

BUSITEMA UNIVERSITY
FACULTY OF ENGINEERING
DEPARTMENT OF COMPUTER ENGINEERING

A WIRELESS BASED ELECTRONIC MENU AND BILLING SYSTEM

By

Oboire Edison

Reg. No: BU/UG/2012/1798

Email: oboireedison@gmail.com

Tel: 0775199871



Supervisor Lusiba Badru.

A Project report submitted in partial fulfillment of the requirements for the degree of Computer Engineering of Busitema University

June 2016

Declaration

This Project report is my original work and has not been presented for a degree in any other University or any other award.

Oboire Edison

Reg. No. BU/UG/2012/1798

Sign: *bu*

Date: *8/06/2016*




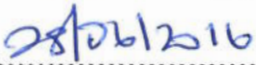
Approval

The undersigned certify that they have read and hereby recommend for acceptance of Busitema University a Project report entitled a wireless based electronic menu and billing system.

Mr Lusiba Badru.

Department of Computer Engineering

Sign:.....

Date:.....

Dedication

I dedicate this report to my family who helped me financially during the course of **this** project development.

Acknowledgment

My supervisor **Mr. Lusiba Badru** has been of vital help throughout the development of this project. Thank you so much for the aid offered to me.

Also, I acknowledge all the other department lecturers who have always given me time for consultation regardless of whether they are my supervisors or not, thank you for the helping attitude.

Many fellow students have offered help in form of advice and information and such is greatly recognized and in this regard, I acknowledge **Kashifa Bingii** for the endless support she offered to me in the struggle to achieve the objectives of my project.

Above all, I acknowledge the Almighty God for the gift of life, wisdom and guidance for without him, I wouldn't have been able to accomplish this project.

Abstract

Time is a commodity that needs to be managed effectively and efficiently in order to maximize productivity. As the process of doing business gets more complex and cumbersome, technology and automation become vital resources for the success and continue growth of sales organization. Through the strategic use of technology and automation, sales of organization can increase, the productivity and efficiency of it sale force by alleviating them from repetitive and mundane administrative task associated with doing business. The biggest benefit of automation is that it saves labor. However, it is also to save energy and materials to improve quality accuracy and precision. Automation is the technology concerned with application of mechanical, electronics and computer based systems to operate and control production. Due to advancement in technology, we have seen atomization of many things. We have seen an atomized vending machine which will serve a hot or soft drinks, Chocolates and many things. There is automation of tickets on railway station. So in today's world due increased demand and competition we need to serve the people as user friendly as fast as possible. In restaurants, menu cards are available on each table. We can refer it and place our order to a waiter. But we never noticed disadvantages of this conventional method. You need to wait for the waiter to attend to you. Even it becomes difficult for the restaurant manager to keep the changing prices on menu card. At the same time adding the new menu to the same card becomes tedious job for anyone who is responsible for this job since changing menu card within less time may result in cost rise. To overcome these problems, this system is installed on every table for ordering the menu. These units will work as slave units and will be connected to central unit which can be kept at managers table.

Table of Contents

DECLARATION	I
APPROVAL	II
DEDICATION	III
ACKNOWLEDGMENT	IV
ABSTRACT	V
LIST OF FIGURES	VIII
LIST OF ABBREVIATIONS	X
CHAPTER ONE	1
INTRODUCTION	1
1.0 BACKGROUND	1
1.1 PROBLEM STATEMENT	2
1.2 OBJECTIVES	2
1.2.1 Main Objective	2
1.2.2 Specific Objectives	2
1.3 JUSTIFICATION	2
1.4 SCOPE	3
CHAPTER TWO	4
LITERATURE REVIEW	4
2.0 INTRODUCTION	4
2.1 KEY TERMS USED	4
2.2 THE EXISTING SYSTEMS	4
2.2.1 Paper Based Menu Card	4
2.2.2 Self Service Food Ordering KIOSK Technology	5
2.2.3 QORDER	6
2.2.4 Computerized Ordering System	7
2.2.5 Personal Digital Assistants (PDA'S)	7
2.3 TECHNOLOGY USED	7
2.3.1 RF TRANSCEIVER TECHNOLOGY	7
2.3.2 AVR Microcontroller technology	8
2.4 COMPARISONS WITH EXISTING SYSTEMS	9
CHAPTER THREE	10
METHODOLOGY	10
3.0 INTRODUCTION	10
3.1 DATA COLLECTION	10
3.2 DATA ANALYSIS	10
3.3 REQUIREMENTS ANALYSIS	11
3.4 SYSTEM DESIGN	11
3.4.1 Tools	12

3.5	SYSTEM IMPLEMENTATION	13
3.6	TESTING AND VALIDATION	13
3.6.1	<i>Unit testing</i>	13
3.6.2	<i>System Integration Testing</i>	14
CHAPTER FOUR		15
SYSTEM STUDY, ANALYSIS AND DESIGN.....		15
4.1	REQUIREMENTS ANALYSIS	15
4.1.1	FUNCTIONAL REQUIREMENTS	15
4.1.2	USER REQUIREMENTS.....	16
4.2	SYSTEM DESIGN	17
4.2.1	HARDWARE ANALYSIS	17
	<i>Data Flow Diagram</i>	17
4.2.2	HARDWARE (ARCHITECTURAL DESIGN).....	18
4.2.2.1	AT MEGA 328P MICROCONTROLLER	18
4.2.2.2	LIQUID CRYSTAL DISPLAY (LCD).....	19
4.2.2.3	RF TRANSIVER.....	20
4.2.2.4	THE SEAT CHANGING SYSTEM.....	21
4.2.2.5	ARDUINO HARDWARE	21
4.2.3	SOFTWARE.....	22
4.2.3.1	ARDUINO IDE	22
4.2.3.2	THE LOGICAL DESIGN.....	23
CHAPTER FIVE		25
IMPLEMENTATION AND TESTING.....		25
5.1	DEVELOPMENT PLATFORM	25
5.2	CODE DESIGN	27
5.3	SYSTEM OPERATION.....	30
5.3.1	TESTING.....	31
	<i>5.3.1.1 Testing System</i>	31
5.4.2.1	TESTING SCHEDULE.....	32
5.4.2.2	HARDWARE AND SOFTWARE REQUIREMENTS.....	33
CHAPTER 6		35
DISCUSSION AND RECOMMENDATIONS		35
6.1	INTRODUCTION.....	35
6.2	SUMMARY OF WORK.....	35
6.3	CRITICAL ANALYSIS / APPRAISAL OF THE WORK	35
6.4	CHALLENGES	36
6.5	RECOMMENDATIONS FOR FUTURE WORK.....	36
6.6	CONCLUSION.....	37
REFERENCES		38
APPENDIX		40

List of tables

Table 1: Table of comparison with existing systems.....	9
Table 2: system evaluation table.....	34

List of figures

Figure 1: RF Transceiver Module [14]	8
Figure 2: The block diagram of the system.....	12
Figure 3 the system flow chart.....	17
Figure 4: The system block diagram.....	18
Figure 5: A microcontroller configuration for use.....	19
Figure 6:20x4 LCD picture.....	19
Figure 7: RF transceiver.....	20
Figure 8: a potential meter.....	21
Figure 9: <i>Arduino uno picture</i>	22
Figure 10: schematic diagram.....	23
<i>Figure 11: Entity relation diagram</i>	24
Figure 12: food registration form.....	31
Figure 13: order retrieval form.....	32
Figure 14: terminal output display.....	33

CHAPTER ONE

INTRODUCTION

1.0 Background

Ordinary Restaurants employ the use of paper/card menus to guide the waiters in inquiring from customers and to guide customers in placing orders. A waiter has to take orders of all available customers. This in most cases cause dissatisfaction in a customer's mind due to being attended to late in terms of order taking by a waiter [1]. Also due to human errors, the wrong order is taken by a waiter and served to a customer .Though in recent cases of technology advancement, these cards have gradually been replaced with electronic mobile gadgets which the waiters move with as they receive customer orders for the dishes they desire [2]. Such systems are however undesirably expensive because they usually require expensive mobile devices like sophisticated smart phones and tablets [3].The above mentioned traditional menu ordering and catering systems are time consuming and susceptible to human errors which can be reduced but can't be avoided.

Some self-service ordering system have been developed for example KIOSK but they are more popular in capital cities. So in smaller cities (towns) there are hardly any self-service systems in restaurants. This self-service systems though in use take unreasonable amount of delays to deliver the order [4].

The idea behind this project is to design and implement a very convenient wireless food ordering system in the restaurant. The project application will become an important tool for restaurants to improve the management aspect by utilizing CPE to coordinate food ordering. This could increase efficiency for restaurants and caterers by saving time, reducing human errors and by providing higher quality customer Service, With the combination of simple design and readily available emerging communications technologies like RF, it can be concluded that this system is an attractive solution for the Hospitality industry [5].

References

- [1] Paresh.R.Bora, "APPLICATION ON ORDER," *International Journal of Application or Innovation in Engineering & Management*, vol. 1, no. 2, pp. 59-62, 2012.
- [2] CHE-CHEN KUNG CHING-SU CHANG, "DEVELOPMENT AND IMPLEMENTATION OF AN E-RESTAURANT FOR CUSTOMER-CENTRIC SERVICE USING WLAN AND RFID TECHNOLOGIES," vol. 3230-3235, 2008.
- [3] Vaibhav Virhande Vikas Mullemwar, "ELECTRONIC MENU CARD FOR RESTAURANTS," *International Journal of Research in Engineering and Technology*, vol. 3, no. 4, pp. 341-345, 2014.
- [4] S.R. Lahane Ashutosh Bhargave, "DIGITAL ORDERING SYSTEM FOR RESTAURANT USING ANDROID," *International journal of scientific and research publications*, vol. 3, no. 4, 2013.
- [5] Rashmi Adatkar Indraneel Guha, "This projects aims to design and develop a wireless food ordering system in the restaurant. The project application will become an important tool for restaurants to improve the management aspect by utilizing PC to coordinate food ordering could increase e," *International Journal of Innovative Science and Modern Engineering*, vol. 3, no. 5, pp. 14-16, 2015.
- [6] Steven Heller Jim Heimann, *Menu Design in America*.
- [7] Priya Jadhav Varsha Chavan, "Implementing Customizable Online Food Ordering System," *International Journal of Innovative Science, Engineering & Technology*, vol. 2, no. 4, pp. 722-727, 2015.
- [8] B. Ashok Nayak B. Shabari, "ZIGBEE BASED E-MENU ORDERING SYSTEM," *international journal of advanced technology in engineering and science*, vol. 3, no. 8, pp. 50-54, 2015.
- [9] Akshaya Shende Abdul karim Gesawat, "User Friendly Ordering System," *International Journal of Electrical and Electronics Engineering*, vol. 2, no. 3, pp. 6-10, 2015.
- [10] Y. Sharvani ChetanPunjiram, "Zigbee Based E Menu Ordering System Using," *IJARIE- ISSN(O)-2395-4396*, vol. 1, no. 2, pp. 330-335, 2015.
- [11] Priyanka Thakare Resham Shinde, "Design and Implementation of Digital dining in Restaurants using Android," *International Journal of Advance Research in Computer Science and Management Studies*, vol. 2, no. 1, pp. 279-384, 2014.
- [12] Priyanka Teli Priya Jadhav, "Implementing Digital Restaurants and Inter-Restaurant Navigation Using Smart Phones," *IJCSMC*, vol. 4, no. 2, pp. 319-324, February 2015.

- [13] Priyanka R Shweta Shashikant, "Automated Food Ordering System with Real-Time Customer Feedback," *International Journal of Advanced Research in Computer Science and Software Engineering*, vol. 3, no. 2, pp. 220-225, 2013.
- [14] G.Satya Prabh Maderla Rajesh, "E-Restaurant: Online Restaurant Management," *International Journal & Magazine of Engineering, Technology, Management and Research*, vol. 2, no. 7, pp. 574-579, 2015.
- [15] N. Sethy, *WIRELESS ALARM SYSTEM USIN AVR MICROCONTROLLER.:* Rourkela, 2013.
- [16] Praveen BaburaoKamble A. K. Lodhi, "AUTOMATIC RESTAURANT ORDER SYSTEM USING ZIGBEE," *Journal of Electronics and communication Engineering*, no. 2278-2834, pp. 19-23.
- [17] John J Rove., *System level solutions Lab manual, a study on Touch Screen.*
- [18] Deepika Bane, Hardik Rawat Amar Pai, "TOUCH SCREEN BASED ORDERING SYSTEM & DISPLAYING SYSTEM FOR RESTAURANTS," *International Journal of Research in Engineering and Technology*, vol. 4, no. 4, pp. 5-8, 2015.
- [19] Nivedita Sethy, "WIRELESS ALARM SYSTEM USIN AVR MICROCONTROLLER," Rourkela, 2013.