LEVERAGING ARTIFICIAL INTELLIGENCE FOR SMART CITY DEVELOPMENT: SOCIAL AND GOVERNANCE IMPACTS IN JAKARTA

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ABSTRACT: The interaction between people and technology is inseparable and use to continuous repetitive daily action. The term of artificial intelligence generally development of technology in conduct daily activity can be easier. This study reveals the extent to which the use of artificial intelligence can affect social life in the people of the Special Region of Jakarta in benchmarking of smart cities too. Data sources are obtained from social media, electronics, Youtube, regulations and others that are considered legitimate in data collection and relevant to be studied. The findings reveal that artificial intelligence integration is most successful when ethical frameworks and transparent data practices are prioritized. Collaboration between artificial intelligence developers and stakeholders is crucial in addressing biases and enhancing the trustworthiness of artificial intelligence systems. The study provides actionable recommendations for improving artificial intelligence adoption while safeguarding ethical standards. A holistic and inclusive approach is needed, including increasing digital literacy, establishing clear regulations regarding the use of data, and closer collaboration between governments, technology developers, and the public. In this way, the use of artificial intelligence in Special Region of Jakarta can run more fairly, transparently, and benefit all level society.

Keywords: Artificial Intelligence; Social Life; Technological Developments; Special Region of Jakarta

Introduction

The interaction between people and technology is inseparable and use to continuous repetitive daily action. The term artificial intelligence generally means development of technology conducting daily activity can be easier. The post-pandemic worldwide has accelerated the application of artificial intelligence (AI). McKinsey & Company (in Alexander et al., 2021) claims that the post-pandemic has seen most large companies shift to a hybrid work model that combines remote work with the help of technology such as artificial intelligence and working at the company's location. For example, before the pandemic, around 62% of employees preferred working at the company's location, but after the pandemic, only 37% showed their preference for working at the company's location. With the use of artificial intelligence, employees work faster, more effectively, and more efficiently (Ayu Gusti et al., 2024).

Technological advancement allows automation in almost all fields. New technologies and approaches that combine the physical, digital, and biological worlds will fundamentally change the pattern of human life and interaction (Gaol, 2021). Artificial Intelligence has been implemented globally. Furthermore, many nations have developed artificial intelligence with a variety of applications and functions. For example, Venezuela has implemented an innovative smart card identification system called the 'carnet de patria'. This identification card integrates government databases associated with social programs, potentially facilitating governmental surveillance of individuals' financial records, medical backgrounds, and electoral participation (European Parliament: Directorate-General for External Policies of the Union & Ünver, 2024). The use of artificial intelligence (AI) in Special Region Jakarta is increasing in line with the city's efforts to become a smart city. However, while artificial intelligence offers a wide range of potential to improve efficiency and quality of life, its implementation in Jakarta faces several significant challenges. artificial intelligence technologies have significant impacts on the way we learn, particularly due to the rapid transformation, development, innovation, and emergence of learning technologies (Margono et al., 2024).

First, the problems of the digital divide where some people still lack understanding or access to artificial intelligence technology. This is exacerbated by the low level of digital literacy among certain circles, which causes inequality in the use of this technology. As a result, not all levels of society can experience the benefits of artificial intelligence equally, thus creating a social gap.

Second, the problem of bias in artificial intelligence data and algorithms is also a concern. Many of the artificial intelligence algorithms used today are built on data that may not fully represent the social and cultural diversity of Jakarta. This bias can lead to inaccurate or unfair results, which in turn can exacerbate existing inequalities.

Third, there are also concerns regarding data privacy and security. Many Jakartans are concerned about the misuse of their personal data, especially when it is collected without explicit permission or used for non-transparent purposes. The lack of strict regulation and adequate legal protection exacerbates public distrust of artificial intelligence technology. In exploring how e-government public service provision influences public trust, understanding the dynamics of institutional trust is crucial for evaluating the effectiveness and impact of digital governance initiatives on the citizen-state relationship (Fadrial et al., 2024).

Finally, there are challenges in terms of collaboration between technology developers and local stakeholders. While artificial intelligence has the potential to improve various public services, its implementation often lacks active participation from the community and relevant stakeholders, resulting in solutions that are less responsive to local needs and conditions.

To address these issues, a holistic and inclusive approach is needed, including increasing digital literacy, establishing clear regulations on data use, and closer collaboration between governments, technology developers, and the community. In this way, the use of artificial intelligence in Special Region Jakarta can run more fairly, transparently, and benefit all.

In conclusion, Jakarta's efforts to implement artificial intelligence (AI) as part of its smart city initiatives show promise in addressing urban challenges, such as traffic management, public safety, and healthcare. However, realizing artificial intelligence's full potential requires overcoming significant social and governance challenges, including the digital divide, data privacy issues, and algorithmic bias. Addressing these challenges demands a collaborative approach involving the government, private sector, academia, and local

communities to ensure fair and inclusive artificial intelligence benefits for all. Increasing digital literacy, establishing clear data regulations, and fostering stakeholder collaboration are essential to align artificial intelligence advancements with Jakarta's broader social and governance goals, creating a more resilient, responsive, and sustainable urban environment. This study reveals the extent to which the use of artificial intelligence can affect social life in the people of the Special Region of Jakarta in benchmarking of smart cities too.

Statement of Problem

1. How to analyse artificial intelligence function for supporting social living in the Urban People in Jakarta?
2. What are the obstacles and challenges in implementing artificial intelligence in Jakarta from the perspective of new institutionalism?

Research Method

This research approach uses qualitative method with descriptive analysis techniques. Data sources are obtained from social media, electronics, Youtube regulations and others that are considered legitimate in data collection and relevant to be studied.

A narrative analysis examines the stories and experiences conveyed in a text, focusing on how these narratives are constructed, their meaning, and their impact on the audience. Based on the article "Leveraging Artificial Intelligence for Smart City Development: Social and Governance Impacts in Jakarta" here's a step-by-step method to perform a narrative analysis.

Result and Discussion

A crucial component of artificial intelligence, deep learning, has advanced significantly across a variety of applications. By building and training deep neural networks that are capable of identifying intricate patterns and separating important pieces of data, this strategy focuses on machine learning (Safitra et al., 2024). Artificial Intelligence can succeed when technological development is sustainable across all aspects. In Indonesia, technology adoption has recently started to exploit improvements in AI to improve services. The fourth industrial revolution and the development of society 5.0, particularly in Indonesia, make it possible for future expansion, even though the conditions still need to be optimum. The Industrial Revolution 4.0 gave rise to technological disruption, which ultimately created a new culture in every aspect of life. With the development of technology and the internet, which is increasingly widespread, its use is in great demand by the world community. AI applications are proven

to help humans work more quickly and efficiently (Helmiatin et al., 2024). The background of the study on leveraging artificial intelligence (AI) for smart city development in Jakarta emphasizes the critical role of artificial intelligence in transforming urban environments and improving daily life efficiency. However, this transformation faces challenges, including digital literacy disparities, data privacy concerns, and algorithmic biases. The study highlights the need for inclusive digital policies and active collaboration among the government, private sectors, and civil society to address these issues. Through such cooperation, artificial intelligence integration can lead to a more equitable, transparent, and sustainable development, setting Jakarta as a model smart city in Southeast Asia. Since implementation development technology in other country ASEAN can be display from this figure below that :

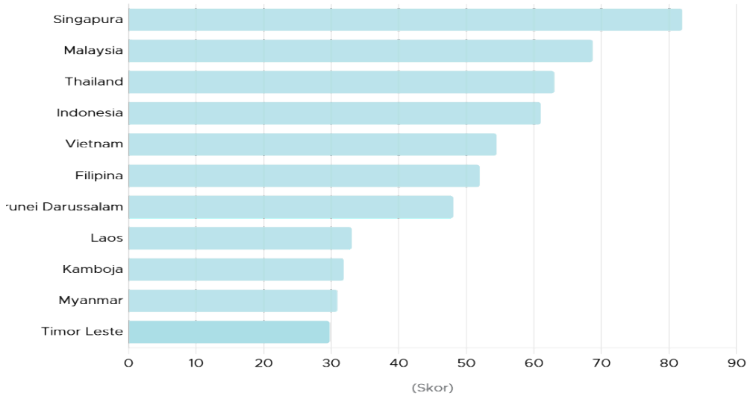

Figure 1. Implementation of Artificial Intelligence in ASEAN Countries in 2023 (Source: Rafli, 2024).

The portrait of technology development in the integration of various services was proclaimed through integrated digitalization. such as in Special Region Jakarta City has implemented several facilities for the use of the area both transportation, licensing and public services that use one integrated application. This reduces the existence of great opportunities in building the construct of society 5.0 society assuming smart cities become a strong foundation in lifestyle development and socialization of people who are able to use technological developments as support for their activities (Syah et al., 2023).

To achieve the goal of becoming a smart city, the capital city of Jakarta uses various Internet of Things (IoT) applications. The following are five main IoT applications, including:

1. Jakarta One Card, is a “smart card” that can be used as an e-KTP, payment tool and BPJS card when shopping.
2. City Surveillance System Around 6,000 CCTV cameras will be installed

throughout the city of Jakarta to monitor traffic and crowds.

3. Dump Truck Tracker Every government waste truck must have a GPS sensor that can be monitored for 24 hours.
4. Heavy Equipment Tracker, special sensors will also be installed on heavy equipment owned by the Special Region Jakarta Provincial Government. Not only can these sensors identify their location, but they can also be used to track routine maintenance and replacement of parts.
5. Smart Street Lighting System, this system will replace 90,000 lights in Special Region Jakarta to reduce electricity consumption (Kristiadi et al., 2022; Puspitasari, 2021).

In other media Channel Youtube can be state deeply the main problem traffic lights have used artificial intelligence with an Intelligence Traffic System with a system called the Network Operation System through the control of the Transportation Office. This system can read the density of the vehicle queue through the calculation of the effective green light duration and the red light will also adjust (Pemprov DKI Jakarta, 2023).

For now, traffic lights with artificial intelligence technology are installed at 20 intersections with a high level of congestion. Since its implementation in April 2023, this system has been observed to be efficient, reducing vehicle queues by around 20%. The plan is that in the future, the Transportation Department will add to 40 points with a high level of congestion through this traffic artificial intelligence system (Pemprov DKI Jakarta, 2023).

From the other side, CEO & Co-Founder of Nodeflux, Meidy Fitranto in Youtube Broadcast CNBC Indonesia, (2023), views the application of artificial intelligence technology as one of the solutions to solve congestion, including detecting various violations and encouraging discipline of road users. However, the success rate still needs to be evaluated. In line with Nodeflux, Public Policy Observer, Trubus Rahadiansyah sees the potential of AI as a strategy to overcome congestion but must be accompanied by policies that encourage the level of discipline of road users. Currently, AI has been implemented in the transportation sector within the urban setting of Jakarta, Indonesia. This utilization has been documented by Solihati & Indriyani, (2021), who have identified several specific applications. The uses of applications are for (1) identifying a vehicle's plate number, (2) counting people by computes to identify human movement within specific regions, (3) counting and categorizing various types of vehicles systematically, including motorcyclists, as they pass through a given area (the system can categorize a total of 23 distinct variations of motor vehicles), and (4) calculating and estimating the duration for which a

vehicle will come to a halt at a particular location.

The findings reveal that artificial intelligence integration is most successful when ethical frameworks and transparent data practices are prioritized. Collaboration between artificial intelligence developers and stakeholders is crucial in addressing biases and enhancing the trustworthiness of artificial intelligence systems in Jakarta.

Based above this fig can be represented Implementation of artificial intelligence in Special Region Jakarta with contributions from Local Government and Society it can be describe Jakarta, as the capital city of Indonesia, is actively

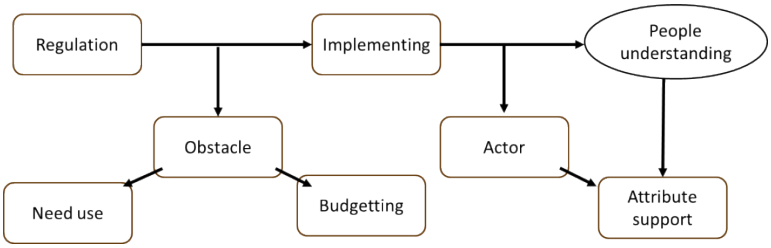

Figure 2. Causality between Artificial Intelligence Implementation and Contributor The Actors

embracing technological innovations, including Artificial Intelligence, to address various urban challenges and improve governance. The integration of artificial intelligence into Jakarta's infrastructure and public services is a multifaceted endeavor, with significant contributions from local government, private sector, academia, and civil society.

1. Role of Local Government

The local government of Jakarta plays a central role in the implementation of artificial intelligence. Under the leadership of the city's governor and relevant agencies like Jakarta Smart City (JSC), artificial intelligence has been incorporated into various sectors:

a. Smart City Initiatives : Jakarta has implemented artificial intelligence-driven solutions to optimize traffic management, reduce congestion, and improve public transportation. The city uses artificial intelligence for real-time traffic monitoring, rerouting, and predicting traffic patterns. JSC employs artificial intelligence to analyze data from millions of vehicles to generate solutions for traffic problems in one of the world's most congested cities.
b. Public Safety and Surveillance : artificial intelligence -powered surveillance systems have been deployed to enhance public safety. By integrating facial recognition and real-time analytics, these systems can monitor crowd activities, detect unusual behavior, and alert authorities to potential security threats. The local government has also used artificial intelligence

to monitor environmental conditions such as air quality and flooding risks, which are critical issues in Jakarta.

c. Healthcare Services: During the COVID-19 pandemic, Jakarta's government utilized artificial intelligence in telemedicine services and data analytics to track and predict the spread of the virus. Artificial Intelligence helped the government allocate resources more effectively, ensuring that hospitals and healthcare facilities were adequately equipped.

2. Contribution from Society and the Private Sector

Civil society and private actors in Jakarta have also contributed to the implementation of Artificial Intelligence:

a. Startups and Technology Companies : Several artificial intelligence-based startups and large tech companies ae working in collaboration with the government to offer solutions. For example, private companies have developed artificial intelligence- driven platforms for public service optimization, ranging from smart transportation apps to healthcare platforms that use machine learning for medical diagnostics.

b. Education and Research Institutions : Universities and research centers in Jakarta contribute significantly to the development and implementation of artificial intelligence. Collaboration between the government and academia has led to research on urban issues that can be addressed with artificial intelligence, such as flood management and smart mobility.

c. Community Involvement : The success of artificial intelligence implementation in Jakarta is partly due to community involvement. Civil society groups, local residents, and advocacy organizations have voiced their concerns and provided feedback on artificial intelligence initiatives. This collaboration ensures that artificial intelligence solutions meet the needs of the public and respect ethical standards, particularly in areas like privacy and data protection.

3. Challenges and Future Directions

While there are many promising artificial intelligence initiatives in Jakarta, there are also challenges. These include:

a. Data Privacy and Security: With increased use of artificial intelligence, there is a growing concern about how data is collected, used, and protected. Both the government and private companies must ensure that personal data is handled responsibly.

b. Digital Divide: artificial intelligence technologies require access to digital infrastructure, and there is a need to ensure that all segments of society can benefit from artificial intelligence solutions, not just the affluent or tech-savvy communities.

c. Ethical Concerns: As artificial intelligence becomes more embedded in governance and daily life, concerns about surveillance, discrimination in artificial intelligence algorithms, and decision-making transparency are gaining importance.

Looking forward, Jakarta is expected to continue expanding its use of artificial intelligence across more sectors, with the ongoing support of local government policies, societal feedback, and collaboration with the private sector. The success of artificial intelligence implementation in Jakarta will largely depend on how well these various actors can align their efforts to create a smart city that is both technologically advanced and socially inclusive.

In summary, the implementation of artificial intelligence in Jakarta showcases a collaborative effort between the local government, the private sector, academia, and society at large. Together, these actors are paving the way for a more efficient, responsive, and sustainable urban environment, making Jakarta a leader in artificial intelligence innovation in Southeast Asia.

Conclusion

The ever-growing city of Jakarta will face many problems that can be solved with the right use of technology. Due to human limitations, artificial intelligence can help optimize performance that is more efficient and effective.

The understanding of the people of Jakarta in the use of artificial intelligence is still minimal, of course, this makes the focus of attention for various parties, both government and private, in optimizing the insight into the needs of the people of Jakarta.

The integration of artificial intelligence in Jakarta offers promising solutions to urban challenges, particularly in the development of a smart city. While artificial intelligence has already contributed to improving traffic management, public safety, and healthcare, its full potential can only be realized through the collective efforts of government, private sectors, academia, and civil society. However, challenges such as the digital divide, data privacy concerns, and algorithmic bias must be addressed. A holistic and inclusive approach—focused on increasing digital literacy, clear regulations, and stakeholder collaboration—will ensure that artificial intelligence benefits all segments of society in Jakarta. The future success of artificial intelligence in Jakarta will largely depend on continued efforts to align technological advancements with the city's social and governance needs.

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