Mobile Fitness System Based User Data Sharing

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Abstract

In today's modern world, the number of obese people increases drastically than in the past. Among other things, strength training plays a big role in preventing and managing obesity. Mobile fitness systems can be used to analyze obesity in a data sharing mechanism. Algorithms can recommend exercise equipment based on the user's BMI and provide previous users historical data as reference. It will also show caloric values exhausted through outdoors exercise for strength training that is currently being used.

Accordingly, in this paper, Recommend the exercise equipment according to the user's BMI (Body Mass Index) indices, and the exercise equipment other users who have used that is a member of the BMI group, such as a user Divide to group users based on the data-sharing mechanism to inform the user the mobile Fitness system was developed. Data sharing mechanism allows providing a generalized data using inductive reasoning method to solve the problem of the absence of an existing system, the service data, and fitness exercise equipment Recommend.

Keywords: BMI, Data Sharing Mechanism, Recommendation, U-Healthcare

1. Introduction

People in modern society than in the past raised the quality of life based on advanced science and technology. Accordingly, interest has been replaced by modern eating any food in any home life. In particular, research and culture of the people about what to eat is evolving at a rapid pace. Nevertheless, the diseases were not in the past. Findings in the medical field, said because most of the modern diseases that are caused by eating food. Because consume high-calorie and high-fat foods than in the past, but reduced momentum. Fitness variety of systems have been developed to solve this problem [1-4].

Fitness conventional systems only tell you the calories burned simply not high value accuracy is only one value that you tell your calorie consumption through exercise using the sensor in the mobile infrastructure. For other systems by analyzing the user's body, it provides information or data according to this method, which was recommended to exercise and fitness equipment. This method is the margin of error is larger due to analyze only the information of individual users [5-8].

In this paper, we can proceed to make strength training to prevent and manage obesity, outside the room, analyzing the user's body movements and physical information and Mobile fitness system has recommend exercise machine. Also it based on a data sharing mechanism to recommend a sensor control mechanism and provides the data to the user and the exercise mechanism to solve the problems of conventional fitness machine.

Data sharing mechanisms are applied to two like algorithm, the first recommendation algorithm allows to analyze the user's body information, BMI (Body Mass Index) indices like exercise equipment. The second recommendation algorithm, data generalization obtained through the causes inductive reasoning to the user by informing users Divide the

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group in accordance with the users on the BMI index upper body exercise equipment and lower body exercise equipment used by the other users belonging to the BMI group, such as myself Based on allowing to select the fitness equipment.

2. Design

This chapter describes the design of the fitness system developed by applying the data sharing mechanism.

2.1 Design of System
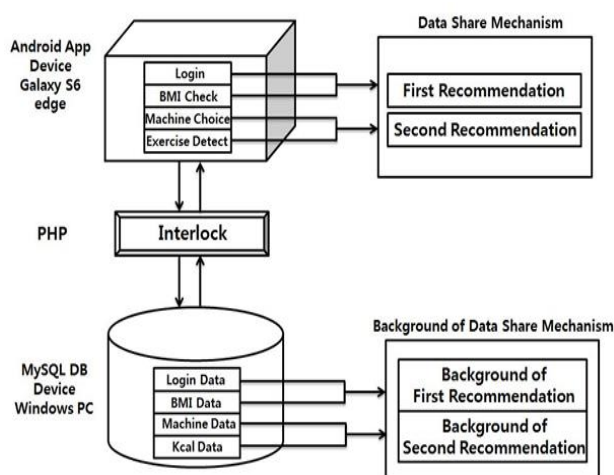
Figure 1 is a block diagram of the system.
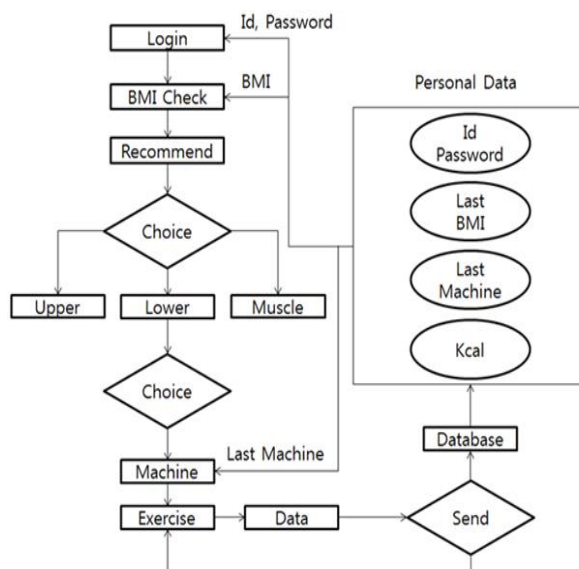

Figure 1. System Configuration

Figure 2. System Processing

Figure 1 is a block diagram of the system. The application operates on Android Mobile. The application function is login, BMI value check, select exercise machine, detect for movement. Login and BMI based on values confirmed the first recommendation made in the data sharing mechanisms. The second recommendation is made based on the selected driving mechanism, and motion detection. PHP will work with Android applications and

MySQL database. PHP was set to perform only a Web programming language, so there is no hardware query. MySQL database and to store the login data, BMI data, exercise equipment data, calorie data available from the Android application, this data based on a data sharing mechanism will operate.

Figure 2 is a flow diagram of the system. The system is started by a user to log in by entering their body starts while receiving information back trainers recommend checking the BMI value. The user will choose to see the upper body exercise, lower body exercises, view a list divided into three kinds of exercise per region. Select an exercise device when the user starts the exercise, and the acceleration sensor is a proximity sensor by means of a sensor control mechanism to sense the user's motion. It transmits and stores the data in the database in response to a user request after the user ends the exercise. Process the stored data are grouped according to the user after the current BMI value analyzed by the recommendation algorithm. Then the user login and weight of the upper body exercise equipment that was used the last time we log in, informs about the lower body exercise equipment. Moreover, by giving those trainers who have a BMI groups they belong to other users also use Toast message to inform people of their BMI levels usually makes recommendations about what exercise equipment you used.

2.2 Data Sharing Mechanism

Figure 3 is a first flowchart of a data sharing mechanisms recommendation algorithm.
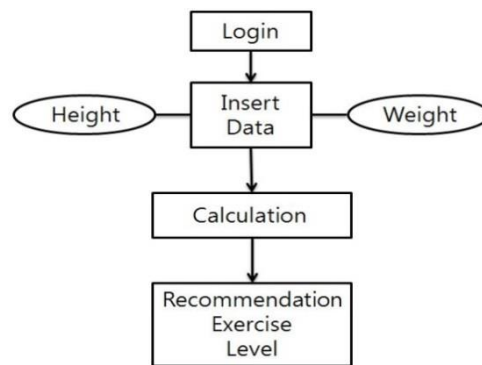

Figure 3. Flow of First Recommendation Algorithm

Figure 3 is a flow diagram of a first recommendation algorithm. When the user enters the rear height and weight, and the Login application recommend the mechanism of strength suitable for the user's BMI values is calculated after the user's BMI. Strength was expressed as Level 1, 2, 3 has. If the BMI group is underweight recommendation for trainers of Level 1 and normal weight, overweight, overweight if recommendation for trainers, Level 2, and obesity, and obesity is recommend if the mechanism of Level 3. Table 1 summarizes the BMI groups according to the user's BMI.

Table 1. BMI Groups According to BMI Levels

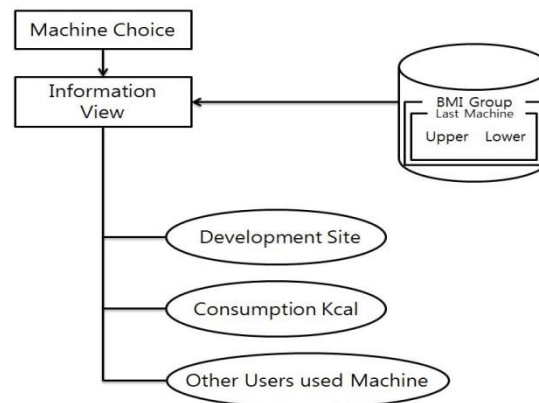| BMI	BMI Group
18.5 < BMI	Under Weight
18.5 ≦ BMI < 23	Normal Weight
23 ≦ BMI < 25	Over Weight
25 ≦ BMI < 30	Obesity
30 ≦ BMI	Extreme Obesity

Figure 4. Flow of Second Recommendation Algorithm

Figure 4 is based on the data of the BMI group, divided according to the user's BMI values. Exercise your upper body, lower body exercise informs when the muscle exercise by one of the trainers selected after selecting the same part in the other exercise equipment that you use the BMI group, to Toast message. The user is able to efficiently exercise by using the data provided by the applications. In addition, real-time user to indicate that improved muscle shows the caloric value consumed by exercise also provides the necessary information to the user.
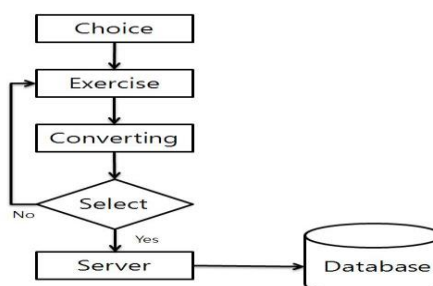

Figure 5. Flow of Data Transfer Algorithm

Figure 5 is a data flow using a data transmission scheme. The user then proceeds to exercise Selection an exercise device. The application detects the user's movements are transmitted to the server or to initialize the data according to the conversion level required by the consumed calorie value, and the user's motion.

3. Implementation and Review

3.1 Application Implement
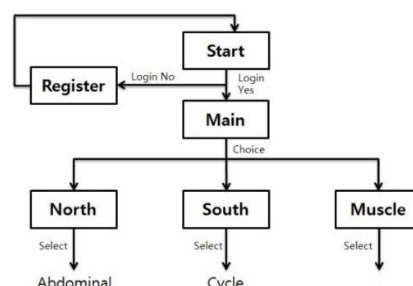
Figure 6 is data flow of Application Activity.

Figure 6. Flow of Application Activity

The Start Activity Register Activity responsible for the user's login and responsible for the registration of new users. The Main Activity Type, and analyzing the user's body information recommendation the strength of the exercise device allows. North, South, Muscle Activity in the list view shows the trainers. Figure 7 is a flow chart of the Main Activity.

The user will input all of the Height, Weight data. If you do not enter the data one thing, you can't advance to the next step. After the data is entered according to the user's BMI Check BMI levels underweight, normal weight, overweight, obese, obesity shows the user's status to obesity. And it makes recommendations for the intensity of the exercise equipment for users. The strength of the movement mechanism is Level 1, 2, 3 are represented by. Upper Body and the user selects a button according to the body movement you want to go to the North Activity showing the upper body exercise machines, or by selecting the button to go to the South Activity Lower Body showing the lower body exercise equipment. You can also see a movement mechanism associated with muscle Develop Site by selecting the button you want develop muscle.

North Activity as a sensor for detecting the movement of the upper body exercise device to indicate the upper body exercise device views the list was used as a proximity sensor embedded in the mobile device. South Activity shows a sensor with a lower body exercise mechanism view list was used as an acceleration sensor built into the mobile device

3.2 Screen of Implementation

The application was developed using the Eclipse Tool. Figure 7 is a display application.
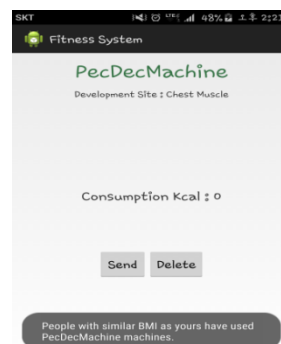

Figure 7. Screen of Select Exercise Machine

Figure 7 is indicating whether any exercise equipment is used to select the other users belonging to the BMI group, such as a user by the second recommendation algorithm for data sharing mechanisms when the user selects the trainers. This allows the user can get a generalized data. It is possible to proceed to a more efficient exercise equipment selection and movement.

3.3 Review

This study was developed through a system other fitness systems have been improved through data transmission techniques and data sharing mechanisms with a common problem. Most fitness systems Server - Client data has occurred in the structure of the Client form and stores transferred to the Server, regardless of your opinion. If, even though the data user does not want to transmit data to the Server, users may have a complaint about the fitness machine. The data transfer method was applied to address this problem. Analyzing the size of the data to be transmitted to determine whether data

compression is implemented and transmitting the data to the Server, if the user desires. The driving mechanism and the like, and two data provided to the user through the data sharing mechanism. This ensures that the user can be provided with accurate data than a generalized lack the small amount of data provided by the other fitness machine. Table 2 compared to the other systems and fitness system developed in this study.

Table 2. System Comparison and Analysis

Device	Explain
Smart Phone	Recommend of exercise machine Offer Diet Schedule
Smart TV	Recommend of exercise machine Offer UCC data
Develop System	Recommend of exercise machine Offer generalized data Offer choice of data transfer

Development of the system compared to other fitness systems use a lot of Mobile Device and the structure of the application is similar to the set of Activity. This is when you copy the Activity of a similar structure, if the content to be added to the application name only setting. Further, by using the method to work to unify the Server has a relatively simple mechanism.

5. Conclusion

Most of the systems currently in use are the fitness helps provide a small display or the calorific value of the data sensed and consumes the user's motion. Data provided is merely a part of the data that you need is an algorithm that recommends exercise and fitness equipment for your situation is under development. In order to provide the data that the user needs to be accurately analyze the data for the user to design and implement the like and a mechanism to provide data. In addition, the development of the application server and database to manage users, and should be based on this analysis of the structural characteristics with the development system. Focus of the research is a data sharing mechanism. The first recommendation is made based on the normalized data in accordance with the BMI values. The second recommendation is made based on the data of other users in the same BMI group and user to select the exercise machines. The data sharing system developed based on the mechanism consists of an application server and a database, and an application to convert the data detected and the user's motion. The converted data is transmitted to the server and stored in the database. Analyzing the stored data provides the appropriate data to the user, and allows others.

To future studies should validate the convenience and efficiency of the system through a variety of experiments to be conducted to modify the UI screen Open API.

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