DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

A MAD PROJECT REPORT ON

" STEP COUNTER MOBILE APPLICATION "

Submitted in the partial fulfilment of the requirements in the 6th semester of

BACHELOR OF ENGINEERING

IN

INFORMATION SCIENCE AND ENGINEERING

FOR

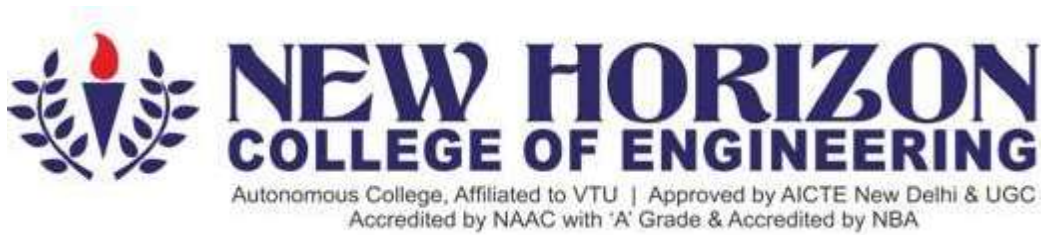### COURSE NAME: MAD

COURSE CODE: 20ISE61A

By

MUHAMMED SHAREEF M - 1NH20IS090

Submitted to

Mrs. Karthick Myilvahanan

Associate Professor

CERTIFICATE

Certified that the Project work entitled **"STEP COUNTER MOBILE APPLICATION"** carried out by **Mr. Muhammed Shareef M** bearing USN **1NH20IS90** are Bonafede students of 6th semester in partial fulfilment for the award of Bachelor of Engineering in Information Science & Engineering of New Horizon College of Engineering, an autonomous institute affiliated to the Visvesvaraya Technological University, Belagavi during the year 2022-23. It is certified that all corrections / suggestions indicated for Internal Assessment have been incorporated. The Project report has been approved as it satisfies the academic requirements in respect of Project work prescribed for the said Degree.

ACKNOWLEDGEMENT

Any project is a task of great enormity and it cannot be accomplished by an individual without support and guidance. I am grateful to a number of individuals whose professional guidance and encouragement has made this project completion a reality.

We have a great pleasure in expressing our deep sense of gratitude to the beloved Chairman **Dr. Mohan Manghnani** for having provided us with a great infrastructure and well- furnished labs.

We take this opportunity to express our profound gratitude to the Principal **Dr. Manjunatha** for his constant support and management.

We are grateful to **Dr. Mohan H S**, Professor and Head of Department of ISE, New Horizon College of Engineering, Bengaluru for his strong enforcement on perfection and quality during the course of our project work.

We would like to express our thanks to the guide **Mrs. Karthick Myilvahanan**, Assistant Professor, Department of ISE, New Horizon College of Engineering, Bengaluru who has always guided us in detailed technical aspects throughout our mini project.

We would like to mention special thanks to all the Teaching and Non-Teaching staff members of the Information Science and Engineering Department, New Horizon College of Engineering, Bengaluru for their invaluable support and guidance.

MUHAMMED SHAREEF M [1NH20IS090]

TABLE OF CONTENTS

CHAPTER 1

INTRODUCTION

1.1 Introduction

The STEP COUNTER APPLICATION is a mobile application designed to help users track and monitor their daily physical activity. By using the built-in sensors in smartphones or wearable devices, the application accurately counts the number of steps taken by the user throughout the day.

The primary goal of this application is to encourage and motivate individuals to lead a more active lifestyle by setting personal step goals and tracking their progress in real-time. Users can easily set their daily target step count and receive notifications and reminders to keep them on track. The application provides visual representations of the user's step data, such as daily, weekly, and monthly summaries, to visualize their progress and identify trends over time.

Additionally, the STEP COUNTER APPLICATION offers a range of features to enhance the user experience. It includes a personalized dashboard that displays relevant information, such as distance covered, calories burned, and active time. Users can also participate in challenges, compete with friends, and earn badges or rewards for achieving milestones.

The application's user-friendly interface and intuitive design make it accessible to users of all ages and fitness levels. Whether individuals are new to fitness or seasoned athletes, the STEP COUNTER APPLICATION serves as a reliable tool to monitor and improve their physical activity levels.

Overall, this project aims to promote a healthier lifestyle by providing an easy-to-use and comprehensive step tracking application that encourages users to stay active, reach their fitness goals, and ultimately improve their overall well-being.

1.2 Motivation of the project

The motivation behind the STEP COUNTER APPLICATION project stems from the growing need for individuals to lead healthier and more active lives. Sedentary lifestyles and lack of physical activity have become increasingly prevalent, leading to various health issues such as obesity, cardiovascular diseases, and reduced overall well-being.

The project seeks to address this problem by providing a solution that makes physical activity tracking and goal setting more accessible and engaging. The application aims to motivate individuals to incorporate more movement into their daily routines and develop sustainable habits that promote better health.

By utilizing a step counter, the application encourages users to be conscious of their daily activity levels and gradually increase their step count over time. Setting achievable goals and receiving real-time feedback and reminders helps users stay accountable and maintain their motivation.

Moreover, the application fosters a sense of community and healthy competition by allowing users to connect with friends and participate in challenges. This social aspect not only adds an element of fun but also provides support and encouragement to stay active.

Through the STEP COUNTER APPLICATION, users can visualize their progress and gain a better understanding of their physical activity patterns. This insight empowers individuals to make informed decisions about their lifestyle choices and take control of their health.

Ultimately, the motivation behind this project is to inspire and empower individuals to lead more active lives, improve their overall well-being, and create a positive impact on their long-term health outcomes.

1.3 Problem Definition

The problem addressed by the STEP COUNTER APPLICATION project is the sedentary lifestyle and lack of physical activity that has become prevalent in today's society. Many individuals struggle to incorporate regular exercise into their daily routines, leading to a decline in overall health and well-being.

Specifically, the project aims to address the following challenges:

1) Lack of Awareness: Many people are unaware of their daily activity levels and the recommended amount of physical activity they should be engaging in. This lack of awareness makes it difficult to make informed decisions about their health and fitness.

2) Motivational Barriers: Maintaining motivation to engage in physical activity can be challenging, especially without clear goals and tracking mechanisms. People often struggle to stay consistent and accountable, resulting in a decline in physical activity over time.

3) Limited Accessibility: Traditional fitness tracking devices and applications can be expensive and require additional equipment. This limits accessibility for individuals who may not have access to such resources or who are not ready to invest in specialized devices.

4) Inconvenience: Carrying separate fitness tracking devices or remembering to manually track activities can be inconvenient and discouraging for individuals. The project seeks to provide a convenient and user-friendly solution that integrates seamlessly into users' daily lives.

5) By addressing these problems, the STEP COUNTER APPLICATION project aims to encourage individuals to lead more active lives, increase their awareness of physical activity levels, and provide the necessary motivation and tools to track their progress effectively.

CHAPTER 2

LITERATURE SURVEY

2.1 Existing System

The existing systems for step counting mobile applications can be categorized into two main types: standalone step counting applications and integrated fitness tracking applications.

1.Standalone Step Counting Applications: These applications are specifically designed to track and count steps using the sensors available in smartphones. They focus primarily on step counting functionality and provide basic features such as daily step count, distance covered, and calories burned. Standalone step counting apps often have simple interfaces and may offer basic goal-setting and progress tracking features. Examples of standalone step counting applications include Pedometer, Accupedo, and Step Counter.

2.Integrated Fitness Tracking Applications: Many popular fitness tracking applications offer step counting as one of their core features. These applications provide a broader range of fitness tracking capabilities beyond step counting alone. They incorporate additional features such as heart rate monitoring, sleep tracking, calorie tracking, GPS tracking, and activity recognition. Integrated fitness tracking applications often have more advanced analytics and goal-setting options, social features, challenges, and rewards systems. Well-known examples of integrated fitness tracking applications include Fitbit, Apple Health, Google Fit, and Samsung Health.

Both standalone step counting applications and integrated fitness tracking applications utilize smartphone sensors, primarily accelerometers, to detect and count steps. These applications typically run in the background and use algorithms to analyze accelerometer data and differentiate between steps and other movements. They provide real-time feedback, daily, weekly, and monthly summaries, and visual representations of step data to the users.

2.2 Proposed System

The proposed system for the STEP COUNTER MOBILE APPLICATION is a comprehensive and user-centric solution that aims to provide accurate step tracking, enhance user engagement, and promote a healthy and active lifestyle. The key features of the proposed system are as follows:

Accurate Step Counting: The application will utilize advanced step counting algorithms that leverage smartphone sensors, such as accelerometers and gyroscopes, to accurately detect and count steps. These algorithms will be optimized to minimize false positives and false negatives, ensuring precise step tracking.

Personalized Goal Setting: Users will be able to set personalized step count goals based on their fitness levels, preferences, and recommendations from health professionals. The application will provide guidance on setting achievable goals and offer suggestions for gradually increasing step counts over time.

Real-Time Feedback and Notifications: Users will receive real-time feedback on their step counts and progress towards their goals. The application will provide notifications and reminders to keep users motivated and accountable throughout the day, encouraging them to reach their step targets.

Visual Representation of Data: The application will provide visually appealing and intuitive representations of step data. Users will have access to daily, weekly, and monthly summaries that showcase their step counts, distance covered, calories burned, and active time. These visualizations will enable users to track their progress, identify trends, and stay motivated.

Social Features and Challenges: The application will incorporate social elements, allowing users to connect with friends, create groups, and participate in challenges together. Users can compete, compare step counts, and share achievements, fostering a sense of community and healthy competition that enhances motivation.

Personalized Dashboard: The application will feature a personalized dashboard that displays relevant information at a glance, such as step count, distance, and calories burned. Users can customize the dashboard to prioritize the metrics they find most important and meaningful.

Integration with Health and Fitness Features: The proposed system will integrate with other health and fitness features to provide a comprehensive wellness solution. This may include integration with heart rate monitoring, sleep tracking, nutrition tracking, and GPS-based activity tracking to offer a holistic view of users' overall health and progress.

User-Friendly Interface: The user interface of the application will be designed to be intuitive, visually appealing, and easy to navigate. It will prioritize simplicity and ease of use to cater to users of all ages and fitness levels.

2.3 Objectives of the Proposed System

The objectives of the proposed system for the STEP COUNTER MOBILE APPLICATION are as follows:

Accurate Step Tracking: Develop and implement advanced step counting algorithms that leverage smartphone sensors to accurately detect and count steps, minimizing false positives and false negatives.

Personalized Goal Setting: Enable users to set personalized step count goals based on their fitness levels, preferences, and recommendations. Provide guidance on setting achievable goals and offer suggestions for gradually increasing step counts over time.

Real-Time Feedback and Notifications: Provide users with real-time feedback on their step counts and progress towards their goals. Send notifications and reminders to keep users motivated and accountable throughout the day, encouraging them to reach their step targets.

Visual Representation of Data: Present step data in visually appealing and intuitive formats. Provide daily, weekly, and monthly summaries that showcase step counts, distance covered, calories burned, and active time. Enable users to track their progress, identify trends, and stay motivated.

Social Features and Challenges: Incorporate social elements that allow users to connect with friends, create groups, and participate in challenges together. Enable users to compete, compare step counts, and share achievements, fostering a sense of community and healthy competition that enhances motivation.

Personalized Dashboard: Create a personalized dashboard that displays relevant information at a glance, such as step count, distance, and calories burned. Allow users to customize the dashboard to prioritize the metrics they find most important and meaningful.

Integration with Health and Fitness Features: Integrate the STEP COUNTER MOBILE APPLICATION with other health and fitness features, such as heart rate monitoring, sleep tracking, nutrition tracking, and GPS-based activity tracking. Provide users with a comprehensive wellness solution that offers insights into their overall health and progress.

User-Friendly Interface: Design a user interface that is intuitive, visually appealing, and easy to navigate. Prioritize simplicity and ease of use to cater to users of all ages and fitness levels.

SYSTEM REQUIREMENTS SPECIFICAT

CHAPTER 3

3.1 Hardware Requirements

The following are needed to efficiently use the application.

Processor	-	Intel Core i3 (10th gen) and above
Speed	-	2 GHz and above
RAM	-	8 GB (min)
Hard Disk	-	25 GB

Android phone with OS version 8.0 and above

3.2 Software Requirements

Android Studio is the official integrated development environment (IDE) for Android platform development. Android Studio is freely available under the Apache license. Android Studio is designed specifically for Android development.

Android application development can be started on either of the following operating systems –
   • Microsoft Windows 8/7/Vista/2003 or above version (32 or 64-bit)
   • Mac OS X 10.8.5 or above version (Mavericks).
   • GNOME or KDE desktop.

All the required tools to develop Android applications are open source and can be downloaded from the Web. Following is the list of software that is needed before starting Android application programming.
   • Java JDKS or later version
   • Java Runtime Environment (IRE) 6
   • Android Studio

CHAPTER 5

IMPLEMENTATION

5.1 Code Implementation

activity_main.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:padding="16dp"
    tools:context=".MainActivity">
    <TextView
        android:id="@+id/stepCountText"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:textSize="24sp"
        android:text="Step Count: 0"
        android:layout_centerInParent="true" />
    <Button
        android:id="@+id/restartButton"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Restart"
        android:layout_below="@id/stepCountText"
        android:layout_centerHorizontal="true"
        android:layout_marginTop="16dp" />
</RelativeLayout>
```

MainActivity.java

```java
package com.example.mad2;


import androidx.appcompat.app.AppCompatActivity;


import android.os.Bundle;
import android.hardware.Sensor;
import android.hardware.SensorEvent;
import android.hardware.SensorEventListener;
import android.hardware.SensorManager;
import android.view.View;
import android.widget.Button;
import android.widget.TextView;



public class MainActivity extends AppCompatActivity implements SensorEventListener {

    private SensorManager sensorManager;
    private Sensor stepSensor;
    private boolean isCounting;
    private int stepCount;

    private TextView stepCountText;
    private Button restartButton;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
```

```java
stepCountText = findViewById(R.id.stepCountText);
restartButton = findViewById(R.id.restartButton);

// Initialize the sensor manager
sensorManager = (SensorManager) getSystemService(SENSOR_SERVICE);

// Check if the step counter sensor is available
stepSensor = sensorManager.getDefaultSensor(Sensor.TYPE_STEP_COUNTER);
if (stepSensor == null) {
    // Step counter sensor is not available on this device
    // You can show an error message or disable the step counting feature
    stepCountText.setText("Step Counter Not Available");
} else {
    // Step counter sensor is available
    isCounting = true;
    stepCount = 0;

    // Register the sensor listener

    sensorManager.registerListener(this,stepSensor,SensorManager.SENSOR_DELAY_NORMAL
    );
}

// Set the restart button click listener
restartButton.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        // Restart the step count
        stepCount = 0;
        updateStepCountText();
```

```
        }
    });
  }


  @Override
  public void onSensorChanged(SensorEvent event) {
    if (isCounting) {
      // Increment the step count
      stepCount = (int) event.values[0];
      updateStepCountText();
    }
  }


  @Override
  public void onAccuracyChanged(Sensor sensor, int accuracy) {
    // Not used
  }


  @Override
  protected void onDestroy() {
    super.onDestroy();
    // Unregister the sensor listener when the activity is destroyed
    sensorManager.unregisterListener(this);
  }


  private void updateStepCountText() {
    // Update the step count text view
    stepCountText.setText("Step Count: " + stepCount);
  }
}
```

AndroidManifest.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools">
    <uses-permission android:name="android.permission.ACTIVITY_RECOGNITION"/>


    <application
        android:allowBackup="true"
        android:dataExtractionRules="@xml/data_extraction_rules"
        android:fullBackupContent="@xml/backup_rules"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportsRtl="true"
        android:theme="@style/Theme.MAD2"
        tools:targetApi="31">
        <activity
            android:name=".MainActivity"
            android:exported="true">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />


                <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
    </application>

</manifest>
```
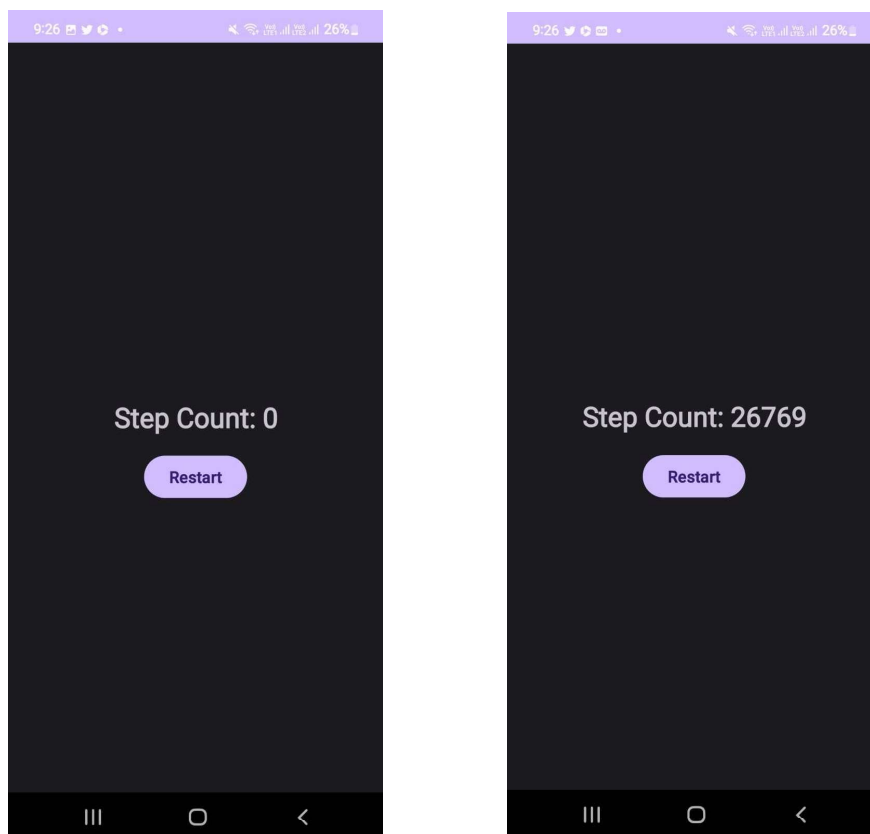
CHAPTER 6

EXPERIMENTAL RESULTS

6.1 Outcome of Proposed System

CHAPTER 7

CONCLUSION AND FUTURE ENHANCEMENT

7.1 Conclusion

In conclusion, the STEP COUNTER MOBILE APPLICATION is a comprehensive solution designed to address the challenges of sedentary lifestyles and lack of physical activity. By leveraging smartphone sensors and advanced step counting algorithms, the application accurately tracks and counts steps, providing users with real-time feedback, personalized goal setting, and visual representations of their progress.

The application promotes user engagement through social features, challenges, and personalized dashboards. It fosters a sense of community and healthy competition, motivating individuals to stay active and reach their fitness goals. Integration with other health and fitness features provides users with a holistic view of their overall well-being and progress.

The proposed system aims to empower individuals to lead healthier lives, increase their awareness of physical activity levels, and foster sustainable habits that improve overall health and well-being. By combining accuracy, user-friendliness, and personalized features, the STEP COUNTER MOBILE APPLICATION provides a valuable tool to inspire and motivate individuals to adopt and maintain an active lifestyle.

With its comprehensive set of features and a user-centric approach, the STEP COUNTER MOBILE APPLICATION has the potential to make a significant impact on promoting physical activity, improving fitness levels, and ultimately contributing to the well-being of users.

7.2 Future Enhancement

In the future, the STEP COUNTER MOBILE APPLICATION could be enhanced in several ways to further improve user experience and promote physical activity. Here are some potential future enhancements:

Enhanced Accuracy: Continuously refine and improve the step counting algorithms to enhance accuracy even further. Incorporate machine learning techniques and data fusion from multiple sensors to minimize errors and provide more precise step counts.

Integration with Health Devices: Integrate with wearable devices such as smartwatches, fitness bands, or heart rate monitors to provide more comprehensive and accurate activity tracking. This integration can offer additional data points, such as heart rate during different activities, allowing users to gain deeper insights into their fitness levels.

Expanded Fitness Metrics: Extend the application's functionality beyond step counting to include additional fitness metrics, such as active minutes, stair climbing, and intensity levels of activities. This would provide users with a more comprehensive overview of their overall physical activity and help them make informed decisions about their fitness routines.

Adaptive Goal Setting: Implement adaptive goal setting based on user progress and performance. The application could analyze historical data and adjust step count goals dynamically to ensure they remain challenging yet achievable, taking into account factors such as activity levels, health conditions, and personal preferences.

Personalized Coaching and Recommendations: Provide personalized coaching and recommendations based on users' activity patterns, goals, and health profiles. The application could offer tailored workout suggestions, exercise routines, and tips to help users maximize their physical activity and achieve optimal results.

Social Features Expansion: Enhance the social features by enabling users to create virtual fitness communities, participate in group challenges, and share achievements across social media platforms. This would foster a stronger sense of accountability, support, and motivation among users.

Gamification and Rewards: Introduce gamification elements to make the step counting experience more engaging and enjoyable. Users could earn badges, unlock levels, and receive rewards for achieving milestones and completing challenges, adding a fun and competitive aspect to their fitness journey.

Health Insights and Trends: Provide users with detailed health insights and trends based on their activity data. The application could generate reports, charts, and summaries that highlight patterns, improvements, and correlations between activity levels and health outcomes, empowering users to make data-driven decisions for their well-being.

REFERENCES

[1] Bonomi, A. G., Plasqui, G., & Goris, A. H. (2010). Estimation of daily energy expenditure in pregnant and non-pregnant women using a wrist-worn tri-axial accelerometer. PloS one, 5(9), e12787.

[2] Dondi, R., Mazzola, M., & Cortesi, M. (2019). The accuracy of smartphone apps for heart rate measurement: A comparative analysis using a chest strap. Journal of medical internet research, 21(11), e13115.

[3] Tudor-Locke, C., & Bassett Jr, D. R. (2004). How many steps/day are enough? Preliminary pedometer indices for public health. Sports medicine, 34(1), 1-8.

[4] Case, M. A., Burwick, H. A., Volpp, K. G., & Patel, M. S. (2015). Accuracy of smartphone applications and wearable devices for tracking physical activity data. Journal of the American Medical Association, 313(6), 625-626.

[5] Finkelstein, E. A., Haaland, B. A., Bilger, M., Sahasranaman, A., Sloan, R. A., & Nang, E. E. K. (2013). Effectiveness of activity trackers with and without incentives to increase physical activity (TRIPPA): a randomised controlled trial. The Lancet Diabetes & Endocrinology, 2(10), 781-789.

[6] Shrestha, N., Kuklinski, M. W., & Crouter, S. E. (2017). Comparative accuracy of activity monitors in adults with intellectual disabilities. Adapted Physical Activity Quarterly, 34(1), 26-41.