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# The Role of Algorithmic Management in HR Practices and Ethical Challenges

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**Abstract**
**Purpose:** This study aims to systematically explore the development of algorithmic management in HR practices, focusing on emerging ethical challenges.
**Methodology/approach:** Using a Systematic Literature Review (SLR), this study analyzes findings from the past five years on the use of algorithms in managerial decision-making and their impact on workers' rights, justice, and welfare.
**Results/findings:** While algorithms bring efficiency, they present significant ethical, social, and legal challenges. Organizations must balance technological efficiency with principles of fairness, transparency, and privacy protection. A collaborative approach between humans and technology, coupled with strict regulation, is essential.
**Conclusions:** Algorithmic management in HR boosts efficiency but raises ethical concerns about fairness and transparency. Its success depends on creating accountable systems that balance technology with human values. Researchers advocate for human-technology collaboration, with algorithms as tools, not substitutes for human decision-making, and the integration of "responsible and explainable AI" to foster fairness and inclusivity.
**Limitations:** The study's focus on references from developed countries limits its applicability to developing countries like Indonesia. Additionally, most of the literature is conceptual and lacks long-term data.
**Contribution:** The study suggests exploring contextual and participatory case studies across sectors and regions, along with both quantitative and qualitative research on algorithms' impact on job satisfaction and employee rights. Further research on the role of national and international regulations is required.

**Keywords:** *Algorithmic Management, Ethics, Fairness, Human Resource Practices, Privacy, Transparency.*

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## 1. Introduction

The development of digital technology has affected almost all aspects of organizational life, including human resource management (HR). One of the most striking forms of digital innovation is algorithmic management, which involves the use of algorithms and data-driven automated systems to support and even replace the managerial role of humans in decision-making (Mateescu & Nguyen, 2019). In this context, decisions such as hiring, work scheduling, productivity monitoring, and performance evaluation can be fully regulated using artificial intelligence (AI) and *machine* learning-based systems.

This model is growing rapidly in digital platform-based organizations, especially in the service sector, such as transportation, logistics, hospitality, and customer service. In Indonesia, the dominance of the service sector in the economy has become increasingly visible. According to data from the Central Statistics Agency (2024), the contribution of the services sector to Gross Domestic Product (GDP) will reach 44.35% in 2023. More specifically, the transportation and warehousing subsector grew by 15.93%, indicating the increasing importance of technology and operational efficiency in this sector. Organizations such as Gojek, Grab, and Shopee, and logistics services such as JNE and SiCepat have adopted algorithm-based management to manage thousands of workers and partners. This practice allows for fast, data-driven, and more objective decision-making than human intervention.

However, the application of algorithms in managerial practice cannot be separated from criticism and ethical concerns. One of the cases that emerged was the protest of online drivers against the assessment and incentive distribution system, which was considered non-transparent and exploitative. Widianto et al. (2021) revealed that digital workers experience psychological distress and work burnout due to the strict supervision of algorithms that regulate the rhythm of work nonstop. It is not uncommon for algorithms to be thought of as treating workers like "machines," without considering human aspects, such as physical condition, mental health, and social justice (Kellogg et al., 2020).

Another challenge is the *asymmetrical information* between organizations and workers. Owing to the often closed nature of the algorithm (*black-box system*), workers do not have access to know how performance evaluations are conducted or how the system determines work scheduling and incentives. This creates power inequality, which reinforces structural injustice (Ayu, 2024; Suryawan et al., 2025). However, organizations also face ethical and legal dilemmas regarding the use of employees' personal data analyzed by algorithms, as well as potential algorithmic bias that can create discrimination in the recruitment or promotion process (Veen et al., 2020).

However, scientific studies on algorithmic management in Indonesia are still very limited, especially those that systematically discuss its implications for HR practices. Most available studies are case studies or focus on developed countries with different regulatory contexts and digital infrastructure (Kellogg et al., 2020; Veen et al., 2020). With the increasing adoption of this technology in service organizations in Indonesia, the need to understand the role and ethical impact of algorithmic management has become more urgent. A systematic literature review is needed to collect, sort, and evaluate relevant scientific findings from the last five years on algorithmic management, particularly in the context of HR practices and the ethical challenges they pose.

This research is not only academically important but also practically relevant for policymakers, organizational leaders, and HR professionals in formulating socially and ethically responsible strategies and policies. To date, there have been no research results that discuss this matter in the Indonesian context, which presents a proposal of innovation that can later be continued by the next researcher in developing into other research results with different models or objects in the Indonesian or global context. The originality of this article is the result of the first article to present results with variables used with Systematic Literature Review (SLR) as results with the research methods used to support it.

This study systematically examines the development of algorithmic management in human resource management practices, with a primary focus on the ethical challenges arising from its application. Through a *systematic literature review* approach, this study seeks to summarize and analyze various scientific findings in the last five years to understand how algorithms are used in managerial decision-making and how these uses impact workers' rights, justice, and welfare. In the context of service organizations in Indonesia that increasingly rely on data-based systems and automation, this research is expected to provide critical insights into the ethical implications of algorithm-based management and encourage the development of more responsible and humane HR policies and practices.

## 2. Literature Review and Thematic Maping

### *2.1 Algorithmic Management* (AM)

*Algorithmic management* (AM) is a new form of managerial decision-making based on data, programming logic, and artificial intelligence (AI). This technology replaces human supervision and decision-making with automated systems that assess performance, distribute tasks, and even assign sanctions (Kellogg et al., 2020) This transformation creates process efficiency, but it also changes the power relationship and work autonomy in modern service organizations. According to Duggan et al. (2020), in this sector, algorithms not only regulate the distribution of work but also determine incentives and penalties in real time. This creates a new form of control over workers that is stricter but not always transparent.

Furthermore, Wood et al. (2019) suggest that AM has created a shift in organizational structure from a hierarchical to a data-driven management system. In this context, workers become part of the evaluative system automation based on digital performance indicators, such as customer ratings or the number of task completions, and are encouraged to continue to adapt to the system without much room for negotiation or reflection. In addition to daily work practices, algorithmic management has entered a strategic stage in long-term HR decision-making. For example, algorithms are currently being used to project future workforce needs, identify potential employee resignations, and design career paths based on historical data and organizational trends. A recent study by Peccei and Van De Voorde (2019) confirmed that the use of analytical data and algorithms in strategic workforce planning increases the efficiency of aligning business needs and workforce capabilities. However, this reliance on data and predictive systems also obscures the moral responsibility of HR managers to workers as human beings and not just data objects.

However, resistance to the use of AM has also emerged from workers and trade unions, particularly in the public service and education sectors. Many workers feel that decisions that were previously negotiable are now unilaterally decided by a system that cannot be consulted by humans. This phenomenon was observed by Hanseth and Modol (2021), who stated that AM has narrowed the deliberative space in industrial relations. In the context of service organizations in Indonesia, where collective values and family approaches are still strong, an algorithmic approach that is too mechanistic can cause value conflicts and lower the organizational commitment. Therefore, it is important to design algorithmic systems that are adaptive to local values and do not ignore universal principles of work ethics.

### *2.2 The Effectof Algorithmic Management on Human Resource (HR) Practices*

The influence of algorithmic management on human resource (HR) practices can be seen in various main functions of HR, ranging from recruitment, work scheduling, performance appraisals, and compensation. This technology allows organizations to manage their workforce more efficiently through the use of algorithms that can analyze big data to support prediction-based decision-making. According to Jooss et al. (2021), the use of algorithms in the employee selection process can increase objectivity and reduce human bias, especially in organizations with large volumes of applicants. However, this approach also presents new challenges, such as a lack of transparency in evaluation criteria and the risk of marginalizing human values in the selection process of the best proposal.

Although AM offers efficiency and objectivity, its use raises serious ethical issues. One of the main challenges is the lack of algorithm transparency. Binns et al. (2018) refer to this phenomenon as algorithmic opacity, where workers and even managers do not fully understand how the system works and the basis of its logic. This creates uncertainty and a sense of injustice in the job evaluation process itself. In addition, the use of algorithms in work supervision affects employees' psychological well-being. Yoon et al., (2022) found that workers in algorithmic systems experience higher pressure than those who work under human managers. Uncertainty about evaluation criteria, which are often not openly explained, leads to stress and decreased work motivation. This shows that while AM offers efficiency, it does not necessarily guarantee improvement in the quality of industrial relations.

Furthermore, in employee performance management, algorithmic management has replaced supervisors' roles in providing feedback and evaluation. Algorithm-based scoring systems can provide productivity scores in real time, which significantly influences decisions regarding promotions, wage cuts, or even terminations. This is reflected in a study by Vignola et al. (2023), which shows that workers in the digital services sector, such as e-commerce and food delivery services, experience psychological distress due to strict algorithmic supervision and a lack of dialogue space. This shows that although algorithmic management can improve HR efficiency, without an ethical approach and adequate human supervision, it can worsen the welfare of work and industrial relations in service organizations in Indonesia.

### *2.3 Ethical Challenges: Transparency, Privacy, and Fairness*

Although AM offers efficiency and objectivity, its use raises serious ethical issues. One of the main challenges is the lack of algorithm transparency. Privacy issues are also in the spotlight. Ajunwa (2019) shows that the use of tracking technologies, such as GPS and digital logs, increases surveillance that violates workers' privacy boundaries. In some cases, the data are used not only for work purposes but also to form behavioral profiles that are vulnerable to abuse. In the context of fairness, when algorithms are trained on biased historical data, the results of algorithmic decisions risk inheriting and exacerbating structural inequality. For example, if job applicant data show that candidates from a particular group have been rejected more often in the past, the algorithm will tend to replicate this pattern (Raghavan et al., 2020). This situation raises the need for ethical and human-in-the-loop audits of algorithmic decision-making.

In the practice of algorithmic management, the issue of transparency is the main highlight because many algorithm-based decision-making systems operate in a black box, that is, without providing clear information to employees about how decisions are made. MÃhlmann and Zalmanson (2018) show that in the context of platform-based work, such as Uber, workers often do not understand the basis for calculating incentives or the reasons for the termination of partnerships by the system. This lack of transparency creates uncertainty, reduces workers' autonomy, and triggers tension in employment relationships. When important decisions regarding performance or the future of work are not publicly accessible, it undermines trust in the system and creates procedural inequities in human resource management. In addition, serious challenges arise in terms of privacy and justice.

Deobald et al., (2019) revealed that algorithms used in HR management often overexploit personal data without explicit consent, thus violating the limits of individual privacy. Moreover, the use of historical data that contains such information can reinforce structural discrimination and exacerbate inequality in organizations. Gal et al., (2020) assert that if algorithms are not ethically designed and not strictly supervised, then the resulting decisions can be discriminatory against certain groups and injure the principle of substantive justice. Therefore, the integration of ethics in the design and implementation of algorithmic management is crucial to ensure that this technology is not only technically efficient but also socially just and humane.

### *2.4 Relevance of the Indonesian Context: Phenomenon and Research Urgency*

In Indonesia, the adoption of AM is increasing, especially in the public service sector and platform-based services such as online motorcycle taxis, delivery services, and customer management. In the Indonesian context, the urgency of research on algorithmic management in HR practices is increasing in line with the rapidly growing digital transformation in the service sector and platform-based industries. This phenomenon is evident in the increasing number of digital and gig economy workers, such as online motorcycle taxi drivers, couriers, and freelancers, who rely on algorithmic systems to get jobs and performance appraisals. Rani and Furrer (2021) show that gig economy workers in Indonesia feel a loss of control over time and volume of work due to algorithmic systems. In addition, the absence of formal channels for submitting complaints makes workers feel alienated.

According to a report from the (BPS, 2022) more than 8.5 million workers in Indonesia are involved in the informal sector based on digital applications, most of which are managed through algorithmic systems. However, the high reliance on these systems is often not offset by adequate protection of

workers' rights, such as assessment transparency, security of personal data, and mechanisms to object to automated decisions. This raises ethical and social concerns that require further investigation (Muhyiddin et al., 2024). In contrast, companies in the formal sector have begun to adopt algorithmic systems in the selection process, productivity monitoring, and employee performance evaluation. Sharifah et al. (2024) show that several large companies in Indonesia are starting to implement algorithm-based workforce management software capable of recording employees' digital activities in real time. Although considered efficient, this implementation creates psychological pressure and lowers the perception of organizational equity. Furthermore, Pea-Assounga and Bindel Sibassaha (2024) found that low digital literacy and weak regulation lead to a power imbalance between management and workers in the use of this technology.

## 3. Research Methodology

This study uses *a Systematic Literature Review (SLR)* approach, which aims to identify, evaluate, and synthesize the results of previous studies on the role of algorithmic management in human resource (HR) practices and the ethical challenges that come with it. This approach was chosen because it can provide a comprehensive understanding of scientific developments, research gaps, and thematic trends in the relevant literature over the past five years. An SLR also allows researchers to explore how algorithmic practices have changed the paradigm of HR management and how ethical issues such as privacy, transparency, and fairness are approached in various organizational contexts.

The number of articles used in this study was fifty–sixty articles, which were used for the SLR of approximately 20 featured articles that were selected by the researcher as findings and discussed to make the findings in this scientific article. The first step in the SLR process is the identification and selection of literature. The researchers used several reputable journal databases *such as Scopus, Web of Science, and ScienceDirect, as well as an addition to Google Scholar, to capture relevant articles. The keywords used in the searches included "algorithmic management," "human resource practices," "ethics," "transparency," "fairness," and "privacy."*

The inclusion criteria were scientific journal articles published in the last five years (2018–2024), written in English, and focusing on the context of organization, HR, or work management technology. Articles that were only opinions, blogs, or did not undergo a peer-review process were excluded from the analysis. From this process, as many as 20 articles were obtained that met the initial selection criteria. Furthermore, thematic filtering and coding were performed on the selected articles. Each article was analyzed based on the main theme, research method, main findings, and contribution to the understanding of algorithmic management and its ethical issues.

The content analysis technique was carried out qualitatively, where the main findings were grouped into several major themes, such as (1) the influence of algorithms on HR practices such as recruitment, monitoring, and performance evaluation; (2) perception and impact on employees; and (3) ethical challenges that include data privacy, algorithmic bias, and decision transparency. To increase validity, the article selection and categorization process was conducted repeatedly and reviewed by two research colleagues as part of data triangulation. The results of this systematic review are expected to provide a strong theoretical basis for further research and offer practical contributions to building more ethical and justice-oriented algorithmic management governance in modern work environments. A prism chart is shown below.

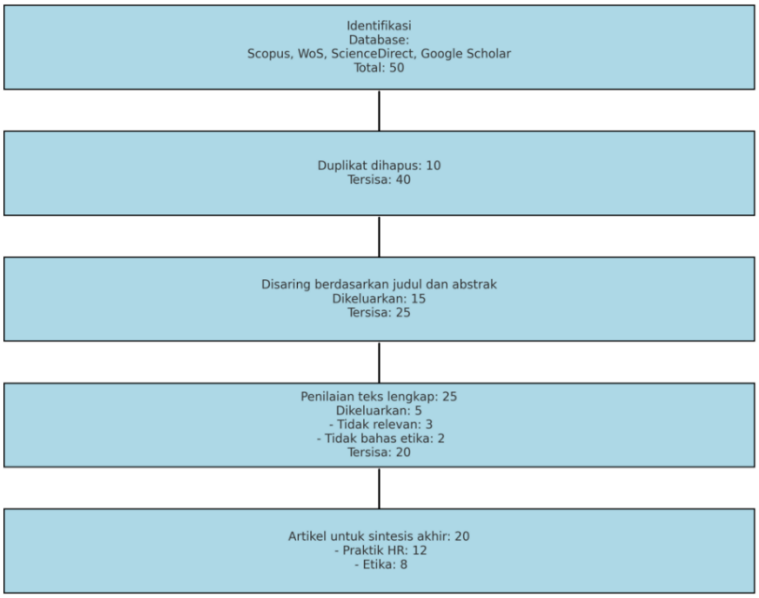


Figure. 1. Prism Bagan

## 4. Result and Discussions

The results of a systematic review of 20 scientific articles show that algorithmic management has changed the way service organizations manage human resources, especially in the context of recruitment, performance evaluation, work scheduling, and managerial decision-making. Most of the articles analyzed reveal that the use of algorithms in HR practices provides advantages in terms of efficiency, decision-making speed, and the ability to process big data in real time (Kellogg et al., 2020; Mateescu and Nguyen, 2019). For example, in the context of digital recruitment, algorithmic systems allow companies to screen thousands of applicants in just a matter of minutes based on specific parameters, such as keywords on CVs or online assessment results.

Nevertheless, the study also noted that the use of algorithms is not necessarily free of bias. Several studies have revealed that assessment processes that rely too much on historical data can reinforce systemic discrimination that was previously undetected in manual practice (Meijerink et al., 2021; Raisch & Krakowski, 2021). Furthermore, ethical challenges are a major concern in the literature. The three main issues that recur in the eight articles that emphasize ethical aspects are algorithm transparency, employee data privacy, and fairness in automated decision-making (Gal et al., 2020; Jarrahi et al., 2021).

Transparency issues arise because most algorithms are black-boxed, so neither managers nor employees have access to or understand how decisions are made. Privacy issues are increasingly complex when personal data are used without explicit consent for performance evaluation purposes or predictions of work behavior. In addition, the concept of fairness is questioned because the decisions made by algorithms often do not consider the social and psychological context of individuals but are based solely on numerical scores. Some articles even highlight the need for regulation and ethical governance so that the use of algorithms in HR does not sacrifice the human values that are the basis of healthy working relationships (Kellogg et al., 2020; Möhlmann et al., 2021).

In terms of human resource practices, companies that integrate algorithms in the process of recruiting, promoting, and evaluating employees tend to ignore the principles of fairness and procedural fairness. This is reinforced by the research of Deobald et al. (2019), who showed that reliance on automated systems can reinforce unconscious bias (algorithmic bias) if there is no adequate human intervention in the decision-making process. Ethical aspects are also a major concern. The results show that employees have a negative perception of algorithms that do not explain the basis for decisions or cannot be

explained transparently (black box decision-making). This is in line with the findings of Wang et al. (2020), who emphasized that a lack of transparency in algorithmic systems contributes to a decrease in employee trust and potential ethical conflicts within organizations. In addition, the dimensions *of transparency* and *fairness* are closely related to each other. When organizations fail to explain how algorithms work, especially in the context of job evaluations or rewards, it lowers workers' perception of fairness. Babic et al., (2021) emphasize the importance of designing algorithms that can be accounted for and understood by all parties in the organization, especially to create a fair and inclusive work environment.

Privacy issues are the most dominant issue when algorithmic management is applied in real-time employee productivity tracking, such as the use of sensors, cameras, and monitoring digital devices. Chan and Wang (2018) showed that excessive monitoring without explicit consent can violate employee privacy rights and reduce employee engagement, especially if it is not accompanied by a strong data protection policy. Human resource management (HR) practices that integrate digital technology, including algorithmic management, significantly impact organizational effectiveness and efficiency (Fenech et al., 2019). This technology adaptation must be accompanied by policies that prioritize worker welfare to increase employee engagement and retention (Kadolkar et al. 2024).

Ethical issues are crucial in the application of algorithmic management, especially related to how algorithmic decisions affect work balance, discrimination, and the fair treatment of employees (Ananny & Crawford, 2018; Zuboff, 2023). Organizations must build a transparent and sustainable ethical framework to ensure that the use of algorithms does not cause injustice (Floridi et al., 2018). Transparency in algorithmic management is essential for building employees' trust. Transparency regarding how data are collected, processed, and used can reduce employee anxiety about digital surveillance and mitigate the risk of data misuse (Binns, 2018; Ryan, 2020).

Fairness is a major issue when algorithms are used to make decisions related to human resource management (HRM). Injustice arises when an algorithm has an undetectable bias that affects the treatment of certain groups (Li et al. 2021). Therefore, periodic audits and evaluations of algorithms must be conducted to ensure fairness in managerial processes (Draude et al. 2020). Employee privacy is an important aspect that must be considered in the application of algorithmic management in the workplace. The massive collection of personal data must be balanced with data protection and compliance with data protection regulations (GDPR and the like) to safeguard individuals' privacy rights (Adolphs & als Anerkennungsgeschehen, 2023).

In the last five years, the development of information technology and artificial intelligence has significantly changed human resource management through the application of algorithmic management. Algorithmic management is defined as the use of algorithms to automate and optimize various management functions, from work scheduling and performance appraisals to decision-making related to remuneration and promotion (Möhlmann et al., 2021; Mateescu & Nguyen, 2019). The use of algorithms in HR management promises increased operational efficiency and accuracy in employee management, which, in theory, can improve organizational productivity (Lee et al., 2022).

However, various studies state that the implementation of algorithmic management cannot be separated from ethical issues and accompanying social implications. Ajunwa et al. (2020) and Zuboff (2019) assert that algorithms can replicate existing social biases, potentially reinforcing discrimination, for example based on gender, age, or race, in the process of employee evaluation and decision-making. This raises important questions regarding fairness in algorithm-controlled employee management (Dignum, 2020; Binns, 2020). The next issue that is highlighted is the transparency or openness of algorithms in management practices. Möhlmann et al. (2021) and Kitchin (2021) confirm that employees are often unaware of how their data are used, how algorithms work, and what criteria influence decisions that directly impact them. This lack of transparency creates uncertainty and mistrust, which can ultimately lead to resistance and lower motivation to work (Veen et al., 2020; Raghavan et al., 2020).

In addition, privacy is the main highlight of algorithmic management. With the increasing collection of personal data and real-time employee behavior data, concerns have arisen regarding potential privacy

breaches and unethical data use. Shilton and Greene (2021) and Wang et al. (2023) remind us of the need for strict data protection regulations and policies to avoid the exploitation and misuse of workers' personal information. This data protection policy is important not only to safeguard employee rights but also to maintain the organization's reputation and comply with increasingly stringent regulations (GDPR, CCPA) (Suo et al., 2022).

On the practice side of human resources, research shows that the success of the implementation of algorithmic management is highly dependent on integration with organizational ethical values and human involvement in decision-making processes. Rosenblat and Stark (2016) and recent updates by Bogen and Rieke (2021) emphasize that algorithms should be seen as an aid, not a complete substitute for humans, to keep decisions balanced and contextual. This hybrid approach can help ensure that the values of fairness and ethics are maintained in management practices while increasing transparency through open communication with employees (Jarrahi, 2021; Lee & Suh, 2024). Furthermore, several studies suggest the application of responsible AI principles in algorithmic management, which include periodic audits of algorithmic bias, the involvement of various stakeholders in system design, and appeal and feedback mechanisms for employees who feel aggrieved by algorithmic decisions (Holstein et al., 2019; Selbst et al., 2019).

This practice is considered an important effort to bridge the gap between technological advancement and the need for fair and ethical management of AI. The application of algorithmic management in human resource practices provides many potential benefits, but it also poses significant ethical, social, and legal challenges. Organizations must balance the benefits of technological efficiency with a commitment to fairness, transparency, and privacy for the use of algorithms to be widely accepted and sustainable. The main recommendation is to adopt a collaborative approach that integrates humans and technology with strong ethical principles and to establish regulations that effectively govern data protection and algorithmic surveillance.

## 5. Conclusions and Suggestions

### *5.1 Conclusions*

The application of algorithmic management in human resource (HR) practices opens up space for further research on integrating technology with human values. From a theoretical perspective, this study emphasizes the importance of building a system that is not only efficient but also morally accountable to its users. Further research is required to explore how algorithms can be used as tools to support decision-making without completely replacing human roles. In addition, the principle of "responsible and explainable AI" must be applied at every stage of the design and implementation of algorithm-based systems in HR management. This can serve as the basis for developing theories that integrate technology with ethics and fairness in organizations.

For HR practitioners and policymakers in Indonesia, the application of algorithmic management can improve decision-making efficiency and speed. However, ethical challenges related to fairness, transparency, and privacy protection must be considered. To maximize the benefits of this technology, organizations must ensure that the algorithm-based management system built has clear accountability principles and considers human values. A collaborative approach between technology and humans needs to be encouraged, where algorithms act as a decision support tool, not as a complete substitute. Governments and policymakers must also formulate strict regulations to regulate the application of algorithms in human resources to create an inclusive, transparent, and fair work culture.

### *5.2 Suggestions*

Suggestion from the results of this study The study suggests exploring contextual and participatory case studies across sectors and regions, along with both quantitative and qualitative research on algorithms' impact on job satisfaction and employee rights. Further research on the role of national and international regulations is required.

## Limitations and Advanced Studies

This study has limitations because most of the references come from the context of developed countries with a more mature technological and regulatory background. Therefore, the results and perspectives

presented may not fully reflect the reality of organizations in developing countries, including Indonesia, which have different structural challenges and work cultures. In addition, most of the literature is still conceptual and normative, and is not accompanied by many longitudinal studies or long-term empirical data.

For follow-up studies, the researcher recommends a contextual and participatory case study approach across different industry sectors and geographical regions. It is also necessary to conduct quantitative and qualitative research on the real impact of algorithm use on job satisfaction, motivation, and employee rights. In addition, the role of national and international regulations on algorithmic supervision in HR needs to be explored so that the use of this technology remains in line with the principles of justice and protection of workers' rights.

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