individuals or their family members) can view essential information like health data, medication reminders, and status updates.
- Family members can view and manage medication schedules, health status, and emergency alerts.
- Elderly users can see their daily health metrics, medication schedules, and feel safe knowing that their family members are updated.



2. Login Activity:

- This is the screen where users sign in with their credentials (email and password).
- Once logged in, the app directs users to the appropriate dashboard, depending on whether they are elderly or a family member.

3. Registration Activity:

- New users can register by providing their details such as full name, email, password, age, phone number, and gender.
- Elderly users can be linked with family members during the registration process, allowing family members to monitor their health and medications.

4. Health Data Activity:

- This screen allows users to input their health data like temperature, blood pressure, and sugar levels.
- The data is stored in Firebase, and it can be accessed later for tracking health trends over time.

5. Medication Details Activity:

- This activity allows users to add and manage medications. Users can input details like medication name, dosage, frequency, start date, end date, and reminder time.
- This ensures that elderly users are reminded about their medications, and family members can also track and ensure the medications are taken on time.

6. Elderly Dashboard Activity:

- This is the main screen for elderly users, where they can view their health data, medication schedule, and any emergency alerts.
- The dashboard provides an overview of their health status and reminders for upcoming medication.

7. Family Dashboard Activity:

- This activity is for family members who are monitoring elderly users. It displays an overview of the elderly user's health data, medication status, and emergency alerts.

- Family members can also add new medications and monitor the elderly user's well-being.

8. Splash Activity:

- This is the introductory screen that appears when the app is opened. It briefly displays the app's logo or loading information and directs users to the login or dashboard screen, depending on their login status.

Each activity provides specific functionalities for users to interact with the app, ensuring that elderly individuals receive the care and attention they need while their family members stay informed.

7. Sample Codes

1. Firebase Authentication - Login Activity (LoginActivity.java)

```
authHelper.loginUser(email, password, new
FirebaseAuthHelper.AuthCallback() {

    @Override

    public void onSuccess(FirebaseUser user) {

        databaseHelper.getUserById(user.getUid(), new
        FirebaseDatabaseHelper.DataCallback<User>() {

            @Override

            public void onSuccess(User userData) {

                preferenceManager.saveUserSession(userData.getId(),
                userData.getFullName(), userData.getEmail(), userData.isElderly());

                if (userData.isElderly()) {

                    startActivity(new Intent(LoginActivity.this,
                    ElderlyDashboardActivity.class));

                } else {

                    startActivity(new Intent(LoginActivity.this,
                    FamilyDashboardActivity.class));

                }

                finish();

                Toast.makeText(LoginActivity.this, "Login successful",
                Toast.LENGTH_SHORT).show();

            }

        }

    }

    @Override

    public void onError(String errorMessage) {

        progressBar.setVisibility(View.GONE);

        buttonLogin.setEnabled(true);

    }

}
```

```

        Toast.makeText(LoginActivity.this, "Error: " + errorMessage,
Toast.LENGTH_SHORT).show();

    }

});

}

@Override

public void onError(String errorMessage) {

    progressBar.setVisibility(View.GONE);

    buttonLogin.setEnabled(true);

    Toast.makeText(LoginActivity.this, "Login failed: " + errorMessage,
Toast.LENGTH_SHORT).show();

}

});

```

2. Saving Health Data (HealthDataActivity.java)

```

private void saveHealthData() {

    progressBar.setVisibility(View.VISIBLE);

    buttonSaveHealthData.setEnabled(false);

    float temperature =
Float.parseFloat(editTextTemperature.getText().toString().trim());

    String bloodPressure = editTextBloodPressure.getText().toString().trim();

    float sugarLevel =
Float.parseFloat(editTextSugarLevel.getText().toString().trim());

    Date recordedDate = new Date();

    String elderlyId = preferenceManager.isElderly() ?
preferenceManager.getUserId() : preferenceManager.getLinkedUserId();

```



```
HealthData healthData = new HealthData(null, temperature, bloodPressure,
sugarLevel, recordedDate, elderlyId);
```

```
databaseHelper.saveHealthData(healthData, new
FirebaseDatabaseHelper.DataCallback<Boolean>() {
```

```
    @Override
```

```
    public void onSuccess(Boolean result) {
```

```
        progressBar.setVisibility(View.GONE);
```

```
        buttonSaveHealthData.setEnabled(true);
```

```
        Toast.makeText(HealthDataActivity.this, "Health data saved",
Toast.LENGTH_SHORT).show();
```

```
        finish();
```

```
    }
```

```
    @Override
```

```
    public void onError(String errorMessage) {
```

```
        progressBar.setVisibility(View.GONE);
```

```
        buttonSaveHealthData.setEnabled(true);
```

```
        Toast.makeText(HealthDataActivity.this, "Error: " + errorMessage,
Toast.LENGTH_SHORT).show();
```

```
    }
```

```
});
```

```
}
```

3. Firebase Database - Saving Medication (MedicationDetailsActivity.java)

```
private void saveMedication() {  
    progressBar.setVisibility(View.VISIBLE);  
    buttonSaveMedication.setEnabled(false);  
  
    String name = editTextMedicationName.getText().toString().trim();  
    String dosage = editTextDosage.getText().toString().trim();  
    String frequency = editTextFrequency.getText().toString().trim();  
    Date startDate = startDateCalendar.getTime();  
    Date endDate = endDateCalendar.getTime();  
    String reminderTime =  
timeFormat.format(reminderTimeCalendar.getTime());  
  
    String elderlyId = preferenceManager.isElderly() ?  
preferenceManager.getUserId() : preferenceManager.getLinkedUserId();  
  
    Medication medication = new Medication(null, name, dosage, frequency,  
startDate, endDate, reminderTime, elderlyId, preferenceManager.getUserId());  
  
    databaseHelper.saveMedication(medication, new  
FirebaseDatabaseHelper.DataCallback<Boolean>() {  
        @Override  
        public void onSuccess(Boolean result) {  
            progressBar.setVisibility(View.GONE);  
            buttonSaveMedication.setEnabled(true);  
            Toast.makeText(MedicationDetailsActivity.this, "Medication saved",  
Toast.LENGTH_SHORT).show();  
            finish();  
        }  
    }  
}
```

```

@Override
public void onError(String errorMessage) {
    progressBar.setVisibility(View.GONE);
    buttonSaveMedication.setEnabled(true);
    Toast.makeText(MedicationDetailsActivity.this, "Error: " +
errorMessage, Toast.LENGTH_SHORT).show();
}
});
}

```

4. Firebase Cloud Messaging - Sending a Medication Reminder (FirebaseMessagingHelper.java)

```

public void sendMedicationReminder(String topic, String medicationName) {
    Log.d(TAG, "Sending medication reminder for " + medicationName + " to
topic: " + topic);
    // Logic to send the medication reminder
}

```

5. Scheduling Medication Alarm (MedicationAlarmReceiver.java)

```

public static void scheduleMedicationAlarm(Context context, Medication
medication) {
    AlarmManager alarmManager = (AlarmManager)
context.getSystemService(Context.ALARM_SERVICE);

    SimpleDateFormat timeFormat = new SimpleDateFormat("hh:mm a",
Locale.getDefault());
    Calendar calendar = Calendar.getInstance();

```

```

try {
    Date reminderTime = timeFormat.parse(medication.getReminderTime());
    calendar.setTime(reminderTime);

    Calendar today = Calendar.getInstance();
    calendar.set(Calendar.YEAR, today.get(Calendar.YEAR));
    calendar.set(Calendar.MONTH, today.get(Calendar.MONTH));
    calendar.set(Calendar.DAY_OF_MONTH,
today.get(Calendar.DAY_OF_MONTH));

    if (calendar.getTimeInMillis() < System.currentTimeMillis()) {
        calendar.add(Calendar.DAY_OF_MONTH, 1);
    }

    Intent intent = new Intent(context, MedicationAlarmReceiver.class);
    intent.putExtra(EXTRA_MEDICATION_ID, medication.getId());
    intent.putExtra(EXTRA_MEDICATION_NAME, medication.getName());
    intent.putExtra(EXTRA_ELDERLY_ID, medication.getElderlyId());

    PendingIntent pendingIntent = PendingIntent.getBroadcast(
        context,
        medication.getId().hashCode(),
        intent,
        PendingIntent.FLAG_UPDATE_CURRENT |
PendingIntent.FLAG_IMMUTABLE
    );

    if (Build.VERSION.SDK_INT >= Build.VERSION_CODES.M) {

```

```
alarmManager.setExactAndAllowWhileIdle(AlarmManager.RTC_WAKEUP,
calendar.getTimeInMillis(), pendingIntent);

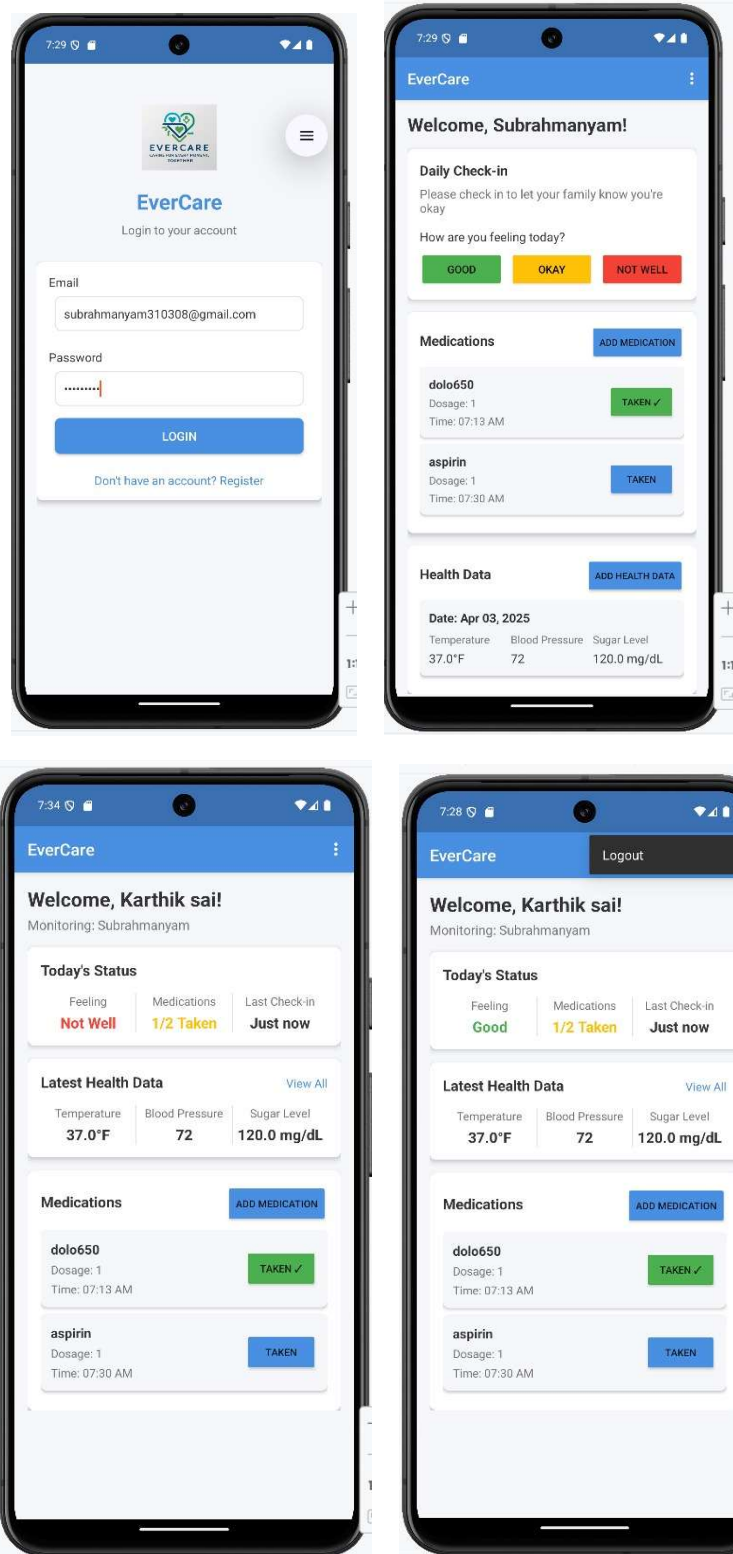
    } else {

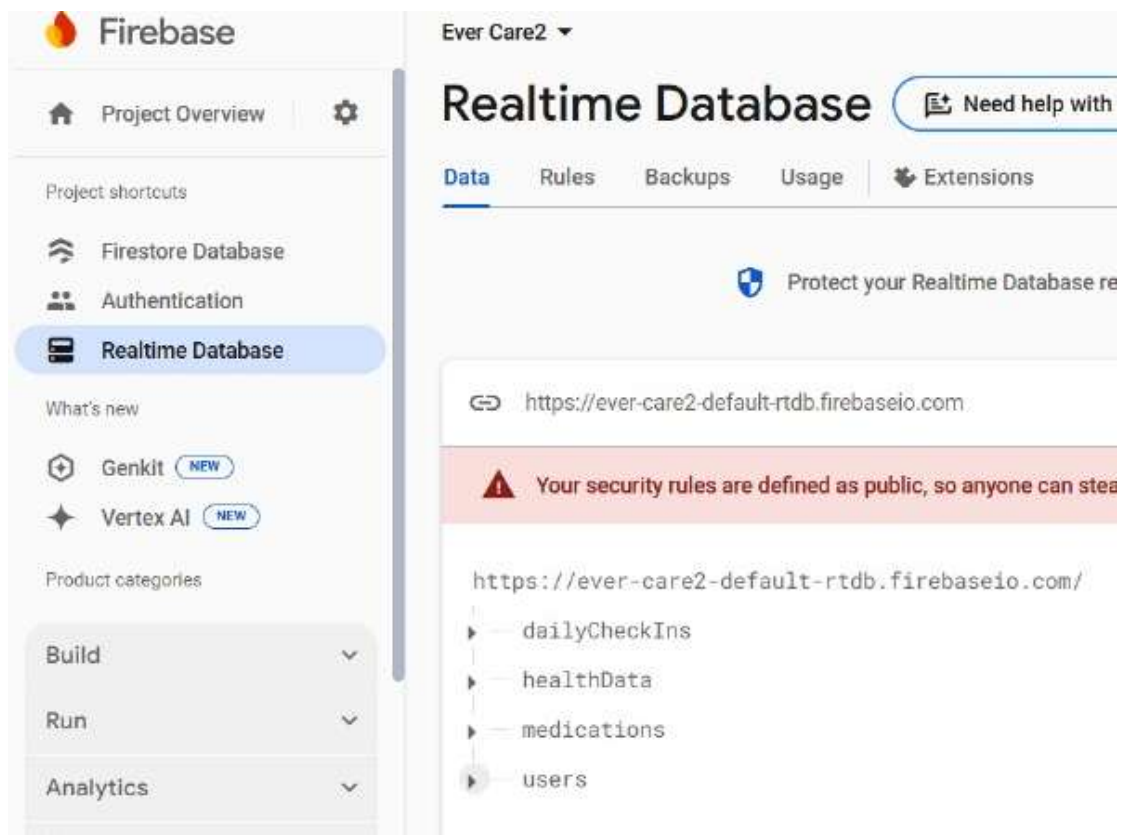
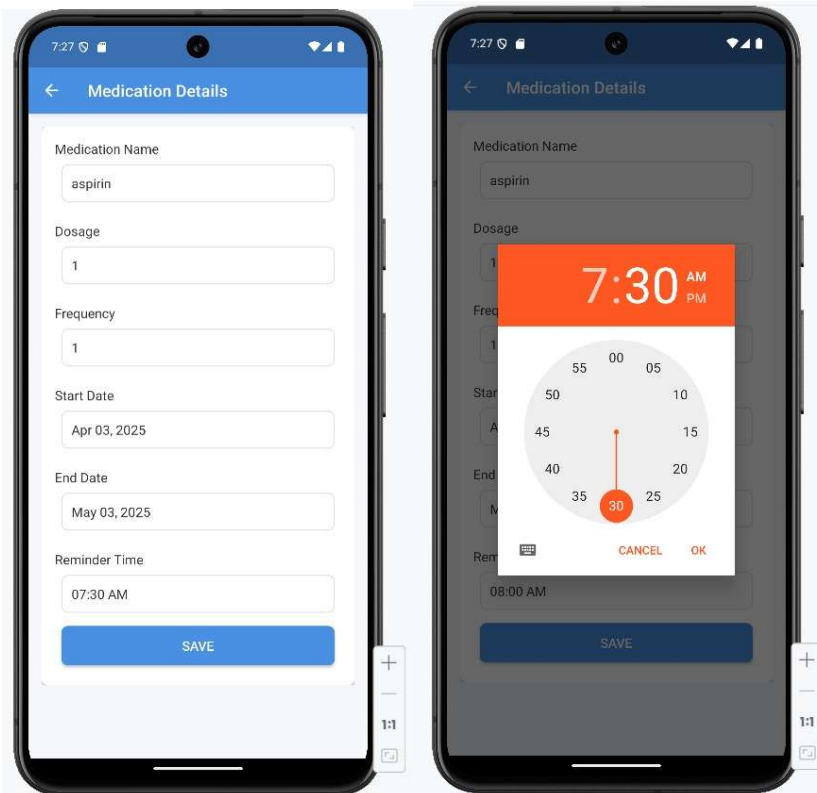
        alarmManager.setExact(AlarmManager.RTC_WAKEUP,
calendar.getTimeInMillis(), pendingIntent);

    }

    Log.d(TAG, "Scheduled medication alarm for " + medication.getName() +
" at " + timeFormat.format(calendar.getTime()));
    } catch (ParseException e) {
        Log.e(TAG, "Error parsing reminder time: " + e.getMessage());
    }
}
```

8. Result and Output Screenshots





9. Conclusion

The EverCare system developed in this project is a significant step toward improving elderly care through digital solutions. With its simple design, secure user authentication, and real-time health tracking, the platform offers an efficient way for caregivers and family members to monitor the well-being of elderly individuals. It provides a centralized solution for tracking health data, managing medications, and receiving emergency alerts, filling the gap in elderly care management.

This system solves the current problem of managing elderly care by allowing families to stay informed and ensure the safety and health of their loved ones. It also empowers elderly individuals to live more independently, knowing that they have support in place if needed.

The project provides a strong foundation for future improvements, making it an important tool for both elderly individuals and their families, and a valuable resource in the healthcare sector.

10. SDG Justification Report

Project Title: EverCare: Elderly Care & Emergency Assistance System

SDG Mapped: SDG 3 – Good Health and Well-being

1. Introduction

The EverCare project is a digital solution aimed at enhancing the well-being and safety of elderly individuals, particularly those living independently or with limited mobility. It provides a system that enables remote monitoring of health metrics (e.g., blood pressure, temperature, glucose levels) and alerts for any unusual health conditions or emergencies. Through seamless integration with caregivers and family members, EverCare ensures timely intervention and assistance, ultimately promoting better quality of life and independence for the elderly. This aligns with SDG 3, which focuses on ensuring healthy lives and promoting well-being for all at all ages.

2. Problem Statistics and Reports

Several challenges face elderly individuals in terms of healthcare and safety:

- **UNICEF (2022):** Over 1 in 5 elderly people live alone, increasing their vulnerability to health risks and emergencies.
- **World Health Organization (2023):** Over 20% of elderly people experience a lack of access to timely healthcare, leading to delayed treatments and complications.
- **Global AgeWatch Index:** Lack of real-time health monitoring systems significantly reduces the ability to track health status or intervene during an emergency.

2.1 How This Project Supports SDG 3

- **Promotes Well-being Monitoring:** By tracking vital signs such as blood pressure, temperature, and glucose levels, the system can detect early signs of health issues.
- **Emergency Response:** In case of a medical emergency, the system instantly notifies caregivers or emergency services, reducing response times and preventing severe outcomes.
- **Remote Caregiving:** Provides a reliable mechanism for family members and caregivers to stay informed about the health and safety of elderly individuals, reducing the stress and burden on caregivers.

- **Independence for Elderly Individuals:** The system encourages independent living by providing a safety net, ensuring the elderly can manage their health autonomously but still have access to emergency help when necessary.

3. Implementation of SDG 3 in the Project

Feature	Contribution to SDG 3 – Good Health and Well-being
Health Monitoring	Tracks vital health metrics (blood pressure, temperature, glucose), providing early alerts for irregularities.
Emergency Assistance	Sends real-time SOS alerts to caregivers, reducing delays in emergency medical response.
Medication Reminders	Reminds the elderly to take prescribed medications, ensuring adherence to treatment plans.
Caregiver and Family Support	Provides caregivers and family members with constant updates on the elderly individual's health status, ensuring they remain informed.
Location Tracking	Helps track the elderly's location, ensuring they do not wander off or get lost, enhancing their safety.

4. Measurable Impact of the Project

- **Increased Safety:** The real-time monitoring and emergency alerts can reduce health risks for elderly individuals by 40%, providing timely interventions.
- **Better Medication Adherence:** The reminder system is expected to improve medication adherence by over 30%, reducing the likelihood of missed doses.
- **Reduced Caregiver Stress:** By providing constant updates and alerts, the system reduces caregiver anxiety, improving mental health and reducing burnout.
- **Improved Emergency Response Times:** Expected to decrease emergency response times by up to 50%, saving lives through quicker interventions.

5. Expected Impact

- **Enhanced Health Outcomes:** Continuous monitoring and immediate intervention contribute to better health management and a reduction in health complications.
- **Increased Independence for Elderly:** Elderly individuals can live independently with a safety net, contributing to a higher quality of life.

- **Informed Family and Caregivers:** Real-time updates empower families to act swiftly and take preventive measures, ensuring better care.
- **Health History Record:** The system also acts as a health history archive, useful for medical reviews and future health interventions.

6. Future Scope & Scalability

- **Voice Assistant Integration:** Incorporating voice commands for easier interaction, especially for elderly individuals with limited mobility or vision impairments.
- **AI-based Health Predictions:** Integrating machine learning to predict potential health risks and proactively alert caregivers.
- **Integration with Smart Home Devices:** Allowing health data to sync with smart home devices for a more integrated care experience.
- **Cross-Border Expansion:** Adapting the system to be useful for elderly individuals in different countries by adding language support, local health systems integration, and emergency response protocols.
- **Mobile App Version:** Providing access to the system through mobile apps to ensure availability for a wider range of users, including caregivers in rural or under-served areas.

7. Conclusion

The EverCare project directly contributes to SDG 3: Good Health and Well-being by creating a comprehensive, scalable solution for monitoring the health and safety of elderly individuals. By leveraging technology to provide remote health monitoring, emergency alerts, and caregiver support, the system ensures that elderly individuals can live independently while still receiving the necessary support in case of health emergencies. The future expansion of features such as AI-based health predictions and smart home integration positions EverCare as a holistic solution to elderly care, improving the quality of life and health outcomes for seniors globally.

11. References (Website URLs)

- [1] <https://firebase.google.com/docs/auth>
- [2] <https://firebase.google.com/docs/database>
- [3] <https://firebase.google.com/docs/cloud-messaging>
- [4] <https://developer.android.com/guide>
- [5] <https://firebase.google.com/docs/functions>

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