

The Acceleration Sensor based Personalized Fitness System

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Abstract

Information technology and medical advances in technology transformed the paradigm of health. In the past, the focus had been on the treatment, but today the current focus is towards maintaining health. This is research project based on the outdoors, running, walking, biking, in contrast to indoor exercise (weight training) can be utilized in an area where research is lacking.

This paper is based on a variety of indoor acceleration sensor movement get figures for the record. This sensor sends data obtained through the Web and market themselves through a suitable exercise program or from users through their Smartphone with purchased recommended programs. Through this research, may be able to have goal-oriented exact figures in the future.

Keywords: Accelerator Sensor, Fitness Measurement, Fitness Market, Smart Phone

1. Introduction

Today medical technical development and together life level improvements welfare the increasing demand and interest. In state-of-the-art IT technology medical services and fusion based on the life quality want to increase student actively made [1, 2] that during the most representative study, "health" the part of the investment costs annually increasing [3].

Ubiquitous-Healthcare, U-Healthcare, whereby state-of-the-art information and communication technology and medical technology fusion anytime, anywhere disease the post management, treatment, and prevention of the management number the service. U-healthcare is features according to significantly healthcare, u-hospital, wellness by healthcare is divided into from the past made tradition concept of disease the treatment the u-hospital of the concept and in the hospital state-of-the-art it technology take advantage of technology says [4] finally, the wellness health maintenance and to improve for provided service. Wellness sector social interest and with state-of-the-art it technology and medical services combined with new industry areas creating and it through users can their health always check the beforehand prevent number that point and aging increase socially interest focused and it student actively made be.

Existing study smart phone's GPS sensor based on outdoor exercise (running, walking, cycling ride *etc.*) records measure the user monitoring which number. Also body mounting sensors based on specific movement the levels smart phones connect the user directly check number the part of was present in addition their exercise records integrated enter the it based on other from users feedback number the system exist.

This study smart phone built-in acceleration sensors based on use the up / down movement the levels recording it possible which web transfer to readily various device in the access number be connected web page their exercise records check number and market access to yourself optimized program or recommended program buy it possible purchase of the data is their smart phone data, load the active target settings possible.

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This paper configuration follows: Chapter 2 regard research, Chapter 3 overall system design part described. Chapter 4 directly implementation of the part check number and Chapter 5 paper conclusions and future research challenges as end paper.

2. Related Researches

Wellness sector Health Maintenance and Improve, manage Student Actively Done make in Smart Phone Built-in Sensors Based on Take advantage of If the Many. Smart Phone Location Tracking Sensors Using Study Users can Outdoor Exercise (running, walking, biking) to The Records Sensors Based on Data, Gets it Leverage Users can Their Records Turning Monitor Which Number And It Based on Yourself Fit Momentum Check Number The Plan is but a GPS Take advantage of Outdoor only Use Available That Point Limited in [5]. Weight Training One Part of the 'dumbbell Local' in The Exercise Records Measure System Using Study Was carried out. For Sensors Mounted Equipment Wrist Garage Levels Get Number And This Smart Phone The Records Check Number Be. The Users Energy Consumption Rotation Move Information and the Calculate the Gets just Specific Movement Optimization the It Other In the field of Movement Apply Difficult Limited Part of Exist [10]. Health Record Management To allow Web Based on Management Number The Study It For Users can Records Web Transmission and It Based on Gathered The data is Other Users Feedback Number Be but Users can Data Records Access to In order By all means Mobile Equipment Through Connection Can be Equipment Subordinate Part of There also Data, Input Part of the Many Data, At the same time Input Difficult [7]. In Same Existing Studies have Smart Phone Sensors Leverage Exercise Records Measure Monitoring The It Possible, but Specific Movement Optimization The Other Exercise has Apply this Difficult or GPS, Leverage Indoors Take advantage of this Was not possible also Automatically Records Impossible In terms of The user Directly Leverage Apply too Difficult Point Existed. This Paper Smart Phone Built-in the Acceleration Sensors Based on Indoors Present Various Movement Various Apply to Number and it Get Data, Personalize the Yourself By applying Use Number the System Implementation.

3. Design

3.1 Development Target

This Research Development of The purpose of the U-Healthcare Market Issues Changing The Situation Actively Responding to Purpose is the past, Disease Treatment Focus But did not fit At present, the future, Health Maintenance and Management Focus By Expected. Health to maintain in order most a lot of Use How to Fitness Club Weight Training the Way this time Use Number So Development Progress Was research Development of Overall Is the <figure 1> System Concept is Seems.

First Smart Phone Built-in The Acceleration Sensors Web and interlocking The user Data, Check the Acceleration Sensors Use Movement Apply to Number Be, which is <Figure 2> System Configuration of the seems.

Interior Exercise (weight Training) during Recorded Figures Web Server Sends written The data is Various Devices Take advantage of Homepage Access to Record Check this Possible also Users Website Other From users Recommendation Been Program or Directly Select to One Exercise Program The Their Exercise Program Apply to the Number. Such The program Smart Phone Data, Take the user Screen Looking Their Exercise Records Acceleration Sensors Based on Levels Receive Records Possible data Web Server Stored Which Equipment, whether Login after Individuals Fit Data, Download it Take advantage of this Possible.

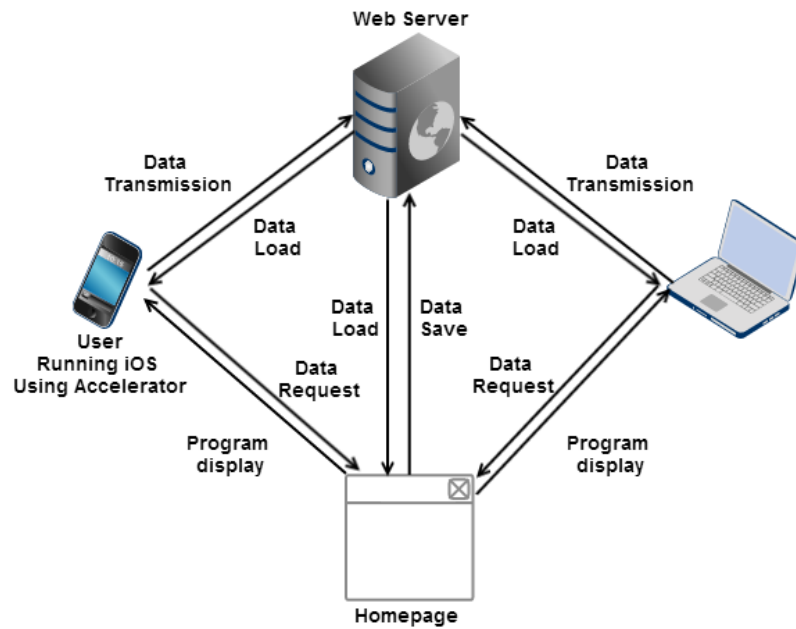


Figure 1. Shows the System Concept

Their Exercise Records Website Other People Check this Possible which The Users can other from users Advice Number It Their Exercise Erroneous Records about Attach Take Modification Possible Points Get Number Be.

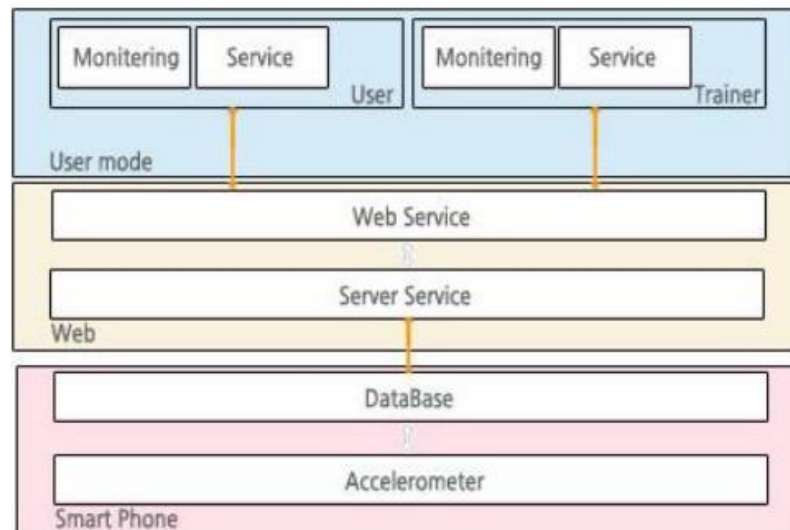


Figure 2. Shows the System Configuration

3.2 Full System Design

3.2.1 Full System

This of paper Custom Health Program the Overall Design of the <figure 3> Flowchart through Egg Number Be. Applications connected the user Login after the main Select "Market", "target program" Check Number and it not selected Without Exercise Record Measure It Possible.

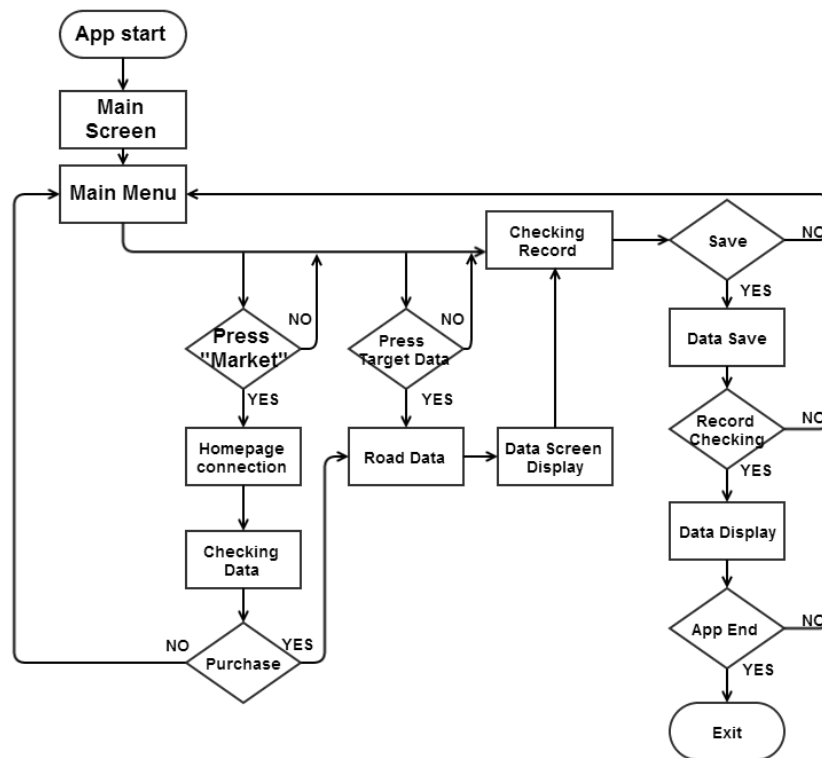


Figure 3. Shows the System Flow Chart

"Market" is Various The user Various Users Target Application Possible Exercise Program Introduction The Page, the user can Yourself Matching Program Select the When you buy He Fit The number and Set, apply Possible Weight Training Kinetic Type Check Number And In The Data, Smart Phone In Application Check Number And Their Exercise Program Apply to the Number Be. "Market" in Purchased Exercise Program "targets Program "in the Recalled Target Numbers and Set Screen Display The Users can Acceleration Sensors Leverage Goals While achieving Levels Get Number A numerical The data is Storage After Past Records Check Number And Save No Not When Applications The main Menu Back Records Again Number The Reset state is To which Users Exercise Records You Ready That Meaning.

Applications Utilization Which Time Exercise Program "Market" in do not buy Even if Users can Smart Phone Built-in the Acceleration Sensors Leverage Weight Training at Exercise Levels Measure Available Number and It Take advantage of Applied Program Conduct It Possible Point Exist.

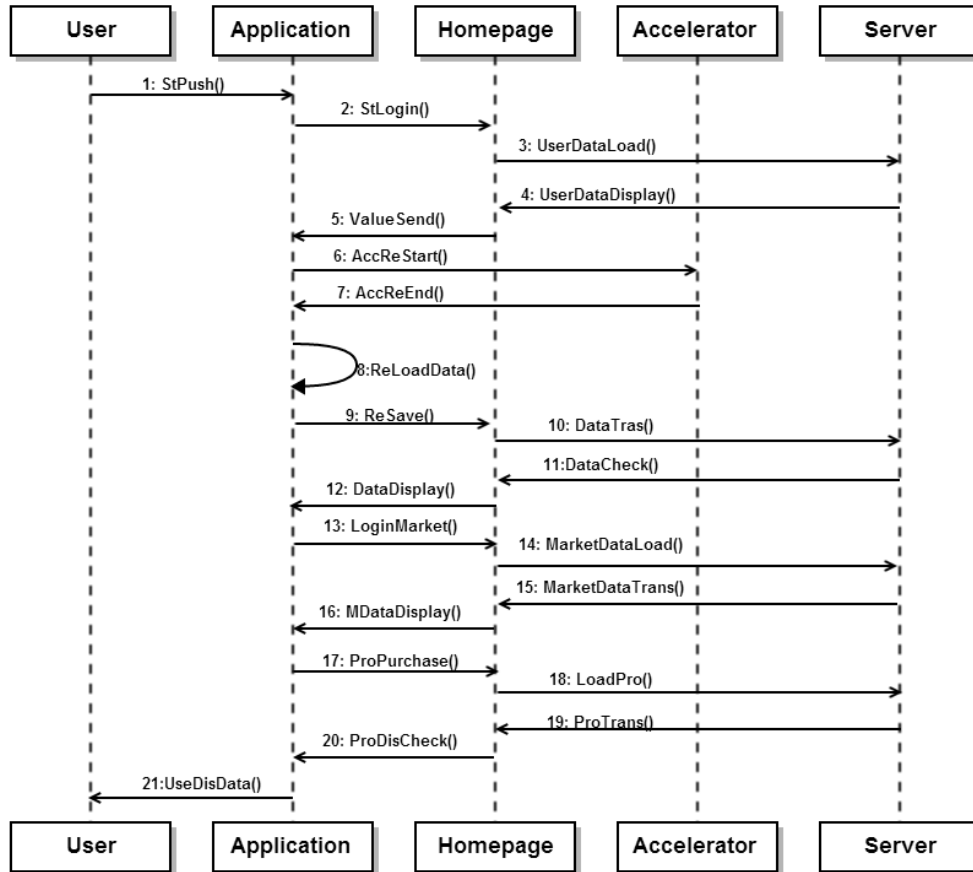


Figure 4. Shows a Sequence Diagram

<Figure 4> is System Sequence Diagram Looks users Application on Connected Homepage From the server Favorite Data, Express. Acceleration Sensors Users Exercise Records The Value Take Expressing In Application Changes Value Apply the To ReLoadData() to The.

After Data, Save the "Market" in Exercise Program Buying an existing Data Load Coming It Possible to It The user Utilize The Order Has the user a "market" in Bought Data and Their Acceleration Sensors Based on Collected Exercise Records Leverage When you take advantage of The.

3.2.2 Acceleration Sensors Design

This Paper In Application Key Where the Acceleration Sensors Leverage Data, Collection Subject Part of the Acceleration Sensors Smart Phone Slope By Levels Come take And Designed to When Left / Right The move Data Not recorded Setting the value to not The user Set the Use the Up / Down Movement Degree Report Exercise Records Obtained Use Number Be. For 'up' part of the Number two Into the 'low' to -2 If you put Smart Phones Rise When the Acceleration Sensors Measure Part 2 Beyond Down -2 When If more than Application on Count values are shown one at a time Increasing Mechanism.

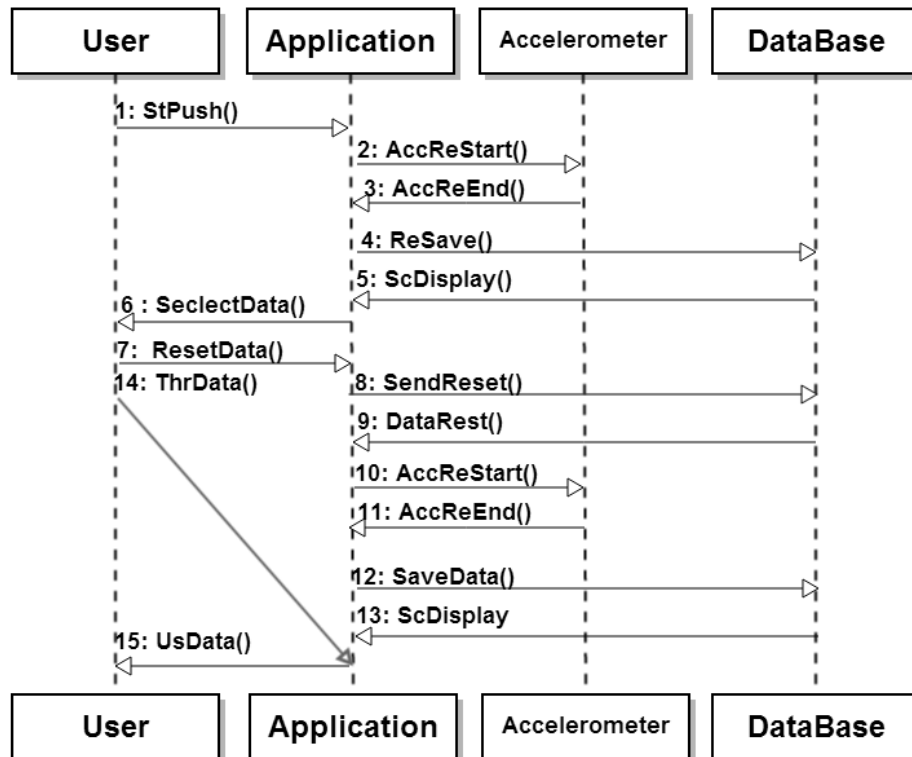


Figure 5. Acceleration Sensor Sequence Diagram

Users can Acceleration Sensors Run the He Data in the DB To store the. Thus The result is Application on To appear And If the Reset the user to Do Without Continuation Want take advantage of Wish, Reset Data () to Do Not this The user Exercise Records Check the Expressed as Data, Check the It Possible. Data, Check the It the user Web Server Present Homepage Access and it the various from users Feedback and Movement the Information Get Number the Part Get Number Be.

<Figure 5> is Acceleration Sensors Focusing on Drawn Sequence Diagram Appears Reset Data () and The Data () part The Existing Data, Remove the New Exercise Records You Whether or Existing Records Based on Users can Data, Application to The Check Number There Whether Choose a It Possible.

<Figure 06>, the Acceleration Sensors Flowchart Check Number Be. Acceleration Sensors The Records Measure I Behind Data, Transfer Whether The Select to The transmission to Do Not Case Data, Smart Phone Records Saving or Existing Records Remove the transmission to Want If the Data is Web Server Transferred to the In The Connection The user Web Through Become accomplished The.

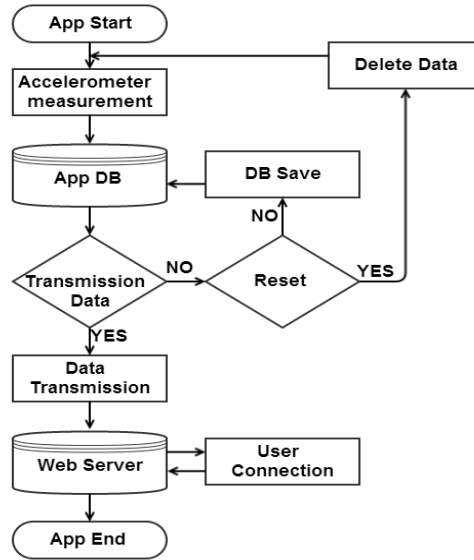


Figure 6. Flow Chart in Accelerometer

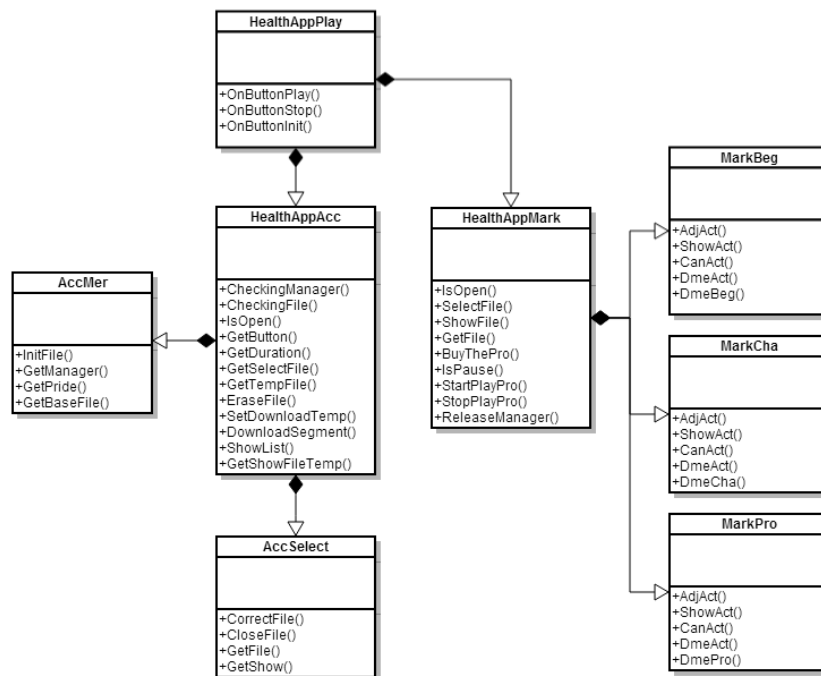


Figure 7. Class Diagram

<Figure 07> is Full Program the Class Diagram Show Be. Application in Focus Show the Acceleration Sensors Implementation of the HealthAppAcc part and Various Exercise Program Check Number and Directly Purchase Apply to Number the Made in part HealthAppMark It Based on Directly Implemented.

4. Implementation

4.1 Implementation Environment

Implementation The In order Into 2 Divided into one for the Smart Phone Built-in Acceleration Sensors to take advantage of For Parts and the rest is Web Server Market and Same Various Web Page the Users Information Show For Part.

Table 1. Implementation environment

Environment	Discription
Language	Objective-C, php
Development Tool	Xcode 5.1
Hardware	apple Mac mini late 2013
Simulator	iPhone 4 and Xcode Simulator
Server	Intel i7(8 GB), OS : Windows Server 2008

Smart IOS-based phones in the MAC environment was developed Web Server is Windows Server 2008. The Services Provided.

4.2 Implementation

This Paper Implementation of the main Screen <Figure 08> and Follows: First, First Screen Through Log in with Sign up Which Number And Login After the "Reset", "Market", "Target Program", "Checking Record" menu Check Number Be.

"Rest" is Obtained Levels Remove the New Get Process and "Market" is other the user Added Exercise Program Buy Number The Place. "Target Program" is the user Purchased Data, Directly From the server Download Load the Smart Phones Check Number So One Part of "Checking Record" is Existing Recorded Data, Everything Check Number and in the Feedback Get Number the Part Provided.

It the Users can during exercise Target Oriented Exercise Which Number So the It Research Goal, and It Implementation of the It By applying Easy Apply to Number So Student Was

<Figure 09>, the in Application Market parts Implementation of the Results Show them Be the first time Market Selected After the Steps Select to The. Beginner / intermediate / advanced in Divided Users can Yourself Fit Exercise Program Check the Purchase After Apply this To allow Divided Was that After The user If you choose Other The user Added Exercise Program Set to be sure, weight Training Type, repeat Number of Confirmation Can be It Based on Users can Buy or Home button Through The main Screen Back The.

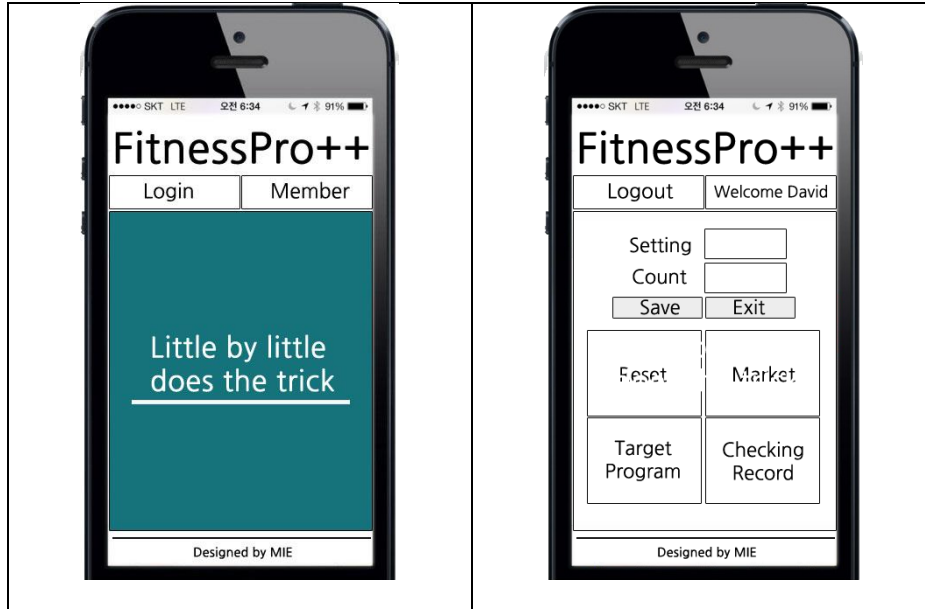


Figure 8. MAIN Application Implementation

Market Implementation of the Exercise The program "Target Program" menu Data, Load the Apply It Possible users Loaded with Data, Based on Goals Hold Acceleration Sensors Leverage Levels Recorded.

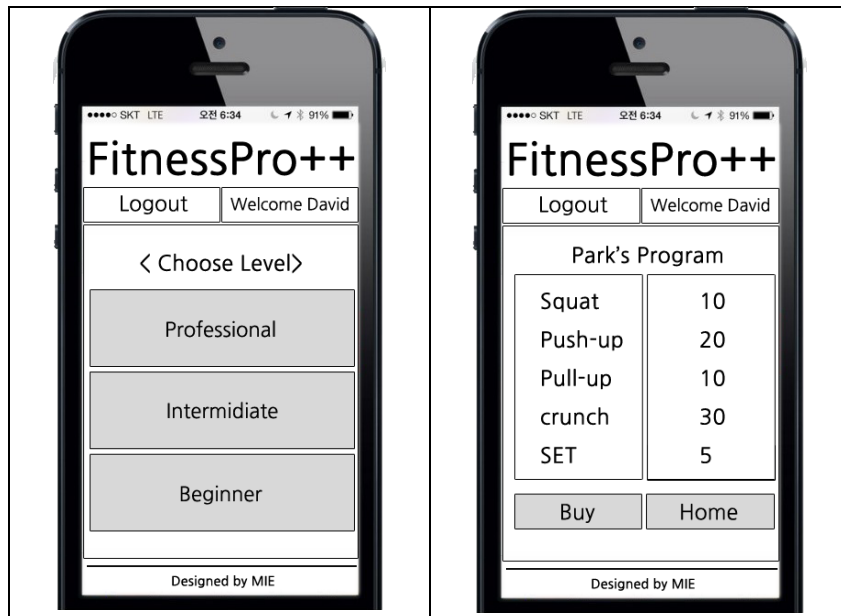


Figure 9. Shows the Main screen Application Implementation

<Figure 10> in the "Target Program Apply Screen." Check Number and the Smart Phone Built-in Acceleration Sensors Based on Levels Count value received Go up The. Thus The Save the value of Web Server Sent to At home He the Value Confirmation Possible The.



Figure 10. Applied to the Target Screen Program

However, the Reset button if you do not want the user to be able to re-record the movement condition.

5. Conclusion

Wellness in the IT technology Leverage Treatment Purpose as Health Maintenance and to improve in order Use Service. Stress Management, the momentum Checks, weight management, U-fitness to Generic name of a U-Healthcare One Part of Such Technology Mobile Equipment Based on Using Room the Student Made Be.

This Paper Mobile Equipment Built-in The Acceleration Sensors Based on Exercise Levels Record Receives the user is Interior Exercise (weight Training) and Progress Which Time Apply this Possible to "Market" on Access to Yourself Appropriate Exercise Program Purchase or Other From users Recommendation Received Exercise Program Their Directly Choose a It Possible also Bought The data is Their "Target Program" in Load The Apply to Number Be, which is Their Smart Phone Screen Out Target To figure The user Repeat Count the movement Levels Climbing Method. Movement Figures the data is Web Server sent to the Various Devices Users Access to Possible Website Check this Available He the Feedback Number the System.

It Based on Future Challenges to the Users Exercise Levels Accurately Obtain In order Various Sensors Take advantage of Plans and It Based on Optimized Exercise Program Medical Areas with Connect the Part of Needed.

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