

Citizen Acceptance of AI-Enabled Public Services and Trust in Government

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Abstract

This study examines how citizen acceptance of AI-enabled public services influences trust in government within the context of smart governance. Drawing on the Technology Acceptance Model (TAM), this study develops an integrated framework in which citizen acceptance is operationalized as AI service acceptance, linking perceived ease of use, perceived usefulness, and trust in government. Data were collected from 341 respondents in Tainan, Taiwan, and analyzed using structural equation modeling (SEM). The results indicate that perceived ease of use significantly enhances perceived usefulness, and both factors positively influence AI service acceptance. Notably, perceived usefulness exerts a stronger effect, suggesting that citizens prioritize functional benefits when evaluating AI-enabled public services. Furthermore, AI service acceptance has a significant positive impact on trust in government, highlighting its mediating role in translating technology perceptions into institutional trust. This study extends TAM into the domain of AI-enabled public services and demonstrates that citizen acceptance functions as a key mechanism linking technology perceptions and government trust. The findings provide important implications for policymakers, emphasizing the need to enhance service functionality, usability, and transparency to strengthen public trust in smart government initiatives.

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Keywords: Artificial Intelligence, Smart government; Technology Acceptance Model (TAM); Trust in government; Citizen Acceptance.

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1. Introduction

With the rapid advancement of artificial intelligence (AI) technologies, governments worldwide are actively promoting digital transformation by integrating AI into public service systems to enhance administrative efficiency and service quality (Kulal et al., 2024). Compared with traditional e-government, AI technologies possess capabilities such as autonomous learning and real-time responsiveness, enabling governments to deliver more intelligent and personalized services, including AI chatbots, smart application systems, and automated decision-support tools (Yiğitcanlar et al., 2024). These innovations not only reduce labor costs and administrative burdens but are also regarded as critical drivers of smart government and digital governance (Gasparyan, 2024).

However, the implications of AI adoption in the public sector extend beyond efficiency and convenience. More importantly, they involve fundamental issues of public governance, particularly citizens' trust in government (Robles and Mallinson, 2023). Within democratic systems, trust in government is a cornerstone of policy legitimacy and public support, and citizens' evaluations of public services and service experiences play a crucial role in shaping such trust.

As AI increasingly replaces human involvement in service processes, citizens' evaluations of government are no longer solely based on interpersonal interactions but are gradually shifting toward perceptions of technology-mediated services (Horvath et al., 2023). Consequently, understanding how AI-enabled public services influence citizens' trust in government has become a critical issue in contemporary public administration and digital governance research. The Technology Acceptance Model (TAM) has been widely employed to explain individuals' adoption of emerging technologies, emphasizing perceived usefulness and perceived ease of use as key determinants of behavioral intention (Ibrahim et al., 2025). Nevertheless, existing studies predominantly focus on usage intention or actual usage behavior, while relatively limited attention has been given to how technology adoption influences broader institutional evaluations, such as trust in government (Morote et al., 2020).

Moreover, trust in government is closely associated with citizens' experiences in their daily interactions with public services (Van de Walle and Bouckaert, 2003). In the context of AI adoption, this relationship may undergo significant changes. On the one hand, AI services can enhance the government's professional image by improving efficiency and consistency. On the other hand, if citizens lack understanding of AI systems or perceive them as difficult to use, their evaluation of service quality may decline, thereby undermining trust in government (Geske and Leyer, 2022). Therefore, perceptions of usability and acceptance of AI services may serve as crucial mediating mechanisms linking technology and governance outcomes.

Against this backdrop, the primary motivation of this study is to integrate the Technology Acceptance Model with theories of trust in government to examine how citizens form trust evaluations through their perceptions and acceptance of AI-

enabled public services. In this study, AI-enabled government services refer to digital public services delivered through artificial intelligence technologies—such as natural language processing, machine learning, and automated systems—including intelligent customer service, online applications, automated review processes, and personalized information services. These services are characterized by their ability to respond to user needs in real time, enhance service efficiency, and reduce reliance on manual operations.

2. Literature Review

2.1 AI in Public Service

The application of artificial intelligence (AI) in public services primarily refers to the use of technologies such as machine learning, natural language processing, and automated decision-making systems by governments to enhance administrative efficiency, optimize service processes, and improve policy implementation outcomes (Ahn and Chen, 2020). Compared with traditional e-government, AI not only improves service efficiency and accuracy but also enables real-time responsiveness and predictive capabilities, allowing governments to deliver more personalized and timely public services (Ahn and Chen, 2020). In recent years, governments have increasingly adopted AI-driven applications across various domains, including intelligent customer service systems, automated administrative procedures, smart traffic management, and integrated urban data platforms. These applications are widely regarded as essential components of smart government and digital governance, as they facilitate data-driven decision-making and enhance the responsiveness of public administration (Yiğitcanlar et al., 2024; Gasparyan, 2024). However, the adoption of AI technologies also introduces significant governance challenges, including algorithmic opacity, unclear accountability, and potential algorithmic bias (Zaidan and Ibrahim, 2024). These issues raise concerns regarding transparency, fairness, and the ethical implications of automated decision-making in the public sector. Therefore, the effectiveness of AI-enabled public services should not be evaluated solely from a technological efficiency perspective but should also incorporate a citizen-centered approach. In particular, it is essential to examine citizens' perceptions and acceptance of AI services, as well as their influence on overall evaluations of government.

2.2 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), originally proposed by Fred Davis (1989), is one of the most influential theoretical frameworks for explaining individuals' adoption of information technologies. TAM posits that users' behavioral intentions toward technology use are primarily determined by two key constructs: perceived usefulness (PU) and perceived ease of use (PEOU). Perceived usefulness refers to the extent to which an individual believes that using a particular system will enhance their performance, whereas perceived ease of use reflects the degree to which an individual perceives that using the system requires minimal

effort. Furthermore, TAM suggests that perceived ease of use not only directly influences behavioral intention but also exerts an indirect effect through perceived usefulness (Davis, 1989).

In the context of e-government, TAM has been extensively applied to explain citizens' acceptance of digital public services. Prior studies indicate that when government-provided services are perceived as convenient and functionally beneficial, citizens are more likely to develop positive attitudes and stronger intentions to use such services (ElKheshin and Saleeb, 2020). However, traditional applications of TAM have primarily focused on individual-level adoption behavior, with relatively limited attention given to how technology acceptance may influence higher-level institutional evaluations, such as trust in government (Hamid et al., 2017). Due to increased technological complexity and uncertainty. The presence of automated decision-making and reduced human interaction may heighten concerns regarding transparency and reliability, making PU and PEOU even more critical in shaping citizens' acceptance of AI services.

2.3 Acceptance of AI Public Services

The acceptance of AI public services refers to citizens' willingness and intention to adopt and use AI-enabled government services. This concept is conceptually derived from behavioral intention in the Technology Acceptance Model (TAM) and reflects individuals' overall evaluation of a technology, including its functionality, reliability, and appropriateness in a given context (Horvath et al., 2023). Existing studies suggest that the acceptance of AI services is influenced by multiple factors, among which perceived usefulness and perceived ease of use are consistently identified as the most critical determinants (Kelly et al., 2022; Yi and Choi, 2023). When citizens perceive AI-enabled services as useful in improving efficiency, reducing time costs, and enhancing service quality, their willingness to adopt such services increases significantly. Similarly, when AI systems are perceived as easy to use and require minimal effort, users are more likely to overcome uncertainty and resistance toward new technologies.

In the public sector context, the importance of AI service acceptance is further amplified due to the universal and often mandatory nature of government services. . Therefore, citizens' acceptance of AI-enabled services directly affects not only individual usage behavior but also the effectiveness of policy implementation and the overall quality of public service delivery (Kaushik and Rathore, 2020). Accordingly, AI service acceptance should be regarded not merely as an individual behavioral outcome but as a critical indicator of public governance.

2.4 Trust in Government

Trust in government refers to citizens' overall evaluation of governmental institutions in terms of competence, integrity, and benevolence, and it is a central concept in public administration and political science research (Kaushik and Rathore, 2020) . According to Roger Mayer et al. (1995), trust is grounded in individuals' perceptions of an organization's ability, integrity, and goodwill, which

are often developed through repeated interactions and experiences. Previous studies suggest that when governments provide efficient, reliable, and fair services, citizens are more likely to develop higher levels of trust. Conversely, poor service quality, lack of transparency, or perceived unfairness may undermine trust in government (Ryzin, 2015). Tolbert and Mossberger (2006) found that the convenience and efficiency of online services can strengthen government trust by increasing satisfaction.

However, the complexity and opacity of AI systems may generate uncertainty, particularly when citizens lack sufficient understanding of how these systems operate (Drobotowicz et al., 2021; Gesk and Leyer, 2022). Such concerns may negatively affect citizens' perceptions of transparency and accountability, thereby influencing their trust in government. Accordingly, this study posits that AI service acceptance serves as an important antecedent of trust in government, linking technology-related perceptions with broader institutional evaluations.

3. Research Method

3.1 Research Framework and Hypotheses Development

Based on the theoretical foundations discussed in the previous section, this study aims to examine how citizens' perceptions of AI-enabled public services influence their trust in government. Drawing on the Technology Acceptance Model (TAM) as the core theoretical foundation, this study integrates the literature on AI public services and trust in government to develop an analytical framework encompassing technology perceptions, service acceptance, and institutional trust. As AI technologies are increasingly embedded in public service delivery, the mode of interaction between governments and citizens has gradually shifted from human–human interaction to human–machine interaction (Horvath et al., 2023). This transformation implies that citizens' evaluations of government are no longer solely based on service personnel but are increasingly shaped by their experiences and perceptions of AI systems. Therefore, understanding how citizens form trust in government through their perceptions and acceptance of AI services has become a critical issue in digital governance research (Robles and Mallinson, 2023).

According to TAM (Davis, 1989), perceived usefulness (PU) and perceived ease of use (PEOU) are the primary determinants of technology adoption. In particular, perceived ease of use not only directly affects behavioral intention but also indirectly influences it through perceived usefulness. This relationship has been widely validated in e-government research, suggesting that when systems are easy to use and provide tangible benefits, users are more likely to develop positive attitudes and stronger intentions to adopt them (Elkhashin and Saleeb, 2020). In the context of AI-enabled public services, when citizens perceive AI systems as user-friendly and accessible, they are more likely to recognize their usefulness in improving administrative efficiency and information accessibility (Ibrahim et al., 2025). Therefore, perceived ease of use is expected to positively influence perceived usefulness.

H1: Perceived ease of use has a positive effect on perceived usefulness.

In addition, perceived ease of use plays an important role in shaping citizens' acceptance of AI services. Prior studies suggest that when systems are easy to operate and require minimal effort, users' uncertainty and resistance toward new technologies are reduced, thereby enhancing their willingness to adopt such technologies (Hamid et al., 2017). In the context of AI public services, a higher level of usability is expected to facilitate citizens' acceptance. Therefore, the following hypothesis is proposed:

H2: Perceived ease of use has a positive effect on AI service acceptance.

Furthermore, perceived usefulness is widely recognized as a key determinant of technology acceptance. When individuals believe that a system can improve efficiency, enhance service processes, and reduce time costs, their intention to adopt the technology increases significantly (Davis, 1989; Kelly et al., 2022). In the AI public service context, citizens are likely to prioritize functional benefits when evaluating such services. Thus, perceived usefulness is expected to have a strong positive effect on AI service acceptance.

H3: Perceived usefulness has a positive effect on AI service acceptance.

Regarding trust in government, prior studies suggest that trust is formed based on citizens' evaluations of government competence, integrity, and service quality (Mayer et al., 1995), and is further shaped by citizens' interactions and experiences with public services (Van de Walle and Bouckaert, 2003). In digital government contexts, positive service experiences have been shown to enhance citizens' trust in government (Tolbert and Mossberger, 2006). However, in the context of AI adoption, this relationship may become more complex. While AI technologies can enhance efficiency and consistency, thereby strengthening perceptions of government capability, concerns related to system usability, transparency, and reliability may undermine trust (Geske and Leyer, 2022; Drobotowicz et al., 2021). Accordingly, AI service acceptance can be conceptualized as a critical mechanism influencing trust in government. When citizens are willing to accept and use AI-enabled public services, it reflects positive evaluations of service quality and system effectiveness, which in turn enhance their perceptions of government capability and performance. Therefore, the following hypothesis is proposed:

H4: AI service acceptance has a positive effect on trust in government.

In summary, this study develops a theoretical model linking perceived ease of use, perceived usefulness, AI service acceptance, and trust in government. The model highlights the mediating role of AI service acceptance in connecting technology perceptions with institutional trust. By extending TAM into the domain of public administration, this framework contributes to a deeper understanding of AI governance and trust formation in the context of digital government.

3.2 Questionnaire Design

This study employed a structured questionnaire as the primary data collection instrument to examine citizens' perceptions of AI-enabled public services, their acceptance of such services, and their trust in government. The questionnaire design was grounded in the Technology Acceptance Model (TAM) and relevant theories of trust in government, ensuring strong theoretical support and content validity.

Regarding the measurement of constructs, perceived ease of use (PEOU) refers to citizens' subjective evaluation of the ease and convenience of using AI-enabled government services. This includes aspects such as ease of learning, clarity of operational procedures, and smoothness of interaction. The measurement items were adapted from the TAM scale developed by Davis (1989) and modified to fit the context of AI public services. Perceived usefulness (PU) refers to citizens' perception that AI-enabled services can enhance administrative efficiency, save time, and improve service quality. The corresponding items were also adapted from TAM and tailored to reflect key dimensions such as efficiency improvement, problem-solving capability, and service quality enhancement.

AI service acceptance represents citizens' overall willingness to adopt AI-enabled public services, including their intention to use, continued usage tendency, and positive attitude toward such services. The measurement items were adapted from commonly used behavioral intention scales in information systems and e-government research (Davis, 1989; Venkatesh et al., 2003) and revised to reflect AI application contexts, covering usage intention, continued use, and recommendation intention. Trust in government refers to citizens' level of trust in government after the adoption of AI services, particularly in terms of government competence, service quality, and risk management capability. The measurement items were developed based on the trust framework proposed by Mayer et al. (1995) and prior studies on trust in government (Tolbert and Mossberger, 2006), encompassing dimensions such as competence, responsibility, fairness, and overall trust.

All measurement items were assessed using a five-point Likert scale, ranging from 1 ("strongly disagree") to 5 ("strongly agree"), to capture respondents' subjective perceptions of each construct. The detailed measurement items are presented in Table 1.

Table 1: Questionnaire items

Construct	Measuring Items
Perceived Ease of Use (PEOU)	PEOU1: I find AI-enabled government services easy to learn and operate. PEOU2: The procedures of AI government services are clear and easy to understand. PEOU3: Using AI government services is simple for me. PEOU4: I can easily complete tasks using AI government services. PEOU5: Interacting with AI government services does not require much effort. PEOU6: Overall, I find AI government services easy to use.
Perceived Usefulness (PU)	PU1: AI government services can effectively improve my efficiency in handling administrative tasks. PU2: Using AI government services saves my time. PU3: AI government services help me obtain information more quickly. PU4: AI government services improve the overall quality of government services. PU5: AI government services help solve problems encountered during administrative processes. PU6: Using AI government services makes tasks more convenient. PU7: Overall, I find AI government services useful..
AI Service Acceptance (AI-SA)	AI-SA1: I am willing to use AI government services to handle related tasks. AI-SA2: I will prioritize using AI government services in the future. AI-SA3: I am willing to continue using AI government services. AI-SA4: I would consider using AI government services in different situations. AI-SA5: I have a positive attitude toward using AI government services. AI-SA6: Overall, I am willing to accept AI government services.
Trust in Government (TG)	TG1: I trust the government to effectively use AI technologies in public services. TG2: I believe the government has the expertise to implement AI services. TG3: I believe the government will use AI technologies responsibly. TG4: AI government services enhance my trust in the government. TG5: I believe the government can ensure fairness in AI services. TG6: I trust the government to properly manage risks associated with AI services. TG7: Overall, I trust the government.

Demographic variables were included in the questionnaire design to capture the basic characteristics of the sample. Drawing on prior studies in the Technology Acceptance Model (TAM) and e-government research (Venkatesh et al., 2003; ElKheshin and Saleeb, 2020), the survey incorporated gender, age, education level, occupation, and monthly income as key demographic indicators. These variables were used to provide a comprehensive profile of the respondents. Furthermore, a screening question regarding prior experience with AI-enabled government services

was included to assess respondents' actual usage experience. This measure helps to better understand the extent to which familiarity with AI services may influence their perceptions and evaluations.

3.3 Data Collection

This study targeted residents of Tainan City, Taiwan, and employed a survey method to collect data for examining citizens' perceptions of AI-enabled public services, their acceptance of such services, and their trust in government. Tainan City was selected as the research setting because it is one of the leading cities in Taiwan promoting smart city initiatives and digital governance. In recent years, the city has actively integrated artificial intelligence and information technologies into public services, including intelligent customer service systems, online application platforms, smart traffic management, and urban data integration systems.

A combination of convenience sampling and partial snowball sampling was adopted to collect data. The questionnaire was primarily distributed online, supplemented by paper-based surveys to enhance sample diversity and response rates. The online survey was disseminated through social media platforms such as Facebook and LINE, targeting individuals with experience in using government services. Meanwhile, paper questionnaires were distributed at public locations, including district offices, libraries, and public service centers, to ensure representation across different age groups and socioeconomic backgrounds.

A total of 400 questionnaires were distributed, of which 341 valid responses were collected, yielding an effective response rate of 85.25%. Invalid responses were excluded due to incomplete answers or evidence of response bias (e.g., identical answers across all items). To ensure data quality, the questionnaire included clear instructions and screening mechanisms, and responses were further examined based on completion time and answer patterns to eliminate unreasonable cases.

In addition, this study adhered to ethical research standards. The purpose of the study and the use of collected data were clearly stated at the beginning of the questionnaire, and respondents were assured of anonymity and confidentiality. These measures were implemented to reduce respondent concerns and enhance the accuracy and reliability of the collected data.

4. Results

4.1 Descriptive Statistical Analysis

Regarding gender, female respondents slightly outnumbered male respondents, with females accounting for 54.5% of the sample and males 45.5%, indicating a relatively balanced gender distribution. In terms of age, the largest groups were respondents aged 41–50 years (35.5%) and 31–40 years (28.4%), suggesting that most participants belonged to the young and middle-aged population with a certain level of digital capability and experience in using government services.

With respect to educational attainment, the majority of respondents held a college or university degree (63.6%), followed by those with a master's or doctoral degree

(24.6%), while respondents with a high school education or below accounted for 12.8%. This indicates that the sample was generally well educated and likely possessed a certain level of technological understanding and information literacy. In terms of occupation, private-sector employees (32.8%) and service industry workers (20.2%) constituted the two largest groups. Regarding monthly income, most respondents fell within the ranges of NT\$30,001–50,000 (28.4%) and NT\$50,001–70,000 (20.8%), suggesting that the sample mainly represented middle-income groups.

As for prior experience with AI-enabled government services, the majority of respondents reported that they had not used such services (69.2%), indicating that the overall penetration of AI public services among the general public remains limited. Overall, the sample demonstrated a reasonable distribution across gender, age, education, and occupation. However, the relatively low level of prior experience with AI government services suggests that most respondents were still at an early stage of exposure or adoption. This characteristic provides an important contextual background for interpreting the subsequent empirical findings and also implies that there remains considerable room for further promotion and diffusion of AI-enabled public services.

4.2 Reliability and Validity Analysis

To assess the reliability and validity of the measurement scales, this study employed factor analysis to evaluate the measurement model. Internal consistency and convergent validity were examined using Cronbach's alpha (α), composite reliability (CR), and average variance extracted (AVE).

Prior to conducting factor analysis, the suitability of the data was assessed using the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity. The results indicated that the KMO values for all constructs were above the recommended threshold of 0.70, with values of 0.904 for perceived ease of use, 0.931 for perceived usefulness, 0.918 for AI service acceptance, and 0.941 for trust in government. In addition, Bartlett's test of sphericity was significant at $p < 0.001$ for all constructs, confirming that the data were appropriate for factor analysis.

In terms of reliability, all constructs demonstrated strong internal consistency, with Cronbach's alpha values exceeding the recommended threshold of 0.70 (Nunnally, 1978). As reported in Table 2, the composite reliability (CR) values for all constructs were also above 0.70, further supporting the reliability and stability of the measurement scales.

Regarding convergent validity, standardized factor loadings, CR, and AVE were examined. The results, as presented in Table 2, showed that all factor loadings ranged from 0.70 to 0.93, exceeding the recommended minimum level of 0.70, indicating that the observed variables adequately represented their respective latent constructs. Furthermore, the AVE values for all constructs were greater than 0.50, demonstrating satisfactory convergent validity (Fornell and Larcker, 1981).

Overall, the results indicate that the measurement model exhibits satisfactory reliability and validity. All constructs demonstrate adequate internal consistency, convergent validity, and discriminant validity, suggesting that the measurement model is appropriate and provides a solid foundation for subsequent structural equation modeling (SEM) analysis.

Table 2: Results for factor loading, reliability, and validity.

Constructs	Items	Factor Loading	Cronbach's α	CR	AVE
Perceived Ease of Use (PEOU)	PEOU1	0.820	0.878	0.908	0.622
	PEOU2	0.773			
	PEOU3	0.770			
	PEOU4	0.803			
	PEOU5	0.798			
	PEOU6	0.766			
Perceived Usefulness (PU)	PU1	0.810	0.911	0.929	0.652
	PU2	0.787			
	PU3	0.807			
	PU4	0.802			
	PU5	0.821			
	PU6	0.825			
	PU7	0.799			
AI Service Acceptance (AI-SA)	AI-SA1	0.823	0.916	0.935	0.704
	AI-SA2	0.834			
	AI-SA3	0.850			
	AI-SA4	0.841			
	AI-SA5	0.827			
	AI-SA6	0.860			
Trust in Government (TG)	TG1	0.856	0.933	0.946	0.713
	TG2	0.833			
	TG3	0.844			
	TG4	0.833			
	TG5	0.855			
	TG6	0.831			
	TG7	0.857			

Note: CR: Composite reliability; AVE: Average variance extracted.

4.3 Structural Equation Modeling and Hypothesis Testing

To validate the proposed theoretical model and research hypotheses, this study employed structural equation modeling (SEM) to estimate the model and assess its overall fit. The results are presented in Table 3 and Figure 1.

Table 3: SEM analysis results and hypothesis verification

Hypothesis	Hypothesized Path	Path coefficient	Results
H1	PEOU→PU	0.56***	Supported
H2	PEOU→AI-SA	0.19***	Supported
H3	PU→AI-SA	0.53***	Supported
H4	AI-SA→TG	0.67***	Supported

Note: *** p < 0.01

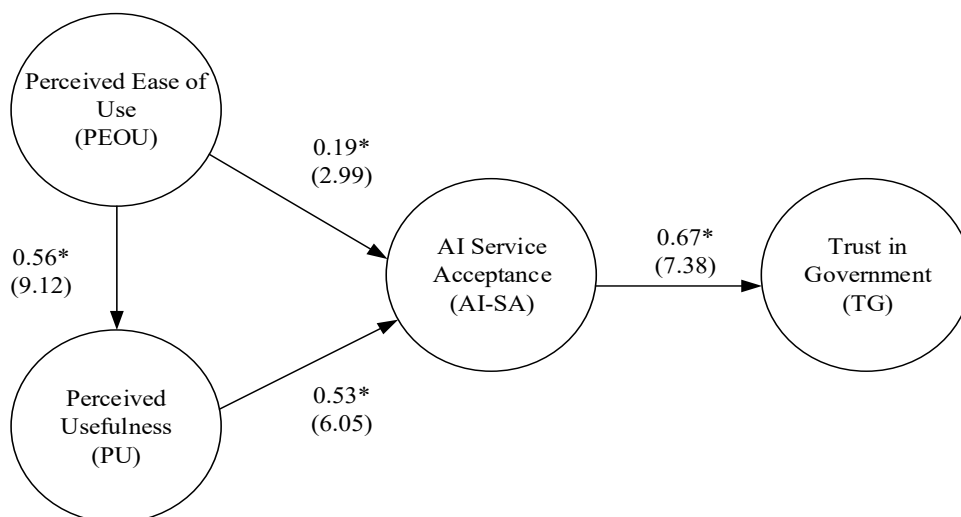


Figure 1: Results of the research model

Note: * p < 0.01

Regarding model fit, the results indicate that the overall model demonstrates a satisfactory fit with the observed data. The chi-square statistic ($\chi^2 = 472.39$, $df = 295$) was significant ($p < 0.001$). However, as the chi-square value is sensitive to sample size, additional fit indices were examined. The results show that the root mean square error of approximation (RMSEA) is 0.042, which is well below the recommended threshold of 0.08, indicating a good approximate fit. Furthermore, the normed fit index (NFI = 0.91), non-normed fit index (NNFI = 0.96), comparative fit index (CFI = 0.96), and incremental fit index (IFI = 0.96) all exceed the recommended threshold of 0.90, demonstrating a strong overall model fit. The goodness-of-fit index (GFI = 0.90) and adjusted goodness-of-fit index (AGFI = 0.89) are close to the recommended levels, while the standardized root mean square

residual (SRMR = 0.062) falls within the acceptable range. Overall, these fit indices indicate that the proposed model provides an adequate and robust representation of the data.

In terms of the structural model, the hypothesized relationships among the latent variables were further examined. As shown in Table 3, perceived ease of use has a significant positive effect on perceived usefulness ($\beta = 0.56, p < 0.01$), supporting H1. This result suggests that when citizens perceive AI-enabled government services as easier to use, they are more likely to recognize their usefulness. In addition, perceived ease of use has a significant positive effect on AI service acceptance ($\beta = 0.19, p < 0.01$), supporting H2. Although the effect size is relatively modest, it indicates that system usability still plays an important role in influencing citizens' willingness to adopt AI services. Furthermore, perceived usefulness has a significant and stronger positive effect on AI service acceptance ($\beta = 0.53, p < 0.01$), supporting H3. This finding suggests that, compared with ease of use, citizens place greater emphasis on the functional benefits and efficiency gains provided by AI-enabled public services. Finally, AI service acceptance has a significant positive effect on trust in government ($\beta = 0.67, p < 0.01$), supporting H4. This result indicates that higher levels of acceptance of AI public services are associated with increased trust in government, highlighting the critical role of technology acceptance in shaping institutional trust.

Overall, the empirical results demonstrate that the Technology Acceptance Model (TAM) retains strong explanatory power in the context of AI-enabled public services. In particular, perceived usefulness plays a key role in influencing AI service acceptance, while AI service acceptance further contributes significantly to trust in government. These findings suggest that AI technologies not only affect individual-level adoption behavior but also have broader implications for public governance and institutional trust.

5. Conclusion

This study investigates how citizens' technological perceptions influence their acceptance of AI-enabled public services and, in turn, their trust in government. By integrating the Technology Acceptance Model (TAM) with trust in government theory, this study develops a comprehensive framework incorporating perceived ease of use, perceived usefulness, AI service acceptance, and trust in government. Empirical data were collected from residents of Tainan City, Taiwan, to test the proposed model.

The findings indicate that TAM retains strong explanatory power in the context of AI-enabled public services. First, perceived ease of use has a significant positive effect on perceived usefulness, suggesting that when citizens perceive AI services as easy to use, they are more likely to recognize their functional benefits. Second, perceived ease of use also positively influences AI service acceptance, indicating that system usability remains an important determinant of technology adoption. However, perceived usefulness exerts a stronger effect on AI service acceptance,

implying that citizens place greater emphasis on efficiency gains and practical benefits when evaluating AI government services.

Furthermore, AI service acceptance has a significant positive effect on trust in government. This finding suggests that when citizens hold positive attitudes toward and are willing to adopt AI-enabled services, their trust in government is enhanced. The results highlight that AI technologies not only influence individual-level adoption behavior but also extend to institutional-level evaluations, carrying important implications for public governance. Notably, the majority of respondents in this study reported limited prior experience with AI government services, indicating that such services are still in the early stages of diffusion. Nevertheless, even under conditions of low usage experience, perceived usefulness and ease of use significantly influence acceptance, suggesting that citizens' evaluations are shaped not only by actual experience but also by cognitive perceptions. This finding underscores the importance of communication and awareness in promoting AI adoption.

From a practical perspective, the results suggest that governments should prioritize enhancing the functional value and effectiveness of AI services to ensure that citizens can clearly perceive their benefits. Improving system usability is also essential to lowering adoption barriers and increasing user engagement. More importantly, governments should strengthen transparency and communication strategies to build public trust in AI technologies and mitigate concerns arising from uncertainty and perceived risks.

This study is subject to several limitations. First, the sample is limited to Tainan City, Taiwan, which may restrict the generalizability of the findings. Future research could extend the analysis to other regions or countries to enhance external validity. Second, this study adopts a cross-sectional design, which limits the ability to capture changes in citizens' perceptions over time; future studies could employ longitudinal approaches. Third, additional variables—such as perceived risk, privacy concerns, and AI transparency—may be incorporated to further enrich the understanding of AI governance.

In conclusion, this study not only confirms the applicability of TAM in the context of AI-enabled public services but also highlights the critical role of AI service acceptance in shaping trust in government. The findings provide valuable theoretical and practical insights for advancing digital governance and the development of smart government.

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