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Development and Threats of Artificial Intelligence in Industry and Workforce

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Development and Threat, Artificial Intelligence, Industry, Workforce.

ABSTRACT

The abstract explores the transformative impact of Artificial Intelligence (AI) on global industries, highlighting its role in enhancing efficiency and innovation while also posing challenges such as job automation, skills gaps, data misuse, and ethical concerns. Drawing from the Global Risk Report 2024 and recent regulatory actions by the European Union and Indonesia, the abstract discusses the pressing need for AI governance. However, it lacks specificity in articulating the study's objectives and scope, and could benefit from providing concrete examples or statistics to support its claims. A clearer organizational structure and citation of relevant sources would enhance the coherence and credibility of the abstract. Furthermore, while emphasizing the importance of human control over AI, the abstract could offer a more nuanced conclusion that underscores the significance of the study's findings in achieving this goal.

INTRODUCTION

The development of Artificial Intelligence (AI) technology has brought significant changes in the field of industry and labor. AI has been a catalyst for transformation in a very significant area of the industry (Abioye et al., 2021; Mahalakshmi et al., 2022; Ofosu-Ampong, 2024; Park, 2024; Thapa et al., 2023). Through the use of these appropriate technologies, companies can evaluate customer data, forecast market trends, and automate business operations with higher efficiency, faster innovation, and better ways of making decisions. AI is also used in healthcare to diagnose diseases, identify genetic patterns, and conduct drug discovery research (Addanki et al., 2022; Habbal et al., 2024; Hasani et al., 2022; Nazir et al., 2024). This makes it possible to identify serious diseases earlier and treat them more successfully. AI has transformed autonomous vehicles in the automotive sector, which can reduce traffic accidents and improve transit effectiveness (Alenizi et al., 2023; Mpatziakas et al., 2022; Sadeghi R. et al., 2024; Trzaska & Sus, 2023).

Another convenience that AI provides is efficiency and automation in everyday life. Virtual assistants like Siri, Google Assistant, and Alexa have become part of the routine, including helping to find information, manage schedules, and perform other tasks (Bangkara & Mimba, 2016; Marr, 2019; Permana et al., 2023; Sudarsono et al., 2022; Sun et al., 2022). AI has also revolutionized the entertainment world with sophisticated recommendation algorithms, expanding the choice for users to find content that matches what is commonly used. Human life has improved thanks to AI technology (Abdullah & Almaqtari, 2024; Chui et al., 2023; Schluse et al., 2018; Schmitt, 2023).

However, behind its benefits, AI also carries threats that need to be wary of. One of the major threats is job loss as AI automation replaces human workers in some areas, such as manufacturing and customer

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service. While AI can increase productivity by taking over routine and repetitive human work, it also adds social inequality and reduces employment for some (Brundage et al., 2018; Druckman & Mair, 2019; He et al., 2023; Supriyanto et al., 2021; Yang et al., 2021).

Other threats related to the development of AI for military purposes, such as the AI arms race and its potential use in armed conflict, have increased with the use of AI in military environments. The development of autonomous weapons can reduce human influence in matters of life and death, incre(Hossain et al., 2022; Liang et al., 2024; Nazir et al., 2024; Spilseth et al., 2022). The likelihood of unplanned attacks, and violate moral standards and international law.

AI also poses another threat, namely disinformation and disinformation (hoaxes), due to the increasing prevalence of AI content creation, which is difficult to distinguish from human content and verify. Ethical issues in AI development, where AI algorithms are based on data collected from various sources. If the data contains discrimination, AI algorithms can also amplify that discrimination, impacting unfair or discriminatory decision-making in the hiring process, law enforcement, and financial systems. Therefore, AI developers need to ensure that the datasets used in AI training reflect population diversity fairly.

In facing the threat of AI, cooperation between governments, research institutions, the technology industry, and civil society is needed. Responsible AI development requires transparency, public participation, and multidisciplinary studies involving experts from various fields, including ethics, law, social, and technology. In addition comprehensive AI regulation in the form of voluntary regulations (ethics) and coercive regulations (laws and regulations) can control AI development and minimize the risk of AI threats.

METHODS

This research uses a qualitative approach with a descriptive method (Sugiyono, 2017). This method is expected to answer research questions related to the development and threat of AI in the industrial and labour sectors. The readiness of governments, companies, and workers to face the development and threat of AI can ensure AI can provide positive benefits and impacts for industry and the workforce through an AI arrangement both voluntary and binding in the form of regulations. The secondary research was conducted based on data from the World Economy Forum in collaboration with Zurich and Marsh McLennan 2024, IBM Corporation 2023, Ministry of Information and Communications, Journal and other related literature. Furthermore, the secondary data were collected according to the writing topic, combined, compared, analyzed using qualitative data analysis, and then concluded.

RESULTS

Artificial Intelligent

Artificial Intelligence (AI) is a computer with characteristics like the human brain, which can think critically, make decisions, and increase productivity. The foundation of AI is the human view in the rules of machinery for simple to complex work. These views converge due to intellectual activity, analytical studies, logic and observation. AI assignments include control, robotics, control mechanisms, computing, scheduling, to data mining. Alan Turing defines AI as a system that acts like humans, is a combination of computer science and big data to solve problems. The basic goal of the emergence of AI is to provide an automated decision-making mechanism based on raw data collected by humans, so that it will save more time and effort. AI optimizes the processes needed to minimize routine work, replaced by the use of different algorithms. AI technology has been used in a variety of fields, including business, healthcare, education, and more. AI encompasses a wide range of technologies, including Machine Learning, Neural

Networks, Natural Language Processing, and Computer Vision. In some cases, AI can even perform tasks that normally require human intelligence, such as facial recognition, natural language processing, and decision-making. Furthermore , AI has shown its strength in many aspects of life, including industry. The use of AI in the global industrial sector is growing rapidly at this time.

Opportunities and Threats of Artificial Intelligence

The Use of AI in Industry

Based on the State of AI in 2022, released by McKinsey, the industrial sectors that use AI the most for product development are the financial, financial services and banking industries. AI is used to improve the quality of their products and services. In addition, professional services, telecommunications/high-tech, healthcare, retail/consumer products. AI is used to design new products, analyze customer service, segment customers, improve product quality, and make business predictions. In general, AI is used to optimize operational activities. In general, McKinsey found that the trend of AI adoption in the industry will likely strengthen in the next few years. The AI referred to in this report is all technologies that can carry out cognitive functions related to the human mind, such as language understanding and cognitive functions related to physical activity, such as robotic automation and manufacturing equipment.

AI gave birth to this technology, which is very important and needed by various industrial sectors, such as virtual reality, live streaming applications, predictive analytics, and drones, to drive animation. The positive impact of using AI on various industrial sectors is the optimization of productivity, speed, accuracy, the efficiency of time, labour and cost. Therefore, various Indonesian industrial sectors have adopted AI, including the financial industry, financial services, health banking, trade, manufacturing, agriculture, logistics, transportation, and public services by the government and the private sector.

AI has also been adopted in the oil and gas industry, encompassing exploration to production and maintenance, logistics management, monitoring supply chains, planning fuel and equipment deliveries, predicting fuel demand at production sites, analyzing data from wells and production, analyzing data from oil and gas production to forecast future production and plan more effective investments and operations. Overall, artificial intelligence has great potential to bring positive changes to Indonesia's oil and gas industry. Using AI, companies can improve efficiency, effectiveness, and work safety at production sites. In addition, AI can help in more informed decision-making and improve logistics management in this industry.

In addition to the above benefits, the impact of the emergence of AI is digitalization and automation in work processes in various industries. Work that used to be done manually can be done digitally. Jobs involving repetition or data use can be completed by entering a work order. One example is using CHATGPT to create campaign briefs for digital marketing.

AI also opens up new opportunities to solve workloads automatically. The rapid development of technology has produced new fields of science, one of which is digital engineering. Quoting from the Idaho National Library, Digital Engineering describes a holistic approach to designing a complex system: Using models/data instead of documents, integrating data across models, and the culture change across project teams to realize significant risk reduction on construction cost and schedule.

The world-class companies that have adopted AI include Alibaba Group, Alphabet and Google, Samsung, Microsoft, Facebook, Instagram, Twitter, Netflix, Coca-Cola, Domino's, Mcdonald's, Unilever, American Express, Mastercard, Harley-Davidson, Uber, BMW, Tesla, Volvo, GE, SHELL and Siemens. Data from McKinsey, Kearney, and CSET in 2023 shows the contribution of AI to Gross Domestic Product (GDP) in 2030 is predicted to reach USD13 trillion globally, USD1 trillion for the ASEAN region, and USD 366 billion in Indonesia. The projected contribution of AI to GDP in 2030, due to the large exposure from the public to the use of AI, as quoted by McKinsey and Company in 2023, shows that 79 per cent of people are exposed to generative AI in their daily lives.

IBM Global Adoption Index data for 2022 shows 35 per cent of global companies have utilized AI, and 42 per cent of companies are exploring the use of AI. Quoting from TechJury in 2023, 77 per cent of features in people's devices utilize AI.

The Negative Impact of AI

A report by the Institute for the Future of Work in collaboration with Warwick Business School and Imperial College London in 2024 found that new technologies, including trackers, robots and AI-based software in the workplace, adversely affect the quality of human life. Conversely, using information and communication technology (ICT) such as laptops, tablets, and instant messaging in the workplace will likely positively impact well-being.

The biggest negative impact of AI is the potential for data breaches. This is because AI systems require large amounts of data to function effectively. Such data often includes sensitive personal information. If it falls into the hands of bad guys, it can lead to identity theft, financial loss, and other dangerous consequences. Another concern is the bias that could be embedded in AI algorithms. These algorithms are often trained with historical data that reflects societal biases and prejudices, leading to discriminatory results. For example, AI systems used for employee recruitment may discriminate against specific demographic categories, such as women or people of colour, based on past hiring patterns. The use of AI in decision-making processes has raised ethical concerns, especially in sensitive areas such as health and law enforcement. AI algorithms will only produce fairness as somewhat as the data used to train them, which can lead to discriminatory results and less accountability. The presence of AI can drastically change the price structure, which will certainly affect the business model and price of a product/service.

The impact of AI developments can cause companies to redefine the value proposition of their business. Some things that need to be reviewed include the reason for the existence of a business, target customers, products, positioning, pricing, and customer support activities. The emergence of AI can make an established product obsolete.

The dangers of artificial intelligence are not just hypothetical; there are vivid examples of businesses and industries being negatively affected by AI. In 2016, Microsoft launched a chatbot called Tay on Twitter. Within 16 hours, the bot was shut down for destructive and offensive tweets. This incident demonstrates the potential for AI to mimic and amplify harmful human behaviour if not adequately controlled and monitored (LI, 2023; Pantano et al., 2024).

Another example is the use of AI in the criminal justice system. Studies have shown that AI algorithms used to predict recidivism rates often exhibit racial bias, resulting in harsher penalties for people of colour. This issue seriously threatens the fairness and integrity of the judicial system. Aside from the real dangers and consequences, the ethical implications of AI cannot be ignored. As AI becomes more pervasive in our daily lives, it has the potential to influence our values, beliefs, and social norms. For example, developing autonomous weapons raises serious ethical questions about using AI in warfare and potentially losing human control.

In addition, using AI in surveying and tracking raises concerns about privacy and personal freedom. Regarding privacy, AI is trained using large data sets that could contain users' personal data. The use of AI technology in collecting and analysing personal data raises concerns about user privacy, facial recognition systems, the risk of misuse of personal data, and the violation of personal data protection principles. In some countries, AI is even used to assess an individual's behaviour based on his or her activities, consequently limiting access to public services for that individual. Irresponsible use of AI will also cause other ethical and digital security problems related to transparency in managing, controlling, monitoring, and interpreting data due to the black box nature of AI, the potential for algorithm manipulation in the form

of evasion models by providing incorrect input data or improper AI decision making can produce wrong or even dangerous output. This is because the characteristics of the black box can be misused by irresponsible parties to discriminate against certain groups with potential biases, hallucinations, and others produced by algorithms. The application of AI that encourages massive use of data also has the potential to cause the spread or disclosure of sensitive information of a person into the public domain, resulting in privacy violations.

Job loss, and automation under AI can cause concern related to job loss. AI could potentially replace specific jobs with machines that can act like humans. Citing the World Economic Forum (WEF) report entitled Future of Jobs 2023, it is estimated that there will be job additions estimated at 83 million and job reductions of 69 million in the next five years. The decline occurs due to changes in the labour market and the adoption of AI and ChatGPT technology. Thus, 14 million jobs, or 2 per cent of the total current jobs, will be lost by 2027. The report predicted the labour market decline would be greater in two sectors. First, supply chains and transportation. Second, media, entertainment, and sports. Smaller disruptions will be experienced by the manufacturing industry, including retail and wholesale consumer goods. On the other hand, clerical and secretarial jobs such as bank tellers, postal services, cashiers, ticket guards, and data inputters will drop quickly. Meanwhile, in terms of sector, large-scale job growth is expected in education, agriculture, and digital trade. Some increasingly needed jobs are vocational education teachers, e-commerce experts, digital transportation experts, and digital marketing experts. In contrast, the sectors that experienced the most job decline were administration and workers in security, factories, and traditional trade. The ability to think analytically and creatively remains the primary ability for workers in 2023.

AI also poses another threat, namely disinformation and disinformation (hoaxes), which are caused by the increasing prevalence of AI content creation that is difficult to distinguish from human content so it is difficult to verify. In the Global Risk Report 2024, the WEF revealed that foreign and domestic parties alike will take advantage of AI-created disinformation and disinformation, further widen social and political inequalities in a country, especially as some countries enter the political year, and nearly three billion people in various countries will go to the polls to elect their leaders, such as in Indonesia, India, Bangladesh, Mexico, Pakistan, the United Kingdom, and the United States. Economic players predict the risk of widespread use of disinformation by AI over the next two years, and its spread, including cyber insecurity, could undermine the legitimacy of the newly elected government. The concern is the occurrence of riots caused by violent protests and crimes in the form of racial hatred, civil confrontation and terrorism. United Nations (UN) Secretary-General Antonio Guterres at WEF 2024 in Davos also highlighted the risks of AI impacts, including human rights, privacy and society.

Government, Company and Worker Readiness to Face AI

With a population of more than 270 million, Indonesia is a vast market for the technology industry, including AI. Based on data published by Datareportal in 2023, as of the beginning of 2023, it is reported that there are (i) 212 million internet users in Indonesia (with internet penetration of 77 per cent); (ii) 167 million social media users (equivalent to 60 per cent of the total population); and (iii) 353 million active cellular connections (equivalent to 128 per cent of the total population). The survey conducted by Ipsos of 22,816 Indonesian adult population in the May-June 2023 period also found that 75 per cent of respondents are excited about the presence of AI products and services and 78 per cent of respondents believe that AI products and services have more advantages than disadvantages. The use of AI technology is believed to increase productivity efficiency, and encourage innovation. However, based on the Global AI Index 2023 published by Tortoise Media, Indonesia is ranked 46th out of 62 countries measured based on a country's AI capacity to a country's population or economy and comparisons with other countries. Oxford Insight

also compiled the Government AI Readiness Index 2023, which ranks 193 countries' readiness for AI presence, of which Indonesia ranks 42nd (below Malaysia and Thailand), and notably lacks value on the technology readiness pillar. In addition, based on a study published by the U.S.-ASEAN Business Council, Indonesia is also projected to face a shortage of 9 million skilled and semi-skilled workers between 2015 and 2030. This condition will certainly challenge Indonesia to integrate AI in various sectors fully.

In 2020, the National Strategy for Artificial Intelligence 2020-2045 has been designed as the direction of national AI technology policy. The draft AI National Strategy contains 4 (four) focus areas: ethics and policy, talent development, infrastructure and data, and industrial research and innovation. In the Draft AI National Strategy, it is proclaimed that the vision of AI Indonesia will be aligned with the Golden Indonesia Vision 2045, and a mission has been designed to (i) realize ethical AI in accordance with the values of Pancasila; (ii) preparing AI talents who are competitive and character; (iii) realizing a data ecosystem and infrastructure that supports AI's contribution to the benefit of the country; and (iv) develop an ecosystem of AI research and innovation collaboration to accelerate bureaucratic and industrial reforms. The mission and policy objectives related to AI will also align with Indonesia's commitment to realising sustainable development goals (SDGs) targets. To achieve the mission designed in the National Strategy of AI, international cooperation is one of the highlights, especially international cooperation, to realize trustworthy artificial intelligence (trustworthy AI).

Indonesia also faces challenges that become a gap between developed and developing countries in the use of AI, including differences in standards and regulations between countries, sovereignty and data management issues, and the rapid pace of development of AI technology that is difficult to catch up with by developing country infrastructure. For this reason, Indonesia needs to be proactive in various international cooperation frameworks to voice AI governance that is effective, responsible, and in accordance with the interests of developing countries. As stated by the Minister of Foreign Affairs in the Annual Press Statement on January 8, 2024, Indonesia's leadership at the global level and the consistency of principled foreign policy have increased the confidence of the world community in Indonesia. Indonesian diplomacy will continue to fight for national interests, strengthen the Golden Indonesia Vision 2045 foundation and continue to contribute to the world. The challenge ahead is how Indonesia's diplomacy is also relevant to efforts to bridge the gap in AI utilization and AI global governance. In the preparation of the Global Digital Compact as a blueprint for global AI governance and utilization cooperation, the Government of Indonesia needs to contribute actively, especially to issues related to digital inclusion and connectivity, anticipation and mitigation of risks and challenges arising from the presence of AI, the role of digital technology for development, especially accelerating the achievement of SDGs in developing countries, data protection and digital security, and realizing digital global governance. Indonesia needs to encourage the Global Digital Compact and other international cooperation frameworks related to AI to bridge the process of upskilling, reskilling, capacity building, and knowledge and technology sharing to increase digital capacity for human resources in developing countries, especially in Indonesia. Finally, Indonesia should benefit from international cooperation related to AI, while a national ecosystem related to AI must also be built.

The Indonesian government is also committed to supporting the positive use of AI technology and strengthening the national AI ecosystem, such as the economy, health, education and other sectors. AI will become a benchmark for mastering digital technology in the next 5 to 10 years. As many as 62 per cent of companies in Indonesia are ready to adopt AI technology. This is reflected in the results of the research 'Artificial Intelligence Adoption Readiness of Businesses in Indonesia' conducted by digital solutions company Mekari. There are three levels of company readiness to adopt AI technology. First, companies have utilized at least one digital solution to increase productivity in one of the central business processes or

activities. As many as 95 per cent of medium and large businesses in Jabodetabek, Bandung, and Surabaya. Second, companies have not only used but also integrated various digital solutions in several processes or operational activities to drive overall business efficiency. Third, the company has formed a technology ecosystem by combining two important factors, namely technology infrastructure and corporate culture, to optimize the use of technology for business growth.

But according to Cisco's first AI Readiness Index, which has surveyed more than 8,000 global companies, released November 17, 2023, 100 per cent of Indonesian companies say the urgency to deploy AI, powered tech has increased. Still, only 20% of Indonesian companies are ready to integrate AI into their business. Thus, there is a gap for companies ready to adopt AI. Not only governments and companies must prepare for the development of AI, but workers and prospective workers must also prepare to adapt and develop skills that AI has not reached. The skills the job market needs do not only focus on hard skills. No longer limited to creating programs, creating machine learning, capturing and processing big data, or the like. Soft skills are also needed, and these skills are the priority indicators sought after by global companies and can be applied in various fields, including the creative industry. For this reason, upskilling and reskilling are needed to improve the skills of the Indonesian workforce in facing the development and threat of AI.

Citing the June 2023 World Economic Forum (WEF) report on employment trends and workers' abilities in the next five years. WEF analyzes the skills or abilities of workers from various positions in global companies and conducts special surveys with the leaders of the companies concerned. According to the WEF, there are 23 key skills that workers need to have in global companies. The top two are filled by cognitive abilities consisting of analytical and creative thinking skills.

Furthermore, character skills consisting of endurance, flexibility, and personal dexterity then also supported by the ability of motivation and self-awareness as well as the desire for continuous learning. The sixth position is filled with technical skills, such as digital literacy. However, in the context of the challenges of the next five years, there is expected to be a shift in proficiency priorities required by several global companies. The first and second positions are still occupied by the ability to think analytically and creatively. Next, the mastery of AI and big data will be followed by shifting the abilities of characters currently occupying the third position. Then, the fourth and fifth positions are filled with leadership ability, resilience, personal flexibility, and agility.

AI Ethics and Regulation in Indonesia

The European Union (EU) argues that comprehensive AI regulation can control AI development, on December 9, 2023, the EU parliament approved AI regulations. AI regulation is necessary because AI contains good sides and negative sides. Regulation is needed to regulate it, not hinder AI development. There are two types of AI regulation: voluntary (ethics) and coercive (legislation). AI regulation in the EU is coercive.

Indonesia already has a National Strategy for Indonesian AI Intelligence 2020-2045. One of the topics of discussion is ethics and policy. The Ministry of Information and Communication has issued Circular Number 9 of 2023, dated December 19, 2023, concerning Artificial Intelligence Ethics, which is intended for business actors of artificial intelligence-based programming activities on the standard code of Indonesian business fields of public scope electronic system operators, private scope electronic system operators.

Implementing AI Ethics is a short-term government tactical step to get around the absence of more comprehensive AI regulations. Still, ethics has weaknesses because it is partial and not comprehensive, only passed within the scope of the company that enforces it. In addition, Indonesia is a country that has adopted fairly high-quality AI technology. AI ethics only applies to fintech companies that are members of the association. There is no principle of equality before ethics. On the other hand, AI is no longer partial but

widespread. About 100 million people use ChatGPT. Ethics only requires voluntariness, not coercion or soft regulation. Ethics is limited to appealing. Because ethics is voluntary, not coercive, there is no adequate sanction for ethics violations. There is no certainty and justice for ethical violations. There are no sanctions for organizations or companies that do not make AI ethics if the preparation of circulars or appeals. On the other hand, there are concerns about the negative impact of using AI.

Comprehensive arrangements that apply to all to bring certainty and justice can only be fulfilled by laws and regulations. The enactment of laws and regulations aims to reduce the negative impact of AI while increasing its positive impact. Indonesia needs EU-like legislation as a long-term strategy for regulating AI. The National Research and Innovation Agency (BRIN) is working on a draft law in the form of a presidential regulation (PerPres) to regulate AI. This intermediate law aims to fill the void of laws and regulations governing AI. In addition, Permenkominfo Number 3 of 2021 regulates licensing aspects for business actors who utilize AI. There have been and its derivative regulations regulating AI with electronic agent terminology, a Personal Data Protection Law regulating the use of AI concerning the processing of personal data even though there have been no derivative regulations until now.

Efforts to regulate the use of AI have also been carried out by the Financial Services Authority (OJK). OJK appointed the Indonesian Financial Technology Association (AFTECH) and other industry associations, namely AFSI, AFPI and ALUDI, to compile and establish 2023. In addition, OJK is also drafting regulations on digital services by commercial banks, which contain the principle of responsible innovation in using new technology, one of which is AI technology. Despite these efforts, Indonesia still needs regulations that specifically target AI technology so that its use can be carried out responsibly while creating a good ecosystem for future AI technology development.

CONCLUSION

AI plays a crucial role in global industrial development, including in Indonesia, but caution must be exercised to prevent overreliance on AI, which could lead to adverse consequences if not optimally utilized. The primary concern lies in AI surpassing human control, prompting debates on its adherence to ethical and moral values. Effective regulations and oversight mechanisms are imperative to ensure human control over AI, necessitating multidisciplinary studies and inclusive policies. Addressing challenges such as transparency and accountability requires identifying and mitigating risks throughout the AI lifecycle, with the Indonesian government playing a pivotal role in mapping vulnerabilities and establishing updated risk management policies. A comprehensive approach incorporating horizontal, vertical, and sectoral models is essential, with central regulations guiding overarching principles and specific sectors tailoring regulations to their unique needs, ultimately ensuring responsible AI development and governance in Indonesia.

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