

Hanyang University Personal Gym Trainer

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Abstract— We are planning to make a website that can be used as a personal trainer in the gym of Hanyang university. This website will tell you your training schedule which includes when you will have to go and what exercises you have to do all based on the feedback data that you put in. For example: how do you feel, how much sleep did you get, how did it go last time, was the intensity appropriate...

This website will guide beginners as well as fanatics. For beginners it will guide you every step of the way so you do not have to do all the research on your own. It will give you an easy to follow routine to begin with and with all the feedback data it will get the algorithm gets to know you better and will find a good routine that suits you and your goals that you have for the future. For gym fanatics it will also be a really helpful tool. It will make sure you do not go over your limits and it can make sure that you will reach your goal without the risk of getting injured. For the people who are new to the gym the interactive map that will highlight all the machines that you have to do for your workout will save a lot of time and for the beginners it will also provide additional information about the exercise that they want to start. Another really helpful feature of the website is that we also provide a warm up routine that fits the type of workout you want to do. To prevent injuries we first of all listen to your feedback as mentioned before but what another essential part in preventing injuries is stretching, after every workout we will provide pictures about how to stretch and an explanation which muscle you should feel during the stretch.

In conclusion, the website will provide the total personal gym trainer experience without breaking the bank. It will keep beginners on track and motivate them to reach their goal and

fanatics can work towards their long term goals without worrying too much about their schedule and injuries.

Furthermore, a function provides the gym owner with information about which weights he has to order in future times based on the usage of the weights. This can be a really helpful tool for him as this keeps his customers happy as well as saving costs because he doesn't have to guess which weights he has to get to keep his customers on track for their workout.

I. INTRODUCTION

We chose this topic because we think that it can be really useful for a lot of students. A lot of students are beginning to become aware of their body and health. One of the things that they consider at that time is starting to go to the gym but most of them never go because once they start doing their research they get overwhelmed with information. Our website can stop this for the students of Hanyang University. It will have all the information in one place and create a personal schedule that will be working towards the goal the user chooses and with all the feedback data it won't be harsh on the user's body. This can increase the overall health of the students. Physical health as well as mental health will cause the students to be more confident with how they look. The website will overall have a positive influence on the wellbeing of the Hanyang students. It can motivate and guide beginners through the first training sessions. Because the website will provide clear explanations about the exercises, it makes sure you do not start with too much weight and even helps you with stretching afterwards with the use of helpful videos. At the same time it can also be helpful for students who have been going to the gym for a long time and want to take their workout to the next level, making sure that they achieve their goals by slowly increasing the intensity without the danger of overloading and a possible injury. All these functionalities will increase the popularity of the gym in Hanyang and therefore will give the university a

healthier image. With this website we expect the amount of students working out to grow exponentially. This will allow the university to expand their gym and make it a place where a lot of students come together and work on their health. A healthier image in a society that values a healthy body and mind more and more can be a factor that pushes the university to the next level.

II. REQUIREMENTS

A. Account Management

The website should provide the user with the basic functions of account management. This includes creating an account when visiting the website for the first time, deleting your account or modifying basic account settings such as your password or your user ID.

The user should be able to create an account with a window on the start screen of the website. The database behind the website should be able to permanently store, modify or delete the user specific log-in data such as the username and the password.

B. Getting starting parameters

After the user logs in for the first time the system should ask the user to enter some personal parameters (gender, height, age, weight, training activity in the past). Furthermore the user should be able to select his workout goals. Based on that the amount of workout sessions/the amount of repetitions varies(for further information see next paragraphs).The database should be able to store this information permanently in context with the username. The user should be able to delete or modify these parameters.

C. Starting and ending workout

Before and after each workout the website has to provide the functionality of starting and ending a workout session by pressing a button. Special functionalities will be available for the user after this. (details will follow)

D. Giving feedback

The website should regularly ask the user about his physical condition. This includes asking for his self perception after his warming up set, after each exercise and after the whole workout. The feedback will be given in the form of questions, which will give several answering possibilities.

For example:

After warming up set:

How do you feel today?

-weak

-weaker than usual

-normal

-stronger than usual

very strong

After one exercise at one machine:

I managed to do...

-all repetitions

-almost all repetitions (only 1-2 less per set)

-very few repetitions

It felt:

-easy

-normal

-hard

After whole workout:

The intensity today was...

too easy

appropriate

too intense

E. Entering sleep quality

The website should ask the user how much he slept last night before the workout begins. As sleep is essential for the recovery of your muscles.

F. Modify preferences

The user should be able to select his favourite machine and his favourite exercise at the gym.

G. Enter schedule

The website should provide a function, in which the user can enter his weekly schedule and other sport activities. Based on that the workout schedule is automatically modified by an AI.

H. Display real time user activity

At all times the user should be able to see how many users are in their training session at the moment in order to see if it makes sense to go to the gym right now as most machines will be blocked by other users.

I. Display training information

The website should show the user stretching guides after workout, which are appropriate for his workout at this day with detailed description and execution guidelines.

Furthermore the website should show the user pictures of how to execute an exercise properly before he starts doing the exercise at each machine.

Additionally an interactive map could show the user which machines are available at the gym and which muscles can be trained at each machine.

J. Generate workout schedule and routine personalized for user.

As shown in the previous paragraphs the user permanently enters information into the System. Based on this information an AI has to generate a workout schedule accordingly to the users schedule and training preferences.

In addition to that the AI has to create and design a detailed training routine, showing the user which machines to use and how many repetitions and sets to do all based on his personal data stored in the database.

K. Display training schedule

The user should be able to display his personal training schedule over the website. Time, duration and trained muscle group should be shown.

L. Motivate User

The website should regularly remind the user to work out. This should happen over push-messages displayed on the phone, laptop or tablet.

Furthermore the website should provide the user with a functionality to view his personal progress including the gain of strength he achieved or the weight he lost.

M. Showing equipment usage statistics

The gym owner should be able to look at the usage statistics of his machines stored on the database. He should be able to see which machines are used how often and which weights were put on most of the time.

Software developer	Mickaël Nguyen	Developing and designing the website.
Development manager	William Chan	Making sure the project is done on time, the cost isn't too high and that all the requirements are met.

IV. DEVELOPMENT ENVIRONMENT

A. Choice of software development platform

The platform we chose for our project is the web. We chose this platform because we wanted our software to be available to as many people as possible.. By using the web we have an application, which makes it possible to use our software on every operating system and every device that is on the market.

There are a couple of reasons why we did not choose to develop our software specifically for an operating system. We did not choose Linux for the obvious reason that too few people use a linux operating system in the classical sense on their mobile devices (of course Android is Linux based, but when it comes to developing apps it's completely different from writing Linux programs). We also opted against making an app because we would make our software only accessible for one group of users, either IOS or Android users. This way we can not reach all the members of the hanyang gym and we also think it is nice that you can access all your data everywhere you go and also on your laptop which gives the user a few more use cases to use the website at home.

The programming languages that we are going to use are html, php, css and sql for the database. For this database we will use a local server since this is the most reliable option. We will use Sublime text for building the website and mysql to set up the database since it is a really common, easy to use and a well known language. The AI part of our software will be embedded into the code. The resources that we will use are our private laptops which are: 2 windows 10, 1 Linux Mint 18.2 and 1 MacOS Catalina laptop. This is everything we need to make this software.

The cost estimates of our project are not clear yet. But we made some time estimates for how many hours it would take to program but keep in mind that these are very rough estimates. We will work with 4 experienced programmers that will work on this project for one and a half months. Each programmer will program 5-8 hours each week on this project. This gives a rough idea how much time will be invested into this project.

III. ROLE ASSIGNMENTS

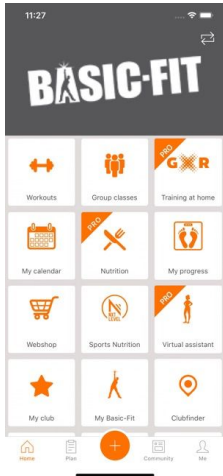
Roles	Name	Task description and etc.
User	Kobe Grobben	Give feedback about useability.
Customer	Fabian Beck	Giving requirements and setting limits to cost and time.

B. Software in use

There is a lot of similar software available on the market but most of it is only for specific gyms or does not offer every functionality our software provides. We did some research and selected two released software products with very similar functionalities and a similar vision.

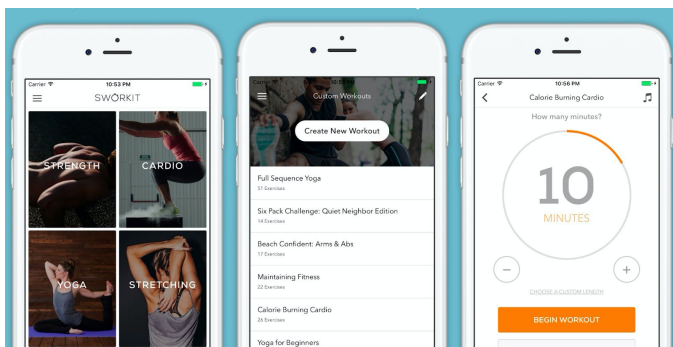
The first one is the Basic Fit application. Basic Fit is a gym chain that is spread across Europe. It has a lot of members and if you are a member you get a free fitness application which contains its personal trainer software. This application provides you with standardized workouts and programs, provides training at home, is your virtual assistant that gives you tips and tricks, gives you a nutrition plan and finally measures your progress. This application provides a lot of useful functions, the only concerns are that it can only be used by Basic Fit members as well as that it only provides standardized programs that do not adjust to your wants and needs properly. It does not change up your schedule based on

how you are feeling or based on other activities you have planned. That part is something that we really want to focus on and that differentiates us from this application. Then finally we are going to take a look at the design of the software. As you can see this app very clearly states its functions, this is something we also want to implement in our website. It is a very intuitive software and looks easy to use which is the most important thing.



Source: <https://www.basic-fit.com/en-fr/fitness/basic-fit-app>

The Second application to name is called Sworkit. This application is not gym specific. You can personalize the workouts a little bit more than in the previous application but it is still not optimal. The app is focused on home exercises only and does not help you in a gym at all, we want to focus on the use at the gym and its equipment instead. We differentiate ourselves from this application by having a more personalized program and also by having all the specific information of a gym (which machines train which muscles, where are the machines inside of the gym, etc.). Taking a look



at the design of this software it also has a very clear and intuitive interface. But you can also see that this software has a lot less functions as it only includes things to do at home and does not give the full experience our software will give.

Source: <https://sworkit.com>

V. SPECIFICATIONS

We had some troubles figuring out the specifications of our project as it is very difficult to do that for a website. As a consequence we tried to give you some imagination of the main website GUI and the functions we want to call when clicking on the icons.

PAGE 1

SIGN UP:

New members can sign up before having utilities

SIGN IN:

Old members can access their account.

Utilities are accessible only if you are connected on your account.

PAGE 2

Account:

- 1) Provide personal information like name, age, gender, favorite machines, number of times going to the gym, weight, goal, exercises used in the past.
- 2) Modify User ID & Password
- 3) Delete account

Progress:

visualize graphs showing the weight evolution, sleep quality variation.

Notifications:

message from the owner, crowdedness alert, stretching alert, motivation message.

Schedule:

visualize the working out schedule made by AI.

GYM information:

we provide a map of machines and we can find every machine of the gym and click on the image to get information (muscles, execution guidelines and images, usage frequency for each machine)

Physical activities:

- 1) Provide machines and exercises used this day.
- 2) Provide feedback about your feelings: before and after

- 3) Provide your sleep quality
- 4) Provide your schedule.

Warming up & stretching:

We can find tutorial videos in 2 sections: Warming up and stretching.

Number of persons who went to the gym today

The number of persons who went to the gym at a certain date should be displayed continuously.

Message:

we can send a message to the owner (Subject, message content)

PAGE 1

HANYANG GYM

SIGN UP

USERNAME :

PASSEWORD :

SIGN IN

USERNAME :

PASSEWORD :

PAGE 2

Account

HANYANG GYM

234 persons

4

Progress

schedule

GYM information

Physical activities

Warming up & stretching

Contact owner :

Subject

Message :