Research Article

The Impact of Digital Transformation and Artificial Intelligence on Bureaucratic Culture Between Efficiency and Discretion

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Abstract.
This study examines the impact of digital transformation and artificial intelligence (AI) on bureaucratic culture in the public service sector, especially related to employee efficiency and discretion in decision making. This study aims to understand how the application of AI determines the flexibility, accountability, and effectiveness of bureaucracy in Gorontalo Province, as well as explore strategies that can be implemented to maintain a balance between technological innovation and administrative policy. Academically, this research contributes to filling the literature gap related to technology-based bureaucratic transformation, especially in the context of developing countries. The practical importance of this study lies in the policy recommendations provided to improve bureaucratic adaptability to technological changes while maintaining flexibility in decision-making. The research method used is a qualitative approach with in-depth interviews with employees at various levels of hierarchy in regional apparatus organizations in Gorontalo that have adopted AI. The results show that the application of AI has improved administrative efficiency and accountability in decision-making, but on the other hand, limits the discretionary space of employees in situations that require contextual considerations. The resulting theoretical novelty is the concept of algorithmic bureaucracy, where AI plays a key element in the bureaucratic decision-making process that has the potential to shift the discretionary function of employees to be more automated. This study recommends that in bureaucratic transformation there are 2 important things that need to be implemented, namely: 1) Strengthening digital capabilities and bureaucratic adaptability. 2) Algorithmic supervision technology governance and policy. As for the strengths of the research where the relevant study introduces new concepts regarding bureaucratic transformation, the weaknesses of the research are limited to geography, the risk of subjective bias, and the lack of quantitative validation of the concepts introduced.

Keywords: transformation, artificial intelligence, algorithmic bureaucracy, bureaucratic discrection

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Published: 18 February 2025

Publishing services provided by Knowledge E

Selection and Peer-review under the responsibility of the 2024 AAPA-EROPA-AGPA-IAPA Joint Conference Committee.

1. Introduction

Digital transformation is increasingly recognized as an important process for organizations, especially in the context of bureaucracy. It involves integrating digital technologies into all areas of the business, fundamentally changing the way operations are conducted and the way value is delivered to customers. This transformation is not just about technology; but it also requires changes in organizational culture, leadership, and structure to improve efficiency and responsiveness to market demands [1] [2]. The bureaucratic transformation proposed by [3] including 1) New Direction of System and Human Resources Transformation in public services; 2) Exclusivity and innovation of public services. In achieving a successful transformation in public service, a synergy between technology, human resource development, and visionary leadership is needed. By integrating all existing elements, the government can create better, responsive, and innovative public services, which will ultimately increase public satisfaction and organizational effectiveness [4] [5].

Elements of bureaucracy and networking can facilitate digital transformation by promoting agility and cross-functional collaboration [2]. For example, the 4R model proposed by Faro et al. illustrates how organizations can adapt their structures to foster resilience and agility, critical traits in a rapidly changing digital landscape [6] Additionally, leadership plays a crucial role in navigating the complexities of digital transformation within the framework of bureaucracy. Effective leaders must not only advocate for technology adoption but also inspire cultural change that embraces change and innovation [7] Aligning information technology resources with business strategy is essential, as it ensures that digital initiatives are not only technology-driven but also strategically relevant [8].

Bureaucratic transformation at the global level is influenced by various structural factors including demographic, technological, economic, and environmental. According to *the Global Trends 2040* report by the National Intelligence Council, global bureaucratic transformation faces several major challenges, namely Demographic Change, Technology and Innovation, and Fragmented Economic Growth. The Bureaucratic Transformation in Indonesia has been focused on implementing reforms through several main policies, such as the implementation of an Electronic-Based Government System and improving more accountable and transparent governance. Successful reforms will depend heavily on the bureaucracy's ability to adapt to these changes through strategic planning, policy improvements, and the appropriate use of technology. The following

is a comparison chart between the trend of global bureaucratic transformation and its impact on Indonesia.

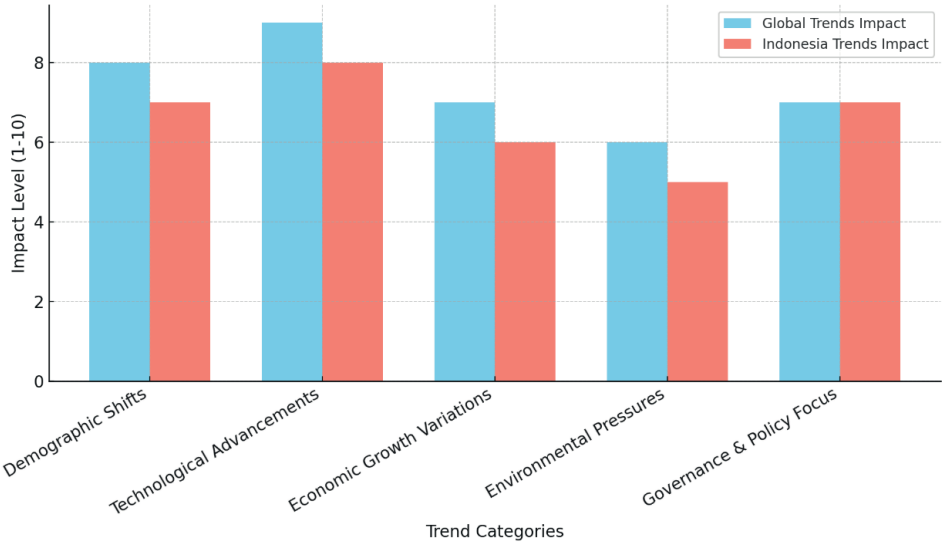

Figure 1: Comparative Impact of Global and Indonesia Bureaucratic Transformation Trends. Source: *Global Trends 2040 (*National Intelligence Council).

This graph shows five main categories, namely Demographic Change, Technological Advancement, Variation in Economic Growth, Environmental Pressures and Policy and Governance Focus. This chart provides an overview of the level of perceived levels both globally and in Indonesia, where the impact of technological advances and demographic changes is most prominent.

The adoption of electronic systems and digital platforms has been identified as a key factor in facilitating transformation in the public sector, allowing for process simplification, cost reduction, and increased transparency [9] [10]. Technology plays a key role as a key driver of innovation, such as the development of web and mobile applications that accelerate business processes and improve public services [10]. A systematic review of public sector innovation shows a growing interest among academics and practitioners in using technology to address complex societal challenges [11]. The e-governance initiative is a vivid example of this trend, to increase citizen participation and the quality of public services [12] However, internal barriers such as limited official capacity, low awareness of participatory innovation, and resistance to change often hinder the effective adoption of the technology [13]. While technology can improve administrative efficiency, without proper management, the system risks exacerbating existing bureaucratic constraints [14] Therefore, an organizational culture that supports innovation and technology integration is needed [15] Bureaucratic reform

and innovation have a complex relationship, where bureaucratic structures, if adjusted, can support innovation by balancing the need for accountability and flexibility [16] [17]. The introduction of a performance management system can mediate the relationship between managerial innovation and organizational performance, creating a conducive environment for innovation [18].

The following is an increase in the use of digital technology by the government in almost every region during the 2010-2020 period. Regions such as North America and Western Europe have the highest levels of digital technology use, while Sub-Saharan Africa still has relatively low numbers. This trend reflects that developed countries are leading the way in the wider adoption of digital services, which support efficiency and innovation in governance.

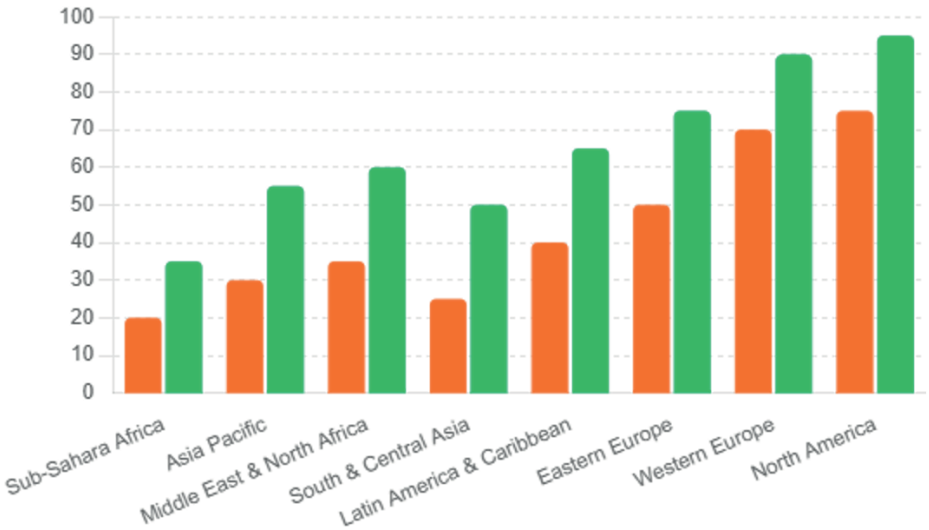

Figure 2: The Use of Digital Technology in Government (2010-2020). Source: *Global Trends 2040 (*National Intelligence Council).

The diagram shows the trends in the use of digital technology in government in different regions in 2010 and 2020. This chart shows a comparison of the adoption rates of digital services in each region such as Sub-Saharan Africa: Increase from 20% (2010) to 35% (2020); Asia Pacific: Increase from 30% (2010) to 55% (2020); Middle East & North Africa: Increase from 35% (2010) to 60% (2020); South & Central Asia: Increase from 25% (2010) to 50% (2020); Latin America & the Caribbean: Increase from 40% (2010) to 65% (2020); Eastern Europe: Increase from 50% (2010) to 75% (2020); Western Europe: Increase from 70% (2010) to 90% (2020); and North America: An increase from 75% (2010) to 95% (2020). The chart shows that countries in the Western European and North American regions are at the forefront of digital adoption for government services, while the Sub-Saharan Africa region is still at a relatively low level, despite

significant increases over the decade. The link between the use of digital technology in government and Artificial Intelligence is very close, because Artificial Intelligence is one of the main components in digital transformation in the public sector.

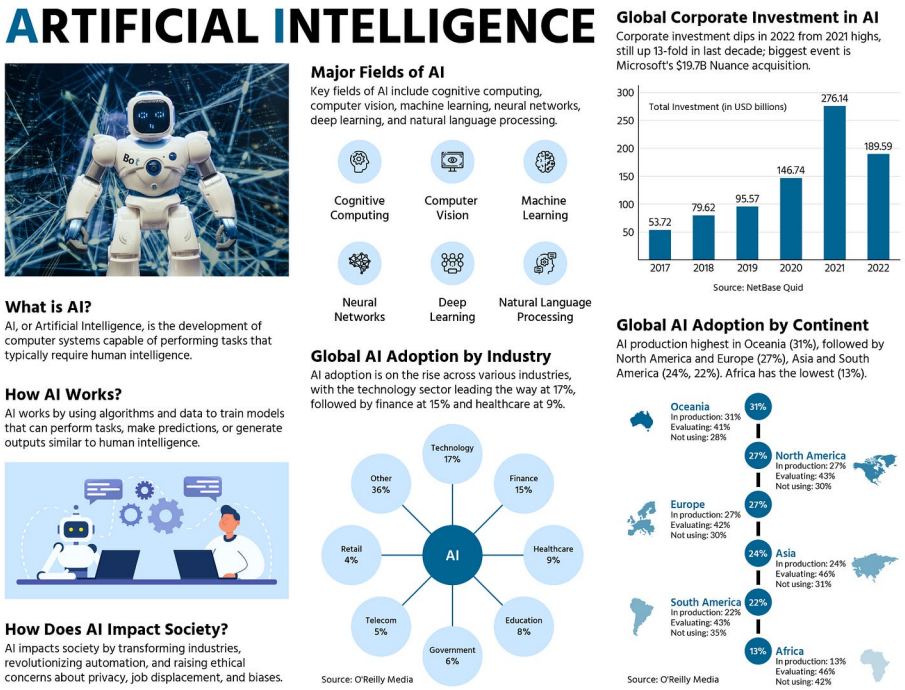

Figure 3: Artificial Intelligence Infographic. Source: https://homism.medium.com/.

The figure describes the artificial intelligence (AI) ecosystem globally, covering key fields such as *cognitive computing*, *machine learning*, *computer vision*, *deep learning*, and *natural language processing*. This image also shows the rapid increase in corporate investment in AI from 2017 to 2022, which peaked in 2021 with a value of USD 276.14 billion. The adoption of AI across various industry sectors looks significant, with the technology sector leading the way (17%), followed by finance (15%), and healthcare (9%). From a geographic perspective, the highest adoption of AI is in Oceania (31%) and North America (27%), while Africa is at the bottom (13%). The application of AI has a major impact on society by changing the way industries work, increasing automation, and sparking discussions about privacy and ethics.

Application Artificial Intelligence In the public sector, especially in public administration, it has changed the way bureaucratic organizations operate and make decisions. Artificial Intelligence It has the potential to increase efficiency, speed up the decision-making process, and reduce errors caused by human factors. However, the integration of this technology also poses new challenges, especially related to its impact on

organizational culture and bureaucratic autonomy. According to [19] Application Artificial Intelligence can shift decision-making from an operational level to a more automated system, potentially reducing flexibility in day-to-day decision-making. This is in line with the findings [20] which indicates that the implementation of the Artificial Intelligence in public administration in Indonesia faces challenges in terms of human resource readiness and impact on work culture.

Artificial Intelligence potentially improve operational efficiency, speed up the decision-making process, and reduce errors caused by human factors ([21]; [22]; [23]. In the context of public administration, Artificial Intelligence can optimize public services by processing data quickly and accurately, as well as increasing transparency and accountability in decision-making [21]; [24]; [25]. However, despite these promising benefits, the integration of Artificial Intelligence It also poses challenges, especially related to its impact on organizational culture and bureaucratic autonomy.

According to [26], Application Artificial Intelligence often adds to the level of bureaucratic autonomy governed by algorithms, which can reduce flexibility in day-to-day decision-making [22] This is in line with findings that suggest that the use of Artificial Intelligence decision-making can lead to reduced human interaction, which is essential for maintaining social and cultural context in public organizations [27]; [28]). In addition, ethical and data privacy challenges are also a major concern in the implementation of Artificial Intelligence in the public sector, which requires the development of appropriate policies to ensure responsible use [21]; [22]; [23].

Further, research shows that despite high expectations for Artificial Intelligence To improve the efficiency and effectiveness of public services, the adoption of this technology in public organizations is still relatively low [23] [29]. This is due to a variety of factors, including resistance to change, lack of understanding of technology, and concerns about the negative impact on work [30] [28]. Therefore, it is important for public organizations to develop strategies that include training and education for employees, as well as create an environment that supports innovation and collaboration [31]; [32].

The main problem faced in this study is the impact of the application of Artificial Intelligence on the flexibility and adaptability of organizational culture in the government environment. Traditionally, bureaucracy has been known to be rigid with many procedures to follow, but with Artificial Intelligence, organizations have become more reliant on algorithmic protocols that can limit the space for employees to move in making

autonomous decisions. For example, Peeters explains that the transformation of bureaucracy from the "street-level" level to the "system-level" level increases dependence on technology, thereby reducing the role of individuals in carrying out administrative policies.

Common solutions that have been proposed in the literature to address this problem include restructuring work systems and policy-making that support a balance between Artificial Intelligence and human intervention. More flexible settings, in which Artificial Intelligence is used as a tool rather than a substitute for human decision-making, have been identified as a more promising approach in maintaining the flexibility and adaptability of civil servants [33]. In more in-depth research, several specific solutions have been proposed to reduce the negative impact of Artificial Intelligence on organizational culture. [26] suggested that the application of Artificial Intelligence should be combined with ongoing training for employees to ensure that they can work effectively in a system governed by technology. This is expected to help improve employees' understanding of Artificial Intelligence and strengthen their adaptation to the changes that occur.

On the other hand, highlights the importance of "system-level" settings that allow greater flexibility in exercising administrative discretion. In a bureaucracy that is increasingly reliant on Artificial Intelligence, there is still a need to maintain a level of human discretion, especially in situations where the decisions made by Artificial Intelligence are not fully in accordance with the prevailing social or ethical context. In addition, Vică and Martin emphasized the importance of transparency and algorithmic oversight to avoid potential bias and injustice in Artificial Intelligence-powered decision-making. There is an opinion that by implementing more open protocols and allowing for human review of Artificial Intelligence decisions, organizations can minimize the risk of errors and maintain more harmonious working relationships more specifically within their own bureaucratic structures.

The integration of Artificial Intelligence into bureaucratic structures has profound implications for organizational efficiency and the nature of the decision-making process. As Artificial Intelligence technologies evolve, they are reshaping traditional bureaucratic frameworks, leading to significant changes in the way public administration operates. This transformation is characterized by the automation of the decision-making process which can improve efficiency but also raises concerns regarding discretion and transparency. Artificial Intelligence has been shown to improve the efficiency and speed of economic activities, especially in the context of bureaucracy. highlighted that the rapid development of Artificial Intelligence systems and software has led to positive

shocks in economic activities, such as the adoption of electronic systems in bureaucratic processes, which streamlines operations and reduces output volatility in OECD countries [34]. This efficiency is echoed in the findings, which argue that Artificial Intelligence is changing the shape of bureaucracy by redistributing wisdom from individual bureaucrats to algorithmic systems, thereby changing the dynamics of decision-making in public organizations [26]

The shift towards "artificial wisdom" as a governance tool illustrates how Artificial Intelligence can improve and complicate bureaucratic processes, which necessitates a reevaluation of traditional roles in these structures [35]. In addition, the implications of Artificial Intelligence beyond mere efficiency gains; They also challenge the basic principles of bureaucratic policy. discusses how algorithmic transparency affects the perceived trust of automated decision-making, emphasizing that the opacity of the system Artificial Intelligence can damage public trust in bureaucratic institutions [33] These concerns are further supported by [19] which notes that although Artificial Intelligence can improve decision-making skills, Artificial Intelligence It also risks reducing the human element in the bureaucratic process, which is essential for maintaining accountability and ethical governance. Balance between utilizing Artificial Intelligence For efficiency and maintaining human oversight is an important issue that public administrators must navigate.

Structural changes caused by Artificial Intelligence It also requires a re-evaluation of the organization's hierarchy and workflows. argues that the influence of Artificial Intelligence on organizational structures are profound, leading to new forms of labor organization and decision-making processes that challenge traditional bureaucratic models [36]. This is especially relevant in the context of public administration, where the integration of Artificial Intelligence can facilitate a more adaptive and responsive governance structure, as noted by , which emphasizes the need for profound structural changes to improve service quality and reduce bureaucracy [37] The concept of "algorithmic bureaucracy" introduced by further illustrates how Artificial Intelligence Reshaping the socio-technical landscape of public administration, highlighting the need for a new understanding of bureaucratic functions in the digital age [38] Bureaucratic transformation proposed by [39] including, 1) New Direction of System and Human Resources Transformation in public services; 2) Exclusivity and innovation of public services.

The existing literature has extensively discussed the impact of Artificial Intelligence on decision-making in the public sector, but the main gap lies in the lack of research that

focuses on how Artificial Intelligence is changing the overall work culture in the context of public administration bureaucracy. [33] note significant changes in automated work routines and bureaucracy, but not much discusses how these changes affect interpersonal dynamics and collaboration between employees. This study also highlights the need to understand the perception of employees towards changes in work culture influenced by Artificial Intelligence with the purpose of this study is to identify changes in organizational culture that occur due to the application of Artificial Intelligence in public administration.

Electronic-Based Bureaucratic Transformation in the Gorontalo Provincial Government Index of the Electronic-Based Government System of the Gorontalo Provincial Government in the last 4 years is as follows:

Table 1: Electronic-Based Government System of Gorontalo Province, Indonesia.

Year	Index	
	Value	Predicate
2018	1,48	Less
2019	3,18	Good
2021	2,51	Enough
2022	2,48	Enough

Source: Gorontalo Provincial Communication and Information Office, 2024

This data shows that there are fluctuations in the implementation of digitalization in the government sector. In 2019, there was a significant increase to the predicate of "Good", but then the value decreased again to the predicate of "Adequate" in 2021 and 2022. The Electronic-Based Government System and Artificial Intelligence are closely related to each other in improving efficiency, effectiveness, and quality of public services in the digital era. Both are key elements in digital transformation that support bureaucratic reform and modernization of public administration.

Based on the previous description, this study aims to examine the transformation of the bureaucracy with the use of Artificial Intelligence in accelerating public services, in addition to looking at the adaptability of civil servants in daily decision-making. This study offers a new perspective by combining the analysis of the impact of Artificial Intelligence on work routines with an in-depth study of bureaucratic perceptions of these changes. The scope of this research includes interviews and surveys of civil servants in Gorontalo Indonesia's public administration institutions, as well as analysis of studies on bureaucracies that have adopted Artificial Intelligence. The focus is on

changes in employee interactions and administrative decision-making, without touching on the technical aspects of Artificial Intelligence development.

2. Methods

This study uses qualitative methods to examine the impact of the application of Artificial Intelligence on discretion, efficiency, accountability, and bureaucratic structure reform in the public service sector in Gorontalo Province. The qualitative approach was chosen because it is able to provide an in-depth understanding of the changes that occur in bureaucratic practices, focusing on the experiences and perceptions of individuals involved in public decision-making. The research data was collected through in-depth interviews and direct observation at social service agencies in Gorontalo Province that have adopted Artificial Intelligence in the administrative process.

Opinions expressed [40] that bureaucratic simplification, work motivation, and job satisfaction have a significant effect on employee performance in the context of the state civil apparatus. In a broader context, qualitative research can also be used to analyze public policies and their impact on society. Thus, qualitative methods are not only relevant for the study of bureaucracy, but also for various other aspects of social research, especially to look at bureaucratic transformation and Artificial Intelligence in Gorontalo Indonesia.

This research was carried out through several stages, starting with field observation at the Gorontalo Provincial Government to examine the implementation of an electronic-based government system associated with the use of Artificial Intelligence in several related agencies. The research also involves an in-depth literature review by analyzing relevant Scopus indexed journal articles, in order to find research gaps that have not been widely discussed before. Furthermore, interviews were conducted with public employees at various levels of the hierarchy to obtain information about the impact of Artificial Intelligence on discretion, efficiency, and changes in accountability in bureaucratic decision-making. These interviews were conducted both online and in person, and the results were supported by the use of Artificial Intelligence applications for data processing, as well as applications such as Publish or Perish for integrated scientific reference collection. The data triangulation approach was used to validate the findings, where the results of the interviews were compared with field observations and literature reviews to confirm the pattern of structural and bureaucratic cultural changes in public service agencies after the implementation of Artificial Intelligence.

In the preparation of the research, the researcher held an intensive team discussion to equalize perceptions and formulate the novelty of the research. The discussion aims to integrate findings, evaluate data interpretation, and ensure that any viewpoints that emerge from observations and interviews are considered comprehensively. Through internal discussions, the research team focused on finding aspects of novelty that can make significant scientific contributions, both in theory and practice, especially in the context of the application of Artificial Intelligence in bureaucratic reform. This collaborative process allows for the preparation of reports that not only describe empirical findings, but also provide policy recommendations that have an impact on the development of public administration science, as well as serve as a reference for future research.

3. Results and Discussion

This study examines the impact of the application of Artificial Intelligence on the bureaucracy in Gorontalo Province, especially in the public service sector. The results show that the application of Artificial Intelligence has provided a significant increase in efficiency, especially in terms of data processing and routine decision-making. Based on interviews with employees in several Regional Apparatus Organizations that already use electronic systems, such as the PMPTSP Office, the Dukcapil Office, and the Education Office, 75% of respondents reported that Artificial Intelligence helps speed up administrative workflows, especially in terms of data verification and service application processing.

The application of Artificial Intelligence in several Regional Apparatus Organizations (OPDs) in Gorontalo Province, such as the One-Stop Licensing Investment Office, the Dukcapil Office, and the Education Office, has had a significant impact on increasing efficiency.

Employees report that administrative tasks that used to take a long time can now be completed faster. For example, at the One-Stop Investment and Integrated Services Office, the permit processing time that previously took up to two weeks now only takes between three and four days thanks to Artificial Intelligence-based process automation. **75% of** employees interviewed stated that Artificial Intelligence has significantly accelerated administrative work processes. Employees of the Investment and One-Stop Integrated Services Office provide the following information:

Table 2: Gorontalo Provincial Local Government Organization Using Electronic Systems.

No.	Local Government Organizations
1.	Gorontalo Province Investment and One-Stop Integrated Service Office
2.	Population and Civil Registration Office and Community and Village Empowerment of Gorontalo Province
3.	Samsat Gorontalo Province
4.	Gorontalo Provincial Education Office
5.	Gorontalo Class I Health Quarantine Center
6.	Gorontalo Provincial Health Office
7.	Gorontalo Provincial Regional Civil Service Agency
Data Source: Provincial Government. Gorontalo 2024	

"Since using an Artificial Intelligence-based system, the permit processing time is very fast. My task has become lighter in terms of administration, but in some cases, the system cannot adapt to the conditions on the ground, especially when there are cases that require more flexible considerations."

On the other hand, the application of Artificial Intelligence also raises concerns regarding the reduction of employee discretion. 65% of employees report that they have less control over decision-making than before. Artificial Intelligence often generates decisions that rely heavily on algorithms, which sometimes do not take into account relevant social and ethical aspects in some specific cases. Employees feel that their discretion in adapting decisions to the situation on the ground is limited, especially in cases that cannot be fully addressed by standard regulations. The opinion of the Dukcapil Office Employee is as follows:

"Artificial Intelligence really helps us verify data quickly, especially in population matters. However, some of the decisions generated by the system are too rigid. There are some situations that require human discretion, but the system rejects without considering the specific context".

The application of Artificial Intelligence also affects communication patterns in the bureaucratic environment. 60% of employees reported that face-to-face interaction between employees decreased because more tasks were carried out through digital systems or communication platforms based on Artificial Intelligence. While this increases efficiency in completing tasks, some employees feel that informal collaborations that often occur in direct interactions are becoming less frequent, which has the potential to reduce team cohesion. The following information was submitted by the Education Office Employee:

"The education administration process is now faster thanks to Artificial Intelligence. However, my interaction with colleagues became less because many things were resolved through the system. It's efficient, but the relationship between employees feels more formal and less collaborative."

Artificial Intelligence helps to increase accountability in decision-making, as every resulting decision can be tracked through system logs. Employees feel that the Artificial Intelligence system provides better transparency because it allows for automated decision tracking. However, some employees also stated that despite increased accountability, their flexibility to adapt policies to local needs has been limited. The head of the health quarantine center conveyed the following:

"Artificial Intelligence helps reduce errors in health document verification. However, I have noticed that some decisions made by the system require additional adjustments from employees, especially for cases that require local policies or special considerations."

The results of this study show that the application of Artificial Intelligence in Gorontalo Province has a positive impact on increasing efficiency and accountability in the bureaucratic process. However, the main challenges faced are the reduction of employee discretion and the decrease in the frequency of face-to-face interactions, which are considered important to maintain policy flexibility and team cohesion. Therefore, this study suggests further training for employees in understanding and managing Artificial Intelligence-based decisions, as well as more flexible policy adjustments to maintain the human element in public decision-making. Artificial Intelligence in the context of bureaucracy, there are two important things to be implemented, namely 1) Strengthening Digital Capabilities and Organizational Adaptability; 2) Algorithmic Supervision Technology Governance and Policy.

Dovers and Hezri argue that adaptation policies should not be seen as a separate domain but rather as an integral part of the coordination and reform of existing policy sectors to effectively address adaptation issues [41]. This perspective emphasizes the need for the bureaucratic system to evolve and integrate adaptability into its core functions. [42] highlighted that senior executives in the Australian public sector demonstrate a commitment to collaboration and participation, which facilitates a better understanding of how environmental change impacts organisations. This collaborative approach is essential for fostering a culture of adaptability within the framework of the bureaucracy, enabling more responsive and effective governance.

[43]discusses how local governments in the United States adopt agile management practices that emphasize rapid decision-making and operational efficiency, leading to increased public participation. This shift towards agile governance reflects a broader trend in which traditional bureaucratic processes are being re-evaluated in favor of a more dynamic and participatory approach that can better respond to crises. However, the rigidity often associated with bureaucratic structures can hinder adaptability [44] noted that public sector organizations tend to maintain static and hierarchical structures, which can hinder their ability to adapt to change. Integration of concepts such as the Balanced Scorecard discussed by [45] can provide public entities with strategic tools to improve their adaptability and performance.

In addition, the relationship between leadership and adaptability in public administration is crucial. Research by Dzigbede and Ivanov emphasizes the need for adaptive leadership traits during crises, which include effective communication, decision-making, and coordination [43] Leaders who foster an environment of trust and collaboration can significantly improve their organization's adaptability, thereby improving overall performance and resilience in the face of challenges.

Integration Artificial Intelligence into public administration is a transformative process that has a significant impact on bureaucracy and organizational culture. This evolution is marked by opportunities and challenges, requiring a comprehensive understanding of how technology Artificial Intelligence can improve the efficiency of the public sector while also raising concerns about governance, policy, and accountability. One of the main advantages Artificial Intelligence In public administration is its potential to streamline processes and improve decision-making efficiency. Technology Artificial Intelligence facilitates the automation of routine tasks, allowing civil servants to focus on more complex issues that require human judgment and creativity. For example Artificial Intelligence can improve the speed and accuracy of decision-making in public services, as noted by Çataldaş, who emphasized that Artificial Intelligence enable target-oriented decisions and faster task fulfillment in the context of public relations [46]

In addition, the ability to Artificial Intelligence to analyze large data sets can lead to more informed policy decisions, as highlighted by Zhang, who discusses the emergence of new governance models supported by Artificial Intelligence [8] This shift towards data-based governance is very important in answering the needs of a dynamic society in the era of digital transformation [47] However, the introduction of Artificial Intelligence It also presents significant challenges, especially regarding bureaucratic structures and the implementation of policies in public organizations. Bullock and colleagues argue that

integration Artificial Intelligence changing the traditional form of bureaucracy, shifting the decision-making locus from human wisdom to algorithmic processes [26]; [35].

This shift raises concerns about the potential for increased state coercion and the erosion of accountability, as Asilyan points out the risks associated with unlimited digital policy in governance [48] The challenge lies in ensuring that the system Artificial Intelligence designed and implemented in a way that upholds democratic values and protects the rights of citizens, as emphasized by Corvalán, which addresses the need for a digital and intelligent administration that respects the dignity of the individual [49] In addition, the cultural implications of adoption Artificial Intelligence in public administration cannot be ignored. Akyazı's research shows a significant relationship between employee attitudes towards Artificial Intelligence and organizational culture, demonstrating that the success of technology integration Artificial Intelligence relying on building a culture that embraces innovation and change [50] This cultural shift is critical to overcoming resistance to Artificial Intelligence and ensuring that civil servants are adequately prepared to utilize this technology effectively.

4. Conclusion

This study finds that in Gorontalo Province, Indonesia, the transformation and application of Artificial Intelligence in the context of bureaucracy, there are two important things that need to be implemented, namely 1) Strengthening Digital Capabilities and Organizational Adaptability; 2) Algorithmic Supervision Technology Governance and Policy. The integration of this technology accelerates data processing and routine decision-making in various Regional Apparatus Organizations, because Artificial Intelligence helps to complete administrative tasks faster, especially in the process of data verification and administrative processing. On the other hand, the application of Artificial Intelligence also increases accountability in decision-making because every step can be traced through system logs. Thus, the application of Artificial Intelligence requires policy adjustments so that employee flexibility is maintained, especially for cases that cannot be overcome by standard regulations.

The practical implications of this study suggest that organizations need to develop more holistic policies to ensure a balance between Artificial Intelligence and the role of humans in decision-making, especially in the context of public bureaucracy. This includes strengthening the human monitoring system of decisions generated by Artificial Intelligence, especially in cases where considerations of ethical values, social norms,

and justice must be considered in depth. In addition, organizations need to invest time and resources in providing intensive training for employees to understand the role of Artificial Intelligence and how to adapt its use to the context of the organization and applicable regulations. From a scientific perspective, these findings add to the evidence that the efficiencies produced by Artificial Intelligence are not always in line with the need for human discretionary wisdom and sensitivity to social contexts. Therefore, further research is needed to develop guidelines that can integrate the analytical capabilities of Artificial Intelligence with local wisdom and value-based policies to minimize potential risks and strengthen accountability in decision-making in the public sector.

This research underscores the importance of intensive training for employees to understand the role of Artificial Intelligence and how to adapt to these technological changes. In addition, the findings of this study show the need for more holistic policies in the application of Artificial Intelligence in the public sector, which not only prioritizes efficiency but also pays attention to social, ethical, and policy flexibility. Thus, this research encourages an integrative approach that accommodates technological developments and maintains fundamental values in the public bureaucracy. As for the strengths of the research where the relevant study introduces new concepts regarding bureaucratic transformation, while the weaknesses of the research are limited geography, the risk of subjective bias, and lack of quantitative validation of the concepts introduced.

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