

Public managers perception on artificial intelligence: the case of the State of Mexico

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Abstract

The use and implementation of Artificial Intelligence (AI) tools for doing repetitive tasks in the public sector is a challenge, particularly in persuading bureaucrats. However, the potential benefits for citizens, such as improved process and services related to tax payments and basic services using machine learning or diffuse logic for decision making or logistic distribution, are significant. This research aims to investigate public managers' competencies to face AI challenges in the public sector. A survey was conducted among 32 key public managers from the government of the State of Mexico in the central region to assess their perceptions of AI. The findings indicate that there is a lack of skills and a limited understanding of AI among public managers, potentially hindering its future implementation. This study is relevant as it identifies the level of competency development for the implementation of AI in a local government.

Keywords: artificial intelligence, local government, public managers, perceptions, competencies.

1. Introduction

The use of technology to improve government management and tasks has been crucial since WWII. The ARPANET communication network helped to win the war, then became an essential element for the information highway in the next century.

This new information age creates a new cyberspace that leads to new organizations, improves tasks, and modifies human interaction. The trend of New Public Management brings the next stage of government, with the reinvention of Government (Osborne & Gaebler, 1992), which formulates the idea of e-government as a combination of technology to support government tasks and cost reduction.

The digital government forces the digitalization process over different tasks in the government process. Still, it introduces new challenges: waves of new data, digital transformation of functions, transparency, open government concerns, privacy, and data security.

AI can be used to automate processes, improve citizen-service, and provide personalized services (Ahn & Chen 2020). This could lead to more efficient and cost-effective services, but it could also lead to a decrease in human interaction and an increase in the use of algorithms to make decisions. Additionally, AI can be used to manipulate behavior, which could lead to a decrease in autonomy and an increase in surveillance.

The objective of this research is to understand the perceptions of public managers regarding AI in this government instance. Specifically, it aims to answer the following research questions:

RQ1: What is the perception of public managers in the State of Mexico government regarding AI applied to the functioning of public administration?

RQ2: What capabilities do public managers in the State of Mexico government have for the implementation of AI applied to the functioning of public administration? To answer these questions, a survey was conducted among 32 key public managers in the central State of Mexico.

Public ICT managers in the State of Mexico demonstrate a strong willingness to adopt AI and acknowledge the need for additional competencies in public employees related to AI. Overall, public managers perceive themselves as having basic skills in AI planning but lacking intermediate skills in the execution of AI projects. At the departmental level, most managers perceive that their departments have basic skills in AI planning but lack intermediate skills in the execution of AI projects. At the local government level, perceptions are like those at the departmental level, with basic skills in AI planning and limited skills in the execution of AI projects. There is a significant knowledge gap in AI at the local government level, suggesting a delay in the learning curve.

This paper is structured into six sections. The second section describes the literature review for the study; the third section outlines the methodology; the fourth section presents the findings. The fifth section discusses the results. The final section concludes with limitations and future directions.

2. Literature review

This section has three subsections. First, it provides a brief introduction to AI. Then, it describes AI in government literature. Finally, it reviews the competencies framework and similar research.

2.1 Artificial Intelligence development

AI is a clear example of how the speed of development and technological capacity are rapidly surpassing previous limits. This is due to its ability to leverage the vast amount of information accumulated since the creation of databases and its global circulation. It holds the potential to transform healthcare by enhancing diagnosis, treatment, and patient data management (Joison et al., 2021). Furthermore, there are ethical and privacy concerns associated with the use of AI. The use of personal data and the potential for algorithmic discrimination pose challenges in terms of equity and justice (Parloff, 2016).

Regarding the handling of personal information in the medical field, Ellahham et al. (2020) address concerns about privacy and data security in the context of AI in healthcare. Davenport & Ronanki (2018) point out that the difficulty of integrating AI projects with existing processes and systems is the primary challenge that derails AI initiatives.

In the context of the local public sector, Mikalef et al. (2019) identified that the most significant inhibiting factor for the development of AI projects is the inability to integrate systems and data, as well as ensuring the use of quality data for AI training. Equally important are organizational factors, including lack of expertise and necessary knowledge, limited financial resources, and organizational inertia (Mikalef et al., 2019).

AI is a rapidly advancing technology that has the potential to revolutionize healthcare, data management, and diagnosis and treatment processes. However, its integration with existing systems and processes in both the private and public sectors presents a major challenge. It is especially important to consider the implications of AI for the public sector, where infrastructure and human skills are lagging, and the social impact of their tasks is greater. In the following section, the effects of AI on government configuration and functioning are discussed.

2.2 Artificial Intelligence in government

This section analyzes the implementation of AI based on four dimensions that distinguish the transformation in the conception of government, the techniques that have been developed, the most

representative applications, and their impact on citizen services.

Currently, there is a movement towards a systematic analysis of the benefits and challenges in the design, management, adoption, and implementation of AI in government, following an initial stage focused on risk and benefit mapping (Medaglia et al., 2021).

The increasing use of AI technologies drives the transition from e-government to intelligent government, incorporating "smart areas" such as urban planning, public services, transportation, agriculture, disaster management, welfare, and healthcare (Ahn & Chen, 2020). Achieving successful implementation of AI requires a mature level of digital government and a data ecosystem includes IoT and digital services (Kankanhalli et al., 2019). Intelligent government is considered a key trend, driven by technologies such as the Internet, Big Data, open data, and AI (Valle-Cruz, Fernandez-Cortez, & Gil-Garcia, 2022). To leverage AI techniques, access to unbiased, high-quality data in sufficient quantity is crucial, as emphasized by Berryhill et al. (2019). However, the adoption of AI in government is not limited solely to data but is influenced by environmental, organizational, innovation, and data governance factors, (Van Noordt & Misuraca, 2022).

The implementation of AI in government has resulted in various use cases. Ahn and Chen (2020) have analyzed examples that illustrate how AI is being applied in different areas of public sector:

1. The Cincinnati Fire Department utilizes data analysis to improve the efficiency and long-term sustainability of emergency medical services. They have created a system that provides specific responses to medical emergency calls.
2. Digital assistance with chatbots: the North Carolina Innovation Center (iCenter) has tested chatbots to relieve internal IT help desk staff from mundane tasks such as password resets.
3. The Los Angeles Airport Police has partnered with the University of Southern California to develop AI that helps make security patrol schedules and routines unpredictable.
4. AI is employed to read and encode responses from surveys on workplace injuries and illnesses, which assists the Labor Office in informing companies and governments on how to prevent them.
5. Cities like Baltimore, New York City, and San Francisco are utilizing AI-based approaches to monitor water flow, identify leaks, and prioritize repairs.

Mehr et al. (2017) proposes six strategies for applying AI in government work: 1) Making AI part of a citizen-centered and goal-based program; 2) Gathering insights from citizens to improve outcomes; 3) Leveraging existing resources and avoiding duplications; 4) Being prepared to handle necessary data and protect privacy; 5) Mitigating ethical risks and avoiding exclusive AI decision-making; 6) Enhancing employee capacity rather than replacing them. In the realm of government, neural network models have been used to predict high crime risk zones in transportation, with the aim of preventing crime or generating public policies to counter these threats (Kouziokas, 2017).

Various studies have analyzed the implications of AI in the public sector and identified its potential benefits in areas such as public health, climate change policies, public management, decision-making, disaster prevention and response, improving government-citizen interaction, service personalization, interoperability, (Valle-Cruz et al., 2019). These use cases demonstrate how AI has been successfully implemented in government to improve various aspects such as resource allocation efficiency, customer service, public safety, and decision-making. Also, according to Mehr et al. (2017), AI can be used to provide emergency responses, deliver personalized and low-cost training. Successful applications have been identified in European countries such as Estonia, the Netherlands, and Belgium.

Van Noordt & Misuraca (2022) provide examples such as the case of the Estonian Agricultural Registers and Information Board (ARIB), where the SATIKAS system has been implemented. Using AI technologies, this system is capable of automatically monitoring whether mowing has been carried out in Estonian grasslands (Van Noordt & Misuraca, 2022). In Belgium, the Flemish Agency for Children and Families (Kind en Gezin) has initiated a pilot project that utilizes advanced data analysis to create a predictive model. AI will have a greater impact if it manages to reduce administrative burdens and enhance the human experience rather than replacing workers.

In the new era of AI-enhanced public administration, national data management becomes crucial in determining national competitiveness (Ahn & Chen, 2020). AI techniques can generate scenarios that assist in the allocation of public expenditure (Valle-Cruz, Fernandez-Cortez, & Gil-Garcia, 2022).

Table 1 summarizes and classifies these literature research about IA and Government, that justifies this investigation.

The research that comes closest to this was developed by Criado et al. (2021) who conducted a study on AI policy based on the perceptions, expectations, and challenges/opportunities raised by Chief Information Officers (CIOs). Their data supports

the existence of different governance models and policy priorities in different countries. The role of CIOs in understanding the design and use of technologies in the public sector is crucial. Criado et al. (2021) research highlights four key conclusions in this regard. The first conclusion emphasizes the significant role of CIOs in the initial stage of AI adoption in the public sector. This represents a shift from traditional digital government applications to algorithm-based technologies.

Secondly, Criado et al. (2021) conclude that senior executives' perceptions are important in recognizing the potential of AI in the public sector. These officials "frame" IT policies. As a third important factor, the authors found that CIOs are open to adopting AI in public sector settings. They believe that AI in the public sector is not significantly different from AI in the private sector. The last conclusion in Criado et al. (2021) study relates to CIOs in the national government of Mexico. They identify security and mobility as the domains of public policy that will be most affected by AI in the early stage.

The second part of this research is to understand the four competencies framework of factors determining the development of AI in the functioning of public administration. According to the World Bank's Government Technology Maturity Index, 47% of countries do not have a strategy to improve digital skills (Dener et. al., 2021). This is particularly crucial in the public sector to build a strong technical workforce.

In order to promote the creation of digital capabilities in the public sector, Balbo Di Vinadio et al. (2021) have developed a framework of competencies necessary for digital transformation and digital governance initiatives. This competency framework is broadly classified into three domains: 1. Digital planning and design, including problem identification and agile strategy; 2. Data usage and governance; 3. Digital management and execution.

The first domain refers to the development of a vision to design and implement projects or policies for inclusive digital transformation. The second domain of Data Usage and Governance focuses on developing the understanding that public officials should have regarding the importance of data. Includes formulating data-driven policies and acquiring basic digital skills.

Lastly, the third domain of Digital Management and Execution, includes iteration and agile execution, refers to the need for officials to incorporate management practices that increase the likelihood of success in digital transformation initiatives. This literature review explores the potential of AI and how governments have used it. It emphasizes the importance of building strong foundations, starting with the skills of public officials.

Table 1. Analytics approaches to AI in government.

Author	Main approach
Jimenez-Gomez et al., 2020	The repercussions of AI in government are broad and significant, impacting aspects like transparency and accountability.
Medaglia et al., 2021	There is a movement towards a systematic analysis of the benefits and challenges in the design, management, adoption, and implementation of AI in government.
Ahn & Chen, 2020	Successful implementation of AI requires a mature level of digital government and a data ecosystem that includes IoT and digital services.
Valle-Cruz, 2022	Collaboration between the public sector, private sector, NGOs, and civil society is crucial for the successful implementation of "intelligent government."
Mehr et al., 2017	AI can reduce administrative burdens, address resource allocation issues, and automate routine processes.
Berryhill et al., 2019	Access to unbiased, high-quality data is crucial to leverage AI techniques.
Van Noordt & Misuraca, 2022	Besides data, strong technical infrastructure in the data ecosystem is essential for successful AI adoption.
Ahn & Chen, 2020	AI is applied in areas like urban planning, public services, transportation, agriculture, disaster management, welfare, and healthcare.
Mehr et al., 2017	AI can enhance efficiency in government work and citizen engagement in five main categories.
Kouziokas, 2017	Neural network models are used to predict high crime risk zones in transportation.
Valle-Cruz et al., 2019	AI has the potential to benefit areas like public health, climate change policies, public management, decision-making, disaster response, and government-citizen interaction.
Mehr et al., 2017	AI can improve public resource allocation efficiency, public safety, and decision-making.
Van Noordt & Misuraca, 2022	Successful AI implementation examples in Estonia and Belgium, monitoring grasslands and childcare services inspection.
Mikhaylov et al., 2018	Collaboration between universities and the public and private sectors is essential to address AI challenges in the public sector.
Medaglia et al., 2021	Successful AI implementation in government should focus on AI governance and generating public value.
Criado et al., 2021	Chief Information Officers (CIOs) play a critical role in AI adoption in the public sector and translating political strategies.
Dener et al., 2021	Nearly half of the countries lack a strategy to improve digital skills in the public sector.
Balbo Di Vinadio et al., 2021	Competency framework for digital transformation and digital governance initiatives.

Source: Authors.

3. Methodology

This study examines the momentum of AI in the local government of the State of Mexico. Specifically, it aims to answer the following research questions:

RQ1: What is the perception of public managers in the State of Mexico government regarding AI applied to the functioning of public administration?

RQ2: What capabilities do public managers in the State of Mexico government have for the implementation of AI applied to the functioning of public administration?

Table 2 illustrates the demographic information about the IT public managers who responded from the State of Mexico government. The average age of the respondents was 44.6 years. Most of the IT public managers were male, accounting for 87.5 percent of the respondents. Most of the IT public managers held a bachelor's degree, while 37.5 percent had a master's degree, 6.2 percent had a non-university degree level, and 3.1 percent had a doctorate.

In most cases, the public managers studied Computer Systems Engineering and Informatics, as well as ICT, computer science, telecommunications, and mechatronics. These demographic data presented a relatively young group of public managers, predominantly male, with diverse and advanced technological educational backgrounds.

Table 2. Information on public managers in State of Mexico

Public managers	32 (104)
Average age	44.6
Gender	
Female	6.25%
Male	87.50%
Other	6.25%
Academic degrees	
Technical diploma	6.20%
Bachelor's	56.25%
Master's	37.50%
Doctorate	3.10%

Source: Authors.

This exploratory research is based on a survey concerning the perceptions of key IT officials within the local government agencies of the State of Mexico, Mexico. The questionnaire was sent via email. The objective of this study is to examine the institutional perceptions of the local government of the State of Mexico by analyzing the opinions of public managers

responsible for ICT management. Research on AI in the public sector has focused on regulation and case studies, with quantitative and comparative data derived from external information.

The literature on AI in the public sector has started to explore the perceptions of IT managers responsible for national-level government policy (Criado et al., 2021; Ruvalcaba-Gomez & Cifuentes-Faura, 2023; Valle-Cruz & García-Contreras, 2023). Consequently, this study contributes to this body of knowledge by delving into the local government sphere, providing key data based on a survey that highlights the perceptions of public officials in the State of Mexico government who manage ICT regarding the application of AI in this government realm.

3.1 Research design

This research aims to identify the institutional perspectives of a local government regarding the different dimensions of AI in public administration. This work includes the following dimensions, based on the opinions of public managers focused on ICT:

1. Perceptions related to the concept of AI in the public sector. Currently, the notion of AI has been expanding in the academic and professional fields focused on the public sector, but it is still not fully shared. This work assumes that public managers in the State of Mexico government have a closer affinity with technocentric perspectives of AI and the derived or parallel technologies (such as big data, robotics, deep learning, and automated systems) than with those that view technology as a tool to improve the interaction of the public sector with citizens, placing citizens at the center.

2. Competencies for the implementation of AI in the public sector. Here, it is assumed that public managers in the State of Mexico government do not possess the strategic capabilities for the development of comprehensive AI projects in public administration. They may share competencies based on technical aspects and ICT infrastructure.

3.2 Research Framework

For the development of this research, a questionnaire instrument was designed and administered to public officials in the departments of the State of Mexico government who are involved in the design and implementation of tasks in the areas of communication and information technologies. The names and contact information of the public managers were gathered from the websites of their respective offices. The contact information, including email addresses of the public managers in the State of Mexico

government, was verified for accuracy through direct communication with their offices via phone. The project presentation, which included descriptions of the researchers and affiliations involved in this project, and the request to respond to the questionnaire, including a web link to the online instrument, were sent via email.

The research technique employed to collect data involved a survey consisting of 35 multiple-choice questions directed at public officials managing ICT in the State of Mexico government. Data collection was from November 11, 2022, to January 31, 2023. The response rate was 30 percent from the surveyed ministries (32 out of 104 requests sent). The validation of this survey was supported by reviews from public managers who examined the content to avoid inconsistencies.

The survey provides insights, from the voices of the involved stakeholders, into the current situation of the State of Mexico regarding technology adoption processes as part of public management modernization. This questionnaire was based on a previous instrument developed in 2020 by the Center for Strategic Studies for Development at the University of Guadalajara (Ruvalcaba-Gomez & Cifuentes-Faura, 2023). It was adapted to the analytical context, modified in its structure, and added sections to fulfill the objective of this research.

To examine the dimensions of the study, the survey results were analyzed using descriptive statistics. These relatively simple yet effective methods were appropriate for achieving the goal of exploratory research. Regarding the survey sample, the State of Mexico is composed of 16 ministries, each of which includes a corresponding ICT department. Therefore, the analysis conducted in this exploratory study is based on the responses from almost all ministries.

4. Main Findings

This section provides results on the two main dimensions that were surveyed among public officials: perceptions and competencies of AI in government.

4.1 Perceptions regarding the notion of Artificial Intelligence in the State of Mexico.

Initially, this study examines the perceptions of local public managers regarding AI in the public sector, as emerging technologies are not uniformly perceived, adopted, and implemented. In particular, the perceptions of public managers will help recognize the scope and potential of AI in the public sector, as this group defines IT policies.

The analysis of the overall question on AI reveals some interesting findings. The question was: "How

much do you agree with the following statements related to Artificial Intelligence?" Based on a scale from 1 to 7, where 1 represents "Strongly Disagree" and 7 represents "Strongly Agree," Table 3 shows that most public managers strongly agree with being open to the introduction of Artificial Intelligence (6.3). Regarding the need for additional "competencies" in public employees, a higher number of respondents strongly agree with this statement (6.2), as well as with the fact that proficiency in new professions related to Artificial Intelligence will have to be addressed (6.2). Moreover, they assume as a natural course of action that robots and humans will share work (6), and that AI in the public sector does not have to differ significantly from AI in the private sector (5.9).

Table 3: General ideas related to artificial intelligence in the public sector.

	Average	Standard deviation
Being open to the introduction of Artificial Intelligence (AI)	6.3	0.9
AI in the public sector doesn't have to be much different from AI in the private sector	5.9	1.4
Assuming with complete naturalness that robots and humans will share work	6.0	1.1
Envisioning the future occupations of public employees is complex, as the substitution process will have profound impacts	5.4	1.5
Additional "competencies" will be required in public employees	6.2	1.1
Addressing the new professions related to Artificial Intelligence will be necessary with expertise.	6.2	1.0

Source: Authors.

On the other hand, in the category aimed at identifying the human capabilities and behaviors that public managers associate with transformations based on the application of AI in the public sector, the survey question regarding capabilities/behaviors was: "Within the following classification of human behaviors/capabilities, to what extent do you agree or disagree with their substitution by Artificial Intelligence in the public sector?" In Table 4, public managers from the government of the State of Mexico commonly perceive the transformation of capabilities and behaviors in the public sector based on AI. The capability/behavior of Monitoring received the highest score (6.2), followed by Remembering (6), Analyzing (5.8), and Anticipating (5.8). As for those capabilities/behaviors where they are "completely disagree" that they should be replaced by AI in the

public sector, these include Feeling (3.6) and Moralizing (3.7).

Table 4: Human capacities and behaviors based on artificial intelligence.

	Average	Standard deviation
Monitor	6.2	1.2
Analyze	5.8	1.3
Act	4.5	1.8
Interact	4.9	1.7
Remember	6.0	1.5
Anticipate	5.8	1.4
Feel	3.6	2.2
Moralize	3.7	2.0
Create	4.8	1.9
Decide	4.6	2.0
Average	5.0	1.7

Source: Authors.

4.2 Competencies for the Implementation of Artificial Intelligence in the State of Mexico

The following document outlines the essential competencies required for the successful implementation of artificial intelligence (AI) in the State of Mexico. These competencies have been carefully identified and curated to ensure that the AI initiatives undertaken in the region are effective, efficient, and aligned with the goals and objectives of the State. The competencies cover various aspects of AI implementation, including technical expertise, data management, ethical considerations, and regulatory compliance. By adhering to these competencies, the State of Mexico can leverage the power of AI to drive innovation, enhance decision-making processes, and improve the overall quality of services provided to its citizens.

Based on the three dimensions of competencies related to AI applied in the public sector (Balbo Di Vinadio, et al., 2022), this second category aimed to identify the perception of public managers in the government of the State of Mexico regarding the level of competencies development they consider existing in three levels: individual, departmental, local government. To assess competencies development, the following levels were used as a scale (Balbo Di Vinadio, et al., 2022):

- Basic: Understanding the complexity and interconnectedness of problems.
- Intermediate: Adopting a holistic and long-term vision, and using simple tools to anticipate, identify, and solve problems.
- Advanced: Mastering approaches, tools, and methods to anticipate, identify, and solve complex problems.

- Specific: Identifying and specifying problems where AI is important and anticipating future AI technological developments.

At the individual level, perceptions of the level of development in the competency areas do not show significant variation (see Figure 1). In the case of the competency area of AI Planning and Design, 56.3% consider themselves at the Basic skill level, 31.3% at the Intermediate level, and 12.3% at the Advanced level.

In the area of competence related to the Use and Governance of AI data, at the individual level, the majority consider themselves at the Basic level (46.87 percent) and Intermediate level (43.75 percent), with just under 10 percent perceiving themselves at the Advanced level.

Concerning the area of competence related to the Management and Execution of AI, like the previous two areas, the Basic skill level predominates in all three domains (56.3 percent), followed by a considerable one-third at the Intermediate level (31.3 percent), with the Advanced skill level being lower, at just over 10 percent.

The outcomes derived from individual perception regarding competency in various areas reveal intriguing findings. Specifically, public managers who were interviewed demonstrated commendable proficiency in AI planning, displaying both basic and intermediate skills. Conversely, their aptitude in managing and executing AI was perceived to be lacking, primarily at a basic level rather than intermediate.

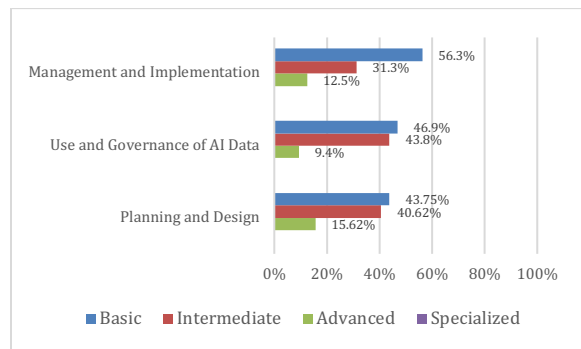


Figure 1. Competencies developed at the individual level.

However, when it comes to the utilization and governance of AI data, public managers exhibited a combination of basic, intermediate, and even advanced skills.

At the department level, the differences between competency areas are also not significantly variable (see Figure 2). Regarding the competency area of AI Planning and Design, 75% perceive the skill level as Basic, while 25% believe their department is at the Intermediate level. In the area of competence related to

the Use and Governance of AI data, there is a noticeable majority rating their competencies as limited, placing their department at the Basic level (71.87 percent), while the remaining public managers believe their department is at the Intermediate level. In the area of competence related to the Management and Execution of AI, there is a clear majority rating it at the Basic skill level (75 percent), with no consideration given to the Advanced skill level, leaving the remaining 25 percent at the Intermediate level.

According to this research, public officials believe that their departments are not ready to implement AI. In the areas of planning, data governance, and government execution, departments are seen as having basic skills, but only a few have intermediate capabilities.

Finally, at the local government level, perceptions regarding the level of development in the three competency areas are even more similar than in the two previous levels (see Figure 3). In the competency area of AI Planning and Design, 53.1% perceive that the local government is at the Basic level, 37.5% consider it to be at the Intermediate level, 6.3% at the Advanced level, and 3.1% at the Specialized level. In the area of competence related to the Use and Governance of AI data, slightly over half perceive it to be at the Basic skill level (53.1 percent), with just over 40 percent at the Intermediate level, and slightly above 6 percent at the Advanced level.

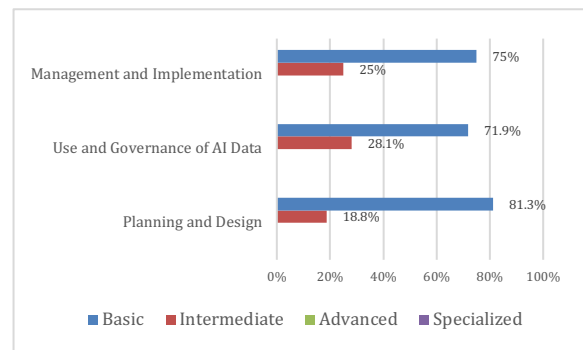


Figure 2. Competencies developed at the Department level.

This trend is repeated in the last competency area, the Management and Execution of AI, with slightly over half perceiving it at the Basic skill level (53.1 percent), just over 35 percent at the Intermediate level, and almost 10 percent at the Advanced level.

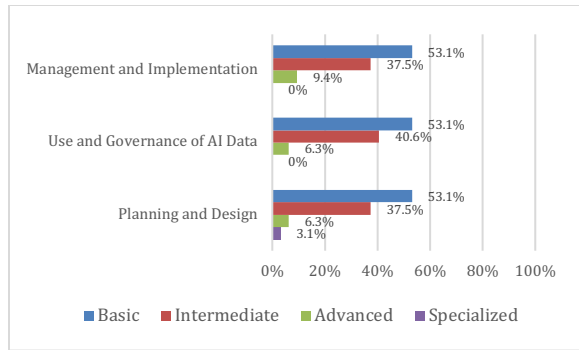


Figure 3. Competencies developed at the local government level.

The outcomes derived from individual perception regarding competency in various areas reveal intriguing findings. Specifically, public managers who were interviewed demonstrated commendable proficiency in AI planning, displaying both basic and intermediate skills. Conversely, their aptitude in managing and executing AI was perceived to be lacking, primarily at a basic level rather than intermediate. However, when it comes to the utilization and governance of AI data, public managers exhibited a combination of basic, intermediate, and even advanced skills.

According to this research, public officials believe that their departments are not ready to implement AI. In the areas of planning, data governance, and government execution, departments are seen as having basic skills, but only a few have intermediate capabilities. The findings of general government level reports indicate a minimal perception of specialization (3.1%) in AI planning among public managers at this level. Despite this perception, the government of the State of Mexico demonstrates an intermediate level of knowledge in the governance of AI data, but a limited level of understanding in the execution and implementation aspects. These results align with the departmental and individual levels as reported in the survey. Notably, public officials at the local government level in Mexico exhibit a significant gap in AI knowledge within this sector, suggesting a lag in the learning curve for AI among local public managers.

5. Discussion

The objective of this research was to examine two distinct aspects of perception: (1) The overall perception of Artificial Intelligence (AI) among public managers in the local government of the state of Mexico, and (2) the competencies associated with AI. The findings regarding the general perception indicate that local public managers generally exhibit openness towards the implementation of AI in government operations, aligning with the conclusions drawn by Criado et al.

(2021) in their studies on the Spanish and Mexican governments. However, there exists a sense of apprehension among these managers regarding the potential replacement of their employees by AI. This fear, commonly observed in other bureaucratic systems, is likely attributed to a lack of knowledge and excessively high expectations of the technology (Ahn & Chen, 2020).

This research analyzes three levels of organization in the local government of the state of Mexico: Government, Department, and Individual. These levels consistently demonstrate a basic knowledge of Artificial Intelligence. However, the public sector in Mexico commonly lacks expertise and innovation. Innovations in this sector often replicate past trends due to social pressure or international requirements.

The public managers agreed that additional competence and new professions are necessary to implement AI in the local government, and they view the use of robots in government tasks as natural. In terms of capabilities, the high rating of the monitoring task by public managers can be attributed to the prioritization of the accountability principle among Mexican public officials, which has been a central focus since the implementation of transparency and open government practices two decades ago. The data reports that most of the public managers consider themselves to be at a basic or intermediate level of skill, which is consistent given that AI technology has not yet arrived at the government. However, the local government of the State of Mexico is considered to have a reduced specialized level on this technology.

This document presents three significant theoretical advancements in the realm of AI implementation. Firstly, it offers valuable insights into the perspectives of local government public managers regarding artificial intelligence, an area that has been largely overlooked by previous studies. Secondly, it conducts a comprehensive analysis of the competencies of public managers in three distinct domains: planning-design, governance of AI-Data, and management and execution of AI. Lastly, it provides empirical evidence supporting the competencies model proposed by Balbo Di Vinadio et al. (2021), which will serve as a foundation for future research endeavors. Another interesting contribution in the competency area focuses only on planning and design skills. However, it lacks competence in execution and management as well as governance of AI data., specialized level.

The combination of Government, Department, and Individual in the local government of the state of Mexico demonstrates a consistent level of basic knowledge of Artificial Intelligence. Unfortunately, this lack of expertise and innovation is a common issue in the public sector of Mexico, where innovations are often

replications of past trends due to social pressure or international requirements.

6. Conclusions

The first research question aimed to understand how public managers in the State of Mexico government perceive the use of AI in public administration. To answer this question, we surveyed 31 cases. The results show that public managers are generally open to the idea of AI, but they have a limited understanding of how it will affect their work. The data also indicate that many managers fear change and resist new technologies that could replace their jobs. This initial perception suggests that public managers in the local government need more knowledge about AI or immediate and ongoing changes to be willing to accept this technology.

The second research question, which sought to understand the capabilities of public managers in the State of Mexico government for the implementation of AI applied to the functioning of public administration, was complemented by the answers from the first question. The level of skills of public managers in local government is still low and basic skill development is needed. Furthermore, the main task public managers assume AI could help with is monitoring, which reflects the lack of knowledge about the potentialities of AI for government, such as analyzing, advising, and helping with decision-making to improve government performance.

The two main findings have significant practical implications. In terms of perceptions of artificial intelligence (AI), it is recommended that local governments prioritize effective communication regarding the utilization of AI's advanced capabilities in decision-making, creation, and analysis, which have been relatively underexplored. Additionally, it is crucial to encourage the adoption of substitution processes among public managers. The data reveals a lack of AI implementation skills within local government departments, emphasizing the need to establish task groups and conduct group training across various areas to facilitate the integration of AI technologies in their respective domains.

The data indicates a widespread anticipation of AI adoption in local government. The survey of public managers indicates that they are aware of this technology and generally support its implementation. However, they perceive a lack of readiness within the overall organization of local government, as well as a lack of proactive efforts within their respective departments to drive this transformation. To address this issue, a practical approach involves two key aspects. Firstly, the development of a national public policy is necessary to gradually introduce AI practices at various

levels of local government, ensuring an expectation for change rather than resistance. Secondly, it is crucial to establish a public policy that focuses on training or hiring dedicated public managers specifically for AI implementation. These managers can then be deployed across key government agencies to educate and drive the necessary changes, ultimately enhancing competencies in this field.

The results provide the government with an initial understanding of public officials. The sample was limited to decision-makers and high-level officials, but a more comprehensive sample could alter their outlook on the same topic. The findings could assist in the introduction of new policies to promote awareness of this technology and its potential adoption soon. It is recommended that further research be conducted to supplement and broaden the current findings. Governments globally will eventually alter their procedures to incorporate more AI technologies that enhance their efficacy, and this outlook will eventually shift.

There are three main limitations to this research. The first limitation is the number of interview cases. Many public managers in the government are unaware of the AI topic, and others are unwilling to answer the survey during the final days of the administration. The second limitation is that the research focuses only on one local government. We cannot generalize the results in this situation. Lastly, as AI continues to advance and new developments emerge, the findings of this research may become outdated or less relevant over time.

Future research in this field will lead to fourth main areas of study. The first area is focused on understanding the factors that will drive the adoption of AI technologies in the public sector. What are the best practices for reducing resistance to change among public managers? The second area of study delves into the topic of government capabilities for AI. A third area of research involves replicating this study in other local governments across Mexico and other countries to gain comparative perspectives. Lastly, there is a need to develop public policies, regulations, and strategies to evaluate the implementation of AI in local governments at the state and municipal levels, despite national efforts.

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8. References

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