A Systematic Literature Review on Transforming HR Practices for ESG Integration: The Role of Artificial Intelligence in Shaping Sustainable Business Strategies

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DOI: https://dx.doi.org/10.47772/IJRISS.2025.907000411

Received: 14 July 2025; Accepted: 20 July 2025; Published: 20 August 2025

ABSTRACT

Artificial Intelligence (AI) is transforming Human Resource Management (HRM) by facilitating the integration of Environmental, Social, and Governance (ESG) principles into organizational strategies. This systematic literature review explores how AI-driven HR practices contribute to enhancing ESG performance and fostering sustainable business environments. Specifically, AI supports green HRM initiatives by streamlining processes, improving decision-making, identifying environmentally conscious talent, and minimizing resource inefficiencies. Moreover, AI enables the development of sustainability-oriented workplace cultures through technologies such as energy management systems and smart building solutions. By synthesizing recent scholarly advancements, this review highlights the strategic role of AI in embedding ESG values within HR functions. The findings underscore AI's potential to shape resilient, future-ready organizations and provide a foundation for further research on AI-enabled ESG integration in HRM.

Keywords: Artificial Intelligence (AI), Human Resource Management (HRM), Environmental, Social, and Governance (ESG), Sustainable Business Strategies, Green HRM ESG Integration.

INTRODUCTION

Artificial Intelligence (AI) is reshaping industries around the world, bringing new levels of innovation, efficiency, and data-driven decision-making to nearly every sector, including human resources (Basnet, 2024; Dwivedi et al., 2023). In Human Resource Management (HRM), AI is increasingly used to support core functions such as recruitment, employee engagement, and performance management (Jarrahi et al., 2022). By automating repetitive tasks and offering predictive insights, AI allows HR professionals to focus more on strategic planning and workforce development that align with broader organizational goals (Tambe, Cappelli, & Yakubovich, 2019; Zhang et al., 2023). With the rise of the Fourth Industrial Revolution (4IR), this technological shift has accelerated, driving not only greater productivity but also more personalized and responsive employee experiences. At the same time, Environmental, Social, and Governance (ESG) considerations have become essential markers of organizational sustainability and ethical leadership. ESG frameworks move beyond traditional financial performance to assess a company's environmental practices, social responsibilities, and governance structures (Khan, Serafeim, & Yoon, 2016; Widyastuti et al., 2022). Growing demands from regulators, investors, and stakeholders have encouraged companies to adopt ESG values at the core of their strategies, aiming to build long-term resilience and maintain trust with the communities they serve (OECD, 2022).

Within this broader context, Human Resource Management (HRM) plays a crucial role in supporting ESG adoption by shaping workplace policies, promoting inclusive and equitable cultures, upholding ethical standards,

and advancing environmental goals (Renwick et al., 2023). While the importance of ESG has been widely acknowledged, there is still a limited and fragmented understanding of how AI can specifically support HRM in achieving these objectives. Key questions remain around the effectiveness of AI-driven HR practices in delivering measurable sustainability outcomes, and how exactly they contribute to improvements across the environmental, social, and governance dimensions. This study seeks to address that gap by conducting a systematic literature review (SLR) that explores the role of AI in transforming HR practices for effective ESG integration. It aims to provide a clear, up-to-date synthesis of research that connects the fields of AI, HRM, and ESG. The review investigates how AI technologies are being used in HR to enhance ESG-related initiatives such as identifying talent with sustainability values, reinforcing ethical decision-making, and enabling environmentally smart workplace systems. By consolidating existing findings, this review offers practical insights into how organizations can strategically apply AI in their HR functions to better support ESG commitments. It also aims to deepen the understanding of how AI adoption in HR influences the development of sustainability-oriented corporate cultures, particularly in a time when both digital transformation and ethical responsibility are becoming essential to long-term business success.

Artificial Intelligence (AI) has made significant inroads into many industries, reshaping how organizations operate and make decisions. In Human Resource Management (HRM), AI is increasingly used to streamline tasks like recruitment, monitor employee engagement, and improve performance evaluations (Basnet, 2024; Jarrahi et al., 2022). Rather than replacing human roles, AI complements HR professionals by handling routine work and enabling more strategic, people-focused initiatives (Tambe, Cappelli, & Yakubovich, 2019). With predictive tools and smarter automation, organizations are now better equipped to make decisions that align with their long-term goals (Zhang et al., 2023). The Fourth Industrial Revolution (4IR) has further accelerated this shift, encouraging firms to adopt advanced technologies that also enhance employee experiences through greater customization and responsiveness. At the same time, Environmental, Social, and Governance (ESG) considerations have transcended mere compliance, and now serve as a core determinant of business success. More recent research, such as Müller et al. (2025), broadens this perspective by looking at the internal governance practices that businesses use to successfully apply ESG strategies. Growing pressure from investors, regulators, and communities has led companies worldwide to integrate ESG into their business strategies (OECD, 2022; Widyastuti et al., 2022). In Malaysia, ESG has gained strong momentum as a national priority. Initiatives such as the Twelfth Malaysia Plan and the Bursa Malaysia ESG Reporting Guide (2023) reflect the government's call for greater transparency and sustainability across industries (Othman et al., 2023; EPU, 2021). As a result, organizations in Malaysia are under increasing pressure to align their HR and operational practices with ESG principles while navigating digital transformation.

HR departments are uniquely positioned to support ESG goals whether by embedding sustainability into workplace policies, fostering inclusive cultures, or upholding ethical conduct (Renwick et al., 2023). However, there is still limited research explaining how AI can help HR teams strengthen ESG outcomes. For instance, how does AI influence hiring practices to support environmental goals? Can it help build more ethical decision-making processes or enhance transparency in governance? These questions are becoming increasingly relevant as ESG expectations continue to evolve. This paper aims to explore those questions through a systematic literature review focusing on how AI contributes to ESG integration within HRM. It examines the current body of knowledge to understand how AI-driven HR practices such as identifying sustainability-focused talent or implementing smart workplace solution scan improve ESG performance. By synthesizing recent research, this review offers insights into how organizations, particularly in Malaysia and other emerging economies, can leverage AI not just for efficiency, but also for long-term sustainability and ethical impact.

RESEARCH OBJECTIVE

To systematically review and synthesize existing literature on the application of Artificial Intelligence (AI) in Human Resource Management (HRM) functions.

To explore how AI-driven HR practices contribute to Environmental, Social, and Governance (ESG) integration within organizations.

To identify the specific roles and mechanisms through which AI enhances sustainability-oriented outcomes in HRM, including environmental responsibility, social equity, and governance ethics.

To assess current research trends, theoretical perspectives, and practical implementations related to AI, ESG, and HRM from 2015 to 2025.

LITERATURE REVIEW

HRM and AI

Human Resource Management (HRM) encompasses the strategic approach to managing an organization's most valuable asset: its people. It includes functions such as recruitment, employee development, performance management, compensation, and organizational development. The wide range of HRM seeks to optimize employee contributions to achieving business goals while maintaining adherence to labor regulations and fostering a positive workplace culture (DeCenzo, Robbins, & Verhulst, 2020). As businesses evolve, the role of HR has expanded to integrate AI into HRM by transforming the landscape of organizational practices, enhancing efficiency and effectiveness across various HR functions. AI technologies, such as intelligent decision support systems, virtual assistants, and machine learning algorithms, are being utilized in recruitment, onboarding, performance management, and employee engagement, indicating a significant evolution in how HRM operates (Alsaif & Aksoy, 2023; Sucipto, 2024; Rooshma et al., 2024).

These tools streamline HR processes, leading to cost reduction and improved decision-making capabilities (Malik et al., 2023; Jangbahadur et al., 2024, Tuffaha & Perello-Marin, 2022). AI's role in HRM is transformative. By streamlining HR processes, AI helps automate time-consuming tasks such as sorting resumes, conducting initial candidate screenings, and handling routine employee inquiries. This enables HR professionals to focus on more strategic activities, such as talent development and employee engagement. AI improves decision-making by providing data-driven insights into employee performance, job satisfaction, and organizational needs. Additionally, AI enhances employee experiences by delivering personalized learning and development opportunities and optimizing career paths. AI in HR has many advantages including increased productivity, data driven decision making and increased employee engagement through personalised attention to requirements and preferences.

Moreover, AI's ability to analyze large datasets enables HR professionals to gain insights into employee engagement and productivity tailored to individual needs, thus paving the way for personalized HRM (Nurimansjah, 2023; Sabil et al., 2023). This approach not only enhances the employee experience but also aligns with contemporary expectations for customization in the workplace (Nurimansjah, 2023; Malik et al., 2022). Such integration fosters higher employee satisfaction and retention, as AI-driven systems provide personalized feedback and development opportunities, bridging the gap between organizational objectives and employee aspirations (Malik et al., 2022; Rane, 2024).

However, the adoption of AI in HRM is not without its ethical implications. As AI systems take on roles traditionally held by humans, concerns regarding bias, transparency, and fairness arise. Studies indicate that biased algorithms can lead to detrimental outcomes, such as perpetuating workplace discrimination (Bartosiak & Modliński, 2022; Du, 2024). Therefore, organizations must implement AI solutions with a framework that considers both the operational benefits, and the ethical ramifications associated with data management and algorithmic decision-making (Prikshat et al., 2022; Fenwick et al., 2024). Developing comprehensive ethical guidelines is essential for mitigating these risks and ensuring that AI augments rather than undermines human dignity in the workplace (Bankins et al., 2022; Hong & Chen, 2024).

Furthermore, the dynamic nature of AI necessitates a continual reassessment of its role within HRM systems. With ongoing advances in AI capabilities, there is potential for significant disruptions, prompting HR leaders to adapt their strategies actively (Sharma, 2024; -, 2024). Each organization must navigate the balance between leveraging AI for operational efficiency while promoting a culture of innovation and human-centric workplace practices (Ghaffar et al., 2024; Böhmer & Schinnenburg, 2023; Jude & Vinayagam, 2024).

AI's Role in Enhancing Environmental Sustainability through Green HRM

Artificial Intelligence (AI) is playing an increasingly important role in advancing environmental sustainability through the lens of Green Human Resource Management (Green HRM). Green HRM refers to the integration of environmentally responsible practices into HR functions, with the aim of supporting broader organizational sustainability efforts. As environmental concerns become more urgent, many organizations are turning to AI to help implement these practices more efficiently and strategically. AI technologies such as data-driven recruitment tools, predictive energy-use systems, and automated reporting platforms are being used to reduce waste, improve energy efficiency, and embed eco-conscious thinking into everyday HR operations. By enabling smarter decision-making and streamlining green initiatives, AI not only improves environmental performance but also helps cultivate a sustainability-minded culture among employees (Renwick et al., 2023; Jabbour et al., 2020).

In this way, AI serves as both a catalyst and a support system for organizations seeking to meet their environmental goals through HR-led strategies. One of AI's most impactful contributions lies in green talent acquisition. AI-powered recruitment systems utilize natural language processing and machine learning algorithms to evaluate candidates' environmental values, sustainability-related experience, and green certifications. These systems can analyze social media profiles, resumes, and prior project involvement to identify applicants who demonstrate a commitment to eco-conscious behaviors. By prioritizing candidates who align with environmental values, organizations can build a workforce that actively contributes to sustainability initiatives, thereby enhancing their long-term environmental performance and brand reputation (Zhang et al., 2024; Malik et al., 2023). Beyond recruitment, AI facilitates operational efficiency in HR processes that contribute directly to environmental conservation. For instance, AI-enabled platforms support digital documentation, virtual interviews, and automated onboarding, reducing the need for paper-based systems and physical infrastructure. Additionally, AI plays a role in optimizing office energy usage through smart systems that monitor lighting, temperature, and equipment consumption. These systems provide real-time analytics that help HR and facilities management teams make informed decisions to reduce waste and promote energy efficiency. Such digital solutions reduce the organization's carbon footprint while simultaneously lowering operational costs (Dwivedi et al., 2023; Zubair et al., 2022).

Finally, AI contributes to building and reinforcing a sustainability-driven organizational culture. By integrating AI into communication and learning management systems, companies can disseminate green policies, environmental awareness campaigns, and personalized reminders that encourage sustainable behavior among employees. AI tools can also monitor environmental KPIs and generate reports that highlight progress toward sustainability goals, reinforcing a sense of shared responsibility. These initiatives not only cultivate environmentally responsible behaviors but also institutionalize sustainability as a core component of the organization's strategic identity. In this way, AI acts as a catalyst for embedding environmental consciousness into both individual and organizational decision-making frameworks (Widyastuti et al., 2022; Jarrahi et al., 2022).

AI in Supporting Social Sustainability in HR

Artificial Intelligence (AI) plays a growing role in advancing social sustainability within Human Resource Management (HRM), particularly through its support of diversity, equity, and inclusion (DEI). AI-powered recruitment tools help reduce unconscious biases by focusing on data-driven criteria rather than subjective judgments tied to gender, race, or background (Biswas & Kirchner, 2023; Jarrahi et al., 2022). These systems can also analyze organizational data to identify patterns in hiring, promotion, and compensation, making it easier to detect disparities and implement more equitable HR strategies (Binns et al., 2023). By leveraging AI in this way, organizations are increasingly able to foster inclusive workplaces that reflect broader social responsibility goals. AI contributes significantly to employee well-being, another critical component of social sustainability. Tools such as AI-enabled sentiment analysis and mental health monitoring applications allow HR teams to gauge employee satisfaction and emotional well-being in real time, enabling timely interventions (Lichtenthaler & Fischbach, 2023). Additionally, AI can support work-life balance by enabling flexible scheduling, monitoring workloads, and identifying stress signals through communication patterns and performance data (Zhang et al., 2023). These capabilities not only help reduce burnout and absenteeism but also promote a healthier, more supportive workplace culture. As such, AI is becoming a key enabler in creating socially responsible organizations that prioritize fairness, inclusion, and employee welfare.

AI and Governance in HR Practices

Governance in HR practices ensures transparency, fairness, and compliance with legal and ethical standards. By implementing algorithms that offer data driven insights into performance reviews, promotions and compensation, AI can assist in ensuring equity in decision making (Jiang et al., 2022). This reduces the potential for bias and human error in these critical decisions. AI can also aid in compliance monitoring, automatically tracking and flagging any deviations from legal or organizational standards, reducing the risk of legal issues.

Additionally, data privacy and security are essential concerns in AI implementation. Organizations must carefully manage the ethical use of AI to ensure that sensitive employee data is protected. By adhering to strict privacy guidelines and using secure AI technologies, HR departments can maintain trust and safeguard employee rights (Zeng, Lu, & Huang, 2022). AI also helps organizations comply with labor laws, diversity regulations, and other ethical frameworks, ensuring responsible and transparent governance within HR practices. AI plays a critical role in creating sustainable workplaces by optimizing resource management and reducing environmental footprints. AI is integrated into energy management systems, helping organizations track and manage energy consumption in real-time. Smart building technologies powered by AI can automate temperature control, lighting, and even water usage, ensuring that resources are used efficiently and sustainably. These technologies not only reduce operational costs but also contribute to the organization’s overall sustainability goals.

Moreover, AI can be used to optimize workplace design, such as improving the layout of office spaces to enhance energy efficiency and reduce waste. By analyzing patterns in employee behavior, AI can recommend changes to office layouts or energy use, contributing to the reduction of the company's environmental footprint. Through these innovations, AI helps organizations operate more sustainably, which is crucial for fostering long-term business resilience.

METHODOLOGY

This study employs a Systematic Literature Review (SLR) approach to investigate how Human Resource (HR) practices are being transformed through the integration of Environmental, Social, and Governance (ESG) principles, with a particular emphasis on the role of Artificial Intelligence (AI) in shaping sustainable business strategies. The SLR methodology ensures a transparent, reproducible, and evidence-based synthesis of existing research, following established protocols such as the PRISMA 2020 guidelines (Page et al., 2021) and the review framework proposed by Tranfield, Denyer, and Smart (2003) for management research.

To maintain consistency and academic rigor, this review exclusively utilized the Scopus database. Scopus was selected for its comprehensive indexing of high-quality, peer-reviewed journals across disciplines such as human resource management, sustainability, and digital technologies. A structured search strategy was developed using a combination of keywords and Boolean operators, including terms such as "Artificial Intelligence", "Human Resource Management", "ESG", "Green HRM", and "sustainability". The search was limited to English-language journal articles published between 2015 and 2025 to capture the most recent developments over the past decade. The inclusion criteria were as follows: (1) studies must focus on the role of AI in HRM, (2) articles must address at least one ESG component within an HR context, (3) papers must be published in peer-reviewed journals indexed by Scopus, and (4) full-text availability. Articles were excluded if they were non-English, not peer-reviewed, lacked relevance to both AI and ESG in HRM, or focused solely on technical AI applications without managerial or HR implications. The initial search yielded 362 documents, of which 12 duplicates were removed. After title and abstract screening of the remaining 350 records, 250 articles were excluded for not meeting the inclusion criteria. 100 full-text articles were assessed, resulting in 40 studies being selected for final inclusion in the synthesis. A systematic data extraction process was carried out for all included articles. Key data fields captured included author(s), year of publication, study location, research methodology, AI application (e.g., recruitment, talent analytics, performance management), ESG dimension (Environmental, Social, or Governance), and major findings. The quality of each study was assessed based on methodological rigor, relevance to the research objectives, and contribution to theory and practice. This structured and exclusive use of the Scopus database enhances the validity, reliability, and replicability of the review findings, providing a robust foundation for understanding the intersection of AI, ESG, and HRM.

Search Strategy

To ensure the inclusion of the most relevant and up-to-date research, a thorough search was conducted across several prominent academic databases. The primary database used was Scopus, selected for its extensive repository of peer-reviewed journal articles, conference papers, and academic books. In addition, Scopus were also searched as supplementary sources to gather a broader spectrum of literature, including gray literature and citations not indexed in Scopus. The search strategy focused on identifying studies that addressed the intersection of HR practices, AI technologies, and ESG integration. A combination of keywords was employed, including "Human Resource Management" AND "ESG Integration," "Artificial Intelligence" AND "Sustainable Business Strategies," and "HR Practices" AND "AI in Sustainability." These terms were chosen to ensure that the search would cover both the conceptual and practical aspects of AI's role in HR and ESG. The inclusion criteria were set to ensure that only the most relevant studies were included in the review. Articles published between 2015 and 2025 were considered to maintain a focus on recent developments in the field. Only studies published in English were included, and only peer-reviewed sources, such as journal articles, conference papers, and book chapters, were considered. Additionally, studies needed to focus on HR practices, AI, and their integration with ESG principles, which were the central themes of this review. Exclusion criteria were also clearly defined to eliminate irrelevant or low-quality studies. Articles that did not focus on HR or AI in the context of sustainability or ESG were excluded, as were studies that did not discuss business strategy or corporate practices. Non-peer-reviewed sources, such as news articles and opinion pieces, were also excluded, as they did not meet the academic rigor required for this SLR. This is presented in Table 1 below.

Table 1: Inclusion and Exclusion Criteria for the Systematic Literature Review

Criteria	Inclusion	Exclusion
Time frame	Publications from 2015 to 2025	Publications before 2015
Language	English	Non- English
Source Type	Peer-reviewed journals, conference papers, book chapters	News articles, blogs, opinion pieces
Content focus	Studies addressing HR practices, AI, and ESG integration	Studies unrelated to HR, AI, or ESG
Relevance to topic	Must relate to sustainable business strategies and organizational practices	Irrelevant to business strategy or practical HR applications
Quality Control	Academic rigor and methodological clarity	Low-quality or unclear methodological approach

Selection Criteria

The selection process followed a two-stage screening approach to ensure that only the most pertinent studies were included in the final analysis. In the first stage, the titles and abstracts of all retrieved articles were screened. During this stage, studies that clearly did not meet the inclusion criteria, such as those unrelated to HR or AI in the context of ESG, were excluded. The second stage involved a full-text screening, in which the full articles were assessed in detail to determine whether they directly addressed the role of AI in HR practices for ESG integration. Studies that were purely technological or focused on general sustainability without specific reference to HR or ESG were excluded. Additionally, studies that lacked empirical data or theoretical grounding in HR or AI were excluded to maintain the focus on robust, actionable findings relevant to HR and ESG.

Document by Year

Figure 1 illustrates the annual publication trend from 2019 to 2025 on the topic of Artificial Intelligence (AI), Human Resource Management (HRM), and Environmental, Social, and Governance (ESG) integration. The number of related documents has shown a consistent upward trend, indicating growing scholarly interest in the intersection of AI and ESG practices in HR functions. Between 2019 and 2021, the number of publications remained relatively low but gradually increased from fewer than 5 documents in 2019 to around 10 in 2021. This

suggests that research in this interdisciplinary field was still emerging during this period. A significant growth occurred from 2022 onwards, with publications rising sharply to over 50 in 2023, and peaking at nearly 150 in 2024. This rapid increase highlights a surge in academic focus and recognition of the role AI can play in advancing sustainable HR practices. Interestingly, the data shows a slight decline in 2025, with the number of documents falling to approximately 130. This may reflect incomplete indexing for the current year or a stabilization in publication momentum. Nonetheless, the overall trend underscores a strong and increasing scholarly engagement with AI-enabled ESG integration in HRM, reinforcing the relevance and timeliness of this systematic literature review.

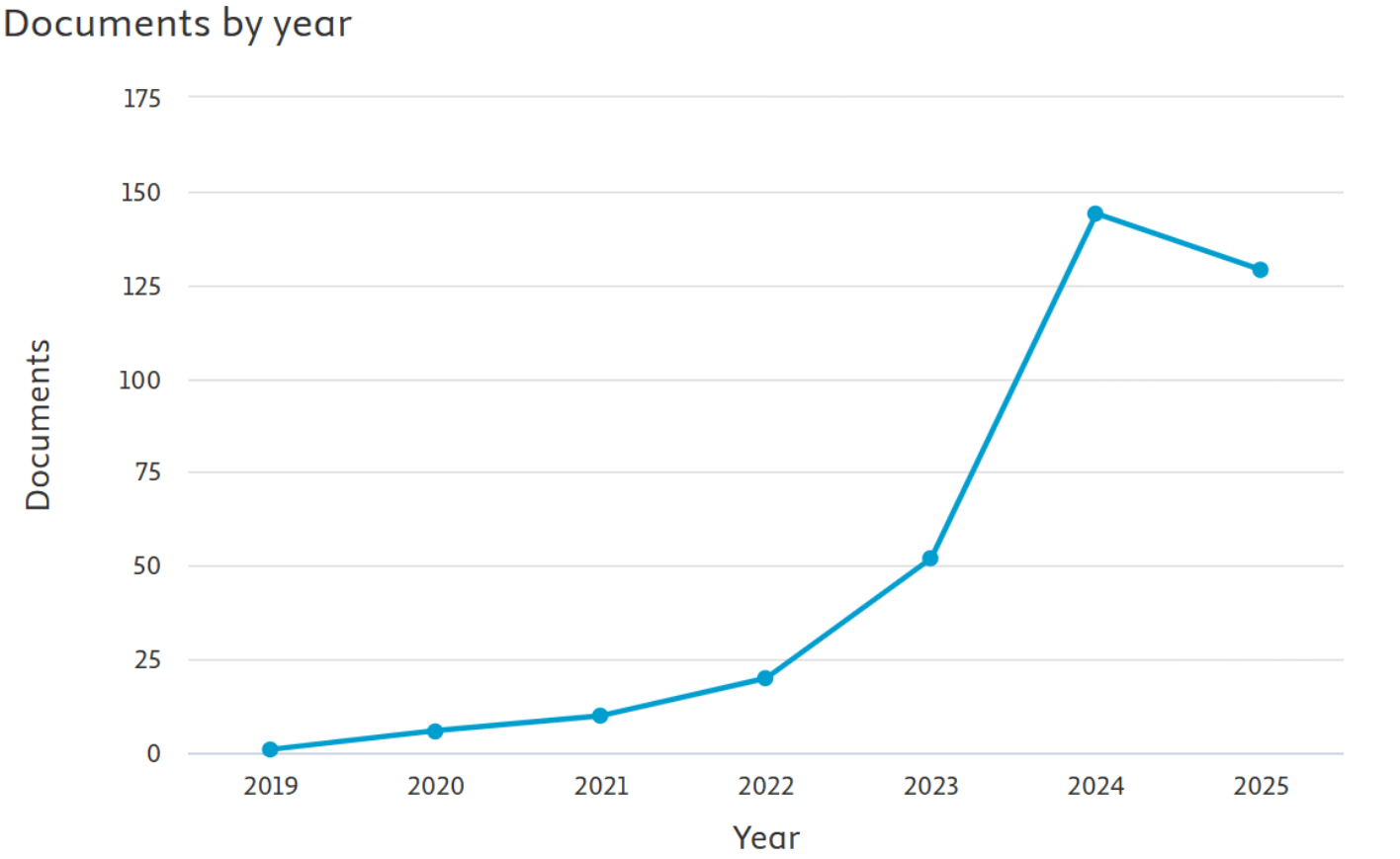

Fig. 1 Document by year

Document by Country

Figure 2 presents the distribution of publications by country or territory related to research on the integration of Artificial Intelligence (AI) in Human Resource Management (HRM) for enhancing Environmental, Social, and Governance (ESG) strategies. The data highlights the geographical concentration of scholarly interest in this emerging interdisciplinary field. India and China lead in publication output, each contributing close to 65 documents, reflecting a strong regional emphasis on AI adoption and sustainable business practices. This surge may be attributed to both nations' rapid digital transformation and policy-level initiatives toward ESG and responsible AI governance. The United States follows closely, contributing approximately 50 documents. As a global leader in both AI innovation and ESG policy discourse, the U.S. continues to produce high-impact research in this domain. The United Kingdom ranks fourth with nearly 30 publications, reflecting ongoing academic and institutional efforts to link HRM with sustainability and technological advancement. European countries such as Italy and Germany also show moderate engagement, with around 20–25 publications each. Meanwhile, Malaysia contributes a noticeable number of documents (approximately 15), signifying growing regional academic interest and potential for future research leadership in Southeast Asia. Other countries including Canada, Australia, and the Russian Federation exhibit relatively lower but still meaningful engagement, each contributing between 10 and 15 documents. Overall, this distribution indicates that while the research landscape is globally diverse, it is

predominantly driven by emerging and developed economies with strong agendas in digital transformation, ESG implementation, and HR innovation.

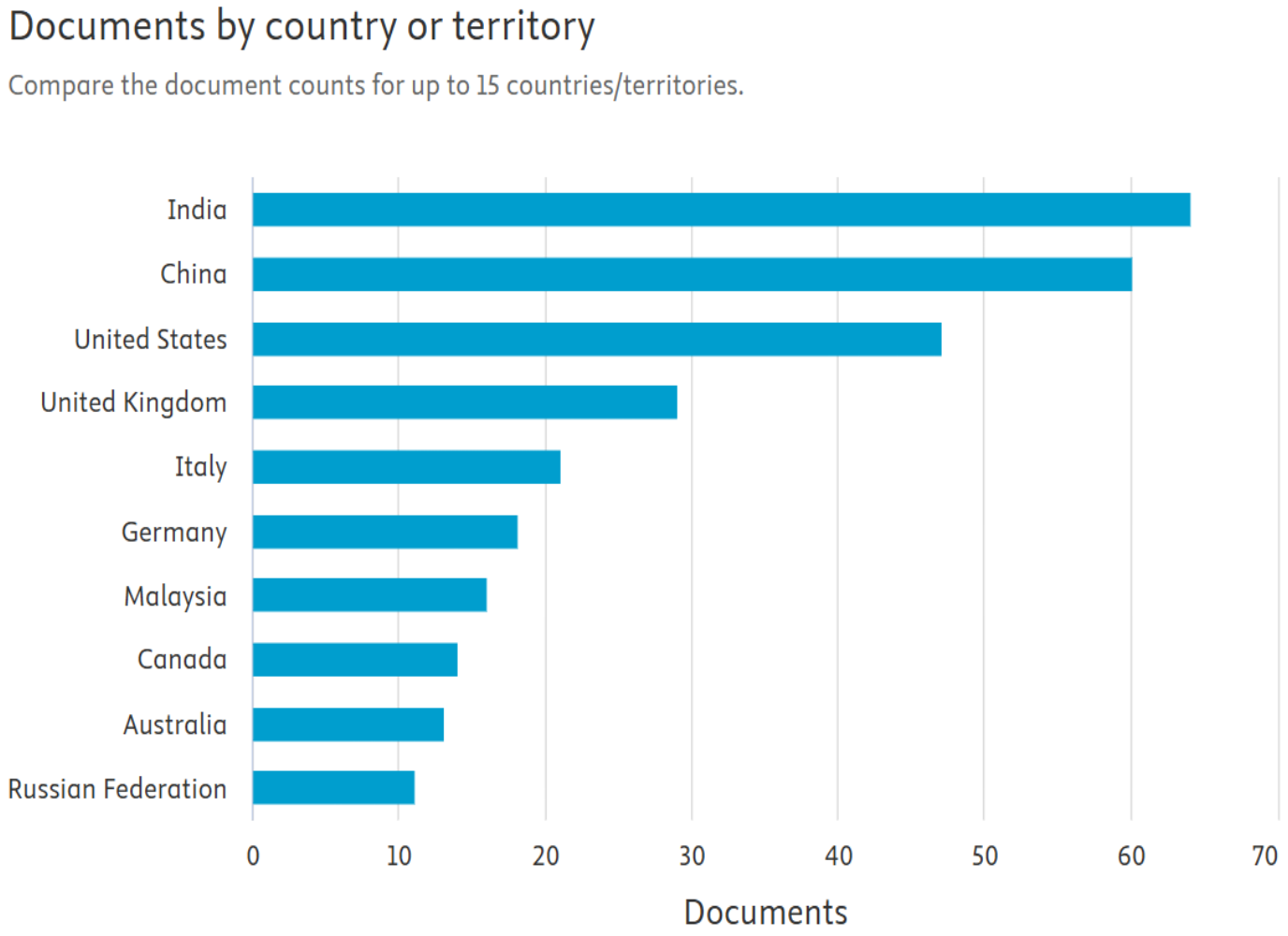

Fig. 2 Document by country

Document by Subject Area

Figure 3 presents the distribution of publications by subject area related to the intersection of Artificial Intelligence (AI), Human Resource Management (HRM), and Environmental, Social, and Governance (ESG) practices. The data reveals the interdisciplinary nature if research, technology, business, social sciences, and sustainability domains. The highest proportion of documents falls under Computer Science (18.6%), underscoring the technological foundation of AI applications in HR functions and ESG implementation. Close behind is the Business, Management, and Accounting category (17.4%), reflecting strong academic interest in exploring how AI transforms organizational practices and supports strategic ESG alignment. Economics, Econometrics, and Finance (14.0%) and Social Sciences (9.1%) also represent significant shares, indicating growing attention toward the socio-economic impacts of AI and sustainability in the workforce. Additionally, Engineering (8.4%) and Energy (7.8%) reflect the relevance of AI in developing smart infrastructure and energy-efficient solutions key components of environmental sustainability. Fields such as Environmental Science (7.1%) and Decision Sciences (4.7%) demonstrate increasing integration of AI tools in environmental performance monitoring and HR-related decision-making. Smaller contributions are noted in Mathematics (5.4%), Arts and Humanities (1.5%), and Other (6.1%), suggesting emerging but limited engagement from non-technical disciplines. This subject distribution highlights the multidisciplinary convergence necessary to address ESG challenges through AI-enabled HRM and supports the relevance of your systematic review across a broad spectrum of academic and practical domains.

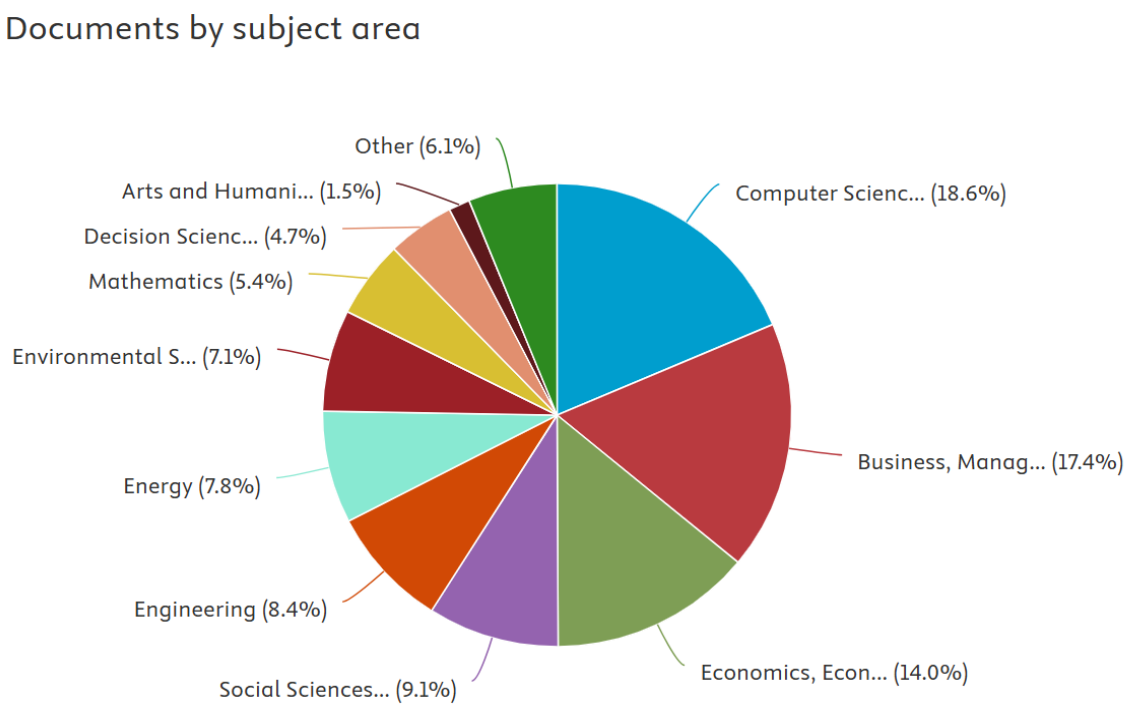

Fig. 3 Document by subject/ area

RESULT

Publication Trends Over Time

The analysis of publication trends from 2019 to 2025 (Figure 1) indicates a significant growth in scholarly interest in the intersection of Artificial Intelligence (AI), Human Resource Management (HRM), and Environmental, Social, and Governance (ESG) integration. From a modest start with fewer than 5 documents in 2019, the number of publications steadily increased to around 20 in 2022, followed by a sharp rise in 2023 with over 50 documents. The year 2024 recorded the highest output, with approximately 150 documents. A slight decline is observed in 2025; however, this is likely due to the year still being in progress at the time of data collection. Overall, the trend reflects increasing global academic engagement and recognition of AI's strategic role in advancing ESG agendas through HR practices.

Geographic Distribution of Publication

As shown in Figure 2, the geographical analysis highlights that the majority of contributions to this field originate from India and China, each producing around 65 documents. These countries' rapid technological development and policy emphasis on sustainability may explain their strong research output. The United States follows closely with approximately 50 documents, reflecting its leadership in both AI research and ESG frameworks. The United Kingdom also makes a significant contribution with around 30 documents. Other European countries, including Italy and Germany, contribute moderately with about 20–25 documents each. Notably, Malaysia emerges as a growing contributor in Southeast Asia, producing nearly 15 documents. Countries such as Canada, Australia, and the Russian Federation also demonstrate scholarly interest, albeit at a lower volume. This distribution suggests that both developed and emerging economies are actively exploring AI's potential to support sustainable and ethical HRM practices.

Subject Area Distribution

Figure 3 reveals the multidisciplinary nature of the research landscape. The highest proportion of documents falls under Computer Science (18.6%), emphasizing the technological foundation of AI applications in HR and ESG domains. This is closely followed by Business, Management, and Accounting (17.4%), indicating strong

interest in the organizational and strategic implications of AI-driven HR practices. Economics, Econometrics, and Finance (14.0%) and Social Sciences (9.1%) reflect broader socio-economic and institutional considerations. Engineering-related disciplines such as Engineering (8.4%) and Energy (7.8%) also feature prominently, particularly in the context of AI-enabled sustainability initiatives like smart buildings and energy management systems. Fields like Environmental Science (7.1%) and Decision Sciences (4.7%) further demonstrate the growing importance of data-driven and environmentally focused HR strategies. Contributions from Mathematics, Arts and Humanities, and other disciplines underscore the expanding reach of this research topic across both technical and non-technical fields.

DISCUSSION

Rising Research Momentum

The increasing number of publications from 2022 to 2024 reflects a growing global recognition of the transformative role AI can play in integrating ESG principles within HRM. This trend aligns with the global push for digital sustainability and responsible AI, as organizations adopt technology-driven solutions to meet regulatory and stakeholder expectations (Dwivedi et al., 2023; OECD, 2023). The sharp rise in 2024 likely coincides with the maturing of ESG frameworks and increased pressure from investors and regulators for transparent ESG disclosures (UNPRI, 2023). Although a slight drop is seen in 2025, this may be attributed to the publication cycle rather than a decline in research interest.

Dominant Contribution and Regional Emphasis

India and China lead the research output, reflecting strong national initiatives in AI innovation and sustainable development (Zhang et al., 2023; Li & Wang, 2022). India's emphasis on green technology and digital HR transformation, along with China's AI-driven governance models, may contribute to their prominence. The United States and United Kingdom remain key contributors, producing both theoretical and empirical studies that explore the business case for ESG adoption via AI-powered HR tools (Jarrahi et al., 2022; Tambe et al., 2019). Malaysia's appearance in the top 10 publishing countries is noteworthy. Although its contribution is comparatively smaller, it indicates an emerging scholarly interest in aligning HR digitalization with ESG priorities in Southeast Asia (Widyastuti et al., 2022). This suggests opportunities for further regional research and policy development.

Interdisciplinary Convergence

The wide range of subject areas spanning Computer Science, Business, Social Sciences, and Environmental Studies demonstrates the inherently interdisciplinary nature of AI-driven ESG integration in HRM (Sivarajah et al., 2024). The prominence of Computer Science (18.6%) confirms the field's technological underpinnings, particularly regarding machine learning, natural language processing, and predictive analytics in HR applications (Dwivedi et al., 2023). Equally, Business and Management (17.4%) and Economics (14%) reflect how organizations are increasingly focusing on ESG value creation, ethical leadership, and governance reforms, using AI as a strategic enabler (Buhmann & Fieseler, 2022). Contributions from Environmental Science and Energy indicate how HRM intersects with operational sustainability efforts, including carbon monitoring and smart workplace systems (Renwick et al., 2023). However, Arts and Humanities and Ethics-focused studies are underrepresented. This signals a gap in addressing the cultural and ethical consequences of AI in HRM, especially concerning surveillance, transparency, and algorithmic bias critical issues when aligning AI use with ESG values (Zhang et al., 2023; Floridi, 2022).

Implication for Practice and Policy

The results emphasize the need for HR leaders to harness AI tools to support data-driven ESG reporting, ethical hiring, inclusive performance evaluation, and climate-conscious operations (Tambe et al., 2019; Renwick et al., 2023). AI-enabled platforms can facilitate real-time ESG tracking, automate diversity analytics, and align corporate governance with sustainability metrics (Jarrahi et al., 2022). For policymakers, the findings support the development of ethical AI frameworks and ESG standards tailored to human capital management. Lastly

cross-sector collaboration is essential to ensure the responsible and equitable deployment of AI in organizational settings (OECD, 2023; UNDP, 2022).

CONCLUSION

This review sets out to understand how Artificial Intelligence (AI) is shaping the future of Human Resource Management (HRM), especially in how it supports Environmental, Social, and Governance (ESG) goals. By following a clear and structured review process, and carefully selecting and analyzing the most relevant studies, the researchers ensured that the findings are reliable and reflect current developments in this fast-evolving area (Page et al., 2021; Tranfield et al., 2003). The results point to a growing interest among researchers in using AI not just to automate HR processes, but to contribute meaningfully to ESG outcomes. Examples include using AI to recruit environmentally conscious employees, supporting inclusive hiring practices, improving workplace energy efficiency, and reinforcing ethical governance (Dwivedi et al., 2023; Zhang et al., 2023). Interestingly, a number of studies are now addressing the practical applications of AI and ESG, particularly in countries like Malaysia, India, and China regions, where digitalization and sustainability are becoming national priorities. However, there are still some clear gaps. Many studies focus only on the environmental aspect of ESG, while the social and governance dimensions remain underexplored. There is also a lack of research on how smaller businesses are managing these changes, and very few studies have looked at the long-term effects of AI-driven ESG initiatives. These gaps present valuable opportunities for future research, especially studies that take a long-term view or examine different industries and sectors (Jarrahi et al., 2022; Renwick et al., 2023). Overall, this review adds to the understanding of how AI and HRM can work together to support sustainability goals. It shows that HR is not just about managing people, it also has a key role in helping organizations become more ethical, inclusive, and environmentally responsible. As the challenges of digital transformation and sustainability continue to grow, AI-enabled HR solutions may be one of the most important tools for building organizations that are not only more efficient but also more future-ready and socially accountable.

ACKNOWLEDGMENT

This research was supported by Universiti Teknologi Malaysia under the Potential Academic Staff Vote No : Q.J130000.2753.03K98.

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