Online PTS : Personal Training Software

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***Abstract*—Few can easily afford to start workout in proper ways nowadays. Heavy cost on personal training, aimless fear to start weight training and having trouble with choosing methods from large amount of information. Our group will develop software that helps beginner to lower the barrier of workout to entry. The software can assure 1) detailed motion of workout by part, 2) proper routines of workout, 3) record of everyday’ workout. Our expectation is to provide detailed and general information about workout for the beginners to get rid of the trouble.**

***Index terms* – weight training, workout, personal training**

TABLE 1

ROLE ASSIGNMENTS

|  |  |  |
| --- | --- | --- |
| **Roles** | **Name** | **Task description and etc.** |
| User | Yoon  Chan Woong | User uses a software and computer provided by program developer to perform a necessary task. Also, the user can give feedbacks about system to the Software developer. |
| Customer | Jeong  Ah Ron | Customers can give feedback to developers after software development is completed. They can test the software and decide what's good or bad, share it with the user, and requirements to the developer. |
| **Roles** | **Name** | **Task description and etc.** |
| Software developer | Kim  Sang Jun | Software developer does computer programming or system design to meet customer or user needs. In addition to programming, it covers the entire spectrum of program design. |
| Development manager | Son  Jae Woo | Development manager coordinates the opinions among users, customers, and software developers. He should not only solve problems, but also fill in the lack of developers. He works to harmonize the entire team. |

# Introduction

Nowadays, compared with the past, importance of fitness and weight training is increasing rapidly. You might have heard of word ‘Dumbbell economy’. As millennials become increasingly preoccupied with their physical wellbeing, gym has become a new pub. Healthy-looking body is regarded as a way of expressing oneself. Also, social mood of seeing muscular people is growing positively. Going along with this atmosphere, many people feel in need of workout and head to the health club. However, beginners would feel there is rather high barrier than they had thought to start weight training properly. Since weight training treats with several weight, it’s quite dangerous when they just ignore proper method and pose. The best way to learn weight training is to get help from personal trainer with rather high cost. An alternative way is to find materials from internet or books and learn with no expense, but that's also not easy within disordered information.

Due to the boom of health-related business, indiscrete information is pouring out anywhere around us. People would simply think that more information, more helpful. Partially agree but, does it remain clear in the brain? Beginners who first visited gym would mostly think ‘What should I do first?’. In order to obviate the inconvenience of finding clear information, we will develop a ‘personal-training’ software that provides clear and specified descriptions that pays no heavy cost. All you need to do is pick the category of body part you want to know about and watch the motion of workout and follow the descriptions. Also, you could record what you did today such as ‘biceps, 12 reps-4 sets, bicep curls-chin up-babel curl’ and store in online. The overall record of what you have done so far would work as a motivation and be a reference when changing method of workout.

We thought for the necessity of clear and concise weight training information for beginners. Therefore, this software is mainly aimed at weight training beginners. For convenience and clearness category, the system gathers helpful information from large and complex data around the internet. This would give great service as online personal trainer.

# REQUIREMENTS

## Login

Login function is created to provide services only to registered customers, not to provide information to non-registered customers. The first way to input their ID/PW they created on the register tab. Otherwise, Social media account or Email account(ex. Facebook, Instagram, Naver, Google, etc.) can be also used to login automatically like many other websites.

## Registration

Registration for our website is necessary for customers to use services that we provide. In order to register for the website, customers have to input Name, Birth, Phone Number, Email address, ID, Password.

 Additional redundancy check for ID will be added to separate accounts between users so that they are not identical. And it includes a function to type passwords twice so that they don’t accidentally miswrite passwords. This will ensure customers to type properly by comparing two passwords.

## Finding id/pw

Users needs ID/PW in order to use services that we provide. However, it’s not easy for users to memorize all of their ID/PW because they probably have several other accounts in the Internet. Therefore, we will make a useful function that users can find their ID/PW based on their private information they entered when registering. ID case, it can be found when users input their Name, Birth.  Password can be found when users input their Name, Birth, ID.

## Modification of personal information

Users can have difficulties when they try to find their id or pw if they accidentally wrote wrong information when registering. Information can be changed anytime users want. Also, user’s private information that is already saved on server can be deleted if user doesn’t want our service anymore.

## Workout description of each part (ex. Chest, Shoulder, Back, Leg, Core, Biceps, Triceps)

People who are about to start weight training or beginners for weight training are not easily able to use the various machines in the fitness center. The reason is not only they don’t know how to use the machines, but also they don’t know how to concentrate and stimulate the muscle. So, we will classify numerous weight training workouts based on used muscles, which is Chest, Shoulder, Back, Leg, Core, Biceps, Triceps. And we will also provide users ‘workout routines’ that fits the muscle they want to train on. Additionally, we will inform in both text and images how to perform the routine in detail like proper pose. Cautions with the bones and muscle will be definitely added.

## Search engine

If you want to find a particular exercise, you can type it on the search engine and leads to its description part right away.

ex). When you type ‘Triceps’ on the search engine, the system directly shows Triceps Dip, Triceps Extension, Triceps Extension(Barbell) in an alphabetical order.

## Bookmark function

This function is a ‘shortcut’ to go directly to what user is looking for. This is located on the top and users can set anything that frequently looks for. No need to type it on the search engine.

## Record of my day-workout

After checking workout description of each part, users will begin to workout. The main purpose of weight training is to improve the volume of muscle. Rather than exercising thoughtlessly, it is more helpful when you record ‘How many sets?’ and ‘How many times you repeated?’ with certain weight of workout tool such as dumb-bell. And if you record every time you train, you can intuitively see how much your workout performance has improved, leading to motivation and improvement. Therefore, we will include ‘My routine’ menu on our service so that users can record their effort on workouts.

## Stopwatch/Timer function

‘Stopwatch’ function and ‘timer’ function is also included in the ‘My routine’ menu.

* *Stopwatch* - It allows users to record how long they actually did workout at the gym to make a routine of workout.
* *Timer* - Interval between sets, in fact, is essential for muscle growth. Rather than estimating interval roughly, setting equal resting time increases workout efficiency.

## Day calorie suggestion

Gender, height, weight, goal weight, weight-loss term, ordinary activity degree should be required to know user’s day calorie suggestion. Appropriate intake of food calorie, appropriate calorie that you should consume by exercise.

Definitely individual’s basal metabolism, number of calorie might be all different due to circumstances of body. However, if users fill in those requirements, the system shows the number of calorie they should consume and intake for a day. By seeing the numerical value of calories for a day, this will help users design their day routine of workout.

* Appropriate intake of food calorie, appropriate calorie that you should consume by exercise. These criteria is suggested for a day calorie.
* Standard weight in accordance with user’s height and weight.

## In-Body measurement health center

Before you begin weight training, it’s essential to measure In-Body and know precisely about yourself. This will help you decide when setting workout intensity and know the deficiency of your body muscle. Luckily nowadays, it’s quite easy to use the In-Body measurement machine in health club, but this does not apply to home-gym cases. Thus, the system will provide the location of the health center which is categorized by regional groups and users can just visit and measure In-Body.

## Terminology

Beginners might have trouble figuring out the exact terms of weight training . Those basic terms that are essential and important will be written down in detail. By organizing terms, this would help beginners to understand the description well.

## Nutrition/Diet

People who work out say that eating well is an extension to exercise. Meaning that it’s also an important thing to care about.

System will suggest some well-balanced diet with calories and users refer to them with their one taste.

## More Info with photos and videos

Photos and videos about weight training which are linked to ‘youtube’ will be arranged in this section. These would work as a motivation to users and also a reference to their work out.

# DEVELOPMENT ENVIRONMENT

*A. Choice of software development platform*

We develop our software in web form. Each member has different develop environment such as window OS or Mac OS but our standard is window OS. We use development language as Python and HTML for development. Our software’s front-end is designed with HTML. Because HTML is the easiest way for us to design web. And we will use Amazon Web Service and Django for building our software’s back-end server. Our develop equipment is Macbook pro 2018 which has 8GB 2133 MHz LPDDR3 Ram and 2.3 GHz Quadcore Intel Core i5. The graphic card is Intel Iris Plus Graphics 655 1536 MB. It’s OS is MacOs Catalina version 10.15.

*B. Software in use*

Due to rise of ‘Dumbbell economy’ nowadays, amount of workout related research is increasing rapidly. In this atmosphere, there are so many working out software and app.

Especially, we refer to application named [Strong]. Their development goal is same with us which is to provide people about workout information. The main difference is that our software’s target is for beginners. So, we provide useful terminology and specific routines, suggestion of meals etc. We refer to some requirement and interface of their software.

# REQUIREMENTS SPECIFICATION

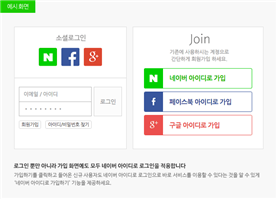
## Login

1) Social media account linkage

Popular social media’s account will be linked to server’s login system.

- Google, Naver, Facebook, Instagram

- Each will be organized using own login linkage API



2) Login sequence

There will be two boxes for typing user ID and passwords. After comparing with the corresponding ID/PW saved in server, allows user to login. Login API based on LDAP will be used.

When user wrote their ID/PW and clicked login button, the screen changes and will show two options. First when the information user wrote is improper, shows ‘Wrong Info’. Otherwise, access succeeded.

In order to utilize this function, user need registration process which is explained below.

## Registration

1) Information required

Specific Information about the user is needed. After those data entry, it is saved in server.

(mandatory input will be checked with ‘\*’).

- First name, Family name (ex. Jaewoo, Son) \*

- Birth (ex.1996-09-07) \*

- Gender (Man/Woman) \*

- Height/weight (input in advance for users to utilize day-calorie system more conveniently)

- Phone number

- E-mail address

- ID (at least 7 words including number and character) \*

- Password (at least 7 words) \*

- Nickname

- My own question

ex). What is my number 1 treasure? my own question will be used when finding for ID/PW when user forgot about it.

2) Redundancy check of ID/PW

- ID check:

After redundancy check for the ID, allows users to register in. Comparing with the users’ ID saved on the server, redundancy check outputs ‘NO’ when its overlapping and user should enter another unique ID. If ‘YES’, user could use that ID and continue on. And, redundancy check button will be located on the right side.

- PW check:

Function to type passwords twice in order to prevent mistake of writing improper passwords.

There’ll be two identical spaces up and down for writing passwords twice and these are compared whether it’s same or not, If not, red sign ‘Password is different from what you wrote’ will be shown.

## Finding id/pw

1) ID

Need to fill out user name and date of birth to find ID. There is only one in the database that matches the name and the date of birth so that’s enough.

2) PW

Finding Password is certified by cell phone or e-mail to check whether corresponding user has credibility. The verification number will be sent to those accounts and user should certify with that number. Or the questions user made for own during registration process.

If all these conditions are met, the temporary password is issued by e-mail so that you can log-in temporarily. And then change it to a password that user is familiar with on the page by modifying personal information.

Also, the temporary passwords that user receives will be randomized numbers.

3) Interface

- ID/PW Finding Button

This button will be located just to the right of the login button on the initial screen of our web page. When user presses this button, a new tab opens where the top of the tab can do the Finding ID, and the bottom of the tab can do the Finding PW

- After issuing temporary password

Finally, if a user succeeded to find the password, the temporary password will be emailed to the user via random number generation. The contents of the email sent are temporary password and a URL link to go to our website. As soon as the user clicks on the URL link, the user will be able to enter the login picture on our website.

## Modification of personal information

1) Scope of the personal information

At first, the range of personal information will be classified whether it will be included or not included. ID, Password, Nickname (which is identification name for customers using our services), Gender, Birth, E-mail address, Phone Number, and etc. corresponding to it.

2) Scope of the modifying information

If we allow users to modify all of the information, it becomes increasingly difficult to manage the server because of the problem of 3). Therefore, among many personal information, we need to decide which information can be changed. So, we will allow users to change Nickname, Gender, PW. And users can change their height, weight(these information will be provided in the Calorie Suggestion tab and the Body Changes tab.)

3) Withdrawal of membership

We will make this function because it is likely that users can’t want to use our services anymore. As the issues of personal information becomes emphasized, we will ensure complete deletion of user’s data on the server. However, we should alert them to whether they truly want to delete it. Because they can push withdrawal button mistakenly and it is very bothering to re-register for re-using our services.

4) Re-sending of the changes to server

After the user modifies the information or withdraws the membership, we need to update the changed information on the server. We will find the way to update the information automatically as soon as user modifies it.

5) Interface

- Page about showing Member information

We thought it would be helpful if there is an interface that shows users briefly about their registration/personal information  before modifying or deleting the information.

- Buttons

In the page about showing member information, there are three buttons. “Modification of member information”, “Modification of Password”, “Withdrawal”

- Clicking the first button, it changes from “page about showing member information” to “page about modifying member information”.

- Clicking the second button, it changes from “page about showing member information” to “page about modifying password” likewise. Then, the space for entering user’s ID, current Password and new Password is represented. Of course, there is redundancy checking about new password. And if user clicks the submit button, we notify him that he succeeded modification of password.

- Clicking the final button, alert message is represented. And it will prevent users from mistakenly clicking the button.

## Workout description of each part (ex. Chest, Shoulder, Back, Leg, Core, Biceps, Triceps)

1) Classification of workout

All the training workouts will be classified by part of muscle. And then, the classified workouts will be sorted alphabetically for users to easily find out the information about workout they want.

2) Description of workout

After 1), each workout will be explained in detail. How? We plan to provide images which show correct posture and procedure about the workout. In addition, if possible, we will provide a short video to show users the correct behavior.

3) Interface

- Clicking on the “Workout by muscle” tab, a user can see new page showing workout lists after logging in.

- Because we categorized all of workouts before we make the interface, this page will have each muscle tab. For example, the “Chest” menu tab, the “Shoulder” menu tab, and etc. And when user clicks each muscle menu tab, they can only see the workout lists for the muscle they want to train.

- For example, if a user clicks on the “Chest” tab and then clicks a “Bench press” item form the large list, page will lead to a new page where you can learn more about the bench press in detail. We plan to include on this page not only a detailed description, but also short videos or photos that will give more accurate description.

## Search engine

## Bookmark function

1) The use of Search engine and Bookmark function is highly related. Both features have something in common that makes it easy for users to find their workout. Search engine feature is reused at “Terminology”(L requirement). In the case of the Bookmark feature, we will create a page that keeps track of and store user’s bookmarked workouts.

2) Interface

We will place the search function at the top or bottom of page. Naturally, the function will be located on the “Workout description” page and the “Terminology” page. the function’s interface is box shaped with submit button. For example, if user inputs only “Tri” in the search box, workouts beginning with “Tri” are shown in alphabetical order. “Triceps Dip”, “Triceps Extension”, “Triceps Extension”, …

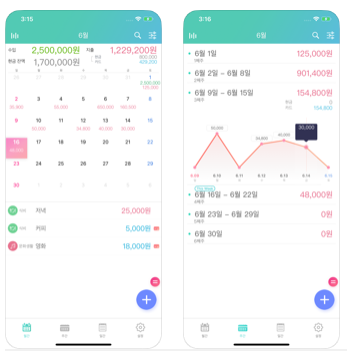
## Record of my daily workout

1) Draft of how to record of My Daily Workout.

 In Record of my day-workout, we adopted to use calendar format in which user can record workout. If user click on the date, user can also see a small pop-up that gives a detailed description of how many hours of exercise they did.

2) Calendar

 Because we have not entered the development stage yet, we do not know the details. But we found a proper application, which has the features we want.



3) Interface

 For example, if user press the Record of my day-workout button, user can get a calendar for November. And if you press Nov. 1, you will be able to record and confirm that you worked out.

## Stopwatch/Timer function

1) Function of Stopwatch

 Stopwatch works when the user starts exercising. User can use stopwatch to know the total amount of time they have worked out in a day

2) Function of Timer

 Unlike the stopwatch which notifies user the entire time he worked out, the timer’s role is to determine how much time to rest between sets. The amount of time given to users depends on whether the goal is to strengthen muscle volume or strength or muscle endurance. The timer frees from the hassle of counting their own interval times. Workout is important, but interval time is more important.

3) Interface

* Location of Stopwatch/Timer

 Stopwatch/timer is placed in a small position in the upper right corner when entering My routine’s ‘Record of my Day-workout’. A rectangular tab has ‘Stopwatch’ on the left and a ‘Timer’ on the right. At the bottom left of the stopwatch/timer is a clock consisting of time, minutes and seconds, and on the right is a reset button and a start/pause button.

* Start / Pause

 In my experience, when I used another stopwatch/timer app, I have an uncomfortable memory because there is no stop button in the app. With that in mind, we'll put the Start/Pause button next to the Reset button. The Start button will be set to when the time is stopped, and Pause button will appear when the time is not stopped in the same position.

## Day calorie suggestion

1) Scope of Gender and Weight-loss term

 There are many requirements for calculating the Day calories suggestion calculator. Above all, the Gender will be divided into men and women, and the web service will help users comfortably press it, not directly with a keyboard. Likewise, Weight-loss term is to be given a range of up to 1 month from 4 month of choice.

2) Order of Ordinary Activity Degree

 To know a person’s basic metabolic rate, you need to know the Ordinary Activity Degree. Accordingly, we will create five steps to provide services for users to choose from. To explain the five steps one by one, we will list ‘Not Active’ → ‘Less Active’ → ‘Active’ → ‘ Quiet Active’ → ‘ Very Active’.

3) Instruction of Ordinary Activity Degree

 Our website will provide a detailed description of the Ordinary Activity Degree because it is more likely that the correct calorie calculation will not be achieved if only explicit activity is presented. You can refer to the following explanation.

- Not active: Rest, desk work, or driving are daily activities. Light lyrics and standing can be included, but not light exercise.

- Less active: In addition to daily activities, add to strenuous activity, such as long standing or household chores. In the form of light exercise, there are slow walking, slow cycling, or gardening.

- Active: At least, sitting, resting, and working environment may require standing or physical movement. Perform moderate exercises regularly, such as dancing, walking, or swimming.

- Quite active: Physical strenuous activities such as construction or jogging, using gym equipment or sports are done most days.

- Very active: If you are an elite athlete or have high-intensity training every day.

4) Calorie calculation

 Users do not need to know ‘Daily Recommended Amount of Calories’ the calculation method but we, as developer, need to know. We are going to use the Harris-Benedict formula, one of the most used and most well-known methods of calculating the Basal Metabolic Rate(BMR). Once the BMR is known, the ‘Daily Recommended amount of calories’ can be calculated through the ‘BMR’ and the ‘Ordinary Activity Degree’. How to use the formula is described in the following places.

\* Basal Metaboli Rate (BMR)  calculation method

- Woman: (10 \* Weight) + (6.25 \* Height) - (5 \* Age) - 161

- Man: (10 \* Weight) + (6.25 \* Height) - (5 \* Age) + 5

Daily recommended amount of calories calculation method

- Not active: BMR \* 1.2

- Less active: BMR \* 1.375

- Active: BMR \* 1.55

- Quite active: BMR \* 1.725

- Very active: BMR \* 1.9

5) Interface

 ‘Daily Recommended Amount of Calories’ is located on the main page tab of the website. Clicking on the interface will open up a new page, which turns the screen around. It’s location where you can input Gender, Height, Weight, Goal weight, and Ordinary Activity Degree.

## In-Body measurement health center

1) Accessibility

For beginners who want to receive an invoice but don’t know where the measuring machine is, our web page is to create a service to find a local health center near the user’s home. Home-training users can be measured free of charge at a nearby local health center once every three months. While we were searching the data, we found a site to find a local health center, so we plan to design it based on that website.

2) Component

The health centers are divided into categories for each region. The components of a health center are the exact location and telephone number of the health center.

3) Interface

The tab for searching the local health center belongs to the etc menu inside the main menu. If you go into the etc menu, there are other menus on a small scale. When 'In-Body Measurement Local Health Center' is pressed, South Korea is divided into 8 degrees. Users can select the area and find a local health center close to their own home.

## Terminology

1) Search Engine

Big searching area is located on the top of the page. There are many terminologies so searching function is more efficiently than just finding one by one.

2) List

Terminologies list is located beneath the searching area. They are arranged in alphabetical order.

3) Write, Modification, Delete

This page’s special point is that the members can do everything. They have large scope of right. They can write new terminology explaining, modify other’s explaining or delete wrong information based on their experience of work out. Collective intelligence will make this page valuable.

4) Interface

 Searching area is on the top of the page. Below, list of terminology is located. Between searching area and list, 3 buttons are located which is ‘write’, ‘modification’, ‘delete’. This page is located on menu bar to access easily.

## Nutrition/Diet

## More Info with photos and videos

1) Video list

There are videos mainly for user’s motivation. Video sources are from ‘Youtube’. Videos are about how experienced muscular people workout in the gym. Muscular Hollywood Top star’s workout video is an example of it. Their passionate workout videos will motivate positively to beginners. And users can also refer to their own workout routine or posture. It will be helpful to people going into slump. There beautiful and muscular body will definitely inspire passion to the users.

2) Search

Users can search the title of videos. They can find their favorite person’s workout through this function or posture of workout.

3) Interface

Interface is simple. Related videos are arranged in this page. All videos are referred to ‘Youtube’ video. Also, in the upper right of the page, searching engine is provided for users.

4) Bookmark

If users want to watch videos again later, they can mark the videos they want. Marked videos have star in the upper right side.

# REFERENCE

1) Login image:

<https://developers.naver.com/products/login/userguide/>

2) calendar image: <https://apps.apple.com/kr/app/%EC%9C%84%ED%94%8C-%EA%B0%80%EA%B3%84%EB%B6%80-weple-money/id467936485>