Pinoy MD: A Mobile Dietary Aide and Recipe Generator

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Abstract—The "PinoyMD: Mobile Dietary Aide and Recipe Generator" is an android application designed to generate adjusted common Filipino viands based on a person's concerned ailment. The study aimed to determine the acceptability of the system. More specifically, the research aimed to determine: 1) the acceptability rating of the experts toward the system's a) Accuracy and b) Reliability; 2) the acceptability rating of the respondents (students and experts) towards the system's a) User friendliness and b) Functionality; and 3) the significant difference between the evaluation of the users (students) and experts (nutritionists and dieticians) in terms of a) User friendliness and b) Functionality. To respond to the statement of the problem, the researchers used a 5-point Likert scale system for 3rd year students taking BS Computer Science and Nutritionists and Dieticians. After the data have been collected, tabulated and processed, the following findings were acquired: 1) The system is acceptable; 2) The null hypothesis is accepted; 3) Though the respondents evaluated that the system is acceptable, there are still area for additional improvement of the system. These areas for improvement are on addition of topics, micronutrient intake of people with common ailment and enhancement of the user interface.

Index Terms—Android application, diet, nutrient content, recipe generator.

I. INTRODUCTION

Food plays a very vital role in Philippine culture simply because Filipinos, for a fact, are fond of eating. This is evident in the number of meals they eat throughout the day: three main meals – Almusal (Breakfast), Tanghalian (Lunch), Hapunan (Dinner) – plus an afternoon snack called Merienda. Sometimes, they also have morning (between breakfast and lunch) and midnight snack. Cooking recipe is a series of instructions on how to prepare a meal. It will list down the ingredients required as well as preparation instruction and other useful information to make one's cooking a success [1].

Knowing the balance of good nutrition and physical activity can help any individual reach and maintain a healthy weight. The body requires carbohydrates, fats, proteins, vitamins, and minerals to maintain healthy organs, bones, muscles, and nerves and to produce hormones and chemicals that are necessary for the proper organ function [2]. But the benefits of good nutrition go beyond weight. Moreover, there is a saying, "Every human being is the author of his own

health or disease" [3]; therefore, people should be cautious in what they eat. It is important that they improve their diet towards a healthy lifestyle. Good nutrition can prevent illness or injury.

Computers are already widely used that they can be a dietary aide and a recipe guide but it is not something that one can bring anywhere, so people need something that is more portable and easier to carry. Mobile phone will be the answer to this problem. More specifically, the Android phone is a software stack for mobile devices that includes an operating system, middleware, key applications, and structured data storage [4]. Applications in smart phones are used in the fields of information technology, business, medical purposes, etc.

This is why the researchers came up with the idea of creating an Android application entitled "Pinoy MD: A Mobile Dietary Aide and Recipe Generator" that will generate adjusted common Filipino viands based on a person's concerned ailment. The researchers' goal is to incorporate a variety of healthy foods cooked in healthy ways into their diet and make these habits their new lifestyle.

II. DEVELOPED SYSTEM

The system was functional in an Android operating system which is intended for mobile devices such as smart phones and tablet computers particularly with Android 2.3 version or higher. Java language was used to develop the software using the Android Software Development Kit. Netbeans 6.9 version was used as its Integrated Development Environment. It will also be developed in J2SE platform. SQLite database was used since it is the most suitable database engine for mobile application.

A. System Architecture

The first requirement of Pinoy MD is for the user to distinguish his/her ailment. From this, the two options that the user may pick are the Available Ingredients function and the Select Dish function. The Select Dish function is done by first selecting the category of dish he/she wishes to cook. After this, the system will display the dishes from that category that the user may cook.

The second option is the Available Ingredients function where the user should specify the ingredients he/she will use. First, the user must indicate the main ingredient and one sub ingredient he/she has. Then, it will display the possible dishes that will suit the ingredients that the user has defined.

After the user selects his/her desire dish, the system will display the recipe of the selected dish with the adjusted set of ingredients (extenders/alternatives) which considers the ailment defined, health tips and the nutrient content of the

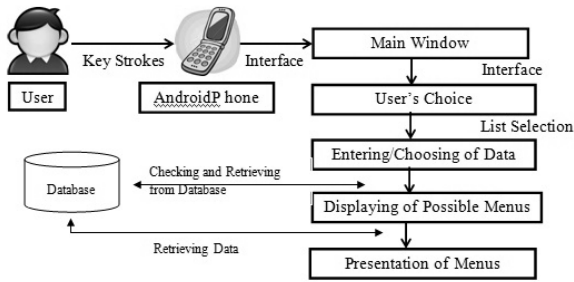dish (calories, carbohydrates, proteins and fats).

Fig. 1. System architecture of pinoy MD: a mobile dietary aide and recipe generator
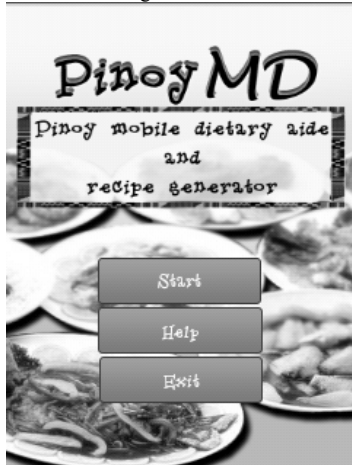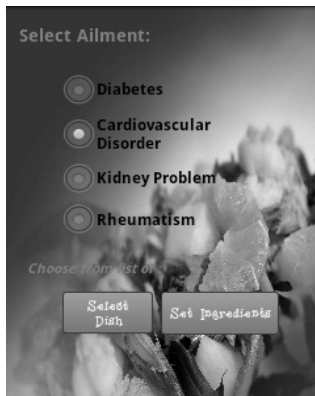

Fig. 2. Main window

Fig. 3. Choosing the ailment

B. Software

The researchers provide different interfaces where the users can interact with the system such as the main menu where the user can choose whether he wants to start navigating the system or view the instructions on how to use the system. Fig. 2 shows the prototype of the interface where the user can choose whether to view Help button or directly proceed to start.

Fig. 3 shows the prototype of the interface for Start where the user can choose his ailment and whether to choose either Select Dish or Set Ingredients.

Fig. 4 shows the prototype of the interface for Select Dish. It contains list of dish by category together with their corresponding list of ingredients.

Fig. 5 shows the prototype of the interface for Select Ingredients where the user can choose their Main Ingredient and other ingredient

Fig. 6 shows the prototype of the interface for submitting

the selected Ingredient. It contains possible available dish that appropriate for his ailment.

Fig. 7 shows the prototype of the interface when the user choose his desired menu. It contains nutrient content, the cooking process and some helpful tips.

Fig. 8 shows the prototype of the interface where the user can view the instructions on how to use the system.
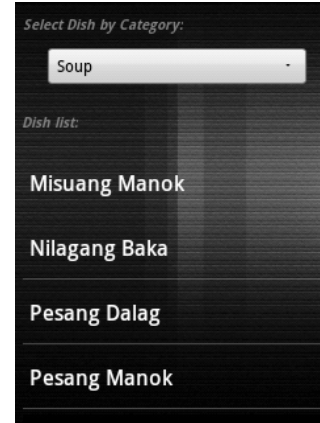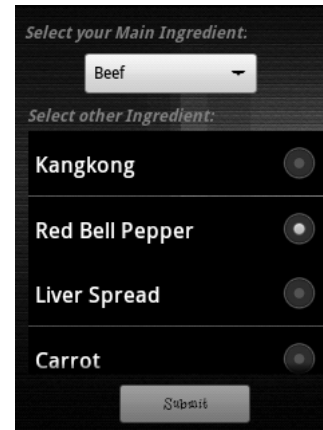

Fig. 4. Selecting dish
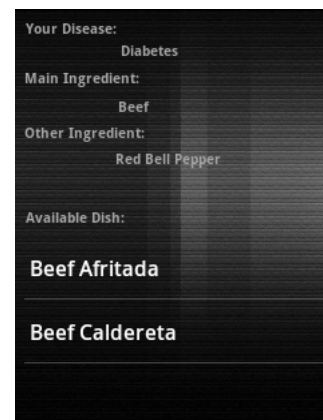

Fig. 5. Selecting ingredients

Fig. 6. Submitting selected ingredients

C. Research Design

The researchers applied the descriptive-evaluative research for it appraises carefully the worthiness of the study [5], which in this study, the Pinoy MD software, was evaluated according to its performance and worthiness. The conditions that were considered by the respondents are the accuracy and reliability of the output, functionality of the system and ease of operating the system. Descriptive method obtains to give information about one or more variable.
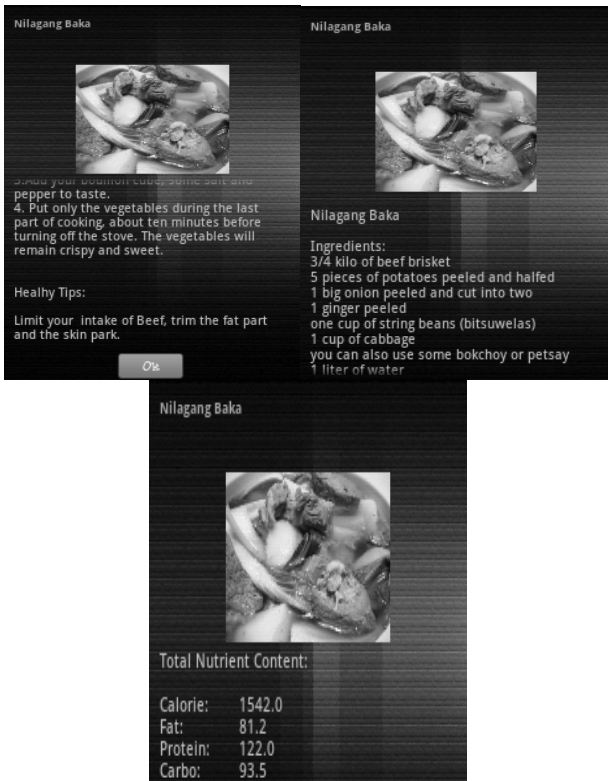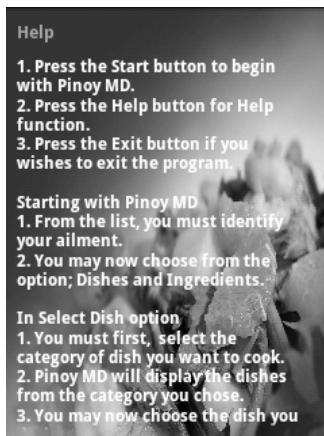
Fig. 7. Choosing desired menu

Fig. 8. Help window

TABLE I: LIKERT SCALE

Scale	Verbal Interpretation
1.0 – 1.49	Strongly Accepted
1.50 – 2.49	Accepted
2.50 – 3.49	Fair
3.50 – 4.49	Not Accepted
4.50 – 5.0	Strongly Not Accepted

D. Statistical Treatments

1) Sample size formula (n)

The extent of the population will depend on the nature of the problem. The census survey will require all individual in the population that is considered while the sample survey will consider a few representative of the population [6]. The formula for identifying the sample size is as follows:

$$n \geq \frac{N}{1 + Ne^2}$$

2) Likert scale

A psychometric response scale primarily used in questionnaires to obtain participant's preferences or degree of agreement with a statement or set of statements [7].

3) Weighted mean (WM)

It is a set of observation of the average measurements in a set of data [6]. The formula is required as one of the aggregates in computing the T-Test.

$$WM = \frac{W1X1 + W2X2 + W2X3 + ...WnXn}{N}$$

4) Standard deviation (SD)

This was used to determine the significant difference between the users (students) and experts (nutritionists and dieticians). This also served as the supplementary variable in identifying the T-Value [8].

$$SD = \sqrt{\frac{\sum fi(x - \bar{x})^2}{n - 1}}$$

5) T – Test for independent samples (t)

T-test is used to compare two means obtained from two uncorrelated or separate samples, in which the formula will answer the significant difference of the two separate groups of respondents are computed [9].

$$t = \frac{(M1 - M2)}{\sqrt{\frac{s_p^1}{n_1} + \frac{s_p^2}{n_2}}}$$

III. RESULTS

The study is evaluated by the Third Year Bachelor of Science in Computer Science students from the College of Computer Management and Information Technology (CCMIT) of Polytechnic University of the Philippines (PUP) and selected nutritionist and dieticians (experts) of the Dietary Department of University of the East-Ramon Magsaysay Memorial Medical Center (UERMMMC). It examines the acceptability of "Pinoy MD: A Mobile Dietary Aide and Recipe Generator". The developed material method of research was utilized; questionnaires were used to collect data. The respondents' assessment of the software is as follows.

TABLE II: ASSESSMENT OF THE EXPERTS ON PINOY MD'S ACCURACY AND RELIABILITY

Criteria	Weighted Mean	Verbal Interpretation
Accuracy	2.0	A
Reliability	1.87	A

Table II shows the Assessment of the Experts on Pinoy MD's Accuracy and Reliability. The result shows, the experts rated the system's Accuracy as Accepted and has a mean of 2.0 and Reliability as Accepted and has a mean of 1.87.

TABLE III: COMPARISON ON THE ASSESSMENT BETWEEN THE STUDENTS AND EXPERTS

Criteria	Students	Experts	Computed T-Value	Decision
User-Friendliness	1.44	1.40	0.4270	Accept H0
Functionality	1.48	1.70	0.7733	Accept H0

Table III shows the Assessment of the Experts and Students on Pinoy MD's User-Friendliness and Functionality. The result shows, the experts rated the system's User-Friendliness as Strongly Accepted and has a mean of 1.40 and Functionality as Accepted and has a mean of 1.70. Also, students rated the system's User-Friendliness as Strongly Accepted having a mean of 1.44 and 1.48 for Functionality.

In terms of User-Friendliness and Functionality, the results show that there is no significant difference between the evaluation of selected BSCS 3rd year students of CCMIT, Department of Computer Science and selected nutritionists and dieticians of the UERMMMC, Dietary Department who have used "Pinoy MD: Mobile Dietary Aide and Recipe Generator", since the computed overall t-value for user-friendliness is 0.4270 and functionality is 0.7733, is all less than the tabular value of 1.9787 with 5% level of significance.

IV. CONCLUSION

Considering the summary of findings stated above, the researchers have drawn into these conclusions:

The developed "Pinoy MD: A Mobile Dietary Aide and Recipe Generator" is acceptable among the subjects of the study who utilized the system as a tool designed to generate adjusted common Filipino viands based on their concerned ailment.

Since there was no significant difference between the assessment of the students and the nutritionist / dietician, the null hypothesis was accepted.

Though the respondents evaluated that the system is acceptable, there are still areas for additional improvement. These areas for improvement are the addition of topics, micronutrient intake of people with common ailment, and enhancement of the user interface.

V. RECOMMENDATION

Based on the findings and conclusion formulated in this research study, the following recommendations are hereby proposed:

1) It would have been desirable if the Pinoy MD recipes will be downloaded with the use of the internet for more variations of dishes. Another improvement would be if the users may upload and share their own special recipes with the aid of the internet connection.
2) The existing ailments of Pinoy MD may be improved by adding ailments which are helpful on people with special diets.

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