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Analyzing the determinants of user behavior toward the Sipenduduk e-government application in Pekanbaru city

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ABSTRACT

This study aims to examine the determinants of citizen behavior toward the Sipenduduk e-government application in Pekanbaru City by extending the Unified Model of Electronic Government Adoption (UMEGA) through the inclusion of trust in government and hedonic motivation. A quantitative explanatory approach was employed using survey data collected from 393 active users of the Sipenduduk application. The data were analyzed using Partial Least Squares–Structural Equation Modeling (PLS-SEM) with SmartPLS 4.0 to assess both measurement and structural models. The findings reveal that performance expectancy, social influence, hedonic motivation, and trust in government significantly influence citizens' attitudes toward using the application. Attitude, in turn, significantly affects behavior toward using e-government services. However, effort expectancy, facilitating conditions, and perceived risk do not show significant effects on behavioral outcomes. The model demonstrates strong explanatory power for attitude (R^2 = 0.583) and moderate explanatory power for behavior (R^2 = 0.285), highlighting the central role of psychological and institutional factors in shaping adoption behavior. These findings suggest that local governments should not only enhance the technical performance of digital services but also strengthen public trust and create engaging user experiences to increase sustained usage of e-government applications.

Contribution/Originality: The present study adds to the role of the UMEGA model the variables of trust in government and hedonic motivation to address the issue of people's behavior in the use of e-government services offered by local governments in the study. The present research addressed a specific research gap in the theoretical accuracies in the models of adapting e-government services in a developing country like Indonesia.

1. INTRODUCTION

A public-driven digital transformation approach is increasingly recognized as a strategic choice to improve public administration's efficiency and transparency. The concept of e-government goes beyond bureaucratic administrative processes and has become a vital tool for governments to deliver public services effectively and efficiently. This development reflects a broader shift toward governance structures capable of meeting the needs of a society that is increasingly digitalized (Assegaff, Andrianti, & Astri, 2021). In Indonesia, the government has introduced numerous

digital service platforms, ranging from population administration systems to licensing applications and other online public services. Nevertheless, citizen utilization of these platforms remains limited. Adoption is hindered in various ways by technological constraints, the social and cultural environment, economic inequalities, and psychological factors. Therefore, to ensure that public expenditures on technological infrastructure in the public sector lead to tangible results and not operational inefficiencies and the wastage of public funds in the process, it has been imperative to investigate the factors that influence user behavior in these systems. (Meiranto, Farlyagiza, Faisal, Yuyetta, & Puspitasari, 2024; Müller, Lerusse, Steen, & Walle, 2021). However, the public use of e-government services has been below promise, despite efforts being made to ensure that these services and processes become faster, cheaper, and more transparent in developing countries like Indonesia, where the research has been undertaken (Fu & Lee, 2014).

There's lots of talk but no action here. Even though the government has introduced a plethora of digital platforms that handle everything from population management to taxation, licensing, and public complaint services, a lot of it hasn't engaged citizens or experienced much traction in real usage. Moreover, in practical implementation, many platforms have failed to experience the level of user engagement that was expected; the data shows there is a clear gap between the provided online services and their usage by the public (Al-Kautsar Maktub, Handayani, & Sunarso, 2025). The major issue, therefore, does not relate to the availability of technological infrastructure but to the mindset with which people interpret the technology and decide to what extent they can build their trust and use the government-operated online platforms. In other words, user behavior and the level of trust are the decisive factors at this stage. This situation illustrates the apparent gap between the government's delivery of online facilities and citizens' preparedness to embrace and use the technology (Galindo, 2001; Hutahaean, Eunike, & Silalahi, 2023; Riedl, 2004).

This particular topic assumes special importance for two reasons. First, digital transformation investments are unlikely to ensure the achieved objectives without mass public engagement. This can be attributed to the fact that the efficiency of public expenditure, the accessibility of public services, and the uptake of digital governance initiatives by the public could be undermined by very low adoption rates (Nawafleh, 2020; Park & Lee, 2018). Secondly, in most areas of life, the COVID-19 pandemic has significantly pushed the need for digital public services. The adoption of digital government services is hindered by the continued concerns associated with the security and risks associated with privacy, although the public now expects services that are quick, easy to access, and safe (Alam, Al Abdouli, Khamis, Bhuiyan, & Rahman, 2021; Roztocki, Strzelczyk, & Weistroffer, 2024; Tetteh, Combs, Geng, & McKay, 2022).

Research has now uncovered a blend of situational and psychological elements that influence Indonesians' reactions to e-government applications. Individuals' willingness to embrace and continue embracing digital government services can be driven by several dimensions, such as a precursor or an expectation of how a system may work effectively, ease of use, support, ready access to valuable resources, risks, trust in government agencies, or even having fun with digital applications (Meiranto et al., 2024; Pribadi, 2024; Sukardi, Fadli, Puspitawati, Maharani, & Luthfi, 2022). At the same time, a nation's or region's prevailing cultural characteristics and norms can shape individual-level predispositions toward embracing digital government platforms or services. These conditions influence technology acceptance behavior and trust positioning within digital platforms administered by governments or state agencies for an intended population (Fadrial, Sujianto, Simanjuntak, Wirman, & Wibowo, 2024; Fakhruzzaman & Dimitrova, 2020; Puspasari, Mustaqim, Utami, Syalevi, & Ruldeviyani, 2024). Sustaining digital transformation over the long term requires governments to understand how user behavior is shaped by psychological, social, and technological considerations. When these dimensions are properly acknowledged, policymakers are able to design digital services that do more than operate effectively but also correspond to citizens' expectations and levels of readiness.

A number of technology adoption frameworks have been developed over time, such as the Unified Theory of Acceptance and Use of Technology (UTAUT), the Technology Acceptance Model (TAM), and the Unified Model of Electronic Government Adoption (UMEGA). These frameworks are used to explain how people adopt and interact with digital technologies. They offer structured insights into why individuals develop certain intentions and

behavioral responses when engaging with technology-based government services (Akinnuwesi et al., 2022; Almourad, Hussein, Kamoun, & Wattar, 2019; Fang, 2002; Naranjo-Zolotov, Oliveira, & Casteleyn, 2019; Rao, 2011). Nevertheless, there has been quite a bit of literature related to the paradigm of organizations and businesses, which means that there has been less attention paid to the normal usage experience of regular citizens utilizing online governmental services. There have been few studies related to the characteristics in behavior exhibited by lower-level users within the realm of e-government that have examined both trust and hedonic motives.

The results of the research are expected to benefit local government institutions by providing them with the knowledge and understanding necessary to develop more user-friendly digital applications and effective communication programs. The title of the research, which is "Analysis of Factors Influencing User Behavior of the Sipenduduk E-Government Application in Pekanbaru City," has strategic implications since it promotes equality and equity in the delivery of public services and aligns with initiatives regarding smart governance and the digital transformation of the nation.

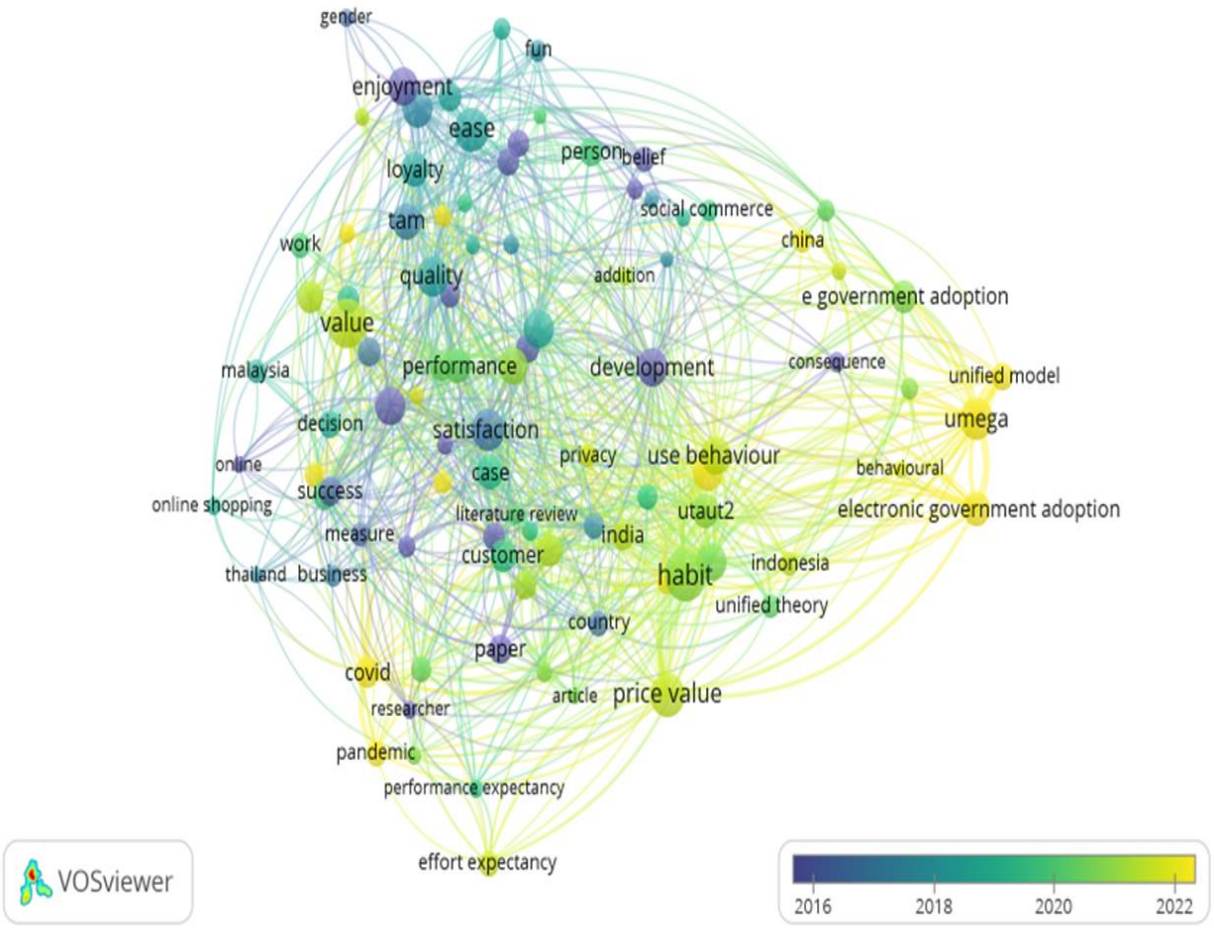

Figure 1. Bibliometric visualization.

A bibliometric analysis utilizing the VOSViewer program is presented in Figure 1, which maps the keywords' occurrence to the papers examining the uptake and usage patterns of e-government. The concepts of habit, performance expectancy, and effort expectancy are highlighted in this analysis, along with significant theories of technology adoption, including UTAUT, UTAUT2, and UMEGA. Although psychological aspects such as enjoyment, ease of use, and personal belief are present, they tend to appear as peripheral elements rather than being fully embedded within institutional adoption models.

The visualization also indicates that, while developing countries, including Indonesia, India, and China are represented, empirical research at the municipal level remains relatively scarce. In addition, few studies combine trust in

government and hedonic motivation within the UMEGA framework. The current study, which aims to expand UMEGA by incorporating institutional trust and affective motivation to better explain user behavior toward the Sipenduduk e-government application in Pekanbaru City, is urgently needed because this trend reveals a glaring empirical vacuum.

Despite numerous studies conducted on the adoption of e-government, there are still very few empirical studies regarding the combination involving trust in government, hedonic motivation, and the UMEGA model explained from the perspective of local citizens in Indonesia.

This applies particularly within the municipal e-government, in which the beliefs of users, together with affective experience, have tremendous implications for adopting the services provided. The current research will serve to fill this gap by adding institutional trust and hedonic motivation to the UMEGA model.

2. METHOD

This study investigated the theories derived from the expanded Unified Model of Electronic Government Adoption (UMEGA) using a quantitative explanatory research design. Partial least squares structural equation modeling (PLS-SEM) was used to examine the relationships between performance expectancy, effort expectancy, social influence, facilitating conditions, perceived risk, hedonic motivation, trust in government, attitude, and behavioral intention to use e-government.

Eight theories were developed using this framework: H1 argues that attitude toward using e-government is positively impacted by performance expectancy, H2 asserts that attitude is positively impacted by effort expectancy, and H3 proposes that attitude is positively impacted by social influence. Moreover, H5 assumes that there will be a negative impact of perceived risk on behavioral intention to use e-government, and the impact of facilitating conditions will have a positive effect according to H4.

Furthermore, the assumptions made by the study include the fact that H6 proposes hedonic motivation to have a positive impact on attitude, and the hypothesis, H7, proposes government trust to have a positive impact on attitude, whereas the assumption made by the study asserts this condition that there will be a positive impact of attitude on behavioral intention to use e-government, according to H8. For testing the hypotheses, the results of the SmartPLS Version 4.0 software were noted, which tested the values of the paths, including β, t-statistic, and p-value using the bootstrapping technique.

2.1. Hypotheses Development

H_1: Performance Expectancy positively influences Attitude toward using e-government.

H_2: Effort Expectancy positively influences Attitude toward using e-government.

H_3: Social Influence positively influences Attitude toward using e-government.

H_4: Facilitating Conditions positively influence Behavior Toward Using E-Government.

H_5: Perceived Risk negatively influences Behavior Toward Using E-Government.

H_6: Hedonic Motivation positively influences Attitude toward using e-government.

H_7: Trust in Government positively influences Attitude toward using e-government.

H_8: Attitude positively influences Behavior Toward Using E-Government.

3. RESULTS AND DISCUSSION

3.1. Outer Model Evaluation

The loading factor values and the average variance extracted (AVE) for each construct were examined in order to assess the outer model. The measurement items' ability to accurately capture the constructs they were designed to represent was assessed using both indicators. An overview of the strength of each indicator's relationship to its corresponding latent variable is given in Figure 2, which displays the loading factor results for Sipenduduk users in Pekanbaru City.

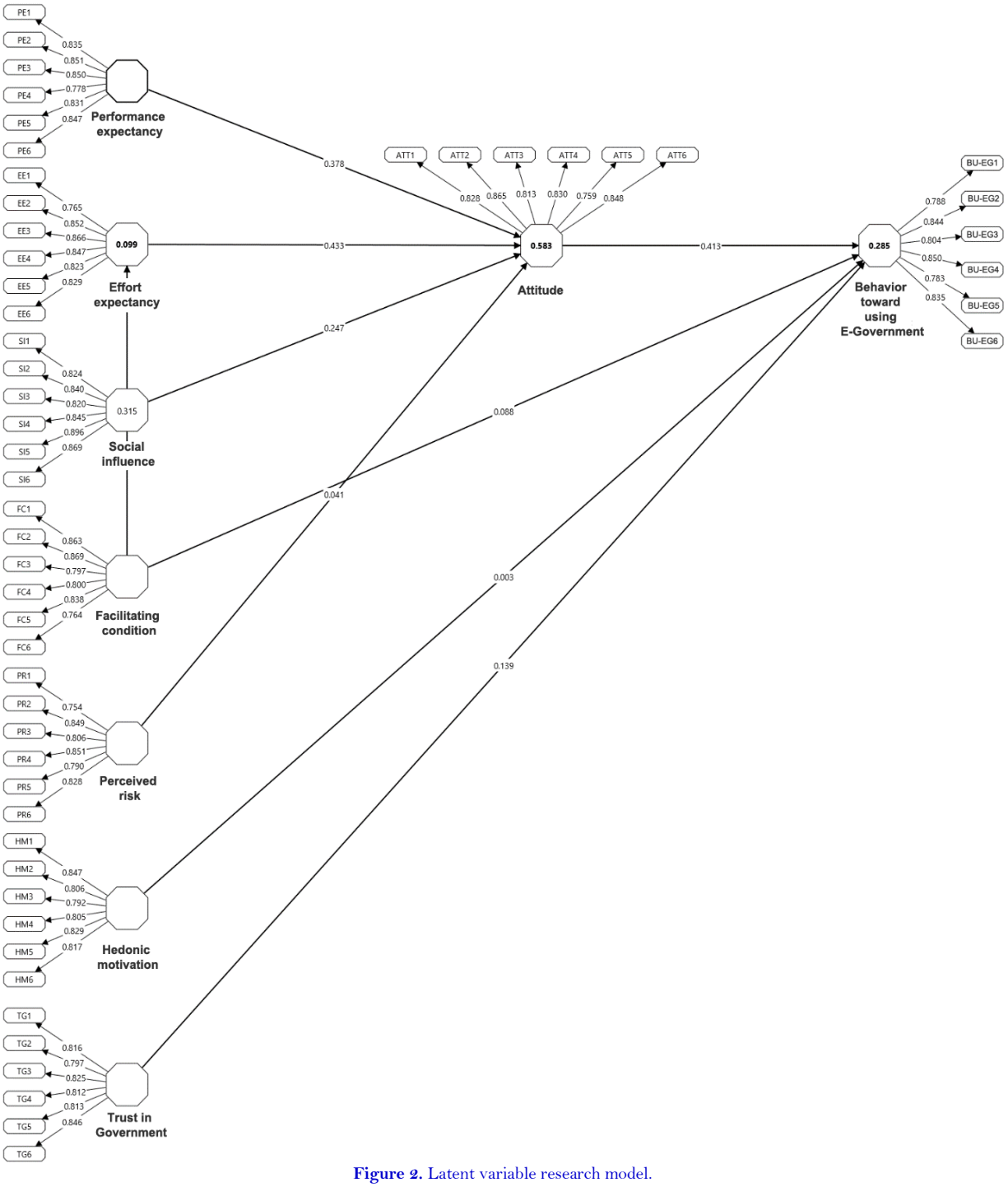

Figure 2. Latent variable research model.

The effects of Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Facilitating Conditions (FC), Perceived Risk (PR), Hedonic Motivation (HM), and Trust in Government (TG) on users' Attitudes (ATT) and Behavior Toward Using E-Government (BU-EG) were investigated in this study using a modified UMEGA framework. Each construct was analyzed for both its immediate impact and its place in the larger Sipenduduk adoption mechanism.

a) Loading Factor and Average Variance Extracted (AVE) Values

The average variance extracted (AVE) and loading factor values were used to evaluate convergent validity. Since most indicators load above 0.75 and AVE values vary from 0.662 to 0.716, the results demonstrate that all reflective constructs meet acceptable validity and reliability criteria. The number of indicators (k), minimum and maximum

loading values, average loading scores, and the AVE computed for each construct are reported in the summary that follows.

Table 1. Outer loading results and AVE convergent validity test.

Construct	(k)	Loading min	Loading max	Loading mean	AVE
Performance expectancy	6	0.778	0.851	0.832	0.693
Effort expectancy	6	0.765	0.866	0.83	0.691
Social influence	6	0.746	0.892	0.845	0.716
Facilitating condition	6	0.764	0.869	0.822	0.677
Perceived risk	6	0.754	0.851	0.813	0.662
Hedonic motivation	6	0.792	0.847	0.816	0.666
Trust in Government	6	0.797	0.846	0.818	0.67
Attitude	6	0.759	0.865	0.824	0.68
Behavior toward using E-Government	6	0.783	0.85	0.817	0.669

In Table 1 Strong convergent validity was shown by each construct. Each construct's minimum and highest loading values fell between 0.746 and 0.892, whereas the average standardized loadings varied between 0.813 and 0.845. These findings verify that each indication has a strong correlation with the latent variable that corresponds to it. Every AVE, which ranged from 0.662 to 0.716 recorded values, was higher than the typical Fornell and Larcker threshold value of 0.50. With averages of 0.845, 0.832, and 0.830, respectively, Social Influence had the greatest AVE at 0.716, followed by Performance Expectancy at 0.693 and Effort Expectancy at 0.691. The remaining dimensions that satisfied the acceptable criteria were Facilitating Conditions (0.677), Hedonic Motivation (0.666), Perceived Risk (0.662), Trust in Government (0.670), Attitude (0.680), and Behavior Toward Using E-Government (0.669). All of these findings demonstrate that the measurement model satisfies the validity requirements and can proceed to the structural model evaluation.

b) Cronbach's Alpha Value and Composite Reliability

As is typical with PLS SEM, the construct reliability values were computed using Cronbach's Alpha (CA) and Composite Reliability (CR). For CA and CR, a value of 0.70 or higher would be deemed appropriate. The outcomes show that every concept satisfies this requirement:

Table 2. Cronbach's Alpha & Composite reliability values.

Variables	Cronbach's alpha	Composite Reliability	Description
PE	0.911	0.912	Reliable
EE	0.910	0.914	Reliable
SI	0.922	0.924	Reliable
FC	0.904	0.905	Reliable
PR	0.898	0.912	Reliable
HM	0.900	0.913	Reliable
TG	0.902	0.909	Reliable
ATT	0.905	0.907	Reliable
BU-EG	0.901	0.902	Reliable

Table 2 presents the Cronbach's Alpha and Composite Reliability values for all constructs in the model. The results indicate that all variables exceed the recommended threshold of 0.70, confirming strong internal consistency and reliability of the measurement instruments used in this study.

Every variable in the study achieves appropriate levels of both Cronbach's Alpha and composite reliabilities, which surpass the suggested cut-off value of 0.70, according to the construct reliability analysis conclusion. This suggests that each collection of indicators quantifies its own concepts. For example, Performance Expectancy returns a Composite Reliability score of 0.912 and a Cronbach's Alpha value of 0.911, indicating strong internal consistency and verifying that the indicators successfully represent users' expectations of system performance. Effort Expectancy,

perceived danger, social influence, enabling factors, and hedonic motivation all show similar reliability patterns and stay above the recognized threshold.

Strong dependability results are also shown by the other dimensions, which include behavior toward using e-government, attitude, and trust in the government. This implies that the indicators accurately gauge users' attitudes, behavioral inclinations, and trust in relation to the adoption of e-government. Taken all together, the above findings confirm the validity of the instruments used in the current study and can form the basis for further research into the structural model assessment.

3.2. Model Fit

To ascertain the model fit, a comparison of the estimation results obtained using the SmartPLS 4.0 software was made against some set standards. The standards for model fit, which are set below, are used to confirm the amount of fit achieved by the model.

Table 3. Model fit test outcomes.

Parameters	Value	Description
SRMR	0.087	Good model fit
NFI	0.864	Good enough
Q^2 Predictive Relevance -Attitude	0.395	High predictive relevance
Q^2 Predictive Relevance -Behavior	0.223	Moderate predictive relevance
Q^2 Predictive Relevance -Effort E.	0.092	Low predictive relevance

Table 3 presents the model fit test outcomes, including SRMR, NFI, and Q^2 predictive relevance values. The SRMR value of 0.087 indicates an acceptable model fit, while the NFI value of 0.864 demonstrates an adequate level of model fitness. The Q^2 results further confirm that the model has strong predictive relevance for Attitude and moderate predictive relevance for Behavior Toward Using E-Government.

The explanatory power of the attitude constructs is high based on the results of the predictive relevance test; hence, the model performs well in explaining the variance in the respondents' perceptions of the usage of e-government services. The model is able to explain actual usage in the digital public space remarkably, as indicated by the moderate level of predictive relevance of the Behavior Toward Using E-Government construct. Effort expectancy performs relatively poorly in terms of predictive relevance; hence, the model explains less variance in this construct than the others. Overall, the Q^2 results show that the suggested study model has significant predictive power, especially for attitudes and actions related to e-government use. The aforementioned findings support the practicality and usefulness of the modified UMEGA model, which incorporates contextual factors and user characteristics to explain e-government adoption.

3.3. Inner Model (Structural Model Assessment)

In Partial Least Squares–Structural Equation Modeling (PLS-SEM), the inner model evaluation aims to assess the explanatory and predictive power of the proposed structural relationships among latent variables. This assessment focuses on hypothesis testing through path coefficients, as well as the proportion of variance explained (R^2) in each endogenous construct.

3.4. Hypotheses Testing and Structural Relationships

Having validated the measurement model, the structural model was tested using a bootstrapping approach using SmartPLS 4.0 software. The result gave the values of the path coefficients (β), the t-statistics, and the p-values that validated the proposed relationships among the constructs. The outcome of the test of the hypotheses is given in Table 4.

Table 4. Structural model results.

Hypothesis	Structural path	Path coefficient (β)	t-value	p-value	Result
H1	Performance Expectancy → Attitude	0.314	> 1.96	0.000	Supported
H2	Effort Expectancy → Attitude	n.s.	< 1.96	> 0.05	Not supported
H3	Social Influence → Attitude	0.132	> 1.96	0.000	Supported
H4	Facilitating Conditions → Behavior Toward Using E-Government	n.s.	< 1.96	> 0.05	Not supported
H5	Perceived Risk → Behavior Toward Using E-Government	n.s.	< 1.96	> 0.05	Not supported
H6	Hedonic Motivation → Attitude	Significant	> 1.96	0.000	Supported
H7	Trust in Government → Attitude	Significant	> 1.96	0.000	Supported
H8	Attitude → Behavior Toward Using E-Government	0.413	7.356	0.000	Supported

The results indicate that Performance Expectancy, Social Influence, Hedonic Motivation, and Trust in Government have significant positive effects on Attitude toward using the Sipenduduk e-government application. Conversely, effort expectancy fails to produce a significant effect on attitude. Additionally, attitude strongly and significantly affects behavior related to using e-government, supporting the mediating role of attitude. However, facilitating conditions and perceived risk do not produce significant results for behavioral consequences.

3.5. Explanatory Power (R-Square Analysis)

The explanatory ability of the model is further evaluated using the coefficient of determination, known as R-square, which shows how much of the variance of the endogenous construct is explained by its predictor. The R-square values are presented below in Table 5.

Table 5. R square test results (R^2).

Dependent variable	R-square	R-square adjusted
Effort expectancy	0.099	0.097
Behavior toward using E-Government	0.285	0.277
Attitude	0.583	0.579

The R^2 value for effort expectancy is very low at 0.099, indicating that this variable can be explained by other variables not included in the model. The R^2 value for behavior towards using e-government indicates a moderate level of explanatory power at 0.285, suggesting that this model explains 28.5% of the variance in user behavior tendencies.

Attitude has the strongest explanatory power with regard to the outcome, due to the high R^2 with a value of 0.583. It indicates that the exogenous variables explain more than half the variability in the user's attitude towards e-government. The results verify that the attitude has the strongest influence compared to the other endogenous variables on the structural model.

3.6. Predictive Relevance (Q^2)

The predictive relevance of the model (Q^2) was investigated by using the blindfolding technique, which was carried out by utilizing the SmartPLS 4.0 toolbox. The outcome will be considered positive if the Q^2 values are greater than zero, and higher values indicate better results.

This result reveals that the Attitude (ATT) construct has a great predictive relevance level since the Q^2 measure equals 0.395. This reveals that it has a very high predictability level in terms of the variations in the attitudes of the citizens concerning the use of e-government services. It can thus be stated that the established constructs have a very high level of predictive power concerning the user attitude.

The Behavior Toward Using E-Government (BU-EG) has a moderate level of predictive significance, with a Q^2 of 0.223. This implies that while it has beneficial predictive value for actual behavior, there may be certain underlying factors within that environment that may be able to explain such behavior. Conversely, results obtained from the model indicate that effort expectancy has little predictive value since its Q^2 value is 0.092. Conversely, the model's results indicate that the predictive significance of Effort Expectancy (EE) is low, as evidenced by a Q^2 value of 0.092, which suggests that the model has limited predictive power regarding changes related to the perceived effort required for ease of use. The overall interpretation of the results of Q^2 values indicates the proposed model has sufficient predictive significance, in particular regarding the attitude and behavioral aspects of the use of e-government. The results further improve the significance of the modified UMEGA model in measuring the adoption of e-government and the predictive potential of change at the level of local government institutions.

3.7. Discussion (Interpretative)

3.7.1. Theoretical Implications

From a theory perspective, this study provides a crucial piece of evidence on the importance of extending the Unified Model of Electronic Government Adoption (UMEGA) framework to incorporate trust in government and hedonic motivation. Thus, in this context, the results have succeeded in demonstrating the relevance of institutional and emotional aspects related to the adoption of e-government services, and not just the technical and cognitive ones.

The significant role of trust in government in shaping attitude supports the use of the Institutional Trust Theory within the context of digital governance. This specific empirical evidence confirms the role of public trust in government institutions, as it has an implication for the attitude of the public towards the use of digital governance. The significant role of hedonic motivation also supports the role of affect within the technology adoption components of the proposed model.

Moreover, the pre-eminent mediating variable of attitude is supportive of the theory of planned behavior, as it continues to emphasize that attitude acts as the most important mediating variable in the relationship of cognitive and social constructs to actual usage behaviors. Together, the results above offer value to the existing body of knowledge through the provision of a more comprehensive approach to the study of the adoption of e-government.

3.7.2. Comparison with Previous Studies

The results of the current study support previous studies that identified the significance of performance expectancy and social influence in encouraging user attitudes towards the use of e-government services (Meiranto et al., 2024; Naranjo-Zolotov et al., 2019). As seen in previous studies in the Indonesian context and other developing nations, performance-related benefits continue to be an influential aspect of producing a satisfactory level of user perceptions. Despite this, it must be noted that the current research makes an addition to existing literature, as it shows that trust in the government was found to become a significant determinant of attitude compared to the technical aspects, as proposed by the arguments of Nawafleh (2020) and Fadrial et al. (2024) in their respective research articles. Furthermore, the current study contributes to the existing body of knowledge by providing empirical evidence from the perspective of end users.

In contrast to previous studies, in which the results indicated a major influence of effort expectancy, the current study reveals the non-significant effect of effort expectancy on both attitude and predictive relevance. This finding indicated that in the current setting, users consider the issue of ease of use to be taken for granted and are no longer influenced by it, in line with the current observations in the electronic services sector.

Overall, compared to earlier TAM- and UTAUT-based studies, this research offers a more context-sensitive explanation of e-government adoption by integrating trust and hedonic motivation within the UMEGA framework, thereby providing both theoretical advancement and practical relevance for digital governance in developing countries.

4. CONCLUSION

This study examined the determinants of citizen behavior toward the Sipenduduk e-government application in Pekanbaru City by applying a modified Unified Model of Electronic Government Adoption (UMEGA) that incorporates Trust in Government and Hedonic Motivation. Using a PLS-SEM approach with data from 393 active users, the findings provide clear empirical evidence regarding the factors that shape attitudes and behavioral intentions toward e-government adoption at the local government level.

The results from the structural equation model testing indicate that the factors that significantly affect the attitude of the members of the public towards the adoption and use of the e-government services are performance expectancy, social influence, hedonic motivation, and trust in government. Effort expectancy fails to establish any significant effect on the attitude. Moreover, attitude was observed to have shown significant influence on behavior towards the use of e-government services. However, facilitating conditions and perceived risk were not observed to have any significant effect on the behavior outcomes regarding the adoption of the technology.

From an explanatory perspective, the model demonstrates strong predictive capability for Attitude ($R^2 = 0.583$) and moderate explanatory power for Behavior Toward Using E-Government ($R^2 = 0.285$). The predictive relevance analysis further confirms these results, with high Q^2 for Attitude, moderate Q^2 for Behavior, and low Q^2 for Effort Expectancy, reinforcing the dominance of psychological and institutional factors over purely technical considerations.

Theoretically, this study extends the UMEGA framework by integrating institutional trust and affective motivation, thereby enriching existing e-government adoption models that have traditionally emphasized cognitive and performance-based factors. The findings also demonstrate the complementary relevance of the Theory of Planned Behavior and Institutional Trust Theory in explaining citizen adoption of digital public services in developing country contexts. Despite its contributions, this study has limitations. Its focus on a single municipality limits the generalizability of the findings, and the exclusive use of a quantitative PLS-SEM approach restricts deeper exploration of users' subjective experiences. Future research is therefore encouraged to adopt mixed-method designs, expand analysis across multiple cities, and examine additional mediating or moderating variables such as digital literacy, perceived transparency, and user satisfaction to further strengthen the explanatory power and applicability of the proposed model.

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Institutional Review Board Statement: This study involved human participants and was conducted in accordance with ethical standards for social science research. The study posed minimal risk to participants. Formal approval from an Institutional Review Board was not required under the institutional policies of Universiti Sultan Zainal Abidin (Malaysia) and Universitas Islam Riau (Indonesia). Participation was voluntary, informed consent was obtained from all respondents prior to data collection, and all data were anonymized to ensure confidentiality.
Transparency: The authors state that the manuscript is honest, truthful, and transparent, that no key aspects of the investigation have been omitted, and that any differences from the study as planned have been clarified. This study followed all writing ethics.
Data Availability Statement: The corresponding author can provide the supporting data of this study upon a reasonable request.
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Disclosure of AI Use: Artificial intelligence tools were used to assist with language editing and grammar improvement. All content was critically reviewed and validated by the authors, who take full responsibility for the final manuscript.

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