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Factors Affecting the Low Adoption of the Human Resource Management Information System 2.0 among Junior Public Officers in Putrajaya

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Abstract

This study investigates the factors affecting the low adoption of the Human Resource Management Information System 2.0 (HRMIS 2.0) among junior officers that fall into grades 41 - 44 working in Putrajaya. Although it has been used for more than ten years now, the adoption rate is still low. Therefore, this research adopts a quantitative research method that utilizes Technology Acceptance Model (TAM) to understand the issue. The results show that perceived usefulness, perceived ease of use, IT infrastructure and individual experience with computers have significant impact. Thus, this research serves to inform public sectors by considering the identified factors.

Keywords: Human Resources, Resource Management, Information System, Public Officers

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1.0 Introduction

Internally, organizations need an effective plan and control solution that synchronizes the plan of all activities across the firm to optimize business performance, including its human resource management plan and information system. In its earlier introduction, human resource management information systems have been employed for the purposes of employee recruitment and administration. Over time, human resource management processes have undergone changes in human resource information collection and storage activities following rapid technological transformation (Kovach et al., 2002). The human resource information system today is composed of various modules that provide a framework for organizing an organization. These modules include company, location, departments, and organizational change, which encompass activities such as transfers and dismissals (Chowdhury, Bandhyapadhya, & Hazra, 2012).

For the Malaysian public sector, there is Human Resource Management Information System 2.0 (HRMIS 2.0), which was introduced on 25 March 2015 as an upgrade to the Human Resource Management Information System (HRMIS), which was developed in 1996. This HRMIS 2.0 was anticipated to facilitate accurate workforce planning, automate human resource management procedures, and foster an environment that minimizes paper usage in the government (Arifin & Tajudeen, 2020). However, there is an issue pertaining to HRMIS 2.0. Although HRMIS 2.0 have been developed for more than ten years now, the adoption rate is still low among junior public officers. For example, the integrity of data for personnel profiles is still low since most users only update it once when they first create their HRMIS account and never return to update it after that. Users also feel insecure with the system (Sinniah et al., 2019). Moreover, the use of HRMIS 2.0 can be complex and time-consuming, which requires significant resources (Ibrahim et al., 2018). Since this issue

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is very significant in public office, this study aims to investigate the factors affecting the low adoption and acceptance of HRMIS 2.0 and provide suggestions to address the issue. The research objectives are: a) To identify factors that affect the low adoption and acceptance of HRMIS 2.0 among junior officers who fall into grades 41 – 44 and work in Putrajaya; b) To suggest actions to improve the adoption and acceptance rate of HRMIS 2.0 for them. The findings from this study may generate new knowledge to inform the better use of HRMIS 2.0 in the public sector in future.

2.0 Literature Review

Townsend and Cairns (2003) explained that a human resource management system encompasses the people, rules, products, and data required to control the human resource function. Nagendra and Deshpande (2014) point out that human resource information system combines human resource management as a discipline, as well as fundamental HR activities and outputs, with the information technology environment. Additionally, according to Hendrickson (2003), a human resource information system is defined as a platform for acquiring, storing, processing, analyzing, retrieving, and distributing crucial human resource data inside an organization. Implementation of the system inside an HR department demonstrated numerous benefits: automated HR function activities and routine operations, decrease in client request execution time, boosting operational efficiency, and enhanced HR quality service through enhanced staff performance and knowledge (Nejib & Rakia, 2020).

The HRMIS 2.0 is a combination of the management of human resources and the utilization of Information Technology. The system is an integrated solution comprising of a database, hardware components, and software applications. Its purpose is to facilitate the storage of data across several departments within the organization's database and afterwards create requested information for the human resources personnel (Sinniah et al., 2019). The primary purpose of the HRMIS project undertaken by the Malaysian government is to guarantee that human resources management generated by public sector employees is competent, trained, and motivated to face future difficulties (Zahari et al., 2021). The ten primary roles of human resource management and procedure in the public sector are founded on a stable philosophy to assure efficiency, effectiveness, relevance, and responsiveness to contemporary circumstances. According to Aladwani (2003), user information pleasure is crucial to the success of information systems.

Nakoo et al. (2019) added that the success of e-government is contingent upon the implementation of HRMIS, which can deliver a system that is of high quality, efficient, and effective. This is particularly crucial at the ministry level and in the state secretary's office. To address issues with regard to HRMIS, the Malaysian Administrative Modernization and Management Planning Unit (MAMPU) and the Public Service Department (PSD) were tasked in March 2012 with redeveloping the HRMIS 2.0 system and addressing the discontent of public service employees. This research is essential to fix the necessary actions and corrective actions so that HRMIS 2.0 may operate at maximum efficiency and effectiveness. Nevertheless, users have expressed criticisms and objections over the ineffectiveness of the Modules or Sub-modules of HRMIS 2.0 (Nakoo et al., 2019). The findings of the study ideally serve as a roadmap for the advancement of future HRMIS adoption throughout government organizations (public sector and agencies).

Fred Davis first introduced Technology Acceptance Model (TAM) in 1986 along with the objective to describe how humans embrace and use new information technologies in the workplace (Kowitlawakul, 2011). Since then, TAM has been widely applied in a variety of situations to comprehend technology adoption and use. The model has experienced multiple alterations and expansions throughout the centuries, but its fundamental components have remained substantially unchanged. The concept indicates that when consumers are confronted with a new software package, for instance, a variety of factors influence their decisions regarding how and when to utilize it. It is believed that two criteria, perceived usefulness and perceived ease of use, are crucial determinants of user acceptance (Davis, 1989), as shown in Figure 1.

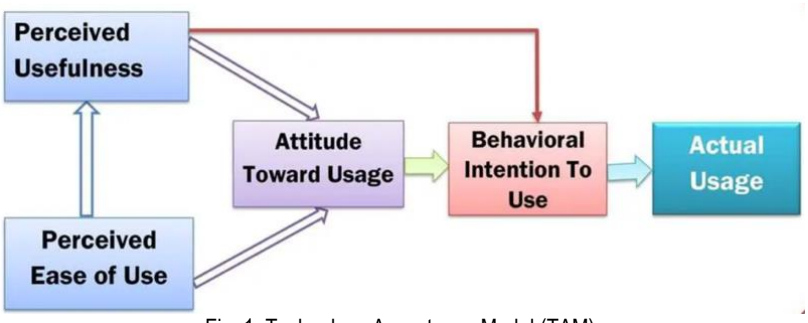

Fig. 1: Technology Acceptance Model (TAM)

TAM, which is based on studies on beliefs, attitudes, and behaviours, suggests that perceived utility and perceived ease of use forecast attitudes and actual behaviours, even though several factors affect the acceptance and usage of technology. TAM represents the user's general attitude toward internet technologies (Vernell & Michael, 2018). Lee et al. (2011) discovered that all criteria influenced e-learning acceptance: organizational support, subjective norm, individual experience with computers, management support, perceived ease of use, and perceived use.

The effect of these five constructs on the successful adoption of HRMIS 2.0 among the junior public officers' grades 41 - 44 working in Putrajaya is measured in the research model developed, as shown in Figure 2.

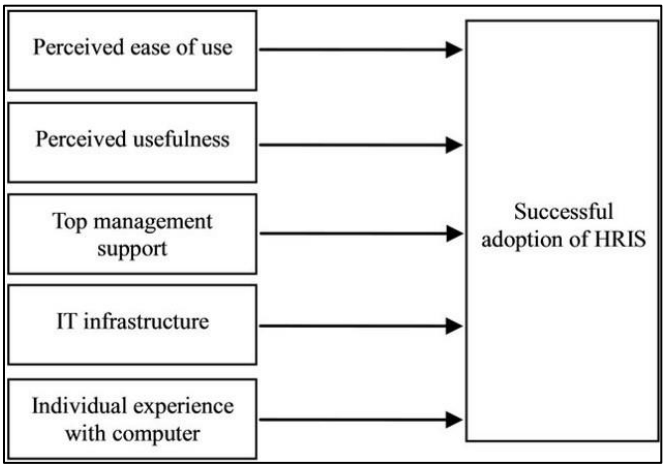

Fig. 2: Research model

3.0 Methodology

In accordance with Cheung (2014), a structured questionnaire is an item that comprises a set of standard questions with a predetermined scheme, which sets the exact phrasing and order of the questions to collect data from respondents. To acquire data from a significant number of respondents, a survey disseminated in Google Forms is used. The development of a questionnaire is inexpensive and requires far less time than conducting an experiment (Gillham, 2008).

The sampling unit consists of junior public officers in grades 41-44 working in three small to medium-sized government agencies located in Putrajaya. The choice of this geographical location Putrajaya is to provide background study to future research on the adoption of HRMIS 2.0 among federal government offices in Putrajaya. According to the Human Resource Department of all three government agencies studied, there were 179 junior officers in grades 41 – 44 who were currently working at the agencies during the study period. The primary data is then obtained by surveying a sample of 171 respondents from a population of 179 junior officers. The sample size is determined using Raosoft software, which indicates a confidence level of nearly 100% with a response distribution of 50% and a margin of error of 5%. This information is presented in Figure 3.

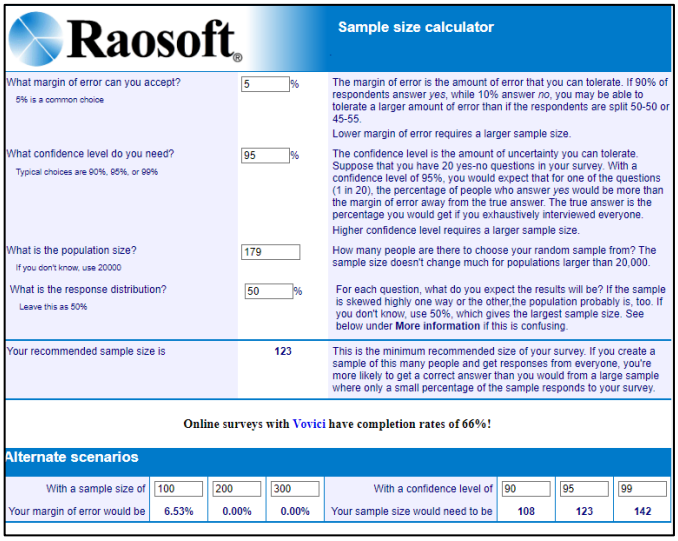

Fig. 3: Sample size determination

The distribution of the research survey involves the utilization of closed-ended questions for interpretation purposes. Online surveys, also known as web-based surveys, have gained significance due to their cost-effectiveness in administering questionnaires. They offer the opportunity to reach a vast population, providing advantages in terms of geographical and temporal accessibility. Additionally, online surveys facilitate the easy targeting of specific populations, among other benefits (Raju & NS, 2016).

Barnes and Rowbotham (2003) outline a four-stage approach for designing a questionnaire, which includes 1) identification, 2) question drafting, 3) question arrangement, and 4) questionnaire testing. Consequently, the questionnaire utilized in this study adheres to the principles (Barnes & Rowbotham, 2003). The study design is taken into consideration in building the foundation for the construction of the questionnaire, which is utilized for data collection purposes. The rationale for the development of the questionnaire is to ensure that each question posed is aligned with the overarching objective of the research attempt. The questionnaire is carefully created to

align with the objectives of the study. It incorporates aspects that are relevant to the research and will be analyzed based on the data collected through the questionnaire. The questionnaire is structured into two primary pieces. The initial segment has demographic information such as agencies, gender, age, working experience, grade, education level and field of work. The subsequent component comprises 22 items that assess the contributing variable of HRMIS2.0 adoption, including Perceived Ease of Use (PEOU), Perceived Usefulness (PU), Top Management Support (TMS), Individual Experience with Computer (IEWC) and IT Infrastructure (ITI). A five-point Likert scale is used to evaluate the perspectives of the respondents based on the criteria.

SmartPLS 4 is utilized for the purposes of data collection, data and descriptive analysis, data screening, and Structural Equation Modelling (SEM) due to the limited sample size. The data analysis process implemented in this study includes data screening, model specification, model fit assessment, hypothesis testing and model interpretation.

4.0 Findings

4.1 Demographic

The survey data revealed that 63.2% of the respondents are from MAMPU, 27.5% are from Jabatan Landskap Negara, and 9.4% are from NADMA. All of them are working in Putrajaya. The distribution of the respondents based on their age is presented as a percentage. 53.8% of the respondents fall in the 30 – 35 age group, followed by 27.5% who belong to the 36- 24 age group. There are only 12.9% of those aged more than 40 years, and only 5.8% aged between 24 and 29 years. The respondents are a young group of respondents who are computer literate. The distribution of respondents based on their experience working in the government is presented as a percentage. Among the participants, 42.1% fall within the bracket of working for 1 to 5 years. Following, 27.5% of respondents have worked for more than ten years. Furthermore, 20.5% of the participants belong to the group that has worked for 6 to 10 years. Moreover, 9.9% of the respondents have only been working for less than one year. A total of 76.3% of the participants reported being in grade 44, and 22.5% of them were in grade 41. The distribution of respondents based on their educational attainment is presented in terms of percentages. A total of 66.1% of individuals possess a bachelor's degree, while 32.7% hold a master's degree. Additionally, 1.2% of the population has attained a philosophy degree (PhD). The distribution of respondents based on their field of work is presented as a percentage as well. A total of 53.8% of the participants are in the core business of each organization. A total of 19.3% of the participants are in the development sector of their agency, and 15.2% are the administrators in their agency. Lastly, only 11.7% of respondents are policymakers in their agency.

4.2 Measurement Model

Using SmartPLS 4, SEM allows researchers to estimate the interconnected and multiple dependencies within a single investigation (Chin, 1999). The utilization of SEM has provided researchers with the ability to assess intricate measurement models and a wide range of variables and levels of constructs. This has facilitated the investigation of complex interactions that were previously challenging to analyze. Partial Least Squares Structural Equation Modelling (PLS-SEM) is a commonly employed methodology for the purpose of theory development in quantitative study methods. It places emphasis on elucidating the variability observed in the dependent variables, estimating path coefficients, and maximizing the coefficient of determination (R2) associated with the target construct. These attempts are undertaken with the goal of attaining accurate predictions.

A PLS path model is constructed by incorporating two existing theories. The structural theory elucidates the interrelationships between constructs within the structural model. The arrangement and placement of the constructs are derived from theoretical observations made by the researcher. Two distinct categories of measurement variables exist, namely, reflecting measurement and formative measurement. The measuring model comprises reflective indicators that can be seen as representative samples of all the potential indicators that can be derived from the constructs (Nunnally & Bernstein, 1994).

In this study, the following reflective measurement model, as shown in Figure 4, is employed to test the data.

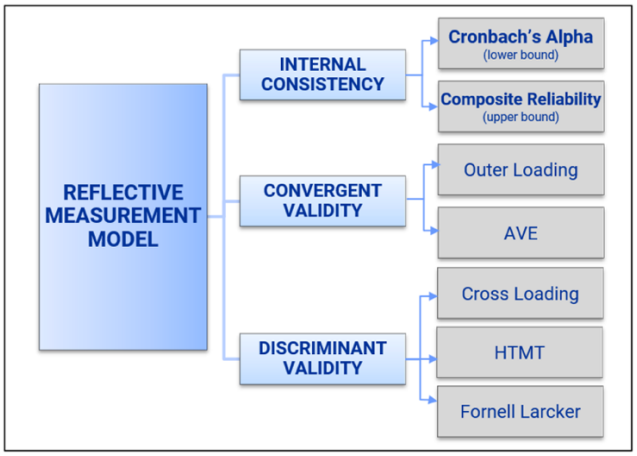

Fig. 4: Measurement model

By utilizing SmartPLS 4, the reflective measurement construct and acquire knowledge on effectively reporting the outcomes of a practical illustration pertaining to the adoption of the HRMIS 2.0 TAM model, as shown in Figure 5 below.

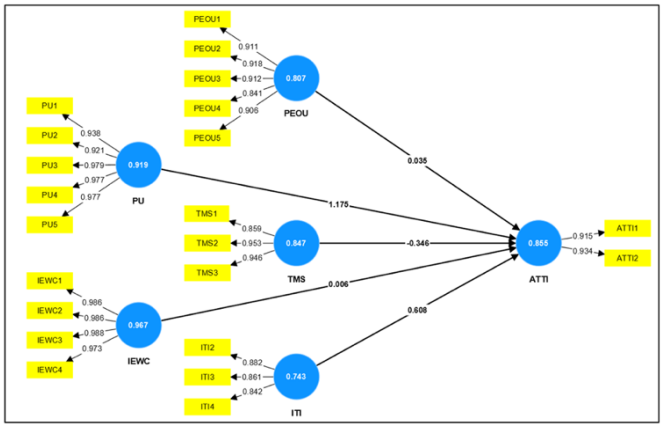

Fig. 5: Path mode in SmartPLS 4

4.3 Structural Model

The assessment of the validity of the structural model is conducted by employing the Variance Inflation Factor (VIF) to identify collinearity issues, the path coefficient, t-value, p-value, and confidence interval. The VIF is a statistical measure that quantifies the level of collinearity among variables. To evaluate collinearity, it is necessary to investigate the VIF values of all predictor components inside the structural model, as shown in Table 1 below.

Table 1. Variance Inflation Factor

	ATTI
IEWC	1.075
ITI	3.106
PEOU	1.859
PU	2.295
TMS	1.453

The present evaluation predicted the capacity of IEWC, ITI, PEOU, PU, and TMS in relation to ATTI. It is evident that all the VIF values are below the established threshold of 5. Hence, the presence of collinearity among the predictor variables does not pose a significant concern in the structural model.

The standardized value of the route coefficient typically falls within the range of around -1 to +1. Path coefficients that are close to +1 indicate a strong positive association, which is typically considered statistically significant. When the value of the path coefficient is extremely low or near zero, it is typically not statistically significant, indicating that there is no meaningful difference from zero.

Table 2. Path coefficient

	ATTI
IEWC	0.006
ITI	0.608
PEOU	0.035
PU	1.175
TMS	-0.346

The primary determinant for the adoption and acceptance of HRMIS 2.0 among junior officers in Putrajaya is the PU, which has a coefficient of 1.175. This is closely followed by the ITI with a coefficient of 0.608. It can be argued that the PEOU and TMS, as well as IEWC, play a significant role in driving the adoption and acceptance of HRMIS 2.0 among junior officers in Putrajaya. There is no significant link between TMS and the adoption and acceptance of HRMIS 2.0 among junior officers in Putrajaya (r = -0.346).

To determine the significance of a route coefficient, it is necessary to assess its standard error, which can be obtained through the process of bootstrapping. The bootstrapping method is employed to estimate the standard error, as well as the empirical t-values and p-values, for all structural path coefficients. When the magnitude of an empirical t-value exceeds the critical value, it leads this study to infer that the coefficient is statistically significant, given a specific error probability or significance level. The commonly employed critical value for two-tailed tests is 1.96, corresponding to a significance level of 5%.

In addition to giving t-values and p-values, it is recommended to include the bootstrap confidence interval as a means of determining the statistical significance of a route coefficient's deviation from zero. The bootstrap confidence interval is constructed using the standard error obtained from the process of bootstrapping. It provides an estimate of the range within which the true population parameter is likely to fall, given a specified degree of confidence (e.g., 95%). If a confidence interval does not encompass zero for an estimated route

coefficient, it indicates that the hypothesis that the path is equal to zero is rejected, leading the study to conclude that there is a meaningful effect.

Most researchers employ p-value as a means of evaluating the levels of significance. A p-value that is smaller than 0.05 is considered to have statistical significance, indicating that the null hypothesis should be rejected in such instances. A p-value exceeding 0.05 is often seen as lacking statistical significance, indicating that there is insufficient evidence to reject the null hypothesis. The p-value is the likelihood of incorrectly rejecting a null hypothesis that is true, presuming that the path coefficient is significant when it is actually not significant. To establish the statistical significance of a link at a 5% level, it is necessary for the p-value to be less than 0.05, assuming a significance level of 5%.

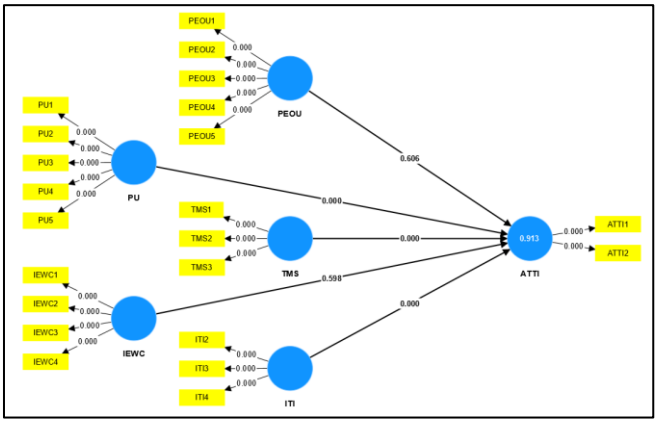

Fig. 6: Path model showing p-value

Following the completion of the surgery, the bootstrapping results for the structural model and measurement model are displayed in Figure 6 and Table 3, respectively, as presented by SmartPLS.

Table 3. Bootstrapping results

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	p-values
IEWC -> ATTI	0.006	0.006	0.012	0.528	0.598
ITI -> ATTI	0.608	0.628	0.122	4.993	0.000
PEOU -> ATTI	0.035	0.033	0.067	0.517	0.606
PU -> ATTI	1.175	1.201	0.105	11.167	0.000
TMS -> ATTI	-0.346	-0.346	0.057	6.019	0.000

Based on a significance level of 5%, the statistical analysis reveals that the relationships in the structural model, specifically IEWC -> ATTI (p=0.598), ITI -> ATTI (p=0.000), PEOU -> ATTI (p=0.606), PU -> ATTI (p=0.000), and TMS -> ATTI (p=0.000), demonstrate statistical significance. When the t-value exceeds 1.96, it can be inferred that the route coefficient is statistically significant at a 5% significance level (α = 0.05) in a two-tailed test. The SmartPLS provides a p-value, which is commonly evaluated using a significance level of 5%. This suggests that a relationship is considered significant if the p-value is less than 0.05.

To analyze the findings, it is necessary to assess the statistical significance of all relationships inside the structural model. This entails examining the empirical t-value, p-value, or the bootstrapping confidence interval. Based on the data presented in Table 3, it can be observed that the path coefficients for the relationships between ITI and ATTI (p=0.000), PU and ATTI (p=0.000), and TMS and ATTI (p=0.000) exhibit statistical significance. The association between IEWC and ATTI, as indicated by a t-value of 0.528 and a p-value of 0.598, and the relationship between PEOU and ATTI, as indicated by a t-value of 0.517 and a p-value of 0.606, both exhibit t-values that are less than 1.96 and p-values that are greater than 0.005. Therefore, based on the findings of this study, the null hypothesis stating that the path is equal to zero is rejected. The results indicate that both IEWC and PEOU have a statistically significant impact on the adoption and acceptance of Human Resource Management Information System (HRMIS) 2.0 among junior officers in Putrajaya.

Table 4. Confidence interval

	Original sample (O)	Sample mean (M)	2.5%	97.5%
IEWC -> ATTI	0.006	0.006	-0.016	0.031
ITI -> ATTI	0.608	0.628	0.409	0.893
PEOU -> ATTI	0.035	0.033	-0.088	0.173
PU -> ATTI	1.175	1.201	1.030	1.444
TMS -> ATTI	-0.346	-0.346	-0.454	-0.229

Upon examining the significance level, it is observed that within the PU -> ATTI relationship, with a probability error threshold of 5%, the confidence interval is determined to have a lower boundary of 1.030 and an upper boundary of 1.444. The significance of the path

coefficient in the link between PU and ATTI is indicated by the fact that the confidence interval does not encompass zero. The significance of the link between ITI and ATTI can also be evaluated due to the absence of zero inside the confidence interval.

In contrast, the results of the TMS to ATTI analysis (t-value -0.454, p-value -0.229) indicate that both the lower and upper boundaries are below zero. This suggests that the null hypothesis can be rejected, leading to the conclusion that there is no statistically significant difference between the two sets of paired data. In the case of PEOU being transformed into ATTI and IEWC being transformed into ATTI, it is observed that the confidence interval encompasses the value of 0. Consequently, it is necessary to reject the null hypothesis. This implies that the PEOU and the IEWC have a statistically significant impact on the effective adoption of HRMIS 2.0 among junior public officers in grades 41-44 working in Putrajaya.

5.0 Discussion

The hypothesis testing results can be summarised in Table 5 below, which includes the t-value, p-value, and confidence interval at (Significant-level of 0.05, 2-tailed).

Table 5. Hypothesis testing

	Relationship between construct	t-value	p-value	Confidence Interval
H01	PEOU -> ATTI	0.517	0.606	(-0.088, -0.173)
H02	PU -> ATTI	11.167	0.000	(1.030, 1.444)
H03	TMS -> ATTI	6.019	0.000	(-0.454, -0.229)
H04	IEWC -> ATTI	0.528	0.598	(-0.016, 0.031)
H05	ITI -> ATTI	4.993	0.000	(0.409, 0.893)

The coefficient of determination (R2) is widely employed as a measure to assess the effectiveness of the structural model. The coefficient quantifies the extent to which the exogenous constructions associated with an endogenous construct account for the variance in that endogenous construct. The calculation of this coefficient involves squaring the correlation between the observed and expected values of a certain endogenous component. The R2 value is a metric that varies between 0 and 1, where a higher number signifies a greater degree of prediction accuracy. According to a study conducted by Hair et al. (2011) on marketing issues research, R2 values of 0.75, 0.5, or 0.25 for the endogenous latent variable can be characterized as significant, moderate, or low, respectively.

In addition, R2, quantifies the proportion of variability in the dependent variables that can be accounted for by the independent variables. Therefore, an increased R2 value enhances the prediction capacity of the structural model. This study utilizes the SmartPLS 4 method to derive the R2 values, while the bootstrapping function in SmartPLS 4 is utilized to create t-statistics values. In the context of this research attempt, the process of bootstrapping involved generating 171 samples from a dataset consisting of 179 cases. The outcome of the structural model is depicted in Figure 7.

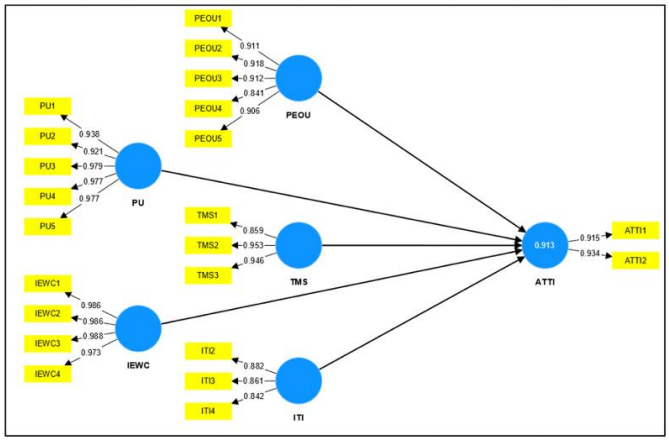

Fig. 7: Structural model

The variables PU, PEOU, ITI, IEWC, and TMS collectively account for 91.3% of the variance seen in ATTITUDE. According to conventional guidelines, the R2 values for ATT (0.913) can be deemed statistically significant. Therefore, the following can be concluded: PU, PEOU, IT, and IEWC have statistically significant effects on the adoption of HRMIS 2.0 within the scope of the junior public officer grade 41-44 working in Putrajaya. In contrast, the TMS is not statistically significant.

The findings also reveal that HRMIS 2.0 lacks customization to meet the specific requirements of the organizations, as indicated by the PU factor, making it less appealing for those with unique HR processes. Meanwhile, the PEOU factor indicates poor user experience, possibly due to the user interface, which is not intuitive or user-friendly. This factor may discourage adoption, as employees and HR professionals may find it difficult to use it. There is also a need to upgrade IT infrastructure so that the system can be more stable and efficient. Lastly, the users may not receive proper training on how to use HRMIS 2.0 effectively, leading to frustration and underutilization of the system, as indicated by the IEWC factor. Thus, training and support should be provided by organizations as a way to increase their skills in using the system (Jalil et al., 2023; Thani et al., 2023).

6.0 Conclusion & Recommendations

Through comprehensive research, this study has successfully identified critical factors influencing the low adoption and acceptance of HRMIS 2.0 within the specific demographic. By conducting a thorough investigation, the study unveiled key barriers and challenges faced by public junior officers in Putrajaya in embracing HRMIS 2.0, shedding light on crucial insights that were previously unexplored. Moreover, this study does not merely stop at the identification of issues; it extends to practical solutions. This study proposes actionable recommendations such as investing in comprehensive training for the officers, clearly communicating the benefits of the system, customizing the system interface to fit their usability, and providing ongoing IT support for the users. Additionally, fostering a culture of change and innovation within the organization can help overcome resistance to adopting new HR technology. These suggestions aimed at enhancing the adoption and acceptance rates of HRMIS 2.0 among junior officers in grades 41- 44. Surprisingly, this study also reveals that top management support does not significantly affect the low adoption of the HRMIS 2.0 system. However, a recommendation from one respondent to provide an enforcing law or policy to increase the adoption of HRMIS 2.0 should be considered by the Public Service Department in an effort to increase the use and adoption rate of HRMIS 2.0. Meanwhile, policymakers can play a crucial role in addressing this issue by implementing a range of strategies and initiatives, such as financial and regulatory support, training and skill development, consultation and support services, as well as research and development funding (Shukor et al., 2019).

In essence, this study contributes not only by uncovering the root causes behind the low adoption rates but also by offering tailored strategies to propel the improvement of HRMIS 2.0 adoption with the targeted demographic. This dual-layered approach ensures that the findings pave the way for practical, informed, and impactful interventions in the realm of human resource management. As this study faced limited time for data collection and analysis, future research may include rural areas and a wider population of sampling. It is recommended that main public bodies such as JPA should conduct the study on all government servants to have more comprehensive results. As this study limits to the independent factors according to the TAM model, future studies may also explore other mediating and dependent factors, expanding on the various factors that could potentially affect the adoption and acceptance of HRMIS 2.0. A qualitative study to understand how to improve HRMIS 2.0 could be proposed as well.

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