SOFTWARE ENGINEERING

FINAL REPORT

REAL STRENGTH

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Overview: Real Strength App		

Introduction

Real Strength is a gym coaching app with training plans and personalized nutrition. We created a completely user-friendly virtual platform to make sure you succeed with your training and nutrition anywhere, anytime. We coach you to the results you want, we gave you the authentic and verified instructions to achieving a perfect and healthy lifestyle.

- Remove the uncertainty from your gym routine and know which direction you should take.
- Be held accountable by a virtual coach, who will provide motivation and support without any cost.
- Get personalized nutritional guidance with daily calorie intake monitor.
- Enjoy your training! With challenging and exciting training and workout drills.

Why Real Strength is the perfect workout app for you?

- + Don't want to pay a personal trainer.
- + Need to know exactly what to do in the gym.
- Need help with your nutrition and are serious about getting results.
- ★ Need motivation to get better results

Aims/Purposes:

We at Real Strength aim to provide you with the most effective ways to workout, give solutions to any workout problems free of charge. Just download our app and let us guide you to achieving your body goals. The most important purpose of this app is to give purpose to your workouts with our motivating user interface and clean and simple functionality.

Background and Research for Real Strength App:

To come up with this idea was easy, the hard part was to implement it, execute it perfectly. In order to provide the user with the incredible experience we researched and got in touch with different physical trainers in our city and noted their response to some

of the basic questions that every beginner in workouts ask or inquire about commonly. Taking surveys and interview was not enough to come with a credible base to start our project, so to back it up we designed custom workouts which were partly inspired from online training application and videos and suggested them to our friends. This process took almost 3 months and we witnessed the results ourselves. The workouts worked, and the interesting part is that they are not so hard as well. So, our team decided why don't we create an app and publicize these workouts to get the most out of them. In this way, we created **Real Strength** app, which provided complete guided workouts and training drills to our users, free of cost. You can work-out wherever you, whenever you want.

Top 3 Competitor:

1. GYM PLAN

Your own in-app personal trainer. Gym plans, one-to-one coaching and personalized nutrition.



2. JEFIT

Tracking workout training routines using JEFIT gym log is easy. Programs from bodybuilding, 3-day splits, 5x5 & strength plans to home exercises & body weight lifting.



3. SKIMBLE WORKOUT TRAINER

Workout Trainer specializes in bodyweight-only high intensity workouts, quick strength building routines, energizing yoga practices, and brutal fitness challenges!



SOFTWARE REQUIREMENT SPECIFICATIONS

1. Introduction

1.1 Purpose

The purpose of this document is to identify the software requirements for the Real Strength Android Application(1.0v). This document covers the entire software specifications needed to produce the intended complete functional application.

1.2 Intended Audience

This document is intended as a reading material for the developers, project managers, marketing staff, testers and documentation writers currently working on the project. The readers are advised to thoroughly read the sections 4, 5 and 6 as they are the most pertinent.

1.3 Product Scope

The Real Strength Android application's purpose is to target the country's population that are in need of a fitness regime, schedule and workouts to transform them into healthy citizens. This will contribute to a healthy environment in our society.

The goal of this software is to become popular as soon as it's launch so it's reach can grow to international boundaries and in the corporate world.

1.4 Technologies and Resources Used

Technology/Resource	Description
Windows or Mac System/Laptop	Android applications can be developed using Android Studio on both windows and MAC systems.
Android Studio	Android studio is the Integrated Development Environment used to create applications for Android devices.

Android Simulator	The Android Simulator is an emulator used to test Android applications outside of their native environment. It is used to run Android applications created in Android Studio on your pc without the need for a physical Android device.
Android Device	An eventual goal is to run the application on the device it was designed to run on. While the simulator will serve all required purposes during early development, full testing and demonstrations will require the application to run on a physical device.
Google or Facebook Account	A social account is needed for testing the registration and profile management in the application.
Google Firebase	A No SQL, real-time, online database used to permanently store application data.

2. User Requirements Definition

2.1 Product Perspective

The software will be written in Java using Android Studio. The software will run on Android mobile platform for the smart phones and tablets. It will provide users with the ability to find workout routines inside the application. Users will be able to register an account and log in using their details to take gain access to user submitted content. Users can create and edit their personal perform and track their workouts and statistics. Users can create a schedule to maintain their workouts. Users can take part in one on one private conversations.

2.2 Product Functions

- Users will be able to register to the application with their personal Google or Facebook accounts.
- Registered Users will be able to sign in and access a list of workout routines built in the application classified by muscle groups.
- Registered Users can maintain a personal profile page which can include their name, profile picture, age, weight, height, goal, level and BMI.
- Registered will be able to track their changing statistics through a timeline graph.
- Registered Users will be able to send a message to the admin for any reason or help.

2.3 User Characteristics

Unregistered User

Unregistered users will not be able to gain access to the application or use any of its features. The whole focus of the application is on user submitted content and social interactions, none of this is possible without an account alias to tie a user to. Additionally, the services offered by the application will be behind a ToS (Terms of Service) agreement, this model was chosen as users will be following programs submitted by our training experts at their own risk. No liability is accepted by the developer of the application or any parties in connection with the developer.

Registered User

Registered users will gain full, non-admin access to the application. Once a user registers their details and agrees to the ToS they will be able to view workout routines, rate workout routines, save routines to their personal profile for edits and chat with other expert trainers.

Administrator

The administrator will maintain the data in the application behind the scenes. The administrator will deal with managing user accounts if any bans are levied against a user. They will also manage workout program data based on user feedback. If a program receives enough negative feedback it will need to be removed from the application by the administrator. The administrator will also carry out day to day housekeeping within the application and ensure the quality of the application content.

2.4 User Documentation

For the user tutorials and instructions will be provided to guide them through the workout schedule and routine. A contact form will also be available for the user's query. A separate page will be dedicated to serve as a user manual for the application.

3. System Architecture

3.1 Operating Environment

- The application is designed to work on all devices that are running Android version 15 or later. Currently this includes the smartphones produced by numerous organizations like Samsung, Huawei, Mii Phone and many more.
- The application will store all data in a Google Firebase database. The application will always
 require an online connection to allow for user sign on, user communication, mapping and
 location functionality and access to online user content.
- Development of software will be carried out in Java using Android Studio.

3.2 General Constraints

• The software requires an Android device running android version 8 or later with a touch screen and simulated keyboard.

- The ability of the software to interface with an online database must be implemented.
- The software must be able to access the social Google and Facebook accounts synced in the user's device.
- Users will not able to edit the workout routines.

3.3 Assumptions and Dependencies

- If no internet connection is available, users will be unable to log in or access any functionality of the software.
- Unregistered users will have no access to the software.
- Users will only be permitted to register and gain access to the software once they agree to the terms of service agreement.

4. Functional Requirements

```
*Priority is mentioned at the end of the requirement. E.g. (P=1)
Priority Scale: 1-5
1 = highest 5
= lowest
```

4.1 User

All users of the software shall have the ability to create an account which is used to store user data and tie user actions to a user alias.

4.2 Register/Login Account

- The system should provide the user with an easy to use GUI to facilitate their creating an account. (P=1)
- The system shall ask for whether to register Facebook or Google Account. (P=1)
- The system should notify the user if their account has already been registered. (P=1)
- The system should prevent the user from completing registration if the terms of service has not been agreed to. (P=1)
- The system should provide a user-friendly GUI to allow the user to login when the application launches. (P=2)

4.3 Profile Page

- The system should allow the user to create a personal profile with his name, picture, age, height and weight. (P=1)
- The system shall import profile details from user's social account upon his/her permission. (P=3)
 - The system should allow the user to edit any changes in his personal profile page. (P=1)

4.4 Statistics

- The system should allow the user to track his updated statistics mainly weight and BMI through a series of graphs and timelines. (P=1)
- The system shall allow the user's data to sync with Google Fit built in android phones. (P=5)

4.5 Workout Programs

- The system should allow the user to access all the workout routines and schedule based on his/her goal and experience level. (P=1)
- The system should modify the programs based on any changes of user's level or goal. (P=2)
- The system shall modify a program upon the user's request. (P=4)
- The system should allow the user to create a personal schedule for the programs. (P=2)
- The system should provide proper instructions and tutorials for the workout programs. (P=1)

4.6 Database Access

- The system should save the user's data on the Google Firebase Database. (P=1)
- The system should retrieve the user's data in real time whenever the user opens the application. (P=1)

4.7 Send Message

- The system shall provide an interface for sending messages between users and administrator.
 (P=1)
- Messages should be sent in real time and have no delays. (P=2)

4.8 About us

• The system should provide a user manual on how to use the application, its intended audience, its purpose and the team behind the development of the application. (P=2)

4.9 Logout/Delete Account

- The system should allow the user to logout his/her social account from the application. (P=1)
- The system should allow the user to delete his/her account permanently from the application also removing user's data from the database. (P=1)

FUNCTIONAL SYSTEM REQUIREMENTS:

Priority Scale: 1-5

1 = highest 5 = lowest

Identifier	Priority	Requirement
REQ-1	1	The system should allow all users of the software to have the ability to create an account which is used to store user data and tie user actions to a user alias.
REQ-2	1	The system should provide the user with an easy to use GUI to facilitate their creating an account.
REQ-3	1	The system shall ask for whether to register Facebook or Google Account.
REQ-4	1	The system should notify the user if their account has already been registered.
REQ-5	1	The system should prevent the user from completing registration if the terms of service has not been agreed to.
REQ-6	2	The system should provide a user-friendly GUI to allow the user to login when the application launches.
REQ-7	1	The system should allow the user to create a personal profile with his name, picture, age, height and weight.
REQ-8	3	The system shall import profile details from user's social account upon his/her permission.
REQ-9	1	The system should allow the user to edit any changes in his personal profile page.
REQ-10	1	The system should allow the user to track his updated statistics mainly weight and BMI through a series of graphs and timelines.
REQ-11	5	The system shall allow the user's data to sync with Google Fit built in android phones.
REQ-12	1	The system should allow the user to access all the workout routines and schedule based on his/her goal and experience level.
REQ-13	2	The system should modify the programs based on any changes of user's level or goal.

REQ-14	4	The system shall modify a program upon the user's request.
REQ-15	2	The system should allow the user to create a personal schedule for the programs.
REQ-16	1	The system should provide proper instructions and tutorials for the workout programs.
REQ-17	1	The system should save the user's data on the Google Firebase Database.
REQ-18	1	The system should retrieve the user's data in real time whenever the user opens the application.
REQ-19	1	The system shall provide an interface for sending messages between users and administrator.
REQ-20	2	The system should provide a user manual on how to use the application, its intended audience, its purpose and the team behind the development of the application.
REQ-21	1	The system should allow the user to logout his/her social account from the application.
REQ-22	1	The system should allow the user to delete his/her account permanently from the application also removing user's data from the database.

5. System Requirements Specification

5.1 External Interface Requirements

User Interface

The user interface shall offer the user a logical representation of what the software is asking the user to do. Dropdown menus and buttons should be used where possible to aid the user. Input hints shall be used to aid the user when entering data.

The application should have its logo present on each screen once a logo has been designed. A user-friendly color scheme should be chosen, UI design should be carried out with visually impaired and color-blind users in mind.

The UI should have well defined constraints to ensure that the software displays correctly on the screens of all compatible devices. The UI should display in both portrait and landscape. The GUI should have continuity, all screens should have the same design and layouts should be consistent.

Hardware Interfaces

The system shall be operated with a compatible Android device using the devices touch screen, virtual keyboard and GPS location hardware.

API Interfaces

The software must store user information and user submitted content in a Google Firebase database using JSON files to achieve communications between the database and the application. The software must show mapping information around the user's current location using the Google maps API.

5.2 Data Requirements

User Data

A user's email address will need to be stored in order to give each user an alias to operate the application under. The email address will be used for account validation and to tie a user to their content.

A user will need to create a password in order to verify themselves when accessing the system. The password will need to be stored in the system and tied to a user's email address.

The user's personal data including current name, picture, age, weight, height and BMI will be stored in the database securely.

Workout Program Data

The application will need to manage the input and display of public workout programs. All public programs will be added to the application by the administrator and will be available for use for registered users. Workout program data will include, but not be limited to, Workout Name, Workout Type, Workout Duration, Exercise Name, Exercise Sets, Exercise Reps and Exercise Instructions.

6. Non-Functional Requirements

6.1 Portability

The application will be written in Java using the Android Studio IDE, the application will run natively on any Android device running Android 15 or later. This includes devices like Android smartphones and tablets. Additionally, Native React JS can be used for cross-platform development and run application on Apple devices with iOS.

6.2 Reliability

- The system should be extremely reliable and have an approximate up time of 99%.
- In the event of a crash or any other error, the System should inform the user of any problems and gracefully terminate.

6.3 Ease of Use

- The application should be user friendly and intuitive to use. GUIs should make their functions clear and navigation around the application should be straight forward.
- Users should be comfortable using the application after 20 minutes of use.

6.4 Speed

- The application should open and be ready to use within 10 seconds of being selected.
- The UI should be quick and smooth with no delays between button presses and screen reaction.
- All database reads/writes should take no longer than 20 seconds. If the database encounters any errors, a user-friendly warning should be displayed to the user.

6.5 Size

The size of the software in relation to storage media should be no larger than 250MB.

6.5 Privacy

All data retained by the system will be stored in accordance with the Data Protection Act 1988 and the Data Protection (Amendment) Act 2003.

BUSINESS REQUIREMENT DOCUMENT

Project Summary:

The application is aimed at developing a workout model for people who needed to perform exercises in a conformable procedure. Real Strength is a mobile application designed with Android technology. Regular exercise has health and physical benefits which are hard to ignore. Health and physical fitness are the fundamental targets for the Application. Basically, Real Strength is implemented in such a way that the collection of implicit routines and that which is prescribed to the trainees by their trainers are in one component. Real Strength is a form of hub and custom workout routines. Real Strength is designed to contain the built-in categories of workouts. The collection of workouts is meant to contain descriptions and procedures on how the workouts should be performed. The collections are the ones recommended by experts and each category of workouts has a set of another workout. Users can also customize their workouts, either with personal training plans or routines given to them by their trainers for the purposes of monitoring their physical and wellbeing outcome. Real Strength application has a component that stores and monitors user's workout routines. Real Strength offers a great intermediate utility between trainers and trainees. However, it is strictly encouraged to monitor the consequence activities in the application for the impact to be felt.

Business Description:

Real Strength is a Unique Fitness Application with a strong focus on providing practical lifestyle enhancement to its members in an optimistic, friendly, yet a professional atmosphere. As a first class exercise application, our company promises to deliver the highest level of personal service to our members.

Products and Services:

Real Strength provides its members with the latest in fitness workouts. From lower body to full body training, the application will customize specific workouts geared for all fitness enthusiasts, from beginners to professionals.

Upper Body	Improves speed, balance and strength which are generated through the muscles of the upper body.
Lower Body	Will help you develop and maintain strong quads, glutes, hamstrings and calves- some of the biggest muscles in the body.
Full Body	Potentially Faster Gains in Strength. If strength is your goal, it's imperative to perform movements that allow you use the most weight and greatest number of muscles.

Abs	the stronger your abs are, the more you are
	able to work from your core, reducing strain
	on your back which means you will avoid
	injury.

Scope:

The Stakeholders of "Real Strength" are:

Stakeholder	Name	Role	Impact
Customer	External Source	Spend as much time as they can with the requirement analyst and tell them each and every detail they want regarding workouts.	 Safe and reliable application. Well- designed application of good layout. Effective workouts 3.
Requirement Analyst	Mohammad Saad Maqsood	Carefully work on identifying the true needs and wants of the fitness maniacs by surveying gyms and carrying out questionnaires on social networking websites. After gathering and recording the data compile it in form of a proper document along with their priorities.	1. A document with required info produced. Help 2. Ammar and Farmal to design and code the application
System and Program Designer	Ammar Rafique	Carefully analyze the document provided by Saad Maqsood. Plan the layout and the features of the "Real Strength" application. He is the one who will make sure that the application is user friendly and does not contain any complexities.	 A user friendly application produced. Best UI

Programmer	Muhammad Farmal Khan	Responsible to convert the work of the Saad into lines of code. He has to make sure that all necessary features are properly coded and are not very complex.	 Application developed. All necessary things coded.
Tester	Saad and Farmal	Make sure that whether the designed application is working properly and meets all the requirements of the fitness lovers plus also check for bugs, restrictions and possible problems in the application produced.	 Bug free application. Application that meets the requirement of customers and users.
Maintenance In charge	Ammar Rafique	Make sure that even after the delivery the application is working properly and is up-to date. Make sure to remove the bugs which occur overtime to ensure loyalty with the customers and users.	New version of Real Strength can be introduced which are better than their old version

Deadlines:

They all have to be in time to ensure the product delivery meets the deadline which is 16th November 2018. Our company will develop a prototype with specific functions and will take the reviews of gym trainers. Keeping their reviews in mind we will modify our application plus add the remaining features and launch the final output of our team on 15th December 2018.

Risk/Opportunities:

The greatest risks deliberating the success of Real Strength are market and execution risk. Because of the sensitivity of the fitness industry, Real Strength has to cognizant and aware of the changing developments in those areas.

The opportunity for Real Strength are significant; and application is in a position to become a major force on play store, providing unique muscle group workouts that can be easily done at home without gym equipment.

Limitations:

- 1. No motivation while doing exercise at home and you can quit anytime
- 2. Working out at gym will definitely yield more results as there are more ways you can enhance or intensify your workout using machines.
- 3. There is no one at home to correct your form/positioning.

User Requirements:

Priority Scale: 1-5

1 = highest 5 = lowest

Identifier	User Story	Priority
ST-1	As an unregistered user, I will be able to create an account using one of my Facebook and google accounts.	1
ST-2	As a registered user, I can create a personal profile page.	1
ST-3	As a registered user, I can access workout programs and schedule according to my goal and level.	1
ST-4	As a registered user, I can browse different workout programs according to muscle group.	1
ST-5	As a registered user, I can track my monthly progress and changes in weight and BMI.	2
ST-6	As a registered user, I can integrate my statistics with Google Fit.	5
ST-7	As a registered user, I can logout of my account from the application.	1
ST-8	As a registered user, I can delete my account from the application.	1

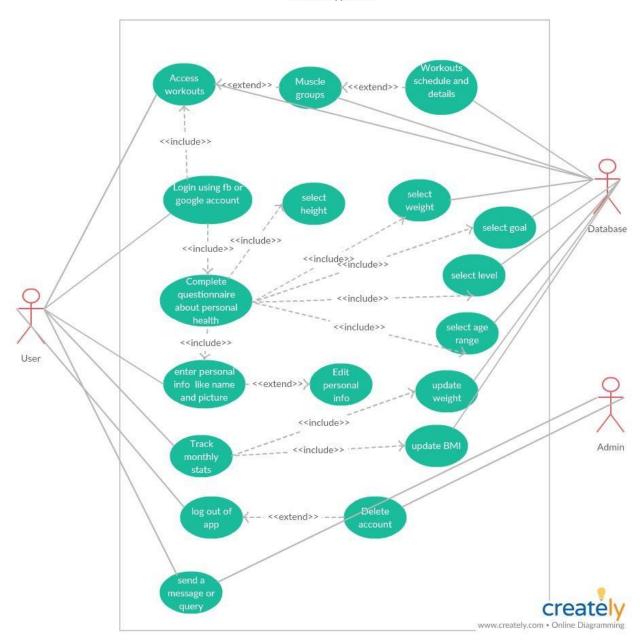
ST-9	As a premium user, I can remove the in-app advertisements.	4
ST-10	As a premium user, I can access diet plans.	3

DESIGN ANALYSIS

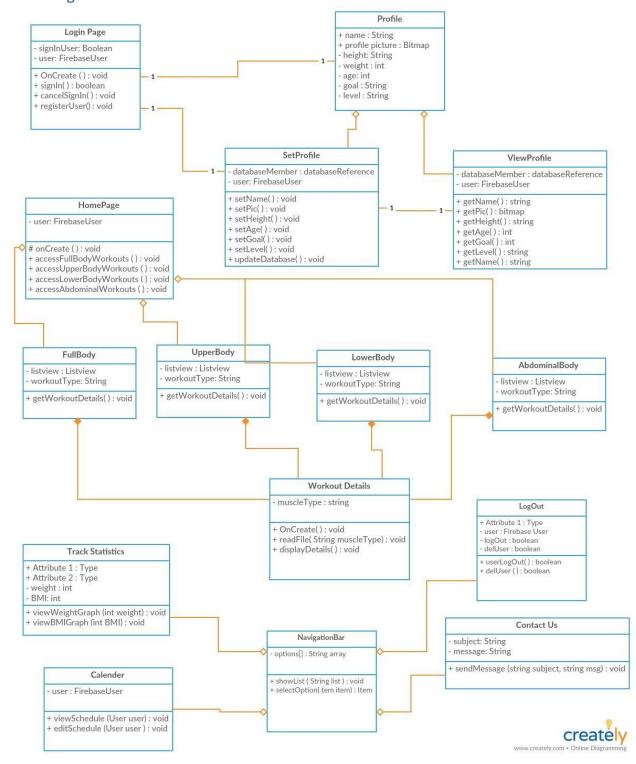
UML Diagrams

Use Case Diagram

Android Application

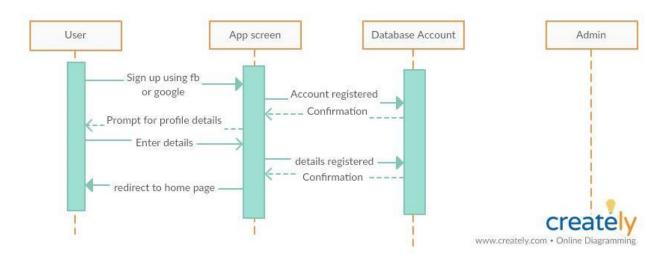


Class Diagram

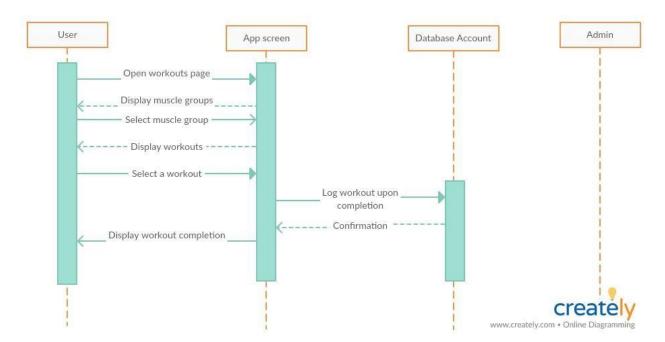


Sequence Diagram

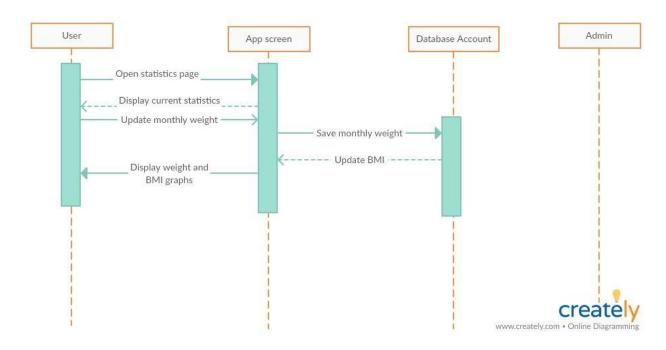
Registration:



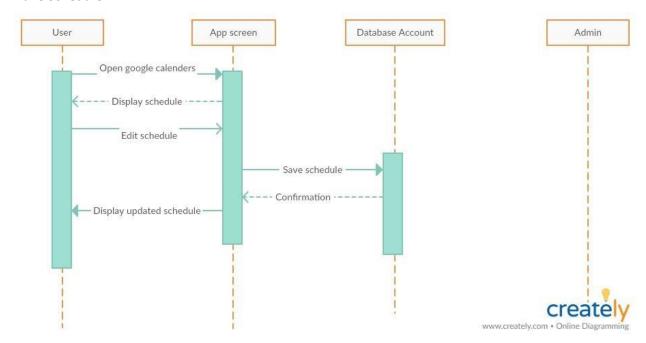
Access Workouts:



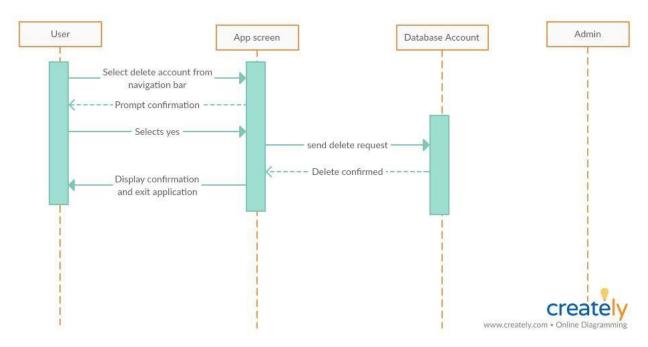
Track Statistics:



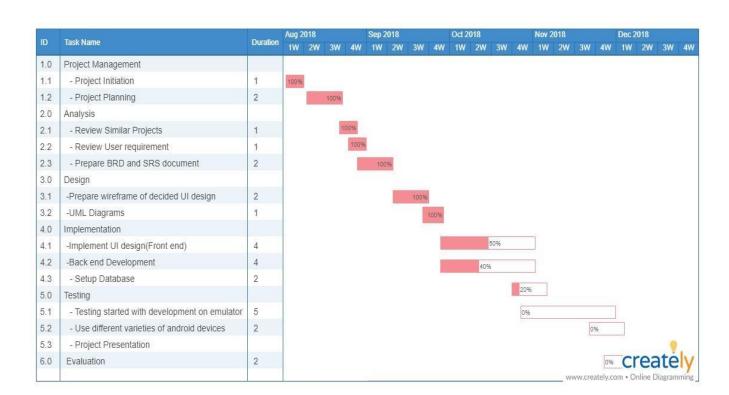
Make Schedule:



Delete Account:



Gantt Chart:



Process Model

Model Selected: Phased Development (Incremental Approach)

Justification:

This process model has been chosen for the development of Real Strength Android Application because of the we want our customers (users of application) to have access to the application via the google play store as soon as possible (subsystem) and then we can keep on adding new updates to the application.

Usually all mobile applications have different versions being released one after another after adding some functionality. We have applied same approach as we want two systems functioning in parallel:

- The production system: currently being used by the user
- The development system: the next version/update of the app provided by development to the user through updates in google play store.

We will not be changing the functionalities of the system provided to the user instead adding new functionality to the previous versions. Hence the reason for the incremental approach.

Some of the planned updates are:

- Allow users to modify workout programs according to their needs.
- Provide more advanced tutorials and instructions to the user for the workouts.
- Ability to rate the workout programs provided by the application.
- Allow synchronization with Google Fit on the user's device.
- Send notifications to user if he/she misses a workout listed on their schedule.

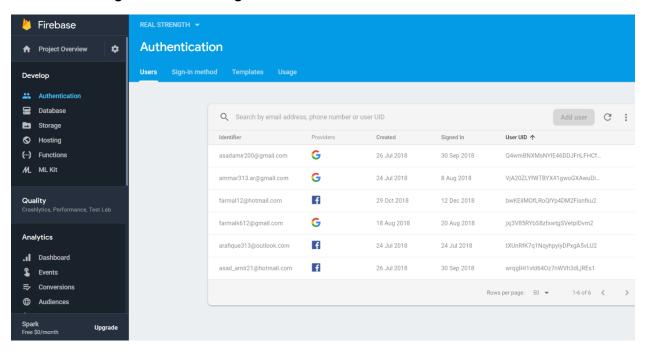
Cost Estimation:

- > Estimations using basic model of **COCOMO**.
- ➤ Organic Model:

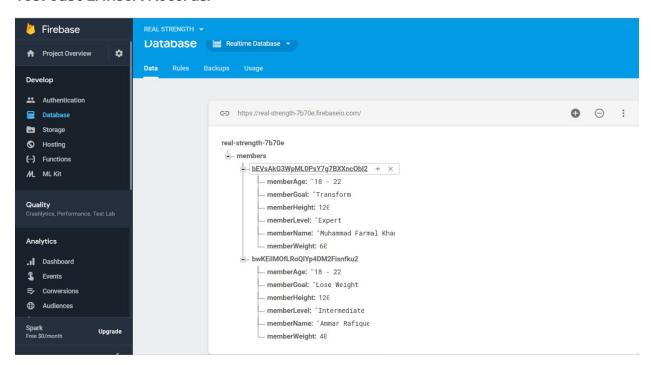
KLOC≈3

- 1. **Effort** = $a(KLOC)^b = 2.4(3)^1.05 = 8.00 \text{ pm}$
- 2. **Deployment Time** = $c(E)^d = 5.50 \text{ pm}$
- 3. Staff Size = E/D = 1.45 persons
- 4. **Productivity** = KLOC/E = 3/8 = 0.375

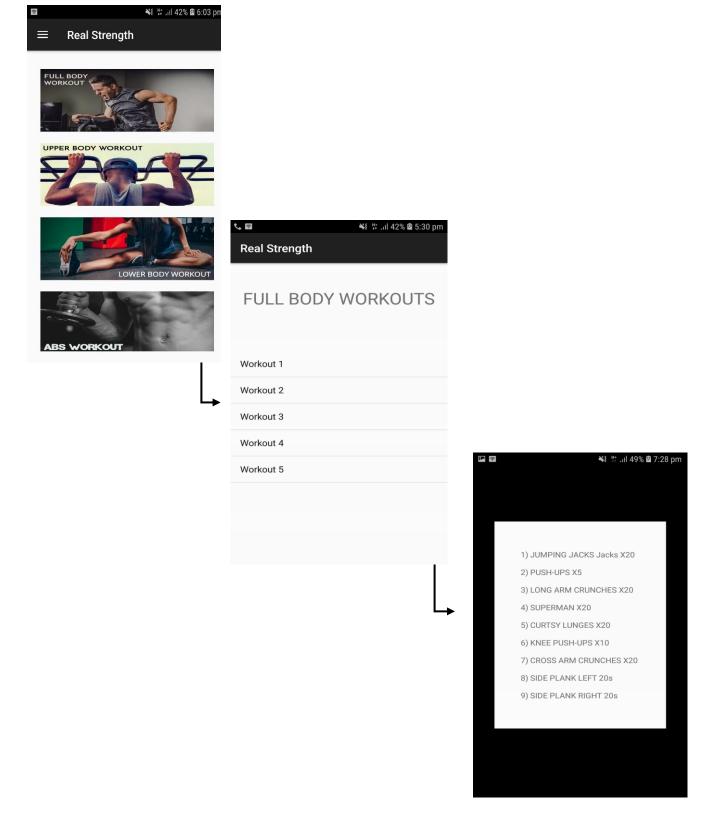
Test Case 1: Registration and Login:



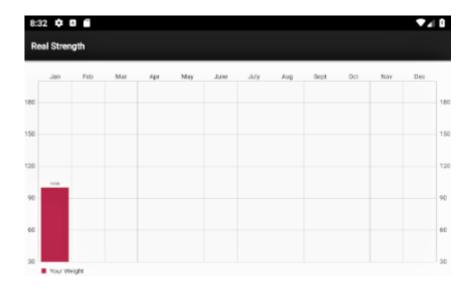
Test Case 2: Insert Records:



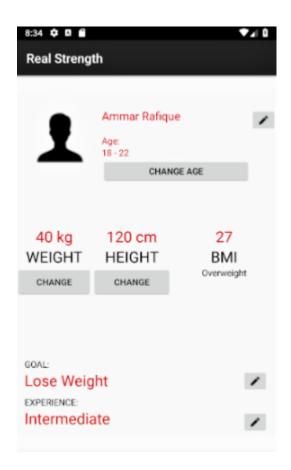
Test Case 3: Accessing Workouts:



Test Case 4: Graph Statistics:



Test Case 5: Profile:



REFERENCES

Business Requirements Document Template:

Date Created: 08/17/2018
Author: Connie Giordano Link:

https://www.google.com/url?sa=t&source=web&rct=j&url=https://techwhirl.com/businessrequirements-document-brd-

template/&ved=2ahUKEwjm18L9jtbeAhVRThoKHYWBAjMQFjAPegQIBBAB&usg=AOvVaw2CLj 5RW OMfkXdTnPnwTtq

System Requirement Specification Template:

Date Created: 09/20/2009 Author: Karl E. Wiegers.

Link:

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