

GroRecipe: A Mobile Application for a Meal Planner

*Muhammad Rusydi Bin Rosman, Siti Nurulain Binti Mohd Rum, Noor Afiza Mohd Ariffin,
Aziah Asmawi and Nor Azura Husin
Faculty of Computer Science and Information Technology, Universiti Putra Malaysia.*

Abstract: Today, the advances in technology have led to the use of smart phones in health practices. In this paper, an android-based mobile application named GroRecipe, a meal planner system is developed. The main objective of developing GroRecipe is to encourage the practice of a healthy lifestyle. This can be achieved by making the meal planning effortless, healthy and tasty. GroRecipe can also speed up the meal preparation process by helping the user to estimate the amount of ingredients needed of a recipe based on the number of serving size per meal. It also provides the feature to auto generate the grocery lists, making the grocery purchasing decisions easier. Users can also enjoy using GroRecipe by sharing their recipe with others and rating the recipes posted by others. This can help to improve the quality of cooking in terms of its taste with healthy ingredients. The technologies used to develop the GroRecipe are Java, as the programming language, Firebase cloud, as the database and Android Studio as the IDE.

Key words: *Meal Planning, GroRecipe, Health Lifestyle, Mobile Application*

INTRODUCTION

Meal plan is an act of taking some time to plan for preparing meals ahead of time. This action provides the potential to offset time scarcity and therefore encourage home meal preparation. Study has shown that has been linked with the improvement of diet quality. Studies also show that having a good meal planning can reduce the intake of the portion size and help people to reach their nutritional goals. Meal planning can be broken down into three parts: selecting recipes, shopping for the ingredients and prepping the meals. These three steps might look apparent and obvious, however, there's a tedious part in each of the step. Usually, people have their own preferences of food based on their liking, allergies, diet conditions and so on. The meal plan is the best way to deal with those tedious parts where people can plan their meal preparation ahead of time. It can be manually done by using paper or using a meal planner software. The advantage of the traditional paper meal planners is that people can easily stick them on the fridge-door or somewhere that can be easily seen in the kitchen. The users also have all the control in designing as simple or as informative as they want. However, a mobile app

uses is convenient where everything can be recorded and translated into the recommended grocery list item. Whichever method suits them best, it will help them to keep a better track of their time and diet.

Today, there are many mobile apps developed to ease our life when it comes to cooking, however, there's hardly to find one that excels in all areas. Studies have shown that practicing a good nutritional intake in eating can help to prevent many serious illnesses that usually caused by obesity and malnutrition [1]. Though, there are many hindrances on the path towards healthy eating, the top one is the lack of time. For instance, working parents with small children in a household always have the difficulty of time to prepare a well-balanced meal on the table for their children. In addition, lack of knowledge in preparing nutritional meals is also one of the obstacles. There are still many are unaware about the importance of well-balanced foods and the dangers of eating too much sugar or the wrong type of fat. The studies also found that young people prefer to spend their money going out to eat instead of cooking as most of them do not know how to

cook. Young people also like to use mobile phones as it increases their sense of independence. Therefore, an app that able to guide on how to prepare a well-balanced meal is an important feature to encourage people to cook. For some people, eating is simply not important to them, for them it is just something that must be done regularly to survive. To nurture the meal planning habit, they must enjoy doing it. A meal plan using the mobile application with intuitive and enjoyable user interface is a promises tool. In this paper, the GroRecipe, a meal planner application is introduced to help users to plan their well-balanced meals and able to generate the grocery lists based on the recipe and number of serve per meal.

LITERATURE REVIEW & RELATED WORK

There are numbers of developed applications available for the meal planner for example Mealime, FoodPlanner, SideChef, Yummly and Recipe Calendar. The Mealime is the most popular meal planner system that is available for free downloaded [2]. In this application, users can look for recipes that match their need and preference such as the allergy friendly recipes, the size of serving per meal, the budget and so on. Once the users have selected their preferred type, the system will give the full instructions of how to prepare the meal and can automatically provide the necessary ingredients to buy as the grocery list. However, Mealime did not provide a scheduling feature that able people to schedule their cook plan. In addition, there is no option for the users to contribute or share their recipe where there are only allowed to select the recipes. With over a million downloads on Google Play, FoodPlanner is also among the popular meal planner application that is available for downloaded [3]. The functions are almost similar with Mealime except, this application allows users to import recipes from other websites. The FoodPlanner provides full package of functions such as meal scheduling, generating grocery list and allowing the users to create and share recipes. Albeit, FoodPlanner seems like a perfect meal planner system, its recipe searching, filtering and sorting is very limited. The SideChef provide over 10,000 recipes with functions such as search filtering, meal planning, ingredient delivery, step-by-step guidance with photos, instructional videos and voice command [4]. The voice command feature is very unique and useful as cooker doesn't have to touch the mobile device screen with their dirty hands. The SideChef has a modern interface design which may appeal more to the younger generation users. The Yummly is a food-sharing and recipe-finding app that features a

rating system to help users find the most popular recipes online [5]. However, users can only rate the existing recipes and they can't customize and share their recipe through the application. SideChef and Yummly equipped with most of the desired features of a meal planner, both provide the ability to schedule the meal and generate the grocery list based on the ingredients required for the recipe. The Recipe Calendar [6], as the name suggests, users can plan meals for upcoming days. Recipe Calendar has meal plans for different type of diets such as low-calorie diet and gluten-free diet. Similar to SideChef and Yummly. Recipe Calendar does not allow the users to customize and deposit the recipes. This feature was studied extensively as it seems to be a recurring lack of feature of these five reviewed systems and was implemented into GroRecipe. Besides that, the searching and sorting function of the recipe is complex and limited as users can only allow to filter the recipe and type of meal (breakfast, lunch etc.).

Functions	System					
	Mealime	FoodPlanner	SideChef	Yummly	Recipe Calendar	GroRecipe
Create account	/	/	/	/	/	/
Schedule meals	X	/	/	/	/	/
Create & share recipes	X	/	X	X	X	/
Review/rate recipes	X	/	/	/	/	/
Search & sort recipes	/	X	/	/	X	/
Generate grocery list	/	/	/	/	/	/
Mobile app	/	/	/	/	/	/

Table 1: Comparison between existing applications and GroRecipe

Most of the applications discussed in this section provide the desire features to the users, however, there is a lack of flexibility in terms of allowing the users to customize and deposit their recipes based on their preference. In this project, GroRecipe is developed with similar functions as already provided by all the applications as shown in Table 1. However, the flexibility will be given to the user to customize and deposit the recipe through the application. The nutritional value of food recommendation feature is also added into the GroRecipe to promote a healthier eating habit.

METHODOLOGY

In this project, the Rapid Application Development (RAD) as shown in Figure 1 is the methodology used to develop the GroRecipe. This iteration process of RAD emphasizes working software and user feedback over strict planning and requirements recording. As a form of Agile software development methodology, RAD helps to break this GroRecipe development into small, more achievable pieces. Besides that, the task-oriented structure allows the

authors to optimize the work efficiently and working product is delivered in a shorter time frame.

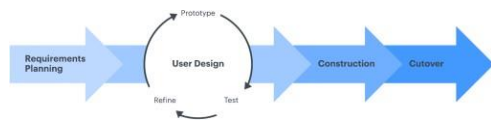


Figure 1: Rapid Application Development

To build an intuitive application and user-friendly interface, constant user feedback is very important. RAD methodology allows near-constant user interface and feedback through frequent iterations and prototype releases. However, as it needs to adapt to the new changes, each component within the system had to be modular, allowing elements to be swapped in and out as to respond to feedback from users. In comparison to the waterfall model that emphasizes strict planning and requirements recording, communication in RAD with the users are more frequent to gain better insight and feedback. The RAD process can be broken down into four phases. The first phase begins with the planning requirements, the project scope as well as the application requirement is presented in the form of a prototype. User Design is the next phase where the user feedback is gathered to derive the initial modelling and prototype creation. This process is repeated until it meets the user requirement. The Justinmind tool is used for the quick making of the interface without having to recreate the new one if any changes of requirements occur.



Figure 2: Prototyping GroRecipe using Justinmind

The third phase of RAD is the Rapid Construction. As the name suggests, this step involves the building of the actual system where the application coding, testing and integration took place. This system is developed in Java Programming Language by using an IDE called Android Studio that connects to Firebase's cloud. This phase requires a repetition as often as necessary to meet the need of the project. The fourth and final phase is the cutover stage where

the finished GroRecipe mobile application is then to be tested by the users.

RESULTS & DISCUSSION

The requirement of the GroRecipe is collected through the initial study of the available applications from the internet. To see exactly whether the developed prototype is really satisfying the users need, the usability test is conducted. The survey involved 10 respondents with different backgrounds and mixed group of ages. The main objective of this study is to measure the user satisfaction towards GroRecipe. Five attributes are measured, namely; user friendly, user interactively and layout design, text style and navigation. The result of the study shows that most of them satisfied with GroRecipe. There is also some feedback received from the respondents for the improvement of GroRecipe such as; to integrate the application with the e-commerce and grocery store online such as Tesco, HappyFresh and other online grocery services to allow users to buy the ingredients of the recipe generated from the application via online. This can be the future work of this project. In overall, it can be concluded that the main objective developing the GroRecipe is achieved. Figure 3 is the final look of GroRecipe.

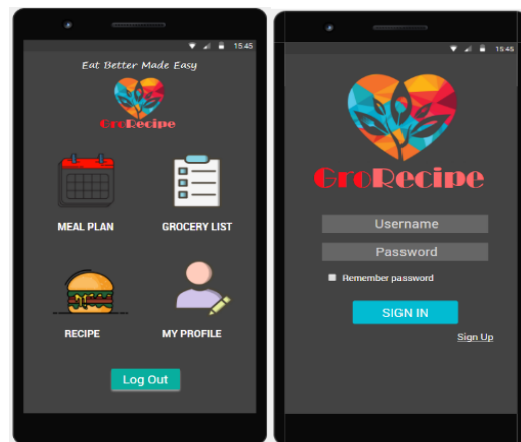


Figure 3: The final look of the login page and menu page of GroRecipe

CONCLUSIONS

GroRecipe is developed to reduce the difficulty of meal planning. The habit of meal planning is very important to promote a healthier lifestyle while making the tedious task such as preparing the grocery list to become easier. The pre-plan of the to-buy grocery items save the time and avoid the waste food due to excess of meals preparation that caused by improper plan. In meanwhile, GroRecipe

provides a platform for recipe sharing among users, where the contributed recipes can be rated and reviewed by others. This can indirectly help to improve the quality of the food in terms of its taste and nutrients.

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