**Introduction**

Application for Health and Fitness is the name of our project. Even if modern medicine has made significant advancements and many diseases that were previously unknown are now curable, prevention is still preferable to treatment. If we can maintain our health and avoid illnesses by just adhering to a simple set of guidelines or habits is preferable than being treated. The same is carried out by our application. It offers tools like meal planning and calorie intake that can help keep the body in shape. One of a person's most basic necessities is water, which, if consumed in the correct quantity, may help us stay healthy. Our programme contains a function called drinking water reminder which reminds the user to drink water at frequent intervals.

Our ultimate objective of allowing healthy lifestyles to avoid obesity and obesity has the potential to be addressed through the development and implementation of wireless technology to encourage healthy lifestyle behaviour, particularly healthy eating and weight control illnesses that are connected. We just eat on a diet during the day. And a balanced diet is one that has the right amount of each vitamin we need each day.

**Abstract**

The usage of mobile phones can make it easier to maintain a healthy diet. Mobile devices offer a reasonable infrastructure that may be leveraged to give affordable, High-quality tools for behaviour change and monitoring. Mobile devices by their very nature allow for customization and personalization, quick access to nutritional data, and accurate tracking of consumption patterns. This Android software offers a comprehensive answer to all health-related problems and queries. It can track your diet, provide nutritional facts about food, calculate your BMI, and provide details about certain common medications, among other things.

The number of members at various Fitness & Health Clubs has significantly increased as people become more health concerned.

Owners of fitness centres may find it challenging to manually handle submissions for admittance, information about current and past members, event planning, etc. The goal of the proposed Android app project is to automate the management of fitness and training facilities. By selecting a membership plan and paying the required fees, new members may easily join the fitness club. Members can then access the app using their login information. Users are able to select a target and establish a goal for themselves. Users of the app will receive notifications of upcoming events, and if they're interested, they may register.

There is a growing market for mobile applications that help users live healthier lives by promoting them to adopt healthy habits. Developers of mobile applications have an intriguing issue. Algorithms for step and sleep tracking are included in our programme. The programme also monitors the user's mood throughout the day, and the user may use this information to study the relationship between activity, sleep patterns, and mood in general. SAM Fitness, a wellness app for the Android operating system, is created and tested as part of this project to keep track of these variables.

**Objective**

Only at the compliance stage have we produced an application with the functionality listed below. The project's primary goal is to build and create an intuitive, effective computerised gym management system. A reliable system with no redundant data. Safekeeping of data for use by the authority. A flexible system that can manage the staff-customer connection well.

1.Improved graphical user interface provision.

2. Automating the current setup.

3.To coordinate the management of the fitness centre and fitness facility.

4.Minimize the cost of gym maintenance, data storage, and the amount of space used up by active files.

5.Minimize data duplication. The recurrence of comparable data in a system is known as redundancy.

In addition to keeping track of people's attendance and gym records, it also keeps track of what medications each person who joins the gym uses. To create an Android-based system for creating and managing nutritional menus based on a model of the dietitian's work flow. The method is intended for use by individuals in remote locations without recognised competent dietitians.

This project serves as an example of how to utilise an Android smartphone. The project sheds light on how it may be applied to provide greater functions for the convenience of human living. Connecting everything to a single database and storing data on the cloud is the sensible approach to operate in this world. A person might log into an application to interact after the information is linked.

1.To cut down on paperwork

2.To save money

3.To make the app always accessible to the user

4.To give information that is clear and understandable

6. To enable downloading of the diet plan

7.To improve the usability of the app

**Existing System**

The system currently in use is referred to as an existing system. The gym is manually operated. The existing method requires a lot of paperwork, which makes it time-consuming and expensive. Handling the system manually was an extremely challenging task. Nonetheless, modern computerization has made job easier. The following are the justifications for computerising the present system: In the current system, examinations are solely administered manually; however, under the proposed system, exams must be computerised utilising this programme.

1.Data security issues.

2.Additional personnel.

3.It takes time.

4.Consumes a significant amount of pare labour.

5.Requires manual computations.

6.No direct responsibility for the superior official.

7.To boost productivity while cutting costs.

8.To lessen the administrative load.

9.To conserve time when recording information about each and every member and employee.

10.To quickly produce the necessary reports.

**Limitation of Current System:**

1.Users are not as satisfied with Current Systems like Gym Master (Customer) Friendly in comparison to the system we proposed.

2.The current system does not facilitate effective member contact because all

3.The gym manager is in charge of the data.

4.Gym centre customers don't have full access, and all permits are

5.The current system cannot make managing money and collecting debt easier.

6.Today's systems require time-consuming software that is difficult to deploy in Operating systems like Novel, Linux, Vista, and Mc- OS. moreover, high PC configuration. It cannot be installed in by regular PCs.

7.A large amount of RAM is needed to install current applications.

8.Current gym management software is unable to carry out all anticipated operations.

**Proposed system**

The application for managing online gyms is user-friendly. With this automated technique, all functionality more convenient for both users and owners. It is incredibly easy to implement and design. The system prerequisites are quite minimal. In practically all settings, system resources and the system itself will function.

**Login/Registration**

The system will register all new users, including administrators, sub-administrators, trainers, and consultants with all the information they require. The respective authenticate user is given a username and password at the time of registration. For security purposes, the user-provided password is encrypted before being saved to the database. Moreover, phone and email address verification is done during registration to determine who the real user is.

**Verification of Phone and Email Addresses**

Having an Aadhaar number is now required for carrying out numerous important operations, and it may be used to confirm a utilised to retrieve some of a person's useful information, such as age and address. The 12-digit UID and Aadhaar card are issued by the UIDAI, which also offers a number of helpful online resources on its website (uidai.gov.in). One of these tools makes it possible to confirm that a user is legitimate by checking their phone number and email against the UID they have supplied. This tool may be used to confirm the cell phone number and email address provided at en-rollment or the most recent successfully completed update.

**Consumers' interactions with trainers and consultants**

Consumers are expected to provide information about their current health and body requirements also any previous medical history. Trainers provide a suitable training regimen and set of exercises that customers may follow to achieve their goals after assessing the data they have submitted. Maintaining a healthy lifestyle is more successful when exercise and a nutritious food are combined. One's health can be improved significantly through consultation. In order to forecast the correct diet and supplements for the in needed workout and diet plans will be offered to user in the form of recommendation reports, the consultant also analyses the data provided by the user. Properly It is solely the duty of the consumer to follow the advised reporting.

**Activity Tracker**

The suggested system's essential component for tracking user activity is the activity tracker. It Users, trainers, and consultants will all benefit from routine tracking and, as a result, updating the logs as needed. Customers are expected to often feedback from the system services is generated.

**Generating Reports Automatically**

There will come a day when this intelligent system won't need the consultants and trainers to lead the when requested, users. Only the system automatically provide recommendation reports for users after assessing past data and requirements. Here, NLP (natural language processing) is the method employed. NLP is a branch of artificial intelligence that studies how computers and natural languages interact.

**Specifications for Requirements**

At first, a 200 MHz processor was the absolute minimum needed for Android 32 MB of storage, 32 MB of Memory, and a 32 MB CPU. 600MB or more of free storage space for the standard SDK package. An additional 00 MB must be downloaded into the SDK for each platform. ARMv4 or lower cannot run native code on Android out of the box; you must have ARMv5 or above to do so. An ARMv7 CPU is required for Android 4+. Nonetheless, ARMv6-specific versions of Android 4+ have been developed.

Cases of Usage:

It is a method for identifying the system's functional needs.

It outlines how the user and the system communicate.

It facilitates the communication of a development project's scope.

**Super Admin Entity**

Application cases for super admin include managing gyms, managing gym shifts, managing gym facilities,

Manage the following: the package, the trainer, the money, and the branch control users and the overall operation of the gym management system.

**User entity for the system**

Manage gym, manage gym shift, manage gym facilities, manage package, and manage trainer are examples of use cases for the system. Handle branch and payments.

**Instructor Entity**

The trainer may be used to establish schedules, diet charts, add training plans, and view members.

**Membership Entity**

Member use cases include looking up a gym, applying for membership, seeing exercises, and making payments.

**System Architecture**

The four basic divisions of the system architecture are: servers, hubs, displays, and sensors. The system was created to be as affordable as it could be while also being universal for many different sorts of gyms. This design makes an effort to handle issues with scalability, range, and varying quantities of exercise equipment. Individuals' bodies would be covered with the screens and sensors.

Gym equipment, so that the user would grasp the impending bookings machine by machine for a certain device. The basic objective of the sensor is to feed data back to the hub so that the server can compile it. The hub's objective is to compile information from the Distribute remote reservation information to the displays as well as sensors and the display, and send it to the server.

The server then communicates with the user and sends information that the user has requested. Also, it deals with fresh reservation requests. One method the user can communicate with the system is by sending HTTP requests to the server, mostly to get information or make reservations. Using the gym equipment is another method the user may communicate with the system. They will then update the hub after activating the sensors. The final method the user interacts with the system is by reading from the \ s displays and finding out the information about \ s reservations for that machine.

The open source Android software stack was developed for a variety of devices and form factors. The Android operating system is a collection of programmes components, which may be loosely categorised into four tiers.

(1) Libraries

ii. Application Framework

iii. Application

Android. See the essential components that make up application user interfaces. Android, in. A wide range of pre-made user interface elements, including as buttons, labels, list views, layout managers, radio buttons, etc., are included in widgets.

**Applications Framework**

Many higher-level services are provided to programmes via the Application Framework layer in the form of Java classes. These services may be used by application developers in their creations. The activity stack and application lifecycle are completely under the control of the activity manager.

Applications can publish data and share it with other apps thanks to content providers.Access to embedded non-code resources like strings, colour schemes, and user interface layouts is made possible via the resource manager. Applications can show warnings and notifications to the user with the help of the notifications manager. An extendable collection of views called a "view system" is used to build application user interfaces.

B. Design Techniques

The majority of current application development approaches are based on the API. Platform: This fundamental characteristic plays a crucial role in how you want to develop your apps.

Prior to selecting your application's phases, you must select the region to which you must send your application and your target customer. Backend - On the other hand, not all of the applications you develop will be able to easily connect to various mobile devices via APIs without changing the backend code. In this manner, you can continue peacefully with your local database, so apps don't require the assistance of the backend

**User interface and design**

If you neglect the UI/UX and outline, then your programme won't receive a positive response from the target audience. The most important pixel is the UI/UX setup since it determines how well your programme works.

Test your app before releasing it to the public. Your app should be simple to use and provide the best performance every time. Consequently, testing your mobile application before releasing it to the market is really essential.

**The waterfall model**

The first Process Model to be introduced was the Waterfall Model. It is incredibly easy to use and comprehend. In With a Waterfall model, there is no overlap between the stages and each phase must be finished before the next may start. The first SDLC methodology to be adopted for software development was the waterfall model. In a sequential design process known as the waterfall model, the steps of conception, initiation, analysis, design, construction.

**High Level Planning**

HLD — System design at the highest level, including system architecture and database layout. It explains the connections between the system's many components and functionalities. HLD covers data structures, flowcharts, and data flow.

**Strategic Planning**

HLD - Highest level of design for a system, comprising system architecture and

database design. It describes how the system's many parts and functions relate to one another. Data flows, flowcharts, and data structures are all covered by HLD.

**Sequence Diagram**

The order of item interactions is shown in a sequence diagram. in order of time. It shows the classes and objects involved in the scenario as well as the flow of messages that must be exchanged for the objects to work as intended. Sequence charts (SDs)

Often connected with use case realisations in the system's logical view. Event diagrams are another name for sequence diagrams. scenarios for events or diagrams.

**Physical Deployment**

A diagram of deployment is one that displays th configuration of the components and run-time processing nodes that reside on them. A type of structure diagram known as a deployment diagram is used to represent the physical components of an object-oriented system. They are frequently used to simulate a system's static deployment perspective (topology of the hardware).

**Schematic of the physical deployment**

A deployment diagram is a diagram that displays the setup of the components located on run-time processing nodes. A type of structure diagram known as a deployment diagram is used to represent the physical components of an object-oriented system. They are frequently used to simulate a system's static deployment perspective (topology of the hardware).

**Security**

We can accomplish almost everything online—from anywhere, at any time—with mobile devices. In a setting where the prevalence of hacking, data breaches, and criminality makes system security a key concern in the creation of mobile applications. Users of this programme will have security.

**Class Diagram**

A class diagram in software engineering is a kind of static structural diagram that explains a system's structure by using the Unified Modeling Language (UML). displaying the classes in the system, their properties, methods, and connections between objects. The class diagram serves as the foundation of object-oriented modelling. Class diagrams can be utilised as well while modelling data.

**User Interface & Navigation GUI Design.**

Everything a user may see and do within an app is part of its user interface. You may create the graphical user interface for your app using a range of pre-built UI elements that Android offers, such as structured layout objects and UI controllers.

**Implementation of a System**

The process of turning an idea from a concept into reality is called implementation. I have a user setting in my app.They may select Days, Body Parts, a food plan, utilities, a competition, and dietary supplements while setting up Gym Buddy. This programme will create daily, weekly, or monthly schedules. The Smart Gym Health/Fitness System will be implemented by this application by: Configuring a gym workout to query that table every minute.

**Runtime for Android**

Each app operates in its own process and with its own set of resources on devices running Android version 5.0 (API level 21) or higher. The Android Runtime on your own computer (ART). ART is developed to execute DEX files, a byte code, to operate numerous virtual machines on low-memory devices.

Format optimised for a small memory footprint and created specifically for Android. Build tool chains, like Jack, translate Java source code into DEX byte code that can be executed on the Android operating system. A few of ART's key characteristics are as follows:

1. Optimised trash collection Ahead-of-time (AOT) and just-in-time (JIT) compilation (GC)
2. Improved debugging assistance, including the ability to specify watch points to monitor certain fields, a dedicated sample profiler, thorough diagnostic exceptions, and crash reporting.

**Conclusions**

The "(SMART GYM) HEALTH/FITNESS SYSTEM" has been successfully created to meet. The system is highly user-friendly, form level validation and field level validation are working very well, and other important criteria that were discovered during the requirements analysis process. There were several issues with the outdated manual system. The current project was created to fulfil the ambitions suggested by the modern era.

The user of the Smart Gym Health/Fitness System may save information on their medications, employees, gym patrons, gym equipment, and more.This software package enables the storage of all gym-related data in its entirety. If the database is maintained and cleaned over a specific period of time, the system is robust enough to resist regressive annual operations. The system's use in the company will significantly cut down on data entering time and allow for quickly computed results.

This system will be effectively planned and built to meet the requirements of the user, such as advising the user to follow a healthy diet and exercise regimen according to well-known consultants and trainers, performing activity tracking, online payments, and field level validation.

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