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“What to Cook?” Mobile Application

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Abstract—Home-cooked food provide many benefits. However, due to current lifestyle, people tend to takeout food or order fast food. This project address the problems where people have trouble on what to cook based on the limited ingredients, they have to spent some time in order to search for the recipes which do not contain ingredients that they are allergic for them to cook and also they need to know the allocation time to prepare the food which is suitable to them. In order to solve the problem, modified waterfall methodology was applied. It consists of three phases which are requirements gathering and analysis phase, design phase and implementation phase. Three objectives have been achieved after the project have been completed, which are gathering and analyzing the requirements needed for developing the mobile application, designing the mobile application according to the requirements that has been analyzed and developing a mobile application that can recommend a variety of recipes for people to cook based on the available ingredients and to exclude recipes that contains the allergy ingredient. Last but not least, an Android mobile application with three features is the result of this project. The features of the application are people can search for recipes either by entering the ingredient, allergy ingredient or time for food preparation.

Keywords—*mobile application, food recipes*

I. INTRODUCTION

Home-cooked food defines as food that is prepared at home according to the Oxford Online Dictionary. There are many benefits of home-cooked food. One of the benefits is people have the knowledge of ingredients that they put in the food and they can even control their intake of sugar and salt. This can be proved when, an article of The Benefits of Home Cooking stated that when it comes to providing your body with healthy nutrition, nothing beats home cooked meals [2]. This means it is better to prepare food by ourselves rather than buying outside food. Besides that, people can even avoid putting any allergy ingredients that they have in the food that they cook. This is on the grounds that as indicated by the law, in the European Union, prepared suppers may contain a blend of various known allergens without demonstrating information on the individual parts of the bundle. Moreover, people can even save their money when cooking by themselves as it is stated in The Star newspaper in an article about the benefits of home cooking [2].

According to the observation that have been done, in this modern era, people tend to choose with fast and easy lifestyle which basically everything that they do must be fast. This is because people consume more time in working and hectic social lives. Besides that, travelling time from home to work place is also time consuming. As for that, they do not have much time allocated in preparing their food. Therefore, people would just takeout food or order fast food as they feel it would save their time rather than cooking by themselves. This is because it just takes a few minutes to order and then they will just have to wait for a while in order for the food to be ready. Moreover, people would have to go for grocery shopping in order to cook their food and this will consume some of their time.

Furthermore, they feel searching for recipes that is suitable with the ingredients that they have in kitchen is time consuming. This is because they need to skim and scan for the recipe ingredients in order to know whether the recipe have the ingredients that they want to use. As a result, they tend to cook the same dishes for many times because sometimes they do not have an idea on what to cook based on the ingredients that they have and they feel it is more time saving. This can be proved in the survey that have been conducted whereby 98.2% cook with the same ingredients that they have while 75 % feels its time consuming to search for recipes to cook as attached in Fig. 1 and Fig. 2 respectively.

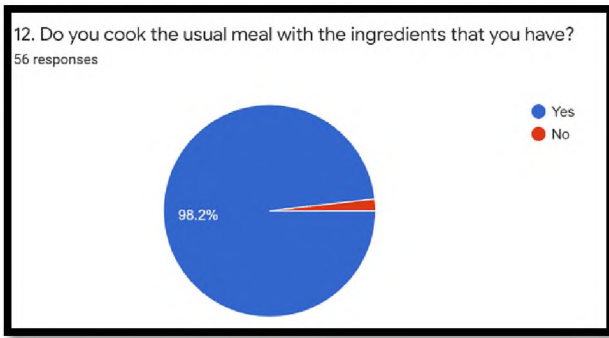


Fig. 1. The respondents whether cook the same meal using the same ingredients.

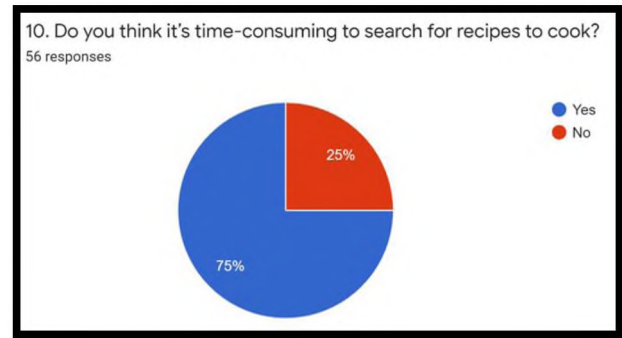


Fig. 2. Searching for recipes either time consuming or vice versa.

Based on the situation explained, there is a need to have an application that can help to solve this problem. In the application, people can enter the ingredients that they have and recipes regarding the ingredients are shown. Besides that, people can enter their allergy and the application will only show recipes that is not related with the allergy ingredients. Last but not least, people can enter the allocation time that they need to prepared the food and the system will show recipes that are related to the time allocation that has been chosen. This mobile application is easier to be access by many people because in this era most of the people are equip with mobile devices. Moreover, this helps people to access the application at anywhere with the use of their mobile device.

II. MATERIALS

A. Hardware

The hardware that has been used to developed the mobile application is a laptop. The laptop model that has been used is Asus Vivo Book S. The processor of the laptop is Intel Core i7 with a 4GB of internal RAM. The operating system of the laptop is 64 bits and the windows type are Windows 10. Besides that, a smartphone has been used in order to test the application after the mobile application has been developed. The features of the smartphone that is being used is it has a processor of Octa-core 1.6 GHz Cortex-A53 and the system memory of 32GB 3GB RAM. The operating system of the smartphone is Android 7.0 Nougat.

B. Software

There is a few software that have been used in developing the mobile application. The language that has been used in developing the mobile application is Java and XML. Android Studio and Java Development Kit (JDK) SE 7 are the platform that has been used in developing the mobile application. SQLite is being used for the database. All the data in the application are stored in SQLite. The prototype is tested using Geany motion before transferring it to the real devices.

III. METHODS

In order to develop a successful What to Cook? mobile application, a methodology which is modified waterfall model has been chosen. The initial waterfall model has been modified so that it can suit the development of the application. [1] The phases in the modified waterfall model which consists of requirements gathering and analysis phase, design phase and implementation phase which the phases have been taken from the original waterfall model by Govardhan. Each of the phases have to be completed in order to proceed with the next phase. This is because the result of one phase acts sequentially as the reference for the next phase. In the requirements gathering and analysis phase, all possible system specifications that needs to be created are collected and recorded in a configuration specification document. Meanwhile, the requirement specifications from the first phase are studied and the design of the system is prepared in the second phase which is design. The overall architecture of the system is going to be defined in the design phase. Implementation phase is where the application has been developed according to the design in design phase.

The reason waterfall has been chosen as the methodology in developing the mobile application because it consists of consistency and completeness in documentation. The developers that use waterfall methodology will even get step by step approach thus this will lead to specific and clear guidance in creating a fully functional mobile application [1]. Besides that, each phases of the waterfall model have specific deliverables and review process. Last but not least, the phases that are in the modified waterfall are defined clearly as for that it is easier to understand and be implemented.

A. Phase I: Requirements Gathering and Analysis

There are a few main steps in this phase which are gathering the requirements, searching for the suitable cookbook, analyze the data from questionnaires survey and cookbook and analyze the features of the application and lastly document all of the requirements in software requirement specifications (SRS).

The first stage is to gather the requirements for the application from the users by conducting surveys. The way of information gathering that have been used to gather the information is by doing questionnaires through google form. There is a total of 22 questions that have been asked in the questionnaire. The total number of respondents of the questionnaire are 56 people where it consists of 33 females and 23 males. The deliverable of this activity is survey data have been gathered.

Next, searching for the suitable cookbook that have the recipes which consists of time to prepared the food have been search and this will result in identifying the suitable cookbook recipe that have been use in the mobile application. The characteristics of the cookbook is that it has recipes and the time to prepared the food. The characteristics of the chosen cookbook have been determined by the features of the application. In order for the application to search for recipes by time preparation, the recipe uploaded must have the time preparation of the food. After this activity is done, an appropriate cookbook with the recipe that consists of time to prepared the food have been identified.

Besides that, the data from the questionnaires survey have been gathered and the cookbook that have been found has been analyzed for the requirements that is being needed in the mobile application. The deliverable of this activity is the list of requirements of the mobile application has been obtained. After the list of requirements have been obtained, then the features of the application have been analyzed. This results in producing the use case, activity diagram, class diagram, and sequence diagram.

Last but not least, all of the requirements that have been gathered is documented in software requirements specification. Therefore, a software requirements specification (SRS) is produced. After this phase has been done, one of the objectives that have been defined before have been achieved. The achieved objective is to gather and analyze the requirements needed in mobile application development.

B. Phase II: Design

In this phase, designing the mobile application have been done. The activities that have been carried out is designing the user interface and the database of the application according to the requirement that have been developed. There are a few main steps in this phase. The main steps are developing entity relationship diagram (ERD), design class diagram, the design for user interface and document all of the design in software design description (SDD).

The design phase is after the requirements and analysis phase. This is because all of the information on designing the application is gathered from the first phase. Design phase is one of the most important phases in developing a successful application. The design phase starts with developing the entity relationship diagram (ERD). This is because the developer will get to see clearly the features of the application that have been developed. ERD is used to view the database of the application in a clearer version. In the ERD, the primary key, foreign key, candidate key and other key have been assigned to each entity if needed according to the dependencies.

After the ERD have been developed, then the design class diagram, package diagram, detail class diagram and multilayer sequence diagram have been developed. The user interface has been designed according to the requirements that have been identified in the first phase. The deliverable of this activity is entity relationship diagram (ERD), design class diagram, package diagram, detail class diagram and multilayer sequence diagram and the user interface structure of the application have been produced.

Last but not least, all the design of database and user interface of the application have been documented in the software design description (SDD) while the deliverable of this activity is that a software design description (SDD) have been produced. At the end of this design phase, one of the objectives that have been achieved is to design the mobile application according to the requirements that have been analyze that have been defined before.

C. Phase III: Implementation

The main steps in this phase are implementing the database, developing the mobile application, doing a functional test for the mobile application and the documentation of the final development of the mobile application.

In the implementation phase, the database has been developed based on the design of the database that have been generated during the design phase. After the database have been developed, then the development of the mobile application begins. The development of the mobile application is according to the requirements that have been identified in the requirements and analysis phase. The user interface design that has been implemented is based on the design phase that have been produced before. After the development have been done, then the functional testing is done by the developer in order to make sure all of functions in the application works according to its function. At the end of this phase, all the documents related in developing the mobile application have been documented. The documentation consists each of the phases of the activities that have been done. The documentation is important for a successful application operation and maintenance as for future reference.

The deliverable of this phase after the activities have been carried out is the application have been developed with all the features and the functions that have been gathered. To develop a mobile application that can recommend a variety of recipes for people to cook based on the available ingredients and to exclude recipes that contains the allergy ingredients is the objective that have been achieved after this phase have been done.

IV. RESULTS AND FINDINGS

The result of the project is “What to Cook?” Mobile Application. The main features of What to Cook? is it allows user to search recipe. The user can search recipe either by ingredient, allergy ingredient or time preparation.

Fig. 3 shows the search recipe by ingredient interface. The user and admin have the same interface. This interface allows the user and admin to search for recipe by an ingredient and the application will show the recipe that contains the ingredient that have been entered. This will solve the first problem statement which is people have trouble on what they want to cook based on the limited ingredient that they have.

Fig. 4 shows the search recipe by allergy ingredient interface. The user and admin have the same interface. This interface allows the user and admin to search for recipe by an allergy ingredient and the application will only show the recipe that does not contain the ingredient that have been entered. This is the solution for the second problem statement which is people will need to take some of their time in order to search for the recipes which do not contain ingredients that they are allergic for them to cook.

Fig. 5 shows the search recipe by time preparation interface. The user and admin have the same interface. This interface allows the user and admin to search for recipe by time preparation and the application will only show the recipe that have the time have been entered. Lastly, this will solve the third problem statement which is people would need to search the allocation time to prepare the food which is suitable with them.

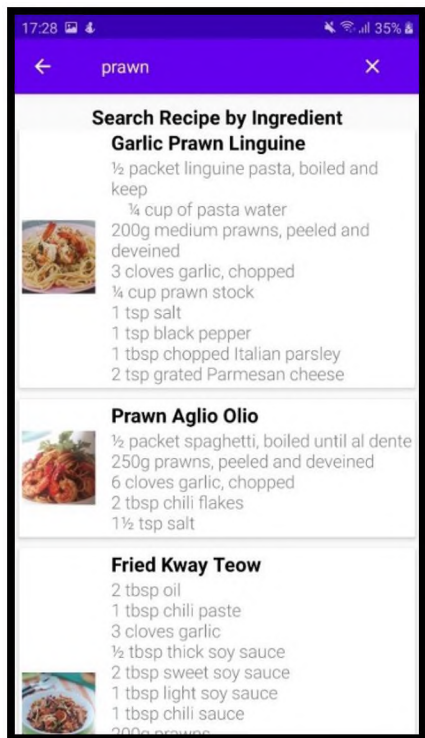


Fig. 3. Search Recipe by Ingredient Interface.

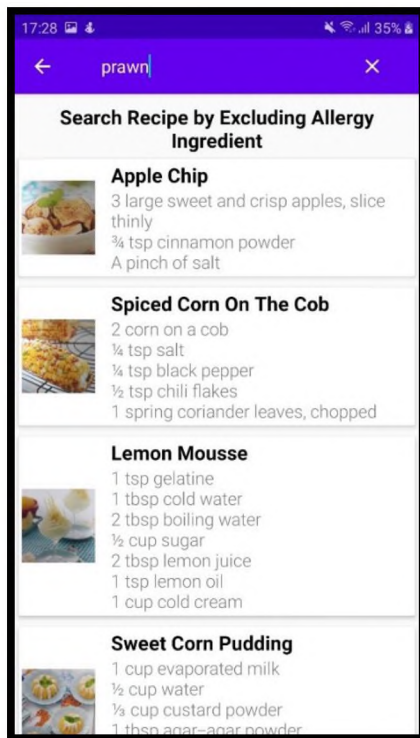


Fig. 4. Search Recipe by Allergy Ingredient Interface.

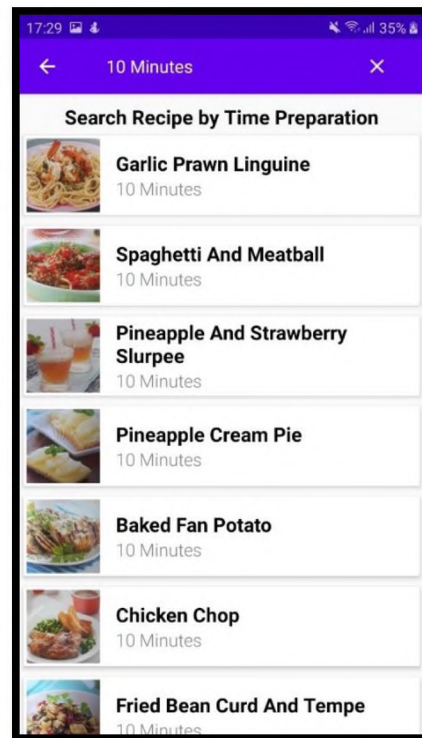


Fig. 5. Search Recipe by Time Preparation Interface.

V. CONCLUSIONS

“What to Cook?” Mobile Application have been developed and achieved all the project objectives. This application will help in solving the problems that people faced when searching for recipe. By using this application, people can search recipes either by ingredient, allergy ingredient or time preparation.

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