

# The Secure Authentication System using RFID System for Institute of Higher Education: Towards Management Perception



Zirawani Baharum, Siti Farah Raziman, Fauziah Abdul Rahman, Nahdatul Akma Ahmad

**Abstract:** Radio Frequency Identification (RFID) has become more important nowadays. Without it, every activity could not be going smoothly and there is a lot of benefits when RFID is implemented. The researcher comes with a few of issues that are arisen which can give negative impacts towards students and staff of the institute itself. The first issue is lack of security system in the campus. Second, Unrecorded data of people movement in the campus area and the third issue is the non-used of student identification card given. The objective of this study is to determine the perception from the management of the institute about implementing secure authentication system using RFID system and identify the list of features for secure authentication system using RFID. A qualitative analysis is being used to analyze all the data needed in order to complete the study. Method that has been used in this research is through interview transcript and coding. The researcher has interviewed the Head of Information Technology Unit of Politenik Metro Johor Bahru (PMJB) and The Executive of Information Technology of Universiti Kuala Lumpur Malaysian Institute of Information Technology (MIIT) to get their perception about implementing secure authentication system using RFID in the institution. This project is designed to use secure authentication system using RFID in the higher institute. The development process of this research is for knowledge of the publics, organization, students and future researcher related to this study who are directly and indirectly involve in improving security system in their organization or institution. From this study, the researcher is hoping that the security in the institutes of higher education areas can be more tighten to avoid the same issues arisen in the future. Thus, the implementation of RFID system can be considered to improve the safety of the surroundings.

**Index Terms:** RFID; Secure Authentication System; Institute of Higher Education.

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## I. INTRODUCTION

This research is conducted to study the Secure Authentication System using RFID System for Institute of Higher Education: Towards Management Perceptions. The study will be held in 3 Institutes which is in University Kuala Lumpur Malaysian Institute of Information Technology (UniKL MIIT) and Politeknik Metro Johor Bahru (PMJB). An institution is continuously working on upgrading their safety, management productivity, administration and infrastructures to improve their institute performance towards more well-known institution with the best qualifications they have. The technology advancements have been encouraging people to improve the way of communication to operate everything without human intervention.

The Radio Frequency Identification (RFID) system has been introduced and implemented into some of the advanced technologies in the various industry to ensure that the data collection are fully protected and confidential. Thus, this RFID system becomes a very important authentication system nowadays [1,2]. This technology is able to overcome the problem of the lack of security in the institution. In another side, the system has an overview that Identification Card (ID) which are using RFID System has a various function. RFID is a promising technology that using radio waves to identify objects [3]. An electromagnetic wave is used by the RFID to exchange the identifying data responded by a transponder.

RFID comprises of the tag (transponder), antenna, and reader and computer host as its main components. The basic of the tag is consist of a small chip and certain amount of storage capabilities The proposed systems use 'cryptographic' techniques to introduce a link of secure communication to get the personal authentication which is this technique is storing and transmitting data in a particular form. It is related to the cryptology and cryptanalysis that concern with these four objectives, which are;

- Confidential,
- Integrity,
- Non-repudiation,
- Authentication.

There are some benefits by implementing RFID in a real world especially in the institute and industrial sector which includes reducing time on manual key-in data in the computer or notes also able to get personal information identification of the tag's owner.



It also able to reduce the misidentification issues order avoid outsiders easily enter or exit the campus area.

Other than that, the internal factors of cost-benefits can be stabilized by implementing this Secure Authentication System using RFID System which can cut the cost of using more electricity for key-in the data [4,5]. The study is researching on the security systems which is to authenticate people movement within the campus area and get the data from management perception. By the research proposed of this secure authentication system using RFID will increase the management intended to improve the security and privacy authentication protocol in the institute of higher education.

## **II. RELATED WORKS**

A literature review discusses published information in a specific subject area within a particular time period. In a literature review, the researchers are going depth into the project research which all the evidence had been issued to support and strengthen the facts given by the researchers. This chapter has covered the existing studies, previous studies, and theoretical framework. It can be justified as a simple summary of the sources, but it usually has an organizational design and combines both of the summaries.

### **A. Radio Frequency Identification (RFID) System**

Radio Frequency Identification system is an important thing to do the tracking process. It has a very limited storage that can be store the security protocol because of the only selected data is necessary to fill up in RFID storage [6-8]. RFID is also known as a system which needs a physical contact with the object to make it connected to the computer host for updated data and has a stronghold of the secure identification of the individuals.

In logistics, it commonly used in Supply Chain activities where is controlled by the Supply Chain Management (SCM). Meanwhile in the aerospace workplace also have logistics activities and most of them are using RFID as part of their everyday lives by touching things like e-passport, electronic items, touch-in and touch-out attendance, and many more. Manufacturing also using this kind of RFID to ensure that their works are running smoothly and more easily [9].

### **B. Information Security**

Totally known, the security is very important these days as the internet recognized as the global network that create an important commodity in human life[10-14]. Parallely, most of the organizational activities are the hinge on the web-based technologies.

Thus, the network security very important especially when it related to private information with high security. The information security is still rounding on controversial issues for both of the users and organizations. Regarding this information security towards student safety [15], argue that Information Security Awareness Training (ISAT) should be held to motivate students on issues related to information security to tighten their self-detailed information. The training also can increase the understanding of students' information security awareness level.

Otherwise, the training also can be held for the higher management in order to control the security awareness within towards students and campus area.

### **C. Secure Authentication System**

A secure Authentication has developed that play a role to enables an efficient monitoring and verification of user entry. A wireless connection is enabled through the use of WI-FI modules in a combination of a PI computer system. Plus, the camera will be used to capture images of the user as and when the system accessed [16-19].

Secure Authentication System is a system for authenticating the identity of the user as a part of the transaction between client device and service provider that conclude unique identifier in order to make the system comprises one or more personal identification upon initial identification of user's identity [20-22].

### **D. Identification (ID) Card**

A student identification card is a piece of card that contained the details of students' information such as name, ID number, school/university details, and a picture of the ID user. The ID card is also known as metric card and smart card at a certain university that provides a lot of benefit to the student itself. For example, which some of the cards have their benefits to the student that can be made as a bonus, discount, or rapid card. It is up to the institute itself either they want to take the benefits or not.

In perspective in the website of Great Schools Partnership [23,24] explained that the unique number or code are assigned to students enrolled in public schools that allow state education agencies, schools, collegiate institutions, and others to track, monitor, organize, and transfer student records more reliably and efficiently. It randomly generated series of numbers to the individual students with each of unique number. This makes it easier for the management for getting student personal. information through the system. The unique number used is for privacy-related reasons and social security number in case of something happen in future, the data has been recorded.

## **III. METHODOLOGY**

A qualitative method will be used by the researcher by undergoing the interview to the respondents which are from the management of the Institute chosen. In this project, the researcher has come out with the idea to get information from the management perception to achieve the researcher's objective. Fig 1 shows the research methodology flow as a summarization of the researcher's study.

The method of coding itself can help the researcher to identify how these challenges intersect and may produce new codes for a new research questions and also bring a new understanding of the meaning of the data. Coding is one of the ways to enable the researcher to make new connections between the interviewee in order to get the information about the issues arisen. The structure of the coding is as follow:



$T \times P \times L_n$

Where: T = Module

P = Page

$L_n$  = Line

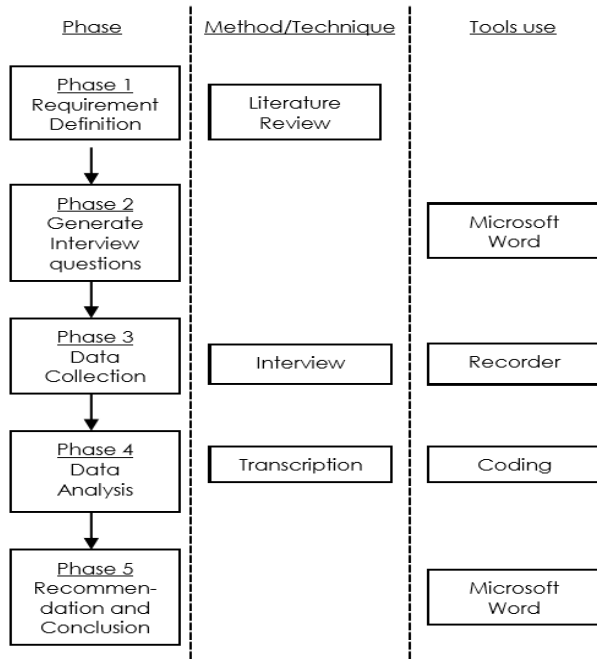


Fig. 1 The Research Methodology

#### IV. FINDINGS AND DISCUSSION

##### A. Hypothesis Setting

A hypothesis is used for this study. The function is to determine and prove the features of RFID and secure authentication system in ID card system throughout the students and staff of the Institute of higher education towards management perceptions. In order to get positive results, hypothesis analysis is applied as below;

**Ho (Null):** What are the perception from the management in the Institute of higher education about implementing secure authentication system using RFID?

**H1:** The better security system used in the institute, the more safely the staff and students in the institution area.

Based on the hypothesis, the security system is much needed in the institution in order to protect students and staffs from harm or dangerous situation. Besides, with the better security system with RFID is most suggested to protect a person as well as their personal information. A confidential information can only be accessed by an authorized person that is responsible for taking care of the information of ID's owner. Furthermore, to get the hypothesis to prove the features had in the institutes chosen that able to implement in Unikl is stated in H2 as below;

**Ho (Null):** What are the features for Secure Authentication System using RFID for Institute of Higher Education?

**H2:** The more features included in the ID card using RFID, the more benefits get by the owner of the ID card.

According to hypothesis 2, ID card can be used in a various way of features which is, ID card is able to accommodate more features in one. It is not only used for touch-in and touch-out system, but able to use as daily routine must have things. Since nowadays are conquered by the cashless system. The more features implemented in the ID card that using RFID, the more benefits that user's get.

##### B. Research Findings

**Objective 1:** To determine the perceptions from the management of the Institute of higher education about implementing the secure authentication system using the RFID system.

**Finding 1:** The perception from The Management in Institute of Higher Education about implementing secure authentication system using RFID For this objective, the researcher wants to identify the perception from the management in the Institute of higher education about implementing secure authentication system using RFID at PMJB and UniKL MIIT campus area. In order to get actual information about implementing the systems, the researcher has conduct interview session with the top management in the department of information technology for both institutions who are well aware of the secure authentication system and RFID system in the chosen institution.

From the data collection that the researcher manages to gather the factors of implementing secure authentication system using RFID applied in PMJB and UniKL MIIT does not give an effect towards the problem statement of this research. From the results of the interviews, the system must be applied to the students and staffs of the institute in order to keep them in a safe area. The implementation is very important to avoid harm or any dangerous incident that could happen at any time. Without an advanced security system especially in ID credential system such as secure authentication system using RFID anyone might be pleased to enter the institution without knowing their identities.

Moreover, since the card technology nowadays is using the cashless system also encourage the institution to have their own card system that provides user to access any relevant application and services using the ID card provided. In an example for the ID card provided by IT unit of UniKL MIIT, it not only can access the classroom doors but it also can be used as a "Touch n Go" system.

**Objective 2:** To identify the list of features for secure authentication system using RFID system.

**Finding 2:** The second objective of this study is focus on the list of features for secure authentication system using RFID. The research question of this objective are asked about "what are the features for secure authentication system using RFID for institute of higher education. The finding for the first objective in this study is required to achieve this objective. From the interview conducted, the list of features listed by using secure authentication system in the institutes chosen as in PMJB the ID card is used by the staff for touch-in and touch-out features meanwhile as for student,



there is no feature are used by them unless for the proof of the students of PMJB. The student is still using manual information detected. Besides, the features provide in students ID card in UniKLMIIT is to access the classroom and attendance.

In addition, the newest feature implemented by IT unit of UniKL MIIT is the students and staffs can use their ID card as “Touch n Go” system as once encourage student not to carry more cash in order to avoid the dangerous incident such as theft and others. Thus, with the features implemented being able to maintain identity, it can also safeguard the security of the ID card owner.

## V. CONCLUSIONS

All the findings have a purpose to achieve the goals of this study. The limitation of the study also will be explained in this chapter whereas the section will explain about the constraint and limitation during undergoing this research study. The researcher also will include the recommendations by referring to all the findings and data that had been collected throughout executing the study. Besides, the recommendations for the future research also will be provided in the part of this research and the idea is come up the researcher itself.

The main focus of the study is to collect perceptions from the management of Institutes of Higher Education in order to get the features of using secure authentication system using RFID in the institute chosen. The benchmark in Johor Bahru (JB) and Kuala Lumpur (KL) had been chosen by the researcher to collect the data information for completing the study. The institution chosen in JB is PMJB while in KL is UNIKL MIIT. The research conducted in both institution because to ensure that the Institute chosen are currently using ID card with an implemented RFID or not. Meanwhile, the researcher can get the information and data of benefits and features of using RFID in certain institutes.

The study is also wanted to prove that either the institution are really taking a responsibility towards the security of students and staff ID credential in order to protect their privacy in the Institute area. Along with that, the interview session also important to this study to collect additional information such as to know the advantages of implementing the system and technology in the Institute of higher education area at once identifying the recommendations that the researcher can provide in this study. This study is to enlighten the perceptions from the top management of the institute about implementing secure authentication system using RFID in the institute of higher education itself. Besides, this study focus on the function ID card that owned by the students and staffs whether it is functional in the institute or not. Thus, this study was held to get to know the features of implementing the systems either it can give benefits to the students and staffs.

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