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***FarmAid: Mobile Application for Agriculture Management***

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# **FarmAid: Mobile Application for Agriculture management**

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## **ABSTRACT**

*Most people are negligent on the importance of agriculture on the society. It is very crucial for society to take agriculture seriously as it is an important asset for their country and as the main source of food for the people. Agriculture have developed rapidly from just a simple hunting and gathering method to the more advance industry level agriculture that consist of technologies, machinery and management skills. With the increase popularity of business in agriculture, it is important for all farmer to manage their farm well to minimize potential loss during the business process. For this reason, FarmAid was design and developed to serve as a method to help farmer managing their farm by providing functions and services to help farmer in agriculture management. FarmAid is a mobile application that intended to provide farmer a platform to manage their farm. The main objective of FarmAid is to help farmer in managing their farm. This mobile application will help the farmer manage their expenses, profit and calculate their total profit gain within planting period. In addition, the mobile apps can be a medium of communication among the farmer to discuss on agriculture matter and ask any question regarding agriculture issues. Besides that, this mobile apps will help farmer in planning their planting process by calculating the estimated seedlings for planting and help farmer to convert SI unit for their planting purposes. This project is using agile methodology which consists of five phases which are planning, requirement analysis, design, develop and documentation.*

## **ABSTRAK**

*Kebanyakan orang lalai terhadap pentingnya pertanian dalam masyarakat. Sangat penting bagi masyarakat untuk mengambil pertanian dengan serius kerana ia merupakan aset penting bagi negara mereka dan sebagai sumber utama makanan bagi rakyat. Pertanian telah berkembang pesat dari hanya kaedah memburu dan pengumpulan yang mudah ke pertanian peringkat industri yang lebih maju yang terdiri daripada teknologi, jentera dan kemahiran pengurusan. Dengan peningkatan populariti perniagaan dalam bidang pertanian, adalah penting bagi semua petani untuk menguruskan ladang mereka dengan baik untuk meminimumkan potensi kehilangan semasa proses perniagaan. Atas sebab ini, FarmAid telah direkabentuk dan dibangunkan sebagai kaedah untuk membantu petani menguruskan ladang mereka dengan menyediakan fungsi dan perkhidmatan untuk membantu petani dalam pengurusan pertanian. FarmAid adalah aplikasi mudah alih yang bertujuan menyediakan petani sebagai platform untuk menguruskan ladang mereka. Objektif utama FarmAid adalah untuk membantu petani menguruskan ladang mereka. Aplikasi mudah alih ini akan membantu petani menguruskan perbelanjaan, keuntungan dan mengira keuntungan keseluruhannya dalam tempoh penanaman. Di samping itu, aplikasi mudah alih boleh menjadi medium komunikasi di kalangan petani untuk membincangkan perkara pertanian dan menanyakan apa-apa persoalan mengenai isu pertanian. Selain itu, aplikasi mudah alih ini akan membantu petani dalam merancang proses penanaman mereka dengan mengira benih yang dianggarkan untuk menanam dan menolong petani untuk menukarkan unit SI untuk tujuan penanaman mereka. Projek ini menggunakan “Agile Methodology” yang terdiri daripada lima fasa iaitu perancangan, analisis keperluan, reka bentuk, pembangunan dan dokument.*

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## **CHAPTER 1**

### **INTRODUCTION**

#### **1.1 Project Title**

FarmAid: Mobile application for agriculture management.

#### **1.2 Introduction**

Agriculture have evolved from generation to generation. From early hunting and gathering method to the existing modern farms nowadays. In this modern era, agriculture is not only a medium to provide food but also a great business opportunity to gain big profit.

For modern farmers, there are many challenges that they faced to build a good farm. The term modern farmer here means farmer who implemented technology in their farming method. In today's times, there are several proprietary solutions have been developed to help farmers manage their farm effectively (Allen, 2011). But most of the existing solutions is only focus on specific task to help certain type of farmer and the content is limited. FarmAid is a mobile application to help handle these shortcomings. Many farmers must go through modernization of agriculture to ease their task and manage their farm well to minimize the risk of loss. Modernization of agriculture is a process of transforming agriculture form traditional labour-based agriculture to technology-based agriculture (Kusz, 2014). Agriculture information resource management is the top priority of achieving agriculture modernization (Duan, 2012). Farmers often experience an overload of information from different data (Sørensen, Pesonen, Bochtis,

Vougioukas, & Suomi, 2011). Farmers found that it is very difficult to store their data and calculate their profit and expenses.

Technology plays a vital role to help improve our life. Mobile technology has greatly improved in the past few years. With the revolution of mobile technologies, ICT become more affordable, easy to access, and easy to adapt even within impoverished rural homes (Kamthania, 2013). Mobile phone not only an important communication device as it also serves as an assistant to improve human's task, making daily tasks easier and help human to stay organized. With the presence of mobile technology in agriculture, farmers can improve their business and effectively manage their farm.

### **1.3 Problem Statement**

New modern farmers found that it was hard to keep track on their farming expenses and managing their farm. Farmers used old method such as using books to record their expenses. This method was found to be hard for the farmers to properly manage their expenses and face difficulties to calculate their profit or lost. Farmer also have difficulties to organize their farming cost as the old method was very hard to read and categorized the investment that they had made.

Besides that, farmers had lack of knowledge in agriculture management as it requires expenses and longer time to study in university or colleges. Therefore, FarmAid mobile application was developed to aid the modern farmers.



## **1.4 Objectives**

- a) To design mobile application that will aid modern farmer in agriculture management.
- b) To develop a new mobile application as a platform for farmer to ease their agriculture management task.
- c) To evaluate the effectiveness of the developed mobile application for agriculture management.

## **1.5 Brief Methodology**

The software development methodology that was used in this project was the agile method. Agile method was very suitable to be used in this project due the timeframe given. Agile model encourages discipline in project management process due to the constant adaptation and review of the system. Agile methodology consists of five phases which are planning, requirement, design, development, and documentation. Figure 1.1 below illustrates the different phases of the Agile Model.

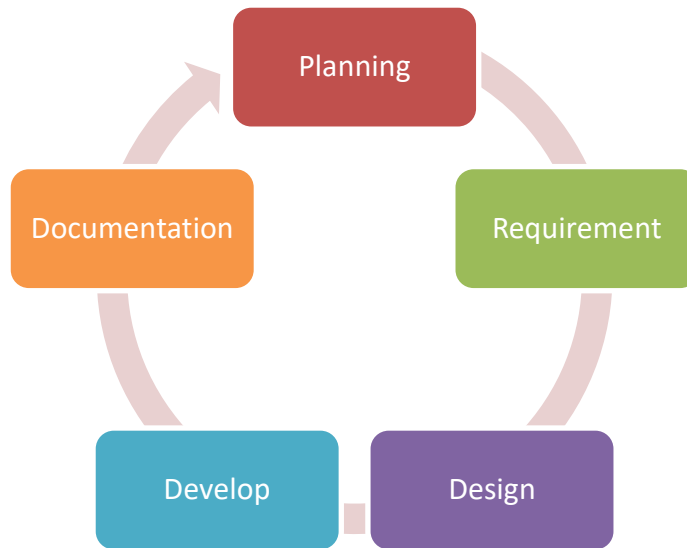


Figure 1. 1: Agile Methodology

The phases in Agile model:

- a) Planning – This phase focus on determining the problems statement, possible requirements, objective and project scope of the system
- b) Requirement – In this phase the requirement specification was studied and the need in the software and hardware requirement. System requirement helps in specifying hardware and system requirements and defining overall system architecture.
- c) Design – The prototype of the system was designed in this phase. Diagrams such as Entity Relationship Diagram (ERD), Data Flow Diagram (DFD), activity diagram, and other diagrams were used to determine the flow of the proposed system.
- d) Development – In the development phase, the proposed system undergoes development process. The system was developed based on the design mentioned in the design phase. The developed system was tested throughout the development of the system.

- e) Documentation – After the development was completed, the system was deployed to the farmer and proper documentation were provided.

## **1.6 Project Scope**

The scope for this project focused on the new modern farmers. This project was limited to the android user only and not an e-commerce platform for the farmers to promote and sell their products.

## **1.7 Significance of Project**

This mobile app aims to help the new modern farmers in their agriculture management skills. It helps farmers to eliminate the old methods to manage their farm by creating a user-friendly interface and well-managed database.

In addition, this project was used to assess the effectiveness of the developed mobile application against farmers in agriculture management. This project helps to investigate the requirements needed for farmers in agriculture management and obtain the result of the effectiveness of the developed mobile application among farmers.

# 1.8 Project Schedule

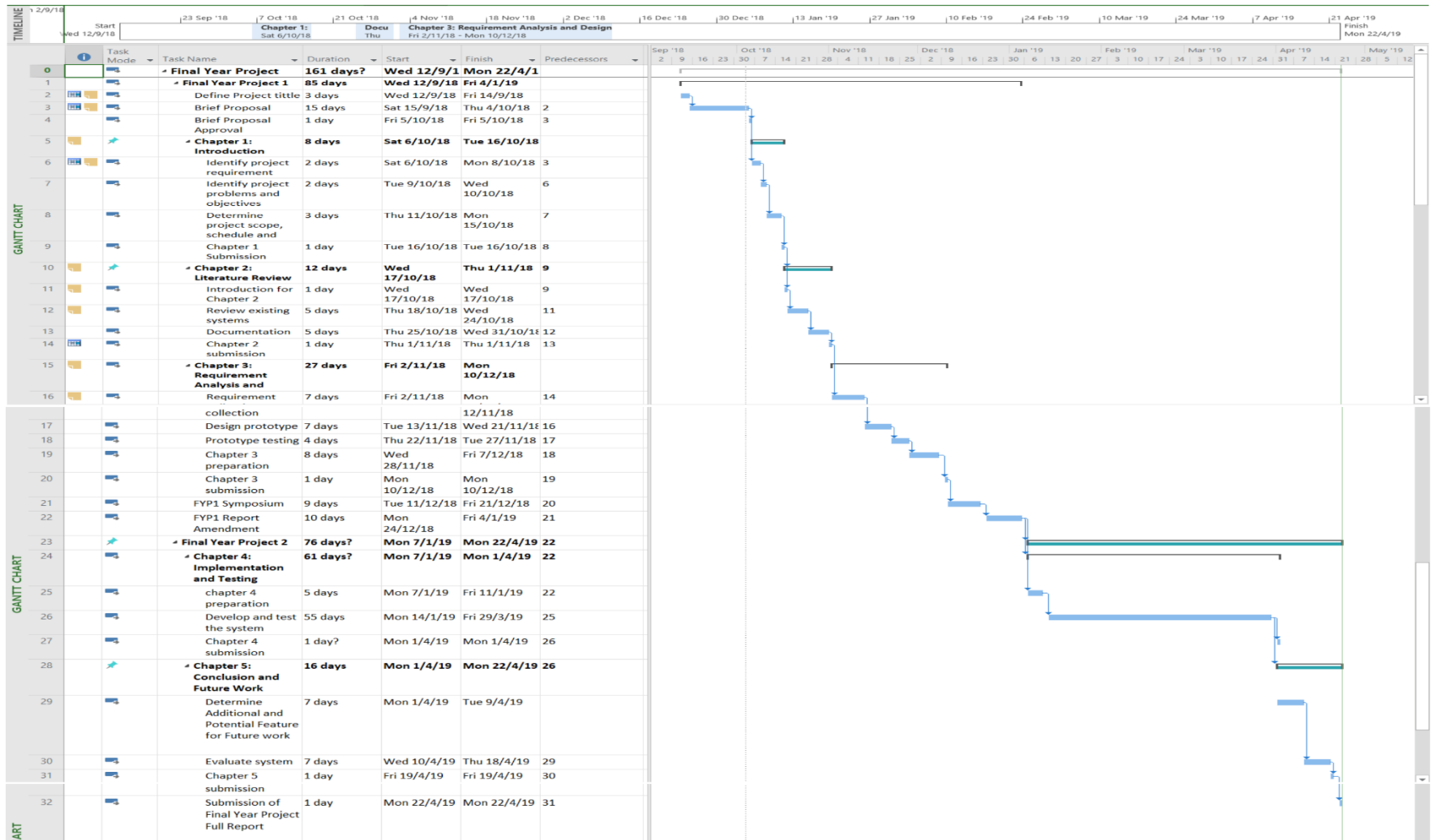


Figure 1. 2: Gantt Chart

## **1.9 Expected Outcome**

At the end of this project, a new mobile application was developed to assist new modern farmer in agriculture management. The mobile application developed aids farmers to improve their management skills in agriculture and as a platform to share and acquire new knowledge on agriculture at the same time.

## **1.10 Outline of Report**

### **1.10.1 Chapter 1: Introduction**

Chapter 1 is the background of the proposed project that defines the overall purpose of the project. In this chapter, the problem statement, objectives, proposed methodology, project scope, the significance of the project, project schedule, and expected outcome are identified and briefly explained. The problem statement explains the problems that current existing facing. The objectives will clarify the main purposes of the project. The project scope shows the limitation of the proposed project. Methodology that was used in this project is Agile Method. A Gantt Chart of the project schedule was created to display the project development step according to milestones and planned dates. The expected outcome describes the result of the proposed project.

### **1.10.2 Chapter 2: Literature Review**

In this chapter, current existing solutions or projects that have similar functionality were used for reviews. Three existing systems was analysed in this chapter. The limitation, constraints,

architecture, structure and algorithms were determined and examined from the existing similar system.

### **1.10.3 Chapter 3: Requirement Analysis and design**

In chapter 3, the methodology of the project was explained further. The methodology that was implemented in the proposed project was the Agile Method while the architecture that was implemented was Service-oriented architecture. The database used was MySQL using PHPMysqlAdmin as the web application to store all the data and costing for the project.

### **1.10.4 Chapter 4 Implementation and Testing**

Chapter 4 described the whole development of the mobile application. The project was developed by using Android Studio, PHP, MySQL, and Java. By using these software development tools, a new mobile application was produced and being implemented and introduced to farmers. Testing was carried out toward farmers to identify the defects of the mobile app and debugging to eliminate the errors.

### **1.10.5 Chapter 5: Conclusion and Future Work**

In chapter 5, potential features and additional functionality that can be added to the mobile application was discussed and take into consideration. These potential features and additional functionality were proposed to enhance and improve the current proposed project. This process was done after the project wrapped up. The achievement of the main objectives will determine at the end of the project.

## CHAPTER 2

### LITERATURE REVIEW

#### 2.1 Introduction

Chapter 2 reviews on similar existing system in mobile application with FarmAid. In this chapter, three similar existing systems that had already been developed were used for comparison. The three mobile applications used were Mardi myAgriSmartCalculator, *Kalkulator Pertanian*, and AgriMaths. The main objective of this chapter was to identify the features, limitations, constraints, architectures, structures and algorithms of the three-existing systems. Then, the identified features were used in the system.

#### 2.2 Background Study

The growing of population had raised the need to focus on agriculture around the globe to cope with humans' needs and pressures farmers to cope with the demand. Using the old method of paper-based farm management, it clearly shows that farmers were outdated and taking longer time to properly manage their profit and expenses data. To produce good quality of goods, quality product, improve their income and adhere to governmental regulation and principles, farmers need to combine all their data effortlessly and take precise decisions. Meanwhile, managing expenses and calculating their profit have becoming a real struggle for every farmer (Kaloxyllos et al., 2012). It has been reported that the conventional paper-based form was not effective and difficult to manage the farming data. The farmers faced difficulties to check their

expenses by referring to their sale information on documents and paper and perform profit calculation according to the recorded expenses and sells. Hence, it is important to do proper planning and managing expenses and resources in agriculture. Kamal, Hassan, Ismail and Affandi (2012) stated that to guarantee the money to be well spent, established project must be plan and manage carefully to maximize the successful rate of the project. Therefore, proper planning and management of farm will help farmers to manage their money well and make better decision in the future. It will also help farmer to be well organized and avoid loss by making better decision and managing their expenses well.

## **2.3 Review on Similar Existing Systems**

This section presents reviews of three related systems on their features. The systems were MARDI myAgriSmartCalculator, *Kalkulator Pertanian*, and AgriMaths. From the reviews, the features were discussed and adopted in the proposed system, FarmAid.

### **2.3.1 MARDI myAgriSmartCalculator**

MARDI myAgriSmartCalculator is one of the mobile applications that was developed by MARDI Apps. Malaysia Agriculture Research and Development Institute (MARDI) is an authorized government body which has been mandated to conduct research in agriculture, food and agro-based industries in Malaysia (Speedminers, 2016).

MARDI myAgriSmartCalculator allows the farmers to calculate their expenses in managing the farm. Through the mobile application, farmers can calculate their expenses by