AUTOFILLING FORM USE AT FKEKK

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A Report submitted in partial fulfillment of the requirements for the award of the Degree of Bachelor of Electronic Engineering (Computer Engineering)

FACULTY OF ELECTRONICS AND COMPUTER ENGINEERING

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

JUNE 2013

UNIVERSTI TEKNIKAL MALAYSIA MELAKA
FAKULTI KEJURUTERAAN ELEKTRONIK DAN KEJURUTERAAN KOMPUTER

BORANG PENGESAHAN STATUS LAPORAN
PROJEK SARJANA MUDA II

Tajuk Projek : AUTOFILLING FORM USE AT FKEKK

Sesi Pengajian : 2012/2013

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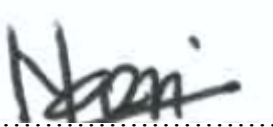

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This project is lovingly dedicated to my beloved parents, En. Chemiran bin Sayid and Pn. Normah bt. Othman@Mohammad as well as to my siblings who give the encouragement and support for me to complete this thesis. Not forgotten to my supervisor Dr. Nor Zaidi bin Haron who gave me a lot of guidance and advises throughout this project until successful. Thank you very much to all of you.

ACKNOWLEDGEMENT

Alhamdulillah, thanks to Allah S.W.T the Final Year Project (FYP) is completed. I hereby would like to take this opportunity to thank all people who has involved generously in helping me and assisting me while I was completing the FYP report which is a compulsory to all Universiti Teknikal Malaysia Melaka (UTeM) students in order to complete our degree. I would firstly to express my deepest gratitude and thanks to my project supervisor, Dr. Nor Zaidi bin Haron for his undivided support morally and physically, assistance, guidance, tolerance, which proved to be invaluable as to completion my FYP.

I also would like to thank the panel; Dr. Fauziyah Binti Salehuddin, Madam Niza Binti Mohd Idris, Dr. Mohd Shakir Bin Md Saat and Mr. Zamre Bin Abd. Ghani which give me a good comment during my presentation. I also would like to take this opportunity to express my appreciation to my family and friends for their patients, understanding and also for their undivided support that they had gave me throughout the completion of my project.

Last but not least, I also would like to thank all who helping and supporting me during my FYP.

ABSTRACT

Current practices in FKEKK department require all FKEKK staff to fill up their information on paper-based application forms manually using handwriting. Such traditional practices not only tedious and slow task, but also can avoid typing error when filling in online forms. This project addresses these matters where a design and implementation of a speedy, secure auto filling form system for use in FKEKK staff card. The speedy, secure auto filling form system comprises two main parts: (i) contact and contactless RFID reader and (ii) digitalized forms. The heart of the RFID reader is a PIC microcontroller that will retrieve the FKEKK staff information from their staff card and transfer to a computer using universal serial bus communication. As a security measure, the digitalized forms are the software part running on a computer and will be developed to imitate the traditional paper-based forms that are used by FKEKK staff. Visual studio software tools such as Visual Basic is used to develop such forms such as name, staff number and etc. a prototype of auto filling form system has been successfully design and developed. Moreover, performance evaluation shows that the project is able to function as desired. For the future works is this system can be upgrade to sending the data via wirelessly to the database for authentication process, the most common wireless device that are use zigbee technology where it can transmit and receive in long range.

ABSTRAK

Amalan semasa FKEKK memerlukan semua kakitangan FKEKK untuk mengisi maklumat mereka di aplikasikan borang berasaskan kertas dengan menggunakan tulisan tangan. Seperti amalan tradisional bukan sahaja membosankan dan tugas yang perlahan, tetapi juga boleh mengelakkan daripada melakukan kesilapan ketika mengisi borang online.Projek ini menangani perkara-perkara di mana reka bentuk dan pelaksanaan yang cepat, selamat mengisi borang secara automatik untuk kegunaan di FKEKK kad kakitangan. sistem mengisi borang tempahan secara automatik terdiri daripada dua bahagian utama: (i) pengimbas RFID dan (ii) borang berdigital. Hati pengimbas RFID adalah mikropengawal yang akan mendapatkan maklumat kakitangan FKEKK dari kad kakitangan dan memindahkannya ke komputer menggunakan komunikasi sesiri. Sebagai langkah keselamatan, bentuk berdigital adalah sebahagian perisian yang berjalan pada komputer dan telah dibangunkan untuk meniru berasaskan kertas tradisional bentuk yang digunakan oleh kakitangan FKEKK. Visual alat perisian studio seperti Visual Basic telah digunakan untuk membangunkan bentuk itu seperti nama, nombor kakitangan dan lain-lain Pada akhir projek ini, satu prototaip sistem auto mengisi borang telah dihasilkan dengan keupayaan untuk meningkatkan kualiti perkhidmatan FKEKK kad kakitangan. Secara kesimpulannya, projek ini berjaya dihasilkan. seterusnya, penilaian prestasi menunjukkan bahawa projek ini dapat berfungsi seperti yang dikehendaki. Bagi kerja-kerja masa depan adalah sistem ini boleh naik taraf untuk menghantar data melalui “wireless” kepada pangkalan data untuk proses pengesahan, kebiasaannya peranti “wireless” menggunakan ZigBee teknologi di mana ia boleh menghantar dan menerima dalam jarak panjang.

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CHAPTER I

INTRODUCTION

1.0 BACKGROUND

Paper-based application forms are widely used in government and private sectors when applying a service. Customers are required to handwrite their personal details on the paper-based application forms. For example, this practice is required when applying new electricity connection and opening a new bank account. Figure 1 shows the example of paper-based application form. The form requires common customer's information such as name, address, New Registration Identity Card (NRIC), gender, birth date, birthplace, etc. The completed forms are then submitted to the officer who will key-in the customer's information into computer system. These application procedures have been put into practice for some time.

The current practice of filling the application forms using handwriting is unfortunately tedious and slow. The structures of application form can also be confusing that leads to time wasting for a customer. In some organizations, not only one form is needed to complete the registration. There are some organization requires customer to fill up a few application forms. This procedure leads to repetition of process where each form requires basic information from the customers.

Figure 1: Application form sample

It is understandable that all of the form needs to be filled up due to formal procedures. However, it is actually a repetitive action for the customer that most of people do not realize it [1].

In addition, some organizations, there is no advance system that can transfer all the information from the application form to the computers. Current practice is that the officer-in-charged will ask the customer to write all the details in the application form and after the customer finished filling up, the officer would key in or type in all the information from the application form completed by the customers into the computer; see Figure 3. As it can be seen here, the process of registering or applying something becomes time consuming and in fact, it is actually doing double work. First, the customer fills up the form and then the officer key in the back all the information on the application form into the computer.

Meanwhile, paper based application form can also be a mess in the office. Many papers need to be stacked on shelf and need to be stack neatly. Large organization that has many customers may require several rooms full of shelf to organize the documentation. Figure 4 shows the example of many files stacked on a

shelf. It could be untidy and also required a lot of space to allocate all of the documentation for references.

Figure 2: Customer fill the form and officer key in the information in the computer

Therefore, this requires the organization to invest to build a special room for documentations. When this happens, some of the profit needs to be cut out for the cost of making this documentation room. Moreover, putting a lot of paper-based form on shelves will give a hard time for the officers to locate the customers file. Officers would take several times to find the correct file before they can proceed with other jobs. These inefficient tasks not only incur high cost and time consuming,

but it also induces a burden to employees and in turn reducing their productivity and profits [1].

Figure 3: Filing room

In addition, monotonous practice is prone to human error due to several reasons. For instance, when a customer is in a hurry, the tendency of making a mistake is highly possible. Some of the customers went to the registration offices during lunch break for which they have limited time. Besides the time limitation, age is another factor. Especially for elder persons, they might be having difficulties to read the form and write down their details causing mistakes. Moreover, disabled and less-literate people sometimes have some difficulties to understand or to read clearly written in the application forms. In most registration areas, not all organizations provide a special counter for the disabled people.

1.1 PROBLEM STATEMENT

There have some problem to the current application form using the traditional method. For the paper-based application form is taking a long time to complete the application form and sometimes people making mistake to filling the application form. In addition, this system can avoid the human error and leading to time-wasting. This system also can avoid people making the mistake when filling the online form such as typing error. Moreover this Autofilling form system can tedious task leading to low productivity. However the using the RFID to filling the application form is fast compare with using the paper-based filling the application form.

1.2 OBJECTIVES

There are three objectives that have been set to guide the project flow. The objectives are as follows:

i. To design a prototype of an auto filling form system that operates in fast.
ii. To avoid human errors when filling in online forms.
iii. To facilitate all staff in completing the form.

1.3 SCOPE

The scope of the work mainly relates to computer engineering including the following tasks:

i. The software development including the design of auto filling application and digitalized forms; see Figure 4.
ii. The hardware design including the fabrication and test of the RFID card reader; see Figure 5.

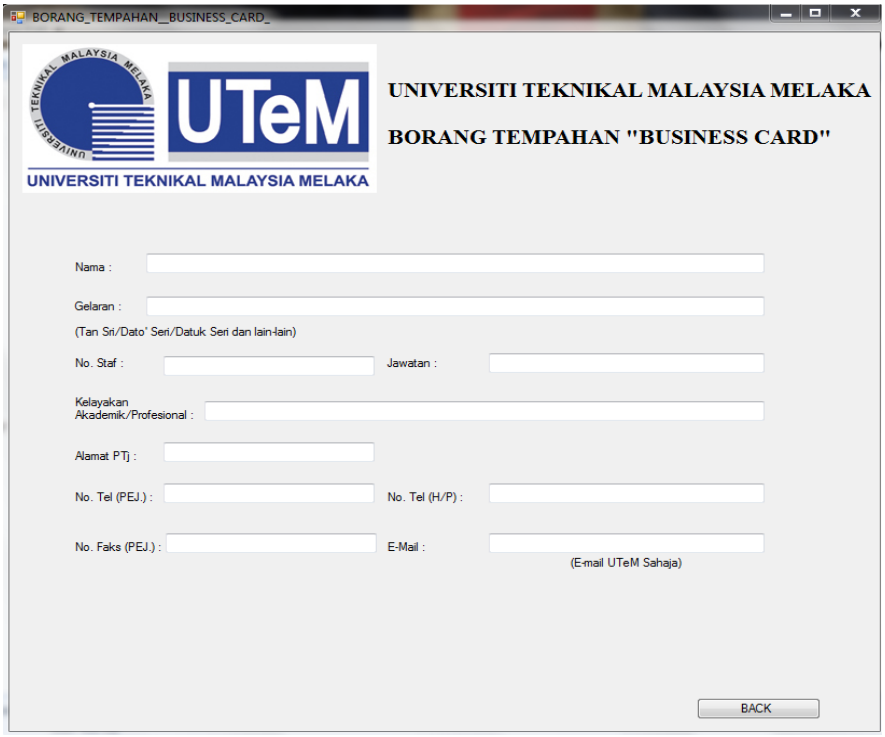

Figure 4: Digitalized form

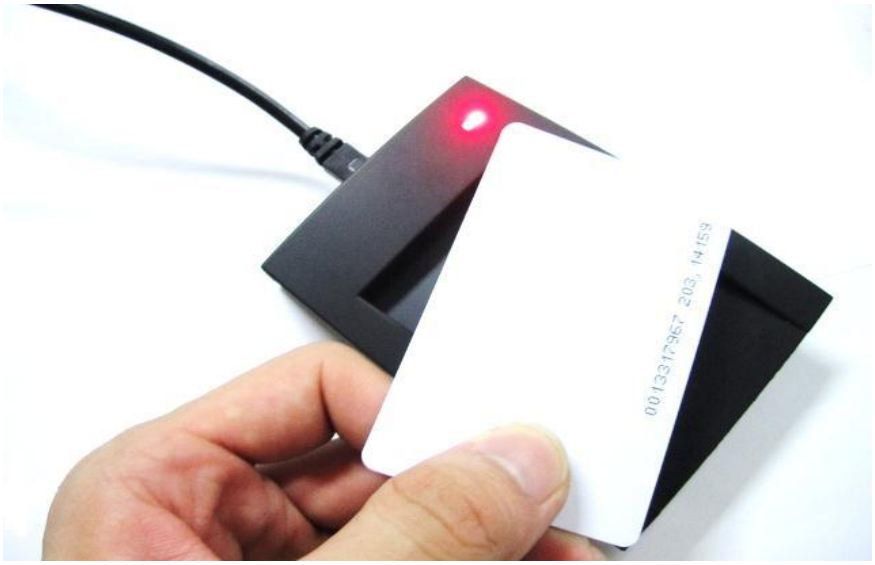

Figure 5: RFID reader and card

1.4 PROJECT SIGNIFICANT

In the modern world today, electronics devices grow very fast. The traditional way of handwriting is tedious and wasting time. The system can provide a better solution to the customers as well to the organizations. The benefit to the customer is that they did not have to write all the details every time they need to apply for a service. It is a simple and smart way yet effective just to bring out their registration card or RFID card as shown at Figure 6 to the officer and all of the details needed is ready.

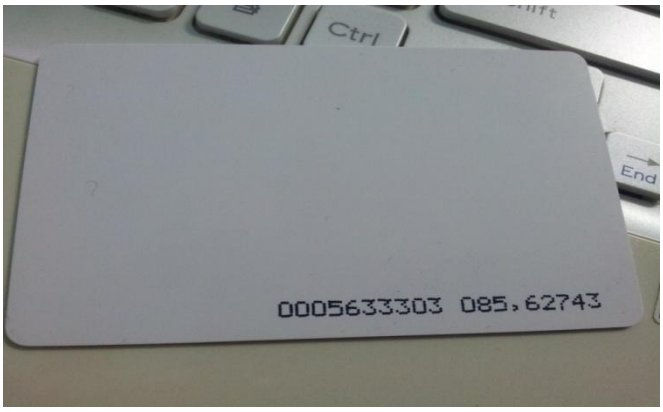

Figure 6: RFID card

As for the organization either public or private sectors, they can improve their quality of service and productivity. Imagine that an officer at the registration counter can finish registering a customer in less than five minutes. It is not only easy, it is much effective to use and consume less time than the traditional handwriting method. Once the officer received the RFID card from the customer, they can just simply swap the RFID card into the RFID reader likes as shown at figure 5 and all the information needed is already there. In fact, this brings good feedback to the customers the process is easier than existing practices.

Besides that, the proposed system can be very useful for senior, disable and less-literate citizens. The reason is because elder person sometimes have health issues that can cause difficulties for them to write on the application form. Using the

proposed system, it is easier for these citizens to apply or register for a service. This productive practice also brings to better service quality of the organization. Therefore, the proposed system is very convenient for this category of people and would make their life much simpler and easier [2].

1.5 THESIS ORGANIZATION

This thesis comprises five chapters: Introduction, Literature Review, Methodology, Result and Analysis, and Conclusion and Recommendations. Introduction has been provided in this chapter whereby it serves as the background for understanding the project described in this thesis. Chapter 2 reviews the theory on xx and existing work related to the project. Chapter 3 discusses the methodology that was followed during the course of this project. Experimental results and analysis is presented in Chapter 4. Finally, this thesis ends with Chapter 5 that concludes the project followed by a number of recommendations for future research.

CHAPTER II

LITERATURE REVIEW

2.0 INTRODUCTION

This chapter describes the theoretical information leading to the development of the project. The chapter begins with the description of paper-based application form. Then, it explains the theory of RFID reader and RFID card. Next, this chapter explains about the Visual Basic that is used to develop the software part. Thereafter, this chapter describes the operation of the RFID reader followed by the fundamental of RFID. After that, it explains about the development of the graphical user interface (GUI) by using the Visual Basic 10. At the end of the chapter, a summary is provided.

2.1 PAPER-BASED APPLICATION FORM

Forms are made up one or more fields that allow users to fill up their information. The application form is used in almost any process of requesting, applying or registering something. For example, when applying a new job, participant or candidates need to fill up an application form. Another example is when a person decided to open a bank account, they need to fill up an application form for the bank references. It can be seen that application form is used worldwide.

Figure 7: Example of paper based application form

A form is basically a piece of paper that requires users to write down required information for further references. Usually a form has the section of basic information and other section requires other data from the user. There are many types and format of the application form which can be designed according to the organization needs of information. Paper-based application form is being used by man ever since the paper was invented. Paper based application form offers superior portability, readability, availability, and ease of use [2].

2.2 RADIO FRECUENCY IDENTIFICATION

Radio frequency identification (RFID) is a generic term that is used to describe a system that transmits the identity (in the form of a unique serial number) of an object or person wirelessly, using radio waves. It's grouped under the broad category of automatic identification technologies.

Auto-ID technologies include bar codes, optical character readers and some biometric technologies, such as retinal scans. The auto-ID technologies have been used to reduce the amount of time and labor needed to input data manually and to improve data accuracy.