Lab 1 Draft - SuperU Overview

Peter Amoah

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Professors Ajay Gupta & James Brunelle

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Version 1
1. Introduction

a. Background

Sometimes training can be very difficult when you do not have the right instructions and training. Nearly half of individuals training regularly face plateaus from under/overtraining, preventing them from reaching their goals.[5] A study with 20 men weightlifters separated into a supervised group and unsupervised group for a period of 12 weeks. The results showed that the supervised group’s squat and bench press one rep max were greater than the unsupervised group.[1] There are also factor that plays huge roles in training that individuals take for granted. The CDC found that 1 in 3 people do not get enough sleep on a day to day basis, something vital to weight training effectively.[2] According to the US National Library of Medicine, there is mounting evidence showing that, due to a variety of reasons, such as a demanding often experience sleep deprivation that in turn hinders their performances. A research conducted on sleep says that, “lack of sleep .. appears to be associated with increased injury risk in an adolescent athletic population”. [16] We also found out that, “Sleep deprivation can affect motor function, mood and cognitive functions, all of which could affect a young student athlete’s performance and injury risk.

b. Societal Problem

Many weightlifters neglect some factors that are crucial to increasing their lift effectively as possible. Weightlifters lack proper guidance which hinders their
progress. Weightlifters also lack sleep. Lastly, weightlifters ignore critical target intensities (RPE).

c. Solution Description

The solution to this problem is the software, SuperU, an application that works in tandem with your phone and smartwatch devices to provide weight lifting guidance and other training information in real-time, in addition to creating a plan custom tailored to the user, based on a learning algorithm that takes the date gathered during each workout to allow the user to progress safely and effectively towards their goals.

d. Solution – SuperU

SuperU will give you the fastest approach to the results the user’s personalization. This platform will also guide user to workout at the most beneficial intensities which is RPE. It also helps you learn some good training techniques to help you in your workout journey. Maximizing your sleep to maximize good results. This platform will help you prevent progress plateaus; you will see results by the app guiding you. This also gives you interface that is easy to use and track progress.
2. SuperU Product Description

a. Summary

SuperU is an application that is open to the public. It is specifically for weightlifters and trainers. It will help guide weightlifter to prevent them from not seeing results by assigning them trainers.

a. Goals and objectives

The goal of the application is to give Weightlifters the platform to learn new training techniques and get trained by the app trainers. Users are allowed to create an account to give them a profile. SuperU help store data based on fluctuating sets as heart rate, intensity and sleep pattern. The application also stores data based on static goals such as weight, height and any health limitation such as asthma. This application utilizes a smartwatch devices and Fitbit API to extrapolate variable data sets. The hardware necessary for this application would be accelerometer/ motion detection and a heart rate monitor. The application will process the data into a proper routine algorithm.
2.1 Key Product Features and Capabilities

a. Mobile Client Application

The weightlifters will be able to create an account. The weightlifter will be able to visualize progress and view data history. The lifter will also have access to custom generated workouts and plans and schedules. With the help of an RPE generating algorithm, will use recorded parameters such as the sleep, previous RPE and 1RM and sore.

Trainers will be able to visualize client and data history. The trainer will also have access to change and modify generated custom client workout plans and client’s schedules.

b. Cloud Architecture

1. Database (Firebase)

The database will be firebase which will be used to store all the user profile data like Name, Email, Password, Date of Birth, Heart Rate and Sleep Score. This database will store weekly information such as a start date, end date, average body weight, and average body fat ratio. It also saves the exercise set information like reps, RPE, sets and the weights as well. The database will store the generated recommended exercise set information such as reps, RPE and sets. They store active day information such as date, body weight, body fat ratio and sleep score.
All the data stored from the Fitbit will go directly into Firestore using Firebase functions. Backup and free up data will be in the database.

c. Fitbit/ Smartwatch API
   
The Fitbit/ Smartwatch will connect with the smartphone SuperU client. They also record data such as heartbeat, accelerometer, etc. It allows highly relevant data collection with respect to the training.

d. Administrator
   
The administrator will have the access to add and remove users manually. Admins will be responsible for database maintenance and repair. Admins will be responsible for data migration.

2.2 Major Components (Hardware/Software)

a. Hardware
   
   1. Smartphone or Equivalent Smart Device which will run the SuperU application
   
   2. Fitbit or Equivalent Smartwatch which will track the fluctuating data point such as heart rate and sleep patterns
b. **Software**

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c. Database: External Storage Firebase

1. Cloud Based Database, NoSQL
2. Firebase Auth offers multiple secure methods to authenticate
3. Stores and syncs data between users and devices – at global scale
3. Identification of Customer Base

a. Who is this product for

This product is for weightlifters, powerlifters, bodybuilders and personal trainers. The product will also be available for anyone who is trying to get stronger.

b. What will it be used for

Weightlifter will use this platform to help increase their lifts. Trainers will also use this platform to analyze the progress and modify the workout plan generated by the algorithm for the weightlifters.

c. Who else might this benefit

Gyms might benefit from this product as well.

5. Glossary

a. **Rating of Perceived Exertion (RPE)** - A way of measuring physical activity intensity level based on objective parameters and the person’s experience[1].
b. **One-Rep Max (1RM)** - The maximum amount of the weight you can lift for a single repetition of a given lift.[1]

c. **Weightlifter** - One who lifts heavy weights for exercise, muscle strengthening, or athletic competition.

6. References


