Fantastic Training – A Training application for Climbing

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ABSTRACT

People do Mountain Climbing either professionally or as a pastime. This sport is evolving into a common recreational activity. Though there are many websites on guiding people climb mountains, finding a customized and user friendly application is quite tough. Sport like Mountain climbing would be better if there was personalized training rather than a generalized one. It requires lot of physical activities and rigorous training. Professionals would have personal trainers to guide them through their climb whereas amateurs would not be able to afford individual training. Hence, a web application is developed to help non-professionals with his/her training schedule. This paper is about a training application that could be used for Mountain Climbing.

INTRODUCTION

Over the last two decades, Mountain Climbing is becoming increasingly popular [5]. A thorough training has to be undergone before one actually climbs. There are three types of training involved: walking/running, weights and hiking. Walking/Running is for increasing the stability. Lifting weights are for improving the muscle strength. Hiking is typically for adapting to various terrains while climbing mountains.

RESEARCH QUESTION

There could be many applications that intend to be customized or user-friendly or User Interface (UI) efficient but not many have all the three. Do we have a personalized, UI efficient and user-friendly application for mountain climbing that is developed considering the physical and the psychological aspects? This is the research question "Fantastic Training" application is intended to answer.

MOUNT KILIMANJARO

This application "Fantastic Training" is developed for climbing Mount Kilimanjaro. It is a dormant, inactive volcanic mountain in Tanzania. It is strato-volcanic i.e. it has alternative layers of lava and ash. It is said to be the highest mountain in Africa and the fourth highest in the world. Its height is about 5895 meters. It is the highest freestanding mountain in the world. Freestanding means the mountain doesn't belong to any mountain range.

The main threats to climb Kilimanjaro are: Altitude Sickness and lack of Endurance. Endurance could be gained by proper training. Ascending slowly and taking medications such as dexamethasone, prophylaxis etc. could prevent altitude sickness. About 25000 people attempt to climb Kilimanjaro every year. $2/3^{rd}$ succeed in climbing whereas the rest do not. Out of the $1/3^{rd}$ who are unsuccessful, 10 people die every year. Most of the deaths are caused due to altitude sickness.

EXISTING APPLICATIONS

There are only a few web applications that are helpful in climbing Kilimanjaro. They have their own advantages and disadvantages. The prominent few are listed below:

Mountain Madness

This website "mountainmadness.com" is ultimately for mountain climbing, trekking and skiing. It is a guide for people who wish to climb seven different summits including Kilimanjaro. They provide a schedule for mountaineering, which is common to all. They have a mountaineering school for all levels. The disadvantage of this website is its vagueness.

All Trails

Alltrails.com is website cobranded by National Geographic. It is a guide for all adventurous activities. It records our paths in maps. Since we log in before using, it has a history of previous trails. There is an advanced map editor, which enables the user to edit the paths. This website is a more generalized one. There is also an Android and iOS application.

Climb Mount Kilimanjaro

This website (climbmountkilimanjaro.com) is an exclusive one for people who wish to climb Kilimanjaro. The basic necessities to climb the mountain, the trainings to be undergone, the physical conditions, various routes for climbing, the fitness schedule to be followed etc. are given in the website. However, this is a paid service. A personal advisor would accompany on request. The disadvantage in this website is the generalized schedule it provides.

Climb Kilimanjaro Guide

This website (climbkilimanjaroguide.com) is similar to the previous website but this has an advantage of training people exclusively for altitude sickness, handling low

pressure etc. This would benefit people with specific medical conditions. Though the basic guidelines are free of cost, a detailed one is chargeable. The paid service apparently has more advantages. This website has a blog where people write about their experiences. This is to motivate people who aspire to climb.

Team Kilimanjaro

Team Kilimanjaro (teamkilimanjaro.com) is a website that focuses on training users in their own norms. The user can register with the website to be guided by a team of trainers. The schedule they provide could be done in our own norms but within a short period. That again is a constraint there. All the climbing essentials must be brought before hand so that the users don't suffer during the climb. The trainers would also verify this. The website contains reviews and ratings from the experience of previous users. The average rating is 9 out of 10 as an informative website. However the disadvantage here is the personalization.

ASPECT CONSIDERATIONS

Many aspects were considered before developing the fitness application to produce a more effective product. A thorough research was done on all the aspects so that the application developed looks appealing and useful to the user. The following are the main aspects considered:

Physical Fitness

Physical fitness is a mandatory requirement for someone who wishes to do any adventurous task. Especially mountain climbing involves a lot of physical activity and requires strength to withstand the strain and finish the climb. The main three types of training involved are: Running/Walking, Strengths and Hiking. Running/Walking could be mastered by everyday training. Increasing muscular strength is possible by lifting appropriate weights regularly. Cycling is also a good form of exercise for endurance.

Psychological aspects

Generally people have the tendency to plan something and not do it. The gap between the goal set and the action performed towards the goal is called as intention behavior gap. An individual cannot convert all his/her intentions into actions as there might be some obstacles [2]. The application developed must be motivating for the user. She/he must be able to do what she/he intends to do. When an application is developed thinking about the psychological aspects as well then the user would intend to have more affinity towards it and will do the destined activity with more ease.

Health

E-health is an emerging field that utilizes the existing technologies in health and medical applications and provides effective solution for healthcare [1]. Since mountain climbing would be painstaking, it requires cardiovascular and respiratory fitness. The higher one climbs, the lower the air pressure becomes. Hence being healthy is very important.

Customization

Personalization has become an important feature to be considered while designing web applications these days. Customizing an application would attract the user more. Personal details of the user could be saved for better utilization of the application.

User Interface

The external appearance and the attractiveness of the application play a major role in determining the usage of it. Some of the major aspects to be considered for Interface design are [4]:

- Shortcuts – For easier access of menus.

- Providing feedback – For betterment of the website and customizing it according to the user's wish.

- Dialogs for closure – For closing the application at ease.

- Reversal action – For ease of access.

- Faster Loading – For faster access.

FANTASTIC TRAINING – TECHNICAL OVERVIEW

This web application is aimed to be user-friendly and appealing with a good interface design. The following are the technical specifications of the application.

TECHNOLOGIES USED

The following are the technologies used in order to develop a more efficient application.

Client Side Coding

Client side codes are those that could be executed or interpreted by browsers. Any visitor to the site could see the coding by clicking on "View Source". Some of the client-side scripting languages used are:

HTML: HTML stands for HyperText Markup Language. It is used to create documents/webpages on the World Wide Web (WWW). They are useful in providing the layout for the website. It uses a variety of tags and attributes.

JavaScript: JavaScript is the most commonly used client side programming language. HTML only provides the layout of the webpages whereas JavaScript tells the browser what to do. Actions for a particular event are defined through JavaScript.

CSS: CSS stands for Cascading Style Sheets are written within Markup languages. They are mostly used to make the webpages look visually attractive. The graphics options it provides are its major advantage. They could be embedded in any part of the HTML code.

Server Side Coding
They are codes that could be executed or interpreted by web servers. They are not accessible or viewable by any visitor. The server side coding language used is:

PHP: PHP is an acronym for Hypertext Preprocessor. It is one of the most common server side scripting language used for developing web applications. It is open source and can be embedded into HTML. PHP has an advantage of being supported in most of the Operating Systems like Linux, Unix, Windows and Mac OS X etc.

Database
A database is required to store all the details of the user as well as the workout schedule of the user. The database used her is:

MySQL: MySQL is a database management system. It is Open Source as well. It uses Structured Query Language (SQL) to add, access and manage content in a database. The main reasons for using MySQL database are ease of usage, inexpensive nature and scalability.

TOOLS USED
The following are the tools used for the website development.

XAMPP: XAMPP stands for Cross-Platform (X), Apache (A), PHP (P) and Perl (P). It is typically used to set up a local web server. It comes with a number of modules such as phpMyAdmin, WordPress etc. It is simple and cross-platform compatible. It is mainly used for testing purposes using remote servers.

WEBSTORM: WebStorm is a commercial IDE (Integrated Development Environment) for JavaScript. It is a specialized version of PhpStorm offering a subset of its features. It is specially equipped for both client side and server side development.

UoA CALENDAR API

Application Programming Interface (API) is a set of instructions for accessing a web-based software application. The UoA (The University of Auckland) Calendar API allows the user to create, display and delete calendar events. It has three types of views for: month view, week view and day view. The user can click on each date to add, update or delete events. The details that could be added on a particular day are the type of workout, start date along with time (which would by default be the present day and time), the end date, duration and status of the planned activity.

FANTASTIC TRAINING – AN INSIGHT
This web application is aimed to be a fitness scheduler for users who wish to climb mountains. It is more personalized for the user to have ease of access. The UoA Calendar API is fitted into the application for the user to edit his/her workout schedule.

Front End

The following is the flow in which the user would encounter the website:

Sign In Page: This is the first page that the user will encounter as soon as he/she opens the website. If the user already has an account then he/she can login immediately. Otherwise a sign in with the Email id and password is required. These details would be stored in the database.

Sign Up Page: If the user is using the website for the first time then he/she has to sign up using Email id and password. These details will be saved in the database for future authentication.

My Profile Page: When the user is accessing the website for the first time, it immediately directs the user to the Profile page. In the profile page, the user details such as Name, date of birth, gender, height and weight are got. Once the height and the weight are entered, the BMI is immediately displayed for the user to know.

Home Page: Home page comes immediately after the user signs in. It has information about Beginner's exercise, Nutrition, Health and about Mount Kilimanjaro. This page is to provide information about all the above to the user. An amateur trying to access the website would have sufficient knowledge about exercising and mountain climbing once they read this.

Top Menu: The top menu has three buttons. My Profile, My Calendar and My Summary. The 'My Profile' button allows the user to view his/her profile and edit it. The 'My Calendar' button opens the calendar schedule for the user so that the user could add, edit or delete workouts. The 'My Summary' button provides the overall summary of the workouts done so far.

My Calendar: This displays a calendar where the user can add workout/ trainings to every date. The user has to mention the type of workout, start date along with time and end date as they are set as mandatory fields. The details entered are stored in the database created using MySQL for report generation. The workouts could be dragged and dropped in any other date. This enhances the usability of the application.
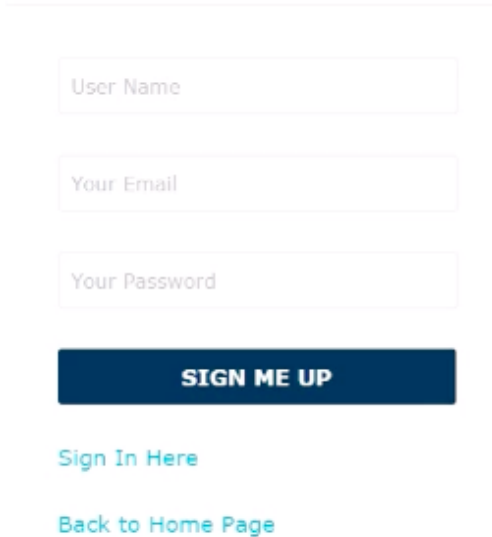
My Summary: The Summary page is the overall workout summary provided for the user. The duration of the workout stored in the database table is retrieved and are provided a graphical representation of the workouts done. There is also a table view where the types of workout and duration are displayed in the form of table.

Side Menu: The side menu unlike the top menu is always accessible for the user. It is on the top right corner and when the user hovers the mouse on that side it immediately appears. This is for providing ease of access.
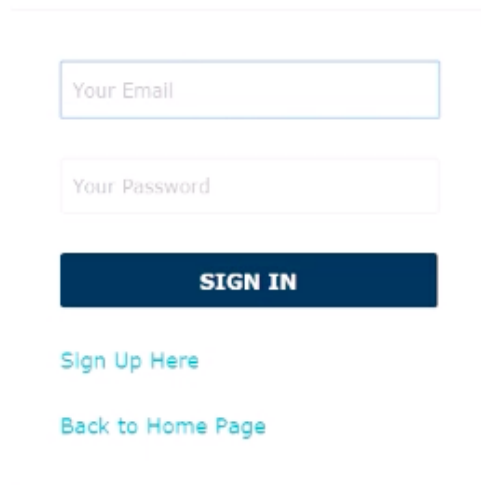
Back End - Database

There are two tables in the backend for storing information. One table is the "Users" table which contains user information such as Name, Email id, Password, Age, Data of Birth, Gender, Height, Weight and BMI. Another table is the "Events" table that contains the list of workouts, start date, end date and duration. The information for "My Profile" is retrieved from the Users table. The information for "My Summary" is got from the events table.
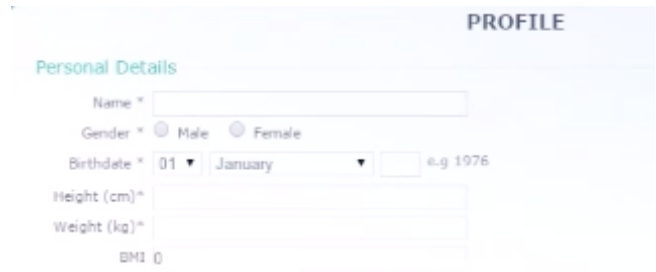
SCREENSHOTS OF THE APPLICATION

Figure 3: The Profile Page

Figure 1: The Sign Up Page

Figure 4: The Home Page with Top Menu buttons

Figure 2: The Sign In Page
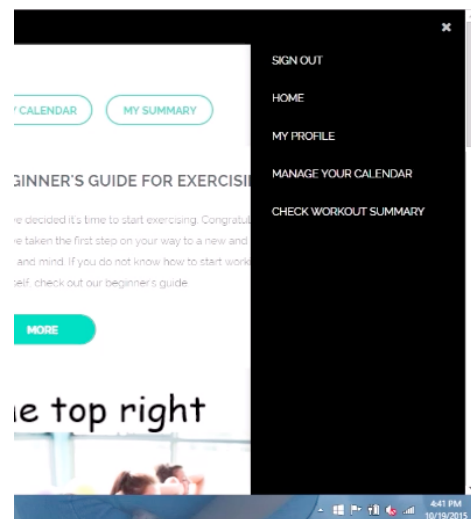
Figure 5: The Top right menu for easier access
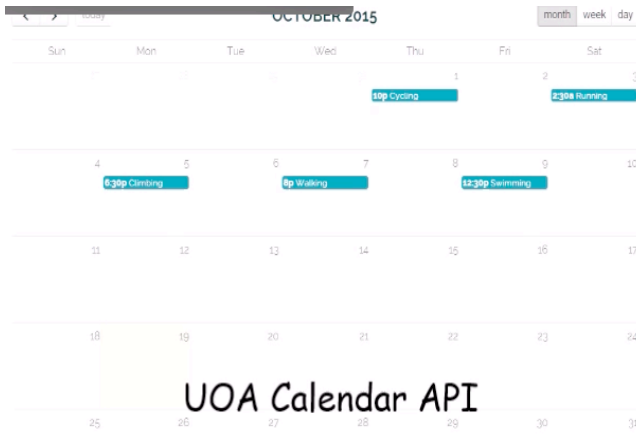
Figure 6: The Calendar Page

Figure 7: Adding workouts

Figure 8: Graphical Representation of the workout summary

Figure 9: Workout summary in table format

FANTASTIC TRAINING – ADVANTAGES
This application has potentially more advantages compared to other applications. The major advantages are:

Web Application
The reason for opting Fantastic training to be mobile application is due to the following reasons:

- The display size is smaller is mobiles. The users would find it easier to access and look at if the display is bigger.

- Computers and laptops usually have more powerful hardware than mobiles.

- Retrieving data from database would relatively be slower if the application is in mobile.

Physical fitness guide
The home page of the web application provides a guide for a beginner who doesn't know anything about workouts and physical fitness.

Health guide
The home page of the web application also contains information regarding health care. A person about to undergo fitness training must be aware of the health aspects related to the training.

Nutritional guide
The Nutritional guide provides information about the healthy diet that could be taken by the user in order to undergo proper fitness training.

Customization

Providing the user the details of his/her workout only when he/she uses his/her appropriate login ensures personalization. This attracts the users more as privacy is preferred by most of them.

UI Efficiency

An UI is said to be efficient when user finds it easy to access. Reversal actions, shortcuts, faster loading etc. are some of the prime features for considering an UI to be efficient. The workouts are in drag and drop manner, easy for user to place it anywhere.

Motivation

Motivating and encouraging physical activity can be a challenging task since keeping up a commitment to pursue the exercise goal people initially set is difficult [3]. This is looked after by providing a visual summary of the workout in forms of graph as well as table. The graph representation makes it easy for any user to understand in what direction their training is heading. The table has smileys to encourage users to workout more. Smileys are used because people are used to smileys in their day-to-day applications like whatsapp, Facebook etc.

Adaptability

This application could be used for any training activity. As it uses a generalized calendar API and it is developed in a generic way, any types of training could be included and done using this application.

FUTURE WORK

This application could be further extended to mobile devices and tablets so that it would be useful to all users. The user instead of him/her entering it manually could embed maps into the application to track the distance jogged/walked. Social networking sites like Facebook, Twitter, and Instagram etc. could be added to the website. There could be a reminder set at a particular time to workout.

CONCLUSION

Thus a customized, user-friendly and UI efficient web application that helps the user train himself for fitness is developed. Customized by providing a unique profile using his/her email id and password. This aspect is now considered as a mandatory one by most of the users as they expect personalization in everything they use. The application is considered user-friendly due to the motivational aspects it contains in the summary and the guide it provides in the home page. When the user finds the app to be appealing, he/she would have the tendency to use it more. This apparently leads to the success of any software product. Ease of customer usage is the prime criteria. UI efficiency is self explanatory by the way the menu and the pages are designed. The side menu on the top right is omnipresent for the user to use at any point of time. Thus the research question is answered.

ACKNOWLEDGEMENT

REFERENCES

1. Al-Mashaqbeh, G.A. "Computers and e-Health: Roles and new applications."*International Conference on Computer Systems and Industrial Informatics (ICCSII)*, December 2012, 1-6. http://ieeexplore.ieee.org.ezproxy.auckland.ac.nz/stamp/stamp.jsp?tp=&arnumber=6454498

2. Fernández, B.R., Fleig, L., Godinho, Cristina A., Montenegro, B. Montenegro., Knolla, N., and Schwarzer, R. "Action Control bridges the planning-behavior gap: a longitudinal study on physical exercise in young adults." *Psychology & Health* 10, Vol. 30, No.8, (2015), 911-923. http://dx.doi.org/10.1080/08870446.2015.1006222

3. Meng, Yao, and Hee-Cheol Kim. "Towards design of technologies persuading more physical activity." *IEEE 15th International Conference on e-Health Networking, Applications & Services (Healthcom)*, October 2013, 710-712. http://ieeexplore.ieee.org.ezproxy.auckland.ac.nz/stamp/stamp.jsp?tp=&arnumber=6720768

4. Nuradin, Faduma A., and Chiew, Thaim. K. "Personalization as a Tool for Improving Usability of a Higher Education Website." *5th Malaysian Conference in Software Engineering,* December 2011, 275-280. http://ieeexplore.ieee.org.ezproxy.auckland.ac.nz/stamp/stamp.jsp?tp=&arnumber=6140683&tag=1

5. Pansiot, J., R.C King, D.G Mcllwraith, B. Lo, and Guang-Zhong Yang. "ClimBSN: Climber Performance monitoring with BSN." *5th International Summer School and Symposium on Medical Devices and Biosensors*, June 2008, 33-36. http://ieeexplore.ieee.org.ezproxy.auckland.ac.nz/stamp/stamp.jsp?tp=&arnumber=4575009