JINAV: Journal of Information and Visualization *ISSN: 2746-1440 (online)*
Vol. 4 No. 2 (2023)
https://doi.org/10.35877/454RI.jinav2418

The Acceptance of Technology in Human Resource Management : Readiness e-HRD Among Healthcare Workers Using Binary Logistic Regression

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Abstract

This research aims to identify the readiness of healthcare professionals in regional hospitals to use e-HRD technology. The use of technology in HRM functions is essential to maintain the efficiency and capabilities of human resources within an organization. E-HRD platforms are computerized systems that support the effective and efficient management of HR processes within an organization. To assess the efficiency of employing this technology, it is essential to determine the preparedness of the users. The Technology Readiness Index (TRI) proposed by Parasuraman is applied to assess healthcare workers' preparedness for using e-HRD. The UTAUT (Unified theory of acceptance and use of integrated technology) theory is employed to identify technological readiness. A quantitative descriptive research design is employed to identify the readiness of hospital healthcare workers. The data source for this research is primary data obtained through a questionnaire. The population in this study consists of 420 healthcare workers employed in regional hospitals in the city of Palembang. The sampling technique used in this research is proportional stratified random sampling. Logistic regression is employed to assess the preparedness of healthcare professionals in regional hospitals. The research findings indicate that male healthcare workers have a tendency to be 1.843 times more prepared to use e-HRD compared to female healthcare workers. The likelihood of healthcare workers using e-HRD tends to decrease by 0.002 times with increasing age. The research concludes that healthcare professionals in regional hospitals are moderately prepared to use e-HRD technology. The study recommends that healthcare organizations should provide training and support to enhance healthcare workers' readiness to use e-HRD technology.

Keywords: technology readiness index; health professionals; logistic regression; UTAUT Method

Received: 9 October 2023 Revised: 18 December 2023 Accepted: 27 December 2023

1. Introduction

Information technology has had a broad impact on every aspect of life in society. From the invention of the telegraph to the creation of smartphones, this technology has evolved the way people live and work. It has transformed how individuals and communities purchase products, communicate, receive healthcare service, manage finanaces and even the approach to education. These changes have significant implications for organizational processes, including Human Resource Management(Berkowitz, 2021; Stone, Deadrick, Lukaszewski, & Johnson, 2015).

In the concept of human resource management, technology transforms the way organizations recruit, motivate, and retain employees. As a crucial component in meintaining the efficiency and capabilities of human resource within organization, the use of technology in the form of software, application and platform related to HRD is essential. E-HRD platforms are computerized systems that support the effective and efficient management of HR processes within an organization.

The primary objective of incorporating technology in HRM functions is to decrease the time needed for task completion without compromising the quality of work (Athithya, Kavitha, & Muralidhar, 2020; Li, Song & Jing, 2018). Consequently, e-HRD strives to close the devide between HRD and information technology (Nawaz, & Gomes, 2017;

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Rony, 2019; Rony et al., 2023). Nevertheless, to assess the efficency of employing this technology, it is essential to determine the preparedness of the users.

This research aims to identify the readiness of healthcare proffesionals in regional hospital in using e-HRD. As workers in the field of extensive service with high working hours, healthcare professionals quickly adapt to and become familiar with tousch-screen devices, requiring minimal technical support. However, e-HRD technology is relatively new in the healthcare domain, as the existing platforms are not related to healthcare scope but focus on individual capacity development of healthcare workers.

Although technology has impacted HRM in an organization, studies focusing on readiness of healthcare workers in using e-HRD technology remain limited. Existing research related to e-HRD in healthcare has primarily focused on the development of e-HRD software and the exploration of new software or platform sspecifically designed for healthcare professionals (Athithya, Kavitha, & Muralidhar, 2020; Li et.al, 2020; Odendaal et. al., 2020).

2. Research Method

To assess healthcare workekr's preparednessfor using e-HED, the Technology Readiness Index (TRI) proposed by Parasuraman is applied. In this case, Parasuraman utilizing the TRI theory, elucidates the stance of technology user. In this scenario, users are individuals who must delve into the details to comprehend the technological system they will be using. Consequently, users prioritize mastering the technological system for its utility. When healthcare workers embraace a new technological system,they will encaounter perceived challenges and conveniences. Users opinions, stemmingfrom curiosity, are gradually formed, and users gain understanding through practical actions. The viewpoints of users are assessed based on four indicators sucah as **optimism, innovation, discomfort and insecurity**.

Furthermore, to identify technological readiness, the UTAUT (Unified theory of acceptance and use of integrated technology) theory is employed (Martín & Herrero, 2012; Sharma & Pratt, 2020; Venkatesh, Morris, & Davis, 2003; Venkatesh & Davis, 2000; Venkatesh, Thong, & Xu, 2012; Venkatesh, 2000). This theory is a collaboration of various models, including the Theory of Reaction Action (TRA), Technology Acceptance Model (TAM), Motivational Model (MM), Theory of Planned Behaviour (TPB), Combined TAM and TPB (C-TAM-TPB), Model of PC Utilization (MPCU), Innovation Diffusion Theory (IDT), and Social Cognitive Theory (SCT). This theory forms four significant determinants of intention to use and actual usage of information systems which are performance expectancy, effort expectancy, social factors and facilitating conditions (Venkatesh et al., 2003)..Previous research also indicates that nearly 70% of studies indicate taht the UTAUT model is the most suitable model for explaining the intention to use technology compared to the other eight theories (Venkatesh, Morris, & Davis, 2003).

Moreover, this model delineates the factors that impact an individual's willingness to embrace Information Technology (IT) Hence, UTAUT serves as a fundamental framework and has been employed to analyze diverse technologies, encompassing both organizational and non-organizational contexts. Individual acceptance, within this framework is directly shaped by four primary construct such as performance expectancy, effort expectancy, social influencee, and facilitating conditions. UTAUT has udergone further enhancement with the inclusion of three additional construct (hedonic, motivation, price velue and habit) The evolution of UTAUT 2 aims to pin point three essential constructs associated with the overall acceptance and utilization of technology by introducing several novel relationships (Venkatesh, Thong, & Xu, 2012). The development of UTAUT model integrates user attributes into technology acceptance, encompassing factors such as gender, age, and experience.Based on the theoretical overview above, the conceptual framework for this research is formulated as follows.

In order to identify the readiness of hospital healthcare workers, a quantitative descriptive research design is employed. In this approach, the researcher provides a description of the level of readiness among healthcare workers and quantitatively test their readiness.

The data source for this research is primary data obtained through a questionnaire. The questionnaire method used is a close-ended questionnaire with the aim of gathering information from respondents regarding their readiness in embracing HRD technology, specifically e-HRD. The questionnaire is devided into two parts. The first part contains respondents perceptions related to independent variables, namely gender, age, experience, and Technology Readiness Index (Optimism, Innovation, Discomfort, and Security). The second part of the questionnaire addresses the readiness of healthcare worker in using e-HRD.

The population in this study consists of 420 healthcare workers employed in regional hospitals in the city of Palembang. The sampling technique used in this research is proportional stratified random sampling. This sampling technique

employed when the population has non-homogeneous and proportionally stratified elements. This sampling techniquqe is utilized to obtain a representative sample by referring to the population of healthcare workers in the two regional hospitals. The first step in appling this technique is to determine the overall sample size. For this study, The Issac and Michael table was used with a 5% margin of error. According to the Isaac and Michael table, the identified sample size for a population 420 is 191. The next step involves using Proportional Stratified Random Sampling by applying the following formula;

$$n_i = \frac{N_i}{N} x\ n \qquad (1)$$

Where, N_i is the number of members in each stratum, and N is the total population size, and n is the sample size. With a total population size of 420 and a sample size of 191, the proportions of each stratum of healthcare professionals are shown on Table 1.

Table1. Proportion of Strata of Healthcare Workers

Category of Healthcare Workers	Number of Strata Members	Number of Samples for each Stratum
Sub Specialist Doctor	6	2
Specialist	42	20
General Practition	26	12
Dentist	4	2
Nurse	259	118
Midwife	21	10
Radiographer	8	4
Analyst	9	5
Physiotherapy	2	1
Nutritionist	12	6
Assistant Pharmacist	23	11
Pharmacist	4	2
Medical Recorder	2	1
Speech Therapy	2	1

Source : data processed, 2023

Based on the calculation of proportionate stratified sampling used, through rounding method, the total sample size in this study is 195 individuals, with details of the sample for each stratum available in table 1.

Then, in evaluating the readiness of healthcare professionals, logistic regression was employed, which is a type of regression used to depict the relationship between the dependent variable which is the readiness of healthcare workers and the independent variables, which include respondent demographic variables and the Technology Readiness Index (TRI).

3. Result

Based on the demographic results presented in Table 2 of data collection, it is revealed that the majority of research respondents are female (60.5%) and are employed in the nursing profession. On average, respondents have work experience of fewer than five years, constituting 38%. The age distribution of research participants spans from 20 to 50 years. The majority of respondents are situated within the 31 to 40 years age bracket, with the average age of research oarticipants falling between 31 and 40 years.

By using the SPSS software, the output result of logistic regression for the readiness of helathcare workforce in regional hospitals in the city of Palembang are obtained as shown on Table 3.

Table 2. Respondent Demographics

Characteristics of Respondents		**%**
Gender	Male	39.5
	Female	60.5

Work Experience	< 5 years	38
	5 - 9 years	33
	10 – 14 years	17
	15 - 19 years	7
	> 20 years	5
Age	20 – 30 t years	36
	31 – 40 years	38
	41 – 50 years	31
	> 50 years	5

Table 3. Logistic Regression Output Results

Variabel	B	Wald	Sig.	Exp (β)
Gender	0.688	0.731	0.246	1.843
Age	-0.118	2.638	0.002	1.826
Work Experience	0.541	1.680	0.173	0.132
Optimistic	0.475	4.374	0.021	0.194
Innovative	0.228	8.243	0.037	1.281
Discomfort	- 0.283	3.026	0.048	0.147
Insecurity	0.361	1.091	0.991	0.973
Constant	-13.309	4.549	0.014	0.000

The logistic regression model to assess the preparedness of healthcare professional in regional hospital as follows;

$$ln\left(\frac{\pi}{1-\pi}\right) = -13.309 + 0.688\,Gender - 0.118\,Age + 0.541\,Work\ Experience + 0.475\,Optimism + 0.228\,Innovation - 0.283\,Discomfor + 0.361\,Insecurity$$

After the logistic regression model was identified, several test were conducted. The first test involved a simultaneous test through the likelihood ratio test. This test aimed to assess the overall readiness of predictor variables toward response variable. The calculation result using SPSS software revealed that the likelihood ratio test produce a G of 113.694. Thus, with a significance level of 5%, the critical value $X^2_{(0,05;6)}$ was found to be 12,591. Since the G value greater than X^2 , it implies that at least one predictor variable is not ready concerning the response variable.

Subsequently, a partial test was conducted to examine the individual influence of each independent variable in the obtained model. The individual test results indicate whether a predictor variabel is qualified to be included in the model or not. Through the ρ value of the Wald Test (sig) on thable 2, it is known that not all variables haave a significant impact on the dependent variable individually. From the logistic regression data processing in the previous table (table 2), it is observed that only the age and discomfort variables have wald significance value smaller than 0.05 (0,002 and 0,007), thus rejecting the null hypothesis (H_0). This implies that these variables have a significant paprtial effect on the readiness to confront e-HRD. On the other hand, other variables have values greater than 00.5, indicating that demographic factors such as discomfort and insecurity do not have a partial influence of healthcare workers in using e-HRD.

Tabel 4. Test Criteria Result

Criteria Result	Result
Ratio Likelihood Test	113.694
Coefficient of Determination (Pseudo R Square)	0.522
Omnibus Test of Model Coefficients	0.00
Goodness of Fit Test (Hosmer and Lemeshow Test)	2.905

The omnibus test of model coefficient is employed to observed the impact when adding independent variables to the model. From the result in Table 4, The Omnibus Test of Model Coefficient obtain ρ value of 0.00. Since the ρ value is smaller than the significance level (0,00 < 0,05), it can be concluded that the regression model is considered effectivve when incorporating independent variables.

The fitness of regression model is assessed using the Hosmer and Lemeshow's Goodness of fit Test and measured by the chi-square value. The Hosmer and Lemeshow's Goodness of fit Test is employed to test the hypothesis that empirical data fits or is in line with the model (meaning there is no significant difference between the model and the data,

indicating that the model is appropriate). Based on the summary output presented in Table 4, the obtained result for HLGF is a chi-square value of 2,905 with a significance level (sig) 0.647. These result indicate that the probability value (ρ value) ≥ 0.05 (the significance level), specifically 0.647 ≥ 0.05. Therefore, the model can be considered capable of predicting the observed values, or in other words, the model is accepted as it fits well with the data.

4. Discussion

From the result, it can be observed that the exp (β) yields a value of 1.843 with a wald value of 0.731 (Table 4). This indicates that male healthcare workers have a tendency to be 1.843 times more prepared to use e-HRD compared to female healthcare workers. With ρ value of the gender variable being greater than 5% significance level (0.0431 > 0.05), it can be concluded that the gender variable is partially ready to use e-HRD. The research findings align with previous studies related to gender differences in technology acceptance in educatioon industry, where males are more accepting of technology based on perceived usefulness compared to female (Padilla-Meléndez, Del Aguila-Obra, & Garrido-Moreno, 2013).

Furthermore, the data processing results also indicate that the age variable has a negative sign on the coefficient ß with an exp (β) value of 1,826 (Table 4). Thus, it is inferred that the likelihood of helathcare workers using e-HRD tend to decrease by 0.002 times with increasing age. The wald value for the age variable is 2.638 with ρ value of 0.002. From these ressult, it is known that the significance of the age variable is smaller than the predetermined significance level of 5% (0.002 < 0.005). This value suggests that age is a crucial factor in indicating its influence on technology readiness. Previous studies have shown similar result, certain research connecting age with online community usage indicates that perceptions of ease of use, perceived benefits and intention to participate in online communities do not change with age (Chung, Park, Wang, Fulk, & McLaughlin, 2010) .

The work experience variable is one of the benchmarks used to measure the readiness level of helathcare workers. The exp (β) value for this variabel is 0.132 with a wald value of 1.680 and has a positive sign. This indicates that the work experience tend to be 0.132 more prepared in forming readiness to adopt e-HRD. However, the significance value obtained for this indicator is above 0.05, indicating that the lenght of service only partially influences the readiness for e-HRD usage. The findings of this research support the study conducted by Mlekus and Colleagues, which explores how technology acceptance is based on user experience (Mlekus, Bentler, & Paruzel, 2020).

Next, the variable within the technology readiness index that influences the readiness to use e-HRD among healthcare workers in hospitals is the innovation level. The exp (β) value for the innovation variable is 1.281 with a Wald value of 8.243. This value indicates that the readiness to use e-HRD will increase by 1.281 if healthcare workers innovate in their work. The significance values for this variable, which less than 0.05, indicates that innovative characteristics affect the readiness to use technology. These result align with previous research conducted by mazman Akar, which argues that personal innovativeness influences technology acceptance (Mazman, 2019).

The discomfort variable is another factor that influences the readiness of helathcare workers to use e-HRD. This is reflected in the significance value of 0.048, which is smaller than the reference significance value of 0.05. With a Wald value of 1.091 and an exp (β) value of 0.147, it means that discomfort has a negative impact on the readiness of healthcare workers to use e-HRD. This implies that as the level of discomforot among healthcare workers increases, there will be a decrease in their tendency to use e-HRD. These findings support previous research which indicates that discomfort in using new technology affects the adoption of such new platform (Blut & Wang, 2020; Kaushik & Agrawal, 2021).

Based on these arguments, the research results indicate that age, optimism, innovation and discomfort have significance values below the reference value (0.05). This identifies that these variables are valid and significanat factors influencing the readiness of healthcare workers in hospitals to utilize e-HRD. Thus, a revised model can be formulated to identify the readiness of healhtcare workers in regional hospitals in the city of Palembang to use e-HRD, as follows;

$$Ln\left(\frac{\pi}{1-\pi}\right) = -13.309 + 0.002\ Age + 0.475\ Optimism + 0.228\ Innovative - 0{,}283\ Discomfort$$

5. Conclusion

This study aim to identify the readiness of healthcare workers to adopt e-HRD in relation to the developmant of technology in Human Resource Management in hospitals. Based on the research findings, it is known that age influences the readiness of healthcare workers from a demographic perspective, while from the indicators of the Technology Readiness Index, optimism, Innovation, and Discomfort play significant roles. Therefore, based of these results, to enhance individual acceptance within organization in facing technological advancements in hospital HRM, emphasis should be placed on aspects such age, fostering the innovative nature of healthcare workers, and maintaining both external and internal environments to ensure healthcare workers feel comfortable in enhancing their HR capabilities. This will enable them to quickly adapt to technological changes.

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