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Development of Artificial Intelligence (AI) Technology and Challenges for the World of Work

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Abstract:

AI has rapidly evolved and been applied in various sectors such as education, healthcare, agriculture, and industry, proving to enhance efficiency, productivity, and service quality. However, this progress also brings serious challenges, including the potential replacement of human labor, issues of privacy, and data security. This research employs a descriptive qualitative method based on literature review from various scholarly sources. The findings indicate that although AI plays a major role in driving digital transformation, it also generates significant social impacts, particularly on the workforce and the mental health of Generation Z, which is highly adaptive to technology. This generation needs to be equipped with critical, logical, and rational thinking skills in order to utilize AI positively while minimizing its negative impacts.

Keywords: *Artificial Intelligence, Digitalization, Workforce.*

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Introduction

The development of digital technology in the 20th century has brought significant changes to various aspects of human life, including the economic, social, and employment sectors. One rapidly developing innovation is artificial intelligence (AI). This technology is not only used in information technology but has also penetrated the industrial, healthcare, financial, transportation, and public service sectors. AI is a tool that can increase operational efficiency in any field, improve decision-making to ensure targeted results, and enhance the employee experience when using AI (Sakinah & Kuswinarno, 2024). In this digital world, AI plays a crucial role in the efficiency of organizational or company performance. AI has transformed the way organizations operate and interact with employees (Pranoto, 2026).

Digitalization, which refers to the process of converting information and business processes into digital format, has become a necessity for organizations to remain competitive in an increasingly complex and dynamic competitive market (Sakinah & Kuswinarno, 2024). Digitalization is a process of transformation from a less efficient traditional era to a highly efficient digital form that increases productivity and service quality. In today's digital world, transformation has become a necessity for individuals who want to remain competitive and relevant. These changes have a significant impact on business processes, organizational structures, and individual tasks within them (Sintani et al., 2024).

The use of technology in today's digital world can provide performance efficiency in all aspects, from business processes and organizational structures to individual tasks. Advances in artificial intelligence (AI) technology open up significant opportunities to increase efficiency and effectiveness in various fields. However, this progress also presents its own challenges,

such as concerns that artificial technology, such as machines, will completely replace human work, as well as issues related to privacy and data security (Hutasuhut et al., 2025). It is important to establish limits on the use of artificial intelligence to address these concerns. This ensures that AI does not completely replace human work but only improves performance efficiency.

The digital generation, often referred to as Generation Z, is the generation born between the 1990s and 2010s (Atmojo et al., 2025). According to age data, Generation Z is from 1995 to 2012, while others say it's from 1997 to 2012. Generation Z was born at a time when technology was already developing rapidly and is highly dependent on existing technology. Generation Z is highly adaptable to change, as they tend to quickly and easily understand and master new technologies. They also possess a high level of creativity in using existing technology (Atmojo et al., 2025). Generation Z's influence on the rapidly evolving technology has significantly impacted their surroundings and, of course, the current era. Social conditions that once emphasized face-to-face greetings and news exchanges have now shifted from simply communicating through gadgets, even while at home.

Facing situations like this, critical thinking, logic, and reasoning skills are crucial for humans when making decisions regarding the development of AI. We need to assess the advantages and disadvantages of AI rationally and objectively by applying critical thinking, both directly and indirectly. According to an international organization official, we should not simply be amazed or dismissive of the developments in artificial intelligence (AI) emerging in our midst. Instead, we need to apply logic and critical thinking in responding to these advances (Oktafia et al., 2025). Critical reasoning and logic are key to navigating the development of artificial intelligence (AI). This allows us to analyze and capitalize on the positive aspects of each development while anticipating the negative aspects.

Critical thinking is a key asset for the Generation Z we encounter today. Generation Z, who are mostly still in their teens, a period when their thinking is still unstable and can be volatile, are highly vulnerable to mental health issues. Therefore, it is crucial to improve psychological well-being and protect adolescents from negative experiences and risk factors that can hinder their growth and development. This is crucial for mental health in adulthood. According to the 2022 Indonesia-National Adolescent Mental Health Survey (I-NAMHS), it is estimated that one in three adolescents, or approximately 34.9%, or approximately 15.5 million adolescents, experience at least one mental health symptom. Common problems include depression, anxiety, stress, and attention deficit hyperactivity disorder. As a result, anxiety is the most common mental health issue among Indonesian adolescents (Saputri, 2025). While mental health issues are multifactorial, current technological advances have a dependency effect on today's adolescents, resulting in anxiety.

Based on the above background, the author aims to describe the development of artificial intelligence (AI) and digitalization along with its impact on company efficiency and productivity, analyze the opportunities and challenges that arise due to the application of AI, especially related to the issue of replacing human labor, privacy and data security, examine the role of generation Z as the most adaptive generation to digital technology in utilizing and developing AI, identify the impact of digital technology development on adolescent mental health, especially related to anxiety and psychological stress, and emphasize the importance of critical, logical, and rational thinking skills as provisions in facing the development of AI technology in order to maximize its positive side and minimize its negative impact.

Research Method

This research employed a descriptive qualitative method, utilizing various literature sources, including books and journal articles, as data sources. The data was then processed by thoroughly decrypting the data obtained. The data was then analyzed comprehensively. This analysis was conducted by reviewing the contents of the literature and then linking them to the

research theme, namely the development of artificial intelligence technology and challenges for the world of work.

Result and Discussion

1. The Development of Artificial Intelligence (AI) and Digitalization and Their Impact on Corporate Efficiency and Productivity. Artificial intelligence (AI) is one of the technologies that must be managed and developed to improve human resource competency for Indonesia's rapidly evolving digital transformation era. Humanity has now entered the 5.0 era, where all aspects of life will be more convenient and easier (Sakinah & Kuswinarno, 2024). People living in the digital age will experience a phase of ease and convenience. All human needs will be easily obtained in a very efficient manner. Therefore, we need to make the most of this digital development so that we can adapt to the digital environment in this era of digital transformation. The application of artificial intelligence (AI) in various fields.
    a. Education
       The use of artificial intelligence (AI) in education will facilitate learning, enabling materials to be tailored to students' specific needs and creative digital learning styles. Artificial intelligence (AI) can also assist teachers in completing administrative tasks such as assessments, record-keeping, and so on.
    b. Health. The use of artificial intelligence (AI) can assist in all aspects of health. For example, it can positively impact the well-being of visually impaired individuals by enabling them to access information and carry out daily activities independently, thereby improving their quality of life and opportunities for education and employment.
    c. Agriculture. An example of the use of artificial intelligence (AI) in agriculture is the E-Tani agricultural monitoring system, which facilitates the selection of suitable land, monitors agricultural environmental conditions, and provides information from planting to harvest. This system can reduce agricultural failures, thereby meeting food needs and increasing market potential for farmers (Cahyani et al., 2024).

   Digital transformation and the use of artificial intelligence (AI) technology in Indonesia have become integral to economic and social development. Along with the advancement of information and communication technology, many Indonesian companies have adopted digital platforms to improve operational efficiency and competitiveness (Mardiana et al., 2024). The use of digital media is considered to be highly beneficial for companies and also opens up opportunities for MSMEs. For companies, the use of technology can provide time efficiency and significantly reduce labor costs. Meanwhile, for MSMEs, the use of digital media offers an opportunity to market their products effectively and efficiently, due to minimal taxes and the potential to enhance their creativity in promoting their products through digital media.

2. Opportunities and Challenges Emerging from the Implementation of AI, Especially Regarding the Issue of Replacing Human Workers.
   In addition to its economic impact and industrial efficiency, AI also has a significant impact on the workforce within a company. According to the World Economic Forum (2023), AI is predicted to replace approximately 85 million jobs worldwide by 2025, but will also create approximately 97 million new jobs focused on data analysis, software development, and AI systems management (Zaenuddin & Riyan, 2024). A study by the McKinsey Global Institute (2023) found that approximately 70% of large companies have now invested in reskilling their human workforce to ensure a smoother transition into the AI-based technology era, both for the benefit of the workforce and the company.

3. The Role of Generation Z as the Most Adaptive Generation to Digital Technology in Utilizing and Developing AI.
   Generation Z is the age at which the digital transformation era is taking place. Statistics show that Indonesia's population in 2019 reached 267 million, with teenagers dominating the population, often referred to as the productive age group. The 2020 Population Census revealed a surge in the number of people of productive age, aged 15-64, from 66.09%, or 157 million, in 2010 to 70.7%, or 191.9 million, in 2020. Of this productive age population, 70.2 million, or 25.87%, are millennials (those aged 24-39), and 75 million are Generation Z (those aged 8-23). Baby boomers, aged 56-74, comprise approximately 11.56%, or 31.37 million, and pre-baby boomers, aged 75 and over, comprise 1.87%, or 5 million (Kristyowati, 2021). This data shows that Generation Z dominates the other generations, numbering approximately 75 million. Therefore, this generation requires extra attention to prepare them for this era of digital transformation. A key advantage is that Generation Z is able to adapt quickly to digital developments. Therefore, this opportunity needs to be directed toward positive initiatives, leveraging technology that can have a broader positive impact, as well as channeling creative and innovative ideas to support a healthier era of digital transformation.

4. The Impact of Digital Technology Development on Adolescent Mental Health, Specifically Regarding Anxiety and Psychological Stress.
   The World Federation for Mental Health defines mental health as a state that supports the optimal development of an individual, including physical, mental, and emotional harmony. Meanwhile, according to the Task Force, psychological and emotional problems, if not properly addressed, will negatively impact the future development of the younger generation, particularly in terms of character maturity, and can potentially trigger psychological and emotional disorders (Saputri, 2025). Good mental health is a state that must be supported in an individual's development, both physically, mentally, and mentally/emotionally. A healthy mental state will influence all aspects of an individual's life, as good mental health fosters a mature character, which will positively impact their future life.
   a. Factors Affecting Mental Health:
      1) Parenting Styles. Sometimes parents are unaware that they are putting excessive pressure on their children or even being overprotective. This kind of pressure can lead to serious psychological disorders during adolescence.
      2) Environmental Conditions. Formal educational institutions that provide systematic and structured education play a crucial role in helping students develop their potential. All of these components can support achievement, both academic and non-academic. This can support student development, including moral, ethical, spiritual, intellectual, and emotional aspects.
      3) Peer Relationships. During adolescence, groups or associations influence an individual's behavior and character. Peer support provides a sense of belonging, fostering mutual respect, understanding, and finding common ground. Individuals surrounded by positive peer influences tend to experience positive development, both academically and non-academically, and play a role in shaping positive character (Saputri, 2025).

   The digital era is a time when almost all aspects of life have shifted from manual to digital. It's clear that digital technology significantly supports the basic needs of humanity today. Regarding the mental health problems experienced by many teenagers today, social media has also become a factor in mental health discourse, with both positive and negative impacts. Social media can provide a sense of community and emotional support, but it also carries the risk of depression and

anxiety. Furthermore, further exploration shows that social media has become a crucial platform for mental health interventions, with usage increasing significantly since the COVID-19 pandemic (Indrasari & Miftahuddin, 2024).

b. Positive impacts of digital technology development:
   1) Improved communication skills.
      The unlimited communication capabilities of digital media mean that individuals now frequently communicate digitally, without the constraints of distance and time. They can easily access communication media at any time, allowing for intense interactions, which in turn enhances their communication skills.
   2) Increased access to information.
      This modern era has significantly transformed several sectors of society, for example, access to information. In the past, people could only obtain information through oral and written media such as newspapers, magazines, and so on. However, all sources of information are now easily accessible through digital media (Sari et al., 2021).
   3) Developing skills in using technology.
      Skills in using technology are very possible. The use of technology is not limited to communication and information; critical, logical, and creative thinking skills are honed when we use technology. We cannot simply accept information at face value; there must be a filtering process to ensure the information we receive truly reflects the facts on the ground. Critical thinking skills must also be strengthened with creative thinking skills. By thinking creatively, they can develop their skills and discover new things from what they develop. Critical and creative thinking, of course, cannot occur alone without the help of others. Collaboration is needed between the current era of Industry 4.0 and the current era of Society 5.0 (Fajri et al., 2024). Amidst today's technological boom, they must be able to adapt to current conditions. With critical and creative thinking skills, they will be able to develop current technology with a positive impact.

c. The negative impact of digital technology development.
   1) Depression from Facebook and other social media.
      Excessive use of social media can lead to addiction in users. According to Goldenberg's theory, characteristics of social media addiction include: frequent loss of time, withdrawal symptoms, a constant need to increase time spent, excessive computer use and equipment, frequent commenting, lying, low achievement, frequent withdrawal, and fatigue.
   2) Cyberbullying
      A study conducted in Nigeria on 300 adolescents found that self-esteem, self-concept, and self-efficacy were significantly related to cyberbullying in schools. This research suggests the need for moral education in schools to foster good character and the ability to build positive relationships (Sari et al., 2021).
   3) Online Sexual Harassment
      This generation, most familiar with digital technology, is considered the most intelligent compared to previous generations. With technological advancements, lax parental supervision, and a lack of understanding of sexual education, minors can easily access negative content. The current state of mental health is increasingly complex, with individuals facing a higher risk of sexual harassment on social media. Sexual harassment on social media involves more than just sending negative texts, images, and content to victims; it can also include attempts to approach the target of the opposite sex (Chairunnisa et al., 2025).

Adolescence is a highly volatile period. Social media plays a key role in the challenges and opportunities for improving mental health. While social media can provide social support and information, it also has the potential for negative impacts,

such as triggering anxiety, depression, and social stigma. Therefore, mental health education and literacy are crucial to ensuring individuals can use social media healthily. Literacy encompasses the ability to recognize accurate information, understand the impacts of media use, and build self-awareness regarding media use (Indrasari & Miftahuddin, 2024).

Conclusion

Based on a literature review and qualitative descriptive synthesis of findings, this study confirms that artificial intelligence (AI) serves as a key enabler of digital transformation across sectors. AI provides large-scale data processing capabilities, routine process automation, and more accurate analytics-based decision-making support. In a corporate context, the application of AI has been shown to improve operational efficiency, service quality, and the speed of innovation, while shifting the focus of human work to high-value-added tasks such as reasoning, creativity, and complex problem-solving. AI is capable of providing intelligent and adaptive solutions to significantly changing corporate challenges and complex problems. AI technology has opened the door for companies to increase productivity, improve product quality, reduce production costs, and optimize supply chains. AI has spread to all corporate sectors for efficiency, both in terms of budget and product quality. In various fields, except for industrial companies, AI also plays a significant role. In education, it is able to provide the best services with innovative teaching methods. In healthcare, AI also helps with patient productivity, and in agriculture, it also improves agricultural services.

On the other hand, the impact of AI on the human workforce is that it can lead to unemployment and require workers to develop new skills. AI has great potential to change conventional paradigms in various sectors of the human workforce. AI can increase efficiency and productivity by automating repetitive manual tasks, accelerating recruitment, and making significant contributions to other fields. While AI is certainly a great development, it will impact the human workforce, leading to the replacement of human jobs and the loss of jobs. One solution is for humans to adapt to their jobs and to learn more to ensure their jobs are not lost to the tide of progress.

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