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Evaluating User Acceptance of Staff Information System Using the Technology Acceptance Model: A Case Study at a Higher Education Learning Institution in Malaysia

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Abstract. The purpose of this paper is to evaluate user acceptance of a Staff Information System at TATI University College (TATIUC), a Higher Learning Institution in Malaysia, using the Technology Acceptance Model (TAM). The evaluation will be based on the two main variables; perceive usefulness and perceive ease of use. This research adopts the criteria of perceive usefulness and perceive ease of use in collecting data from the respondents. Results indicate there are positive correlations between perceived usefulness, perceived ease-of-use and attitude towards the Staff Information System.

INTRODUCTION

The exponential growth of *Information Communication Technology* (ICT) has significantly affected business process and organizations. The utilization of computer information systems has become a vital requirement of businesses to date, in the era of *Big Data* and *Internet of Things* for maintaining competitive advantage over competitors. Manual data manipulation is the process of the yesteryears as more and more business organizations opt for computerized information systems. Not only this system reduce information processing time significantly, but also eases the presentation of information, tailoring to the needs of business organizations. Nevertheless, not all changes are received with an open hand. Some users are reluctant to accept changes especially to processes they have become accustomed to [1]. The implementation of new innovation in the organization is a challenging and daunting task [2]. The organization's ICT personnel and department have to consistently promote users to fully utilize newly introduced information systems in the organization to meet the systems' objectives. A *Staff Information System* (SIS) is a centralized repository that manages information related to the employees of an organization. The goal and purpose of this system is to improve work performance, efficiency and the productivity with the organization [3]. This system is also known as *Human Resource Information System (HRIS), Human Resource Management (HRM)*, *Human Resource IT*, and *e-Staff Information System* [3-6]. Despite of having different names, these systems have a common goal and function, which is to assist the human resource department in managing employee's records. Typical data stored in SIS include personal details, attendance, training, annual leave, and medical leave.

An effective SIS would reduce administrative tasks such as record keeping and would facilitate the generation of automated reports for strategic decision-making activities [7]. Online approval workflows (such as leave and training applications) can reduce face-to-face interactions between employees and enable automatic notifications. Due to its critical functions in assist works related to the human resources, SIS is increasingly widely been used by the

organizations [5]. This study was prompted when *TATI University College* (TATIUC), a *Higher Learning Institution* (HEI) in Malaysia stated implementing an SIS at its main campus. The SIS, known as *e-Staff*, is a result of the conversion of manual work process into online form. Main functions of the *Human Resource Department* (HRD) at TATIUC were part of this conversion which included attendance record, leave applications, outstation applications, training applications and others. Two critical HRD functions in e-Staff are the attendance module and leave application module. The attendance module is a biometric system that tracks employee daily work hours whilst the leave application module is an online leave application and approval process. These modules enable HRD to manage data more effectively compare to the previous manual process, and offer the capability for report generation in a timely manner.

This study aims to investigate the acceptance of e-Staff at TATIUC using the *Technology Acceptance Model* (TAM) based on two independent variable constructs namely *perceived usefulness* and *perceived ease of use*.

LITERATURE REVIEW

Software quality characteristics have long been used to assess the utilization of information systems by end users. Lack of quality would lead users to find gaps in the systems, thus making them reverting to manual process [8]. One main quality characteristic as outlined in quality models such as ISO 25020 [9] is *Usability* and it is closely related to the interface design of the system [10]. A good interface design can contribute to the productivity and satisfaction of users (*user acceptance*) and assists them to accomplish their tasks [7].

End user's acceptance evaluation has been an afterthought process although it is crucial for the improvement information systems [11]. Existing models for acceptance evaluation include the *Technology Acceptance Model* [12], Task Technology FIT [13], Technology Readiness Acceptance Model [14] and the Unified Theory of Acceptance and Use of Technology [15]. Table 1 summarizes the existing models for user acceptance evaluation of information systems found in literature.

TABLE 1. Model for Evaluating User's Acceptance

Model/ Theory	Explanation
Technology Acceptance Model (TAM)	Theory and model that explain how information system users accept and use a technology [12].
Technology Acceptance Model 2 (TAM 2)	Perceived usefulness and usage intentions as it relates to the processes of social influence and cognitive instrumental [16].
Technology Acceptance Model 3 (TAM 3)	Proposed in the context of e-commerce application with the inclusion of trust and perceived risk on a system use [17].
Task Technology FIT	Holds that ICT is more likely to have a positive impact on individual performance and used if the capabilities of the ICT match the tasks that the user must perform [13].
Technology Readiness Acceptance Model (TRAM)	Combination of *TAM* and *Readiness* models. Explains how the dimensions of personality can affect a person's experience and the way s/he uses new technology [14].
Unified Theory of Acceptance and Use of Technology (UTAUT)	User intentions for using information system and subsequent usage behaviour [15].

All model proposed in [13-17] are rooted from TAM [12] and have been revised accordingly based on the suitability of the type of information systems and target environments. TAM has been widely used and the most cited model related to the user's acceptance [18]. It can be easily applied across different research settings and novelty technology on a single platform [19].

In addition, TAM acts as a good predictor to measure technology acceptance among respondents through questionnaire [20]. Using TAM, respondents will be evaluated using two main criteria: *Perceived Usefulness* (PU) and *Perceive Ease of Use* (PEU). PU is the degree to which a person believes that using a particular system would enhance his or her job performance [12] while PEU is the degree to which a person believes that using particular system would be free of effort [12]. Both PU and PEU play important factor in determining user's attitude and acceptance in using information systems [21].

Another variable that affects user acceptance towards information systems is *attitude*. Attitude refers to the person's feeling when using the information system. Attitude is subsequent with PU and PEU. PEU has a strong positive effect on attitude and indirect effect on attitude via usefulness [22]. The easier a user feels to use a technology, the greater the benefits gained by users [23] and better received by users [3]. A person will be satisfy to use an information system if they believe that the system is easy to use and increases productivity [24].

METHODOLOGY

This study is a collaborative effort between the Faculty of Computer, Media and Technology Management, the Centre of Information Technology and the Human Resource Department at TATIUC. It is carried out as part of the TATIUC Strategic Plan 2015-2020 to evaluate user acceptance of the university's information systems. A questionnaire was constructed and electronically distributed to academic and non-academic staffs at TATIUC. Table 2 lists the dependent variables used in this study.

TABLE 2. List of Dependent Variables

Variables	Type	Values
Perceived Usefulness	Ordinal	20 -100
Perceived Ease-of-Use	Ordinal	20 -100
Attitude	Ordinal	20-100

The questionnaire was divided into three sections consisting of *Demographics*, *User Acceptance* and *Suggestions*. The questionnaire adapted constructs from [25-27] in determining the *usage*, *usefulness*, *easy-to-use* and *attitude*; and measurements from [16]. Since there is no objective measure available for evaluating *usage*, *usefulness*, *easy-of-use* and *attitude*, a Likert scale is used [28]. Questions for *usage* are measured using 5-point, Likert-type scale, ranging from 1 (*not satisfied*) to 5 (*extremely satisfied*). Questions for *usefulness*, *easy-to-use* and *attitude* are measured using a 5-point, Likert-type scale, ranging from 1 (*strongly not agree*) to 5 (*strongly agree*). The results of the survey are loaded into SPSS for statistical analysis. An assessment was conducted to test the reliability and validity of the measurement used.

RESULTS

A total of 114 respondents were involved in the study. *Cronbach's Alpha Coefficient* was used to test the reliability of the questionnaire (Table 3).

Variables	Cases	Items	Alpha
Perceived Usefulness	113	7	0.947
Perceived Ease-of-Use	112	8	0.952
Attitude	113	2	0.854

Based on [29], Cronbach's alpha of 0.8 is considered highly reliable. Since the results shows a range higher than 0.8, it can be concluded that the questionnaire is a reliable measurement instrument. The demographic profile of the respondents comprises of 34% male and 66% female staff; 61.4% are between the age of 30 to 39; 71.9% are academic staffs; and 47.4% hold a Master's degree. Mean scores are classified into five categories, Not Satisfied (0.00 – 1.00), Slightly Satisfied (1.01 – 2.00), Moderately Satisfied (2.01 – 3.00), Very Satisfied (3.01 – 4.00) and Extremely Satisfied (4.01 – 5.00). Table 4 illustrates the reasons for using e-Staff by the respondents. The main reason is recorded high in items R1, R2 and R3 with a mean score 4.3, 4.0 and 4.0 respectively where users use the system for accessing the attendance, leave and training modules. The attendance module is highly use due to it was closely related to the other module such as leave and training.

TABLE 4. E-Staff System Usage Reasons

	Not satisfied	Slightly satisfied	Moderately satisfied	Very satisfied	Extremely satisfied	Mean
R1	0.9	0.0	12.3	42.1	44.7	4.3
R2	1.8	3.5	18.4	43.0	33.3	4.0
R3	3.5	2.6	16.7	50.0	27.2	4.0
R4	3.6	2.7	30.0	37.3	26.4	3.8
R5	5.3	7.1	23.0	36.3	28.3	3.8
	3.0	3.2	20.1	41.7	32.0	

Tables 5, 6 and 7 illustrate the means for the second section of the questionnaire. The mean scores are classified into five categories, Strongly Disagree (0.00 – 1.00), Disagree (1.01 – 2.00), Neutral (2.01 – 3.00), Agree (3.01 – 4.00) and Strongly Agree (4.01 – 5.00). PU of e-Staff is recorded high in items U1and U3 with a mean score of 4.2 where users perceived the use of e-Staff is useful and saves time when used. The PEU of the e-Staff system is recorded high in items E3, E4, and E5 with a mean of 4.2, 4.1 and 4.1 respectively, where users can learn to use it quickly, easy to remember how to use it and easy to learn to use it.

TABLE 5. Perceived Usefulness of the e-Staff System

	Strongly Not Agree	Disagree	Neutral	Agree	Strongly Agree	Mean
U1	1.8	1.8	16.8	35.4	44.2	4.2
U2	0.9	1.8	15.9	42.5	38.1	4.1
U3	0.9	0.0	15.9	44.2	38.9	4.2
U4	0.0	5.3	22.1	44.2	28.3	4.0
U5	0.0	5.4	23.2	45.5	25.9	3.9

	Strongly Not Agree	Disagree	Neutral	Agree	Strongly Agree	Mean
U6	0.0	3.5	35.4	37.2	23.9	3.8
U7	0.9	6.3	25	41.1	26.8	3.9
	0.6	3.4	22.0	41.4	32.3	

TABLE 6. Perceived Ease-of-Use of the e-Staff System

	Strongly Not Agree	Disagree	Neutral	Agree	Strongly Agree	Mean
E1	0.9	4.5	17.9	42.9	33.9	4.0
E2	1.8	3.6	25.0	44.6	25.0	3.9
E3	0.0	0.9	21.2	38.9	38.9	4.2
E4	0.9	1.8	18.6	44.2	33.6	4.1
E5	0.9	1.8	22.3	39.3	35.7	4.1
E6	0.0	1.8	27.7	39.3	31.3	4.0
E7	0.0	1.8	26.8	40.2	31.3	4.0
E8	0.0	3.5	23.9	41.6	31.0	4.0
	0.6	2.5	22.9	41.4	32.6	

The *attitude* towards using of the e-Staff system is recorded high in item A1 with a mean of 4.0 where user are satisfied with it.

TABLE 7. Attitude Towards Using the e-Staff System

	Strongly Not Agree	Disagree	Neutral	Agree	Strongly Agree	Mean
A1	1.8	2.7	20.4	44.2	31	4
A2	0.9	2.7	20.5	49.1	26.8	3.98
	1.35	2.7	20.5	46.7	28.9	

Among suggestions made by respondents in the last section of the questionnaire include increasing the limit for file uploads (current limit is 1MB), adding functionality to leave application, and integration with pay advice. Table 8 lists the mean scores for each user acceptance level. The mean scores are classified into three categories according to the level of user acceptance, *Negative* (0.00-1.66), *Neutral* (1.67-3.33) and *Positive* (3.34-5.00).

TABLE 8. Mean Scores for User Acceptance of the e-Staff System

	Variables			Acceptance Level
	Usefulness	Ease of Use	Attitude	
Mean	4.00	4.00	3.99	4.00

Results revealed that the acceptance level of the e-Staff system is positive (score between 3.34 and 5.00).

CONCLUSIONS

User acceptance of information systems is not a new problem and has been studied extensively to support organizational work process. A survey in the form of questionnaire was carried out to evaluate the *perceived usefulness*, *ease-of-use* and *attitude* towards using the e-Staff system at TATIUC. Results of the controlled survey demonstrate that the questionnaire is a reliable tool and distinguishes between the concepts of *usefulness*; *ease-of-use*; and *attitude*. Analysis revealed positive findings with regards to *perceived usefulness*, *perceived ease-of-use* and *attitude* towards the system using TAM. Respondents consider e-Staff as useful and easy to use; and confidently use it in managing daily activities including attendance, leave and training applications. Future research work include the investigation of the e-Staff system to facilitate the use of new ICT technologies; investigation of *behaviour*, a variable not included in this study, in e-Staff; and the investigation of other external variables such as job relevance, availability and experience in e-Staff.

REFERENCES

1. Delaney, Rob and D'Agostino, Robert, 25 (2015).
2. Khalid, Fariza & Joyes, Gordon & Ellison, Linda & Daud, Md Yusoff, IES 7, (2014).
3. R. Rosly, and F. Khalid, (TAM), CE, 9, 675-686 (2018).
4. Mobaideen, Hisham, IIM 5, 1-9, (2013).
5. M. Y. Yusliza, T. Ramayah and I. Haslindar, AJBM 4, 3039-3045 (2010).
6. Heikkila, Jukka-Pekka, JSIS 22,(2014).
7. Hwee, Liow, K. Yew, John, IJEDICT, 14, 75-82 (2018).
8. K. Kamaludin, IRMM, (2017).
9. "Systems and Software Engineering, Systems and Software Quality Requirements and Evaluation (SQuaRE), System and Software Quality Models" International Organization for Standardization, pp. 34 (2011).
10. Fahmy, Syahrul, Ngah, Nurul, Othman, W. Fariha, Ziti, IJCAS 5, 115-122 (2012).
11. Rizky, Soetam & Amelia, Audrey, Technology Acceptance Model (TAM) Evaluation for Academic Information System (case study Ma Chung University) (2015).
12. F. D. Davis, MIS Quarterly 13, 319-340 (1989).
13. D. L Goodhue, and R. L. Thompson, MIS Quarterly, 19, 213-236 (1995).
14. Lin, Chien-Hsin & Shih, Hsin-Yu & Sher, Peter, Psychology and Marketing 24, 641-657 (2007).
15. Venkatesh, Viswanath; Morris, G. Michael; Davis, B. Gordon; Davis, D. Fred, MIS Quarterly **27**, 425–478 (2003).
16. V. Venkatesh & Davis, F. D, MNSC, 46, 186-204 (2000).
17. P. C. Lai, JISTM 14, (2017).
18. Christos D. Melas, Leonidas A. Zampetakis, Anastasia Dimopoulou &, Vassilis Moustakis, Journal of Biomedical Informatics, 44, (2011).
19. Mudiana, Zatul & Saidatul, IJIPM, 2, 34-46 (2011).
20. Helia, Vembri & Asri, Vikha & Kusrini, Elisa & Miranda, Suci, MATEC Web of Conferences, 154, (2018).
21. D. A. Adams, R. R. Nelson, and P. A. Todd, MIS Quarterly, 16, 227-247 (1992).
22. Oliver Laitenberger, Horst M.Dreyer, Fifth International Symposium on Software Metrics (1998).
23. M. Gao, P. Kortum, F. Owald, Proceedings of The Human Factors and Ergonomics Society Annual Meeting 62, (2018)