

A STUDY OF SMART SHOPPING SYSTEM USING
RADIO FREQUENCY IDENTIFICATION

ROSPI BIN MAT HUSIN

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Dedicated to Mat Husin Bin Yaacob, Wan Suzi Wan Mohd Zawil Abidin,
Nur Sofia Balqis, Nur Sofia Zulaikha, Muhammad Amir Yusof,
Sibling and Friends

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ABSTRACT

This project report presents a smart shopping system by using RFID technology. The usage of RFID improves the current system of payment method at the payment counter. The current payment system in most supermarkets is using barcode and a scanner to read the code. The bar code is used to identify the information such as a product price, product name and others. Using this method, product price need to be scan one by one by the scanner to get the prices and also the total price. Since this method will take some times, consumers have to wait before they can pay the total price to the cashier. This could be worst if there are many consumers want to make the payment and each of them buy a lot of goods. This research will be divided into two parts which are the hardware module and the software module. In this study, RFID reader with five active tags, C# programming language and Microsoft Access 2007 as a database were used to build the whole system. This new system can ensure that the product prices and the total price bought by the customer could be displayed all at once.

ABSTRAK

Laporan yang disediakan ini merupakan hasil kajian terhadap sistem jual beli pintar yang telah dibangunkan dengan menggunakan teknologi RFID. Teknologi RFID ini digunakan untuk memperbaiki sistem pembayaran yang sedia ada di kaunter pembayaran. Sistem yang diguna pakai pada masa sekarang adalah dengan menggunakan pengimbas dan kod bar. Kod bar ini digunakan untuk mengenalpasti maklumat bagi sesuatu produk seperti nama produk, harga produk dan lain-lain lagi. Dengan menggunakan kaedah ini, harga produk mesti diimbas satu persatu bagi mendapatkan jumlah harga yang dikehendaki. Ini menyebabkan pelanggan terpaksa menunggu agak lama sebelum dapat membuat bayaran. Keadaan ini akan menjadi lebih sesak sekiranya terdapat ramai pelanggan yang beratur untuk membuat pembayaran. Kajian yang dilakukan ini dibahagikan kepada dua bahagian iaitu modul perkakasan dan modul perisian. Dalam kajian ini, pembaca RFID, lima tag aktif, bahasa pengaturcaraan C# dan Microsoft Access 2007 sebagai pangkalan data telah digunakan untuk membangunkan keseluruhan sistem. Sistem yang dibangunkan ini dapat digunakan untuk memaparkan harga setiap barangan dan jumlah harga secara sekaligus tanpa perlu diimbas satu persatu.

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LIST OF SYMBOLS AND ABBREVIATIONS

RFID	Radio Frequency Identification
°	Degree
C	Celsius
RS	Recommended Standard
USB	Universal Serial Bus
V	Voltage
Hz	Hertz
G	Giga
M	Mega
C#	C Sharp

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Shopping at the supermarket is a common routine for the most of the peoples. They often purchased a lot of goods at a time and they need to pay the prices on the spot. Usually, the price of the goods purchased will be scan by the cashier by using a scanner. Price per item will be scanned one by one and this will take some times before the total price of the goods can be displayed. Sometimes, there also occur that the goods cannot be scanned because of the problems of the bar code or the scanner. When this happens, the cashier needs to enter the product code by typing the code and it takes a long time. Therefore, the customers had to wait and it is not convenient at all. RFID is a technology that can be used to overcome these existing problems. RFID can be modified to allow the total price of the product to be displayed at once. The product prices need not to be scanned one by one by the cashier. RFID is a technology that uses radio frequencies to track an item or person directly. Therefore, this technology can be use to improve the efficiency of the current system nowadays.

1.2 Objective of the Project

The objectives for this project are as below:

- i. To develop a smart shopping system using active RFID.
- ii. To investigate the active tags orientation in a trolley.
- iii. To analyze the factors that influences the reading range of RFID.
- iv. To determine the duration of time taken using RFID compare to the barcode.

1.3 Problem Statement

When shopping at the supermarket, the consumers always faced with a problem of waiting a little longer at the payment counter. This is because they have to wait for the cashier to scan the product price one by one to get the total price or cost. This situation will get worsen if there are many consumers buy a lot. Nowadays, most of the products are equipped with the bar code. Therefore, to get the price, the product has to be scan individually by the scanner. To address these issues, RFID technology can be used as an alternative to improve the efficiency of the payment process. RFID technology will be used to develop a new method of payment system. This new system will be able to read the prices of all products in a trolley and then display the total price at one.

1.4 Project Scope

To achieve the above objective, this project will cover the following scopes:

- i. This system is only to read and identify five products prices in a trolley automatically without scanning the product's price one by one.
- ii. This system is developed using Microsoft Visual C# 2010 as a programming language and Microsoft Access 2007 as a database.
- iii. This system only totals up the prices of items but does not include the payment transaction.
- iv. This project research is using active RFID reader with UHF 2.4GHz.
- v. This study is for the indoor shopping only.

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