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***INVENTORY MANAGEMENT SYSTEM USING RFID
TECHNOLOGY***

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Inventory Management System Using RFID Technology

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ABSTRACT

Inventory management system using RFID technology offer a feature that makes inventory management system simpler and more efficient. The main purpose of developing this project is that this system allows the user to scan every item in a single room and directly update the database from the RFID reader. This will help the user by greatly reduce the time taken in updating the database also reduce the time taken for searching the item. Besides that, this system has the ability to update the location of the item, where it can be helpful in finding the items.

ABSTRAK

Sistem pengurusan inventori menggunakan teknologi RFID menawarkan ciri yang menjadikan sistem pengurusan inventori lebih mudah dan lebih cekap. Tujuan utama untuk membangunkan projek ini ialah sistem ini membolehkan pengguna mengimbas setiap barang dalam bilik tunggal dan terus mengemas kini pangkalan data dari pembaca RFID. Ini akan membantu pengguna dari segi mengurangkan masa yang diambil dalam mengemas kini pangkalan data dan juga mengurangkan masa yang diambil untuk mencari barang tersebut. Selain itu, sistem ini mempunyai keupayaan untuk mengemas kini lokasi barang tersebut, di mana ia dapat membantu dalam mencari barang.

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CHAPTER 1

1.1 Introduction

Most people nowadays think that inventory management only applies to retail applications. While retail operation indeed relies heavily on inventory management system, the usage of inventory management systems did cover a wide variety of industries, from manufacturing to utilities, healthcare, education, government and more. The importance of inventory management systems is to ensure that the right amount of inventory is available at the right time and have the right quality and that's where this project is very suitable to improve the inventory system nowadays. The usage of RFID inside this project will combine the technologies and processes together with procedures that can monitor the whereabouts of the inventory and the amount of that inventory inside the database that can be accessed through the desktop. Without the implementation of RFID inside inventory management system, the goods and the products that flow through an organization will be inevitably in a disorder manner that will bring a lot of troublesome to the one who updating the goods and the product.

1.2 Problem Statement

Inventory management systems can dramatically improve the productivity and efficiency when put into practice properly. But the inventory management systems nowadays are still lacking in effectiveness that causes time to lose just like that. For example, when the items are constantly being used without being put back to its original location. This will cause this item to be hard to find and wasted a lot of man hours trying to locate it. Furthermore, inventory management system nowadays still using a manual documentation of the inventory and by

doing this the possibility of an inaccurate records will be really high. For example, wrong part numbers or incorrect inventory counts. This mistake could cause a havoc by updating the wrong item and buying unnecessary stock that cause the organization to lose profits or run out of budget. Besides, by manually updating the inventory system, this will cause the person in charge of updating the inventory need to do two task which is by writing the part number inside a file and update the system manually at the organisation inventory management database and this usually take hours to update.

1.3 Project Scope

The project scopes are:

1. The system is design mainly for items that are frequently being move from one room to another.
2. The inventory management system is a database system that can integrate with the RFID scanner.

1.4 Objective

The main objective of this project is to improve the inventory management systems through the use of RFID technology.

Other objectives:

1. To develop a system that is user friendly that allow the user to update the database using the RFID scanner.
2. To allow the user to display the inventory database right at where they are.
3. To allow the user to scan the tags at a distance of several metres away without the need to go very near to the item

1.5 Methodology

Rapid Application Development (RAD) will be implemented in the process of developing Inventory Management System using RFID technologies. The figure below shows the phases inside the RAD methodology.

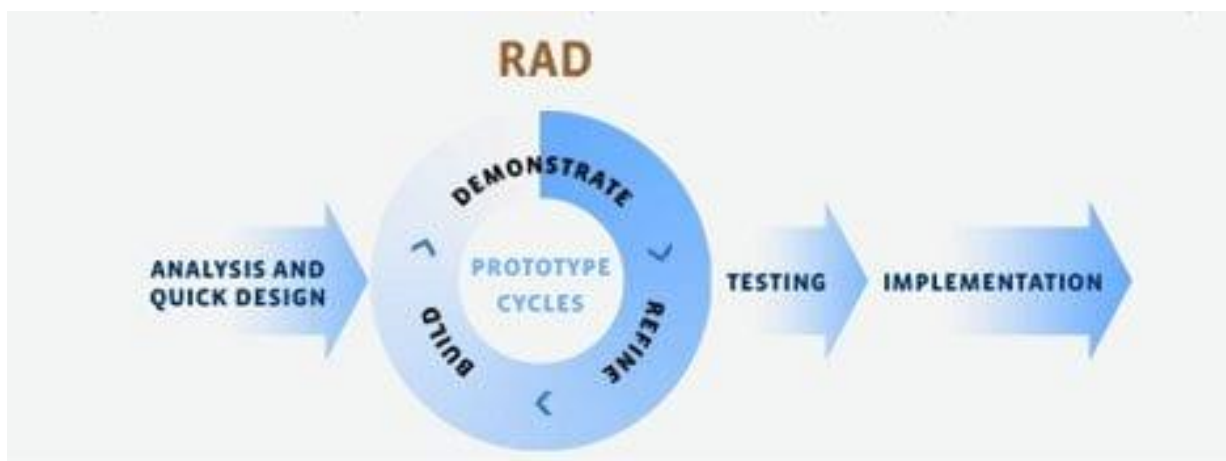


Figure 1.1 Rapid Application Development Methodology Phases (2019). Retrieved from

<https://blog.capterra.com/what-is-rapid-application-development/>

1.5.1 Analysis and Quick Design

In this phase, the main goal of the proposed system will be identified. All the requirements needed for the proposed system will be collected through survey and interview. The collected data will be analysed in order to identify functionality and non-functionality function. Other than that, in this phase we will consider the best hardware and software to be used is throughout the timeline. This is all needed to be done for the first phase that need to be prioritize at the beginning of the proposed system

1.5.2 Prototype Cycle

Before proceeding into the creation of the prototype, we need to identify the database structure for this system. Besides that, the proposed system prototype should follow the requirement of the stakeholder before starting the designing. The prototype design created must be presented to the stakeholder to get stakeholder agreement to ensure that the prototype produced meets their expectations. After the stakeholder satisfied with the prototype design, the developer then can start developing or programmed the system based on the prototype. This process of designing the prototype will be repeated if there are any changes done by stakeholder requirements or the stakeholder does not satisfy with the prototype. In this development process, the language used will be php language and using MySQL to create the database.

1.5.3 Testing

After the prototype has been approved and development process is done, a test is what will be done next. The purpose conducting a test is to identify and fixed any error that exist due to unforeseen defect that occur during the development process. There is various type of testing that can be used but the most commonly used test is white box testing and black box testing. In this system development, white box testing will be use to conduct the test to find out if there are any error that occur during the development process same with black box testing, and it is used to check the function and non-functional requirement is being fulfil without any bugs. We need to ensure that the system produced are defect and error free before the system can be release to the public

1.5.4 Implementation

This phase is where the proposed system supposed to be release to the client side but this project is only a prototype system, there will be no implementation to the client side.

1.6 Significance of Project

The significance of this project is to improve the overall inventory management system by allowing the user to directly update the inventory database by using the RFID scanner from a distant. Thus, this will be the solution to increase the efficiency of the of the inventory management system and save a lot of precious times because there is no need to go near the item in order to do the scanning. Besides that, this project also reduces the chances for human making an error down to 10% in entering the information of the item inside the database.

1.7 Project Schedule

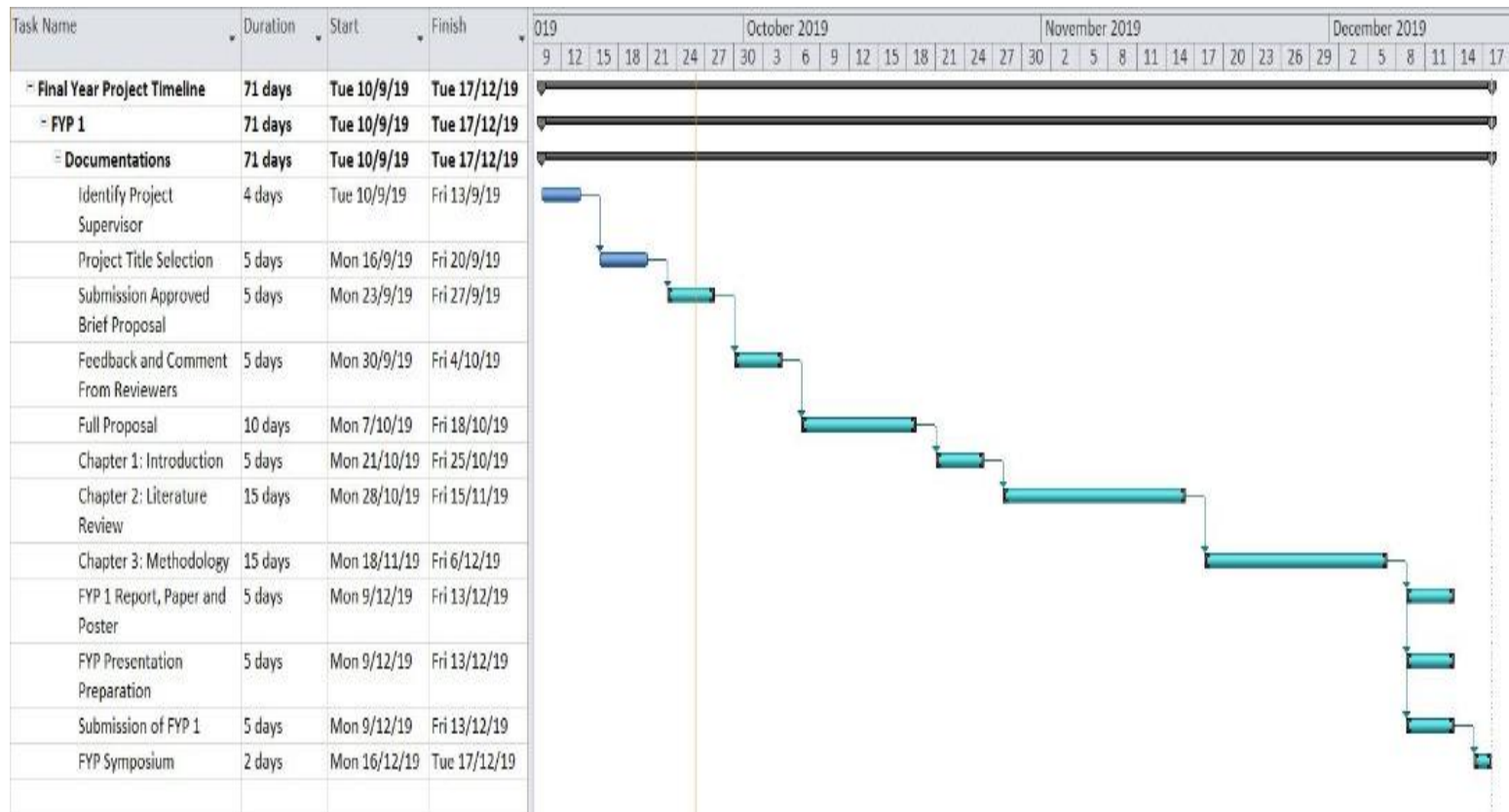


FIGURE 1.2: PROJECT SCHEDULE

1.8 Expected Outcome

By the end of this project, a working prototype of the Inventory Management System that implement RFID technology will be developed. The system will allow the user to directly update the inventory database by scanning using the RFID scanner. The user can also view the database from a website using any mobile devices. Other than that, the expected outcome is to ensure that the system is user friendly for the convenience of the user.

1.9 Report Outline

Chapter 2: Literature Review

This chapter explains the review based on current approaches or similar system which can be mentioned on any related articles and journals. The importance of this chapter is to provide an early expectation of the proposed system. Moreover, the strength and limitation of the existing system will be explained and discussed in this chapter.

Chapter 3: Requirement Analysis and Design

In this chapter, methodology will be discussed which is Rapid Application Development. The method to obtain user requirement is being discussed in this project beside analysing the user requirement to ensure the information is useful for the project's benefits. The design phase also being explained for the proposed system specifically on database design.

Chapter 4: Implementation and Testing

The implementation and testing of the proposed system are being done to ensure the system can be understood. Besides that, it tests the functionality of the system. The importance of implementation and testing will be discussed in this chapter.

Chapter 5: Conclusion and Future work.

A summary will be made to conclude the project based on the proposed system that are made. The future enhancement of the system will be discussed.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

In this chapter, the findings and previous studies regarding this project title will be presented. Most of the finding materials are based on the book and published journals. From the findings, the general information about the project can be gathered more easily when do the experiment. In section 2.2, a detail explanation about inventory management system will be discussed. While in section 2.3, a detailed explanation regarding the existing Inventory Management System will be address. Furthermore, in section 2.4 the comparison between existing system will be stated. Lastly, in chapter 2.5, the summary for the whole chapter will be defined.

The aim of this literature review is to study the related and selected inventory management system. Based on these studies, different significant information can be found such as strengths, weaknesses and requirement specification. The ideas can be gained to achieve the proposed objectives and implemented on the proposed system to overcome the weaknesses found in the selected inventory management system. Moreover, commonly used functions are found in selected inventory management system will be selected as functions of the proposed system as well. This chapter will analyse some tools and technology used for development and find out why the tools and technology are used to develop the proposed system.

2.2 INVENTORY MANAGEMENT SYSTEM

Inventory management system is a process for managing and locating objects or materials like idle stock of physical goods that is either a spare part or a piece of equipment that is always being used and being moved. Inventory management system is an efficient way of handling the flow of item in and out from an existing inventory, therefore it will bring benefits outcome especially to that related to the industrial area. This process usually involves controlling the transfer of material in order to avoid inventory becoming too high and costly to company. An analysis of issues involves in assessing inventory management system reveals that inventory management often hold process, planning, information and organization dimension (Corbey and Jansen,1993). Balancing the various tasks of inventory management and calculating known as buffer stock is the key of success in managing the inventory. Inventory management system is not limited to document of delivery raw material but the movement of those material also important. Normally known as work in progress or goods, tracking materials are used to identify and adjust the amount of ordering the material before inventory get low and become dangerous to company as well.

Inventory management system has been recognized as one of the most important functions of industrial and commercial enterprises, which often has a great impact on overall performance. Inventory is probably the most thoroughly researched area of production and operations management. However, almost large companies and many small and medium-sized enterprises increasingly try to apply scientific methods for better managing their inventory, the use of these methods is often limited to some basic tools like the computation of economic order quantities and rough approximations of reorder points or base stocks for achieving target service levels. The way inventory management system generally considered as important key