

EFFECTIVENESS OF ATTENDANCE SYSTEM USING RADIO FREQUENCY IDENTIFICATION (RFID) WITH “DRIVE THRU” TECHNIQUE

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UNIVERSITI PENDIDIKAN SULTAN IDRIS
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STUDENT'S DECLARATION

I, Nurul Husna Binti Abdul Kahar, D20141068012, Faculty of Art, Computing and Creative Industry hereby declare that the thesis for Bachelor of Education (Computer Aided Design Technology) with Honors titled **Effectiveness of Attendance System Using Radio Frequency Identification (RFID) With “Drive Thru” Technique** is my original work. I have not plagiarized from any other scholar's work and any sources that contains copyright had been cited properly for the permitted meanings. Any quotations, excerpt, reference or re-publication from or any works that has copyright had been clearly and well cited.

Signature of the student





SUPERVISOR'S DECLARATION

I, Dr. Abu Bakar Bin Ibrahim hereby certify that the work titled **Effectiveness of Attendance System Using Radio Frequency Identification (RFID) With “Drive Thru” Technique** was prepared by the named student and was submitted as fulfillment for the conferment of Bachelor of Education (Computer Aided Design Technology) with Honors, and the aforementioned work to the best of my knowledge, is the said students' work.



Date

Signature of the supervisor





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ABSTRACT

The current state of Radio Frequency Identification (RFID) have been expanding in the terms of implementations of controlling the information and material flow. It is one of numerous technologies grouped under Automatic Identification such as bar code, magnetic inks, optical character recognition, voice recognition, touch memory, smart cards, and biometrics. RFID become an important feature due to its capability to track objects under unique identification. Thus, one possible approach with project of **Effectiveness of Attendance System Using Radio Frequency Identification (RFID) With “Drive Thru” Technique** outline the possibility that can be used to significantly improve the efficiency of staffs’ UPSI attendance. The intent of this project is to improve old attendance system and capable to eliminate time waste during manual collection of attendance. The RFID reader is located at security guard main gate of Kampus Sultan Abdul Jalil Shah (KSAJS) where’s the staff will pass through the gate in their vehicles to scan identification card (ID) tag for the attendance. Then, the information is process by MPLAB and PICKIT2 before display the receive data on LCD and output shown on PC/Laptop. The attendance system can be read several centimeters away during “drive-thru” at security guard which is low cost project method and flexible. The result reveal that if the ID card is unregistered, it cannot access the attendance of the staff. About 70% of respondents agree with this project based on questionnaire distribution. As a conclusion, the “drive-thru” indicate staff to arrive punctually and capable to eliminate time waste.





ABSTRAK

Keadaan semasa Pengenalan Frekuensi Radio (RFID) telah berkembang dari segi pelaksanaan mengawal maklumat dan bahan. Ia adalah salah satu daripada teknologi yang terkumpul di bawah Pengenalan Automatik seperti kod bar, dakwat magnet, pengecaman optik, pengecaman suara, memori sentuhan, kad pintar, dan biometrik. RFID menjadi satu ciri penting kerana keupayaannya untuk mengesan objek di bawah pengenalan yang unik. Oleh itu, satu pendekatan melalui **Effectiveness of Attendance System Using Radio Frequency Identification (RFID) With "Drive Thru" Technique** menggariskan kemungkinan yang boleh digunakan dalam meningkatkan kecekapan kehadiran kakitangan UPSI. Tujuan projek ini adalah untuk meningkatkan sistem kehadiran lama dan mampu untuk menghapuskan pembaziran masa semasa pengumpulan manual kehadiran. Pembaca RFID terletak di pintu utama pengawal keselamatan Kampus Sultan Abdul Jalil Shah (KSAJS) di manakah kakitangan akan melalui pintu gerbang melalui kenderaan mereka untuk mengimbas (ID) tag kad pengenalan untuk kehadiran. Kemudian, maklumat itu akan diproses oleh MPLAB dan PIC2KIT sebelum dipaparkan LCD dan *output* yang ditunjukkan pada PC/Laptop. Sistem kehadiran boleh membaca beberapa sentimeter semasa "*drive-thru*" di pondok pengawal keselamatan yang merupakan kaedah projek kos rendah dan fleksibel. Hasilnya mendedahkan bahawa jika kad ID salah atau tidak didaftarkan, iainya tidak dapat mengakses kehadiran staf. Sekitar 70% responden bersetuju dengan projek ini berdasarkan pengagihan soal selidik. Kesimpulannya, "Drive Thru" menunjukkan kakitangan tiba tepat pada masanya dan mampu menjimatkan masa.





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LIST OF ABBREVIATION

ICSP	In Circuit Serial Programming
RFID	Radio Frequency Identification
UPSI	Universiti Pendidikan Sultan Idris
PIC	Peripheral Interface Control





CHAPTER 1

INTRODUCTION



1.1 Overview

Radio Frequency Identification (RFID) play a big role in people daily lives. Various applications of RFID including transportation and logistics, manufacturing and processing, security, animal tagging, waste management, time and attendance, road toll management and etc. The aim of this research is to improve old attendance system that capable to eliminate time waste during manual collected attendance by create “drive-thru” attendance system. This model can be given an access badge with radio frequency identification (RFID) chip in it as its use technique of electromagnetic fields to exchange data from a tag (like a smart tag) to an object (a reader) at the post guard for the purpose of identification





or tracking. Development in RFID technology widely increasing in adopting new and many features.

This thesis consists of six chapter. The first chapter provides an overview of the research, including its background, aims, specific research questions and hypotheses. The second chapter is the literature review of recent study on “drive-thru” attendance system using RFID. The third chapter present the methodology and the research design of this study. Chapter four shows a design, development and the using of RFID. Chapter five shows the analysis and the last chapter is the conclusion, which would summarizes all proposition made throughout the research and explains overall contribution and limitation of this research.



1.2 Research Background

Today's, lots of colleges, schools, and universities have a problem to handle large number of students and staffs especially to get their attendances. Manually, the attendance are given whenever the lecturer comes to class and pass it around for the students to tick. This manual process shows a flaws since the students can cheat and lecturer had to enter the attendance into database for record. Zatil Singhal (2012), describes the conventional method of taking attendance by calling names or signing on paper is very time consuming and insecure, hence inefficient. Krenare R. Pireva (2013) tells that counting students' absence, teachers lose couple of minutes of their classes to fill in the attendance sheet manually by calling the students for signing the documents and the worst just come after classes where there





should be spent extra time for inserting the attendance data in a computer to generate the statistics and send them per email to each student and of course to the administrator and lecturer in total. Meanwhile, the staff has to queue up for a long time to punch card and put it in the slot provided according to their name which shows that both system are slow in performance and not efficient express Mr.Tushar T. Tanpure¹ et. al (2013). This would cause a big problem.

Sequel to these, Arulogun O.T (2012) states that lecturers and administration in most developing countries have had to come up with ways to ensure a healthy participations from students and make sure that the students-lecturer interactive relationship is kept intact. However these strategies' are time consuming, stressful and laborious because the valuable lecture time have been used for student attendance taking and sometimes not accurate express Olatunbosun (2012). Besides that, Nurbek Saparkhojayev (2012) support the issue that universities lecturer and institution are considerable disadvantages when it comes to taking attendance since friends of absent students may write down their names and surname. This is really posing a great challenge in academic setting as the attendance is an important part of students' and staff academic record since in some institutions without a certain percentage students cannot sit for an examination tells Barroon Ismaeel Ahmad (2014). These are some of the challenges that call for an improvement as technology has advanced to provide more convenient ways in monitoring the students and staffs.

In this study we implement the Radio Frequency Identification (RFID) technology as one of figures development focuses on staffs of Universiti Pendidikan Sultan Idris (UPSI) as this university have two main campus which is Kampus Sultan Azlan Shah





(KSAS) and Kampus Sultan Abdul Jalil Shah (KSAJS) a niche in educational leadership that lead to the global change. The main purpose of this research is to develop a “drive-thru” attendance system for staff UPSI by using Radio Frequency Identification (RFID). The staffs are having difficulties to punch their card as a sign of attendances due to the long distance between two main campuses which is 7.5km from each other’s as the staffs might have a lecture at one of the campus. Besides that, the flow of the traffics affect the time of the staffs to arrive punctually for the attendances due to the amount of vehicles on the road such as cars, buses and lorries’ been using the same routes to their respective journey during peak hour for 8am lecture. The using of RFID in attendance system for staffs UPSI can improve the existing system that capable to eliminate time waste. This statement is supported by Fakolujo O. (2012) that RFID is an automated identification and data collection technology, that ensure more accurate and timely data entry and quickly gained more attentions due to current low cost and advances that open up more application area.

On the other hands, Ankita Agrawal (2013) mentions that RFID systems have been widely used in many different application areas such as; product tracking through manufacturing and assembly, control of inventory, parking lot access and control, container tracking, ID badges and access control, equipment tracking in hospital and etc. which researcher find it is suitable to be use for taking attendances of staffs UPSI. It is one way to improve efficiency as researcher found out the parking problem on Kampus Sultan Abdul Jalil Shah (KSAJS) that is limited for the staffs. If there are any program being held on E-learning building the staffs found out the difficulties to find the parking lots and it’s stressing them to punch card for the attendances. Thus, manual attendance system are very time consuming supported by Priyanka A. Sathe (2014).





As a conclusion, RFID system play a big roles for the staffs UPSI due to its performance with best user interface and improve old attendance and monitoring system for better results. Question problem is how development of “drive-thru” attendance system outline that Radio Frequency Identification (RFID) can be applied for this research?

1.3 Problem Statement

Day by day, technology play a big roles in our life that give a better performance and improving current traditional ways by integrated the monitoring of attendance system in the institutions, colleges and universities. The disadvantages has become a difficult challenge for the staff of Universiti Pendidikan Sultan Idris (UPSI) managing their attendance as UPSI have two main campus which is Kampus Sultan Abdul Jalil Shah (KSAJS) and Kampus Sultan Azlan Shah (KSAS) and the distance between two campuses is 7.5km. The unpunctuality that show toward the attendance would resulting bad quality reputation of the staff UPSI. Attendance is defined as the act of being present (at meetings or events), the frequency with which a person is present or the number of people that are present (Zainirah, 2014). Thus, the use of Radio Frequency Identification (RFID) technology would bring efficiency and improving effectiveness of attendance staff UPSI.

This research aim of “drive-thru” attendance system by using RFID is to improve old attendance system that capable to eliminate time waste compare manually collected attendance. It supported by Z.K Adeyemo (2014), that this system helps in recording the attendance of people easily within fraction of seconds. As a solid foundation in this issue





we will use Radio Frequency Identification (RFID) technology that deploys tags that emit radio signals and devices called readers that pick up an information or respond from the signal to improve the process. There are two main components involve in RFID system which are tags and RFID reader that work fast as it would be put at the security guard from both campus for faster action from the staff of their attendance.

Due to the advantages and disadvantages stated, researcher would proposed method that able to solve the attendance problem focusing on staffs of Universiti Pendidikan Sultan Idris (UPSI) and questionnaire would be distributed to the staffs to show to the researcher from their respondent respective view about the “drive-thru” attendance system by using RFID.



1.4 Research Objectives

The study is conducted based on the following objectives:

1. To identify the Radio Frequency Identification (RFID) affected faster access of attendance for staff Universiti Pendidikan Sultan Idris (UPSI).
2. To develop a “drive-thru” attendance system that integrated with RFID to capture and record the attendance of the staff Universiti Pendidikan Sultan Idris (UPSI).
3. To analyses the “drive-thru” attendance system are the best user interface affected the performance of staff Universiti Pendidikan Sultan Idris (UPSI).





1.5 Research Questions

Based on the above objectives, the following are the questions posed:

1. Where the “drive-thru” attendance system will be put?
2. Why research designing the attendance system for staff Universiti Pendidikan Sultan Idris (UPSI)?
3. How you outline that the Radio Frequency Identification (RFID) can be used for this system?

1.6 Research Scope



The scope of this study focused on staffs Universiti Pendidikan Sultan Idris (UPSI) perceptions of the “drive-thru” attendance system by using Radio Frequency Identification (RFID). This study was conducted to improve old attendance system that capable to eliminate time waste during manual collected attendance. Based on the populations of staff UPSI, study have made at random against the respondents that are 30 staffs various departments such as Faculty of Languages and Communication, Faculty of Science and Mathematics, Faculty of Education and Human Development, Faculty of Economic and Management, Faculty of Human Sciences, Faculty of Music and Performing Arts, Faculty of Arts, Computing and Creative Industry, Faculty of Sports Science and Coaching, and Faculty of Technical Educational and Vocational. The number of staffs involved is a total of 30 people.





However, the differences in terms of gender, age and department represented are taken for the records. The respondents who participated in the study have the abilities to read and understand English very well. Time for conducting this study is limited because the period of completing this study have been set because there are only a university here so the study does not represent all staffs from others institution.

1.7 Research Interests

The results of this study are important as a reference because it can contribute in the field of study as using technology integrated from Radio Frequency Identification (RFID) system significantly can improve current manual process of attendance tracking and recording system especially in a university. The system promotes effectiveness for the performance result of attendance of staff Universiti Pendidikan Sultan Idris (UPSI) besides save time and errorless.

As the staff from their respective vehicles such as cars and motorcycles' would flash their card to the RFID reader at the security guard which research apply the same concept as smart tag for tolls that save time with less risk of data loss. This may enhance the quality time to manage as the staff do not need to find the parking first for punch card either at Kampus Sultan Azlan Shah (KSAS) or Kampus Sultan Abdul Jalil Shah (KSAJS) that are limited. The development system can be improve and upgraded in the future with extending a new features or offer further enhancement such as long range contactless access control system to monitor staff attendance record.





1.8 Operational Definition

1.8.1 “Drive thru”

According to Hoskisson & Michael A.H (2013), “drive-thru” or drive through is a type of service provided by a business company that allows customers to purchase product without leaving their cars. “Drive-thru” is essential in facilitating of university or institution to improve flow of performance and reduce time waste.

1.8.2 Attendance System



Attendance is the act or fact of attending something or someone based on dictionary of Merriam Webster. Meanwhile, system is an organized set off doctrines, ideas or principles usually intended to explain the arrangement or working of a systematic whole. Thus, attendance system is a system that provide the easiest way to the institution or universities to assist the staffs and students with time-consuming process. It is the most common use system to track their students and staff attendance and save the record for further used that have been upgraded from manually punch card and sign in sheets during lecturer.





1.8.3 Universiti Pendidikan Sultan Idris (UPSI)

Universiti Pendidikan Sultan Idris (UPSI) was established on May 1, 1997 under the Universiti Pendidikan Sultan Idris (Incorporation) Order 1997 and Universiti Pendidikan Sultan Idris (Campus) 1997 through the Government Gazette P.U (A) 132 & 133 dated February 24, 1997.

UPSI in Tanjung Malim, Perak Darul Ridzuan. UPSI has two campuses Campus Sultan Abdul Jalil Shah (KSAJS) and Campus Sultan Azlan Shah (SAH) is incomparable in educational leadership based glorious history and lead the global change.

UPSI is committed to bring about a change in education through the dissemination of knowledge through teaching and learning, research, publishing, consulting and community service in the context of the development of talent within the country and internationally.



1.8.4 RFID

Zatil Singhal (2012) state that RFID means Radio Frequency Identification that is a wireless identification techniques which becomes popular that being used for the identification of physical objects like products, humans and etc. by the use of radio frequency. It has been use as it is advantageous, safe, secure and easy compare other conventional technique used. It is much faster and have two components such as RFID tad and RFID reader.





1.9 Conclusion

In a conclusion, this chapter has been discussing in general the research of “Drive Thru” attendance system for staff Universiti Pendidikan Syltan Idris (UPSI) by using radio frequency identification (RFID) conducted includes research background, problem statement, research objectives, research questions, research scope, research interest and operational definition that being used.

