

Project Proposal - HealthKeeper**1. Project Goals and Objectives**

We are excited to develop viable application working on the Android platform named **HealthKeeper**. The topic we chose to develop is mainly based on the fact that nowadays more and more *sub-health* occurs amongst young people and college students. Overweight, diabetes and hypertension, such senior health issues have gradually moved to the young people. It is the age we are living that contains a lot of fast-food and high-sweet food around us and adversely affected our everyday life. We discovered that the similarities between these kinds of disease are:

- 1) These health issues are all reversible issues by changing life style.
- 2) These health issues have no obvious symptoms when it begins to occur, but it may cause severe, life-threatening, or fatal health problems if people take care of them too late.

Accordingly, the best way to deal with such kinds of sub-health issues is to monitor some typical health parameters in our daily life, in order for the early discovery of our potential health issues.

Therefore, a nice solution to deal with this problem is to design a useful tiny application that can analyze the inputs of some physical parameters. What is more, based on the analytical result the program has given, it also provides some basic suggestions related to “how to improve yourself”, e.g. what kind of diet is recommended and how many calories is the best number for a daily eating.

Compared with the current existing application we can find related to weight control or blood pressure control, we would like to introduce something new to our program, that is, the **graphical analysis**. This is a picture-reading age we are living. A graph may worth a thousand words. Consequently, our program should make mathematical/statistical curves that represent the changes of certain physical parameters of the user in the last week or month. Also, it can analyze the curve and detect whether or not you did a good job for your health in that time period.

2. Specific Aims of the Proposed Project

- 1) Create a user log-in system that the server can remember a user's history input data.
- 2) Monitor the weight, blood sugar and blood pressure independently so that the user can choose with physical parameter is appropriate for him/her.
- 3) Analyze the user input data and automatically generate the semi-diagnostic result talking about how dangerous the user is currently under some potential health issue. The “diagnose” is based on the papers/data found in U.S. health authorities^{[1][2]}.
- 4) Based upon the degree of the health condition the user may confront, sincere advices/suggestions will be given to the user, remarking how to change life style in order to reverse the condition or to prevent the condition going worse.
- 5) The program should have some features of graphical analysis. It automatically makes the curve of the propensity of change of physical parameters. It generates weekly and monthly reports to the user and tells them whether or not they took good care of their health during that time period.
- 6) The suggestion/result creating process is linked to a remote database relevant (probably Google API). The program needs to find the cause of a certain health condition and the solution of the problem.

3. Preliminary Work

Several efforts were made for finding out the reliable result for overweight and hypertension^{[3][4]}.

- 1)MEN: $BMR = 66 + (6.2 \times \text{Weight}) + (12.7 \times \text{Height}) - (6.76 \times \text{Age})$
- 2)WOMEN: $BMR = 65.5 + (4.35 \times \text{Weight}) + (4.7 \times \text{Height}) - (4.7 \times \text{Age})$

We also collected information in the hypertension part. These results can be used to pre-estimate the health condition of the user and give a rough result. Input of the rough result to the remote resource can increase the speed of searching and organizing.

We believe this proposed project is a viable application for graduate study. The size of the

project is appropriate for a four-member team and topic is worthy to be further delved later.

3. Back-up Project

Our second idea comes from the fact that amongst the youth, especially in colleges of the United States, they really already lose the ability of expense management and control. It is very easy for the students to spend an extra \$600 on top of their necessary expense for living in one month without being aware of the server problem. An elegant way to deal with this kind of wasteful spending is to take a new habit of recording the expenses. Therefore, we propose a back-up project which is another mobile application which is used to record and diagnose expense for a user.

To simplify this, we hereby restrict our “spending region” to the Walmart Super Market, for we could find the API from there and each shopping receipt there has a QR code to scan. The innovation of this idea is that many people do want to well manage their expenses, but they also feel tired and boring record every single transaction they made. A simple scanning help solve this concern, by sharing data in the Walmart’s API.

The program has the following features. First of all, it automatically inputs the detailed information of the transaction once the QR is scanned, including items purchased, item types (grocery, living, entertainment, etc.), price, and more. Second, the program should let the user give his/her budget for certain types of items every month. When he/she is approaching that limit, the application should give warning to the user. Third, the program makes a professional analysis of the percentage of each kind of expense, then describes the spending habit of the user.

Other than the automatic scanning, the application also allows user to input his/her expenses manually. The login system is still need to be established, in order to save the user’s history inputs and other information.

We think this proposed project will be very helpful to the college students nowadays. The work load is just appropriate for a four-member group. The core difference of our proposed application from the current existing ones is that the user will not need to check his expense deliberately and the every reminder/message/warning is provided to the user by the system automatically.

4. References

- [1] Frankenfield, David C., Eric R. Muth, and William A. Rowe. "The Harris-Benedict studies of human basal metabolism: history and limitations." *Journal of the American Dietetic Association* 98.4 (1998): 439-445.
- [2] Tsai, Christopher C., et al. "Usability and feasibility of PmEB: a mobile phone application for monitoring real time caloric balance." *Mobile networks and applications* 12.2-3 (2007): 173-184.
- [3] Chobanian, Aram V., et al. "Seventh report of the joint national committee on prevention, detection, evaluation, and treatment of high blood pressure." *Hypertension* 42.6 (2003): 1206-1252.
- [4] McCarron, David A., et al. "Blood pressure and nutrient intake in the United States." *Science* 224.4656 (1984): 1392-1398.