Smart Gym Health/Fitness System android Mobile Application

[1]Hafiza Maria Rafique, [2]Maria Ilyas, [3]Ms.AmnaNisar

[1,2]*Graduate student, Department of Computer Sciences, Government Collage Women University Faisalabad, Pakistan.*

[3]*Lecturer, Department of Computer Sciences, Government Collage Women University Faisalabad, Pakistan.*

Abstract

The emerging popularity of so-called "Wellness Apps" (mobile applications designed to assist users in pursuing a healthy lifestyle by encouraging them to make positive lifestyle decisions) has presented an interesting challenge to mobile application developers. Our application incorporates step and sleep tracking algorithms. In addition, the application tracks the user's mood throughout the day, and, using this data, the user can monitor the correlation between his or her exercise, sleep habits, and overall mood. In this project a Wellness App for the Android platform, SAM Fitness, is developed and tested to track these factors.

Keyword: *Wellness Apps, incorporates step, sleep tracking, user's mood, exercise, SAM Fitness, track.*

Introduction

The main purpose of this project is to automate a gym or a fitness center and therefore facilitating its operations. It makes the clients and staff data and schedule easily accessible and also making it easy to keep records in a secure database.Gym Buddies is a community based health and fitness mobile application. It aims to offer a social environment for people interested in health and fitness. The application will be fueled by user generated content, users will be able to submit and view exercise programs within the application. All programs in the application will be submitted by users of the application, so if a user finds a certain program works really well for them or finds a useful workout on the internet, they can submit it to the application for other users to try out. Users will be able to rate programs submitted to the application, this will help ensure high quality content within the application. Users can browse and try out programs as provided in the app, or they can save a program to their own personal list and make tweaks to them in order to better suit their needs. A user could have an injury or other health related reason not to do a certain exercise so they can then switch out certain ones as they wish from the program they are using. Additionally, a one to one messaging system will be attempted, this serves many purposes but the main one is to help users pose any questions they may have about a program to its author.This idea was chosen as there is huge interest in the health and fitness industry and activity in this area continues to rise. While the health and fitness industry continues to grow at a rapid pace, unfortunately, so too do obesity levels. Ireland is on track to become the most obese nation in Europe by 2030 so another tool to help tackle this, as well as encouraging people to be more active, can only be a good thing. The application aims to give people a tool to help them be their best self and turn the tide on obesity. To this end, the application will also have a "gyms nearby" feature. As the name suggests, this feature will show users the closest gyms to their current location plotted on a map.

Objective

We have developed an application only on compliance stage where the application contains following features: The main objective of the project is to design and develop a user friendly efficient computerized Gym Management System.

- An accurate system without any data redundancy.
- Secured data storage for Authority end.
- A flexible system which can maneuver the customer-staff relationship in an effective manner.
- To provide better graphical user interface.
- Automating the existing system.
- To centralize the management of the gym and fitness center.
- Reduce the cost of maintenance of the gym and data storage and reducing the space occupied the files being used.
- Reduce data redundancy. Redundancy is the repetition of similar data in the system.
- It even maintains the data of what and all medicines used by the people who join the gym.
- It also maintains the people's attendance, gym records.

Existing System

An Existing system refers to the system that is being followed till now. The gym is working manually. The current system is time consuming and also it is very costly, because it involves a lot of paperwork. To manually handle the system was very difficult task. But now-a-days computerization made easy to work.

The following are the reasons why the current system should be computerized:

In the existing system the exams are done only manually but in proposed system

We have to computerize the exams using this application.

- Lack of security of data.
- More man power.
- Time consuming
- Consumes large volume of pare work.
- Needs manual calculations.
- No direct role for the higher official.
- To increase efficiency with reduced cost.
- To reduce the burden of paper work.
- To save time management for recording details of each and every member and employee.
- To generate required reports easily.

Limitation of Existing System:

- The existing System such as Gym Master is not as much as user (Customer)
- Friendly as compare to our Proposed System.
- The communication with members is not well in Existing System because all
- The data is handled by Gym manager.
- Customers don't get full accessibility to Gym center and all permissions are
- Today's System cannot take effort out of finances and debt collection.
- Today's systems are time taking software and cannot be easily install in
- Operating System like Linux, Vista, Mc-OS, and Novel. And also need high
- Configuration of PC. Normal PC's cannot install in it.
- Lot of memory space is required for installing existing software.
- Existing Gym management software cannot perform all operation expected
- By manager such as keeping record of machinery maintenance and service.

Proposed System

The online gym management system is user-friendly application. This automated system makes all functionality easier for both owners and customers. It is very simple in design and to implement. The system requirements are very low. System resources and the system will work in almost all configurations.

Login/Registration

All the new users of system (including Admin, Sub-Admin, Trainers, and Consultants) will register themselves with all the necessary details. At the time of registration the respective authenticate user is provided with a username and password. The Password provided by the user is encrypted before saving to the database for security reason. Also phone and email address verification is carried out at the time of registration to identify the genuine user.

Phone and Email Address Verification

Aadhaar number is now mandatory for carrying many essential tasks, is can be used for verification of a person and also used for fetching some useful data of a person like Age and Address.

The UIDAI, the issuer of the 12-digit UID and the Aadhaar card, has provided many useful online tools on its portal (uidai.gov.in). One of these tools enables to verify the valid user by verifying the user's phone no. and email from the UID provided by the user. This feature can be used to verify email address and mobile number that has been declared during enrolment or latest successful processed update.

Interaction of Customers with Trainers /Consultancy

Customers are intended to specify their body requirements along with their present health condition also past medical history if any. By analyzing customer provided data, Trainers suggest them proper set of exercise and routine, by following which customer can fulfill their desires. Combining exercise with a healthy diet is a more effective way to maintain healthy lifestyle. Consultancy plays a significant role in boosting one's health. User provided data is also analyzed by consultant in order to predict proper diet and supplements for the needy workout and diet plans will be provided to user in the form of a suggestion reports. Properly Following the suggested reports is mere responsibility of customers.

Activity Tracker

Activity Tracker is one of the key feature of proposed system which will keep the track of user's activity. It will benefits to both users as well as trainers and consultancy for regularly tracking and thus updating the

logs if & when required. Users are intended to regularly generatFeedback reports about the system services.

Automated Report Generation

There will be a point when this intelligent system will not require the trainers and consultancy to guide the users when requested. The system only, by analyzing the previous data & the requirements, will automatically generate the suggestion reports for users. The technique used here is NLP (Natural Language processing). NLP is a field of artificial intelligence that deals with the interaction between computers and Natural languages.

Requirement Specifications

- The absolute minimum requirement for Android were originally a 200 MHz processor, 32 MB of RAM, and 32 MB of storage.
- For the base SDK package, at least 600MB of available disk space. For each platform downloaded into the SDK, an additional 00 MB is needed.
- Out of box, Android is incompatible with ARMv4 or lower: ARMv5 or higher is needed to run native code without modifications.
- Android 4+ requires an ARMv7 processor. Custom version of Android 4+ have been made for ARMv6 however.

Use Cases

- It is the technique for capturing the functional requirements of the system.
- It describes the interaction between the user and the system.
- It helps to communicate the scope of a development project.
- Emphasis on **what** a system does rather than **how.**

The relationship between and among the actors and the use cases of Gym Management System:

- **Super Admin Entity**

Use case of super Admin are manage gym, manage gym shift, manage gym shift, manage gym facility, manage package, manage trainer, manage payment, manage branch manage user and full Gym management system operation.

- **System user entity**

Use cases system user are manage gym, manage gym shift, manage gym facility, manage package, manage trainer. Manage payment, manage branch.

- **Trainer Entity**

Use case of trainer are create schedule, create diet chart, add workout plan, view member.

- **Member Entity**

Use case of member are search gym, Apply for membership view workouts, make payments.

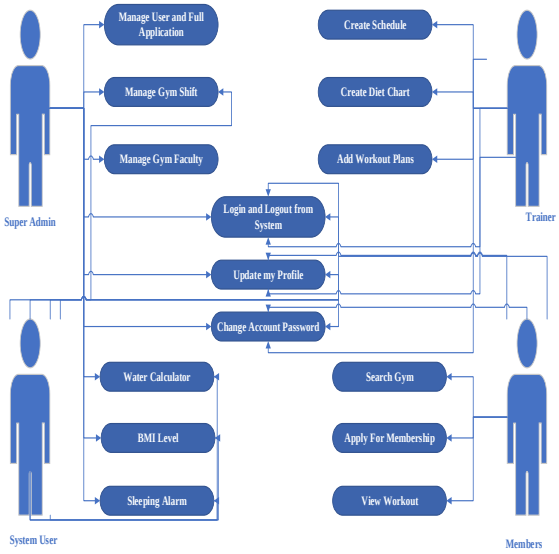


Figure 3.1: Use Case

A. System Architecture

The system architecture is split into four main categories: Sensors, Displays, Hub, and Server. The overview of the architecture can be seen in Figure 3. The system was designed in order to be as low cost as possible, while still retaining generality for many different types of gyms. This architecture attempts to address problems of range, variable amounts of gym equipment and scalability.

The displays and sensors would be placed on individual gym equipment, so that the user would have a by-machine understanding of the reservations upcoming for a given machine. The sensors main goal is to send information back to the hub, for collation by the server. The goal of the hub is to gather the data from the sensors and the display and send it to the server, as well as distribute remote reservation data to the displays. Finally, the server interacts with the user and sends information as requested to the user. It also handles any new reservation requests.

One way the user interacts with the system via HTTP requests to the server, primarily for requesting information or setting reservations. Another way the user will interact with the system is using the gym equipment. By doing so, they will activate the sensors, who will update the hub. The final way the user interacts with the system is by reading from the displays and finding out the information about reservations for that machine.

Android is an open source, Linux-based software stack created for a wide array of devices and form factors. Android operating system is a stack of software components which is roughly divided into 4 layers.

i. Libraries
ii. Application Framework
iii. Application

a) Libraries

i. **Android. View** − the fundamental building blocks of application user interfaces.

ii. **Android. Widget** − A rich collection of pre-built user interface components such as buttons, labels, list views, layout managers, radio buttons etc.

b) Application Framework

The Application Framework layer provides many higher-level services to applications in the form of Java classes. Application developers are allowed to make use of these services in their applications.

- **Activity Manager** − Controls all aspects of the application lifecycle and activity stack.
- **Content Providers** − Allows applications to publish and share data with other applications.
- **Resource Manager** − Provides access to non-code embedded resources such as strings, color settings and user interface layouts.
- **Notifications Manager** − Allows applications to display alerts and notifications to the user.
- **View System** − An extensible set of views used to create application user interfaces.

B. Design Methodology

Current methodologies for developing an application is mostly based on the API.

- **Platform** - This is a basic parameter and it assumes a critical part when you are intending to build up your applications. Before picking the stages for your application, you have to choose the area where you need to dispatch your application and your objective client
- **Backend** - At the extremely same time, not all applications that are created by you won't require an alter backend programming and can without much of a stretch associate with different mobiles utilizing APIs. Along these lines, you can continue serenely with your neighborhood database accordingly applications don't need the help of the backend
- **User interface and design** - In the event that you overlook the UI/UX and outline, at that point your application won't get a decent reaction from the gatherings of people. The UI/UX configuration is the most noteworthy pixel since it chooses the accomplishment of your application.
- **Test your app before it launches in the market** - Your application ought to be easy to understand, and will dependably give the best execution. Therefore, it is extremely basic to test your portable application before you are wanting to dispatch it in the market.

a) Waterfall Model

The **Waterfall Model** was first Process Model to be introduced. It is very simple to understand and use. In a *Waterfall* model, each phase must be completed before the next phase can begin and there is no overlapping in the phases. *Waterfall* model is the earliest SDLC approach that was used for software development. The waterfall model is a sequential design process in which progress is seen as flowing steadily downwards (like a waterfall) through the phases of Conception, Initiation, Analysis, Design, Construction, Testing, Production/Implementation and Maintenance.

Figure 4.4**: Waterfall** Model

C. High Level Design

HLD -- High Level Design (HLD) is the overall system design - covering the system architecture and database design. It describes the relation between various modules and functions of the system. Data flow, flow charts and data structures are covered under HLD.

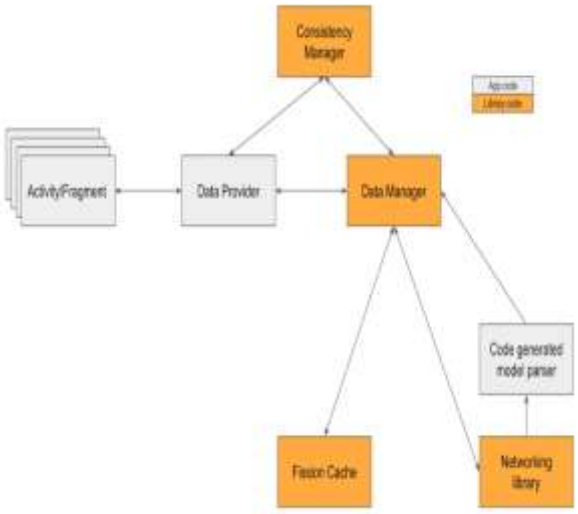


Figure 4.5**:** High level Design

a) Main Design Features

The main design features include five major parts: the architecture, the user interface design, external interface, the database, process relation, and automation.

b) Conceptual or Logical:

Package Diagram

A package is a collection of logically related UML elements. Package diagram, a kind of structural diagram, shows the arrangement and organization of model elements in middle to large scale project. Package Diagram can be used to simplify complex class diagrams. Package diagram can show both structure and dependencies between sub-systems or modules, showing different views of a system.

c) Process

Sequence Diagram

A sequence diagram shows object interactions arranged in time sequence. It depicts the objects and classes involved in the scenario and the sequence of messages exchanged between the objects needed to carry out the functionality of the scenario. Sequence diagrams are typically associated with use case realizations in the Logical View of the system under development. Sequence diagrams are sometimes called event diagrams or event scenarios.

d) Physical Deployment Diagram

A deployment diagram is a diagram that shows the configuration of run time processing nodes and the components that live on them. Deployment diagrams is a kind of structure diagram used in modeling
the physical aspects of an object-oriented system. They are often be used to model the static deployment view of a system (topology of the hardware).

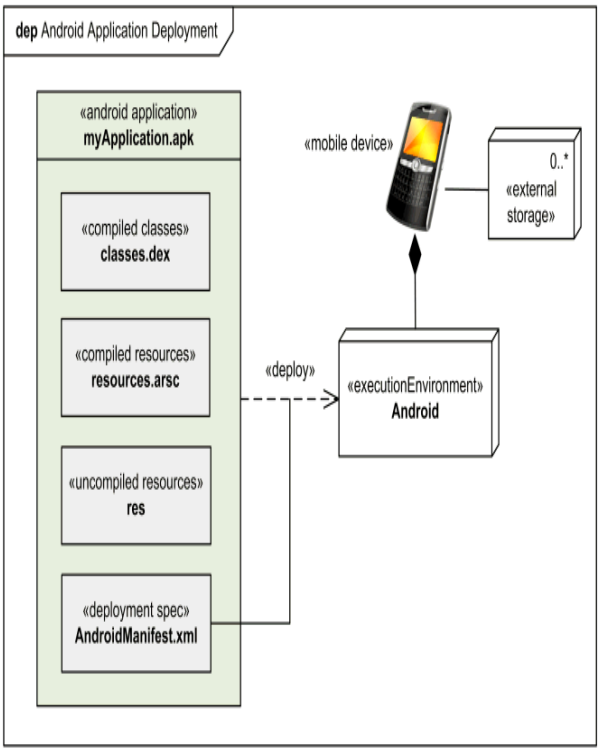


Figure 4.6**:** Deployment Diagram

e) Security:

Mobile devices allow us to do nearly everything online—from anywhere, at any time. In a world where hacking, data leaks, and cybercrime is more prolific, System security is an important concern in mobile application development. This application will provide security to users.

D. Low Level Design

a) Class Diagram

In software engineering, a class diagram in the Unified Modeling Language (UML) is a type of static structure diagram that describes the structure of a system by

showing the system's classes, their attributes, operations (or methods), and the relationships among objects. The class diagram is the main building block of Object-Oriented modelling. Class diagrams can also be used for data modeling.

E. GUI Design

User Interface & Navigation. App's user interface is everything that the user can see and interact with. Android provides a variety of pre-built UI components such as structured layout objects and UI controls that allow you to build the graphical user interface for your app.

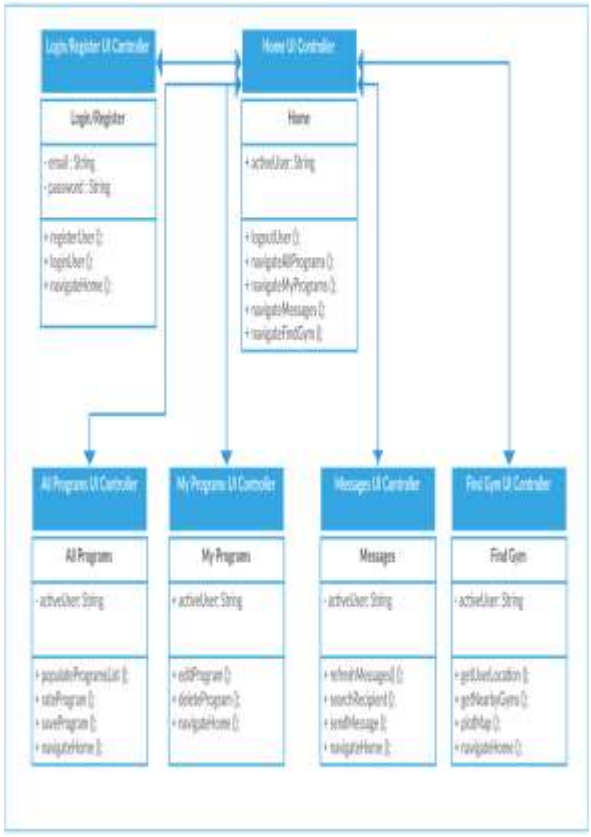


Figure 4.7**:** GUI Design

System Implementation

Implementation is the process of moving an idea from concept to reality. In my app, I have a setting for user to set Gym Buddy and they can choose Days, Body parts, diet plan, utilities, competition, and dietary supplement. This application will schedules on daily and weekly or monthly basis. This application will implement a Smart gym health/fitness system by: Then set up a gym workout to query that table every minute.

System Architecture

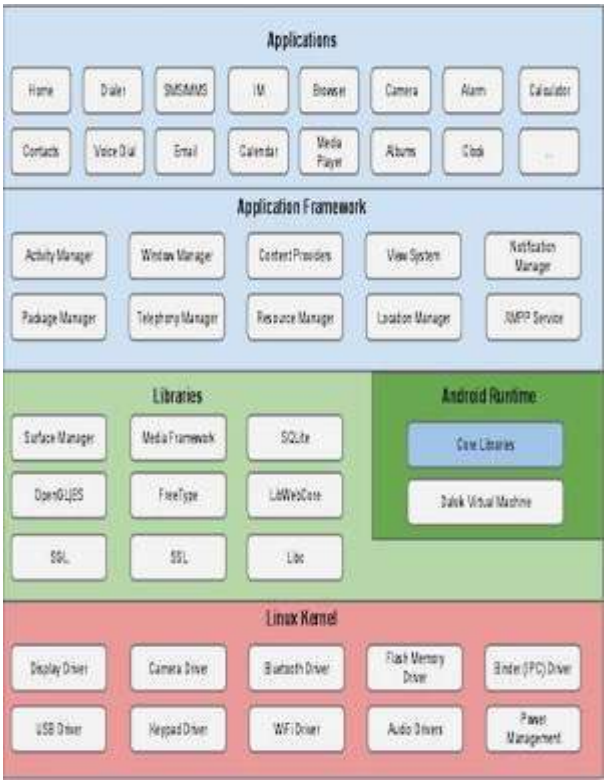


Figure 5.1:System Architecture

Android Runtime

For devices running Android version 5.0 (API level 21) or higher, each app runs in its own process and with its own instance of the Android Runtime (ART). ART is written to run multiple virtual machines on low-memory devices by executing DEX files, a byte code format designed especially for Android that's optimized for minimal memory footprint. Build tool chains, such as Jack, compile Java sources into DEX byte code, which can run on the Android platform.

Some of the major features of ART include the following:

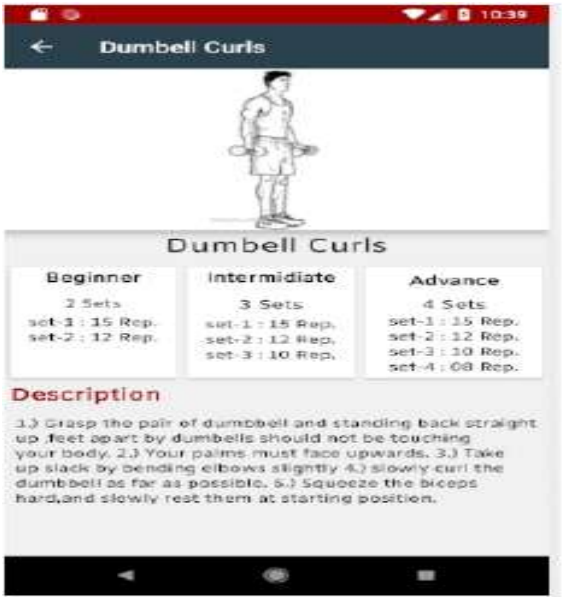
- Ahead-of-time (AOT) and just-in-time (JIT) compilation
- Optimized garbage collection (GC)
- Better debugging support, including a dedicated sampling profiler, detailed diagnostic exceptions and crash reporting, and the ability to set watch points to monitor specific fields

- Prior to Android version 5.0 (API level 21), Dalvik was the Android runtime. If your app runs well on ART, then it should work on Dalvik as well, but the reverse may not be true.

Gym Application

This application is for People. First of all Application's Splash form appear, then user will create his/her account enter his/her data in signup page and will login. User can also change his/her password. After Login Main Activity will appear.

Figure 4.8**:** Menu Figure



4.24**:** Exercise detail

Figure 4.27**:** Diet plan vegetarian

Figure 4.28**:** Diet plan Non vegetarian

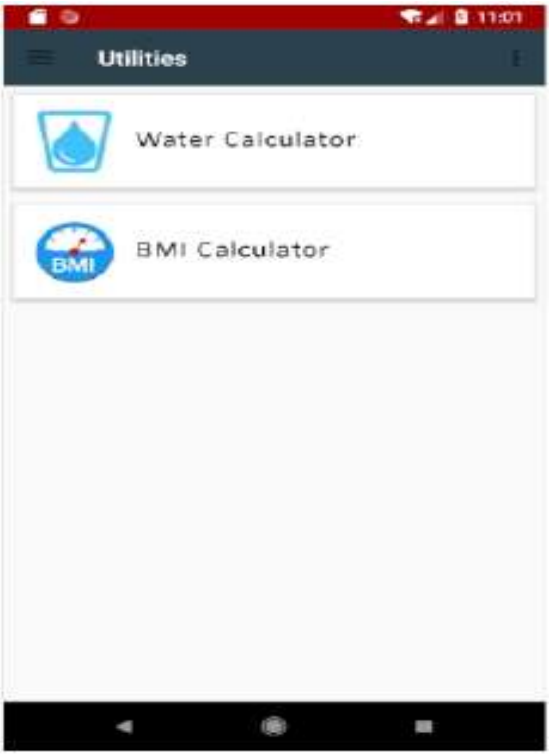


Figure 4.29: Calculator's

Figure 4.31: BMI Calculator

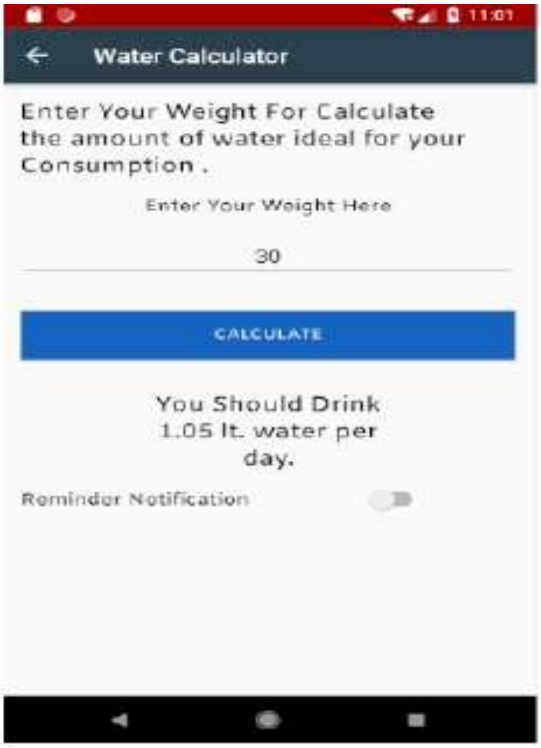


Figure 4.30: Water Calculator

Figure 4.32: Competitions

Figure 4.33: Diatry Supplements

Figure 4.35: Detail

Figure 4.34: Product Detail

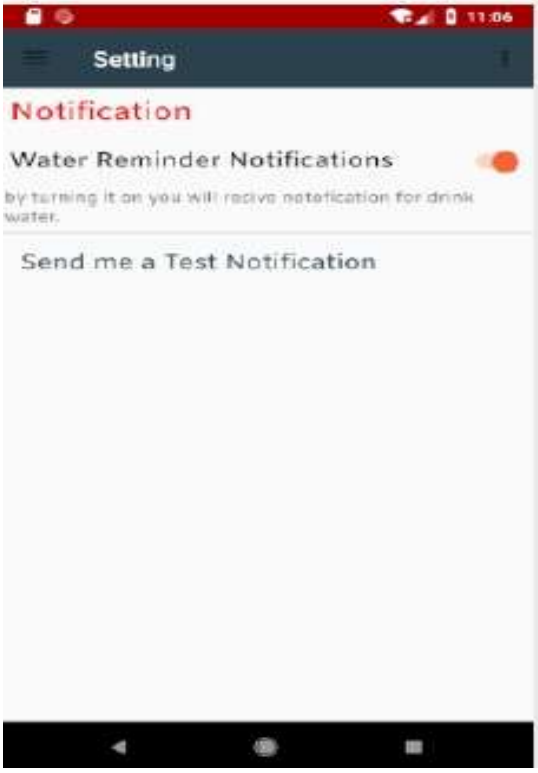


Figure 4.34: Setting

Conclusions

The "SMART GYM HEALTH/FITNESS SYSTEM" is successfully designed and developed to fulfilling the necessary requirements, as identified in the requirements analysis phase, such as the system is very much user friendly, form level validation and field level validation are performing very efficiently. The old manual system was suffering from a series of drawbacks. The present project has been developed to meet the aspirations indicated in the modern age.

Smart Gym Health/Fitness System allows the user to store the medicine details, employee details, the details of person who is in the gym, gym equipment details etc. This software package allows storing the details of all the data related to gymnasium. The system is strong enough to withstand regressive yearly operations under conditions where the database is maintained and cleared over a certain time of span. The implementation of the system in the organization will considerably reduce data entry, time and also provide readily calculated reports.

This system will be successfully designed and developed to fulfill the necessary requirements of user, such as recommending proper diet and exercise to user by well-known consultancy & trainer respectively, activity tracker, online payment and field level validation will perform efficiently .Even this system includes intelligence i.e. after certain data get store, system will recommend diet and exercise to user rather than any trainer and consultancy which will be benefited for admin as well as for user. Therefore, this project will be developed to meet the aspirations indicated in the modern age.

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AUTHOR'S BIOGRAPHY

1: Hafiza Maria Rafique has completed Bachelors in Computer Science (4 years Program) in session 2014-2018 from Department of Computer Sciences, Government Collage Women University Faisalabad, Pakistan. She is currently doing internship at Govt postgraduate college for women.

2: Maria Ilyas has completed Bachelors in Computer Science (4 years Program) in session 2014-2018 from Department of Computer Sciences, Government Collage Women University Faisalabad, Pakistan. She is currently doing internship under prime minister e-rozgaar‟s program.