

Awareness and acceptance of barangay officials in navigating artificial intelligence in data governance

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Abstract

Artificial intelligence is rapidly transforming how governments handle data and deliver public services. This study examined how aware and accepting barangay officials are of the use of artificial intelligence for data governance in selected barangays in Roxas City, Capiz. Using the Theory of Planned Behavior and the Unified Theory of Acceptance and Use of Technology, the research focused on measuring awareness and acceptance among barangay officials. The study used a quantitative approach, with a structured survey given to Barangay Captains, Barangay Kagawads, and Sangguniang Kabataan Chairpersons. Descriptive statistics and regression analysis helped assess level of awareness of attitudes, social norms, and perceived control, as well as level of acceptance based on performance expectations, effort, social influence, and available support. Results showed that most respondents had a moderate level of awareness and acceptance of artificial intelligence in data governance. Additionally, the study found that higher awareness led to greater acceptance of artificial intelligence tools. Still, challenges such as limited technical knowledge, insufficient training, and poor infrastructure affected officials' readiness to use artificial intelligence. The findings point to the need for better digital literacy, more training programs, and stronger institutional support to help barangays adopt emerging artificial intelligence. This research contributes to understanding digital governance by showing how awareness and acceptance help local governments, especially at the barangay level, integrate artificial intelligence in barangay operations.

Keywords: Artificial Intelligence; Awareness; Acceptance; Data Governance

1. Introduction

Artificial Intelligence (AI) is increasingly transforming public administration by enhancing data management, service delivery, and policy formulation (1). As part of global digital transformation initiatives, AI adoption aims to improve efficiency, transparency, and responsiveness within governance systems. In the Philippines, this transition is reflected in national frameworks, including the Philippine Development Plan 2023–2028 (2), the National AI Roadmap (3), and the Department of the Interior and Local Government's (DILG) digitalization initiatives (4). Nevertheless, despite these national efforts, AI integration at the grassroots level, particularly in barangays, remains limited. Many local offices continue to rely on manual systems for administrative and data management functions (5).

Barangays, the smallest and most direct units of government, play an important role in public service delivery and local governance (6). Barangay officials are responsible for essential administrative tasks, including record management, certification issuance, and addressing community concerns, all of which demand efficiency and data accuracy. Despite their significance, many barangays encounter challenges such as inadequate infrastructure, limited technical training, insufficient digital tools, and low awareness of AI applications in governance. These challenges highlight a substantial

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gap between national digital transformation objectives and local-level readiness, particularly regarding the adoption and understanding of AI in data governance.

In response to these challenges, this study assesses the awareness and acceptance of barangay officials regarding the use of AI in data governance. Specifically, it examines awareness in terms of attitude, subjective norms and perceived behavioral control (7), and acceptance based on performance expectancy, effort expectancy, social influence and facilitating conditions (8). The study further investigates whether respondents' profiles influence their awareness and acceptance, and whether awareness affects acceptance of AI (9).

Consequently, the hypotheses of this study posit that there is no significant influence between the respondents' profile and their awareness of artificial intelligence (AI) in data governance (10). Likewise, it is assumed that respondents' profiles do not significantly influence their level of acceptance of AI in data governance (11). Furthermore, the study assumed that there is no significant relationship between respondents' awareness of AI and their acceptance of its use in data governance (12). These hypotheses collectively aim to determine whether demographic and professional characteristics, as well as awareness levels, have any meaningful effect on the acceptance and understanding of AI among barangay officials (13). Thus, the findings aim to provide empirical evidence to inform capacity-building programs, policy development, and digital transformation strategies that support AI integration in barangay governance (14).

2. Methodology

A quantitative cross-sectional research design was utilized to evaluate barangay officials' awareness and acceptance of artificial intelligence (AI) in data governance (15). This approach was suitable because it enabled the systematic collection of numerical data and enabled the examination between variables at a single point in time (16). The study focused on six barangays in Roxas City: Tiza, Tanque, Cogon, Baybay, Dinginan, and Milibili. These barangays were selected based on their geographical classifications—landlocked, coastal, and agricultural—to provide a broader and more representative understanding of AI integration across different governance contexts. Additionally, the selected barangays varied in population size, urbanization, and administrative demands, making them suitable for evaluating AI awareness and acceptance among barangay officials. The respondents of the study consisted of 54 elected barangay officials, including Barangay Captains, Barangay Kagawads, and Sangguniang Kabataan Chairpersons. A population study method was employed to ensure that all qualified officials within the selected barangays were represented in the research (17).

The main research instrument utilized in this study was a survey questionnaire developed using the Theory of Planned Behavior (TPB) (18) and the Unified Theory of Acceptance and Use of Technology (UTAUT) (19). The questionnaire comprised three main sections: demographic profile of respondents, AI awareness, and AI acceptance. To enhance comprehension and clarity, the survey questions were translated into Hiligaynon. Research experts and advisers validated the instrument to ensure alignment with the study's objectives (20). A pilot test involving 30 barangay officials, excluded from the main sample, was conducted to evaluate the instrument's reliability. The resulting Cronbach's alpha value of 0.869 indicates strong reliability and internal consistency. (21).

Data collection was conducted using a systematic and ethical approach. Permission was first obtained from barangay authorities, after which questionnaires were distributed directly to respondents. Informed consent was secured to guarantee voluntary participation, confidentiality, and clear communication of the study's purpose. Completed questionnaires were collected immediately to reduce incomplete responses and enhance data accuracy and were secured.

3. Results

3.1. Level of Awareness on Artificial Intelligence in Data Governance

3.1.1. As a Whole

The findings indicate that respondents possess a moderate level of awareness regarding the use of artificial intelligence (AI) barangay data governance. Specifically, attitude toward behavior yielded a mean score of 3.37, subjective norm recorded a mean of 3.23, and perceived behavioral control had a mean of 2.82; all were verbally interpreted as "moderate." These results suggest that while barangay officials generally acknowledge the potential benefits of AI for enhancing governance processes, their knowledge, confidence, and preparedness to fully implement AI technologies

remain limited. The moderate awareness level implies that respondents are still developing a more comprehensive understanding and acceptance of AI applications in governance.

Among the indicators, the highest mean was recorded for the statement “AI tools for data governance help efficiency in our barangay,” with a mean score of 3.46, interpreted as “high.” This finding indicates that respondents perceive AI as beneficial for enhancing efficiency and productivity in barangay operations. Respondents also recognized AI’s capacity to improve the accuracy and reliability of data governance, as reflected by a mean score of 3.41. The results of the study are consistent with the findings of Davis (22), who emphasized that perceived usefulness significantly influences individuals’ attitudes toward technology adoption. Additionally, Kahneman (23) noted that exposure to information and environmental factors shapes perceptions and decision-making regarding technological innovations.

Regarding social influence, the subjective norm indicator achieved an overall mean of 3.23, indicating that respondents receive moderate encouragement from peers, constituents, and local leaders concerning AI adoption. Statements addressing constituents’ awareness, constituent expectations, and leadership support yielded mean scores between 3.19 and 3.25, suggesting that while AI discussions and institutional encouragement exist, they are not yet firmly established. This observation aligns with Sohn and Kwon (24), who found that social support and institutional reinforcement affect individuals’ willingness to adopt emerging technologies.

Perceived behavioral control received the lowest overall mean score of 2.82, indicating limitations in respondents’ confidence and preparedness to use AI tools effectively. The statement “I have access to training of AI tools that help me learn about AI in data governance” received the lowest mean score of 2.57, interpreted as “low.” These results suggest that insufficient training opportunities, limited technical resources, and inadequate institutional support impede respondents’ readiness to integrate AI into barangay governance. According to the Theory of Planned Behavior (18), perceived behavioral control increases when individuals have access to adequate resources, knowledge, and opportunities to perform a behavior effectively

Table 1 Level of Awareness of Respondents on Artificial Intelligence as a Whole and in terms of Attitude Towards the Behavior; Subjective Norm; and Perceived Behavioral Control

Variables	SD	Mean	Verbal Interpretation
Attitude Towards the Behavior			
I am aware that AI tools for data governance helps efficiency in our barangay.	0.5734	3.46	High
I believe that AI tools enhance the accuracy and reliability of data governance in our barangay.	0.6873	3.41	High
Integrating AI for data governance is important for barangay.	0.5879	3.35	Moderate
I am aware that AI tools help navigate barangay data collection and processing.	0.5879	3.35	Moderate
Use AI tools in data governance improve our barangay.	0.5002	3.30	Moderate
Total		3.38	Moderate
Subjective Norm			
My fellow officials are aware of the potential of AI in data governance.	0.4624	3.22	Moderate
My constituents expect me to be knowledgeable about AI tools in data governance.	0.4624	3.22	Moderate
Local leaders in barangay emphasize the need to be aware of AI tools for data governance.	0.4196	3.22	Moderate
My fellow officials discuss the importance of understanding AI for effective data governance.	0.4375	3.19	Moderate
Government policies foster awareness of AI tools for data governance in barangay.	0.4315	3.25	Moderate

Total		3.23	Moderate
Perceived Behavioral Control			
I have access to training of AI tools that help me learn about AI in data governance.	0.6896	2.57	Moderate
I am confident that I can understand and use AI tools for data governance with proper support.	0.5047	3.17	Moderate
I have the knowledge necessary to use AI tools.	0.5623	3.20	Moderate
I have control over using AI tools.	0.4364	3.13	Moderate
Given the resources in our barangay, it is easy for me to use AI tools.	0.3281	3.07	Moderate
Total		2.82	Moderate
Grand Mean		3.14	Moderate

Legend: 4.21-5.00 = Very High; 3.41- 4.20 = High; 2.61- 3.40 = Moderate; 1.81- 2.60 = Low; 1.00- 1.80 = Very Low Source: Data from the researchers

3.2. Level of Acceptance on Artificial Intelligence in Data Governance

3.2.1. As a Whole

The overall findings revealed a grand mean of 3.26, verbally interpreted as “moderate.” This indicates that barangay officials demonstrate a fair but cautious level of acceptance toward artificial intelligence (AI) in data governance. While they are generally open to its adoption and recognize its potential benefits, their confidence and readiness remain limited. This supports the Unified Theory of Acceptance and Use of Technology (UTAUT), which explains that user acceptance is gradual and shaped by multiple interacting factors (25).

For performance expectancy, the overall mean was 3.37 “moderate”. Respondents agreed that AI can improve efficiency and accuracy, with the highest score of 3.46 for managing barangay data efficiently “high” and 3.43 mean score for increasing productivity “high”. Other indicators, such as improving job performance with a mean score 3.24 and ease of work with mean score of 3.22, remained moderate. These findings validate Davis (22), who emphasized the importance of perceived usefulness, Brynjolfsson and McAfee (26), who highlighted efficiency gains, and Davenport (27), who noted productivity as a key driver of AI adoption. Rogers (28) further explained that adoption depends on perceived relevance and compatibility with existing practices, which helps explain why usefulness is acknowledged but not yet fully internalized.

For effort expectancy, the overall mean was 3.30 “moderate”. Indicators ranged from 3.37 mean score for ease of understanding to 3.22 mean score for requiring less effort. This suggests that respondents perceive AI as manageable but anticipate challenges in learning and skill acquisition. The moderate scores validate Venkatesh et al. (25), who argued that effort expectancy strongly shapes behavioral intention during early adoption. Respondents’ cautious stance reflects limited training opportunities and exposure, which moderates their confidence in mastering AI tools.

For social influence, the overall mean was 3.26 “moderate”. Respondents reported moderate encouragement from peers with a score of 3.17, constituents with a 3.31 mean score, barangay support with 3.24, and government policies 3.22 mean score, while community expectations scored lowest 3.10. These results validate the role of external reinforcement, consistent with Venkatesh et al. (25) and Rogers (28), who emphasized that institutional norms and peer expectations are critical for adoption. The findings suggest that while interpersonal and organizational support exists, it is not yet strong enough to drive full acceptance, reflecting the need for more visible and consistent reinforcement.

Finally, facilitating conditions recorded the lowest overall mean of 3.10 “moderate”. Access to sufficient technology scored 3.05, technical support with 2.87 score, training programs 2.48 lowest, perceived skills with 3.17 mean score, and government programs with 3.13 mean score. These findings validate the importance of infrastructure, training, and institutional readiness, consistent with Venkatesh et al. (25) and Gupta and George (29), who emphasized capacity-building and support systems as essential for digital transformation. The particularly low score for training highlights a critical gap, as respondents feel unprepared to use AI effectively without structured learning opportunities.

Table 2 Level of Acceptance of Respondents on Artificial Intelligence as a Whole and in terms of: Performance Expectancy; Effort Expectancy; Social Influence and Facilitating Conditions

Variables	SD	Mean	Verbal Interpretation
Performance Expectancy			
Use of AI in data governance helps my ability to manage barangay data efficiently.	0.5395	3.46	High
Use of AI tools improve my job performance in the barangay.	0.4316	3.24	Moderate
Use of AI tools increase my productivity in processing and analyzing data.	0.5697	3.43	High
Use of AI tools make it easier to do my job.	0.4624	3.22	Moderate
AI tools are useful in my job in the barangay.	0.4521	3.28	Moderate
Total		3.37	Moderate
Effort Expectancy			
AI tools are easy to understand and helpful for data governance.	0.4874	3.37	Moderate
Use of AI tools for data governance is easy to learn.	0.4820	3.35	Moderate
AI tools are flexible to use with.	0.5197	3.35	Moderate
It is easy to become skillful at using AI tools.	0.5434	3.31	Moderate
Use of AI tools for data governance do not require excessive effort.	0.4195	3.22	Moderate
Total		3.30	Moderate
Social Influence			
My fellow officials and constituents expect me to accept AI tools in data governance.	0.5075	3.31	Moderate
Our barangay supports the use of AI for data governance.	0.4316	3.24	Moderate
My fellow officials encourage the use of AI tools.	0.4234	3.17	Moderate
Our community expect us to use AI tools in data governance.	0.4013	3.10	Moderate
Government policies and programs support the use of AI tools in data governance.	0.4196	3.22	Moderate
Total		3.26	Moderate
Facilitating Conditions			
Our barangay has access to sufficient technology resources to implement AI in data governance.	0.3019	3.05	Moderate
Adequate technical support available to assist us with AI tools.	0.5157	2.87	Moderate
Access to training programs that help me use AI for data governance.	0.5405	2.48	Moderate
As a barangay official I have necessary skills and knowledge to use AI tools for data governance.	0.4658	3.17	Moderate
Government programs and policies is available to support AI tools acceptance in the barangay.	0.3391	3.13	Moderate
Total		3.10	Moderate
Grand Mean		3.26	Moderate

Legend: 4.21-5.00 = Very High; 3.41- 4.20 = High; 2.61- 3.40 = Moderate; 1.81- 2.60 = Low; 1.00- 1.80 = Very Low Source: Data from the researchers

3.3. Influence of Respondents' Profile on Awareness in Artificial Intelligence in Data Governance

The regression analysis revealed that gender, ChatGPT use, and Microsoft Copilot use are statistically significant predictors of awareness of artificial intelligence (AI) in barangay data governance, while other variables such as age, education, position, location, Internal Revenue Allotment (IRA), other AI tools, frequency of use, and exposure to AI did not demonstrate meaningful influence. This highlights the importance of both social influence and direct technological engagement in shaping awareness among barangay officials.

Gender emerged as a significant predictor ($\beta = 0.370$, $p = 0.009$), suggesting differences in engagement with AI tools between men and women. This finding resonates with prior research by Venkatesh and Morris (30), who identified gender differences in confidence and willingness to experiment with new technologies, and Cooper (31), who noted that structural barriers such as access and cultural expectations often shape women's opportunities in technology adoption. In barangay governance, these disparities may influence how officials perceive artificial intelligence (AI) role in decision-making and data management.

ChatGPT use ($\beta = 0.288$, $p = 0.037$) and Microsoft Copilot use ($\beta = 0.265$, $p = 0.042$) also significantly predicted awareness. This validates the argument of Dwivedi et al. (32), who emphasized that direct interaction with AI fosters familiarity and trust, and Ivanov and Webster (33), who highlighted that embedded AI systems like Copilot increase awareness through continuous workplace exposure. These findings suggest that experiential learning—using AI tools in practical governance tasks—drives awareness more effectively than abstract knowledge. Other tools such as Google Gemini, Meta AI, and Google Assistant did not show significant effects, reflecting differences in adoption rates or perceived utility. According to the Technology Acceptance Model, perceived usefulness and use of use strongly influence whether a technology impacts user behavior (22). Tools less frequently used or perceived as less relevant may not significantly contribute to awareness.

Interestingly, age ($\beta = -0.098$, $p = 0.589$) and education ($\beta = 0.031$, $p = 0.809$) were not significant predictors. This challenges traditional assumptions from Rogers' diffusion of innovations theory (28), which often emphasizes younger and more educated individuals as early adopters. In this study, awareness appears democratized, cutting across demographic boundaries. Similarly, position ($\beta = 0.093$, $p = 0.589$), location ($\beta = 0.101$, $p = 0.451$), and IRA ($\beta = 0.031$, $p = 0.827$) were not significant, indicating that awareness is not strongly shaped by organizational role or barangay resources. Moreover, frequency of AI use ($\beta = -0.041$, $p = 0.768$) and exposure to AI ($\beta = -0.159$, $p = 0.229$) were not significant predictors. This suggests that mere exposure is insufficient; rather, meaningful engagement with specific tools like ChatGPT drives awareness. Selwyn (34) emphasized that awareness develops through quality of engagement, not quantity of interaction, reinforcing the importance of substantive use in governance tasks.

Table 3 Influence of Respondents' Profile on Awareness in Artificial Intelligence in Data Governance

Variable	Beta	t-value	Sig. P-value	Remarks
Age	-0.098	-0.545	0.589	ns
Gender	0.370	2.766	0.009	s
Highest Educational Attainment	0.031	0.243	0.809	ns
Position in the Barangay	0.093	0.545	0.598	ns
Geographical location of the Barangay	0.101	0.761	0.451	ns
2025 Internal Revenue Allotment (IRA)	0.031	0.220	0.827	ns
AI Tools Use - ChatGPT	0.288	1.755	0.037	s
AI Tools Use – Google Gemini	-0.022	-0.154	0.878	ns
AI Tools Use – Microsoft Copilot	0.265	2.103	0.042	s
AI Tools Use – Google Assistant	0.046	0.382	0.704	ns
AI Tools Use – Meta AI	0.078	0.540	0.592	ns
AI Tools None	-0.087	-0.426	0.673	ns
Frequency of AI Use	-0.041	-0.297	0.768	ns
Exposure to AI	-0.159	-1.223	0.229	ns

Legend: p-value < 0.05 alpha = significant: p-values > 0.05 alpha = not significant Source: Data from the researchers

3.4. Influence of Respondents' Profile on Acceptance in Artificial Intelligence in Data Governance

The regression analysis revealed that gender is the only statistically significant predictor of acceptance of artificial intelligence (AI) in barangay data governance ($\beta = 0.354$, $p = 0.006$). Other variables such as age, educational attainment, position in the barangay, geographical location, Internal Revenue Allotment (IRA), and frequency of AI use did not exhibit significant effects. These findings highlight the role of social influence in shaping attitude towards artificial intelligence (AI) adoption and challenge the assumption that traditional demographic characteristics are the primary determinants of acceptance.

The significant role of gender suggests that acceptance of AI differs meaningfully between male and female respondents. This finding is consistent with Gefen and Struab (35), who reported that men and women differ in their perception of ease of use and trust in information technologies, and Venkatesh and Morris (30), who demonstrated that social influence and gender norms play a critical role in shaping technology usage behavior. In governance contexts, these differences may manifest in varying levels of openness to automation, reliance on AI-driven decision-making, or concerns about fairness and accountability. This underscores the need for inclusive strategies that increase acceptance among women officials and constituents.

Traditional demographic variables such as age and education did not significantly predict acceptance, challenging the common assumption that younger or more educated individuals are more likely to embrace AI. Instead, acceptance appears to depend more on perceptions of usefulness, trustworthiness, and relevance to governance processes. This finding validates the Unified Theory of Acceptance and Use of Technology (UTAUT), which emphasizes constructs such as performance expectancy, effort expectancy, and social influence rather than demographic characteristics (25).

The analysis of AI tool usage revealed no significant effects for platforms such as ChatGPT, Gemini, Meta AI, or Google Assistant. However, Microsoft Copilot usage ($\beta = 0.223$, $p = 0.059$) and exposure to AI ($\beta = -0.227$, $p = 0.067$) emerged as borderline predictors. The positive trend for Copilot suggests that embedded workplace AI systems may foster greater trust and usability, consistent with Ivanov and Webster (33). Conversely, the negative trend for general exposure indicates that deeper familiarity can sometimes lead to skepticism or awareness of limitations, reflecting the paradox of AI acceptance. The insignificance of frequency of AI use ($p = 0.958$) reinforces the idea that acceptance is not simply a matter of repeated interaction but hinges on the quality of experiences and perceived reliability of AI systems. This aligns with Davis (22), whose Technology Acceptance Model (TAM) emphasized perceived usefulness and ease of use as primary determinants of adoption. Overall, the findings indicate that acceptance of AI in barangay governance is significantly influenced by gender and may also be shaped by specific experiences with AI tools.

Table 4 Influence of Respondents' Profile on Acceptance in Artificial Intelligence in Data Governance

Variable	Beta	t-value	Sig. P-value	Remarks
Age	-0.019	-0.113	0.910	ns
Gender	0.354	2.903	0.006	s
Highest Educational Attainment	-0.072	-0.621	0.538	ns
Position in the Barangay	0.144	0.930	0.358	ns
Geographical location of the Barangay	0.172	1.433	0.160	ns
2025 Internal Revenue Allotment (IRA)	-0.027	-0.028	0.836	ns
AI Tools Use - ChatGPT	0.204	1.368	0.179	ns
AI Tools Use – Google Gemini	-0.166	-1.265	0.213	ns
AI Tools Use – Microsoft Copilot	0.223	1.949	0.059	ns
AI Tools Use – Google Assistant	-0.006	-0.056	0.955	ns
AI Tools Use – Meta AI	0.173	1.323	0.194	ns
AI Tools None	-0.125	-0.674	0.504	ns
Frequency of AI Use	0.052	0.408	0.685	ns
Exposure to AI	-0.207	-1.754	0.067	ns

Legend: p-value < 0.05 alpha = significant; p-values > 0.05 alpha = not significant Source: Data from the researchers

3.5. Influence between Respondents' Level of Awareness on their Level of Acceptance on Artificial Intelligence in Data Governance

The regression analysis revealed that awareness of AI has a strong and statistically significant positive influence on acceptance among barangay officials. The standardized coefficient was $\beta = 0.808$, indicating a strong effect size, while the computed t-value = 9.888 and $p = 0.000$ confirmed statistical significance at the 0.05 threshold. These results demonstrate that awareness is a major contributing factor in explaining variations in acceptance levels.

This finding is substantiated by established theoretical frameworks. The technology Acceptance Model (TAM) introduced by Davis (22) posits that users are more likely to adapt a technology if they perceived it as both useful and easy to use. Within this study, awareness forms the basis for developing positive perceptions, which subsequently enhance acceptance. Similarly, the Unified Theory of Acceptance and Use of Technology (UTAUT) developed by Venkatesh et al. (25) asserts that experience and knowledge regarding a system significantly influence users' behavioral intentions to adopt it.

Furthermore, international organizations reinforce these findings. The OECD (37) and the World Bank (14) identify awareness and digital capacity as essential factors in facilitating the adoption of emerging technologies, including AI in governance. These reports emphasize that increasing familiarity and understanding of AI reduces resistance and fosters confidence among public officials.

Table 5 Influence between Respondents' Level of Awareness and their Level of Acceptance on Artificial Intelligence in Data Governance

Variable	Beta	t-value	Sig. P-value	Remarks
Level on Awareness on AI a. Dependent Variable: Level of Acceptance on AI	0.808	9.888	0.000	s

Legend: p-value < 0.05 = significant Source: Data developed by the researchers

4. Conclusion

The study found that barangay officials in selected areas in Roxas City exhibited a moderate level of awareness and acceptance of artificial intelligence (AI) in data governance. Respondents acknowledged AI's potential to enhance efficiency, transparency, decision-making, and public service delivery, particularly within data management and administrative processes. However, their knowledge and preparedness for comprehensive AI integration were constrained by insufficient training, limited technical expertise, inadequate digital infrastructure, and concerns about data privacy and security. While officials expressed openness to adopting AI technologies, their acceptance was contingent on appropriate guidance, institutional support, and capacity-building initiatives. The findings also indicated that awareness and acceptance were shaped by attitudes, perceived usefulness, social influence, and confidence in using technology. The study concluded that effective AI integration in barangay governance requires ongoing intervention, stronger institutional commitment, improved infrastructure, and coordinated efforts from government agencies to deliver training, establish policies, and develop support systems that will advance AI literacy and digital transformation at the grassroots level.

Compliance with ethical standards

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Disclosure of conflict of interest

The author declares no conflict of interest.

Statement of ethical approval

The research process consistently adhered to established ethical standards and the Data Privacy Act of 2012. The use of AI tools, including ChatGPT, Grammarly, and Microsoft Copilot, was acknowledged for grammar improvement, paraphrasing, and writing assistance. All AI-generated content was thoroughly reviewed, edited, and fact-checked by the researchers to maintain the study's accuracy, credibility, and integrity.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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