Navigating the Digital Frontier: Adoption of Artificial Intelligence for Efficient Public Service in Solano, Nueva Vizcaya

Esconde, Francess Dhanna Marielle L., Bautista, Cherry Mae R., Buguina, Aikol F., and Galima, Xaviery Brent D.

ABSTRACT

This study delved into the application of Artificial Intelligence (AI) in politics, examining its efficiency and influence on decision-making through data analysis and insights from elected officials. However, it is crucial to address potential drawbacks, including algorithmic bias, data privacy concerns, and the misconception that AI is intended to replace human agency. Ultimately, a balance between technological advancement and human judgment is essential to ensure ethical and effective AI implementation. This quantitative approach gathered data from thirty-five (35) respondents, thirteen (13) municipal officials, and twenty-two (22) barangay captains from Solano, Nueva Vizcaya. Based on the results, while AI tools are rarely used in decision-making, municipal and barangay officials still recognize their importance in improving task efficiency. However, the respondents are concerned about the adoption of AI because of its challenges. Despite these challenges, there is a general awareness of the use of AI. Lastly, demographic factors like age, current position, sex, and years in service do not influence how AI is used or perceived. It is recommended that every municipality invest in AI applications and focus on how to make AI more effective in a government setting.

Keywords: digital technology, ethical implications, local government, governance, political process, transparency

INTRODUCTION

The pervasive influence of technology on society, from the earliest tools to the internet age, is undeniable. Technological advancements have profoundly reshaped daily life and human interaction, with artificial intelligence emerging as a transformative force with the potential to revolutionize various aspects of society. This is underscored by research from Zhang et al. (2023), which emphasizes the critical need to understand public perception of AI in local governments. Their study, conducted in Australia and Hong Kong, two regions with advanced digital infrastructure but differing cultural contexts and levels of technology acceptance, examined how public trust, expectations of technological improvement, and transparency influence AI adoption in public services. The findings revealed that public receptiveness to AI is significantly higher when its purpose is clear, it demonstrably improves services, and its implementation is transparent. Australia, with its established norms and ethical standards, showed higher AI acceptance compared to Hong Kong, where skepticism was more prevalent, especially concerning personal data and automated decision-making. Nevertheless, the potential for AI to streamline government processes such as traffic management, sanitation, security, and service delivery remains significant.

The Philippine Supreme Court's initiative to integrate AI into its operations exemplifies this potential. Senior Associate Justice Marvic Leonen highlighted the focus on reliability, transparency, accountability, fairness, non-discrimination, data protection, and security in AI's governmental application. The court's aim is to leverage AI to expedite case resolution. However, Senator Grace Poe voiced concerns about over-reliance on AI, arguing that human judgment should remain central to decision-making, particularly in matters of law and equity. This debate underscores the complexities inherent in AI adoption, even within established institutions.

This research delves into the utilization of AI within the political landscape, specifically focusing on its impact on the decision-making processes in the local government of Solano. The

study's relevance stems from its potential to illuminate whether AI adoption in Solano enhances community and public service or exacerbates existing issues. To contextualize the research, the researchers compared their work to Amil's 2024 study, "Integration of Artificial Intelligence (AI) in Philippine Public Administration," which identified challenges such as limited knowledge and comprehension regarding AI adoption. In contrast to Amil's broader focus, this research concentrates on the specific adoption of AI within Solano's municipal operations, exploring its impact on public officials and the challenges of implementation. Both studies, however, highlight the crucial need to address the knowledge gap surrounding AI among local officials. The study also explored the utilization of various AI applications, including ChatGPT, Co-pilot, and Gemini, analyzing their effectiveness and the challenges associated with their implementation. This includes considerations of ethical implications, data protection, and the potential for bias in AI-driven decision-making. The research aims to provide a comprehensive understanding of AI's role in local governance, contributing valuable insights to the ongoing discourse surrounding AI adoption and its impact on public service.

METHODOLOGY

This research employed a quantitative, descriptive-comparative design to investigate AI adoption in Solano, Nueva Vizcaya's local government. Data collection focused on the demographic profiles of respondents, their AI application usage, and their awareness of AI. The study also compared perceptions of AI adoption among municipal officials and barangay captains. Solano was chosen as the research locale due to its status as a first-class municipality with advanced technology use, including an electronic legislative system. The research participants comprised a total of 35 individuals, encompassing the Mayor, Vice Mayor, Presiding Officer, seven Councilors, three Sectoral Representatives, and 22 Barangay Captains. The researchers employed purposive sampling, a non-probability sampling technique, to select participants. This approach was deemed appropriate because it targeted individuals presumed to possess a higher level of knowledge and experience regarding AI utilization within a local government setting. This targeted selection allowed for a more in-depth exploration of the complexities of AI adoption and its impact on governance.

The anticipated benefits of AI adoption in Solano include faster, more accurate, and accessible public services, along with enhanced community engagement. The research instrument was a survey questionnaire, piloted in Villaverde, Nueva Vizcaya, to assess validity and reliability. The questionnaire comprised four sections exploring AI application utilization in decision-making, the effectiveness of AI in public service, challenges in AI adoption (including technical and ethical issues), and the perceptions of officials regarding AI's role in local governance. Data gathering involved obtaining permission from relevant authorities, identifying qualified respondents, scheduling meetings, conducting in-person questionnaires, and ensuring data confidentiality. Data analysis utilized mean, standard deviation, frequency, percentage, Kruskal-Wallis Test, and Mann-Whitney U Test, depending on the variable. The study adhered to ethical standards set by Saint Mary’s University Research Ethics Board (SMUREB), addressing potential risks to participants, obtaining informed consent, and outlining clear terms of reference. The dissemination plan includes a digital infographic. The research is expected to contribute to the understanding of AI adoption in local government, offering valuable insights into challenges and opportunities.

The study's methodology involved a multi-faceted approach, combining descriptive and comparative elements to analyze the complexities of AI integration within this specific context. The descriptive component focused on gathering data related to the demographic profiles of the participants, the extent to which they utilize various AI applications, and their overall level of awareness concerning AI technologies. This provided a foundational understanding of the current state of AI adoption within the local government structure.

The comparative aspect of the study delved into the nuanced differences in perceptions regarding AI adoption between two key groups: local government officials and barangay captains. This comparative analysis aimed to identify potential discrepancies in understanding, attitudes, and experiences related to AI integration within the municipal governance framework.

RESULTS AND DISCUSSION

Survey results reveal low utilization of various AI applications among Solano's local government officials. While tools like ChatGPT and Gemini showed some usage ("seldom"), others such as Jasper Chat, Chatsonic, and YouChat were reported as never used. ChatGPT had the highest mean rating (2.34), still falling within the "seldom" category. This low overall AI adoption contrasts with the potential benefits highlighted by Damar et al. (2024), who emphasize the transformative potential of AI and machine learning in enhancing public services and efficiency. While Solano's officials aim to improve public services, the low AI usage suggests a significant gap between aspiration and implementation.

Despite low utilization, a generally positive perception of AI's effectiveness among officials who did use it. The overwhelming agreement across indicators suggests that AI tools improved task efficiency, informed decision-making, service delivery, and document processing speed. This positive perception aligns with the increasing adoption of AI-driven technologies in Philippine local government units noted by Miranda et al. (2024), highlighting the potential for AI to enhance various aspects of public service. However, the low usage rates raise questions about the scalability and widespread impact of AI within the municipality. The critical role of local governments in efficient service provision, as highlighted by Yigitcanlar et al. (2021), further emphasizes the need for a more comprehensive AI strategy.

A substantial majority (77.1% to 82.9%) agreed with statements highlighting limitations in AI implementation, privacy and security concerns, lack of public trust, potential bias, difficulty understanding AI decision-making processes, and insufficient guidelines and regulations. These findings underscore the unpreparedness of the local government to fully utilize AI. The high level of agreement across these challenges points to a lack of information and a need for comprehensive policies and education before widespread AI adoption can be successful.

The concerns about potential job displacement, algorithmic bias, and the widening digital divide align with broader discussions on the ethical and societal implications of AI (Mora et al., 2023; Zhang et al., 2024). The need for public participation in policy formulation and the importance of aligning AI with societal values are crucial considerations for successful AI integration.

There is a generally positive perception (overall mean of 2.81) of AI among Solano's elected officials. While most officials reported familiarity with AI concepts and recognized its potential benefits, the lower mean score for actual AI use (2.71) indicates a gap between awareness and practical application. The high mean score for investment in AI technologies (3.17) demonstrates openness to innovation, but the lower score regarding AI's ability to handle complex decisions (2.65) highlights reservations, possibly stemming from concerns about ethical and legal implications. These findings align with the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT), emphasizing the influence of perceived usefulness and ease of use on technology adoption. However, the gap between positive attitudes and actual usage suggests a need for support, training, and infrastructure improvements. Furthermore, the hesitation to entrust AI with complex decisions highlights the importance of addressing concerns about fairness and algorithmic bias, as discussed by Virginia Eubanks. A holistic approach, integrating AI into the government's culture and supported by legal, ethical, and technical frameworks, is crucial for successful implementation.

Conclusion

While tools such as ChatGPT and Gemini see some use, many AI applications remain largely underutilized. Despite this, officials generally acknowledge that AI enhances efficiency, specifically in document processing and decision-making accuracy. However, significant concerns persist regarding privacy, security risks, and the potential for job displacement. Notably, the study found no significant correlation between respondent demographics—such as age, sex, position, or years of service—and AI utilization or perceived effectiveness.

Although officials maintain a positive outlook on AI's potential, the combination of low usage and ethical concerns highlights a critical need for strategic planning, infrastructure investment, and specialized training. Establishing clear guidelines and regulations is essential for responsible implementation. Ultimately, this positive perception provides a foundation for future integration, provided these challenges are addressed proactively. As part of the study's dissemination plan, a digital infographic was developed to educate stakeholders on AI in local governance.

Recommendations

Despite officials' reported familiarity with AI, the study emphasizes the need for local governments to translate national AI regulations into context-specific policies, including guidelines for ethical and safe AI use. Moreover, to promote responsible AI adoption, the study recommends municipalities conduct seminars and capacity-building activities to educate officials on AI's principles, applications, and potential risks. These recommendations highlight the need for both policy development and educational initiatives to foster successful and ethical AI integration within local government.

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