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Transformation and Adaptation of Artificial Intelligence Technology in Public Administration in The United States and Indonesia

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ABSTRACT

The application of artificial intelligence technology is considered to be able to overcome the problems of public administration work systems in many countries today. But every country has different views and challenges in the application of artificial intelligence technology in the field of public administration. This paper aims to determine the policy and application of artificial intelligence in the field of public administration in developed countries (United States) and developing countries (Indonesia). This study used a qualitative method which was analyzed descriptively, which was obtained from secondary data in the form of journals, books, and other sources relevant to the topics discussed. The research results show that; The US government makes science and technology policies that focus on the application of AI artificial intelligence in the field of public administration, invests in budgets and research, trains the workforce for development and establishes institutions. Meanwhile, the Government of Indonesia carried out the transformation and adoption of AI technology without any policies and preparation of resources. This study finds that there is a need for advanced and comprehensive research in Indonesia regarding the application of AI in the public sector, and anticipating the impact of the risks posed.

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INTRODUCTION

Progress in artificial intelligence (AI) has been made in waves. A computerized system that performs and reacts in ways that are typically assumed to need intelligence, such as the capacity to learn, solve problems, and achieve goals in a range of difficult and uncertain scenarios, is referred to as artificial intelligence (AI) today. Robotics, natural language processing, and machine learning (ML) are just a few examples of the methodologies and application areas that make up the study of artificial intelligence. Artificial intelligence (AI) was initially developed to address issues with natural language processing, perception, planning, learning, reasoning, knowledge representation, and the ability to move and manipulate objects, (Gati et al., 2021) in (Luger 2005; Nilsson 1998 ; Poole, Mackworth, and Goebel 1998; Russell and Norvig 2010). The approach used is not far from statistical methods, computerization and the use of symbols. Rapid developments in all fields have meant that artificial intelligence (AI) is used in almost all sectors to make work easier, one of which is in the public sector. The use of artificial intelligence (AI) in government is nothing new. In the 1990s, the US Postal Service used this technology to recognize handwriting, making it easier to deliver letters. Although artificial intelligence (AI) in the public sector is not yet able to match the private sector, its use is able to reflect the common applications of both sectors. (Gati et al., 2021) in (Deloitte, Eggers, Schatsky, Viechnicki 2017, and Mehr 2017) stated that cognitive technology can revolutionize every aspect of government operations.

There are 6 (six) main problems in government that can be solved by using artificial intelligence (AI). First, allocate resources for administrative support so that work can be completed more quickly. Second, the data collection is large, employees have difficulty managing large amounts of data. In fact, if combined, they can produce broader insights. Third, there is a lack of experts so that simple problems cannot be resolved properly. Fourth, Prediction, the presence of historical data makes situations easier to predict. Fifth, Procedure, is a repetitive task between input or output with a binary answer. Sixth, diverse data, data both in visual and linguistic form need to be summarized regularly. Apart from that, there are 3 main functions of using AI that contribute to the public sector. First, Contribute to public policy goals. Second, helping community interaction with the government. Third, legal preparation and document translation. (Gati et al., 2021) in (Mehr, 2017).

(Wirtz et al., 2019) said that artificial intelligence technology provides opportunities to be implemented in the public sector, to create public sector work efficiency. But the challenges of implementing artificial intelligence should not be dismissed, as they will hinder its implementation. (Wirtz et al., 2019) identified 17 previous research results that discussed the challenges of artificial intelligence in the public sector, which sparked debate in science and society regarding the impact of applying artificial intelligence to the public sector. Based on this debate, (Wirtz et al., 2019) concluded that there are 4 (four) main dimensions that are challenges to artificial intelligence in the public sector, namely; implementation of artificial intelligence

technology, artificial intelligence legislation, artificial intelligence ethics and artificial intelligence society.

Various descriptions of research results explored by researchers, it can be concluded that the use of artificial intelligence (AI) technology in all sectors of life is very important, especially in the field of government related to public policy and public services. Thus, this paper aims to explore the transformation and adoption of artificial intelligence (AI) in the field of public administration in the United States and Indonesia. The author will analyze the results of research related to the policy of transformation and adoption of artificial intelligence (AI) technology in the field of public administration. Then, critically examine public administration experts about the positive and negative impacts or risks of integrating artificial intelligence (AI) technology in the public administration framework. Then, it also describes the readiness of the Indonesian government in dealing with the current transformation of artificial intelligence (AI) technology in the field of public administration in Indonesia.

The concepts underlying artificial intelligence (AI) and its conceptual framework have reportedly been studied since at least the 1940s and formalized in the 1950s. Intelligent machines have been discussed and popularized by scientists such as Alan Turing and Isaac Asimov. The "artificial intelligence" project was first proposed in 1955 by Dartmouth, and completed in 1956. At first the research on artificial intelligence (AI) developed focused on theory rather than practical use, so that its practical application had not yet been implemented, due to limitations in technology. The development of artificial intelligence research began to develop since the 2010s, which was marked by the availability of large amounts of data, better machine learning (ML) techniques and algorithms, and more sophisticated computer systems, (Harris, 2021).

Artificial intelligence (AI) also has limitations and challenges in addition to potential, benefits, and opportunities. Artificial intelligence (AI), for instance, can improve human decision-making, speed up and provide insights into data processing, maximize performance for challenging tasks and systems, and raise worker safety in hazardous jobs. However, in order to support research and development, artificial intelligence (AI) systems frequently rely on vast unavailable data, order adequately explain the decision-making process (R&D). Stakeholders also question the suitability of current regulations to meet any social and ethical problems that may arise in the usage of artificial intelligence (AI), as well as the suitability of human resources in the public and private sectors to create and work with AI (AI). These difficulties may make it difficult to completely evaluate and comprehend how artificial intelligence systems work and what they produce. According to (Fejes & Futó, 2021), the rapid advancement of technology, the introduction of digitalization, and solutionsnew technology provide significant problems for public administration. Public administration-related development initiatives must keep up with broader trends for public services to be effective, affordable, technologically advanced, and current, new technologies must be adopted and

transformed. The new digital era gives the chance to create linkages between enterprises, citizens, and government agencies that are more successful and efficient.

According to (Fejes & Futó, 2021), the use of 'artificial intelligence' (AI) can be used in the areas of policy, institutional strategy, making administrative decisions, and providing information, in addition to other institutional activities and daily internal tasks of the (Fejes & Futó, 2021) examines how 'artificial intelligence' tools can be used in public administration with a focus on administrative decisions which can documented according to the law on public administration. Therefore artificial intelligence helps improve the efficiency of public services electronically and is very useful in creating the modernization of public services.

(Pencheva et al., 2018) say artificial intelligence will have a profound transforming impact on governments around the world. Therefore, it is important for policy analysts to provide useful knowledge related to the analysis of "artificial intelligence" to public managers and policy makers. This study identifies policy analytic theory and policy cycles as new to artificial intelligence. Researchers say artificial intelligence has great potential to support public sector transformation, and it is important for public administration scholars to take on this task and support public managers in carrying out public sector reforms. But to implement artificial intelligence in the public sector, the government must provide support in knowledge creation and analysis efforts by opening up further data, collaborating and actively seeking input from researchers to understand how big data can be utilized in the public sector. The statement (Pencheva et al., 2018) is in line with the opinion of (Bullock et al (2020) that there is a relationship between artificial intelligence (AI) and bureaucracy in public organizations. The use of information and communication technology (ICT), and artificial intelligence technology (AI) has changed administrative practices in public institutions. Since the beginning of the 21st century, modern artificial intelligence (AI) has increasingly enhanced the ability of ICTs to perform the work of public organizations. Research (Bullock et al (2020) examines how the use of artificial intelligence (AI) changes the implementation of policies in an organization and forms of bureaucracy, and when artificial intelligence (AI) is used in bureaucracy creates automation.

Although artificial intelligence (AI) has progressed rapidly, governments around the world are facing difficulties in using AI. According to (Taeihagh, 2021) the challenges of using AI, because the government must control the scope and speed of the socio-technical transition that occurs. Theoretically there is a lot of literature explaining the governance of artificial intelligence (AI), where the use of AI presents opportunities to increase productivity and economic welfare, but on the other hand there are unintended consequences in the form of new risks that must be considered in the use of AI in the public sector. Therefore, governments must maximize the positive effects of using artificial intelligence (AI), while minimizing the negative harms. Governments around the world need to better understand the scope and depth of the risks posed and develop regulatory and governance processes and structures to address these challenges.

METHODOLOGY

This research departs from the constructivist or interpretive philosophy and paradigm in a qualitative research approach, (Creswell, 2014) Qualitative approaches have the option to choose their own data that is relevant to the chosen topic. Qualitative data helps ensure that researchers use coherent data, and the information collected helps to solve problems (Szaboand & Strang, 1997). Data collection techniques in research, using literature studies. Where the researcher prepares the research framework by utilizing library resources to obtain research data, (Zed, 2014). Research literature studies rely on the power of secondary data obtained from various scientific publications. (Szaboand & Strang, 1997) state that secondary data can be gathered through databases, websites, and published scientific articles from a variety of publications using existing data or data that has been published from multiple data sources. To obtain secondary data in the form of scientific publications, researchers access and collect various reputable and indexed international journals from the results of previous research, to be analyzed with content analysis related to policies, implementation, constraints or challenges of the state in the process of transformation and adaptation of artificial intelligence in the field of public administration. in the United States and Indonesia. To obtain relevant and credible secondary data related to the topics discussed, researchers use data sourced from ScienceDirect and Web of Science (WoS) articles. Researchers reviewed 20 reputable international journals and 1 international proceedings.

RESULTS AND DISCUSSION

The Transformation and Adoption of Artificial Intelligence in Public Administration in the United States

In 2019, the United States Government committed to creating "artificial intelligence" (AI) technology. The main actions taken by the US government are to encourage investment, coordinate R&D, provide national data, models and resources. The US government is also developing international technical standards around “artificial intelligence” innovation, lowering barriers to the use of “artificial intelligence” technologies, developing action plans around “artificial intelligence” (AI) security issues nationally, and training the workforce to develop and use “artificial intelligence.” ". President Donald Trump's administration in the United States issued two executive orders during the 115th and 116th Congresses, establishing the American AI Initiative and encouraging the federal government to use "artificial intelligence" (AI) in a credible manner (E.O. 13960). Four laws relating to "artificial intelligence" (AI) were passed during the 116th congress. 1). National Defense Authorization Act 2021, National Artificial Intelligence Initiative Act 2020, Public Service Administration Act 2021, which aim to address various “artificial intelligence” (AI) activities related to defense and security, creating an “intelligence Center of Excellence” (AI) technology that can facilitate the adoption of "artificial intelligence" (AI) technologies in the United States federal

government, Act on research support for Generative Adversarial Networks (GANs), aims to become the primary technology used to create facial recognition and deepfakes . Furthermore, the Law on financial programs related to the export of 'artificial intelligence' (AI) among other fields. So it can be concluded, the United States government is very serious about responding to the development of 'artificial intelligence' (AI) in the form of various public policy packages, (Harris, 2021)

The United States government in 2020, concretely provides support in the form of budget allocations for Research and Development (R&D) artificial intelligence (AI). The total budget for 'artificial intelligence' (AI) development in 2020 is $1.1 billion and in 2021 it reaches $1.5 billion. According to research (Harris, 2021) federal agencies such as Gedung Putih, badan-badan federal, and Kongres provide funding for research and development (R&D) on artificial intelligence so that the technology can be used to address problems in the public sector. During the administration of Barack Obama and the administration of Donald J. Trump, investment in artificial intelligence (AI) R&D became one of the focused programs of the United States government. Through the policy of the 2020 National Artificial Intelligence Act, the United States government on January 12, 2021 established the National Artificial Intelligence (AI) Initiative Office (NAIIO). To increase public confidence, the US government through the NAIIO agency provided a basic set of guidelines for the design, development, acquisition, and use of artificial intelligence (AI) in the federal government and directed the Office of Management and Budget (OMB) to establish policy direction and integrate principles into in various organizations. The government brings together federal science and technology professionals through the National Science and Technology Council Committee (NSTC) to coordinate science and technology policy across federal departments. To coordinate across agencies on the use of "artificial intelligence" (AI) in public administration, the US government has created a new committee and increased working groups through the agency NSTC.

The use of 'artificial intelligence' (AI) is very useful when the COVID-19 pandemic hits the world. The United States government adopted 'artificial intelligence' (AI) to facilitate the government's work in tackling the Covid-19 outbreak. The study (Hussain et al., 2021) stated that overcoming COVID-19 through vaccination turned out to raise various public sentiments towards vaccines, both sentiment positive or negative. Artificial intelligence (AI) was adopted to be useful for analyzing public sentiment on social media in the UK and the United States towards the Covid-19 vaccine. According to the study's findings, organizations and governments should think about using social media analysis powered by artificial intelligence (AI) in addition to polls and other traditional techniques to gauge public opinion. An analysis of public opinion in the United States shows the potential for real-time monitoring of social media through artificial intelligence (AI) on public sentiment and attitudes. Monitoring public opinion on social media using 'artificial intelligence' (AI) helps to detect and prevent public fears and also enables policy makers to understand the reasons why some social groups are reluctant to be vaccinated. In

addition, artificial intelligence (AI) can also provide information for policy makers to encourage participatory dialogue with citizens about the ins and outs of vaccine use in conditions of uncertainty, including decisions about priority and equity, to help maximize the use of available vaccines.

Study (Ahuja et al., 2020) discovered novel information regarding the application of "artificial intelligence" (AI) to the management of COVID-19. The creation of vaccines using "artificial intelligence" (AI) can hasten the process and aid in the prediction of new medications that can treat Covid-19 illness. Additionally, "artificial intelligence" (AI) methods can help disseminate crucial information globally and stop the spread of untrue information about COVID-19. In the fight to stop the spread of COVID-19, save lives, and lessen the economic catastrophe brought on by this terrible disease, the positive power and potential of "artificial intelligence" (AI) must be harnessed. Researchers suggest using artificial intelligence (AI) technology to address some of the most pressing problems posed by the COVID-19 pandemic in the global world. Using precise "artificial intelligence" (AI) technology to identify COVID-19 drugs and vaccinations. Although 'artificial intelligence' (AI) technology is certainly not the only factor in the development of antiviral drugs or vaccines that are guaranteed to work against (covid 19). However, it is very important for the scientific community to understand that strong artificial intelligence (AI) technology can at least speed up the process. Artificial intelligence (AI) is a tool for generating innovation in many industries and can help medical staff, patients and citizens alike. However, AI is not the most effective technique to address the unprecedented challenges of the COVID-19 pandemic. Medicine by doctors and the use of "artificial intelligence" (AI) can work together to develop new treatments and help fight this devastating pandemic.

In line with that, (Chymis, 2020) stated that overcoming the Covid-19 requires global cooperation and synergy. Artificial intelligence (AI) technology is actually getting real benefits from COVID-19, because artificial intelligence (AI) technology is useful for reducing the bad impact of Covid-19. Thus, public administration should transform to digital to facilitate its citizens during social distancing restrictions. In fact Covid-19 has changed the way public administration works and made it global. Governments, the commercial sector, public society, academic institutions, and international organizations shouldn't waste the chance to work together globally to combat COVID-19 and develop more responsible AI. The COVID-19 pandemic is a momentum for humanity to seize the chance to employ artificial intelligence (AI) to counteract the pandemic's negative impacts as well as to advance everyone's well-being and get closer to achieving the sustainable development goals (SDGs).

Transformation and adoption of artificial intelligence in Public Administration in Indonesia

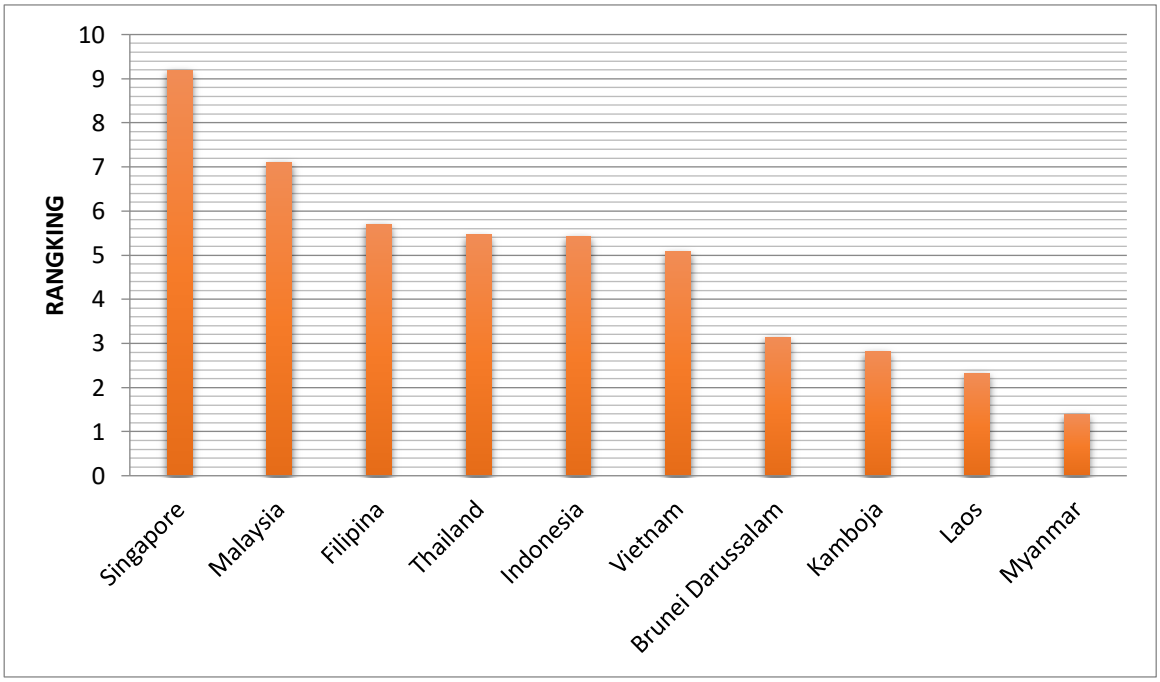
To implement artificial intelligence (AI) technology in the field of Public Administration, both in aspects of public policy, public services, organizational governance, it is necessary to prepare human resources for the apparatus who are ready to face technological developments themselves (Supriyadi & Asih, 2021). The ability of the government in the era of the industrial revolution 4.0 is required to be able to adapt to all changes. Artificial intelligence (AI) technology in the form of artificial neural networks can solve problems in the field of public administration, especially in the field of public policy making, improving the quality of public services and modern organizational governance, (Saluky, 2018).

In order to raise the standard of public services in Indonesia, the government of Indonesia has adopted policies to speed up bureaucratic reform. The government developed a comprehensive plan for reforming Indonesia's bureaucracy from 2010 to 2025 and enacted Presidential Regulation Number 95 of 2018 about Electronic-Based Government Systems in order to achieve this (SPBE). The SPBE policy serves as the cornerstone for all government organizations including the national and local levels, to establishing a clean, efficient, transparent, and accountable system of governance as well as high-caliber, dependable public services. In order to achieve Digital Governance in Indonesia, the SPBE policy can use ICT in an integrated and comprehensive. According to (Gati et al., 2021), advances in information and communication technology (ICT) have encouraged the Indonesian government to implement e-government and carry out a number of innovations in the public sector, particularly in the field of improving the quality of public services. SPBE and the application of artificial intelligence (AI) technology in the public sector have emerged as a strategic concern for the Indonesian national government, and have been defined in the National Strategy for Artificial Intelligence (Strana KA). The Policy (Strana KA) focuses on key areas of AI technology and provides guidelines for conducting AI-related activities in Indonesia by government organizations, including ministries, agencies, local governments, and other stakeholders. There are the Strana KA's five policy priority areas, namely health services, bureaucratic reform, education and research, food security, mobility, and smart cities, are all directly related to the public interest.

(Supriyadi & Asih, 2021) explains the importance of AI transformation in the field of public services. Heads of Ministries, Heads of Non-Ministerial Institutions, Heads of other State Commission Institutions, Regional governments (Governors, Mayors, Regents), are obliged to meet the needs of the community through the provision of efficient and effective public services. The Law Number 25 of 2009 explanation of public services places emphasis on the duty of the government to offer public services that are in line with community needs. As a result, in the era of the industrial revolution 4.0 the government must play a significant role in being able to offer the community services

based on information technology that are suited to the community's needs. In order for the government to carry out its functions in public services in the current era of the industrial revolution 4.0, government policies are needed to carry out technological transformation in the delivery of public services. One of the adaptations of current technological developments is to apply artificial intelligence technology in the field of public administration.

Various policies on the transformation and adaptation of artificial intelligence (AI) in the public sector are still experiencing many obstacles. The study (Supriyadi & Asih, 2021) stated that judging from the aspect of the current readiness of the Indonesian government compared to ASEAN countries, Indonesia is in fifth place based on the results of the 2019 Government AI Readiness Index assessment.



Source: Data from the Center for International Development Research, (Oxford Insight, 2019) obtained from research (Supriyadi & Asih, 2021)

Grafik 1. Government AI Readiness Index 2019 di ASEAN

The data above can be explained that currently the Indonesian government, in terms of readiness to implement 'artificial intelligence' (AI) is still far behind compared to other ASEAN countries, Indonesia still ranks fifth in terms of readiness. Meanwhile, judging from Indonesia's readiness at the world level, Indonesia is ranked 57th out of 194 countries with a score of 5,420. This means that Indonesia is still very far behind in terms of readiness to implement the transformation of 'artificial intelligence' technology into the public sector, (Supriyadi & Asih, 2021). Indonesia's readiness to implement artificial intelligence (AI) in 2020 according to data from the (Government AI Readiness Index,

2020) is decreasing. Indonesia is in position 62 of 172 countries studied with a score of 47,528. This position is down 5 places from 57 in 2019, (Gati et al., 2021).

Another finding, from the results of a survey conducted by the United Nations, sees that as a whole Indonesia is still a lot and has not fully implemented e-government principles in public sector services. This shows the low capacity of Indonesia to implement E-Government in the public sector, (Nuryanto et al., 2020) said that the obstacles in implementing e-government in Indonesia are due to limited regulations as a legal umbrella, limited experts who are competent in the field of informatics engineering, not yet integrated data between government agencies due to different data formats, inadequate budget, no standard infrastructure and minimal level of information security. In line with the research results (Puspitasari & Wiryantiningsih, 2022) said that there are challenges to the application of artificial intelligence (AI) in the field of public administration in Indonesia, especially in the use of automated decision-making within the government administration environment, which is still constrained by adequate legal instruments, thus requiring fundamental changes to several laws to implement artificial intelligence (AI) in public administration. According to research findings (Gati et al., 2021), Indonesian artificial intelligence (AI) systems are restricted from a governance perspective because there are currently no specific laws that govern and ensure the security and protection of citizens' data as well as the use of algorithms to prevent transaction abuse electronic. From a governance perspective, the development of artificial intelligence (AI) is necessary as an effort to maintain public trust and government legitimacy. (Supriyanto & Saputra, 2022) states that e-Governance innovation is needed in decision making. Various literature reviews mention that the key components needed for the functioning of a company that stimulate its innovation have been identified that implementing and managing the creation of an organization must have innovation-based resources and creativity by utilizing technology. But according to (Supriyanto et al., 2021) the presence of big data and artificial intelligence in public policy making in the current era can no longer be denied as a solutive approach to help public leaders make decisions and produce superior policies. Big data and artificial intelligence can provide powerful evidence of policy issues throughout the public policy-making cycle.

According to (Supriyadi & Asih, 2021) the factors causing the low level of readiness of the Indonesian government to transform and adapt artificial intelligence in the public sector are the cost of procuring expensive software and hardware infrastructure, and the readiness of human resources for the Indonesian government bureaucratic apparatus which is still relatively low. Meanwhile, implementing artificial intelligence technology requires the competence of human resources who have the capacity that leads to mastery of digital technology. Competence of human resource skills is a major factor in efforts to encourage industry to enter into digital transformation in accordance with the development of the industrial revolution 4.0 in Indonesia. Various skill competencies are needed in every industrial revolution, where the 4.0 industrial revolution requires capabilities that lead to digital technologies such as artificial intelligence, cloud

computing, machine learning. In addition to technical competence (technical skills), the adaptation of artificial intelligence technology in the public sector also requires non-technical skills (soft-skills). Another contributing factor from the results of the study (Nuryanto et al., 2020) said that according to World Bank data, 10 percent of high-speed internet network penetration can increase a country's economic growth by around 1.38 percent. Internet penetration in Indonesia in January 2019 has reached 56 percent. This means that 56 percent of the total population in Indonesia has been reached by the internet. Despite an increase of 13 percent from the previous year, the internet penetration rate in Indonesia is still the lowest compared to other Southeast Asian countries. We Are Social noted that in the same time period, internet penetration in Vietnam had reached 66 percent, the Philippines 71 percent, Malaysia 80 percent, Thailand 82 percent, and Singapore's highest 84 percent.

Although there are many challenges and obstacles to the application of artificial intelligence (AI) technology in the public sector. The Indonesian government has a great opportunity to rapidly carry out transformation and adaptation. This is supported by the results of research (Maulana et al., 2022) which examines the perceived trustworthiness of Generation Z and millennials in the implementation of artificial intelligence in public sector services in Indonesia. The results of the study state that Generation Z and Millennials have a perception of trust in the government in implementing artificial intelligence (AI) technology. Researchers found that Generation Z and Millennials view that the government has the ability and expertise to implement AI because government agencies already have human resources to utilize technology. In terms of policy, Generation Z and Millennials consider that the government has a responsibility and can be trusted by the government to implement artificial intelligence (AI) technology. So, Generation Z and Millennials give a positive response to trusting the government's integrity in implementing artificial intelligence (AI) in the public service sector.

Research (Supriyadi & Asih, 2021) identifies the impact of the application of 'artificial intelligence' in the field of public administration in Indonesia. This study explains 2 (two) things, namely the advantages and disadvantages of applying 'artificial intelligence' (AI) to people's lives and the impact of the application of AI technology in the field of public administration. The advantages of 'artificial intelligence' (AI) in the field of public administration. First, there is an increase in government performance that is more effective, the bureaucratic work process is faster so as to create efficiency in terms of time and cost. Second, the government is helped to meet the needs of the community in many aspects of life, especially in the field of government's task of providing quality public services. Meanwhile, the weakness of artificial intelligence (AI) technology is in the field of public administration. First, direct social relations are reduced between the community and the government as service providers. This creates a gap or social distance between the community and the government. Second, technology in the form of applications provided by the government to provide services gives rise to various technological crimes such as (cyber criminals, hackers, theft of passwords, data, on various government

websites, Thirdly, the increase in prices in the procurement of 'artificial intelligence' (AI) technology infrastructure.), both hardware and software devices.

Furthermore, (Supriyadi & Asih, 2021) said the impact of the application of 'artificial intelligence' (AI) in the field of public administration. First, the positive impact. Government productivity increases, because government tasks can be delegated through 'artificial intelligence' (AI) technology devices, long government bureaucratic procedures, become shorter and more efficient due to the creation of a service system that is connected between various organizations, and the public feels satisfaction from the results of the service. provided by the government. Although this is in the perspective of office services, not from the perspective of public goods and services, which are actually the most important and must be delivered by the government to the public. Second, the negative impact of the adoption of 'artificial intelligence' (AI) in the field of public administration. Negative in the sense of the unpreparedness of the government bureaucracy that is not ready for change. The application of 'artificial intelligence' (AI) can realize the restructuring of bureaucratic work units or streamlining of structural officials of the government bureaucracy. The Indonesian government, through a speech by the President (Joko Widodo), after being sworn in as president for the second term, revealed that there would be a streamlining of government bureaucratic structural officials in every organizational unit of the central and regional governments, especially at the level of echelon III and IV officials. The President said that the government's technical tasks in the future will be replaced by artificial intelligence (AI) technology that is currently developing. Thus, if the Indonesian government's policies are truly implemented, there will be a shift in the role of humans in the government bureaucracy to be able to adapt to technological developments in the era of the industrial revolution 4.0.

(Fauzan, 2020) conducted a research study on the importance of using Artificial Intelligence (AI) in the field of civil service administration in Indonesia. This study describes the concept of an artificial intelligence (AI) for its application to the process of monitoring and controlling staffing. The use of artificial intelligence to supervise and control staffing is "artificial neural networks" that can be used by personnel management agencies in supervising and controlling the open selection process for high leadership positions (JPT). Through artificial neural networks, it can provide an overview and predict the requirements of candidates for high leadership officials who will participate in the selection, suitability and mismatch of candidate requirements in the selection process, supervision and control of personnel in the fields of code of ethics, employee discipline, tracking posts of candidates on the internet, especially on social media, blogs, and websites and can see the extent of the ethical corridors, ethics and code of ethics as a state civil apparatus in the public. In addition, it can also see how the public opinion of a candidate candidate. Through the comprehensive use of artificial intelligence in the world of government, in the future research based on mathematical models and also a touch of information technology is needed to provide theoretical progress on the exploration of artificial intelligence theory in the world of government.

The latest research conducted by (Benhamou, 2020), (Yusriadi et al., 2023) concluded that the adaptation of artificial intelligence in the public sector in Indonesia will be able to improve the quality of public sector services, currently many government institutions in Indonesia are utilizing AI, especially in the field of education, health services, ICT, licensing, transportation, and economic services. Apart from that, in the employment sector, the application of AI will change the nature of work and employment structure, especially in the field of basic services such as health services and other public services in government bureaucracy. This change certainly requires increasing skills and restructuring the placement of human resources in the public sector.

As for efforts to transform and adopt artificial intelligence in the field of public administration, the Indonesian government in 2021 has exposed several Ministries and Regional Governments that have made innovations in the field of information technology-based public services:

Practice of transformation and adaptation of artificial intelligence in the field of public services at the Central Government level:

1. The Ministry of Home Affairs makes the Dukcapil's Signature Electronic (D-SIGN) application for the Directorate General of Population and Civil Registration. This app aims to provide all residents with a legal identity quickly, accurately and for free. The D-SIGN application is useful for printing documents independently by residents without having to meet face to face with Dukcapil Office staff. The D-SIGN application as a system that is integrated with the Population Administration System (SIAK) is in the form of an electronic document menu that can be affixed with a D-SIGN (Dukcapil electronic signature).
2. The Ministry of Law and Human Rights, created an innovative Legal and Human Rights Research Information System Service (Sipkumham). Sipkumham was built as a database service for legal and human rights issues as well as public service issues with the aim of supporting policy making in the field of law and human rights that are evidence based. This innovation also supports the improvement of the quality of research in the field of law and human rights by providing adequate data, as well as providing information on legal and human rights issues as well as public services to all main units within the Ministry of Law and Human Rights and the public.
3. The Ministry of Finance creates an innovative Financial Advisor (AIFA) for Regional Governments. This product is the work of the Directorate General of Fiscal Balance (DJPK) to perform data analytics to build an artificial intelligence model in the form of a dashboard that can provide financial advice automatically to local governments so as to improve the quality of regional financial management. This financial advisor model can strengthen the DJPK's role in improving the quality of regional financial management which in turn can improve the quality of public services and people's welfare.
4. The Ministry of Agriculture has created an innovative Indonesian Map of Agricultural Commodities Exports (IMACE), this system provides farmers with information

regarding market access for agricultural commodities. Then, this system is useful for local governments to optimize assistance and development of agricultural commodities so that they are more targeted. The IMACE system innovation also provides potential information in the form of real-time agricultural export data.

5. The Ministry of Maritime Affairs and Fisheries through the Fish Quarantine Center, Quality Control and Safety of Fishery Products (BKIPM) Mataram makes service application applications quite easy and easy (Si Chupang) through this application business actors get service convenience to expand production market access. Service users no longer need to come to the Mataram BKIPM office to get service, they can simply use the application (Si Chupang) which can be downloaded on their Android Playstore. (Natalisa, D. 2021)

Practice of Transformation and adaptation of artificial intelligence in the field of public services at the Regional Government level:

a. The Bandung City Government makes several applications for public services:
    1. e-SATRiA (Electronic Self Assessment Tax Reporting Apps), which is an online tax reporting application for Self Assessment Taxpayers.
    2. GAMPIL (Gadget Application Mobile for License) is a mobile/smartphone-based online licensing service application.
    3. TREATMENT. An online-based IMPILO application system to provide preventive, promotive, and curative health services (basic health services).
    4. Moovit Application. A system that is integrated with GPS that is installed on public transportation so that users can find out the location of public transportation that will be used. (Supriyadi & Asih, 2021)
b. The Jakarta Special Capital Region Government created the Taman Sari Community Integration Screening (SI-Imut), as an innovation product of the Taman Sari District Health Center, DKI Jakarta Province. The SI-IMUT application is useful for making a breakthrough in the implementation of integrated health screening and is easily accessible to the people of DKI Jakarta. This system is also useful in overcoming the weaknesses of the screening process and procedures carried out at the Taman Sari Health Center, and has been used during the Covid-19 pandemic. The SI-MUT application system also improves service quality, facilitates access, costs and time efficiency. (menpan.go.id. 2021).
c. The Gresik Regency Government created (SIGAP-RTLH), an Information System for Uninhabitable Houses Data Collection Program.
d. The Tegal City Government created an application (e-Kelurahan) for the Kelurahan service system based on electronic signatures.
e. The Badung Regency Government created a fish catch area detector using the internet of things (PATRIOT) system.
f. The East Java Provincial Government created (SAMSAT 4.0) the SAMSAT ATM transformation system with proof of payment and QR Code-based authentication.

g. The Province of North Kalimantan created a Smart Population Administration Service System in Inland and Border Areas (SIPELANDUKILAT). (Natalisa, D. 2021)

CONCLUSION

Conceptually, 'artificial intelligence' (AI) has been known since the 1940s, but it was only formalized in the 1950s. Researchers in various countries have paid attention to the presence of 'artificial intelligence' (AI) around 2010. The peak of attention of researchers, the government and the private sector on the use of 'artificial intelligence' (AI) when the covid-19 pandemic hit the world. The necessity of limiting human physical distance and social interaction during the covid-19 pandemic, requires the use of 'artificial intelligence' (AI) technology in all activities of human life, including having an impact on the framework of public administration at all levels of government, so that the likes and dislikes of public administration must can transform, adopting the development of 'artificial intelligence' (AI) technology. The implementation of 'artificial intelligence' (AI) in the field of public administration from various research results shows that 'artificial intelligence' (AI) presents a serious challenge for public administration in order to be able to present appropriate and superior public policies, efficient public services, effective and economical .

The implementation of transformation and adoption of 'artificial intelligence' (AI) technology in the field of public administration in the United States has become a priority policy of the United States government. Several policy packages in the form of laws were issued by the United States Government to implement 'artificial intelligence' (AI) in various ministries and countries, establish special agencies or institutions, and increase support for budget allocations. Meanwhile, the implementation of the use of 'artificial intelligence' (AI) in Indonesia is still far behind compared to other ASEAN countries. Indonesia is still ranked fifth in readiness. Meanwhile, if we look at Indonesia's readiness at the world level, Indonesia is ranked 57th out of 194 countries with a score of 5,420, and in 2020, Indonesia will be in 62nd position out of 172 countries studied with a score of 47,528. This position fell 5 places from 57 in 2019. This means that Indonesia is still far behind in terms of readiness to carry out transformation and adoption of 'artificial intelligence' (AI) technology in the public sector. However, since the Covid-19 pandemic and post-pandemic era, the Indonesian government, both central and regional, has begun to make innovative efforts by carrying out an 'artificial intelligence' (AI) transformation in the public sector. The Indonesian government continues to carry out digital literacy programs in government institutions, and currently the government has issued a policy on digitizing the management of the state civil apparatus through law number 20 of 2023 concerning the state civil apparatus, as the legal basis for the government bureaucracy to design a digital-based public service sector. However, based on the results of the study, researchers still doubt that there will be a negative impact on humanity from the application of artificial intelligence in the public sector. Thus, the author suggests that the use of 'artificial intelligence' (AI) in the field of public administration, especially in

Indonesia, should be carried out research studies. a more advanced and comprehensive account of the impact of 'artificial intelligence' (AI) on the public sector, especially in relation to the ethics of artificial intelligence.

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