A Mobile Application that Promote Healthy Eating Habits

By

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Dissertation submitted in partial fulfillment of the requirements for the

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CERTIFICATION OF APPORVAL

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A project dissertation submitted to the

Computer Information System Programme

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Approve by

_____

(Dr Jefreezal Jaffar)

CERTIFICATION OF ORGINALITY

This is to certify that I am responsible for the work submitted in this project, that the original work is my own except as specified in the references and acknowledgements and that the original work contained herein have not been undertaken or done by unspecified sources or persons

IYLIA BINTI ROSLAN

ABSTRACT

"A Mobile Application to Promote Healthy Eating Habits " is a diet-based android mobile application that promotes healthy eating habits based on Malaysian foods. This project aims to cater or meet the need of Malaysians by creating an application that suites Malaysians lifestyle that is currently lacking in diet-based application available today. This dissertation will focus on the introduction of the project, followed by the literature review, the methodology used, results and discussion of the project and lastly conclusion and recommendation resulting from this project. It is concluded that application develop has hold some potential as there potential for the application to be commercialize in the future. The application aim to be bridge between mobile technology and healthy living.

ACKNOWLEDGEMENT

First and foremost, I would like to praise Allah Al-Mighty as without His blessing and grace this project would not have been complete. Secondly I would to express my upmost appreciation to my supervisor Dr Jefreezal for his guidance and support for the entire duration of the project. Lastly I would thank family and friends who have given support throughout the duration of this project.

TABLE OF CONTENTS

CHAPTER 1: INTRODUCTION 1

1.0 Background of study 1
1.1 Problem Statement 2
1.2 Objective 3
1.3 Scope of study 4
1.4 Relevancy of project 4
1.5 Feasibility of project 5

CHAPTER 2: LITERATURE REVIEW 7

2.0 Obesity in Malaysia 7
2.1 Controlling Calorie Intake 8
2.2 Mobile Application in Healthcare 9
2.3 Mobile Computing 9
2.4 Android 10

CHAPTER 3: METHODOLOGY 11

3.0 Research Methodology 11
3.0.1 Planning 12
3.0.2 Analysis 12
3.0.3 Design 13
3.0.4 Testing and Evaluation 14
3.1 Key Activities 15
3.2 Key Milestone 16
3.3 Tools Required 18

CHAPTER 4: RESULTS AND DISSUCION 20

4.0 Results and Discussion 20
4.1 User Needs Assessment and Analysis 20
4.2 Experimental and Modeling 24
4.3 Prototype 28
4.3.1 Interfaces 28
4.4 Project Deliverables 29

CHAPTER 5: CONCLUSION AND RECOMMENDATION 34
5.0 Conclusion 34
5.1 Relevancy to Objective 34
5.2 Recommendation 34

REFRENCES 35
APPENDICES 36

LIST OF FIGURES

Figure 1.0: Survey question 1 2

Figure 2.0: Survey question 2 3
Figure 3.0: Rapid Application Development Methodologies 11
Figure 4.0: System Architecture 15
Figure 5.0: Gantt Chart 18
Figure 6.0: Survey question 21
Figure 7.0: Survey question 4 22
Figure 8.0: Survey question 5 23
Figure 9.0: Survey question 6 24
Figure 10.0: Home Page 28
Figure 11.0: Menu Page 29
Figure 12.0: Application Main Page 30
Figure 13.0: BMI Calculator 31
Figure 14.0: Exercise Plan 31
Figure 15.0: Application Recommendation 32
Figure 16.0: Food drop list 33

LIST OF TABLES

Table 1.0: Compatibility Test 25
Table 2.0: User Satisfaction Test 27

CHAPTER 1

INTRODUCTION

1.0 Background of study

This project has been proposed to be a bridge between mobile applications and instilling healthy eating habits. Realizing the increasing rates of obesity in Malaysia, importance of maintaining a healthy lifestyle and the increasing independence and popularity of mobile applications, thus lead to the initialization of the project.

On November, 14 2011, the Dewan Rakyat made a shocking announcement that Malaysia had the highest obesity rate in Southeast Asia and rank sixth in the Asia-Pacific region. Deputy Health Minister Datuk Rosnah Abdul Rashid Shirlin Malaysia mentions that the daily sugar intake for Malaysians is 51g. Hence, this is an indication that Malaysian does not monitor their eating habits thus increasing the potential for the raise in obesity rate. The project aims to instill good eating habits. This is done by producing an android based application.

Mobile applications are chosen for this project because of its increasing popularity. The International Data Corporation stated in 2010 that sales of Smartphone have exceeded sales of personal computer by 8.8%. With that, it would be more suitable that the project focused on mobile application. The operating system that would be used is Android. Android is chosen based on its availability and increasing popularity. Android is an open source code and dominates sales by having a 50.9% market share. In the nutshell, the project purpose is to become a bridge between mobile application and healthy eating.

1.1 Problem Statement

There are the occurrences whereby Malaysian users not have the suitable application or lack choices of application that are suitable for the Malaysia diet. This is proven during a survey conducted with 50 Malaysian that are android smart phone users in which the majority states that the current application in the Play Market are not compatible with them. Below is a figure taken from the survey conducted.

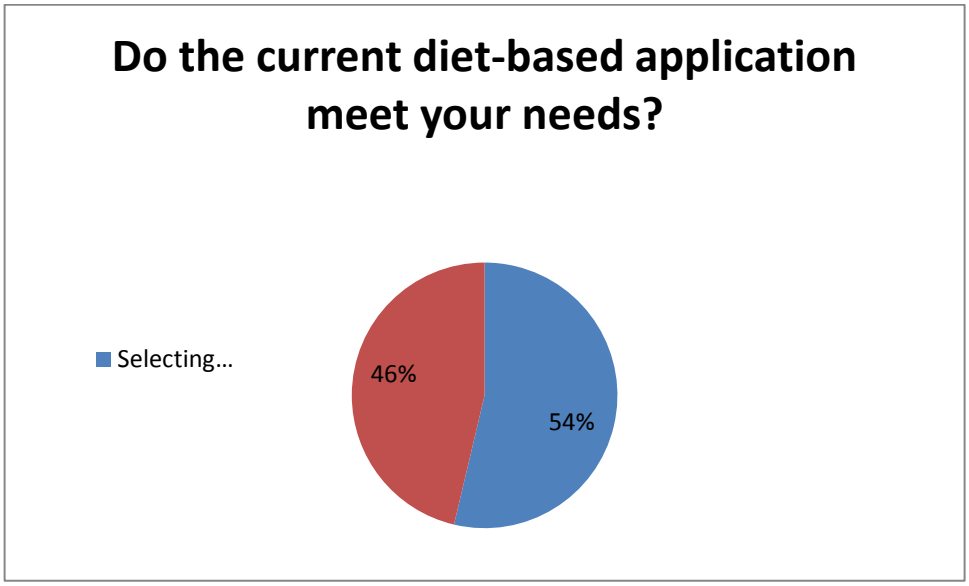

Figure 1.0: Survey question 1

This shows that Malaysian users feel that there is a lack or limited choice for diet-based that meet their needs. The majority or most of the available diet-based application are based on the western diet and this would not meet the needs of Malaysians. Hence, this discourages Malaysian smart phone users to use current applications which in turns increases disregard for their diet. Decreasing knowledge regarding the food that is consumed will result in an unhealthy diet that could lead to diabetics, obesity and other heart related illnesses.

Furthermore, there are occurrences whereby Malaysian will settle for convenience rather than choosing to take the trouble to find healthy food. Below is a figure that supports the statement above.

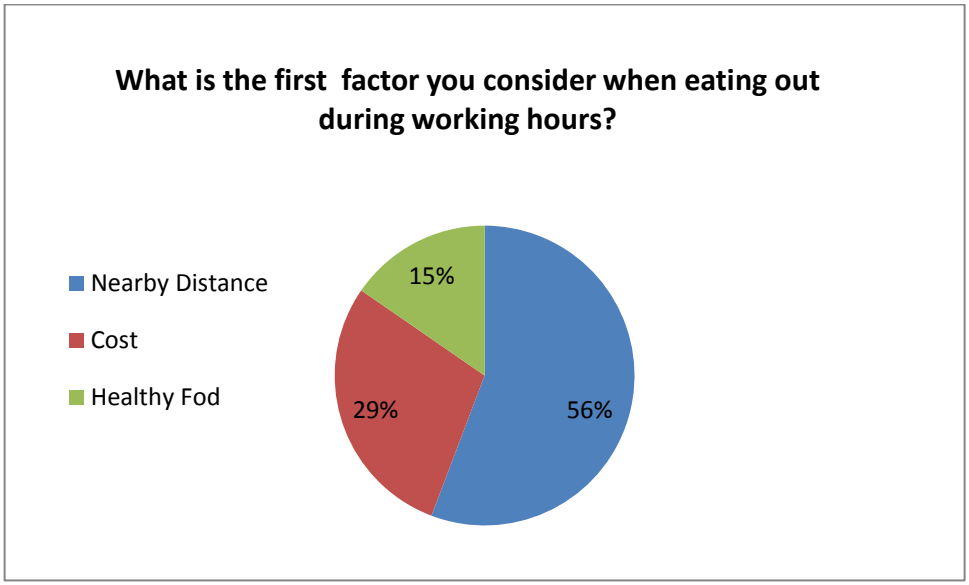

Figure 2.0: Survey question 2

This figure is based on a survey conducted on 50 smart phone users. The user consists of working adults and university student that have demanding schedule. This proves that nowadays the majority would settle for convenience rather than healthy options. The propose application will help complement healthy eating habits into the current busy lifestyles. The application will help create awareness regarding the food that the user is planning to take and help users to better options. With that users, are able to make the best choice with the options available to them.

1.2 Objective

The first objective would be to analyze requirement and features that would be included the application. The analysis phases would include

undertaking a user requirement analysis in order to build an application that would best fit the targeted users.

The second objective would be to design and develop the mobile application. Design and development is based on the analysis. The design phase will include design of interface and function. Design phase will begin by design the system architecture first to receive a general idea of the overall system. Then will proceed with the interface design. Interface design will begin with the main page then continue with other pages corresponding to the main page. After completion of the design phase, the development phase will commence based on works that have been done in the design phase. The development phase will be on coding and programming of the system. The design for the mobile application is subjected to change according to difficulties faced during the development stage.

The third and final objective of this project would be testing and evaluation of the mobile application developed. The testing is being focus on the functionality of the overall application.

1.3 Scope of study

The project will focus on android-based smart phone users aged between 18-45 years. This age is chosen as android-based smart phones and android based application are popular among this age group. Furthermore, this age group would be considered to be technology savvy. The area of the project would be Malaysia to ensure the feasibility of the project.

1.4 Relevancy of project

According to Khor, G.L (2007) *A national study on the prevalence of obesity among 16,127 Malaysians* suggested that increase in obesity is because of the fast-paced economic development that leads to increase in urbanization. Khor further suggested that urbanization has a profound

impact on how people lead their lives which would include their diet. People who live in cities and town areas especially families with both spouses work because facilities are available to them and it is more timesaving.

The statement above supports the aim of the project which is to use mobile application to promote healthy eating. The statement made by Khor suggested that rates of obesity is increasing as people do not have the time and are more depended on facilities for daily routine. This project complements fast-pace life and urbanization as it is mobile and can be used anywhere. Furthermore, the application in non-complex, easily to understand and is not time consuming to learn how to use.

The project is relevant to Business Information System academic syllabus of Universiti Teknologi PETRONAS (UTP). It includes system analysis design and programming subject especially object-oriented programming. Furthermore, the project is related to both management and business subject. The project also touches on humanities subject especially communications.

In the nutshell, the project is considered to have relevance to both the society and the academics learning of the university.

1.5 Feasibility of project

For this project, the first semester will focus on methodology formulation and design conceptualization. The second semester will focus on detail design and development of application. The objective of this project is considered achievable within the given timeframe.

The second semester will focus on development, testing and evaluation. Works executed during the second semester will be based on the design conceptualization completed during the first semester. Development,

testing and evaluation of the application are achievable given the timeframe of the second semester.

In addition the area and target users mention in the project scope adds to the feasibility of the project

CHAPTER 2
LITERATURE REVIEW

Before designing and developing the mobile application, there is a need to understand the fundamentals of android application and components relating to it. Research papers are the foundation of methodology formulation and generation of concept that applies the theoretical knowledge

2.0 Obesity in Malaysia

On November, 14 2011, the Dewan Rakyat made a shocking announcement that Malaysia had the highest obesity rate in Southeast Asia and rank sixth in the Asia-Pacific region. Deputy Health Minister Datuk Rosnah Abdul Rashid Shirlin Malaysia mentions that the daily sugar intake for Malaysians is 51g. According to the World Health Organization, daily intake should be only 50g. Kopelman, P. (2000) *Obesity as a medical problem* highlighted that obesity in our country is becoming a more prevalent problem compared to under nutrition in both rural and urban areas.

Mohd Ismail Noor (2002) *The nutrition and health transition in Malaysia* argued that change is health is due to change in dietary habits which are the result of the nutrition transition in this country. According to the statistic that had been compiled, it showed that there has been increase in intakes of calories, fats and sugar. The study also showed a significant increase or growth of the fast food industry in this country. Hence, this contributes to the increasing obesity rate in Malaysia.

According to Khor, G.L (2007) *A national study on the prevalence of obesity among 16,127 Malaysians* suggested that increase in obesity is because of the fast-paced economic development that leads to increase in urbanization. Khor further suggested that urbanization has a profound impact on how people lead their lives which would include their diet. People who live in cities and town areas especially families with both spouses work because facilities are available to them and it is more timesaving.

Reduce physical activities, increase dietary fat, increase in sugar and decrease in fiber intake has contributed to health problems like overweight and obesity. High prevalence in obesity is observed in Malaysia compared to other nations in South East Asians Countries. An estimated percentage of Malaysia population that is overweight is 29.1% while the percentage of obese is 14%.[1] Recent evidence shows that women are at greater risk than men for overweight and obesity. Apart from that the highest level of obese are among adults aged 40-59 years old. Indians have the highest overweight levels followed by Malays, Chinese and Aboriginals. [2]

2.1 Controlling Calorie Intake

Method for behavioral weight loss included promotion of self-monitoring behaviors that would include calorie counting. [3] Obesity is not only becoming a cause for physical illness but also to mental illness. [4] Hence this would further encourage people to adopt a healthier eating lifestyle as the risk of illness related to obesity and overweight have increase. An effective diet management system would be firstly that system would need to have a calorie tracker and the system would need to be mobile. [5]

Popular methods used for calorie intake calculation are Metric BMR Formula and Harris Benedict Formula. The Metric BMR Formula are categorize into two which are the suitable calorie intake for men and the suitable calorie intake for women. Below is the Metric BMR Formula.

- Men : BMR = 66 + (13.7 x weight in kilos) + (5 x height in cm) – (6.8 age in year)
- Women : BMR = 66 + (13.7 x weight in kilos) + (5 x height in cm) – (6.8 x age in year)

The Harris Benedict Formula focuses on the fitness level of the individual and to what v extent the individual is active. Below is the Harris Benedict Formula.

- No exercise : BMR X 1.2
- Lightly Active : BMR X 1.375

- Moderately Active : BMR X 1.55
- Hard Exercise : BMR X 1.725
- Athlete Level : BMR X 1.9

2.2 **Mobile Application in Healthy Eating**

Mobile applications have a positive effect on healthy eating as it focus on persuasive and basically telling people what to implicitly and explicitly. [6]. Thus this makes user of mobile applications more aware of their and other decision. The central or the root of the mobile application must the persuasiveness feature. Furthermore must maintain some flexibly and allow users to make their own decisions.

Lopez, I.M (2011), suggested that mobile application in crucial in a healthy diet as it delivers actions to users anytime and anywhere. Features that users look for or a reason as to why users presently are highly dependent on the mobile technology is because of the immediate response. A healthy diet requires constant discipline, motivation and monitoring. Mobile applications are able to offer that constant feature as users carry their smart phone everywhere which gives mobile application a positive effect on user trying to keep a healthy lifestyle.

Mobile application present a positive energy to a user as mobile application displays some sort of goal setting and rewards. [7]. Mobile application allows user to know what they need to achieve and will also track and record the users performance so that users are to know current progress. Feedback is a positive reinforcement one that can be given by a mobile application.

2.3 Mobile Computing

Mobile devices are a revolution as it has become an object or a tool used in our daily life use for communication purposes and to access information. The combination of mobile devices, third generation wireless services with multimedia capabilities, and Internet and portal technology, this allows data

and information to be received “anywhere”, “anytime”, and by “anyone”. [8] As the ability to retrieve data increase so will the need to retrieve data. This will result in application being built to cater to those needs thus having positive effect on the community as a whole. The paper focused on the impact that Mobile Computing and the opportunity that it opens for application development.

The process of obtaining or discovering new information is a form of learning. Without realizing it we go thru the process of learning in our daily life. Nature of receiving and obtaining information is changing due to the influence of mobile connectivity. Mobile connectivity increases learning opportunity thru project collaboration and media sharing. [9]

2.4 Android

Android is a software for mobile devices that has operating system, middleware and key applications. The architecture of the Android is like a stack with Application being the top layer and Linux Kernel being the bottom layer of the Android. [10] Core applications of Android include e-mail client, SMS program, calendar, maps, browsers and contacts which are mostly text input based.

CHAPTER 3
METHODOLOGY

3.0 Research Methodology

The methodology that will be applied for the purpose of this project is Rapid Application Development Process (RAD). This particular software development methodology is widely throughout the world. This is because Rapid Application Development Process takes an approach whereby minimal planning is required and focuses more rapid prototyping. The methodology is an integration of various structure technique mostly focusing on data-driven Information Engineering with prototyping accelerating the development of system. (Whitten,2004)

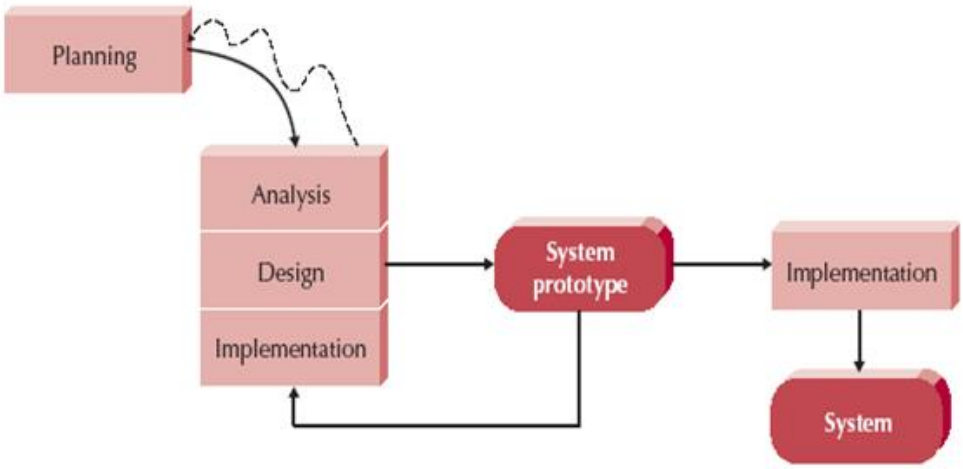

Figure 3.0: Rapid Application Development Methodologies

Rapid Application Development is chosen as the method for this project because of its approaches. The approaches clustered in Rapid Application Development include development and refinement of data models, process model and

prototyping in parallel using iterative process which is a repetition of prototyping, testing, analyzing and refining the output. Advantages of using this methodology is that is help to reduce time consumption. This is because the method for planning, analysis, design and implementation to be done in a parallel process. Furthermore, the method help to better identify the user requirement throughout the analysis and design phase up to the development of the prototype itself

3.0.1 Planning

The planning phase means project initiation. The planning phase will take part in the first semester. The main activities that will be executed during the planning phase include undertaking a literature survey.

Literature survey will focus mobile application development and BMI and food calorie calculation System requirement will be specified here based on information gathered. The literature survey will be conducted both via internet and library.

Furthermore, a research study will be conducted to see current works that have been carried out for diet-based or calorie counting android based mobile application. This will assist in obtaining a clearer and better understanding of the subject matter. In addition, new modification or new findings can be observed thru studying new projects related to diet-based applications.

In the nutshell, the main objective of this phase is for information gathering and to gain full understanding regarding all components. The planning phase is vital as it is the foundation for the project and the planning phase will determine the course of direction for the project

3.02 Analysis

The analysis phase began a few weeks after project initiation in which the project proposal had already been submitted and approved. The Rapid Application Development methodology states that in the analysis part must consists of four elements which are methodology, people, management and tools.

The methodology that has been identified is Rapid Application Development. This methodology is chosen because it focuses rapid prototyping and favors minimal planning. Hence, this methodology focuses on refining the final output. In additional this methodology is said to help reduce time consumption.

For this project the people would be the targeted end users. The targeted users for his project are android-based smart phone user aged between 18 to 45 years. The reason for this age range is because of the popularity of android smart phone of this range gap. Issues that are involved in this context would be the user requirement, user wants and user needs. Hence the author conducted a survey that involved 50 respondents of the mention age range to collect useful information and user requirement that can be used for this project. From the survey, the author has concluded some functionality that would be included in the system. The functions that have been indentified include:

- The application should be able to identify the user's BMI based on information user has selected
- The application should have a list of Malaysian food and user's should be able to know the calorie's of the food
- The application should identify the appropriate diet plan for the user
- The application should identify the appropriate exercise routine for the user

- The application should give recommendation whether the food should be taken or not based on BMI status

The analysis part also required to indentify the tools that would be used for the project. The tools identified for the project is divided into hardware and software. The required hardware includes

- Computer
- Mobile phone
- Printer
- Scanner

The software required is:

- MIT app inventor

3.02 Design

The design of the application will be based on the results of the analysis phase.. The design phase is carried out during the second semester. Duration of the second semester is between the end of May 2012 until end of August 2012. The design phase will focus on interface design and function design. Interface design is based on user interactivity. The interface will be design to be as user friendly as possible. Function design will be based on the operations that the application will execute. Each function will be design separately and integration of function will be implemented once the design for each function has been completed. Design of the database will be commence during the phase. However, database design will only begin one interface and function design has been completed.

The next page shows the system architecture.

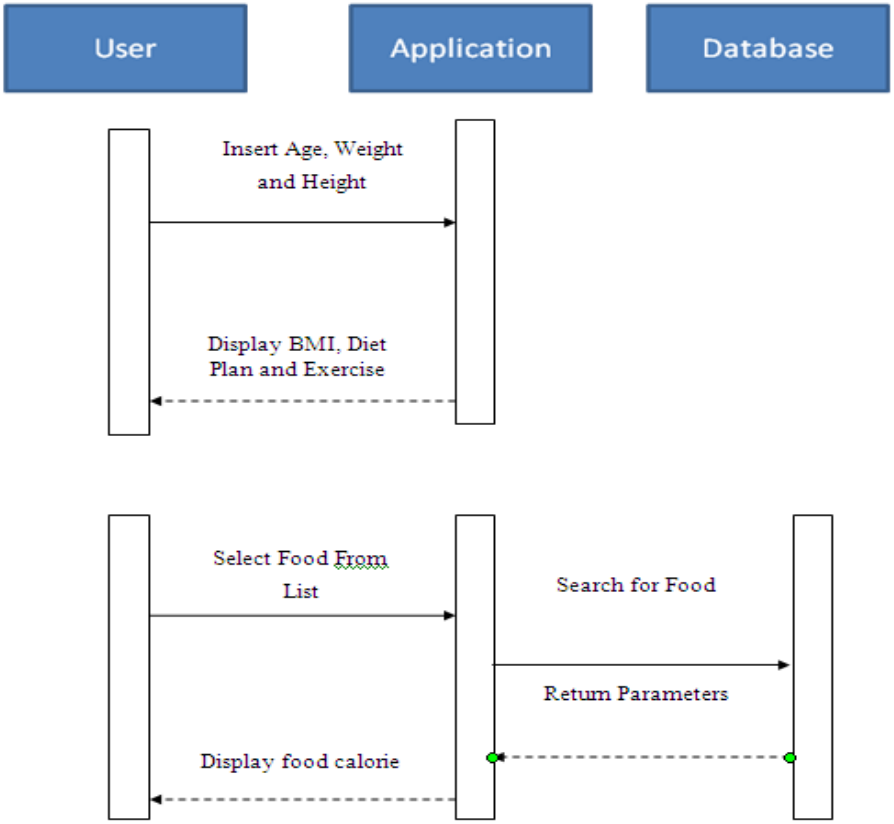

Figure 4.0: System Architecture

3.03 Implementation

The implementation involves the development of the application. This phase will focus on the coding and programming of the prototype. System testing is done after completion of the coding and programming of the prototype. Implementation begins by completing the design of the home or main page of the system and after that proceed to design other or sub pages of the system. After design the interface of each of the system, the next phase would be to code the functionality of each interface.

3.04 Testing and Evaluation

The output of the project would be a prototype. Hence this eliminates the need for system training. However user acceptance test will be conducted to see if the application is fully functioning. This test will determine the success of the project.

3.1 Key Activities

The activities that have been undertaken for this product would be conducting a literature analysis, conducting a survey, design the system architecture; design the interfaces, and coding for the interfaces.

The literature analysis was carried out with the objective to obtain a clearer understanding regarding mobile application development, BMI and calorie calculation, Malaysian foods and diet. The literature was the base or foundation of this project as without understanding the matter the project would be successful.

The author conducted a survey to understand the user wants and needs. The objective of this project is to design and develop an application that meets the needs of Malaysian users. Hence, this calls for the need to conduct a survey to know functions and feature that the application must have to meet the needs of Malaysian users.

Design the system architecture illustrates the overall idea of how the system would work. The system architecture is design based on the finding of the survey. From the system architecture, interfaces for the prototype were design. Design of the interfaces started with the main page that followed with the other sub-pages.

Coding and programming for the system began after interfaces had been design. Coding and programming are the most important part of the project as failure to do so will result in the project being deemed unsuccessful. Since the author has limited experience in development of mobile application, the author took time between the months of June and

July to familiarize with the platform used to develop an android mobile application.

Other key activities include presentation of the prototype along with a poster summarizing the entire project to Associate Professor Dr Dayang Rohaya, a lecturer of the Computer Information Sciences of Universiti Teknologi PETRONAS. Suggestion and opinions made by Dr Dayang Rohaya were taken into account to assist for the upcoming assessment.

3.2 Key Milestone

Key milestones that have been identified for the project include:

- Completion of literature survey
- Completion of survey
- Completion of user assessment
- Completion of interface design
- Completion of coding and programming

There are several important deadlines throughout the duration of the project. These deadlines are taken into high attention. The important deadlines include

- Submission of Progress Report – Week 7
- Pre- Engineering Design Exhibition – Week 11
- Dissertation – Week 12
- Viva Presentation – Week 13
- Final Dissertation and Technical Report – Week 14

The deadlines and submission is based on the Final Year Project 2 Timeline given by the programme coordinator. Below is the gantt chart for this project.

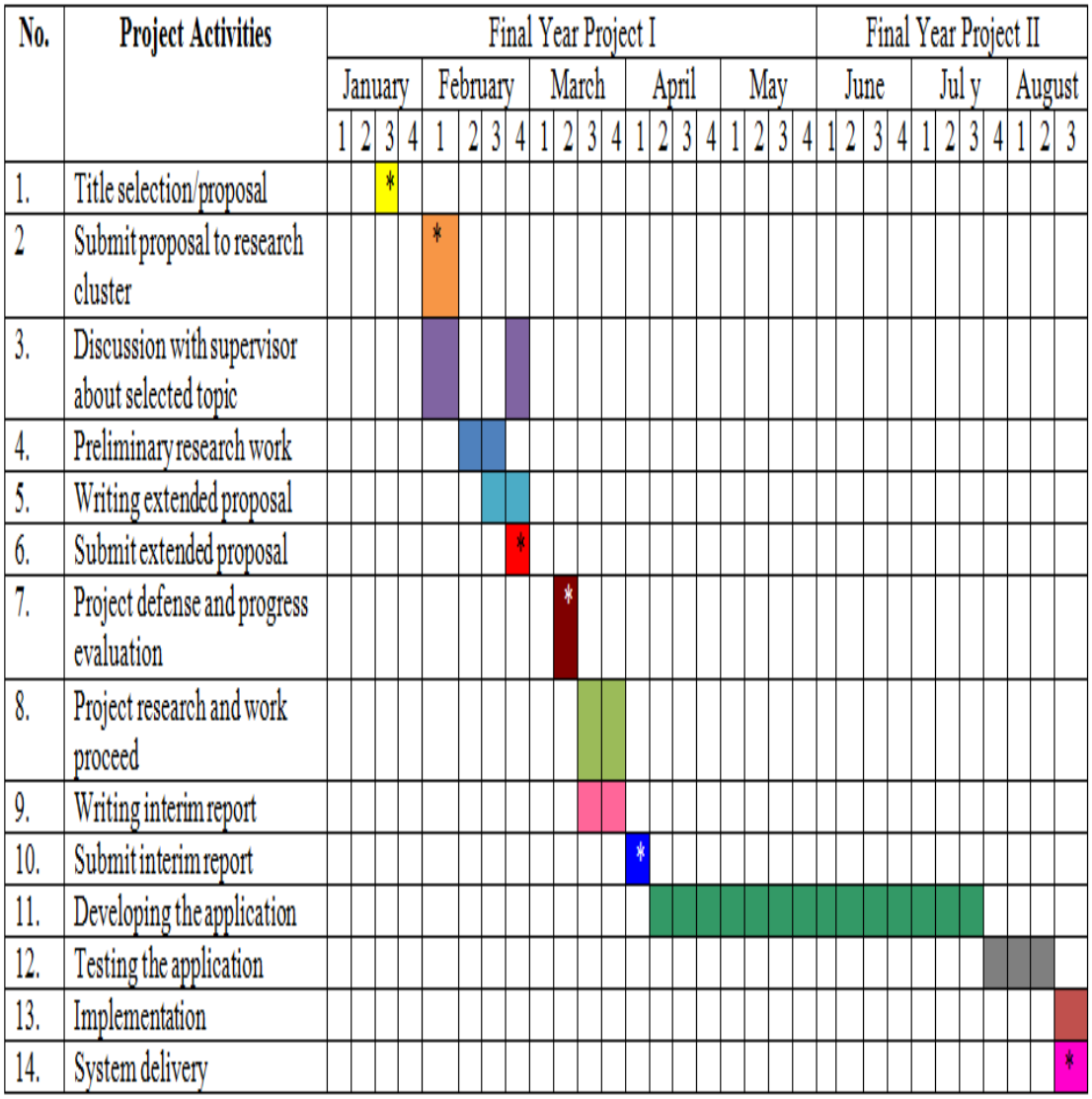

Figure 5.0: Gantt Chart

3.3 Tools Required

The tools required for the project will be divided into hardware and software.

The required hardware includes:

- Computer
- Mobile phone

- Printer
- Scanner

The software required is:

- MIT app inventor

CHAPTER 4

RESULTS AND DICUSSION

4.0 Results and Discussion

4.1 User Needs Assessment and Analysis

The user needs assessment and analysis was carried out through survey with parties that are android smart phone users and are use to purchasing android application thru the play market. The survey conducted involved 50 respondents aged between 18 and 45 year. The respondent consists of working personal, some with families and some still single and student. The reason as to why this age range was chosen is because the majority in this age range is currently living an active lifestyle and android smart phone and applications are popular among the individuals in this age range.

The first finding found by the author is that the majority of the respondents are currently not using any diet-based application. Among the 50 respondents only 14 respondents are currently using some health-based application. The finding concludes that the respondents are not or do not put health as a priority and that the current application in the market may not meet the needs of the Malaysia users. The figure below shows the number of respondents currently using a health-based application.

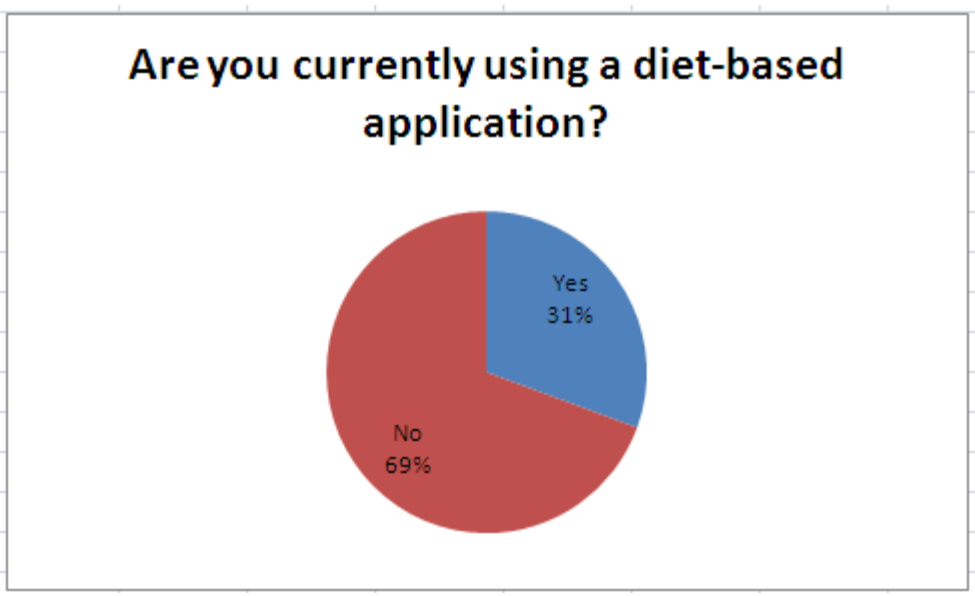

Figure 6.0: Survey question

This figure shows that only 31% of the respondents are currently using a diet based application. The respondents that are currently using a diet based application are mostly females and aged below 35. Another interesting finding is that the majority of diet-based application comes from the Chinese race.

For the respondents that are do not use any diet-based application, the respondents were given a list of reasons as to why they we not using a diet-based application. Among reasons that were given was that the applications were costly, diet is not a priority and that the applications were not suitable for them. Respondents were also given an option allowing them to state their own reasons if their reasons had not been listed. The figure below shows the responds to the question.

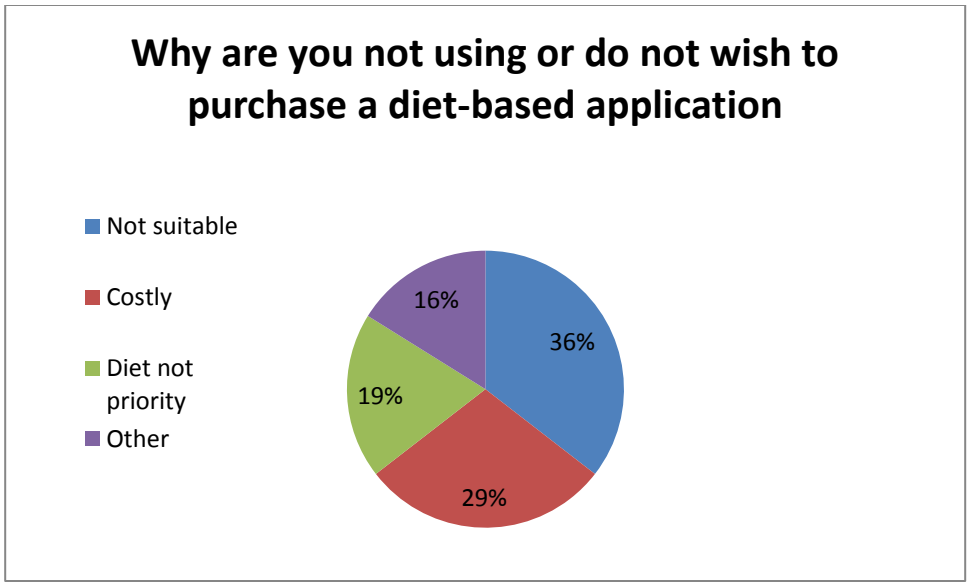

Figure 7.0: Survey question 4

The majority answered that the application in the market were not suitable for them and did not meet their need therefore the respondents did not see the reason as to why they should invest in a diet based application.

Another finding that was found is that the majority of the respondents are willing to purchase a diet-based application that consists of Malaysian foods for a reasonable price. This part of the survey was address to all 50 respondents. Below shows the results of the survey questions.

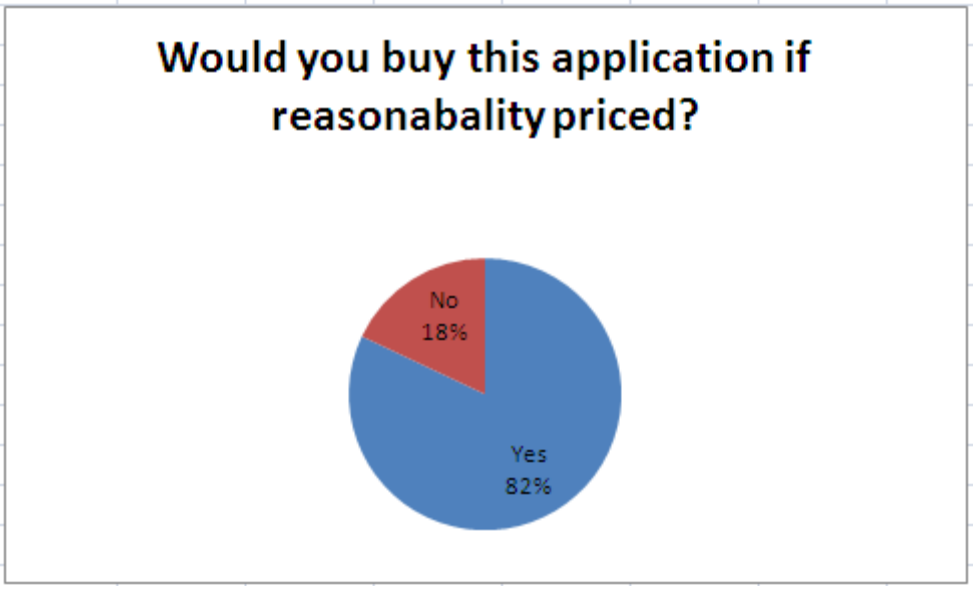

Figure 8.0: Survey question 5

The figure shows that the majority would want to purchase the application if it were price reasonably. The figure shows that 82% of the respondent would want an application that meet their need and in this case in would mean that a diet application consisting of diet food.

The next part of the survey was to understand features or elements that the user would want in the application. The survey listed certain features that the author had propose to be in the system as well as giving space for the respondents to list other features that they would like to include. The features preferred by user are identified as below:

- BMI calculator
- Suggested Diet Plan
- Suggested Exercise Routine
- Recommendation to eat certain food or not
- Malaysian food calorie database

The survey was also design to identify the user's preference. A key component of the system is how the user would prefer to insert data. The

option given was to either insert data manually or select for a drop down list. The majority wanted to select from a drop down list and for the purpose of the project, the author followed the majority. However a large number preferred to insert data manually and this should be taken into consideration when it comes to expansion of the product. The figure below shows user preference in term of data insertion

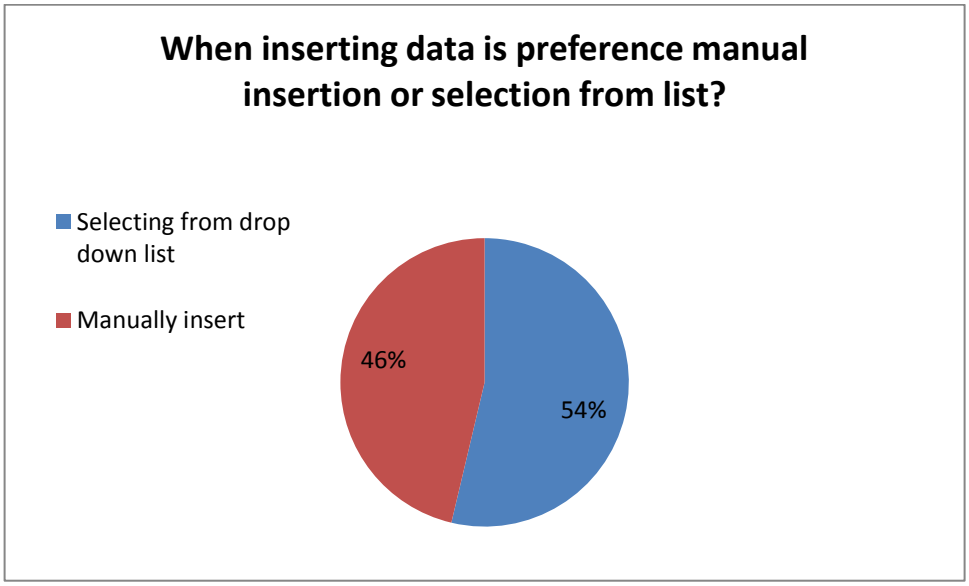

Figure 9.0: Survey question 6

From the user assessment done, the author is able to see current flaw and problems and is able to identify the user wants and preference. With that the author is able to develop mobile application that would meet the needs of the users.

4.2 Experimentation and Modeling

Test had been done after development of the system had been completed. The objective of the test was to see areas which needed improvement and to identify any system flaws.

One of the tests done was for compatibility. This was to test if the application is able to run on the android operating system. Four devices are test. 3 of the devices was a smart phone while one was a table. Below shows the results of the test

Device	Results
Samsung Galaxy II	Successful installation
Sony Erikson Xperia	Successful installation
HTC Incredible S	Successful installation
Samsung Galaxy Tab 7.7	Successful installation

Table 1.0: Compatibility Test

The figure above shows that the application has been successfully install in four different mobile devices. Hence this proves the compatibility of the application with the android operating system.

The second test that is conduction is to test the user satisfaction. The components that are tested include:

- Ease of application installation
- Interface
- Functionality

- Application runtime
- Application presentation

Ease of application installation covers area on the ease the application can be install on the hardware. In other words, users did not find difficulty when installing the application.

For interfaces, it covers the aspects regarding the user friendliness of the interface and how easy the user can navigate from one interface to another. Interfaces focuses on it user friendliness and easement of use.

Functionality focuses on functions and features that have been created and seen if the function and features have meet the user requirements

Runtime test on aspect on which the time is taken for the application to run on the devices and how long it would take to launch the application.

Presentation of the application focuses the overall attractiveness and visual appeal of the application.

Users would rank these components on a scale of 1 to 5. The scale would convey meaning as follows:

1 = Very dissatisfied
2 = A little dissatisfied
3= Neither satisfied or dissatisfied
4= Satisfied
5= Very satisfied

Below shows the results of the test conducted.

Components	Rating	Remarks
Ease of installation	5	The installation is simple
Interfaces	4	The interfaces are easy to use and navigate however improvement can still be done
Functionality	4	Current function are working but new functions can be added
Runtime	5	Runtime is not time consuming
Application Presentation	3	Presentation needs improvement

Table 2.0: User Satisfaction Test

Based on the results of the test, the author has identified the areas where the application needs improvement. However, there element whereby the author has managed to satisfy the user. The author has identified on elements which need to be added in order to make the application more attractive to the user. The author has noted on one error at this stage which is that the author did not emphasis enough on the presentation.

This error would be corrected immediately and the correction will be show in the next phase of the project.

4.3 Prototype

4.3.1 Interfaces

Interfaces developed are based on the emulator and not on the screen of the mobile devices. This is because the emulator shows the interfaces from a developers view during the stage of development.

The home page is the first page that can be seen on the emulator. The home page is similar to the home page of smart phone running the android operating system. Below is a screen shot of the home page of the emulator.

Figure 10.0: Home Page

From the main page or home page , users will then select the menu button and from the menu users can select the application of their choice. Below is the menu page.

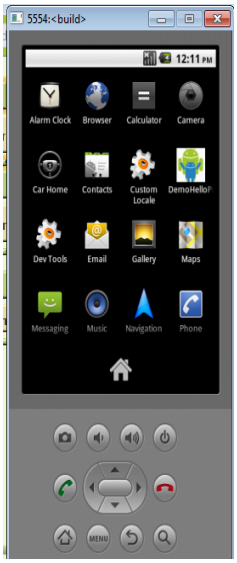

Figure 11.0: Menu Page

For the main page of the application, the user has an option to go to two other interfaces. The first would be to the BMI calculator and the next would be to the list of food showing the calorie. In total users can only navigate thru two interfaces from the main page. The two buttons are named ‘Measure Up!’ and ‘Know your food’. ‘Measure up!’ will lead to the BMI calculator and the other button will to the food list. Below is a screen shot for the main page of the application.

Figure 12.0: Application Main Page

For the screen title measure up acts as a BMI calculator. Here users select their height, weight, age and gender from a drop down list. Then users will push the button which will results in button becoming visible and well as the display of the BMI and BMI status. The button will lead to the diet plan and exercise plan. Below is a screen shot of the BMI calculator.

Figure 13.0: BMI Calculator

The diet plan and exercise plan that is being displayed is based on the users BMI. Below is the screen shot of the exercise plan.

Figure 14.0: Exercise Plan

For the screen showed below, this interface gives users the freedom to select their own meal instead of following the recommendations output by the system. However there is a standard of controls provided by the system. The drop down list consists of food that the user based on the BMI should only take and there will recommendation and advice whether the user should consume the food or not. When users press the button they will know the calorie contain in the food and the system recommendation.

Figure 15.0: Application Recommendation

The interface shown below runs independently from the users BMI. This means that the user are able to know the calorie contain in the food. For this case is would be the Malaysia food.

Figure 16.0: Food drop list

4.4 Project Deliverables

The deliverable of the project is the submission of reports from Final Year Project 1 (FYP/1) that is completed and submitted during the January 2012 semester and the remaining reports to be completed and submitted during the May Semester 2012. Reports that are included during the entire duration of the project are as follows:

- FYP/1 Extended Proposal (Submitted)
- FYP/1 Proposal Defense (Presented)
- FYP/1 Interim Report (Submitted)
- FYP/2 Progress Report (Submitted)
- FYP/2 Pre-Edx (Presented)
- FYP/2 Dissertation (To be submitted)
- FYP/2 Viva (To be presented)

This project delivered all the required deliverables including the prototype.

CHAPTER 5
CONCLUSION AND RECOMMENDATION

5.0 Conclusion

As a conclusion, this system is considered 70% completed because it has produce the planned meeting the project timeline. This system has the functionalities that has been design and the meet the integrate project objective which are

- Analyze user requirement of the system
- Design and develop mobile application
- Test and evaluate application

5.1 Relevancy to objective

This project is relevant to its objective as all functionalities have been developing. The application aim promote user to adopt a healthy diet and lifestyle and ensured that user are more aware of the food they consume.

5.2 Recommendation

An advancement of this project would to integrate content-image based retrieval so that user would not need to insert data or select data from a list but instead able to capture image and the application will return the corresponding parameters.

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Appendix A : Technical Paper

ABSTRACT **-** A Mobile Application to Promote Healthy Eating Habits "is a diet-based android mobile application that promotes healthy eating habits based on Malaysian foods. This project aims to cater or meet the need of Malaysians by creating an application that suites Malaysians lifestyle that is currently lacking in diet-based application available today.

I.INTRODUCTION

Background of study

This project has been proposed to be a bridge between mobile applications and instilling healthy eating habits. Realizing the increasing rates of obesity in Malaysia, importance of maintaining a healthy lifestyle and the increasing independence and popularity of mobile applications, thus lead to the initialization of the project. On November, 14 2011, the Dewan Rakyat made a shocking announcement that Malaysia had the highest obesity rate in Southeast Asia and rank sixth in the Asia-Pacific region. The project aims to instill good eating habits by producing an android based application. Mobile applications are chosen for this project because of its increasing popularity. The International Data Corporation stated in 2010 that sales of Smartphone have exceeded sales of personal computer by 8.8%.

Problem Statement

There are the occurrences whereby Malaysian users not have the suitable application or lack choices of application that are suitable for the Malaysia diet.

Objective

The first objective would be to analyze requirement and features that would be included the application. The second objective would be to design and develop the mobile application. The third and final objective of this project would be testing and evaluation of the mobile application developed.

Scope of study

The project will focus on android-based smart phone users aged between 18-45 years. This age is chosen as android-based smart phones and android based application are popular among this age group. Furthermore, this age group would be considered to be technology savvy. The area of the project would be Malaysia to ensure the feasibility of the project.

Relevancy of project

The project is relevant to Business Information System academic syllabus of Universiti Teknologi PETRONAS (UTP). It includes system analysis design and programming subject especially object-oriented programming.

Feasibility of project

The objective of this project is considered achievable within the given timeframe. In addition the area and target users mention in the project scope adds to the feasibility of the project

II.LITERATURE REVIEW

Controlling Calorie Intakes

Method for behavioral weight loss included promotion of self-monitoring behaviors that would include calorie counting. [3]

Popular methods used for calorie intake calculation are Metric BMR Formula and Harris Benedict Formula. The Metric BMR Formula are categorize into two which are the suitable calorie intake for men and the suitable calorie intake for women. Below is the Metric BMR Formula.

- Men : BMR = 66 + (13.7 x weight in kilos) + (5 x height in cm) – (6.8 age in year)
- Women : BMR = 66 + (13.7 x weight in kilos) + (5 x height in cm) – (6.8 x age in year)

The Harris Benedict Formula focuses on the fitness level of the individual and to what extent the individual is active. Below is the Harris Benedict Formula.

- No exercise : BMR X 1.2
- Lightly Active : BMR X 1.375
- Moderately Active : BMR X 1.55
- Hard Exercise : BMR X 1.725
- Athlete Level : BMR X 1.9

Mobile Application in Healthy Living

Lopez, I.M (2011), suggested that mobile application in crucial in a healthy diet as it delivers actions to users anytime and anywhere. Features that users look for or a reason as to why users presently are highly dependent on the mobile technology is because of the immediate response. A healthy diet requires constant discipline, motivation and monitoring. Mobile applications are able to offer that constant feature as users carry their smart phone everywhere which gives mobile application a positive effect on user trying to keep a healthy lifestyle.

Mobile Computing

Mobile devices are a revolution as it has become an object or a tool used in our daily life use for communication purposes and to access information. The combination of mobile devices, third generation wireless services with multimedia capabilities, and Internet and portal technology, this allows data and information to be received “anywhere”, “anytime”, and by “anyone”. [8] As the ability to retrieve data increase so will the need to retrieve data. This will result in application being built to cater to those needs thus having positive effect on the community as a whole. The paper focused on the impact that Mobile Computing and the opportunity that it opens for application development.

III. METHODOLOGY

The methodology that will be applied for the purpose of this project is Rapid Application Development Process (RAD). This particular software development methodology is widely throughout the world. This is because Rapid Application Development Process takes an approach whereby minimal planning is required and focuses more rapid prototyping. The methodology is an integration of various structure techniques mostly focusing on data-driven Information Engineering with prototyping accelerating the development of system. (Whitten, 2004)

Planning

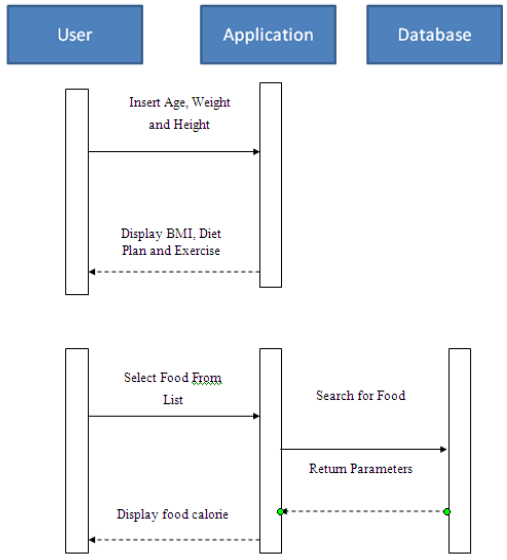
The planning phase means project initiation. The planning phase will take part in the first semester. The main activities that will be executed during the planning phase include undertaking a literature survey. Literature survey will focus mobile application development and BMI and food calorie calculation System requirement will be specified here based on information gathered. The literature survey will be conducted both via internet and library. Furthermore, a research study will be conducted to see current works that have been carried out for diet-based or calorie counting android based mobile application. This will assist in obtaining a clearer and better understanding of the subject matter. In addition, new modification or new findings can be observed thru studying new projects related to diet-based applications.

Analysis

The analysis phase began a few weeks after project initiation in which the project proposal had already been submitted and approved. The Rapid Application Development methodology states that in the analysis part must consists of four elements which are methodology, people, management and tools. The methodology that has been identified is Rapid Application Development. This methodology is chosen because it focuses rapid prototyping and favors minimal planning. Hence, this methodology focuses on refining the final output. In additional this methodology is said to help reduce time consumption. For this project the people would be the targeted end users. The targeted users for his project are android-based smart phone user aged between 18 to 45 years. The reason for this age range is because of the popularity of android smart phone of this range gap. Issues that are involved in this context would be the user requirement, user wants and user needs. Hence the author conducted a survey that involved 50 respondents of the mention age range to collect useful information and user requirement that can be used for this project. From the survey, the author has concluded some functionality that would be included in the system.

Design

The design of the application will be based on the results of the analysis phase. This is the system architecture.



Implementation

The implementation involves the development of the application. This phase will focus on the coding and programming of the prototype. System testing is done after completion of the

coding and programming of the prototype

Testing and Evaluation

User acceptance test will be conducted to see if the application is fully functioning. This test will determine the success of the project.

Tools Required

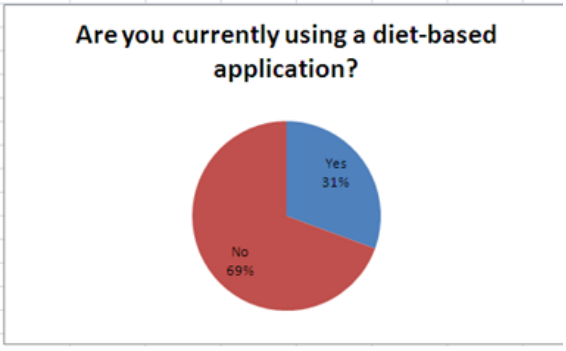
The required tools include

- Computer
- Mobile phone
- Printer
- Scanner
- MIT app inventor

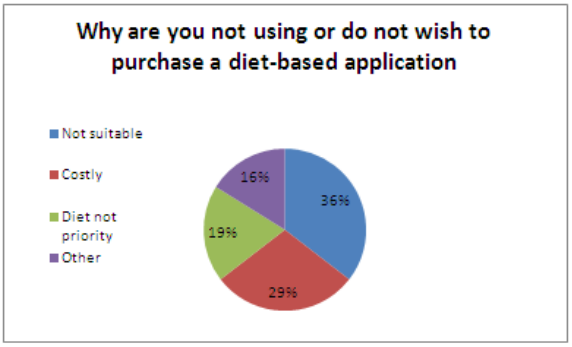
IV.RESULTS AND DISCUSSIONS

User needs and assessment analysis

The user needs assessment and analysis was carried out through survey with parties that are android smart phone users and are use to purchasing android application thru the play market. The survey conducted involved 50 respondents aged between 18 and 45 years. Among the 50 respondents only 14 respondents are currently using some health-based application.



For the respondents that are do not use any diet-based application, the respondents were given a list of reasons as to why they we not using a diet-based application. Among reasons that were given was that the applications were costly, diet is not a priority and that the applications were not suitable for them.



The survey listed certain features that the author had propose to be in the system as well as giving space for the respondents to list other features that they would like to include. The features preferred by user are identified as below:

- BMI calculator
- Suggested Diet Plan
- Suggested Exercise Routine
- Recommendation to eat certain food or not
- Malaysian food calorie database

Experimental and Modeling

One of the tests done was for compatibility. Four devices are test. 3 of the devices was a smart phone while one was a table. Below shows the results of the test:

Device	Results
Samsung Galaxy II	Successful installation
Sony Erikson Xperia	Successful installation
HTC Incredible S	Successful installation
Samsung Galaxy Tab 7.7	Successful installation

The second test that is conduction is to test the user satisfaction. The components that are tested include:

- Ease of application installation
- Interface
- Functionality
- Application runtime
- Application presentation

Users would rank these components on a scale of 1 to 5. The scale would convey meaning as follows:

1 = Very dissatisfied
2 = A little dissatisfied
3= neither satisfied or dissatisfied
4= Satisfied
5= Very satisfied
Below shows the results of the test conducted.

Components	Rating	Remarks
Ease of installation	5	The installation is simple
Interfaces	4	The interfaces are easy to use and navigate however improvement can still be done
Functionality	4	Current function are working but new functions can be added
Runtime	5	Runtime is not time consuming
Application Presentation	3	Presentation needs improvement

V.CONCLUSION AND RECOMMENDATION

Conclusion

As a conclusion, this system is considered 70% completed because it has produce the planned meeting the project timeline. This system has the functionalities that has been design and the meet the integrate project objective which are

- Analyze user requirement of the system
- Design and develop mobile application
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Relevancy to Objective

This project is relevant to its objective as all functionalities have been developed. The application aim promote user to adopt a healthy diet and lifestyle and ensured that user are more aware of the food they consume.

Recommendation

An advancement of this project would to integrate content-image based retrieval so that user would not need to insert data or select data from a list but instead able to capture image and the application will return the corresponding parameters.

Integrated Development Environment 10

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