INTENTION TO USE FINGERPRINT SYSTEM IN ELECTRONICS INDUSTRY

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Abstract

Purpose: The aim of this study is to assist the Malaysian electronics companies in reducing the non-value added practices and in return, will minimize the cost and improves productivity with the use of the fingerprint system.

Methodology: This study uses a quantitative research approach and data were sampled from 137 front-line employees using simple random sampling technique.

Result: The empirical findings of the study confirm that perceived usefulness and perceived ease of use significantly affect the intention to use the fingerprint system. However, there was not enough evidence that relative advantage has any effect on the intention to use the system.

Implications: The study results affirmed that business organizations, especially electronic companies should transform their use of conventional attendance system to fingerprint system in improving efficiencies and effectiveness within the human resource practices.

Keywords: *Relative Advantage, Perceived Usefulness, Perceived Ease of Use, Fingerprint system, Non-value added practices.*

INTRODUCTION

In recent days, human resources functions have undergone tremendous changes and the use of evolving technology has made this a reality. The use of technology such as biometric devices in work practices has been very useful (Pankanti, Prabhakar, & Jain, 2002). A biometric system is a method to recognize an individual based on biological and behavioral characteristics such as fingerprint, vein, palm, iris, voice, and face recognition have been used to identify individuals since time immemorial (Ratha, & Bolle, 2007; Jain, Ross & Prabhakar 2004).

In Malaysia, biometrics technology has been widely used by many public sector agencies and the private sector business organizations in improving the safety and quality of their service delivery system. Among the applications, that use of biometric technology is My Kad as national identification documents and Automated Fingerprint Identification System (AFIS) to ascertain the identity of Malaysians through fingerprint detection (Thomas, 2004; O'Gorman & Chatham, 1999). Biometric technology that uses fingerprints is used for Passport System, Biometrics System for Detection of Illegal Immigrants (PATI) and Biometric Fingerprint Identification System (BIOFIS) to track criminals (John W. Bond, 2009). There are also agencies that use biometrics for access into an office building (Jiang, Zhang, Fu, Liu, & Su, 2015). This is not new for the private companies in Malaysia that use fingerprints system in improving the safety and quality of their human resource management practices. Increasingly, countless firms use the fingerprint attendance system compare to the classic time registration system (based on pin codes or badges) which carries problems to them (Ogbanufe & Kim, 2018; Ratha, & Bolle, 2007). There are a number of problems and weaknesses of the present system are still used in most of the companies. Lee, Ramotowski, & Gaensslen (2001) affirmed that manager or supervisor should call the name of each employee workers to record their presence and this consumes a lot of time and affects the productive hours which otherwise could be used for better means.

LITERATURE REVIEW

Numerous researchers have identified the determinants of adopting biometrics. (Byun & Byun, 2013; Lancelot Miltgen, Popovič, & Oliveira, 2013; Soh, Wongand, & Chan, 2010; James, Pirim, & Boswell, 2006) suggested that the purpose to use the system is depending on factors of effectiveness, user-friendliness, threat, and benefits. There has Review of literature applied Rogers's (1995) Theory of Diffusion of Innovation and Technology Adoption Model (TAM) proposed by Davis, Bagozzi and Warshaw's (1989) to establish the relationship between the variables and the usage of fingerprint system. These variables are relative advantage, perceived usefulness and perceived ease of use.

Relative advantages

The relative advantage is known as a great predictor of the role of innovation (Rogers, 2015; Agarwal, 2000). (Davis, Bagozzi, and Warshaw, 1989)defined relative advantage as the degree of innovation which seen as better than the ideas that substitute. It can also be expressed as what would be the cost and what will be the benefits of innovation (Moore, & Benbasat, 1991; Mattila, 2015).Relative advantages including user-friendly, low initial cost, comfort, time-efficient, fewer

errors, improve service, and the ability to provide sufficient data and immediacy of the reward. Fingerprint system can systematize management task, reduce paperwork, simplify processes and distributes the necessary information to top management, thereby it increases the effectiveness of the human resource management practices (Ogbanufe & Kim, 2018; Arif, Li, & Cheng, 2017; Jiang et al., 2015). It also helps the organization to save time in gathering information about the worker's arrivals and strategic planning. Therefore, this research hypothesizes that relative advantages would positively affect the intention to use fingerprint system.

H₁: Perceived usefulness would positively influence the intention to use fingerprint system in Human Resources Management practices.
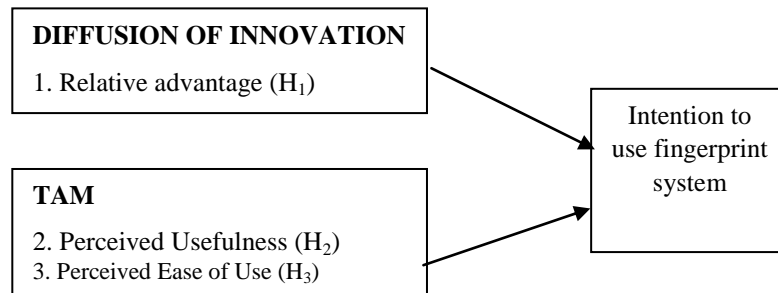

Figure 1: Conceptual Framework

Perceived Usefulness

Perceived usefulness is known as which a person believes that it will enhance their performance by using a particular system (Davis, 1989). In the organizational context, employees are normally reinforced by a noble performance by increments, bonuses, promotions and other rewards (Dooley, 2011; Vroom, 1964). Any system which is categorized as high in perceived usefulness turns to be one of the user's strength who believes in the existence of a positive user-performance relationship (Davis, 1989). There are several types of research has been done in various industries such as hospital, pharmaceutical, food and beverage, hotels and etc. its shows that, perceived usefulness significantly influence the intention to use fingerprint system (Alalwan, Dwivedi, Rana, & Williams, 2016; Ogbanufe & Kim, 2018; Lian &Tui, 2012; James et al., 2006). Although past literature contributed to global human development, it will be beneficial to study the use of fingerprint system among manufacturing industries in Malaysia. Therefore this research also hypothesizes that perceived usefulness would positively influence intention to use fingerprint system.

H₂: Perceived usefulness would positively influence the intention to use the fingerprint system in Human Resources Management practices.

Perceived Ease of Use

Perceived ease of use is defined as a level of a personal consideration of using a system that can reduce one's effort in doing something (Hamid, Razak, Bakar, & Abdullah, 2016). The ease of use perspective is able to convince the user that the information technology to be applied is an easy thing and not a burden to them. All users seem to accept the usage of an application which perceived to be easier and its supported by past studies which (Hamid, Razak, Bakar, & Abdullah, 2016; Kucukusta, Law, Besbes, & Legohérel, 2015; Hernandez & Mazzon, 2007; Guriting & Oly Ndubisi, 2006; Eriksson, Kerem, & Nilsson, 2005; Wang, Wang, Lin, & Tang, 2003; Venkatesh,2000; McGrath, Tsai, Venkataraman, & MacMillan, 1996; M. Igbaria & Iivari, 1995). However, the findings of (Magid Igbaria, Zinatelli, Cragg, & Cavaye, 1997; Davis, 1989) found that perceived ease of use has no impact on the usage and adoption of the technology. Regulatory of the usage and interaction between the system handlers is also show the ease of use. The more the usage of the system, it is easier to operate, and be the mastered of it. The results of this study show that this factor is proven empirically, can explain the reasons the end-user in using the information system and explain that the new system which was then being developed, accepted by end-user users. Therefore this research hypothesizes that perceived ease of use would positively influence the use of the fingerprint system.

H₃: Perceived ease of use would positively influence the intention to use the fingerprint system in Human Resources Management practices.

RESEARCH METHODOLOGY

The research was conducted with employees at one of the electronic companies in Penang (Malaysia), especially front-line employees which refers to non-managerial employees who perform according to the instructions by supervisor and division managers. The estimated population for this research is 11,200 employees (Department of Statistic Malaysia 2012). According to Raosof sample size calculator, 400 sample sizes were recommended as a sample size. Out of 400 distributed questionnaires, researcher successfully collected only 137 completed questionnaires. The distributed questionnaire consists of total of three sections with Likert scale ratings. The questionnaire was adapted by previous research and designed to accommodate this research.

RESULTS/FINDINGS

Testing Methods

The structural equation modeling (SEM-PLS) approach was used in this research to examine the level of significance (Ramayah, Yeap, and Ignatius, 2013). A measurement model and the structural model been obtained to complete this research (Anderson and Gerbing, 1988). Common bias method is negligible in this study due to 70% of total variance. To get the assumption for data normality Shapiro-Wilk and Kolmogorov been conducted Based on Park (2015). The researcher will be able to conclude the test if outcome as non-significant (p>0.05), which shows the normal distribution. Next, the technique if outlier detection which is known as anomaly decision was used to identify the unusual patterns that do not conform to expected behavior (Choudhary & Nagaraja, 2017).

Descriptive Analysis

Table 1: Demographic profile of the respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Gender	Male	37	27.0	27.0	27.0
	Male	100	73.0	73.0	100.0
	Total	137	100.0	100.0	
Age Group	18 to 30 years	39	28.5	28.5	28.5
	31 to 40 years	52	38.0	38.0	66.4
	41 to 50 years	36	26.3	26.3	92.7
	Above 50 years	10	7.3	7.3	100.0
	Total	137	100.0	100.0	
Race	Malay	116	84.7	84.7	84.7
	Chinese	13	9.5	9.5	94.2
	India	3	2.2	2.2	96.4
	Others	5	3.6	3.6	100.0
	Total	137	100.0	100.0	
Marital Status	Married	103	75.2	75.2	75.2
	Unmarried	34	24.8	24.8	100.0
	Total	137	100.0	100.0	
Education	Bachelors and Above	11	8.0	8.0	8.0
	STPM/Diploma	28	20.4	20.4	28.5
	SPM and Below	98	71.5	71.5	100.0
	Total	137	100.0	100.0	

Measurement Model

Firstly, reliability, convergent validity, and discriminant validity were tested before testing hypothesized model (Silaparasetti, Srinivasarao & Khan, 2017). All loading which shown in table 2, was higher than 0.70 which threshold (Hair, Hult, Ringle, and Sarstedt, 2016).The convergent validity is achieved with higher composite reliability and average variance extracted (AVE).

Table 2: Convergent validity

No	Items	Loadings	Cronbach's Alpha	rho_A	CR	AVE	VIF
1	**IT1**	0.813	0.86	0.861	0.899	0.641	2.193
2	**IT2**	0.798					2.151
3	**IT3**	0.816					2.065
4	**IT4**	0.789					2.059
5	**IT5**	0.787					1.95
6	**PEU1**	0.902	0.886	0.89	0.917	0.688	3.329
7	**PEU2**	0.854					2.484
8	**PEU3**	0.818					2.267
9	**PEU4**	0.75					1.745
10	**PEU5**	0.816					2.099

11	PU1	0.725	0.879	0.88	0.912	0.676	1.489
12	PU2	0.849					2.516
13	PU3	0.884					3.313
14	PU4	0.84					2.203
15	PU5	0.803					2.248
16	RA1	0.901	0.874	0.879	0.923	0.799	2.562
17	RA2	0.92					2.864
18	RA3	0.86					2.028

Table 3 shows that all constructs have discriminant validity. To indicate sufficient discriminant validity, all loadings of measured variables should be higher than the cross-loadings by at least 0.1 (Hair et al. (2016). Multicollinearity is examined in Table 2. VIF below the range of 3.3 shows, all constructs confirm that the construct validity is sufficient which falls below the minimum threshold of 9 (Yong & Pearce, 2013).

Table 3: Discriminant validity of the construct

Construct	IT	PEU	PU	RA
IT	**0.801**			
PEU	0.584	**0.83**		
PU	0.617	0.737	**0.822**	
RA	0.408	0.547	0.539	**0.894**

Note = IT = Intention to use, PEU= Perceived ease of use, PU = Perceived usefulness, RA= Relative advantage

Table 4: Cross Loadings

Items	IT	PEU	PU	RA
IT1	**0.813**	0.5	0.542	0.297
IT2	**0.798**	0.51	0.463	0.274
IT3	**0.816**	0.464	0.472	0.314
IT4	**0.789**	0.464	0.494	0.387
IT5	**0.787**	0.394	0.494	0.365
PEU1	0.49	**0.902**	0.642	0.572
PEU2	0.525	**0.854**	0.654	0.405
PEU3	0.483	**0.818**	0.603	0.456
PEU4	0.538	**0.75**	0.531	0.373
PEU5	0.386	**0.816**	0.622	0.452
PU1	0.516	0.668	**0.725**	0.391
PU2	0.488	0.596	**0.849**	0.503
PU3	0.557	0.603	**0.884**	0.487
PU4	0.515	0.612	**0.84**	0.418
PU5	0.443	0.531	**0.803**	0.408
RA1	0.36	0.503	0.492	**0.901**
RA2	0.401	0.513	0.495	**0.92**
RA3	0.33	0.45	0.457	**0.86**

Note = IT = Intention to use, PEU= Perceived ease of use, PU = Perceived usefulness, RA= Relative advantage

This study has tested the discriminant validity and the results are shown in Table 5. To assess the discriminant validity two methods were used which is (1) as the criterion and (2) as a statistical test. The HTMT value is greater than 0.85 (Kline 2015), and 0.90(Gold & Arvind Malhotra, 2001). This study follows the guideline of Henseler et al. (2016) to assess the measurement model. This study shows that there is a problem of discriminate validity.

Table 5: Heterotrait-Monotrait (HTMT)

Construct	Intention	PEU	PU	RA		Saturated Model
IT					SRMR	0.067
PEU	0.668				d_ULS	0.773

PU	0.705	0.832		**d_G1**	0.53
RA	0.47	0.619	0.613		

Note = IT = Intention to use, PEU= Perceived ease of use, PU = Perceived usefulness, RA= Relative advantage

Table 5 shows, 0.53 dG, 0.773 dULS and 0.067 SRMR which lesser than the off of 0.08 (Hu & Bentler, 1999) which fits well the measurement model.
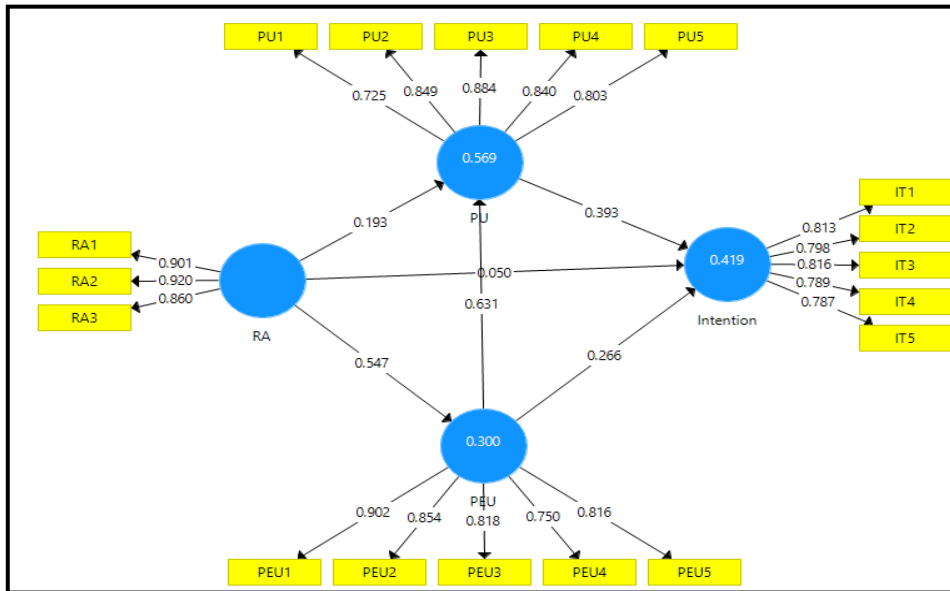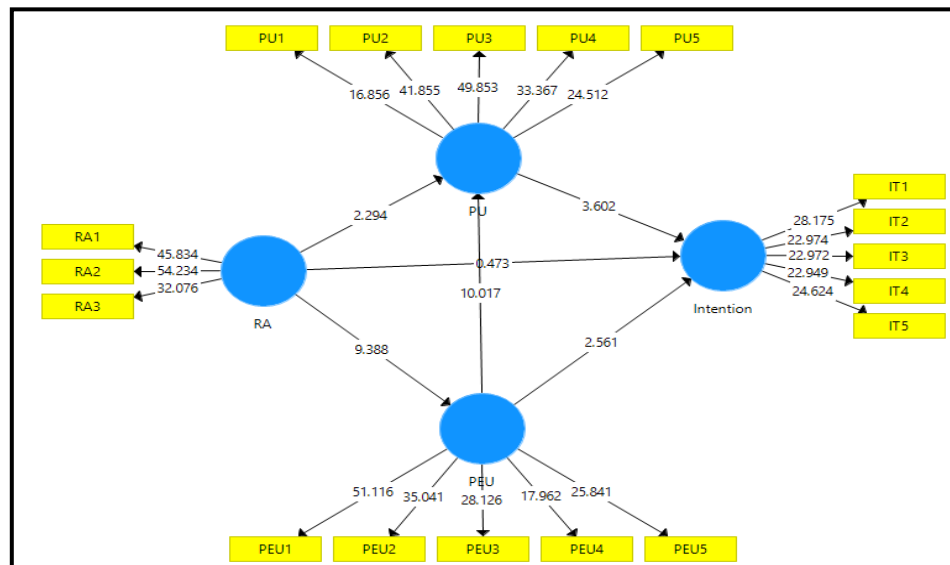

Figure 2: Measurement Model

Fig. 3: Structural model

Table 6: Hypothesis results

Hypothesis	Beta	Std Err	T Value	P Values	LL	UL	f2	r2	Q² (=1-SSE/SSO)	Decision
H₁	0.05	0.106	0.473	0.636	-0.161	0.26	0.003		0.352	Not Supported
H₂	0.393	0.109	3.602	0.000	0.16	0.585	0.115		0.187	Supported
H₃	0.266	0.104	2.561	0.010	0.065	0.474	0.052	0.419	0.239	Supported

Note = IT = Intention to use, PEU= Perceived ease of use, PU = Perceived usefulness, RA= Relative advantage

Figure 2 presents a structural model that shows all path coefficients and their corresponding t-values as well as the explanatory power of the estimated model. Meanwhile Table 6 presents the outcomes of the hypothesis testing. The

multiple regression analysis models were significant (p, 0.01) and the coefficients show, 0.419, which indicates that 41.9% percent of the variation in intention to use. Thus, H2 and H3, were supported as shown in Table 6, H1 (β = 0.05, p< 0.05), H2 (β = 0.393, p< 0.05), H3 (β = 0.266, p< 0.05). Thus, the study concludes that H2, and H3 was supported except H1 (β = 0.05, p> 0.05).

DISCUSSION

The result of Pr>F in the multiple regression analysis is < 0.0001. It shows out of three independent variables, two variables have significant relationship with dependent variable. In addition, the R-square is 0.419, which indicates that 41.9 percent of the variance in the dependent variable (intention to use) is explained by the three independent variables (relative advantage, perceived ease of use and perceived usefulness).

Based on the result, relative advantage has pointed out the greatest contribution to the variation of the dependent variable (intention to use) with the highest value of beta which is 0.065 compared to other independent variables. Besides that, perceived usefulness and perceived ease of use showed the least contribution to the variation of the dependent variable (intention to use) with the lowest value of beta this is 0.000. Furthermore, both of the independent variables (Compatibility, Complexity) are found significantly to predict the dependent variable (Behavioral intention) with the beta of 0.010 and 0.000 respectively. Based on these findings, the researcher would like to conclude that human resource management practices have significant positive relationship with behavioral intention. It shows that, when human capital practices are good, the behavioral intention will be higher in an organization.

CONCLUSION

Thus, the findings from this study are very crucial for the management of the electronic industry to understand behavioral intention. Besides, this study also explored how employees perceive importance of human resource management practices such as relative advantage, perceived ease of use and perceived usefulness, Human resources management practices are the essential tools that had been used by the organization nowadays for stimulating their strategic management by using fingerprint system. The main purposes of human resource management practices are to motivate, attract and retain employees. Effective human resources management practices such as fingerprint system will obtain quality employees and it also will motivate them to improve their job performance and helps them to meet their psychological needs and social needs (Kepha, 2015).Therefore, innovative human resource management practices will increase employee's commitment and help them to achieve organization's goals. The more satisfaction of employees with human resources management practices, the more commitment of employees toward the organization (Kumar & Krishnaveni, 2008).

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