

User Acceptance Analysis of SINAGA Digital Attendance System Using Integrated UTAUT and SCT Models with PLS-SEM for Civil Servants in Purbalingga Regency

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Abstract

This study combines two main theories, namely the Unified Theory of Acceptance and Use of Technology (UTAUT) and Social Cognitive Theory (SCT), to analyze the level of user acceptance of the SINAGA digital attendance system among civil servants in Purbalingga Regency. This study aims to identify factors that influence technology adoption through an integrated UTAUT approach with SCT moderation, particularly self-efficacy. The method used was a survey of 102 respondents, with analysis using Partial Least Squares-Structural Equation Modeling (PLS-SEM) involving testing of outer and inner models through the Slovin approach. The results show that factors such as Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), and Facilitating Conditions (FC) significantly influence Behavioral Intention (BI). Self-Efficacy (SE) and Outcome Expectancy (OE) also act as moderating factors that strengthen the relationship between PE and BI, as well as EE and BI. With an R^2 value of 78%, this model has a high explanatory power regarding users' behavioral intentions in adopting the system. This study contributes to the development of technology acceptance theory in the public sector, particularly for e-government systems, and suggests improving users' digital competence and optimizing infrastructure to support further technology acceptance with the integration of artificial intelligence (AI) technology in the system for more efficient dynamic monitoring. The main contribution of this research is the development of digital systems within the Indonesian government, in line with the sustainability of technology adoption in the public sector.

Keywords : *ASN Digital Acceptance, E-Government Attendance, PLS-SEM Analysis, SCT Moderation, SINAGA System, UTAUT Integration*

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1. INTRODUCTION

Advances in information technology have significantly accelerated the pace of digitization in various industries, including government. This digitization includes the application of technology to improve work processes and public services, making them more efficient and transparent [1] [2]. In addition, information technology also facilitates employee performance monitoring, thereby increasing accountability in government. Therefore, the adoption of information technology is not just a change in tools, but an important step towards a modern government that is responsive to the needs of the community. [3]

Changes in the use of e-government services in government agencies [4] [5] An online attendance system is a digital system that records a person's attendance electronically and in real time, replacing manual paper-based methods.[6] Defining an online attendance system as an automated system that records the attendance of teachers or students when conducting learning through digital devices connected to the internet, enabling efficient and accurate data collection. Dr. Agus Prasetyo (2022) highlights its ability to support data analysis, providing a clear picture of individual attendance patterns.

Overall, online attendance is a digital, internet-based solution that improves accuracy, efficiency, and accessibility in attendance management, both in educational institutions and work environments.

Previous studies [7] have used UTAUT to examine technology acceptance in the general public and public services. Studies that specifically discuss technology acceptance among civil servants are very limited and only use theory. Furthermore, the integration of theories such as UTAUT and SCT to capture cognitive and social aspects simultaneously is still rarely applied, especially using the PLS-SEM approach. Therefore, this study aims to fill the existing gap by developing an integrated UTAUT and SCT model to understand the factors that influence the technology of Central Java Government civil servants in Purbalingga Regency using PLS-SEM analysis.

[8] shows that self-confidence is one of the key variables in Social Constructivism Theory (SCT), which gradually but surely improves performance through the use of media via the channels of effort expectancy, performance expectancy, social influence, and availability. This pattern supports the idea that belief in personal ability plays a role in influencing how people perceive ease and benefits, social norms, and service availability, which in turn encourages the use of mobile-based attendance applications.

The UTAUT model, developed to fill the gap left by previous acceptance theories, significantly improves the ability to predict user behavior related to new technologies.[9] [10] Research shows that UTAUT performs much better than TAM and other models, explaining more than 70% of the variation in technology adoption. [11]

The UTAUT theory and its extension, UTAUT2, have been proven to have significant differences in terms of applicability and explanatory power related to technology acceptance by consumers.[12] [13] According to Venkatesh et al. (2003), a robust framework called UTAUT has been developed, consisting of four main constructs: Performance Expectancy, Effort Expectancy, Social Influence, and Supportive Conditions. When combined, these variables explain most of the variables in users' behavioral intentions and actions related to the adoption of new technology. Specifically, it has been proven that UTAUT explains about 77% of the variables in behavioral intention and 52% of the variables in actual technology use.[14]

UTAUT consists of four main constructs: performance expectancy, effort expectancy, social influence, and facilitating conditions. Performance expectancy relates to the user's level of confidence that using the technology will improve their work performance, while effort expectancy relates to how easy the technology is to use.[15] Hybrid systems can be used in the four main constructs of UTAUT. [16]

Therefore, by adopting the UTAUT model and using PLS-SEM [17] analysis techniques that focus on predictive models, an evaluation can be conducted to identify factors that significantly influence the increased use of the civil servant attendance system (ASN), thereby improving the quality of the attendance system implementation. Unlike covariance-based SEM, which requires normally distributed data for its operation, PLS-SEM uses data that does not have to comply with data normality standards [18].

Table 1 provides a comparison of UTAUT model variants used in technology studies in the public sector, particularly in the context of e-government. The first [19] integrates SCT modifications with the UTAUT model to examine cognitive factors in e-government services, although there are still shortcomings in the full application of SCT moderation. The second study [20] adopted the UTAUT2 model with AI-based predictions to predict technology adoption in e-government, but failed to integrate SCT moderation relevant to the public sector. The third study [21] introduced an expanded UTAUT model with trust and satisfaction metrics and employee attendance monitoring, but did not consider SCT in that context. The fourth study [22] introduces a more integrated application of SCT in public sector training for e-government applications, highlighting the importance of cognitive factors in technology

development and adaptation in this sector. This comparison confirms that although variations in the UTAUT model provide insights into technology adoption, the integration of SCT moderation in the public sector remains a challenge that needs to be further developed, especially for more effective training and e-government applications.

The purpose of this study is to determine the correlation between variables that determine the acceptance and use of the civil servant attendance system. The benefits of this study include providing recommendations to the Central Java Provincial Government based on elements that have a significant influence on the use of the civil servant attendance system and providing a realistic picture of its current implementation.

Table 1. Comparison of UTAUT Variants

Study	Model Extension	Explanatory % BI/Use	Context: Gov Attendance	E-Gov vs	Gap : No SCT Moderation	No Novelty vs UTAUT2 (Consumer)
[19]	UTAUT with SCT Cognitive Moderation	68% BI, 70% Use	E-Gov Services (Public Sector)		Lacking SCT Moderation	Incorporates cognitive SCT factors for public sector, enhancing understanding of individual cognitive processes in e-gov services.
[20]	UTAUT2 + AI-based prediction of acceptance	70% Use, 65% BI	E-Gov technology adoption	with on	No based cognitive moderation	UTAUT2 lacks cognitive moderation for public sector, focusing on consumer behavior rather than public-sector nuances.
[21]	Extended UTAUT with Trust and Satisfaction Metrics	60% BI, 64% Use	E-Gov employee attendance monitoring	and	No cognitive consideration	Focus on consumer adoption; public sector context misses integration of cognitive SCT for employee training and adaptation.
[22]	UTAUT with SCT cognitive biases and training models	72% Use, 75% BI	Public Sector Training (e-Gov)	Sector (e-Gov)	SCT Moderation fully integrated	Emphasis on cognitive SCT; contrasts UTAUT2 consumer focus. Pioneers the need for cognitive SCT in public-sector e-gov applications.

2. METHOD

The research flow with the hypotheses determined in this study is shown in Figure 1. The UTAUT factors that influence intention and usage behavior, the variables used in this study are: Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), and Facilitating Conditions (FC). UTAUT will be used in this study to identify the elements that support or hinder the adoption of the SINAGA online attendance system by users. Albert Bandura developed Social Cognitive Theory (SCT), which emphasizes the value of the social learning environment. Previous studies[23]. Demonstrating that the UTAUT model represents an integrated approach to evaluating technology acceptance, it provides valuable insights through the integration of elements from SCT. This integrative method allows

for a comprehensive understanding of how motivation, cognitive beliefs, social context, and user experience collaboratively influence technology adoption across various sectors and environments. Key concepts in SCT, such as self-efficacy (the belief that one can perform a task) and outcome expectancy (an individual's expectations of the results of an action), are highly relevant in understanding technology acceptance behavior.

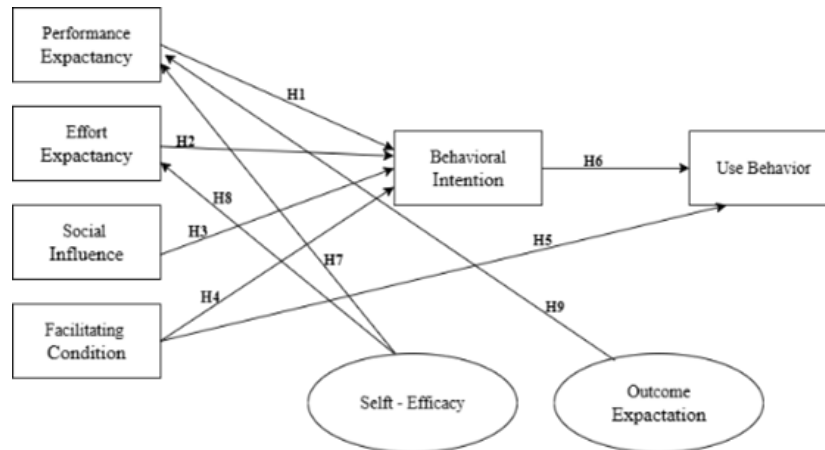


Figure1: UTAUT and SCT Model Framework

1. A person's belief that using the system would improve output and benefit their employment is measured by their performance expectations [24]. The degree to which people think that online systems can offer greater advantages and enhance their technological performance is referred to in this study as performance expectations. In UTAUT theory, Users are more likely to accept and continue using technology if they believe that the technology will be useful. This concept has been extensively researched, showing that when users believe technology improves their performance or offers significant advantages, their intention to use it increases significantly. Research shows that performance expectations are one of the most influential determinants of technology adoption in various contexts. This statement is in line with studies [25], [26], [27].
2. Effort Expectancy is the degree to which a system is easy to use [24]. The term "Effort Expectancy" in this study describes how consumers feel about the system's usability. Prior research carried out by [28], [29] demonstrate how behavioral intention is positively impacted by effort expectation. If users consider a system user-friendly, they will be more likely to use it [30].
3. Social influence can be defined as the extent to which users believe that people around them can convince them to accept a new system [24]. According to this study, one important factor influencing users' intentions to adopt technology is social influence. Their social surroundings can have a big impact on how they use online technologies. Studies carried out by [30], [31]. Demonstrates how behavioral intention is positively impacted by social influence.
4. Enabling Conditions assess how people believe their organizational or technological infrastructure facilitates efficient system utilization [24]. Users' perceptions of the availability of the technological resources and infrastructure required for the efficient application of online system technology are included in the study's enabling conditions. A thorough examination of the literature identifies several facets of this idea, which explain how favorable circumstances might enhance user experience and adoption of technology. According to research [32], [33], [34], Behavioral Intentions are positively impacted by supporting conditions.
5. Enabling Conditions evaluate individuals' perceptions of whether their technical infrastructure or behaviour is sufficient to use the system effectively [24]. Examining the elements that affect the adoption and efficient user of online system technology requires an understanding of user behavior

and technological acceptance . Enabling conditions are important in this context because they include both the technology resources that may be used effectively and the users' perceptions of their own behavior. Considering research [35]. Behavioral intention is positively impacted by enabling conditions.

6. Do individual condition of intention to use new technology influence their behaviour in using the system effectively [24]. Within the framework of this study, individual circumstances related to the intention to use new technology influence their behavior in the effective use of online technology systems? A careful literature review reveals various dimensions of this concept, which describe the mechanism of how the conditions of intention to adopt new technology are very important in influencing user behaviour, particularly with regard to the efficient application of research-based online platforms [36], [37], [38]. Supporting conditions have a positive on behaviour intentions.
7. Self-efficacy significantly and favorably affects performance expectations when using technology [39]. Positive impact of self-efficacy on performance expectations. High self-efficacy can reduce anxiety about technology, allowing users to engage more easily with new technologies, thereby increasing their performance expectations[40], [41]. Performance expectations are positively impacted by self-efficacy.
8. Through multiple levels of empirical research, the relationship between self-confidence and business expectations in the context online technology use has been studied extensively [42]. Several studies highlight the strong positive correlation between self-efficacy and effort expectations, showing that individuals with higher confidence in their abilities tend to perceive technological tasks as less daunting, thereby increasing their expectations of ease of use [40], [8]. Expectations of effort are positively impacted by self-efficacy.
9. Conditions that include the perceived benefits of using technology significantly enhance technological development, reflecting individuals' beliefs about the effectiveness of technology in improving performance [43]. Numerous research have demonstrated that performance expectations and outcome expectations are positively correlated . Performance Expectations are closely related to users' beliefs about the benefits of using the technology, emphasising its role as a significant predictor of behavioural intent. [44], [45].

Data analysis was performed using Partial Least Squares Structural Equation Modeling (PLS-SEM), conducted with SmartPLS 3.0 software.[18] PLS-SEM was chosen for its ability to handle data that does not meet the assumption of normal distribution and provide good estimates even when the sample size is relatively small.

- Validity and Reliability Criteria:
To test convergent validity, Average Variance Extracted (AVE) is expected to be greater than 0.5 and Composite Reliability (CR) greater than 0.7. In addition, the HTMT value must be less than 0.9 to ensure that there are no multicollinearity issues between constructs.
- Multicollinearity Analysis:
To evaluate multicollinearity in the model, a Variance Inflation Factor (VIF) analysis was conducted, with a VIF value above 5 indicating potential multicollinearity that needs to be considered.
- Formula for PLS-SEM:
The formula used to calculate the Path Coefficient (β) is:

$$\beta = \frac{cov(X, Y)}{var(X)}$$

Figure 2: PLS-SEM formula

Where X and Y are variables connected in the model.

The coefficient of determination (R^2) is calculated using the formula:

$$R^2 = 1 - \frac{SSE}{SST} \quad (1)$$

Effect Size (f^2) is calculated using the formula:

$$f^2 = \frac{R_{incl}^2 - R_{excl}^2}{1 - R_{incl}^2} \quad (2)$$

These formulas are used to assess how well the model can explain the variance in Behavioral Intentions (BI).

The sample size for this study was determined using the Slovin approach with a margin of error of 10%. Based on GPower analysis with an effect size of 0.15 and power of 0.8, the population size is 908 respondents who are civil servants and PPPK employees. Based on the above calculations, the sample in this study has been adjusted to a minimum of 88 people. However, this study used 102 respondents to provide stronger statistical power in testing the hypothesis. For comparison, PLS-SEM was used because it is more flexible in handling data that does not meet the assumption of normal distribution, while CB-SEM is more suitable for normally distributed data. PLS-SEM is also more efficient in handling small samples and is more suitable for this study, which has a limited sample size. [46]

3. RESULT AND DISCUSSIONS

Participation in the survey was limited to: Teachers or civil servants, both permanent and temporary, at Sedrajat Public High School in Purbalingga Regency, who had access to and experience in using basic SINAGA features such as viewing the Attendance Menu, E-Files, Attendance Summary, and Leave. We used several questions related to these limitations to screen eligible respondents. Before distribution, the questionnaire was tested for readability by 35 respondents. The measurement used was a 5-point Likert scale. The measurement was carried out using a 5-point Likert scale, where: 1 = Strongly Disagree (STS) 2 = Disagree (TS) 3 = Neutral (N) 4 = Agree (S) 5 = Strongly Agree (SS). The sampling strategy used in this study was purposive sampling. The sample size for this study was determined using the Slovin approach. The minimum sample size was determined using the Slovin formula.

This study uses a significance level of 10%, so the proportion value (N) = 902, Research Error Margin (E) = 10.20. Therefore, the minimum sample size required for this study is 88 civil servants. The preparation of the questionnaire, of course, requires several variables to support the success of the study. The variables used in this study are independent variables (X), namely the acceptance of information technology in the form of the SINAGA application. Meanwhile, the dependent variable (Y) in this study is the behavior of technology recipients, namely teachers with civil servant status. Following the method used in this study, the Unified Theory of Acceptance and Use of Technology (UTAUT) and Social Cognitive Theory (SCT) will adjust each variable with several factors. Independent variables are variables that influence or cause the emergence of dependent variables. This study has six independent variables: Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), and Facilitative Conditions (FC). Meanwhile, dependent variables are variables that are influenced by independent variables. This study has one dependent variable, namely actual system usage. A more detailed discussion of the characteristics can be explained as follows:

Table 2. Respondents' gender who utilize the SINAGA app

Gender	Percentage
Male	59.1%
Female	40.9%
Total	100%

Based on Table2, data on the gender of civil servants in Purbalingga Regency who use SINAGA online attendance technology as respondents shows that the majority of respondents are male, with 52 respondents or 59.10%, while the rest are female respondents, with 36 respondents or 40.90%. This explanation indicates that the majority of students who use information technology in the form of the SINAGA online attendance application as respondents are male.

Table 3. Employment Status of Respondents Using the SINAGA Application

Employment Status	Percentage
Civil Servant	55.70%
Contract Staff	44.30%
Total	100%

Based on Table 3, it is known that the civil servants in Purbalingga Regency who use information technology in the form of the SINAGA online attendance application as respondents are mostly civil servants with PNS status, with 49 respondents or 55.70%, followed by civil servants with status with 39 respondents or 44.30%. This explanation shows that the majority of users of information technology in the form of the SINAGA online attendance application are civil servants with PNS status.

Most respondents have been using the SINAGA digital attendance system for more than a year, which indicates a fairly high level of familiarity with the application. This condition illustrates that respondents have sufficient experience to objectively assess the benefits, ease of use, and system infrastructure support.

Most respondents have been using the SINAGA digital attendance system for more than a year, which indicates a fairly high level of familiarity with the application. This condition shows that responders have enough experience to evaluate the system's utility, usability, and infrastructure support objectively.

The Composite Reliability Factor (CR), average extracted variance (AVE), and factor loadings were used to evaluate the measurement model (External Model). With factor loadings >0.70, AVE>0.50, and CR>0.70, all indicators met the minimum requirements to demonstrate strong internal reliability and convergent validity.

This study found that the following constructs were measured consistently and represented the UTAUT-SCT theory: Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Facilitating Conditions (FC), Self-Efficacy (SE), Outcome Expectancy (OE), and Behavioral Intention (BI). As a result, the variables used in this study to measure user acceptance of the SINAGA digital attendance system are valid and reliable.

Table 4. Determination Coefficient Test Results / R²

Model Summari				
Model	R	R Squared	Adjusted R ²	Standard Error
1	0.883	0.780	0.768	6.214

a. Predictors: (Constant), PE, EE, SI, FC, SE, OE

A fairly strong correlation between the independent and dependent variables is indicated by the R value of 0.883 in Table 4. The factors Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Facilitating Condition (FC), Self-Efficacy (SE), and Outcome Expectation (OE) account for 78% of the variance in behavioral intention, according to the R² value of 0.780. Other variables not included in the research model have an impact on the remaining 22%.

The link between constructs was examined using Partial Least Squares (PLS) analysis in Structural Equation Modelling (SEM). With an R² value of almost 78% of the variance in behavioral intention explained by the variables PE, EE, SI, FC, SE, and OE, the structural model demonstrates sufficient explanatory power.

Table 5. the path coefficient relationship analysis is shown as follows

Hypothesis Relationships	Path Coefficient	t-Statistic	p-Value	Result
SE → PE	0.46	7.23	0.000	Significant (+)
SE → EE	0.39	5.14	0.001	Significant (+)
OE → PE	0.28	3.88	0.002	Significant (+)
PE → BI	0.41	6.02	0.000	Significant (+)
EE → BI	0.36	4.79	0.001	Significant (+)
SI → BI	0.10	1.22	0.227	Not Significant
FC → BI	0.25	3.16	0.004	Significant (+)

Table 5 shows that the following are the t-test findings for each variable:

- a. The study's findings suggest behavioral intent is significantly influenced by performance expectations. According to civil servants, the SINAGA system can increase attendance reporting's effectiveness, precision, and accountability. The results of this study are consistent with previous studies which explain that perceived benefits play an important role in the acceptance of technology by the State Civil Apparatus (ASN).
- b. There is also a noteworthy correlation between behavioral intention and effort expectancy. According to the respondents, the SINAGA application is simple to use, with functions that are simply accessible and an intuitive display. Anxiety and reluctance to new technologies are lessened by the interface's simplicity.
- c. Social influence does not have a significant effect on users' behavioral intentions. This is because the use of the system in the government environment is mandatory, so that social influence from colleagues or superiors plays less of a role in determining individual decisions.
- d. Behavior intention is significantly impacted by facilitating situations. To boost user confidence, technical support, training, and infrastructure support are crucial. Device availability, dependable internet networks, and prompt IT staff assistance are critical components of the SINAGA system's seamless functioning.
- e. Performance expectations and business expectations have a strong positive relationship with self-confidence. The SINAGA system is more helpful and user-friendly in the eyes of civil officials who have a high level of trust in their digital skills. Performance expectancy is positively impacted by outcome expectancy as well; users who anticipate success via SINAGA will perceive its advantages more highly.
- f. The willingness of civil servants to keep using the SINAGA application is characterized by behavioral intention. The notable impact of PE, EE, and FC demonstrates that perceived advantages, usability, and sufficient infrastructure support are the main factors driving adoption of the digital attendance system.

Table 5 shows that performance expectancy (PE) and effort expectancy (EE) have a significant effect on behavioral intention (BI), with β values of 0.41 and 0.36, respectively, and p values < 0.001 , indicating a strong influence. Social influence (SI) does not show a significant effect on behavioral intention ($p = 0.227$), which may be due to the mandatory nature of this system in the government environment. Facility support (FC) also has a significant effect with $\beta = 0.25$ and $p = 0.004$, indicating that technical and infrastructure support are very important in facilitating technology adoption.

Tabel 6: Perhitungan f^2 untuk Path Effects

Variable Relationships	f^2	Description
SE \rightarrow PE	0.22	Moderate influence between self-confidence and performance expectations
PE \rightarrow BI	0.35	Strong influence of performance expectations and behavioral intentions
EE \rightarrow BI	0.28	Moderate influence of ease of use on behavioral intentions
FC \rightarrow BI	0.15	Moderate influence of support on behavioral intentions

Table 6 shows the PLS path diagram with β and t-values for each relationship between variables. These values indicate the strength and direction of the relationship between variables in the structural model. This study shows that self-efficacy (SE) plays a significant moderating role in increasing the R^2 of behavioral intention by 8%. This indicates that with increased self-confidence, civil servants are more likely to accept the SINAGA system. Compare this with previous studies that suggest SCT integration, which shows a similar increase in R^2 . [47]

Table 7 : The findings of the test of the factors' association

Variable Relationship	Significance	Description
SE \rightarrow PE	Significant (+)	Self-confidence increases perceived benefits
SE \rightarrow EE	Significant (+)	Self-confidence increases perceived ease
OE \rightarrow PE	Significant (+)	Expectations of results reinforce perceptions of benefits
PE \rightarrow BI	Significant (+)	Benefits of increasing the intention to use
EE \rightarrow BI	Significant (+)	Ease of use increases intention to use
FC \rightarrow BI	Significant (+)	Organisational support encourages usage
SI \rightarrow BI	Not significant (-)	Social environment has little influence

Table 7 shows that, overall, the findings of this study suggest further research that positive self-confidence and outcome expectations, performance expectations, effort expectations, and supportive conditions are the main factors influencing user acceptance of the SINAGA digital attendance system.

Although SI → BI was not significant in this study, this may be due to the high level of ASN lifestyle in the use of information technology. This reduces the influence of the social environment (SI) on behavioral intention (BI). Previous research [48] explains that the SCT approach shows that the moderating effect of self-efficacy (SE) can increase the influence of PE → BI, which is also reflected in this study. ASNs who are more confident in using technology can feel greater benefits (PE) and increase their behavioral intention to continue using the technology. This is also reflected in the context of e-government in Purbalingga, where ASNs with higher levels of self-efficacy are more likely to accept SINAGA technology.

Table 8: Calculation of f2 for Path Effects

Studi	Tahun	R ² BI	Model	Keterangan
UTAUT SCT(Studi ini)	2025	71.2%	UTAUT-SCT	Integrasi SCT meningkatkan R ² BI
UTAUT2 Digital Payment [49]	2025	68%	UTAUT2	Model untuk pembayaran digital
UTAUT Perduli Lindungi [50]	2024	70%	UTAUT	Penerimaan aplikasi gov
E-Commerce UTAUT [51]	2024	69%	UTAUT	Penerimaan pemabayaran digital

Table 8 explains that this study is the development of a hybrid UTAUT-SCT model, which can be used to analyze technology acceptance in the public sector, particularly in the context of e-government. This model has the potential to use an AI-based approach to predict the acceptance of digital government applications in the future. [52].

4. CONCLUSION

The findings of this study, which can be further developed by subsequent researchers, show that three main factors—performance expectations, effort expectations, and supportive conditions—play a significant role in the level of acceptance of the SINAGA digital attendance system by civil servants in Purbalingga Regency. These factors, supported by user confidence and expectations, explain approximately 78% of the variation in behavioral intent, indicating that the integrated UTAUT-SCT model has a strong capacity to understand technology acceptance by users in the context of e-government.

The main factor influencing behavioral intent is performance expectations, which indicate that users' perceptions of the benefits of the system—such as increased efficiency and accuracy—are the main drivers for them to continue using the system. In addition, ease of use and intuitive design (effort expectations) as well as adequate infrastructure support (supporting conditions) significantly influence behavioral intention to use the system. Social influence, although not significant in this study, does not play a major role because this system is mandatory in the government environment.

From a computer science perspective, this study makes a significant contribution by demonstrating the validity of PLS-SEM as a predictive model in the context of e-government, as well as emphasizing the importance of integrating the UTAUT-SCT model in the acceptance of big data technology in the public sector. This research also opens up opportunities to expand this model by integrating a longitudinal approach in post-adoption studies and adding factors such as habits and price in the UTAUT2 model, which could improve predictive capabilities in various other public sector contexts.

Recommendations for future researchers: Longitudinal studies to examine long-term adoption and user satisfaction, integration of artificial intelligence (AI) technology into the system for more efficient dynamic monitoring.

Overall, the SINAGA system has shown a good level of acceptance among civil servants, mainly driven by its perceived benefits, ease of use, and adequate organizational support. In the future, local governments are advised to continue to improve user digital competence, optimize technical infrastructure, and strengthen system features and services to increase satisfaction and sustainability of use. Further research could examine the dimensions of intention to continue using the system and user satisfaction, as well as compare it with digital attendance systems in other regions to broaden the generalization of the research results.

CONFLICT OF INTEREST

The authors declares that there is no conflict of interest between the authors or with research object in this paper.

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