

SYSTEMATIC EVALUATION OF AI IMPLEMENTATION: FROM TECHNOLOGICAL INNOVATION TO SUSTAINABLE PRACTICE

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Abstract

This study aims to analyze the strategy of applying new technology in the form of AI to improve operating efficiency in several industries. This research uses the Systematic Literature Review (SLR) method. The purpose of research using this method is to identify, review, evaluate, and interpret all available research on the topic of interesting phenomena with certain relevant research questions so as to answer the questions in the specified research. The research results from analyzing this that AI has great potential in improving efficiency, accuracy, and quality of service. However, significant challenges such as stakeholder resistance, complexity of technology integration, and ethical issues such as data privacy and algorithm transparency need to be addressed. The research also reveals that adaptive approaches such as stealth science and digital ambidexterity can help overcome these barriers. In addition, collaboration among stakeholders and the development of supportive policies were identified as key factors for successful AI implementation. Key recommendations include the development of adequate technological infrastructure, workforce training, further research on the long-term impact of AI, and increased awareness and education about AI.

Keywords: *New technologies, AI*

1. INTRODUCTION

The development of artificial intelligence or AI technology is one of the main drivers of transformation in various sectors including the health sector, public services, agriculture and social media. AI provides increased efficiency, accuracy and service quality that can revolutionize the way things work in these sectors. In the health sector, AI can diagnose quickly so that decision making can be faster too. In the public service sector, AI can improve operational efficiency and quality of service to the public. In the agricultural sector, AI can increase crop yields and optimize resource use, while in social media, AI can help create more dynamic user interactions. Apart from the advantages provided by AI, the implementation of AI also presents challenges such as system complexity, resistance from stakeholders, and ethical and privacy issues are some of the main obstacles faced in the adoption of this technology. These challenges include complex technology integration, concerns about algorithm transparency, and protection of user data. In the healthcare sector, resistance from medical professionals to AI often arises due to concerns about the accuracy and accountability of the technology in clinical decision making. Meanwhile, in public services, limited

technological infrastructure and the need for supporting regulations are significant obstacles.

These challenges demand an approach that is not only innovative but also adaptive to ensure the continued success of AI implementation. These approaches include developing flexible regulations, increasing collaboration between stakeholders, and adopting adaptive strategies such as stealth science and digital ambidexterity. In addition, the importance of paying attention to ethical aspects in the development and application of AI is increasingly emphasized, to ensure that this technology is used responsibly and sustainably.

The main objective of this Systematic Literature Review (SLR) research is to identify, analyze, and synthesize existing literature related to the implementation of artificial intelligence (AI) in various sectors, including health, public services, agriculture, and social media. This research aims to understand more deeply how AI is applied in each of these sectors, identify the challenges faced during the implementation process, and evaluate the solutions and strategies that have been developed to overcome these obstacles.

In addition, this research aims to explore the impact of implementing AI on efficiency, effectiveness and service quality in various sectors. By conducting a comprehensive analysis, this research is expected to provide in-depth insight into the factors that influence the success or failure of AI implementation, as well as offer practical recommendations for increasing AI implementation in a sustainable manner. Specifically, the objectives of this research include:

1. Identify trends and patterns in the application of AI in various sectors.
2. Analyze the technical, social, and ethical challenges faced in AI implementation.
3. Evaluate the solutions and adaptive approaches that have been implemented to overcome these obstacles.
4. Provide policy recommendations and best practices to support more effective and sustainable AI implementation.

By achieving these goals, it is hoped that this SLR research can contribute to the development of policies, strategies and best practices that can support broader and responsible adoption of AI in various sectors.

2. METHODOLOGY

This research uses the Systematic Literature Review (SLR) method, which is a research method or technique that systematically reviews a topic by selecting, identifying, then highlighting specific questions in terms of a predetermined theme. Systematic Literature Review is a term used to refer to research methodology or specific research and development carried out to collect and evaluate research related to a particular topic focus (Triandini, *et al.*, 2019). This research uses 5 articles that have been selected so that they meet the suitability criteria and are relevant to the themes and topics discussed, namely regarding "strategies for implementing new

technology (AI) to increase operational efficiency". The blood collection process was carried out using ScieneDirect, the selected articles were articles from 2024, then these journals were analyzed and compiled into a table containing columns for the researcher's name, research title and conclusions from the results in the 5 selected articles. Next, the results of the analysis in the table will be examined in more detail and depth, then conclusions will be made from the data obtained from the analysis.

3. FINDINGS AND DISCUSSION

Based on the analysis of 5 articles conducted in 2024, the results of the article analysis are presented in Table 1 below.

Table 1. Analysis of Research Results

No	Peneliti	Jurnal dan Tahun	Hasil Penelitian
1	Sandra Gillner	Social Science & Medicine, 2024	<p>The results of this study reveal that AI technology providers face significant challenges in deploying their technology across complex health systems. To overcome these challenges, AI providers are adopting adaptive strategies that include stealth science, agility, and digital ambidexterity.</p> <p>These strategies allow AI providers to be more flexible in dealing with challenges in various implementation contexts.</p>
2	Fandi Omeish, Mohammad Al Khasawneh, Nadine Khair	Computers in Human Behavior Reports, 2024	<p>The research found that AI, through applications such as augmented reality (AR), virtual influencers, and chatbots, increases user engagement and satisfaction.</p> <p>The analysis results also show that AR, virtual influencers, and chatbots play a mediating role in strengthening the relationship between AI and user experience.</p>

No	Peneliti	Jurnal dan Tahun	Hasil Penelitian	
3	Siamak Hoseinzadeh, Davide Astiaso Garcia	Renewable Sustainable Reviews, 2024	and Energy	The research results show that the application of AI can significantly reduce energy consumption, especially heating loads, without sacrificing the quality or quantity of crop yields. In addition, AI implementation is recognized as capable of facilitating in-depth predictive analysis, supporting resource efficiency, and meeting sustainability goals in modern agriculture.
4	Siamak Hoseinzadeh, Davide Astiaso Garcia	Energy Conversion and Management: X, 2024		The results of this research focus on several things, namely: energy and heat efficiency, plant productivity, environmental impact, resource optimization. This research highlights the need for better AI algorithm development and technology calibration to achieve more consistent benefits. These findings are important for policymakers, researchers, and industry in evaluating the adoption of AI technologies in sustainable agriculture.
5	Abhinandan Kulal, Habeeb Ur Rahiman, Harinakshi Suvarna, N. Abhishek, Sahana Dinesh	Journal of Open Innovation: Technology, Market, and Complexity, 2024		The results of this research focus on several things, namely: maturity of AI adoption, functions affected, efficiency of public services. This research highlights the importance of adequate technological infrastructure, workforce training, and attention to ethical issues, such as algorithmic bias and data privacy. The results demonstrate the enormous potential of AI to support inclusive growth and sustainable development in public service delivery, but note the importance of careful planning to mitigate potential risks.

Source: Secondary Data (2026)

Table 1 shows that there are five research articles published in 2024 and discussing the adoption of artificial intelligence (AI) in various sectors. In general, the five articles emphasize that AI has a significant impact in improving efficiency, service

quality and user experience, but on the other hand it also faces social, technological, institutional and ethical challenges in the implementation process.

In the health sector, research by Gillner (2024) identified three main subsystems that hinder AI adoption, namely socio-cultural, technological and institutional. Medical personnel's skepticism regarding the accuracy and accountability of AI, limited data integration due to diverse technological infrastructure, and strict regulations are the main obstacles. To overcome these obstacles, AI providers are employing adaptive strategies such as stealth science, agility, and digital ambidexterity, which enable innovation flexibility despite potentially increasing health system complexity.

In the realm of social media, a study by Omeish et al. (2024) shows that the use of AI, such as augmented reality, virtual influencers, and chatbots, can increase user engagement and satisfaction, especially among the millennial generation. This technology creates a more immersive, interactive and personalized experience. However, this research also emphasizes the importance of paying attention to ethical aspects, especially data privacy protection and algorithm transparency.

In the agricultural sector, research by Hoseinzadeh and Garcia (2024) shows that AI plays a role in improving energy efficiency and the accuracy of greenhouse production yield predictions. However, challenges are still found in managing carbon dioxide emissions and water use. AI contributes to achieving sustainability goals, but requires the development of more optimal algorithms so that its benefits can be felt consistently.

Meanwhile, research by Kulal et al. (2024) in the public service sector revealed that AI is able to increase the efficiency of service delivery, reduce costs and time, and expand access for underserved communities. AI also contributes to increasing citizen satisfaction, although its impact on executive and political decision-making remains limited. Infrastructure support, increasing human resource capacity, as well as mitigating algorithmic bias and privacy risks are crucial factors in AI adoption in this sector.

Overall, the reviewed articles excel in their use of empirical data and strong qualitative methodology, thereby enhancing the validity of the findings. A cross-sector approach provides a comprehensive picture of the opportunities and challenges of AI implementation. However, limitations were also found, especially in the aspect of generalization of results, the relatively short data collection period, the lack of a multidisciplinary perspective, and the in-depth discussion of ethics and privacy. Therefore, further research is needed to understand the long-term impacts of AI as well as integrate a more comprehensive ethical approach in its implementation.

4. CONCLUSION

This Systematic Literature Review (SLR) research analyzes the implementation of artificial intelligence (AI) in various sectors, namely health, public services, agriculture and social media. The study results show that AI has significant potential in improving efficiency, accuracy and service quality. In the health sector, AI contributes to speeding up the diagnosis process and supporting medical decision making. In the public service sector, AI improves operational efficiency and quality of service to the public. Meanwhile, in the agricultural sector, AI plays a role in optimizing resource use and increasing production results, while in social media AI strengthens user interaction and personalizes content.

Despite its great potential, AI implementation still faces various technical, social and ethical challenges. These challenges include resistance from stakeholders, complexity of technological systems, as well as issues of data privacy and algorithm transparency. In the health sector, resistance from medical personnel arises due to concerns about the accuracy and accountability of AI. In the public service sector, limited technological infrastructure and the need for adaptive regulations are the main obstacles. To overcome these challenges, several adaptive approaches such as stealth science and digital ambidexterity have been proposed to increase flexibility in AI implementation, despite the potential to increase system complexity.

Overall, this research emphasizes the importance of adaptive and collaborative approaches in supporting successful AI adoption. The research findings provide important implications for policy makers, industry players and academics in designing more effective and sustainable AI implementation strategies. Based on the results of the study, it is recommended to develop policies that support innovation while ensuring privacy protection and algorithm transparency, increasing collaboration between government, academia and the private sector, as well as investing in training and increasing human resource capacity.

In addition, further research is needed to examine the long-term impact of AI with a multidisciplinary approach that includes ethical and social aspects. Increasing public awareness and education regarding the benefits and risks of AI is also an important factor in reducing resistance and encouraging acceptance of the technology. Responsible AI development, by paying attention to aspects of ethics, privacy and bias mitigation, is expected to be able to build trust and ensure sustainable implementation of AI in various sectors.

REFERENCES

- Admin. (2024, Agustus 14). *Panduan Menyusun Artikel Systematic Literature Review (SLR)*. Retrieved from BPJIID Universitas Medan Area : <https://bpjiid.uma.ac.id/2024/08/14/panduan-menyusun-artikel-systematic-literature-review-slr/>

- Faisal, T. A., Hasanah, R. U., & Fatmawati, R. (2024). Systematic Literatur Review (SLR) : Analisis Problematika Mahasiswa Pendidikan Matematika Pada Mata Kuliah Analisis Real. *Student Scientific Creativity Journal (SSCJ)*, 2(3), 42-51.
- Gillner, S. (2024). We're Implementing AI Now, So Why Not Ask Us What To Do? – How AI Providers Perceive and Navigate The Spread of Diagnostic AI in Complex Healthcare Systems . *Social Science & Medicine* , 1-9.
- Hoseinzadeh, S., & Garcia, D. A. (2024). AI-Driven Innovations in Greenhouse Agriculture: Reanalysis of Sustainability and Energy Efficiency Impacts. *Energy Conversion and Management: X*, 1-13.
- Hoseinzadeh, S., & Garcia, D. A. (2024). Can AI Predict The Impact of Its Implementation in Greenhouse Farming? . *Renewable and Sustainable Energy Reviews*, 1-21.
- Kulal, A., Rahiman, H. U., Suvarna, H., & Abhishek, N. (2024). Enhancing Public Service Delivery Efficiency: Exploring the Impact of AI . *Journal of Open Innovation: Technology, Market, and Complexity*, 1-16.
- Omeish, F., Khasawneh, M. A., & Khair, N. (2024). Investigating the impact of AI on Improving Customer Experience Through Social Media Marketing: An analysis of Jordanian Millennials. *Computers in Human Behavior Reports*, 1-11.
- Triandini, E., Jayanatha, S., Indrawan, A., Putra, G. W., & Iswara, B. (2019). Metode Systematic Literature Review untuk Identifikasi Platform dan Metode Pengembangan Sistem Informasi di Indonesia. *Indonesian Journal of Information Systems (IJIS)*, 1(2), 63-77.