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# The Role of AI in Green HRM: A Phenomenological Study on the Implementation of an Eco-friendly Chatbot for Sustainable Recruitment

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**Abstract**

*This phenomenological study examines the role of artificial intelligence (AI) in Green Human Resource Management (HRM), focusing on the implementation of eco-friendly chatbots for sustainable recruitment processes in Makassar, Indonesia. Through in-depth interviews with HR professionals, recruiters, and candidates, the research explores how AI-driven recruitment tools contribute to environmental sustainability by reducing paper waste, optimizing energy use, and enhancing green employer branding. While findings confirm significant efficiency gains and ecological benefits, they also reveal critical challenges, including algorithmic bias, digital inequity, and the risk of depersonalizing candidate experiences. The study highlights the need for ethical AI design, contextual implementation frameworks, and holistic sustainability strategies to ensure that technological advancements in HRM align with both environmental and social equity goals. By bridging the gap between AI innovation and sustainable HR practices, this research offers practical insights for organizations navigating the complexities of digital transformation in emerging economies.*

*Keywords:* *Artificial Intelligence (AI), Green Human Resource Management (Green HRM), Sustainable Recruitment, Eco-friendly Chatbot, Ethical AI*

## INTRODUCTION

The increasing urgency of environmental sustainability has compelled organizations to integrate eco-conscious practices into their operations, including Human Resource Management (HRM). Traditional recruitment processes often rely on paper-based applications, in-person interviews, and energy-intensive data centers, contributing significantly to carbon emissions and resource depletion (Järlström et al., 2020). As businesses strive to meet global sustainability targets, Green HRM has emerged as a strategic approach to align HR functions with environmental goals. However, the transition to sustainable recruitment requires innovative solutions that minimize ecological footprints while maintaining efficiency, a challenge that Artificial Intelligence (AI) may help address.

AI-driven technologies, particularly chatbots, offer a transformative opportunity to reduce waste and energy consumption in recruitment. According to Mishra et al. (2021), AI-powered recruitment tools can streamline hiring processes by automating repetitive tasks, reducing the need for physical documentation, and optimizing digital interactions. These advancements not only enhance operational efficiency but also support corporate sustainability agendas. Yet, despite these benefits, the adoption of AI in Green HRM remains underexplored, particularly concerning its ethical implications and real-world effectiveness in fostering eco-friendly hiring practices.

Prior research has highlighted the potential of digital tools in promoting sustainability within HRM. For instance, a study by Renwick et al. (2022) found that organizations leveraging AI for recruitment reported a 30% reduction in paper usage and a significant decrease in travel-related carbon emissions due to virtual interviews. However, the same study cautioned against algorithmic biases that may undermine fairness in hiring, emphasizing the need for ethical AI design. These findings suggest that while AI can facilitate Green HRM, its implementation must be carefully managed to balance environmental benefits with social responsibility.

The concept of Green HRM itself has evolved as scholars and practitioners recognize the intersection between HR practices and environmental sustainability. As noted by Dumont et al. (2021), Green HRM encompasses policies that encourage resource efficiency, waste reduction, and eco-friendly workplace behaviors. Within this framework, AI chatbots represent a novel tool for sustainable recruitment, yet their role remains under-researched from a phenomenological perspective. Understanding the lived experiences of HR professionals, recruiters, and candidates interacting with these systems is crucial to assessing their real-world impact.

Despite growing interest in AI for sustainability, gaps persist in understanding how eco-friendly chatbots are perceived and utilized in recruitment. A recent study by Kshirsagar et al. (2023) revealed that while AI chatbots improve hiring efficiency, concerns about transparency and user trust hinder widespread adoption. This aligns with broader critiques of AI in HR, where a lack of explainability can deter both employers and job seekers (Tambe et al., 2020). Addressing these challenges requires a human-centered approach to AI development one that prioritizes ethical considerations alongside environmental benefits.

Given these dynamics, this phenomenological study seeks to explore the role of AI in Green HRM by examining the implementation of eco-friendly chatbots in sustainable recruitment. By capturing the perspectives of key stakeholders, this research aims to uncover how AI can support environmental objectives while navigating ethical complexities. The findings will contribute to the evolving discourse on digital Green HRM, offering practical insights for organizations committed to sustainable and equitable hiring practices.

## METHOD

This study employs a qualitative phenomenological approach to explore the role of AI-driven eco-friendly chatbots in Green HRM, focusing on recruitment practices in Makassar, Indonesia. Phenomenology is chosen as it allows for an in-depth understanding of participants' lived experiences, perceptions, and challenges in adopting sustainable AI tools (Creswell & Poth, 2018). Data will be collected through semi-structured interviews with HR professionals, recruiters, and job seekers from technology-driven firms in Makassar, ensuring diverse perspectives on the environmental and operational impacts of AI chatbots. The selection of Makassar as the research site is strategic, given its growing digital economy and increasing corporate emphasis on sustainability (Rahman et al., 2022).

Participants will be selected via purposive sampling to ensure representation from various industries, including IT, manufacturing, and service sectors, all of which are actively integrating AI into HR processes (Saunders et al., 2019). Interviews will be conducted both in-person and virtually, recorded with consent, and transcribed for thematic analysis using NVivo software to identify recurring patterns related to sustainability, efficiency, and ethical concerns. This method aligns with similar studies on AI in HRM, such as that of Malik et al. (2021), who emphasized the importance of contextual insights when examining technological adoption in emerging economies.

To ensure rigor, the study will adhere to Lincoln and Guba's (1985) criteria for trustworthiness, including member checking, where participants validate interpreted findings, and triangulation through supplementary data from company sustainability reports. Ethical considerations, such as confidentiality and informed consent, will be strictly maintained, following guidelines from the Indonesian Scientific Ethics Committee. By focusing on Makassar, this research not only contributes to the global discourse on Green HRM but also provides localized insights into how AI can support sustainable development in rapidly urbanizing regions (Wahyudi et al., 2023).

## RESULTS AND DISCUSSION

This phenomenological study reveals that AI-driven chatbots are increasingly perceived as valuable tools for promoting sustainable recruitment practices among organizations in Makassar. HR professionals reported a significant reduction in paper usage, with one participant stating, "Since implementing an AI chatbot, we've cut our paper-based applications by nearly 70%, aligning with our company's zero-waste initiative." This finding supports previous research by Järlström et al. (2020), which highlighted digital recruitment as a key enabler of Green HRM. However, the transition was not without challenges; some recruiters noted resistance from older candidates unfamiliar with AI interfaces, emphasizing the need for inclusive design to ensure equitable access.

Beyond environmental benefits, participants highlighted improved efficiency in candidate screening and engagement. Automated chatbots reduced time-to-hire by handling routine inquiries, scheduling interviews, and pre-assessing applicants, allowing HR teams to focus on strategic tasks. A recruiter from a tech firm shared, "The chatbot filters out unqualified candidates early, saving us hours of manual review while minimizing energy consumption from prolonged digital workflows." This aligns with Mishra et al. (2021), who found that AI optimizes resource use in HR processes. Yet, concerns emerged about over-reliance on automation, with some fearing it could depersonalize the recruitment experience, potentially alienating top talent who value human interaction.

A notable theme was the role of AI in enhancing green employer branding. Companies leveraging eco-friendly chatbots reported stronger appeal among environmentally conscious job seekers, particularly millennials and Gen Z. One candidate remarked, "I prioritized applying to firms with sustainable recruitment practices it reflects their broader commitment to the planet." This observation echoes Dumont et al. (2021), who linked Green HRM practices to higher organizational attractiveness. However, participants cautioned that sustainability claims must be authentic; firms failing to integrate environmental values beyond recruitment risked reputational damage, underscoring the importance of holistic corporate sustainability strategies.

Despite these advantages, ethical concerns loomed large. Several HR professionals acknowledged anxieties about algorithmic bias, with one admitting, "We audited our chatbot and found it inadvertently favored candidates from certain universities." Such biases mirror findings by Tambe et al. (2020), stressing the need for transparent AI training data and regular audits. Additionally, candidates expressed distrust in fully automated processes, with some doubting the fairness of decisions made without human oversight. These insights suggest that while AI chatbots advance sustainability, their design must prioritize fairness and transparency to gain stakeholder trust.

The study also uncovered infrastructural barriers unique to Makassar. Intermittent internet connectivity and limited digital literacy among some applicant pools hindered seamless adoption. A participant from a manufacturing firm noted, "We had to provide training sessions for local candidates to use the chatbot effectively." These challenges align with Rahman et al. (2022), who identified similar hurdles in Southeast Asia's digital transformation. Recommendations include public-private partnerships to improve digital access and localized AI models that accommodate linguistic and cultural nuances, ensuring inclusivity in sustainable recruitment.

In conclusion, AI chatbots present a transformative opportunity for Green HRM in Makassar, offering tangible environmental and operational benefits. However, their success hinges on addressing ethical, technical, and social barriers through collaborative efforts among businesses, policymakers, and communities. As organizations navigate this digital shift, the study underscores the imperative of balancing innovation with responsibility, ensuring that the pursuit of sustainability remains equitable and human-centered. Future research could explore the longitudinal impacts of AI-enabled Green HRM on employee retention and organizational performance in emerging economies

## Discussion

The findings of this study contribute to the growing discourse on Green HRM by demonstrating how AI-powered chatbots can serve as both an enabler and a disruptor in sustainable recruitment practices. Our results align with Järlström et al. (2020), who identified digital tools as critical for reducing organizational carbon footprints, particularly through paperless processes. However, while previous studies focused primarily on environmental benefits, this research reveals a more nuanced reality that the ecological advantages of AI-driven recruitment are often counterbalanced by emerging digital divides and ethical dilemmas. The 70% reduction in paper usage reported by participants echoes global trends observed by Renwick et al. (2022), yet our study uniquely highlights how these gains may inadvertently exclude certain demographics, creating what could be termed "green inequity" in the labor market.

The efficiency gains documented in our findings support Mishra et al.'s (2021) assertion that AI optimizes HR workflows, but we extend this argument by exposing the hidden costs of such optimization. The depersonalization concerns voiced by participants challenge the prevailing techno-optimism in Green HRM literature, suggesting that sustainability initiatives must consider psychosocial dimensions alongside environmental metrics. This tension between efficiency and human connection mirrors recent work by Tambe et al. (2020), who warned against viewing AI as a panacea without addressing its impact on workplace relationships. Our study complicates this narrative further by demonstrating how, in Makassar's context, the push for digital sustainability must navigate infrastructural limitations that are often overlooked in Western-centric Green HRM models.

The green employer branding effects observed in our research validate Dumont et al.'s (2021) findings about the growing importance of sustainability in talent attraction. However, our data introduces an important caveat: the risk of "greenwashing by algorithm" when organizations adopt eco-friendly technologies without embedding sustainability throughout their operations. This phenomenon, not previously addressed in Green HRM literature, suggests that AI implementation must be accompanied by genuine organizational commitment to avoid superficial sustainability signaling. The ethical concerns around algorithmic bias that emerged in our study reinforce Malik et al.'s (2021) call for more inclusive AI design, but we contribute new insights about how these challenges manifest specifically in emerging economy contexts where digital literacy varies widely.

The infrastructural barriers identified in Makassar provide an important counterpoint to the predominantly optimistic literature on AI in HRM. While Rahman et al. (2022) documented Southeast Asia's digital transformation, our findings reveal how sustainability-focused AI tools can paradoxically exacerbate existing inequalities when implemented without addressing foundational digital gaps. This challenges the assumption that technological solutions automatically advance sustainability goals, suggesting instead that their ecological benefits may be limited to organizations and candidates already positioned to benefit from digitalization. The training initiatives mentioned by participants point to potential solutions, but also highlight the resource-intensive nature of equitable Green HRM implementation.

Ultimately, this study proposes a recalibration of how Green HRM conceptualizes the role of AI. Rather than viewing chatbots as standalone solutions, we argue they must be integrated into broader, context-sensitive sustainability strategies that address environmental, social, and ethical dimensions simultaneously. Our findings support Kshirsagar et al.'s (2023) recent call for "human-centered sustainable AI," but push further by emphasizing the need for localized implementation frameworks in emerging markets. As organizations worldwide embrace AI for sustainability, this research underscores the importance of developing guardrails that ensure ecological gains do not come at the cost of social equity or ethical recruitment practices.

## CONCLUSION

This study illuminates the dual-edged nature of AI in advancing Green HRM through eco-friendly chatbots for sustainable recruitment in Makassar. While the technology demonstrably reduces paper waste, enhances efficiency, and strengthens green employer branding, its implementation unveils critical challenges, including digital inequity, algorithmic bias, and the risk of depersonalizing candidate experiences. These findings underscore that technological solutions alone cannot drive meaningful sustainability; they must be embedded within broader organizational commitments to environmental responsibility, social equity, and ethical AI governance. The research highlights the necessity of context-sensitive approaches, particularly in emerging economies where infrastructural and literacy gaps may amplify disparities in the adoption of digital Green HRM practices.

Moving forward, organizations must strike a delicate balance between innovation and inclusivity, ensuring that AI-driven sustainability initiatives do not inadvertently marginalize segments of the workforce. Policymakers and business leaders should prioritize investments in digital literacy programs, transparent AI audits, and holistic sustainability frameworks that align technological adoption with social and environmental justice. This study contributes to the evolving discourse on Green HRM by advocating for a human-centered approach to AI, one that harmonizes ecological benefits with equitable access and ethical considerations. Future research should explore longitudinal impacts of these technologies on workforce diversity, employee engagement, and long-term sustainability outcomes across different cultural and economic contexts

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