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Pre-Acceptance of Fingerprint Identification:
A Case Study Among Department of Administration Staff Versus
Academic Staff in UiTM Pahang, Campus Jengka

Rozita Mengen [1]*, Nor Farhana Mohd Azmi [2], Azwan Shah Aminuddin [3]

Faculty of Business Management, Universiti Teknologi MARA Cawangan Pahang
Kampus Jengka, 26400 Bandar Pusat Jengka, Pahang, Malaysia
rozita@pahang.uitm.edu.my, norfa610@pahang.uitm.edu.my,
azwanamin@pahang.uitm.edu.my
*Corresponding Author

Abstract: This study is conducted to investigate the pre-acceptance of fingerprint identification system, amongst chosen staff in Universiti Teknologi Mara (UiTM) Jengka, Pahang in recording their work attendance in the future, if management were to pursue the method. The method of recording is yet to be established, although a few other campuses have already done it. The data collection is by questionnaires distribution. Fingerprint identification system was selected among other biometric system devices in some of UiTM campuses due to its affordability, in comparison to other biometric system devices. Reliability also contributes to the selection of the system. Other reason for its selection was it could provide higher security level, eliminate buddy clocking, increase productivity and simplify many aspects of work, improve punctuality, and eliminate physical punch cards thus there will be no recurrence cost. The fingerprint identification system provide benefits to the organization in order to achieve the organization goal. This study will deliver the pre-acceptence of such technology among two sets of staff, differed by job responsiblilties, in UiTM Jengka Pahang. Findings showed non academic acceptance is higher in comparison to the academic staff. ready for change and to introduce the effectiveness of using fingerprint identification compared to using the manual punch card. This study is about time management awareness among UiTM staff that signifies the ability to accept change and new technology in an organization that is complesent with a fully manual clocking system .

Keywords: Biometric, Fingerprint Identification, User Acceptance, UTAUT, TAM

1.   Introduction

Biometric has long been used as an authentication method that refers to verifying single human identification based physiological or behavioral patterns on a person's body, such as fingerprint, face, and iris (Li, Yang, & Niu, 2006). The fingerprint scanners are among the cheapest, most prolific, and most accurate biometric application today (Brass, 2003; Brownstein, 2004; Middlemiss, 2004; Clodfelter, 2010). Uzoka and Ndzinge (2008) said that, eventhough there have been recent advancements and apprehension for increased security, biometric authentication has yet to be implemented in large scale proportion especially in developing countries. Adoption of this technology is limited but it has increased gradually. They also stated that there is a dearth of research (especially in developing countries). This may be due to the low popularity of biometric authentication in most developing countries. Venkatesh, Viswanath and Morris (2003) did a study that developed and validated a new research model in 2003, with seven constructs: performance expectancy, effort expectancy, attitude toward using technology, social influence, facilitating conditions, self-efficacy, and anxiety, which are hypothesized to be fundamental determinants of the user behavioral intention of information technology. In relation to this study, a model is being adopted to identify a small group of respondents with different job specifications in UiTM Pahang Campus Jengka. This campus has yet to install the fingerprint identification for it's staff daily attendance record and is still using the punch card method.

Previous research done by the co-author of this study (Mengen, Nasaruddin & Nazar, 2012) was a similar study on administration staff in UiTM Perak that has already installed this

biometric attendance recording since early 2011, a post installation study. The study was an acceptance study after having to use the fingerprint system, whereby in comparison to UiTM Pahang which is a pre acceptance study. As Mills, Meyers and Byun (2010) anologized in their review on technology acceptance, having the "chauffer problem"amongst wealthy car owners poses other problems because the owner does not know how to drive and the cost of having other people to drive their car is high and not economical. Therefore, as a pre determinent survey, this study could be a gap enclosure to see what the users are behaving towards the idea of an automated and technology usage in their daily clocking in and out of work before it is actually being implemented.

1.1   Problem Statements

Although the trend has long been applied in the use of fingerprint identification in Malaysia to record employee attendance using fingerprint, UiTM Pahang has yet to implement it. This study will not go into the mechanics of costing, managing or installing the equipment as there are yet any discussion on such attempt in UiTM Pahang. Nonetheless there is no denial that fingerprint identification is more reliable compared to stamping machine. In the future it might be put into perspective that biometric would not only provide a basis for effective security; it would also impact on the quality of service (Heracleous & Wirtz, 2006).

1.2   Research Objectives

The objective of this research concentrated on the theory of technology acceptance that many of the employees may not be comfortable with, afraid and feel sceptical toward new computerized system in their working environment due to such change and the feeling of comfort for the last 30 years in UiTM Pahang clocking in and out mannualy. Current manual setting of using the card to clock in and clock out of work seems to be backward and outdated, for a university that carries the vision of transformation and carries the importance of quality in its goal. This case study is to identify the acceptance on fingerprint technology according to factors that influence the users.

1.3   Significance of Study

The study signifies various factors; are the staff ready for change and to introduce the effectiveness of using fingerprint identification compared to using the manual punch card. This study also about time management awareness among UiTM staff. User acceptance is crucial in order to increase the user adoption of new technology. Therefore, this study would create the acceptance of fingerprint identification level, it's usefulness, and its reliability. Employee also has the right to ensure their records are attended correctly because issues of system malfunction and physical disability may deter the success of this finger print system. In the organizational prospects, this study may help the organization identify the future planning on enhancing the daily business operations that includes recording the staff attendance from manual to fingerprint identification.

1.4   Definition of Terms

1.4.1   Fingerprint identification. Fingerprints are one of the most popular biometric techniques in both of verification and identification modes (Hong & Jain, 1998). A Fingerprint is a pattern composed of ridges and Valleys (Luis, Alberola, Aghzout, & Ruiz, 2006). A minutia can be a ridge bifurcation or a ridge end (Rokbani & Alimi, 2005).

1.4.2   Administration Staff. Non-academic or supporting staff in registra department, UiTM Pahang, Campus Jengka

1.4.3   Academic staff. Lecturers involve in the areas of teaching, learning and research on academic as according to the majoring of their faculties from Applied Management, Faculty of Business Management.

1.4.3   UiTM. Universiti Teknologi MARA is Malaysia's largest institution of higher learning in terms of size and population. It has experienced phenomenal growth since its inception in 1956 and it is still growing. The university has expanded nationwide with vast network and a workforce of 17,000 employees.

2.   Literature Review

Biometric technology is vastly becoming a primary technique of recognition in these days fast-paced set of connections and safety aware measures society (Jackson, 2008). Biometrics can be defined as the process used to identify or authenticate the identity of a person using any of a series of physical or behavioral characteristics (Clodfelter, 2010). Clodfelter (2010) also stated that fingerprint identification represents the great combination of several factors, including cost, accuracy, and size. User acceptance refers to the decision made by the individual whether to interact with the technology (any new system installed) or not use it at all by avoiding it (Al Awadhi & Morris, 2008). Privacy concern may become one of the factors that may affect user acceptance of a new technology. Tang, Bringer, Chabanne, and Pointcheval (2008) stated that biometrics are usually regarded to be sensitive because they uniquely identify an individual.
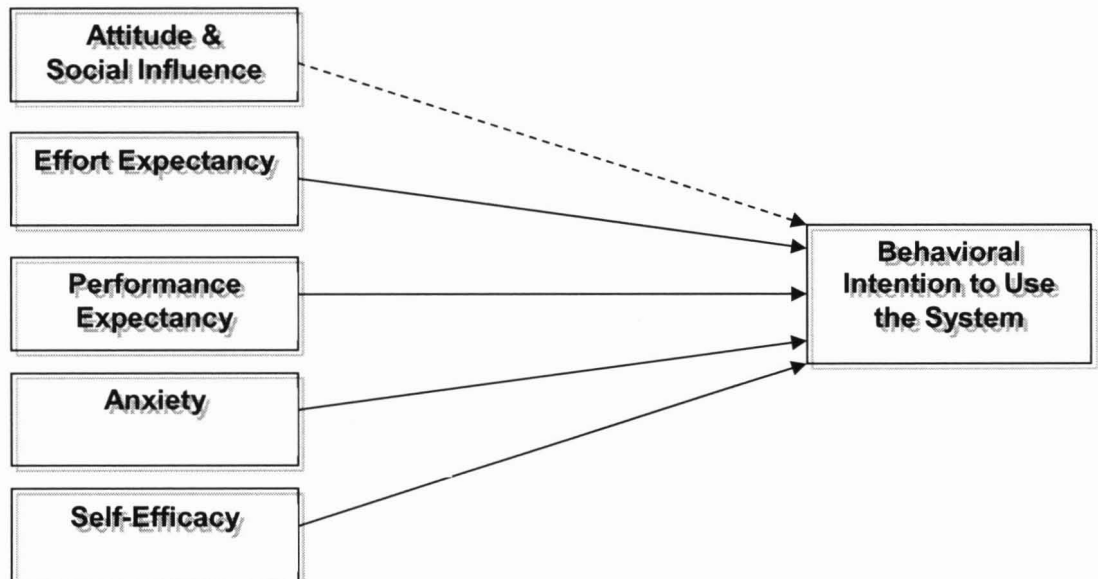

Fig.1 Research Model Adopted from UTAUT (Venkatesh et., al 2003)

3.   Methodology

According to a research done, one of the patterns of biometric tools is swap a typical username/password method using the fingerprint and login into a system (Clodfelter, 2010).

Users may prefer to the traditional methods and may take some time to accept the new fingerprint identification. Issues such as privacy concern, data loss, and so on may significantly affect their acceptance to the new fingerprint identification that being installed. According to Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003), there were several reasons might influence user acceptance which are performance and effort expectancy, social influence, facilitating condition , self-efficacy, and anxiety.

3.1   Research Design

The researchers choose a descriptive research type in order to conduct the research. A descriptive research is a research that describes the phenomenon without attempting to determine what causes the phenomenon (Salkind, 2009). The descriptive research is focused on the event that occurs. A researcher described the current state of a fair at the time of the study. The research was conducted one time in an attempt to know the user's acceptance of fingerprint identification technology among supporting staff from two department in UiTM Pahang, Campus Jengka.

3.2   The Respondents

The researchers' sampling frame that was used in the study is the supporting staffs in Administration Office and Academic staffs from Center of Applied Management, Faculty of Business Management from UiTM Pahang, Campus Jengka. They were choosen as prototype samples for this case study to represent two sets of job function in the organization. Among the administration some 70% (7 out of 10) responded and academic staff 82% (14 out off 17) responded. This is to differentiate the pre-acceptance of two different job function.

3.3   Instruments

The instrument used by the researchers in order to collect data for this study was questionnaires. The questionnaires adopted User Acceptance of Information Technology: Toward a Unified View by Venkatesh et., al (2003). Section A analyzed the demographic profile of the respondents, while section B identified the factors that influence the user's acceptance towards the new technology with seven subsections that are performance and effort expectancy, social influence, facilitating condition, self-efficacy, and anxiety. The researchers used five (5) point Likert scale in order to measure the responses.

3.4   Instrument Administration

The questionnaire items were adapted from the UTAUT study of Venkatesh et al. (2003). These items represent independent and dependent variables utilized in the current study. Appendix A demonstrates the questionnaire items to measure the behavioral intention of staff to use fingerprint. Other than wording modifications to fit the specific technology studied in this research, no changes were made to the user acceptance scale. All items were measured on a five point Likert scale, where 1 = highly disagree, 2 = disagree, 3 = neutral (neither disagree nor agree), 4 = agree, 5 = highly agree.

3.4   Data Analysis

The plan for data analysis explains the techniques used to analyze data obtained from the questionnaire. The researchers analyzed the data that have been collected using the Statistical Package of Social Sciences (SPSS). Data were described according to the descriptive statistics which includes percentage and mean

4.   Findings

The findings below was derived from the questionaires distributed earlier. The statistical analysis was only done on the percentages upon the scale and items based on the model adopted. Using frequency processing the result is as stated in the table below. Two segment of analyzed data consisting findings from the respondents. The results were also shown in bar charts for each scales for easier intrepretaion.

In summarizing the pre-acceptance analysis from the mean total from the likert scale answers, low means are seen among academician in comparision to administration staff. SI, FC and AX are the three behavioral influence that shows some moderate negative pre acceptance on the system. Other 5 behavioaral patterns are showing positive acceptance with means mostly between 3.5 to 4.5.

Table 1. Total Mean

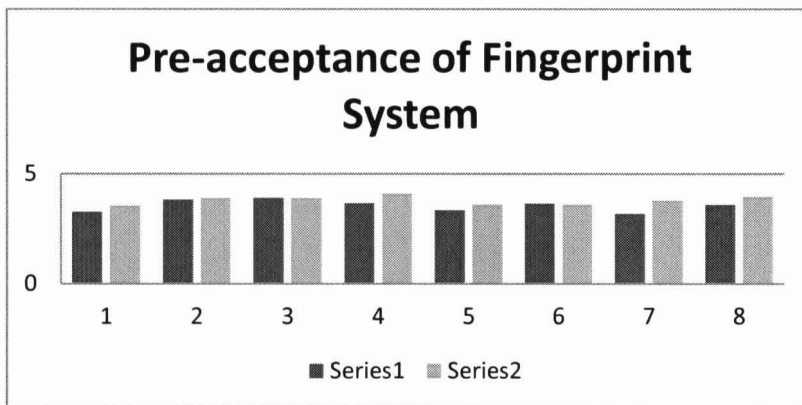| Construct	Scales/Series	Academic staff (PPG/FPP)	Administrative staff (Registrar Office)
1.	Social Influence (SI)	3.25	3.53
2.	Attitude toward Using Technology (AT)	3.81	3.89
3.	Effort Expectancy (EE)	3.89	3.89
4.	Performance Expectancy (PE)	3.64	4.07
5.	Facilitating Conditions (FC)	3.32	3.57
6.	Self-Efficacy (SE)	3.62	3.57
7.	Anxiety (AX)	3.16	3.78
8.	Behavioral Intention to Use the System (BI)	3.57	3.95

Fig. 2 Total Mean

Note:
Series1 = Mean for administration staff
Series2 = Mean for academic staff
Numbering 1 through 8 refer to table 19 on the matching conctruct

After the analysis, it is concluded that most of the respondents accept the idea of fingerprint identification. This based on the findings in which most of the respondents provide positive answers regarding the fingerprint identification. There are five main factors that influence user acceptance of fingerprint identification and three have less percentage of

acceptance in UiTM Jengka. The five factors that influence a user are attitude towards using technology, effort expectancy, performance expectancy, self-efficacy, and behavioral intention to use the system showed no problem for users to change in accepting the new technology. Although social influence, facilitating condition and anxiety reveals some behavioral patterns that respondents are still cautious in the system acceptance. Influences on the later behvioural factors should be looked into more rigorously for future study. Among the two groups of staff that were studied, academician seems to be more cautious towards the new system, in comparison to the administrative staff. In general, there seems to be high initial positive responses to the questions relating to the factors that may influence the user acceptance of fingerprint identification. Factors that derived from the UTAUT model (Venkatesh et., al, 2003) were very much helpful in the process of identifying some behaviorals impact on the fingerprint pre-acceptance system.

5. Conclusion and Recommendations

Overall the new system is not totaly accepted (100%) but some concerns exists. Flexibility on the work time may be of concern towards influencing the acceptance and thus resulting in lower acceptance for academician as compared to adminstrative staff. Based on the study, the researchers suggest that further research should be conducted to improve the acceptance of fingerprint identification system in the organization by using other possible variables or factors to ensure this investigation be more practical and significant, such as impact on budget, support, and maintenance. Next is to target all UiTM Pahang's staff as the respondents.

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