ADOPTION FACTORS OF INNOVATION DATABASE SYSTEM IN STUDENTS MATRIC CARD TO ENHANCE THE UTILITY IN UNIVERSITIES

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DECLARATION

“I hereby declare that this project paper is the result of my own and independent work except the summary and experts that have been specifically acknowledgement”

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DEDICATION

This paper is dedicated to both my father and mother who always motivate me in completing this research. They always give me support and advice to me in order to fulfill the requirement of the research. Without their support and motivation, it will be impossible for me to complete the research.

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ABSTRACT

Database innovation is a new development that is crucial for providing a big data collection that can be used for other application. The steps towards database innovation requires creativity and willingness. Furthermore, database innovation is very important especially for universities to increase the efficiency from the facilities provided. Thus, to encourage the implementation in the students' matric card, a few factors should be analyzed. Basically, this research was conducted in order to analyze the adoption factors towards database system in student matric card. The adoption factors choose were based on three adoption theory that is Technology Acceptance Model (TAM), Theory of Reason Action (TRA) and Diffusion of Innovation. These theories were referred to while developing the adoption factor for service innovation in restaurant. To collect and analyze data, this research is using quantitative data analysis. Questionnaire were distributed as a primary data collection to more than 300 respondents. Result for this research will be analyze using SPSS to test relationship with variable.

ABSTRAK

Inovasi pangkalan data adalah perkembangan baru yang penting untuk menyediakan koleksi data yang besar yang boleh digunakan untuk aplikasi lain. Langkah-langkah ke arah inovasi pangkalan data memerlukan kreativiti dan kesediaan. Selain itu, inovasi pangkalan data sangat penting terutamanya bagi universiti untuk meningkatkan kecekapan dari kemudahan yang disediakan. Oleh itu, untuk menggalakkan pelaksanaan dalam kad matrik pelajar, beberapa faktor perlu dianalisis. Pada dasarnya, kajian ini dijalankan untuk menganalisis faktor penggunaan terhadap sistem pangkalan data dalam kad matrik pelajar. Faktor adopsi dipilih berdasarkan tiga teori adopsi iaitu Model Penerimaan Teknologi (TAM), Teori Tindakan Alasan (TRA) dan Difusi Inovasi. Teori-teori ini dirujuk semasa membangunkan faktor penerimaan untuk inovasi perkhidmatan di restoran. Untuk mengumpul dan menganalisis data, kajian ini menggunakan analisis data kuantitatif. Soal selidik diedarkan sebagai pengumpulan data utama kepada lebih daripada 300 responden. Hasil kajian ini akan dianalisis dengan menggunakan SPSS untuk menguji hubungan dengan variabel.

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CHAPTER 1

INTRODUCTION

This chapter will introduce the adoption factors of innovation database system in students' matric card to enhance the utility in universities. This chapter also will provide all the innovations, research questions and also research objectives for this research.

1.1 BACKGROUND OF STUDY

Towards the new development of technology, there are so many technologies that keeps changing and innovates into something that can helps the society including the development of database system. Database system is widely use in organisation or any private institution and the network is huge and need a constant care to avoid any mispurpose of the technology. In relating the study, the researcher would like to study about the adoption factors of innovation database system in students' matric card to enhance the utility in universities.

In this study also, researcher would like to embedded the new system of database system in matric card as well as to find the factor to adopt this technology. Matric card database is consisting of all the information of the student and many organisations use this but in different term. Mobile computing is also changing the way of communication between teachers and students and can be used effectively to

improve instructional quality. Campus Information System for students is defined as "An interrelated group of information resources, accessible by computer through the campus institutional external and internal web environment, that a university places at the disposal of its users to enable them to consult it and/or provide a selection of significant and relevant data, in the wide context of their university life in its academic, administrative and social senses, in order to improve student's knowledge base" (Cobarsı´ et al., 2008).

1.2 PROBLEM STATEMENT/INNOVATION

University is a learning organisation that have good development which the management are trying hard to give and facility to their student. Recently in UTeM the management had already open up a new hostel to the student in main campus. Also surrounding the campus there are a lot of facility such as the cafe, library, field, and for the web facility UTeM had its own private web that connecting the students with the lecturers which is the Ulearn and for an account web called SMP`s. Hence by implementing the new innovation of the database system in student respective matric card, it can help the student easily reach the facility.

The technology system that can be implement in matric card is the contactless payment system. This technology is widely used in our daily life which is in our debit and credit card. The system is using the pay wave method or in other word student just bring their matric card instead of cash to eat at the café because their matric card already linked to their bank account.

The enhancement of the database system can easily help the student. The usage of matric card before is just use for borrowing the books from the library which is very good system but the researcher wants to make it enhance. For example, if the student went to a library the just scan their matric card and it will give some point as well as they attending the event held in university. Eventually the points will give some benefits to them for example it can redeem as money or a free meal in all café in campus which give a good impression to the student.

1.3 RESEARCH QUESTION

To continue the research related to the factors of adoption of the database system, the study needs to answer the following questions:

I. What are the innovation database system can be embedded in students` matric card?
II. What are the services and facilities suitable for adoption of database system in students` matric card in Universities?
III. What are the students` acceptance factor towards innovation database system in the matric card?

1.4 RESEARCH OBJECTIVE

The research objective of this study:

I. To investigate the innovation database system can be embedded in students` matric card.
II. To study services and facilities suitable for adoption of database system in students` matric card in Universities.
III. To investigate are the students` acceptance factor towards innovation database system in the matric card?

1.5 SCOPE, LIMITATION AND KEY ASSUMPTION

1.5.1 Scope

The researcher focuses on the factors that affect the database system in matric card as the independent variable and the adoption of the technology as the dependent variable. The researcher would like to investigate on the factors that will affect the use of the technology as the database innovation that will concern in the matric card among students. Thus, the questionnaires will be distributed to 250 students in UTeM and may other public universities. Next the researcher would like to investigate what are the database system that can be embedded in matric card that appropriate the facility in UTeM. To generate the result survey will be conducted in Melaka because the location restricted in UTeM which basically around Melaka.

1.5.2 Limitation & Key assumption

The limitation that researcher should face during the study of adoption factors of innovation database system in students' matric card to enhance the utility in universities is the basic knowledge of the respondent during answering the question. It is because the knowledge of the database for example the usage of microchip in normal card and others application of the technology. Second limitation is if the respondent simply answers the questions. The answer of the question must be based on own experience and knowledge. Extra knowledge will also can be consider the third limitation such as the more knowledge about the database for example the student from the faculty of technology of information and communication. It is because they may have more knowledge and the answer provide by the respondent must be justified.

1.6 IMPORTANCE OF THE STUDY

The significance of this study is to analyse the factors that affecting the usage of database system and the main importance is to introduce the new digital system because nowadays the world is striving the digital system in most of the activity. For example, the purchasing of items can be done through online. The researcher seeks the chance the technology and use it in the matric card. If the system can be implement fully in the matric card system, it will gain a few achievements such as the university may gain the publicity among the media and also gain the world recognition. The future research is may to implement the database technology in the primary school or the medium organisation that can applied the technology.

1.7 SUMMARY

This whole chapter introduced the readers about the research objective, research question, scope and limitations and importance of the research. The next chapter will explain more about the literature review and the theory that suitable. The researcher would like to analyse the theory of acceptance model, innovation on diffusion and come out with the suitable theoretical framework for this study.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter presents literature review from different perspective of researcher of previous research and study that are related to the factors that affect the adoption of technology of database system in Students Matric card. The previous study will be used as reference to complete this study. This chapter begin with the definition of the database system, smartcard system, and the usage of the matric card also the limitation and the advantages in which be the main reason researcher choose to develop this study. The information in this chapter are retrieved from secondary data collection which are from book, journal and internet.

2.2 Database system

Most of database system implementation, the technology is embedded to a smart card. According to (Chun Kit Lok,2017), Smart card-based E-payment systems are receiving increasing attention as the number of implementations is witnessed on the rise globally. Understanding of user adoption behaviour of E-payment systems that employ smart card technology becomes a research area that is of particular value and interest to both IS researchers and professionals. However, research interest focuses mostly on why a smart card-based E-payment system results in a failure or how the system could have grown into a success. This signals the fact that researchers have not

had much opportunity to critically review a smart card-based E-payment system that has gained wide support and overcome the hurdle of critical mass adoption. The Octopus in Hong Kong has provided a rare opportunity for investigating smart card-based E-payment system because of its unprecedented success.

2.3 Smart Card System

Smart card based on the definition is literally is a card that the user can do more than one activity with the card. Based on (Costas Lambrinoudakis 1999) these cards contain a few bytes of reusable memory, and often the chip will incorporate some type of hardwired security to protect the card from being tampered with. These show that smart card is not merely a simple card and it is a safe technology where the information of the user is highly secured. But the recent days people are finding the ways or trying to hack the information related to the profile or data of the card user. But as the smart card technology developing the researcher convince that it will be a minor issue. Also, there is a problem related to the smart card usage which expansion of smart cards in the international market is the wide spread of magnetic cards (it is estimated that approximately a billion magnetic cards are currently in circulation all over the world) mostly by the banks. However, the lack of security by magnetic cards in conjunction with the aforementioned smart card advantages, has become the driving force for many organizations around the world to adopt this new ICC technology for many distinct application areas like electronic purse (Fancher, 1997), electronic commerce (Schier, 1998), mobile phones (ETSI), health, network security (Itoi and Honeyman, 1999; McChesney, 1997; Verschuren, 1998), etc. Although it might bring some issue the researcher sure that to implement the technology into the student matric card is possible because the network of the system is not vast and it can be control and well managed.

2.4 Usage of database system of Smart Card in organisation

The application of the smart card is widely use and for closer look, we can see the application of the Mykad. MyKad is a standard, credit-card-sized plastic token with an embedded microchip that stores and accesses information including cardholder's biometric data such as fingerprints (Hiltz, Han, & Briller, 2003). The initial version of MyKad contained a 32 kB EEPROM (Electricity Erasable, Programmable, Read-Only Memory) chip running on the M-COS (MyKad Chip Operating System). In November 2002, the memory capacity was increased to 64 kB to allow more applications to be added into MyKad (Jaring Internet Magazine, 2005). The researcher would like to adopt this application to the Student Matric Card because of to bring up the name of university and enhance the utility provided in the university. Others might saying simply add the student account in the Mykad but from researcher perspective, with the implementation of the technology, the student eventually will nurture a feel of belonging and for long term and will make any kind of activity can be recorded or use the matric card. Second application is the normal ATM card which is a card produce by the bank in order for the consumer to do some transaction such as withdrawal, cash deposit, obtaining the account number, etc. However, the approach of online banking my limit the usage of the ATM card. It has been proved that online banking channel is the cheapest delivery channel for banking products once established (Sathye, 1999; Robinson, 2000; Giglio, 2002). Second, banks have reduced their branch networks and downsized the number of service staff, which have paved the way to self-service channels as quite many customers felt that branch banking took too much time and effort (Karjaluoto et al., 2003). To apply the online database in the matric card may be possible but due to the network is more converge to the UTeM, a simple database system might be work on the Matric card. Third application is the TITO (touch in touch out) which had been implemented in Sekolah Menengah Komplek Gong Badak whereas the combination uses of the identity card and Touch N Go features which use by the teacher to collect the attendance of the student. The system is well monitor by the developer because it has only done using the pilot testing. The objective of the project is to reduce the workload for the teacher and the students embrace the technology very well. Therefore, researcher did recover some of the application of the smart card in our country and the researcher would like to study about the adoption of this technology in the students' matric card.

2.5 Requirement system for Smart Card

One of the requirement system is the RFID technology. Contactless cards use radio frequency identification (RFID) technology to transmit card information to the reader. In most instances, there is no need to sign a receipt, input a personal identification number (PIN) or hand the card to the cashier. This expedites the transaction for both the consumer and business. Contactless cards are also equipped with a magnetic strip so they can still be used in traditional swipe machines. Industries using contactless smart card technology include government and corporate ID cards, transit fare payment cards, passports and visas, and financial payment cards. Leading financial and transit institutions have adopted contactless payment technology to offer customers increased convenience and speed when making purchases. Cards no longer have to leave the consumers hands; they are simply waived in front of a device to complete the transaction. Consumers do not have to bother with change, cash or swiping their card.

RFID is a combination of radio-frequency-based technology and microchip technology. The information contained on microchips in the tags affixed to library materials is read using radio frequency technology regardless of item orientation or alignment (i.e. the technology does not require line-of-sight or a fixed plane to read tags as do traditional theft detection systems) and distance from the item is not a critical factor except in the case of extra-wide exit gates (BookTec Information, 2007).

2.6 Students Matric Card

Every learning institution or any university has their own matric card for student. The purpose of matric card is to determine the matric number of the student and the course related. The usage of the matric card is limited. The matric card is use when the student had an intention to borrow the books from the library and the researcher notice that only the one kind of the application of the matric card does. The adoption of the smart card technology into the matric card helps the student to manage their daily routines which had been explained in previous chapter.

2.7 Types of Innovation of Database System

2.7.1 Contactless Payment

Contactless payment is type of payment that does not require two people to do the transaction. It can be exampled by the payment using the credit and the debit card. Credit cards are a mode of payment that allows a buyer to purchase a product or service immediately even if the buyer does not have the money at hand. The buyer is able to do this because a financial institution has extended credit to him/her. Upon use of the credit card, the buyer is obliged to pay back the amount used in full by a certain time (i.e. grace period) without interest or in smaller payment amounts over time with interest (Thomas Foscht,2009). The concept of the credit card can be use in the matric card because researcher notice that at the end of the semester, most of the student do not have enough money and the they can use the matric credit card to purchase the food from the café and the debt can be settled after the new semester begin. The data was stored and every transaction had been recorded.

Debit cards, on the other hand, are a form of payment that requires that the buyer has the funds (or a line of credit attached to the account) in his/her

account before a purchase transaction is consummated. The chief advantage of using a debit card is that it is a cashless way of paying cash for a product or service. The immediate deduction of the payment amount from the account also ensures that the customer does not spend more than what he/she has in his/her account. However, a service fee may be levied by the financial institution processing the debit transaction. (Thomas Foscht,2009). Researcher would like to combine these two concepts where the debit the student can store any amount of money in the matric card which can use in mini mart at main campus or other stall in universities facility.

2.7.2 SMPs collective point

Student in UTeM must involve themselves in any kind of event held in the university to increase or obtain points known as SMPs. It is differently with the academic pointer where the point is evaluate based on curriculum involvement. The concept is more like the attendance system but the student can swipe the matric card on a devise the database of the student will be upload to the main portal web. Hence it may solve the problem where the student attended to the event but when they checked in the portal, there is no record at all and researcher convince this adoption may solving this problem.