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MASTER OF BUSINESS ADMINISTRATION

User acceptance of RFID technology application in the retail industry

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Abstract

RFID technology as highly praised as the next wave of innovative technology, using RFID technology in the retail industry can help the organization satisfy customer demand, reduce management cost and increase the efficiency of product flows. While most of businesses still do not want to use RFID technology in their organization and the drivers of user acceptance of RFID technology remain unclear because the RFID technology has seldom been tested in the retail industry. This study is to identify the factors which can influence the acceptance of RFID technology in the retail industry.

The quantitative survey was completed by 85 employees in the retail industry in Nilai. The survey included measures of eight main factors of acceptance of RFID technology through literature review: perceived ease of use (PEOU), perceived usefulness (PU), relative advantage (RA), compatibility (CA), complexity (CL), cost saving (CS), organizational context (O) and environmental content (E). Results were obtained through reliability test, validity test and correlation analysis.

Results obtained that perceived ease of use (PEOU), perceived usefulness (PU), relative advantage (RA), compatibility (CA), cost saving (CS) and organizational context (O) has positively influence on acceptance of RFID technology.

Keywords: RFID technology, Acceptance of new technology, Retail industry.

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Xiao Jing

March, 2013

Declaration

"I hereby declare that this research project is of my own effort except for the information that has been used from various authors that have been cited accordingly and ethically."

Xiao Jing

March 2013

Table of Contents

List of Tables

List of Figures

List of Abbreviation

ID	:	Identity
CS	:	Cost saving
CL	:	Complexity
CA	:	Compatibility
RA	:	Relative Advantage
IS	:	Information System
PU	:	Perceived Usefulness
PEOU	:	Perceived Ease of Use
O	:	Organizational Context
E	:	Environmental Content
IT	:	Information Technology
SMS	:	Short Messaging Service
ATU		Attitude of New Technology
DIT	:	Diffusion of Innovation Theory
MMS	:	Multimedia Messaging Service
TAM	:	Technology Acceptance Model
RFID	:	Radio Frequency Identification
SPSS	:	Statistic Package for Social Science
ETP	:	Economic Transformation Program

List of Appendices

Chapter 1: Introduction

1.0 Chapter Introduction

In this chapter, the researcher will provide the readers with the background of this study. Firstly, the background of the study is presented in section 1.1. This is followed by section 1.2 which introduces the RFID technology which includes the RFID technology structure and working principle, the application of RFID technology in the retail industry. Section 1.3 discussed the problem statement, which highlights the problem faced by RFID technology in the retail industry. The research objective, the research problem together with its significance, limitations and scope of the study are presented from Section 1.4 to 1.8. Lastly, section 1.9 presented the outline of the research.

1.1 Background

Rosen (2010) pointed out that Malaysia government is taking economic reforms. The Economic Transformation Program (ETP) is an integrated effort that will change Malaysia into a state with high income by 2020. The program will cause gross national income (GNI) per person of Malaysia to rise from USD6, 700 or RM23, 700 in 2009 to over USD15, 000 or RMB48, 000 in 2020, making the country reaching the level of other high-income ones (Rosen 2010). If the ETP is implemented successfully, Malaysia will witness significant changes in economies that are similar to other developed countries. Malaysia government will go on the transformation towards an economy based on the service sector, and the sector will make contributions increasing from 58 percent to 65 percent in the same period (Rosen 2010; Rackham 2011). Based on the dynamic comparative advantage theory, it pointed out that in the era of knowledge economy with a fierce competition today, conducting in the global scale and allocating the various resources among different development entities around the whole world is significant (Kasahara 2008).

Nowadays, organization's advantages and comparative advantages should consider its competitors as well especially for under this globalization era. For organizations, the impact of the technology innovation has forced them to

consider their advantages again, based on their existing resources and conditions (Ang 2007). Ritchie (2005) pointed out that only a technological innovation can achieve transcendence and generate a competitive advantage. As the developing country—Malaysia, Ritchie (2009) pointed out that a country must hold long-term strategic objectives for industrial development, so that it can occupy a favorable position in the international labor division to support the subsequent growth of the economy.

Lee (2009) pointed out that new technology has been an important means to enable domestic companies to establish contacts with global companies throughout the world. For some companies, using paper documents to plan and control the flow of goods are increasingly being replaced by computer system (Muller-Seitz, Dauzenberg, Creusen & Stromereder 2009). The computer system can help to manage the goods during the goods flow. There are several existing systems which can track goods which include barcode, portal, SMS (Short Messaging Service), MMS (Multimedia Messaging Service) and RFID technology (Nasir, Norman, Fauzi & Azmi 2011). Comparing these five existing systems, Nasir, Norman, Fauzi and Azmi (2011) point out RFID technology is the best tool for organizations to record information to improve the efficiency. In addition, Malaysia Prime Minister Datuk Seri Najib Razak (Anon 2012) points out that Malaysia will focus on the quality of services by using new technology in the next few years.

1.2 RFID Technology

Radio Frequency Identification (RFID) is one of the automated data-collection technologies which can allow equipments to read tags without contact directly (Brown & Russell 2007). Owning to RFID technology's MOST (mobility, organization, systems and technology) characteristics, it has received considerable attention and is considered to be the next wave of the IT revolution (Tzeng, Chen & Pai 2008). This is also a powerful record tool for the retail industry (Hong et al. 2011). Using RFID technology to monitor and track the food product has benefit for businesses. Businesses using RFID technology can improve the performance of the whole supply chain management (Zhang & Li 2012). Tajima (2007) pointed out that using RFID technology in supply chain management may reduce management cost. Chen (2004) pointed out that RFID technology can help businesses maintain its competitive advantage and to achieve profitability in the short or the long term.

1.2.1 RFID Technology Structure and Working Principle

RFID technology consists of three components: tags, reader and communication infrastructure (see Figure 1).

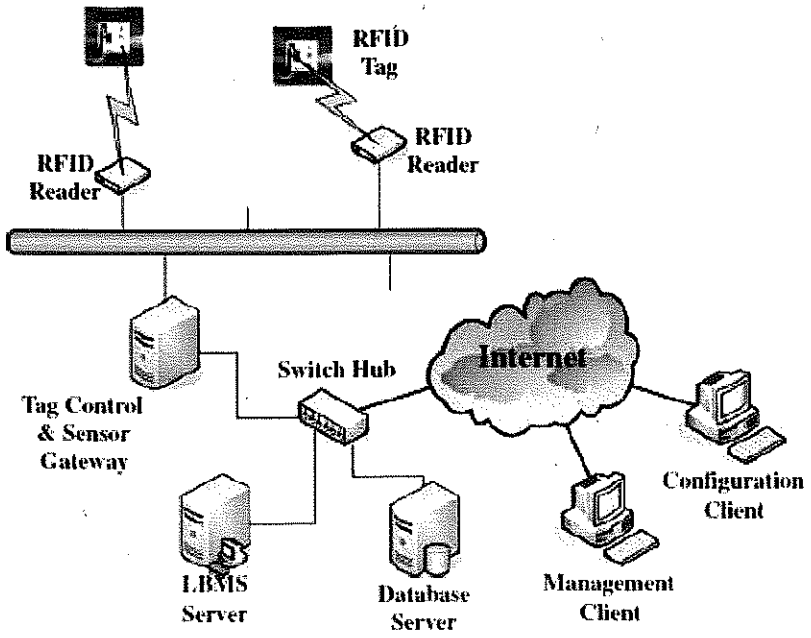

Figure 1: RFID technology overview (Roberts 2006)

a) RFID tag consists of an integrated circuit with memory, which is essentially a microprocessor chip. RFID tags can be active (with batteries) or passive (without batteries). The tag has an identity (ID) that can be broadcast to a reader that is operating on the same frequency and under the same tag protocol. This specific area of research includes tag design and testing, performance analysis, manufacturing processes, materials and process development, and power sources for passive tags (Roberts 2006).

The antennae are the conduits for the communication of data between the tag and the reader. An RFID antenna has a reading range both sideways and in front of the antenna. Antenna design and placement play a significant part in determining the coverage zone, range, and accuracy of communication of a tag, because the antenna both draws energy from the reader's signal to energize the tag and sends the data that are received from the reader (Roberts 2006).

b) An RFID reader is a device that can read data from and write data to compatible RFID tags. The communication between the tag and reader enables the location information of an item to be recorded and transferred to a server through a computer network, thus allowing the movement of the item to be tracked and traced. To ensure the compatibility of the communication, the tag and the reader must work at the same specified working frequency and comply with specific regulations and protocols (Roberts 2006).

c) The communication infrastructure is a collection of wired and wireless network communications that carries out a series of information transfer actions that deliver the data that are stored in a tag to the reader. This category includes articles on the relevant communication criteria and protocols, safeguards, and network connectivity issues (Roberts 2006).

1.2.2 RFID Technology Applications

In today's business environment and with the development of information technology, businesses start to use information technology to plan and control the flow of goods, by using an automated computer system instead of paper documents (Ilie-Zudor, Kemeny & Blommestein 2011). Ilie-Zudor, Kemeny and Blommestein (2011) stated that RFID technology is one of the information technologies, which is rapidly pushed to the marketing in recent years. The advantage of RFID tags is that businesses can store a large number of data by this memory storage device, the data may include price, cost, manufacture date, location and so on (Liao, Lin & Liao 2011). With the advantages of RFID technology it can help companies improve operational efficiency and to gain a competitive advantage to make more profits (Liao, Lin & Liao 2011). Previous studies (Ngai, Moon, Riggins & Yi 2008; Wu, Nystrom, Lin & Yu 2006; Ferrer, Dew & Apte 2010; Liao, Lin & Liao 2011) showed that RFID technology has been successfully applied in many areas.

1.2.3 RFID Technology in the Retail Industry

In order to maintain its competitive advantage and to achieve profitability in short or the long term, the retail industry has seen the potential benefits in the use of RFID technology (Chen 2004). Koh, Kim and Kim (2006) mentioned that with the globalization of the retail industry, it is facing fierce competition which will make supermarkets struggle harder and harder to succeed through better performance. The global RFID market is expected to reach $ 3.0 billion by 2008 with a growth rate of 23% (Chen 2004).

Apart from Wal-Mart in USA, RFID technology is well accepted in retail industry in many countries, such as Germany, Taiwan, and South African. Nevertheless, RFID technology was not used in the retail industry in Malaysia. According to IdTechEx (2006), the retail industry comprised 44% of the global RFID market value of systems including tags by the year 2016. How and Chen (2011) pointed out that organisations want to use RFID technology in the retail industry for its perceived benefits which can help the organisation satisfy customer demand on commodity purchase, reduce management cost and increase the

efficiency of product flows (Hong, Dang, Tsai, Liu, Li & Wang 2011). RFID can provide benefits such as operational efficiency, improved visibility, reduced cost, improved security, improved customer service levels, better information accuracy and increased sales (Lee 2009). In the next few years, RFID technology is expected to replace the barcode technology in the retail industry (Chen 2004).

In the retail industry, the existing shopping model is inconvenient and inefficient (Hou & Chen 2011). An effective shopping service model and technology can assist customer (1) provide customer with food information to help them find the products easily; (2) help retailing analysis customer behaviour based on the recorded data; (3) offer the customized recommendations based on historical shopping lists of the target customer (Hong, Dang, Tsai, Liu, Li & Wang 2011; Hou & Chen 2011; Chen 2004). All these services can be provided by RFID technology which can increase both sales volume and customer satisfaction for supermarkets.

RFID technology has highly praised as the next wave of innovative technology (Tzeng, Chen & Pai 2008), and RFID technology is used in many areas in Malaysia. In 1998, RFID technology was used at the Kuala Lumpur International Airport to identify criminal suspects when try enter Malaysia (Tzeng, Chen & Pai 2008). By establishing the airport passenger tracking and tracking system, Kuala Lumpur International Airport improved the efficiency of the security management (Hou & Chen 2011). In 2006, the Malaysia Road Transportation Department uses RFID technology to identify stolen cars which has been reduced the number of automobile thefts in the country (Nasir, Norman, Fauzi & Azmi 2011). RFID technology is also used for Halal food in Malaysia (Szajna 1996). Nasir, Norman, Fauzi and Azmi (2011) mentioned that RFID has been suggested to be the best validation system in the Halal industry.

RFID technology was accepted in the retail industry in many countries as well, such as German, Taiwan, and South African. Nevertheless, RFID technology was not used in retail industry in Malaysia. It is still not yet widely accepted in practice in the retail industry in Malaysia (Tzeng, Chen & Pai 2008). A large

number of supermarkets know the importance and benefits of RFID technology; they still not want or ready to use it for some reasons. Understanding why supermarkets did not want to use RFID technology can help technology producers improve it and push RFID technology development.

The acceptance and use of information technology has received the attention of researchers and professionals in the different areas (Silva & Dias 2007). A large number of studies have been done to explore the acceptance about RFID technology used in different areas such as manufacturing, warehousing, transportation, retailing and agriculture (Ferrer, Dew & Apte 2010). And in order to identify the user acceptance of RFID technology, many models have been employed to explore the factors such as theTechnology Acceptance Model (TAM) (Wu & Wang 2005, Chuttur 2009), Diffusion of Innovation Theory (DIT) (Brown & Russell 2007; Fazel, Forouharfar & Fazel 2011; Wu &Wang 2005). However, different areas have different factors to affect the user acceptance of RFID technology as well as in different countries.

1.3 Statement of the Problems

Muller-Seitz, Dauzenberg, Creusen and Stromereder (2009) mentioned that RFID technology is assumed to be a key technology for the retail industry. RFID technology has received a great deal of attention over the last few years, Wamba, Lefebvre, Bendavid and Lefebvre (2008) pointed out that RFID technology has been a hot topic since 2003 due to 1) recent key developments in microprocessors, and 2) demands of Wal-Mart, Wal-Mart requires their suppliers adopt and implement RFID technology from the beginning of 2005. Using RFID technology can help organizations reducing the inventory loss through increased inventory accuracy and better control of stock rotation (Wamba, Lefebvre, Bendavid & Lefebvre 2008). Furthermore, RFID technology can improve replenishment productivity through increased asset visibility (Wamba, Lefebvre, Bendavid & Lefebvre 2008). All the evidence shows that it is the trend for the retail industry to implement the RFID technology.

In Nilai, there is no supermarket implement RFID technology in their

organization and the drivers of user acceptance of RFID technology remain unclear because RFID technology has seldom been tested in the retail industry. Hence, there is a need to explore the factors which can influence user acceptance of the RFID technology in the retail industry. With better understanding of these factors, companies can better facilitated employee acceptance of new technology usage in their company which can benefits them in the long term.

Therefore, this study aims to identify the factors that can influence the acceptance of RFID technology in the retail industry in Nilai.

1.4 Research Questions

In responding to the problem statement, the research is to explore the factors which can influence the acceptance of RFID technology in the retail industry. Hence this research is guided by the following research questions:

i. What are factors influencing the user acceptance of RFID technology in the retail industry?

ii. What is the most important predictor of the user acceptance of RFID technology in the retail industry?

iii. How can company improve the acceptance of RFID technology in the retail industry?

1.5 Research Objectives

This research is to identify the factors which can influence the user acceptance of RFID technology; hence, there are three main objectives:

i. To identify the factors influence the acceptance of RFID technology in the retail industry.

ii. To determine the most important predictor of the acceptance of RFID technology in the retail industry.

iii. To recommend the solutions for further improving the acceptance of RFID technology in the retail industry.

1.6 Significance of Study

In this article, the researcher introduces the development of RFID technology in the retail industry; it also explores the factors which have a strong influence on RFID technology accepted in the retail industry. By identifying the factors which can influence user accept RFID technology in their organization have several significances.

Firstly for businesses, the development of science and technology accelerated the development of retail process which can enhance work efficiency. RFID technology is the trend in the retail industry; this research helps business understand the benefits of using RFID technology in their organization. Using RFID technology can reduce the operations costs and control inventory efficiency as well as increase competitive advantages. On the other hand, Walmart as the largest retail chain enterprise in the world, it has already used RFID technology in 1993, hence, for the Malaysia retail industry, it is necessary to use RFID technology to compete with other enterprise.

Secondly, for government, it is important to promote the application of RFID in the retail industry to make improvement on the quality of service. Encouraging company developing and using new technology can help the government

implement the Economic Transformation Program (ETP) successfully and can expand overseas investment. With the development of new technology, it can accelerate the transformation of Malaysia at a developed country.

Lastly, for customer, with the improving living standard, customers have strong purchasing power, enjoying good shopping experience is more important than buying their goods. RFID technology as the high technology it can raise the quality of service in the retail industry to provide a pleasant shopping experience to them.

1.7 Limitations of Study

There are some limitations of this study for some reasons:

Time restriction, this thesis was completed in three months (from January to March, 2013). In this short time, the researcher cannot cover all the details about RFID technology acceptance in the retail industry and test all the factors which have been done. While the researcher has tried her best to cover all the significant parts about RFID technology and the main factors which can influence user acceptance of RFID technology.

Only 85 employees working in the retail industry in Nilai were used to fill out the questionnaire. This sample cannot represent the whole population of the industry. Some of the employees fill out the questionnaire sincerely while some of them do not care about it and some of them refuse to answer the survey question. The researcher's assumption is that all of the responders know and answer the questions sincerely.

There are 13 states in Malaysia and Negeri Sembilan is just the one of the states, therefore the collecting of data in Nilai in Negeri Sembilan only cannot represent the whole Malaysian attitude regarding RFID technology application in the retail industry due the time limitation and financial support.

1.8 Scope of Study

This research is to investigate the factors influence user acceptance of RFID technology in the retail industry in Nilai. The unit of this study is employees whom working in the retail industry

1.9 Outline of Research

This research study includes five chapters. In the **Chapter 1** background of this study and RFID technology is introduced, together with the research problems and research objectives is in chapter 1. And, the limitations and scope of the study are explained. Chapter 1 also concludes with the justification and contributions of this research.

Chapter 2 is about the literature review. A large number of previous studies come from journals; articles and dissertation are referenced to find out some main factors which can influence user acceptance of RFID technology in the retail industry. After reviewing the literature and dividing into eight dependent variables which can influence user acceptance of RFID technology in the retail industry. These eight independent variables include perceived ease of use (PEOU), perceived usefulness (PU), relative advantage, compatibility, complexity, cost saving, organisational context and environmental context. As for the dependent variable of this study is attitude of new technology (ATU). The research model is shown at the end of chapter 2 to illustrate the outline of this research.

In Chapter 3, the methodology of this research paper is outlined. The research design, approach and framework are shown in this chapter. The sample size, sampling design and unit analysis will be utilized following. Furthermore, the data collection and analysis methods will be discussed at the end of Chapter 3.

In Chapter 4, the analysis of the data that was attained was done using specific analytical tools and software's. The results that were generated have been presented in tables to present the data in an organized manner. This first part of

the chapter includes a demographic analysis and a hypothesis test on the questionnaire, for the second part is about the regression analysis to test the hypotheses.

In Chapter 5, the results are discussed and also the implications, what's more, suggestions for future research will present before the conclusion which is then followed by the personal reflection of the researcher.

Chapter 2: Literature Review

2.0 Chapter Introduction

In this chapter, findings and related theories from previous research papers related to this study will be discussed to identify some variables which have a strong influence regarding the acceptance of RFID technology used in the retail industry. Section 2.1 presents the overview of RFID technology, which includes RFID technology structure and working principle of RFID technology and the RFID technology applications especially in the retail industry. This is followed by section 2.2 which introduces the Technology Acceptance Model (TAM) which is a widely studied area to explain and predict the actual use of RFID technology. Section 2.3 discusses the Diffusion of the Innovation Theory, which is like TAM, which test five innovations contributes to explain and predict the actual use of RFID technology. In section 2.4 to 2.6, the cost saving, the organisational context and the environmental context are discussed. All of these factors were highlighted by pervious researches that show significant influence in the retail industry of the acceptance of RFID technology. In each section, the hypothesis is presented based on previous research papers. The research model was then presented in section 2.7 of this chapter.

2.1 Acceptance of RFID Technology

Davis, Bagozzi and Warshaw (1989) indicated that organisations accept the new technologies in order to improve the efficiency and effectiveness of various work processes. Burton-Jones and Hubona (2006) pointed out that, many technology-based products and services never reach their full potential, and some are just simply rejected. Failed investments in technology may not only cause financial losses, but also lead to dissatisfaction among employees (Venkatesh 2000). Hence, explaining and predicting user acceptance of new technology is important.

2.1.1 Concepts of Acceptance

From the Dillon and Morris (1996) perspective, they considered user acceptance is defined as the demonstrable willingness within a user group to employ information technology for the tasks it is designed to support. Obviously there is a degree of fuzziness here, because the actual usage is always likely to deviate slightly from idealized, planned usage, but the essence of acceptance theory is that such deviations are not significant; that is, the process of user acceptance of any information technology for intended purposes can be modeled and predicted (Dillon & Morris 1996). Lacking of user acceptance is a very important part to impede the success of new information system or information technology (Dillon & Morris 1996).

And the truth was, users were often unwilling to use new information technology or information systems (Dillon & Morris 1996), in their opinion using the new technology means spend a long time to learn a new skill. Therefore, user acceptance has been viewed as the pivotal factor in determining the success or failure of any information system project (Dillon & Morris 1996).

2.1.2 Attitude about Technology Acceptance

Davis (cited in Malhotra & Galletta 1999) observed that :" the subject may want to do what Referent X thinks he/ she should do , not because of X's influence, but because the act is consistent with the subject's own [attitude]." Malhotra and Galletta (1999) and Lee (2009) pointed out that the user or organisation's attitude in information technology implementation and usage plays an important role. More recently, this issue seems particularly relevant to successful implementation of collaborative systems such as RFID technology, where effective utilization is often dependent upon user or organisation's attitude of new technology. Malhotra and Galletta (1999) pointed out that usage behaviours caused by one's or organisation's attitude are more sustainable in the absence of external influences such as competitor pressures. Such

internalized attitude would motivate an organisation accept the new technology or not.

In recent years, despite RFID's popularity, not all companies are eagerly adopting it especially in the retail industry in Malaysia. The use of RFID in most companies is at the early stages and its potential value has not been fully realized yet (Lee 2009). What's more, many researchers have shown the risk relevant to RFID technology in terms of cost, organisational change which prevents the implementation of RFID technology in the retail industry. This research is to study the RFID technology acceptance in the retail industry in Malaysia. So, it is very important to investigate the factors that affect RFID acceptance and to find out which factors are most important. Hence, the attitude about new technology is independent variable in this study.

Previous studies pointed out that there are some factors can influence the acceptance of RFID technology in the retail industry. This study focus on eight main factors: perceived ease of use (PEOU), perceived usefulness (PU), relative advantage (RA), compatibility (CA), complexity (CL), cost saving (CS), organizational context (O) and environmental content (E). Perceived ease of use (PEOU) and perceived usefulness (PU) come from Technology Acceptance Model, relative advantage (RA), compatibility (CA), complexity (CL) from Diffusion of Innovation Theory, cost saving (CS), organizational context (O) and environmental content (E) from other relevant studies. The following part will explain these factors.

2.2Technology Acceptance Model

The acceptance and the use of information technologies is a hot topic and a large number of studies and researches have been done in this area (Silva & Dias 2007). Venkatesh (2003) pointed out that innovations need to be accepted and used, and the researcher added that to search the behaviour of who will use is more important than understand the use of technology (Venkatesh 2003). The study about the user's behaviour is always a difficult area. There are several theories of technology acceptance: Theory of Reasoned Action (TRA),

the Theory of Planned Behaviour (TPB) and finally the Technology Acceptance Model (TAM) (Silva & Dias 2007). Although many models have been proposed to explain and predict the actual use of the system, the Technology Acceptance Model (TAM) is the most significant one (Chuttur 2009). In the case of a new technology, on the other hand, the attitude toward the technology was emphasized to predict the acceptance intention. Numerous empirical tests have indicated that TAM is a robust model of technology acceptance behaviours in a wide variety of information systems and controls (Chuttur 2009; Venkatesh 2003; Silva & Dias 2007). Since RFID technology is information technology, TAM is suitable to be applied in explaining RFID acceptance behaviour.

In 1985, Fred Davis proposed the Technology Acceptance Model (TAM) where the author considered the actual system used can be explained or predicted by user motivation. The system features and capabilities have direct influence on user's motivation (see Figure 2). And after that, Davis further refined his conceptual model where the Technology Acceptance Model as shown in Figure3.

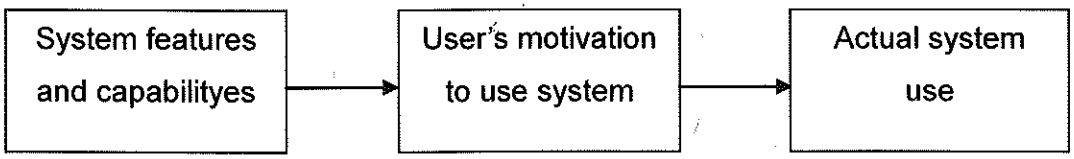

Figure 2: Technology acceptance model (Chuttur 2009)

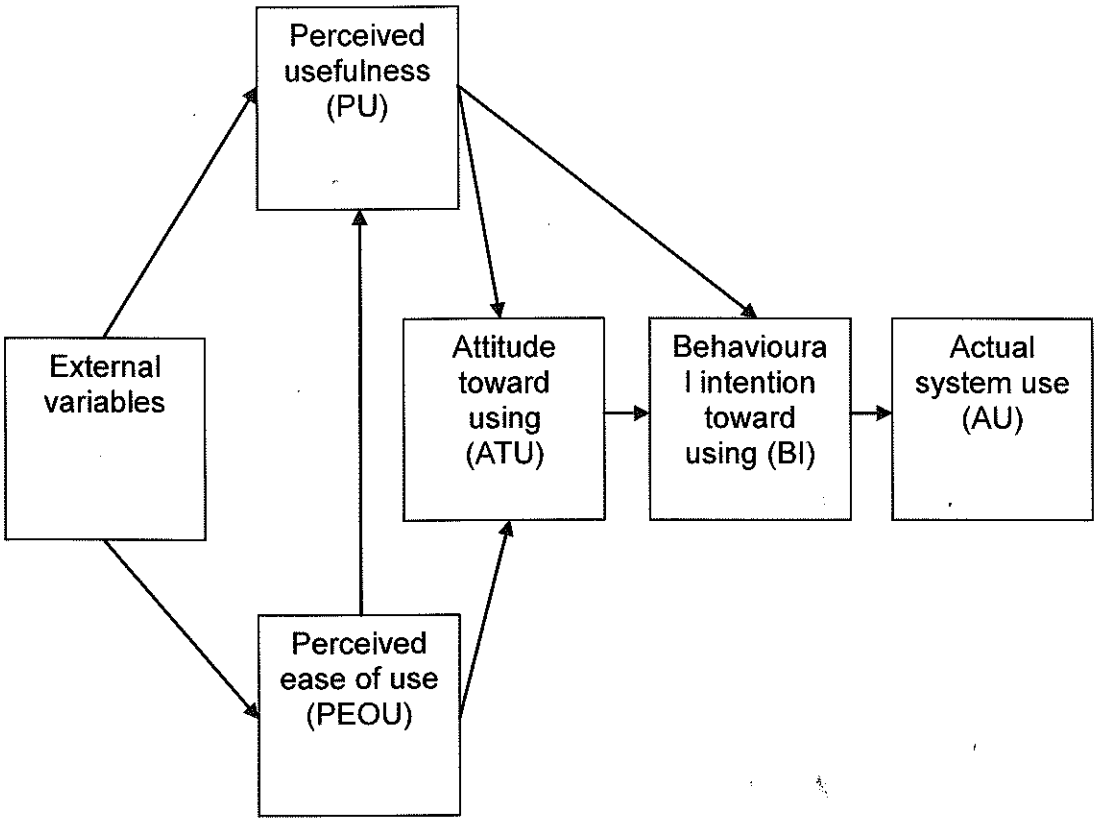

Figure 3: Conceptual model for technology acceptance (Chuttur 2009)

Thus, the basic assumption of the TAM is that (see figure 1.3) the actual system use depends on behavioural intention to use (BI), the user attitude toward the use (ATU) and perceived usefulness (PU) have the direct influence on BI. The ATU is determined by PU and perceived ease of use (PEOU). PEOU also has influence on PU, and external variables can affect both PU and PEOU. In the TAM model, PEOU positively affects the PU.

2.2.1 Perceived Ease of Use (PEOU) and Perceived Usefulness (PU)

Perceived ease of use (PEOU) is defined as the degree to which a person believes that using a particular system would enhance his or her job performance (Lee 2009) and perceived usefulness (PU) is defined as the degree to which a person believes that using a particular system would be free of effort (Lee 2009). Moreover, PEOU and PU positively affect the attitude toward a 1n information system, and further, positively affect individuals' intentions to use and accept the information system. Based on studies (Wu & Wang 2005; Chutter 2009), PU and PEOU are shown to be important determinants of the system use. The user accepts or actually use new technology only if technology promise to improve and easy to use. Thus, the hypothesis for this study is:

H1: There is a relationship between perceived ease of use (PEOU) and acceptance of new technology (AT) in the retail industry.

H2: There is a relationship between perceived usefulness (PU) of RFID technology influences its acceptance in the retail industry.

To date, the TAM has been applied to many technologies (Malhotra & Galletta 1999). Although TAM has received theoretical and empirical support (Silva and Dias, 2007), many researches (Wu & Wang 2005; Chutter 2009; Malhotra & Galletta 1999) still suggested that there is a need to input more variables to provide an even stronger model.

2.3 Diffusion of Innovation Theory

The Diffusion of innovation theory (DOI) is another theory proposed by Rogers (Tsai, Lee& Wu 2010). In recent years, DOI has been widely used for relevant information technology (IT) and information system (IS) researches. The characters of the innovation can influence user acceptance of new technology (Tsai, Lee& Wu 2010). The authors also suggested that DOI is the best model to explore the factors that can influence user acceptance about the new technology. The definition of diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system (Tsai, Lee& Wu 2010). Innovation is an idea, practice, or object which is viewed as new by an individual or group. According to Rogers's theory on innovation diffusion, he identified five attributes of an innovation that are key influences on innovation acceptance (Zhang, Wen, Li, Fu& Cui 2010). According to Rogers (cited in Sahin 2006), these characters include relative advantage, compatibility, complexity, durability, and observability. These attributes are used to explain the user adoption and decision making process. They are also used to predict the implementation of new technological innovations and clarify how these variables interact with one another (Wu &Wang 2005).

These attributes are defined by Rogers (cited in Sahin 2006). Relative advantage as the degree to which an innovation is perceived as being better than the idea it supersedes. As for compatibility, it is the degree to which an innovation is perceived as being consistent with the value, past experiences, and needs of potential adopters. Complexity as the degree to which an innovation is perceived as difficult to understand and use. For trialability, it is the degree to which an innovation may be experienced with on a limited basis. Lastly, observability is the degree to which the results of an innovation are visible to others.

Previous studies show that there is a relationship between these five attributes and the RFID acceptance in the retail industry but not all characters have strong influence. Tsai, Lee and Wu (2010) considered that relative advantage and