FITNESS APP

Submitted in partial fulfillment of the requirements for the award of the degree of

Master of Computer Application (MCA)

to

Guru Gobind Singh Indraprastha University, Delhi

Supervisor:
DR VANDANNA SHARMA
Designation

Submitted by:
VIBHOR JAIN
Roll No.:01511104420

Banarsidas Chandiwala Institute of Information Technology, New Delhi – 110019 Batch (2020-2022)
MCA-269

CONTENTS

Certificate

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Signature of the Guide
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ACKNOWLEDGEMENT

In the “Acknowledgements” page, the writer recognizes his indebtedness for guidance and assistance of the thesis adviser and other members of the faculty. Courtesy demands that he also recognize specific contributions by other persons or institutions such as libraries and research foundations. Acknowledgements should be expressed simply, tastefully, and tactfully **duly singed above the name.**

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Student Name:

Student Roll No:

Director / HOD

SYNOPSIS ON

"FITNESS APP"

Submitted by:

Mr. Vibhor Jain
MCA

Guru Gobind Singh Indraprastha University

UNIVERSITY SCHOOL OF INFORMATION AND COMMUNICATION TECHNOLOGY

Sector 16 C, Dwarka, New Delhi, Delhi 110078

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INTRODUCTION

Since the emergence and popularization of smartphones, many mobile applications that track and record data about their users have been created. The classic example of this is the pedometer which utilizes the mobile device's built-in accelerometer to track the number of steps the user takes each day. Applications in this category, that track and record health or activity data about their users, are typically called Wellness or Fitness Apps. These Wellness Apps are designed to assist the user in pursuing a healthy lifestyle by encouraging them to perform positive activities, and improve lifestyle choices. Factors that are typically targeted by such applications include exercise, sleep, and diet. Understanding the nature of this relationship is crucial when designing a Wellness App. Applications like this have the potential to motivate its users into maintaining a cycle of positive lifestyle decisions and/or breaking a cycle of negative lifestyle decisions. Diet, exercise and sleep can influence several physiological pathways associated with depression and a bidirectional relationship likely exists between depression and these lifestyle factors, thereby creating a potentially increasing cycle of influence .The goal of this project: The purpose of this project was to create a wellness application for the Android platform capable of tracking, recording, and displaying data relevant to a user's sleep, activity, and mood habits. This application also enables individuals to become aware of deficiencies in their everyday habits and will hopefully encourage the user to selfregulate towards improvement. The addition of an avatar to represent the user's current wellness . features further promotes user engagement and continued usage of the application. The overall goal is to show the user his or her daily habits and help them to make choices that will result in a healthier lifestyle, and therefore, a happier life. This document will comprehensively describe such an application's research, design, testing, and development.

Problem Definition:

Applications that manage wellness have become some of the most popular downloads for smartphones today. These apps commonly track various types of user inputs such as exercise, sleep and other health habits. In theory, organizing this I information in an easily interpretable way, motivates the user to continue a healthy lifestyle. Each of these apps has a unique way of expressing data to the user, and some methods have proven more effective than other.

Objectives & Scope

Studies have shown the positive effects that increased exercise can have on a person's overall mood, and it has been widely recommended that people suffering from a history of mental disorders such as depression and anxiety incorporate more exercise into their daily routines (Peluso Mam et al 62). There are several theorized reasons for this correlation between an increase in daily exercise and an improved state of mind. The first is the idea of distraction. A person placing his or her focus on exercise rather than the stressful or anxiety-inducing aspects of life, are more likely to temporarily forget about these depressants and have an improved state of mind. Another possible side effect of continuous daily exercise is a general improvement of a person's self-image due to becoming more physically fit, and healthier overall. Exercise can lead to an increase in self-esteem, and physical acceptance (i.e one's acceptance of his or her own physical body). In general, there is a direct correlation between a person's self-esteem and their overall happiness. Finally, when a person exercises, they are constantly overcoming obstacles and improving themselves. For example, a person that is only able to run for one mile at one point in time might be able to run two miles after spending several months running on a daily basis. This sense of achievement brought about by hurdling a personal obstacle, can also lead to an increase in overall mood.

METHODOLOGY

TOOLS AND PLATFORM

Hardware Requirement:

Processor: intel CORE i5 RAM: 2GB or more
HD: 500 GB

Software Requirement: Operating System : Windows 10: android studio java xml

Modules

- the fitness app features :
- Fitness goal calorie, fitness tracker, fitness calorie calculator
- Fitness goal calorie:
- A calorie is **a unit that measures energy**. Calories are usually used to measure the energy content of foods and beverages. To lose weight, you need to eat fewer calories than your body burns each day.
- fitness tracker-A fitness tracker is a **device that uses sensors to track your orientation, movement, and rotation**. The device collects data and converts it into steps, calories, sleep quality and general activity you perform through the day. ... A fitness tracker can easily figure whether you are running or spinning.
- Fitness calories calculator: Use our calorie-intake calculator to determine your daily caloric needs based on your height, weight, age and activity level. In addition to determining the calories needed to maintain weight, use this as a calorie burner calculator and figure out how many calories you need to burn in order to drop pounds. Then use the nutritional needs calculator and figure out how to break those calories into carbs, proteins and fat.

Chapter-1: Introduction/Problem Definition

1.1 : Brief Description of the Organization

Since the emergence and popularization of smartphones, many mobile applications that track and record data about their users have been created. The classic example of this is the pedometer which utilizes the mobile device's built-in accelerometer to track the number of steps the user takes each day. Applications in this category, that track and record health or activity data about their users, are typically called Wellness or Fitness Apps. These Wellness Apps are designed to assist the user in pursuing a healthy lifestyle by encouraging them to perform positive activities, and improve lifestyle choices. Factors that are typically targeted by such applications include exercise, sleep, and diet. Understanding the nature of this relationship is crucial when designing a Wellness App. Applications like this have the potential to motivate its users into maintaining a cycle of positive lifestyle decisions and/or breaking a cycle of negative lifestyle decisions. Diet, exercise and sleep can influence several physiological pathways associated with depression and a bidirectional relationship likely exists between depression and these lifestyle factors, thereby creating a potentially increasing cycle of influence .The goal of this project: The purpose of this project was to create a wellness application for the Android platform capable of tracking, recording, and displaying data relevant to a user's sleep, activity, and mood habits. This application also enables individuals to become aware of deficiencies in their everyday habits and will hopefully encourage the user to selfregulate towards improvement. The addition of an avatar to represent the user's current wellness . features further promotes user engagement and continued usage of the application. The overall goal is to show the user his or her daily habits and help them to make choices that will result in a healthier lifestyle, and therefore, a happier life. This document will comprehensively describe such an application's research, design, testing, and development.

1.2 : General Description of the System under Study

Applications that manage wellness have become some of the most popular downloads for smartphones today. These apps commonly track various types of user inputs such as exercise, sleep and other health habits. In theory, organizing this information in an easily interpretable way, motivates the user to continue a healthy lifestyle. Each of these apps has a unique way of expressing data to the user, and some methods have proven more effective than other.

1.3. : The Need of the New System

Sports have always been an integral part of human lifestyle, becoming even more popular in our days, with numerous fitness apps and trackers. According to Pew Research Center, 21% of Americans own a smartwatch or fitness tracker. Recently the popularity of health and fitness apps has skyrocketed, mainly because of the COVID-19 pandemic. And this popularity is so great that even Apple is getting into this. The company launches its first fitness service built around Apple Watch and will include 10 workout types.

During the last week of March 2020, downloads of Health & Fitness apps grew by 67%, and May 2020 saw 48% more sessions than the annual average.

As gyms and fitness studios have been closed for months due to the COVID-19 virus, people around the world have started to actively use fitness apps in order to stay healthy and in shape. New data from the Adjust marketing platform shows that the trend towards self-development has gradually moved from New Year's resolutions into quarantine this year, attracting even more users to apps in the Health & Fitness category.

1.3 Objectives of the proposed System

Studies have shown the positive effects that increased exercise can have on a person's overall mood, and it has been widely recommended that people suffering from a history of mental disorders such as depression and anxiety incorporate more exercise into their daily routines (Peluso Mam et al 62). There are several theorized reasons for this correlation between an increase in daily exercise and an improved state of mind. The first is the idea of distraction. A person placing his or her focus on exercise rather than the stressful or anxiety-inducing aspects of life, are more likely to temporarily forget about these depressants and have an improved state of mind. Another possible side effect of continuous daily exercise is a general improvement of a person's self-image due to becoming more physically fit, and healthier overall. Exercise can lead to an increase in self-esteem, and physical acceptance (i.e one's acceptance of his or her own physical body). In general, there is a direct correlation between a person's self-esteem and their overall happiness. Finally, when a person exercises, they are constantly overcoming obstacles and improving themselves. For example, a person that is only able to run for one mile at one point in time might be able to run two miles after spending several months running on a daily basis. This sense of achievement brought about by hurdling a personal obstacle, can also lead to an increase in overall mood.

1.5: Methodology

A fitness app is an application that can be downloaded on any mobile device and used anywhere to get fit. ... Apps can perform various functions such as allowing users to set fitness goals, tracking caloric intake, gathering workout ideas, and sharing progress on social media to facilitate healthy behavior change

1.6 : Data required & data collection method

Medical, health, and fitness apps are increasingly popular tools, with many endorsed by the NHS and approved as 'medical devices' by regulators. The apps encompass a range of functions, from calorie counting to tracking menstruation and mood. While their benefits are well known, they pose concerns regarding data privacy due to the sensitive information they can access and the use of a business model centred on either subscriptions or collection of user data.

A team of researchers from Macquarie University, Australia, examined the extent of the data privacy threat through a privacy audit of more than 15,000 free health apps from the Google Play Store, comparing their privacy standards with those of 8,000 non-health apps.

They analysed the app files and source code (static analysis) for the presence of data-collection operations and third-party presence in app sources, investigated the network traffic generated as the app runs (dynamic analysis) for ads, trackers, and personal data transmission, and also considered reviews posted by users. The analysis involved extracting permissions requested by the app to access OS components, using supervised machine learning to assess privacy policies, and building a dedicated app testbed, which runs a tool to intercept all traffic

transmitted to the internet. The apps were individually tested, with an average of 35 different activities each. The researchers found that 88 per cent of the health apps in their study could access and potentially share personal data, such as location, email address, and IMEI.
Four per cent of the apps transmitted data (mostly health and fitness apps). While this is a significantly lower proportion than for other apps, they noted that this still represents a large number of apps and is a cause for concern. This is because over 87 per cent of the data collection and 56 per cent of the data transmission was on behalf of third-party services; the strong presence of third parties was confirmed by examining the app traffic, which largely went towards third-party servers.

Chapter-2: System Analysisof existing System

2.1: Existing System along with limitations

In social interaction phase we have social features of fitness applications which can influence on changing health and fitness behavior and receiving support by other people in these social networks . Currently physical activity is a good way in order to improve resistance against psycho social stress [20] and recently Garmin has introduced a mechanism to measure stress level of smart watch's users by determining the interval between each heart beat. 2 One of the technologies which can hep smart fitness to be more effective for user is "Social-IoT" which actually is "device to device" interconnection that provides information sharing between non-human devices such as smart phones.

2.1 : Proposed System along with intended objectives

Feasibility is determination of whether or not project is worth doing i.e the system which is going to develop will be useful to the organization. The process followed in the making the determination is called feasibility study.

The five import tests are described below.

- Operational Feasibility
- Technical Feasibility
- Economical Feasibility
- Time Feasibility
- Legal Feasibility

Operational Feasibility- Proposed project is a which can be turned into information system that will meet the operation requirements of the user.

Technical Feasibility:-Technical feasibility is concerned with specifying equipments and software that

will successfully satisfy the user. Some import techs are: androidstudio

Economical Feasibility:- It looks at the financial aspects of the project.

Software cost:-

Androidstudio	**Free**

Manpower cost:-

Team cost	**0**
System cost	**65000**

Total cost:-

Total cost	**65000**

Time Feasibility:- We examine whether our proposed can be completed in specified time frame or not .

Duration of Project

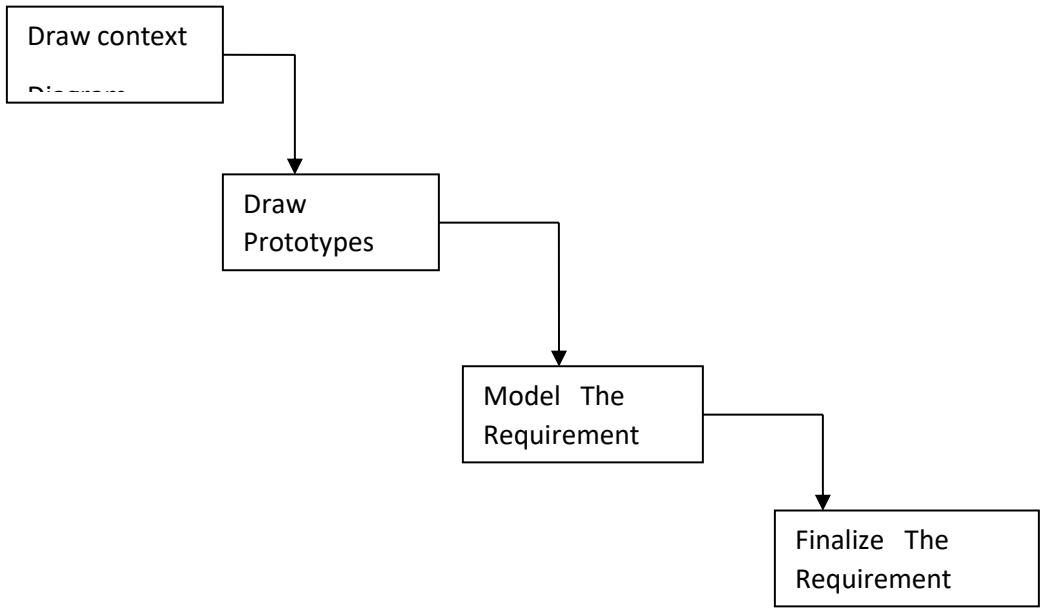
Time Duration	
For study	**19 days**
Designing	**18 days**
For development	**21 days**
Testing	**18 days**

Total time	**76 days**

Chapter-3: System requirement analysis

3.1:Requirement analysis

We should need to analyze for the FITNESS APP the following things—



Draw Context Diagrams – The context diagram is a simple model that defines the boundaries and interfaces of the proposed system with the external world. It identifies the entities outside the proposed system that interact with the system

Development Of Prototype – One effective way to find out what the customer really wants is to construct a prototype, something that looks and preferably acts like a part of the system they want.

Model The Requirement – This process really consist of various graphical representations of functions, data entities, external entities and the relationship between them. The graphical view may help to find incorrect, inconsistent, missing and superfluous requirement.

Finalize The Requirements – After modeling the requirements we will have better understanding of the system behavior. The inconsistencies and ambiguities have been identified and corrected.

FUNCTIONAL REQUIREMENTS

Functional requirements define the fundamental actions that must take place in the software in accepting the inputs and in processing and generating the outputs. These are listed as "shall" statements starting with "The system shall

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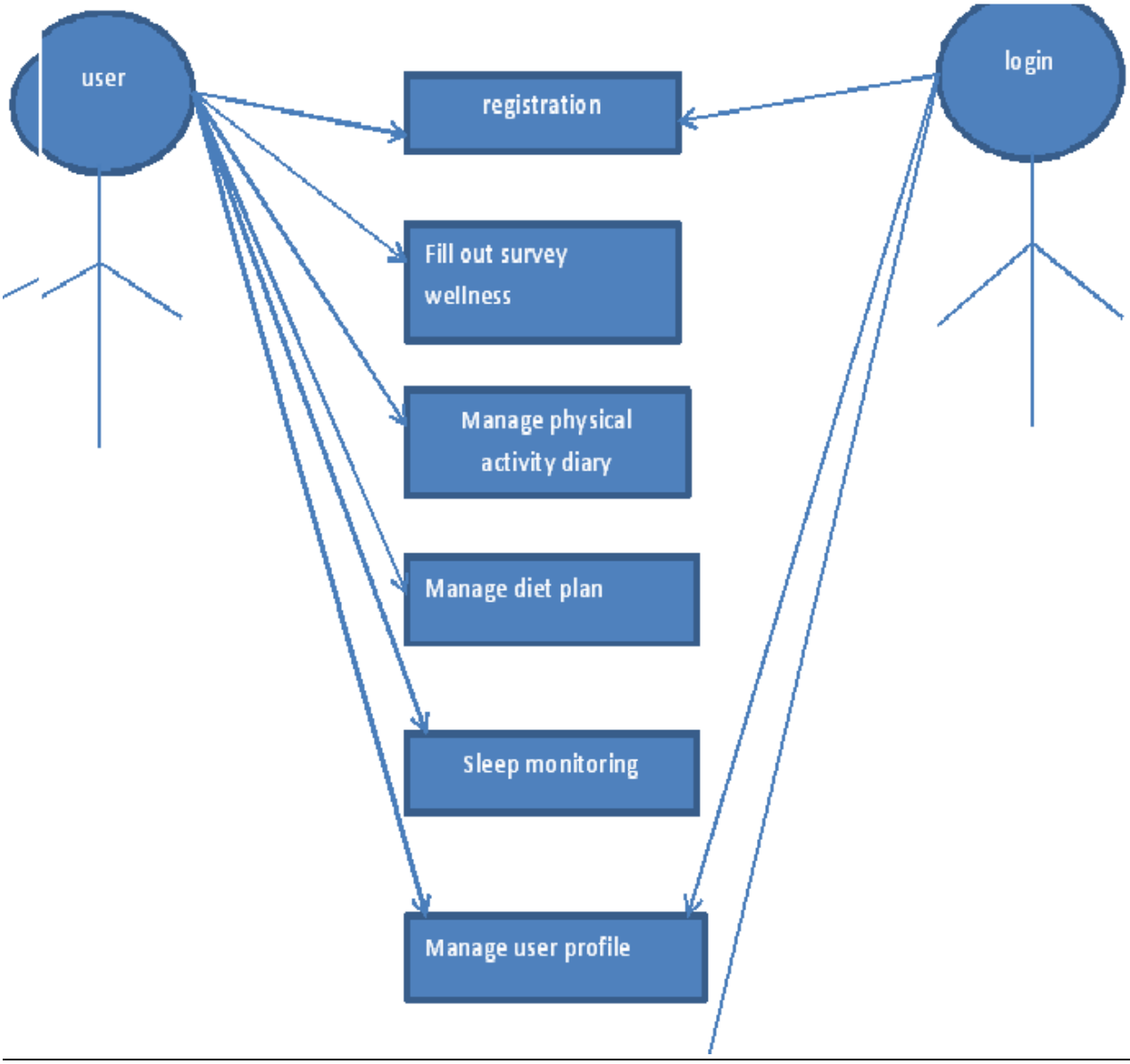
- Fitness goal calorie, fitness tracker, fitness calorie calculator
- Fitness goal calorie:
- A calorie is **a unit that measures energy**. Calories are usually used to measure the energy content of foods and beverages. To lose weight, you need to eat fewer calories than your body burns each day.
- fitness tracker-A fitness tracker is a **device that uses sensors to track your orientation, movement, and rotation**. The device collects data and converts it into steps, calories, sleep quality and general activity you perform through the day. ... A fitness tracker can easily figure whether you are running or spinning.
- Fitness calories calculator: Use our calorie-intake calculator to determine your daily caloric needs based on your height, weight, age and activity level. In addition to determining the calories needed to maintain weight, use this as a calorie burner calculator and figure out how many calories you need to burn in order to drop pounds. Then use the nutritional needs calculator and figure out how to break those calories into carbs, proteins and fat.
- **NON FUNCTIONAL REQUIREMENT**
- **Performance Requirement**
- The performance of the product mainly depends on the speed of Internet connection. If the user wants hard real time response, then this is definitely not the product to go for.
- **Safety Requirements**
- The electrical connection to the devices is critical and should be done according to the standards to avoid any

short circuits.

* **Security Requirements**
* We aim to provide high security features like encryption to the user accounts to provide security from illegal hacking and gaining access to the system.

Chapter-4: System Design

4.8: use case diagrams



Chapter-5: System Development

5.1: Program Development

Programming Improvement Life Cycle is the utilization of standard strategic policies to building programming applications. It's regularly isolated into six to eight stages: Arranging, Prerequisites, Plan, Fabricate, Record, Test, Convey, Keep up. Some venture directors will consolidate, split, or discard steps, contingent upon the undertaking's extension. These are the center parts suggested for all product improvement projects.

SDLC is an approach to quantify and improve the advancement cycle. It permits a fine-grain examination of each progression of the interaction. This, thus, assists organizations with boosting proficiency at each stage. As figuring power builds, it puts a more appeal on programming and designers. Organizations should lessen costs, convey programming quicker, and address or surpass their clients' issues.

SDLC accomplishes these objectives by distinguishing shortcomings and greater expenses and fixing them to run easily.

5.2 : Programming Platform

ANDROIDSTUDIO is a free, open source, integrated development environment (IDE) that enables you to develop desktop, mobile and web applications. They supports application development in various languages, XML,JAVA. The IDE provides integrated support for the complete development cycle, from project creation through debugging, profiling and deployment. They runs only on SMARTPHONES.

5.3: Query language

The Wear OS form factor is well-suited for situations when other form factors are less desirable, such as during exercise. In these situations, your app may need frequent data updates from

sensors, or you may be actively helping the user manage a workout. Health Services provides APIs that make it easier to develop these types of experiences.

Chapter-6: System Testing

Here the entire software system is tested. The reference document for this process is the requirements document and goal is to see if software meets its requirements.

Testing Techniques

Two Category of Software Testing

- Black Box Testing
- White Box Testing

Black box testing :System test falls under the **black box testing** category of software testing. This is applied during the later stage of testing. It enables the software developer to derive a set of input conditions that will

fully exercise the functional requirements of a program.

White Box Testing: This method also knows as glass box testing, is performed early in the testing process. Using the software engineer can derive a test that guarantees that all independent paths within the module have been exercised at lest once.

Chapter-7: Systems Implementation

Implementation (Techniques)

Structured Programming

In the process of coding, the lines of code keep multiplying, thus, size of the software increases. Gradually, it becomes next to impossible to remember the flow of program. Structured programming states how the program shall be coded. Structured programming uses three main concepts:

- **Top-down analysis** - A software is always made to perform some rational work. This rational work is known as problem in the software parlance. Thus it is very important that we understand how to solve the problem.
- **Modular Programming** - While programming, the code is broken down into smaller group of instructions. These groups are known as modules, subprograms or subroutines. Modular programming based on the understanding of top-down analysis.
- **Structured Coding** - In reference with top-down analysis, structured coding sub-divides the modules into further smaller units of code in the order of their execution.

Functional Programming

Functional programming is style of programming language, which uses the concepts of mathematical functions. A function in mathematics should always produce the same result on receiving the same argument. While control flow is transferring from one procedure to another, the program changes its state.

Functional programming provides means of computation as mathematical functions, which produces results irrespective of program state. This makes it possible to predict the behavior of the program.

Functional programming uses the following concepts:

- **First class and High-order functions** - These functions have capability to accept another function as argument or they return other functions as results.
- **Pure functions** - These functions do not include destructive updates, that is, they do not affect any I/O or memory and if they are not in use, they can easily be removed without hampering the rest of the program.
- **Recursion** - Recursion is a programming technique where a function calls itself and repeats the program code in it unless some pre-defined condition matches. Recursion is the way of creating loops in functional programming.
- **Strict evaluation** - It is a method of evaluating the expression passed to a function as an argument. Functional programming has two types of evaluation methods, strict (eager) or non-strict (lazy). Strict evaluation always evaluates the expression before invoking the function. Non-strict evaluation does not evaluate the expression unless it is needed.
- **λ-calculus** - Most functional programming languages use λ-calculus as their type systems. λ-expressions are executed by evaluating them as they occur.

Common Lisp, Scala, Haskell, Erlang and F# are some examples of functional programming languages.

1.1 Programming style

Programming style is set of coding rules followed by all the programmers to write the code. When multiple programmers work on the same software project, they frequently need to work with the program code written by some other developer. This becomes tedious or at times impossible, if all developers do not follow some standard programming style to code the program.

Coding Guidelines

Practice of coding style varies with organizations, operating systems and language of coding itself.

The following coding elements may be defined under coding guidelines of an organization:

- **Naming conventions** - This section defines how to name functions, variables, constants and global variables.
- **Indenting** - This is the space left at the beginning of line, usually 2-8 whitespace or single tab.
- **Whitespace** - It is generally omitted at the end of line.
- **Operators** - Defines the rules of writing mathematical, assignment and logical operators. For example, assignment operator '=' should have space before and after it, as in "x = 2".
- **Control Structures** - The rules of writing if-then-else, case-switch, while-until and for control flow statements solely and in nested fashion.
- **Line length and wrapping** - Defines how many characters should be there in one line, mostly a line is 80 characters long. Wrapping defines how a line should be wrapped, if is too long.

- **Functions** - This defines how functions should be declared and invoked, with and without parameters.
- **Variables** - This mentions how variables of different data types are declared and defined.
- **Comments** - This is one of the important coding components, as the comments included in the code describe what the code actually does and all other associated descriptions. This section also helps creating help documentations for other developers.

Software documentation

Software documentation is an important part of software process. A well written document provides a great tool and means of information repository necessary to know about software process. Software documentation also provides information about how to use the product.

A well-maintained documentation should involve the following documents:

- **Requirement documentation** - This documentation works as key tool for software designer, developer and the test team to carry out their respective tasks. This document contains all the functional, non-functional and behavioural description of the intended software.
- **Software Design documentation** - These documentations contain all the necessary information, which are needed to build the software. It contains: High-level software architecture, Software design details, Data flow diagrams,
- **Technical documentation** - These documentations are maintained by the developers and actual coders. These documents, as a whole, represent information about the code. While writing the code, the programmers also mention objective of the code, who wrote it, where will it be required, what it does and how it does, what other resources the code uses, etc.

  There are various automated tools available and some comes with the programming language itself. For example java comes JavaDoc tool to generate technical documentation of code.
- **User documentation** - This documentation is different from all the above explained. All previous documentations are maintained to provide information about the software and its development process.

Software Implementation Challenges

There are some challenges faced by the development team while implementing the software. Some of them are mentioned below:

- **Code-reuse** - Programming interfaces of present-day languages are very sophisticated and are equipped huge library functions. Still, to bring the cost down of end product, the organization management prefers to re-use the code, which was created earlier for some other software. There are huge issues faced by programmers for compatibility checks and deciding how much code to re-use.

- **Version Management** - Every time a new software is issued to the customer, developers have to maintain version and configuration related documentation. This documentation needs to be highly accurate and available on time.
- **Target-Host** - The software program, which is being developed in the organization, needs to be designed for host machines at the customers end. But at times, it is impossible to design a software that works on the target machines.

Post Implementation (Implementation)

PIER is a tool or standard approach for evaluating the outcome of the project and determine whether the project is producing the expected benefits to the processes, products or services. It enables the user to verify that the project or system has achieved its desired outcome within specified time period and planned cost.

PIER ensures that the project has met its goals by evaluating the development and management processes of the project.

The objectives of having a PIER are as follows −

- To determine the success of a project against the projected costs, benefits, and timelines.
- To identify the opportunities to add additional value to the project.
- To determine strengths and weaknesses of the project for future reference and appropriate action.
- To make recommendations on the future of the project by refining cost estimating techniques.

- Project team and Management
- User staff
- Strategic Management Staff
- External users

System Maintenance / Enhancement

Maintenance means restoring something to its original conditions. Enhancement means adding, modifying the code to support the changes in the user specification. System maintenance conforms the system to its original requirements and enhancement adds to system capability by incorporating new requirements.

Thus, maintenance changes the existing system, enhancement adds features to the existing system, and development replaces the existing system. It is an important part of system development that includes the activities which corrects errors in system design and implementation, updates the documents, and tests the data.

System maintenance can be classified into three types −

- **Corrective Maintenance** − Enables user to carry out the repairing and correcting leftover problems.
- **Adaptive Maintenance** − Enables user to replace the functions of the programs.
- **Perfective Maintenance** − Enables user to modify or enhance the programs according to the users' requirements and changing needs.

Summary/Conclusion

The project titled Fitness App is an android based application that enables the user to keep an eye on their fitness regime. The project has been completed successfully with maximum satisfaction. The constraints are met and overcome successfully. The system is designed like it was decided in the design phase. The project gives a good idea on developing a user-friendly application satisfying the user. The system is very flexible and versatile. This application has a user-friendly screen that enables the user to use it without any inconvenience. This project is more informative and more helpful for understanding the concept of android app development. This project is only a small and easy one but it is enough to implement my concept. I can further try much harder to make a much more efficient and useful app that can benefit others.

Limitations Of the Project

Although I have tried to do the best and try to do all the things that are possible in an FITNESS APP, but still the system contains some of the limitations.

The reason of these limitations is the time constraints. Time is the major problem. I Have to deliver the project in a particular time period. That's way I have to leave Some of the topics that actually I want to cover, I am still working on this software And my next goal is to remove these limitations and develop a more efficient and Elegant system.

1. This project does not give the information about the stock (quantity) present within the shop.

2. This project does not create monthly, yearly Reports.

After removing these and other minor limitations I hope this project will very efficient and effective.

Future Directions

To make our offering clearer to our users, we showed them a variety of workout plan options from the start. And we then customised these in real time based on the user's feedback, their performance, and changing needs. The information they provide has a direct impact on their future workouts. And it also provides data that we use to generate even better workouts for similar users in the future. This way we are constantly improving the workout experience.

Here's an example of what users see in the app and how their feedback is helping us create a more tailored workout for them in the future.

References

Google Search Engine for various searching

ONLINE REFRENCES

- https://developer.android.com/docs
- **https://github.com**