UNIVERSITI TEKNIKAL MALAYSIA MELAKA

SMART CART WITH AUTO BILLING

This report is submitted in accordance with the requirement of the Universiti Teknikal Malaysia Melaka (UTeM) for the Bachelor of Electrical Engineering Technology (Industrial Automation and Robotics) with Honours.

by

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APPROVAL

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ABSTRAK

Pada masa kini, kesibukkan di pusat membeli belah kebiasaanya berlaku pada hujung minggu ataupun hari cuti terutama apabila ada tawaran hebat ataupun diskaun besar. Penggunaan troli semasa diawal pembelian dan pembayaran barang-barang di kaunter pembayaran adalah proses membeli yang biasa kita lakukan. Dengan menggunakan pembaca kod bar, kaunter pembayaran akan memakan masa untuk mengesan kod-kod bar tersebut. Ini akan mengakibatkan pelanggan akan beratur panjang di kaunter pembayaran. Projek ini membentangkan idea untuk membangunkan sistem di pusat membeli-belah untuk mengatasi masalah di atas. Untuk mencapai semua produk di pusat membeli-belah projek ini perlu dilengkapi dengan tag RFID dan semua troli perlu dilengkapi dengan pembaca RFID dan skrin LCD. Apabila seseorang meletakkan sebarang produk dalam troli kodnya akan dikesan secara automatik, dan harga kos akan dipaparkan pada LCD. Jika pelanggan ingin mengeluarkan produk dari troli, kos produk tersebut akan ditolak dari jumlah keseluruhan dan maklumat yang sama akan dihantar ke unit pembayaran melalui modul Wi-Fi. Oleh itu bil boleh dilakukan di dalam troli dan menjimatkan banyak masa kepada pelanggan

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ABSTRACT

Nowadays we can see you a huge rush in the metro cities on holidays and weekends at shopping malls. When there are huge offers and discounts, this becomes even more so. People now buy a variety of items from a day and put them in the trolley. One should approach counter for billing purposes after total purchase. The cashier prepares the bill by using the barcode reader, which is a time-consuming process. This leads to long billing counters queues. This project presents an idea of developing a system to overcome the above problem in shopping malls. All products in the mall should be equipped with RFID tags to accomplish this and all trolleys should be equipped with an RFID reader and LCD screen. When the customer places any product in the trolley, their code will automatically be detected, the name and cost of the item will be displayed on the LCD, thus adding the cost to the total bill. If we want to remove the product from the trolley, the product can be removed and the quantity of that particular product is deducted from the total quantity and the same information passes through the Wi-Fi module to the central billing unit. The billing can therefore be done in the trolley itself, saving the customers a lot of time.

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DEDICATION

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LIST OF SYMBOLS

MHz	-	Mega Hertz
GHz	-	Giga Hertz
V, volts	-	Voltage
mA	-	miliAmpere
KB	-	Kilobits

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LIST OF ABBREVIATIONS

IoT	Internet of Things
RFID	Radio Frequency Identification
LED	Light Emitting Diode
IDE	Integrated Development Environment
USB	Universal Serial Bus
AC	Alternating Current
DC	Direct Current
GND	Ground
LCD	Liquid Crystal Display
IEEE	Institute of Electrical and Electronics Engineers
SEP	Smart Energy Profile
WPA	Wi-Fi Protected Access
UART	universal asynchronous receiver-transmitter
SRAM	Static Random Access Memory
ICSP	In-Circuit Serial Programming

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CHAPTER 1

INTRODUCTION

1.0 Introduction

The introduction discusses the project background, problem statement, project scope, and objective. This section will explain the overall view to guide and development of an application for IoT based application with a Wi-Fi module as a network system.

1.1 Background of study

Basically, the supermarket is where customers come to buy their products on a daily basis and pay for it. Therefore, the number of products sold and customer's bill must be calculated. Based on studied of US Department agency, people are spending their time around 1.4 hours consistently in a shopping mall and it will affect the people to tend to leave if the line is too long for paying their stuff.

The grocery atmosphere is divided into two classifications, which are shopping individually and shop absentia (meganas, systems and engineering). Shopping in absentia is carried forward from a wide range of points of view, including web shopping, online shopping, and the buyer does not have to be held manually. Individual purchases include a single call at the nearest store and the selection of items in view of different variables

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such as need, comfort, brand, etc. In order to help shoppers, minimize their shopping time, the proposed strong Shaufing Basket Framework is designed to make a persistent change in their shopping background. We have developed a shopping basket to overcome the above problems and to improve the current framework.

The new design process for services is important to recognize and understand because knowledge of the creation of new services is lacking while world economy is changing from production to services (Smith et, Al 2007). He also says what the customer needs and how they have to meet these requirements. To fulfil the customer, the service development needs to create a customer-friendly search for a service.

We therefore propose developing an intelligent shopping cart system to keep trackof products bought as well as transactions for online billing using RFID and Wi-Fi Module. The system will also propose products to be purchased from a centralized, user purchase history-based system. Each Mart product has an RFID tag and every cart has an RFID reader and Wi-FI Module attached to it.

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1.2 Problem Statement

Nowadays, shopping is the trendiest activity either online or in-store for all type of genders. For women, shopping able to relieve their stress and get to be updated in many aspects such as fashion, make-up and etc. Besides that, it also important for people to escape stress or it can even be as enjoyable to make ourselves happy. Basically, this project is more focus on in-store shopping where the barcodes are found on almost every products or item. Furthermore, Shopper needs to wait on a bill counter to pay their stuff, item or products because the process of scanning the barcode is quite slow and it takes much customer's times to settle down. In that case, this project to design the cart which capable to reduce the human effort and avoid wasting the customer's time during in-store shopping.

1.3 Objective

i. To implement a shopping cart with RFID technology for brainstorm purchase process.

ii. To evaluate the performance of component used such as RFID and NodeMCU

iii. To analyse the performance design cart.

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1.4 Scope

The scopes of work for the project include the following areas:

i. The project related to IoT based application.

ii. Focus about Wi-Fi module application as a communication protocol and network system

iii. To study RFID module and microcontroller which is NodeMCU that conduct a centralized system.

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CHAPTER 2

LITERATURE REVIEW

2.0 Introduction

This chapter will explain the overall this project which is a Smart cart with auto billing that related with the previous researches had been done. In order to improve the current project, the information or data collected by researcher help student such as gain knowledge's in limitation aspects, the specification of devices and so on.

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2.1 Overview of the Internet of Things (IoT)

According to Learning (2016), numerous visionaries frequently use the phrase "Internet of Things" is indicated to the common thinking of things, particularly normal objects that are clearly identified as controllable by Internet effects from 1999 to directly.

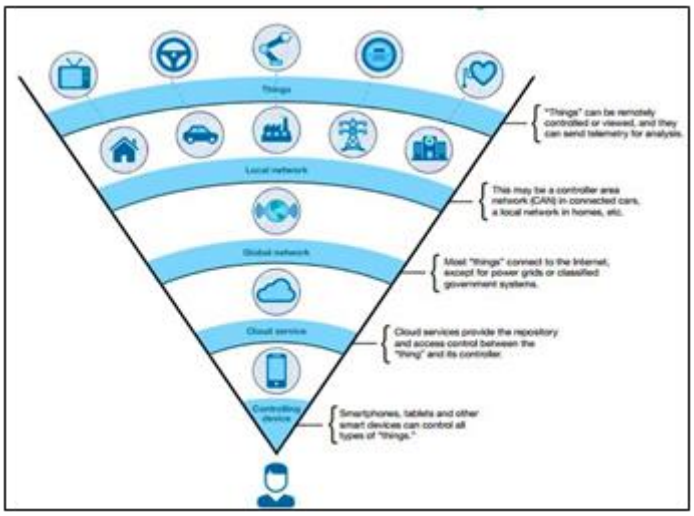

Figure 2.1: Architecture of the Internet of Thing (IoT) (Learning, 2016).

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