

The Utilization of Artificial Intelligence Technology in the Transformation of Smart and Environmentally Friendly Office Management

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ABSTRACT

The development of Artificial Intelligence (AI) has driven significant changes in modern office management. The implementation of AI enhances operational efficiency through automated workflows, algorithm-based data analytics, and the optimization of energy usage and facility management. However, conventional office management practices still face challenges, including inefficiencies, high energy consumption, and limited adoption of environmental sustainability principles. This study aims to analyze the role of AI in supporting the transformation toward environmentally friendly smart offices through its integration with the Internet of Things (IoT) and Green Human Resource Management (GHRM) practices. This research employs a literature review method based on recent scholarly sources. Findings indicate that AI has the potential to reduce carbon footprints, improve workplace environmental quality, and strengthen sustainability-oriented organizational culture. Nevertheless, successful implementation of AI requires adequate infrastructure readiness, enhanced human resource competencies, and robust governance of data privacy and security. With appropriate strategic planning, AI can serve as a catalyst for developing efficient and sustainable office management systems.

Keywords: Artificial Intelligence; Smart Office; Green Management; Sustainability; Internet of Things (IoT)



Received: 21 November 2025

Accepted: 18 February 2026

Available online: 29 April 2026

DOI: 10.61242/ijabo.26.635

JEL Classifications: M10, M15, O33, Q55



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INTRODUCTION

To maximize work demands and operational efficiency, the concept known as the Smart Office has emerged. In simple terms, a Smart Office is an office environment where individuals can work and communicate more effectively and efficiently (Siswanto & P, 2022). From a technological development perspective, a Smart Office System is a complex integration of hardware and software designed to regulate automated systems within office spaces. The smart office concept focuses on building occupants who perform routine tasks and utilizes both hardware and software components to control various systems in automatic mode according to the smart office features implemented. This concept allows all office units to be unified into a single management system, which can also reduce operational costs, particularly in maintenance (D. P. Sari *et al.*, 2024). Smart Offices further provide benefits in improving work quality, making processes more efficient and effective compared to conventional methods. A Smart Office is also defined as an office concept that optimizes the use of technology to enhance productivity and efficiency (Zaman & Hanif, 2023). Sensor-based systems can reduce energy consumption by approximately 30-60%, while document digitization can decrease paper usage by 80-90%. However, the successful implementation of a Smart Office does not rely solely on technology, but also on human resource readiness. Green Human Resource Management (GHRM) practices such as digital training, strengthening technological literacy, and internalizing environmentally friendly behaviors play a crucial role in ensuring that technology adoption is carried out sustainably (Efawati & Rinawati, 2026).

Although there is extensive research on AI, smart offices, and green management, existing studies show that these topics are often examined separately. Research on Artificial Intelligence has predominantly focused on improving productivity, decision-making accuracy, and organizational performance (Ghosh, 2025; Neiroukh, 2024). Studies on smart office systems mainly emphasize energy efficiency, sensor-based automation, and building optimization (Hasiwar *et al.*, 2024; Zhang, 2021). Meanwhile, Green Human Resource Management (GHRM) research highlights the role of employee environmental behavior, green competencies, and sustainability-driven culture (Ren, 2018; Sharma & Mehta, 2025). However, very few studies integrate AI, IoT-enabled smart office systems, and GHRM into a single comprehensive framework, especially in developing countries such as Indonesia, which simultaneously faces challenges in digitalization, technological readiness, and sustainability transitions (Pradisti, 2024; Syafi'i, 2023). Therefore, this study addresses this research gap by examining how the integration of AI, IoT, and GHRM can collectively support the transformation toward sustainable smart office management.

Therefore, this research aims to analyze the role of AI in transforming office management toward a sustainable smart office through integration with IoT and GHRM. The study is expected to provide theoretical contributions in the form of an integrative AI-Smart Office-GHRM model, as well as practical contributions for organizations in designing office transformation strategies that are efficient, adaptive, and environmentally friendly in the digital era.

LITERATURE REVIEW

Office Management

Office management refers to all organizational arrangements and activities that encompass every aspect related to the implementation of administrative tasks within the office system to achieve organizational goals (Ardiansyah & Teruna Awaloedin, 2022).

In the literature on office management, the office is viewed as a central hub for organizational data processing and communication. It functions to collect, process, store, and distribute information that supports managerial decision-making. Accordingly, office management should not be understood merely as an administrative function, but as an information system that integrates operational activities with strategic processes within the organization (Chaniago, 2025).

Furthermore, office management encompasses a range of supporting activities, including record keeping, correspondence management, documentation, administrative services, and the provision of office facilities. Workspace planning, the utilization of office equipment, and the management of work facilities are organizational efforts aimed at creating efficient working conditions and enhancing employee productivity. This indicates that office management operates across both operational and strategic dimensions that function interdependently to support organizational performance (Chaniago, 2025).

From a contemporary perspective, the office is no longer perceived solely as a physical workspace, but rather as an integrated system that manages the flow of organizational information. This shift is driven by increasing demands for efficiency, faster information processing, and the integration of internal and external communication. Consequently, organizations are required to adapt their office management practices to technological developments and evolving business environments in order to remain relevant and competitive (Chaniago, 2025).

The advancement of digital technology has brought significant transformation to office management practices. Administrative tasks that were previously performed manually are increasingly carried out through digital systems involving software applications, automation, and network-based data management. Digitalization facilitates more rapid information flow, improves data accuracy, and reduces dependence on physical documents, thereby forming the basis for more efficient and modern organizational workflows (Chaniago, 2025, Chaniago & Efawati, 2026).

Digital transformation in office management also involves the adoption of advanced technologies such as Artificial Intelligence (AI), the Internet of Things (IoT), and cloud computing. These technologies enable the automation of administrative processes, the monitoring and control of office facilities, and the integration of data across organizational units. As a result, organizations are better equipped to manage digital documentation, oversee office operations, and enhance employee collaboration through centralized information systems (Chaniago, 2025, Efawati, 2020).

In line with these developments, the concept of the Smart Office has emerged as an integrated work environment that utilizes sensors, automated systems, and real-time data to support flexible and efficient working practices. The Smart Office not only improves operational efficiency but also creates adaptive and comfortable workspaces that facilitate data-driven decision-making. This development represents a paradigm shift in which the office evolves from a conventional administrative space into a connected and responsive digital ecosystem (Chaniago, 2025).

Artificial Intelligence (AI) in the Management Context

Artificial Intelligence (AI) is a system that studies how to enable computers to think, learn, and act like humans. This study discusses AI, which has the potential to revolutionize various aspects of life, including business (Marsella, 2023). Conceptually, Artificial Intelligence (AI) is defined as a system's ability to correctly interpret external data, learn from such data, and use the acquired knowledge to achieve specific goals and tasks through flexible adaptation (Kaplan & Haenlein, 2019; Russell & Norvig, 2021). In

the context of management, AI is not merely an automation tool, but an entity that replicates human cognitive functions such as problem-solving and pattern recognition.

AI holds significant potential to revolutionize managerial practices by enhancing decision-making processes and operational efficiency. This technology enables organizations to identify complex patterns, conduct in-depth data analysis, and provide accurate recommendations for business strategies (Neiroukh, 2024; Sultana, 2024; Efawati et al., 2024). Beyond efficiency, the adoption of AI allows companies to become more adaptive and responsive to rapid market changes (Ghosh, 2025). In human resource management, AI contributes to improving personalized employee experiences and supporting diversity and inclusion (Triono, 2025).

However, the integration of AI presents dual challenges. On one hand, there are technical issues such as infrastructure readiness and data security. On the other hand, there are ethical concerns related to algorithmic bias, which require decisions to be fair, transparent, and accountable (Neiroukh, 2024). Therefore, organizations must develop a holistic approach that includes adaptive policies, clear ethical frameworks, and continuous education programs for human resources. These measures are crucial to creating an innovative ecosystem that is not only operationally efficient but also socially responsible (Ghosh, 2025; Sultana, 2024, Chaniago & Efawati, 2023).

Digital Transformation in Management

Digital transformation, commonly referred to as Digital Transformation, is a depiction of an organization's journey in transforming its operations from initially manual processes to digitized ones by leveraging advancements in digital technology (Wahidin & Wati, 2024). Digital transformation in management is a strategic process that goes beyond merely adopting new technologies; it involves a shift in organizational culture that fosters innovation, collaboration, and data-driven decision-making to enhance efficiency and responsiveness (Kasde, 2021; Syafi'i, 2023). This process reshapes how organizations operate and create value, where digital technologies are utilized to optimize business processes, improve stakeholder interactions, and reduce information asymmetry to achieve more transparent governance (Asrul, 2025; Pradisti, 2024; T. P. Sari & Fitranita, 2022).

The success of digital transformation largely depends on the integration between technological aspects and human resource readiness. Top management commitment is a determining factor in providing resources and instilling a digital vision, while investment in training is required to ensure employees can adapt to technological change (Kasde, 2021; Syafi'i, 2023). Furthermore, effective digital transformation requires a comprehensive approach that considers data security, psychological factors, and social dynamics. With appropriate strategies, organizations not only improve marketing and operational performance but also build sustainable competitive advantage in the information-based economy (Asrul, 2025; Malay *et al.*, 2023; Efawati et al., 2025).

Smart Office

Smart Office is defined as an integrated digital workspace that utilizes cloud computing, IoT devices, and automation systems to enable personalized, adaptive, and efficient work environments based on real-time data (Hasiwar *et al.*, 2024). A Smart Office is a way to manage an office that uses technology, especially AI and the Internet of Things (IoT), to make the workplace more productive, flexible, and connected. This idea came about because organizations needed to better manage information, work tasks, and physical space in the digital age. Smart Offices want to create a work environment that is

sustainable, adaptable, and based on real-time data by combining automation, data analytics, and smart gadgets. They want to do this by making people more productive.

A Smart Office is built by combining cloud computing and IoT devices that let systems automatically share data with each other. One way to do this is to employ microservices and environmental sensors connected by a Workplace Environment Index (WEI) to keep an eye on the lighting, air quality, and room temperature and change them automatically based on what the user requires (Hasiwar *et al.*, 2024). This method makes better use of space while giving the system control over ambient settings, which makes people more comfortable and productive.

Smart Offices do more than just automate physical spaces; they also make it easier for people to do their jobs. Chan and Shum (2018) talk about how voice-controlled systems like Amazon Alexa and Raspberry Pi may be used to control workplace gadgets without having to touch them. This includes things like registering attendance, accessing workspaces, communicating with coworkers, and managing operational data. This change is vital for both productivity and inclusion, especially for workers who have trouble using work instruments because of physical restrictions.

So, Smart Offices don't just change how administrative chores are done; they also change the office into a digital coordination hub that connects people, physical spaces, and information technologies at the same time. This idea helps organizations go digital by making them more productive, efficient with their resources, and able to adapt to changes in technology.

Strategic Advantages of Intelligent Workspaces

1. Making decisions and processing data in real time
Sensors, AI, and the Internet of Things (IoT) all work together to process data in real time. This lets businesses find out about work routines, productivity trends, and make decisions based on data. Smart Offices have integrated platforms for monitoring, processing, and managing information, which makes it easier for people to work together and get things done. Traditional workplaces, on the other hand, often have fragmented and unstructured data.
2. Scheduling and administration that happens automatically
Smart offices make scheduling and administrative tasks easier by using automated systems to keep track of what employees are doing, how much time they have, and how different units are connected. These solutions cut down on mistakes made by hand and speed up cooperation throughout the company, especially in big companies or those with flexible work schedules.
3. Making the most of resources and saving money
IoT sensors look at how space and facilities are used, which helps businesses cut expenses, avoid damage by finding problems early, and control energy use based on how they are used. Cloud computing makes things even more efficient by removing the need for physical storage devices and letting people access data from anywhere and at any time (Bandyopadhyay & Sen, 2011; Kim & Lee, 2014; Sunchu, 2019).
4. Making the organization's digital identity stronger (Smart Brand)
Smart offices add strategic value by creating a digital organizational identity, or smart brand, that makes it easier for customers and other stakeholders to interact with the company. Automated check-ins, digital meeting invitations, and data-driven services are some of the technologies that improve the user experience (Katasonov *et al.*, 2008). This makes businesses more competitive in the digital service era.

From the point of view of human resources, smart offices make the workplace more comfortable by automatically controlling the lighting, ventilation, temperature, and

air quality. This affects motivation, health, and attendance. Better working conditions help keep employees, lower turnover, and make collaboration and work-life balance better. Identity management technologies like facial recognition and digital tracking also make security, attendance tracking, and remote work arrangements safer. These are becoming more popular.

Conclusion in general, the goal of Smart Office implementation is not just to make processes more digital, but also to improve organizational governance by making them more cost-effective, time-efficient, secure, and environmentally friendly. The idea is a strategic base for getting businesses ready for fast-changing technology and the growing need for flexible, data-driven work patterns in the modern world.

Internet of Things

The Internet of Things (IoT) is a technology idea that connects physical items over the internet so that they can share data, automate processes, and operate systems in real time. IoT is the main infrastructure that connects all the gadgets in a smart office, like environmental sensors, security systems, computers, and office equipment. This makes the workplace more efficient, flexible, and integrated. This technology keeps becoming better because communication networks are getting better, sensors are getting smaller, and there is an increasing need for automation to make modern workspaces more productive and comfortable (Fatima, 2015).

The use of IoT in smart offices came from the use of Wi-Fi-based gadgets like smart TVs, digital meeting systems, and mobile devices that work as access points and control hubs in smart homes and smart buildings. Digital apps can now handle conference rooms, presentation systems, and workplace facilities from one central location thanks to this network infrastructure. Using these ideas in an office setting turns simple home automation into facility management at work that uses sensors and real-time data.

IoT implementation in intelligent buildings is very important for smart office environments. This is especially true for automatic lighting management, adaptive air conditioning systems, indoor air quality monitoring, and sensor-based security. These solutions help businesses use less energy, make their employees more comfortable, and let them control their facilities from afar using connected devices (Sajja, 2016). This technology helps make smart building management systems that focus on making operations more efficient and predicting when assets need maintenance (Lobaccaro *et al.*, 2016; Mendes, 2015).

Smart grids help smart offices run smoothly by making sure that electricity is distributed efficiently. This is especially important in regions where digital devices like computers, digital panels, and automated workstations are used a lot. Smart meters let firms control how much energy they consume based on the needs of the workplace, the schedules of their operations, and the patterns of device use (Mohassel, 2014). This helps save money on operations and follow sustainable energy policies.

IoT is used in health and workplace safety through smart workplace health monitoring systems, like ergonomic chair sensors, indoor air quality detectors, and wearable gadgets that keep an eye on employees' health to keep them safe. Previously employed in smart healthcare, these technologies are now being applied to lower health risks, weariness, and environmental dangers at work (Niewolny, 2016).

IoT helps organizations with transportation by connecting systems that keep an eye on operational vehicles, integrating smart office parking systems, and employing remote monitoring data to support electric vehicles. These solutions improve the mobility of workers and make transportation more efficient (Chatzimilioudis, 2011; Mirzabeiki, 2010).

Industry 4.0 technologies help smart offices grow in factories by letting machines talk to one other, using AI, and using big data analytics for office automation, inventory management, and making decisions based on data. Smart offices use these ideas to make digital collaboration, facility monitoring, and automated document processing better (Atos, 2014).

IoT makes it possible to keep an eye on indoor air quality (IAQ), waste management, water use, and emergency threat warnings from an environmental point of view. These sensor-driven insights help people make choices that will keep the workplace safe and good for the environment (Bhattacharjee & Bera, 2014; UNDP, 2015). IoT is the main building block of smart offices because it makes the workplace digital, responsive, and data-driven. Sensors, networks, and smart devices work together to automate buildings, make them more comfortable, predict when assets need maintenance, save energy, and make employees more productive and healthier.

Green Management and Sustainability

Green Management is an organizational approach that balances profit objectives with social and environmental responsibility. One of its core components is Green Human Resource Management (Green HRM), which aims to cultivate collective awareness and a sustainability-oriented culture within organizations (Sharma & Mehta, 2025). Through Green HRM, employees become key actors in environmental initiatives through recruitment, training, and performance evaluation aligned with ecological values. This approach not only benefits the environment but also improves organizational efficiency and competitiveness.

Successful green management requires strong cultural support and committed leadership. Yajman (2025) emphasizes that transitioning toward sustainability necessitates behavioral change, value alignment, and structural adjustments that support ecological practices, ranging from waste management to sustainable supply chain operations. In modern organizations, green management intersects with digital transformation, where technologies such as AI support energy efficiency and reduce physical waste. However, technology remains an enabler; long-term success depends on deeply internalized sustainability values across organizational levels.

Integration of AI, Smart Office, IoT, and Sustainable Management

The integration of Artificial Intelligence (AI), Smart Office systems, IoT, and Green Human Resource Management (GHRM) forms the foundation of a modern office management model that is adaptive, efficient, and environmentally sustainable. Technologically, AI represents computer systems that mimic human intelligence through data processing, pattern learning, and automated decision-making. AI operates through three primary stages: data collection and rule formation (learning phase), algorithm selection (reasoning phase), and output validation and consistency (self-performing phase). Through these mechanisms, AI provides automated recommendations for workspace management, employee scheduling, and operational oversight.

The Smart Office is an automated work environment driven by sensors, mobile applications, computing devices, and information systems to manage organizational functions in an integrated manner. These systems transition manual tasks into data-driven processes, such as employee efficiency applications and automatic attendance systems that verify presence through single authentication. Thus, Smart Offices not only reduce administrative burdens but also improve task execution speed and operational accuracy (Ulla, 2024).

Meanwhile, IoT serves as a network of interconnected devices that exchange real-time data to manage physical facilities such as lighting, temperature, security, and energy consumption. To optimize IoT integration, AI becomes a core component because IoT devices require analytical capabilities to generate automated responses. This integration enables resource usage adjustments based on spatial occupancy, environmental conditions, and operational patterns, reducing costs, preventing equipment failure through early detection, and improving employee productivity (Katasonov *et al.*, 2008; Kim & Lee, 2014). In essence, AI acts as the data processor, while IoT functions as the sensor-based data provider.

Operationally, AI–IoT integration enables automation of managerial tasks such as employee scheduling, performance tracking, and task distribution based on availability. AI-driven systems analyze task timelines, location-based activities, and performance outcomes to evaluate productivity and punctuality. These features enhance performance transparency and reduce manual bias in evaluation. The system also provides real-time support in client interaction, delivery tracking, and service demand prediction, enhancing service quality and organizational reputation.

In sustainability, this integration is strengthened through Green HRM, which drives ecological policies and environmentally responsible work behaviors. Digital technology acts as an enabler, while GHRM ensures cultural adoption supporting energy efficiency, document digitalization, and waste reduction. The synergy results in a work ecosystem that is not only productive but environmentally conscious, reflected in paperless policies, flexible work arrangements, automated energy controls, and training in digital sustainability competencies (Pandey, 2024).

Nevertheless, implementing this integrative model presents challenges, including IoT investment costs, employee digital competency gaps, and privacy concerns regarding activity tracking. These issues require phased technological planning, transparent security policies, and strengthened digital literacy to ensure successful transformation. Despite these challenges, the approach provides strategic value through enhanced efficiency, safety, comfort, and employee retention while supporting long-term organizational sustainability (Ulla, 2024).

Thus, integrating AI, Smart Office systems, IoT, and GHRM is not merely a technological innovation but an organizational strategy to develop intelligent, data-driven, responsive, and sustainability-oriented work systems. This transformation marks a shift from traditional administrative spaces into smart ecosystems that support digital efficiency, employee well-being, and environmental sustainability.

RESEARCH METHOD

This study employs a narrative literature review approach. This method is selected because the research aims to describe and synthesize theoretical perspectives and previous findings regarding the integration of Artificial Intelligence (AI), the Internet of Things (IoT), Smart Office systems, and Green Human Resource Management (GHRM), without using systematic procedures such as PRISMA, strict inclusion–exclusion criteria, or formal quality appraisal, as required in Systematic Literature Review (SLR) or integrative review. Data were collected from academic journals, books, and relevant scientific publications. The analysis was carried out through content analysis and descriptive comparison, allowing the researcher to interpret concepts and identify patterns across studies to formulate comprehensive conclusions on AI-driven smart office transformation.

Data sources consist of scientific publications, including academic journals and research articles relevant to the research focus. The selection of literature in this study followed clear inclusion and exclusion criteria to ensure academic relevance and credibility. Only peer-reviewed journal articles, conference papers, and scholarly books published in English or Indonesian within the last 10–12 years were included, particularly those addressing Artificial Intelligence (AI), the Internet of Things (IoT), smart office systems, and sustainability-oriented management practices. Non-academic sources, duplicated materials, and studies lacking methodological clarity were excluded. The literature search was conducted through major academic databases such as Google Scholar, Scopus, ScienceDirect, DOAJ, and Garuda, using keywords related to AI integration, digital transformation, smart office development, and Green HRM.

RESEARCH RESULTS

Changes in Office Management Functions Through AI Integration

The development of Artificial Intelligence (AI) has brought fundamental changes to the functions of modern office management. In traditional systems, office management focused on administrative activities, record-keeping, and physical documentation; however, in the digital era, these functions have shifted toward data-based information management, process automation, and real-time operational optimization. This shift demonstrates that AI not only enhances efficiency but also transforms the paradigm of office management from task-oriented to data-driven.

In traditional systems, work effectiveness was largely determined by human capacity in managing documents, communication, and clerical tasks. In contrast, in the era of AI, these responsibilities are handled by predictive algorithms, machine learning, and automated systems, resulting in administrative processes that are faster, more efficient, and less prone to error. This transformation also impacts employee roles: individuals who previously acted as administrative operators now shift to roles as system supervisors, data analysts, and decision-makers based on digital information.

As summarized in Table 1, the changes in office management functions between traditional and AI-based models encompass significant shifts in information processing, communication, archiving, decision-making, and employee roles. Each aspect reflects fundamental and interconnected differences, illustrating how artificial intelligence not only automates processes but also reshapes work structures, organizational culture, and decision-making orientation in modern office environments.

Table 1. Comparison of Office Management Functions: Traditional vs AI-Based Models

Office Aspect	Function	Traditional Model	AI-Based Model	Theoretical Basis (From Literature Review)
Information Processing		Manual, paper-based, slow processes	Automated, real-time, deep analytical processing based on data patterns	Sultana & Rao (2024) (<i>Pattern identification & deep data analytics</i>)
Communication		Physical memos, letters, rigid face-to-face interaction	Voice-controlled systems, touchless digital interaction, centralized coordination	Chan & Shum (2018) (<i>Voice-controlled systems & digital coordination</i>)
Archiving & Infrastructure		Physical archives (cabinets), prone to damage and loss	Cloud-based architecture, IoT-integrated, high data accessibility	Hasiwar <i>et al.</i> (2024) (<i>Cloud-based microservices & system integration</i>)

Decision-Making	Intuition-based, subjective experience, reactive	Data-driven prediction, machine learning, and objective	Neiroukh <i>et al.</i> (2024); Pandey (2024) (<i>Predictive analytics & decision revolution</i>)
Employee Roles & Culture	Administrative operators, routine task execution	System supervisors, innovation collaborators, data-adaptive roles	Syafi'i <i>et al.</i> (2023); Kasde (n.d.) (<i>Innovation culture adaptation & digital skills</i>)

Source: Own Compilation (2025)

This transformation indicates that AI shifts the function of the office from a purely administrative workspace to a data-driven coordination hub, similar to the institutional shifts observed in prior studies on public organizations.

New Organizational Identity of Offices within the Smart Office Ecosystem

The implementation of Artificial Intelligence (AI) and the Internet of Things (IoT) has reshaped the identity of the modern smart office. The office is no longer perceived merely as a physical space, but as a coordinated system connected through digital devices, sensors, and automated algorithms. The identity of offices in the AI era is constructed upon three components: digital infrastructure, automation systems, and human adaptive capability. This aligns with the findings of Hasiwar *et al.* (2024), which argue that integrating microservices architecture and IoT devices enables offices to transform into digital entities capable of autonomously personalizing workspaces.

In smart offices, lighting, room temperature, space utilization, security, and attendance systems can be automatically controlled through IoT sensor data. AI enables predictive environmental adjustments based on usage patterns, providing comfort while simultaneously reducing energy consumption. The system's ability to monitor environmental conditions in real time reinforces the notion that modern offices function as responsive and intelligent work environments, as explained by Ulla, Preethi, & Sapna (2024) and Hasiwar *et al.* (2024) regarding data-driven energy efficiency and user comfort.

AI also redefines employee roles. Workers no longer function solely as administrative executors, but as system managers, behavioral analysts, and data-driven decision-makers. This shift is supported by Neiroukh *et al.* (2024), who state that AI enhances strategic decision-making capacity. Thus, the identity of contemporary offices represents a synergy between intelligent technologies and human behavior oriented toward innovation and sustainability, creating alignment between operational efficiency and environmental responsibility (Pandey, 2024).

This transformation also presents challenges, including employee resistance, gaps in digital literacy, and risks of workplace dehumanization. Therefore, strengthening organizational culture and human capital remains essential to the success of smart office implementation. Organizations must invest in digital skills training and ensure managerial commitment to foster a culture that supports technological adaptation (Syafi'i, 2023).

Evaluating the Effectiveness of AI Integration in Achieving Sustainable Offices

The integration of AI within smart office ecosystems serves as a critical catalyst for achieving organizational sustainability targets. In line with green management principles, intelligent technologies reduce resource inefficiencies, minimize operational waste, and optimize facility utilization. This reflects Sharma and Mehta's (2025) argument that integrating green practices such as Green HRM not only benefits the environment but also correlates positively with productivity and institutional competitiveness.

Operationally, the effectiveness of AI in green office initiatives is evident in energy management and work process transformation. Through IoT sensors integrated with predictive analytics, systems can automatically regulate lighting and room temperature based on real-time occupancy data. This supports findings from Ulla, Preethi, and Sapna (2024) as well as Hasiwar *et al.* (2024) that data-driven environmental adjustment significantly reduces energy waste. Additionally, the shift from paper-based administration to automated digital documentation greatly reduces physical waste, a key component of green management strategies toward sustainable operations (Pandey, 2024; Yajman, 2025).

Despite its ecological benefits, the realization of AI-enabled green offices faces complex challenges. Infrastructure readiness and data security assurance remain critical factors influencing successful implementation (Asrul, 2025; Sultana, 2024). Meanwhile, non-technical challenges such as resistance to new work patterns demand inclusive management approaches. Therefore, the effectiveness of AI in fostering environmentally sustainable workplaces depends on coherence between technological readiness and human resource governance, particularly through training and cultural formation that support digital transformation (Syafi'i, 2023)

Repositioning Human Resources and Governance in AI-Based Offices

AI-driven office transformation necessitates a strategic reconfiguration of employee roles and organizational governance. As emphasized by Syafi'i *et al.* (2023), successful digital transformation cannot rely solely on technology adoption; it requires alignment between human capability and digital systems to ensure organizational continuity. In this context, implementing AI must coincide with Green Human Resource Management (GHRM), which embeds environmental awareness and sustainability into workplace values (Sharma & Mehta, 2025).

To support this transition, continuous development of employee competencies through digital skill training becomes imperative (Kasde, 2021). Workers must be equipped with data literacy and technical understanding of automation systems to successfully adapt. However, technical skills must be balanced with organizational policies that encourage environmentally responsible behaviors. Although AI and IoT serve as enablers that provide accurate monitoring and data (Pandey, 2024), long-term energy efficiency and waste reduction ultimately depend on human commitment supported by strong organizational culture (Yajman, 2025).

This dynamic creates an urgent need to reposition human roles within AI-based work environments. Employee functions evolve from static administrative tasks to strategic roles, including:

- a. Office Data Analyst: Utilizing AI-based analytical insights to support strategic decision-making (Sultana, 2024).
- b. IoT System Manager: Ensuring integration and maintenance of digital infrastructure.
- c. Information Security Supervisor: Managing data privacy and digital security risks (Neiroukh, 2024).
- d. Sustainability Culture Facilitator: Promoting ethical and eco-conscious practices in daily operations (Triono, 2025).

Thus, modern AI-driven offices are not merely collections of advanced devices but holistic ecosystems that integrate digital technologies with adaptive human behavior. This synergy is key to maintaining organizational relevance, competitiveness, and agility within the information-driven economy (Asrul, 2025; Malay *et al.*, 2023).

DISCUSSION

The ontological transformation of offices in the digital era highlights a shift from traditional offices as passive workspaces to entities capable of acting as intelligent agents. AI and IoT integration enable offices not only to support administrative activities, but also to autonomously execute operational decisions such as regulating lighting or temperature. This capability shifts oversight functions from humans to algorithms, positioning the office as a managerial actor that contributes to resource efficiency. This interpretation extends Hasiwar *et al.* (2024), who emphasize technical personalization through microservices architecture, by highlighting managerial implications wherein technology assumes partial control of organizational governance, consistent with Neiroukh *et al.* (2024) on AI-driven operational transformation.

This study identifies a technology–ecology paradox in implementing green office concepts. On one hand, digitalization and IoT devices consume energy; on the other, they are indispensable tools for reducing consumption and improving efficiency. The paradox is resolved through strong organizational culture. Technology acts as a hard enabler by providing infrastructure and data, while cultures shaped by GHRM acts as a soft enabler aligning employee behavior with sustainability goals. These findings strengthen Sharma and Mehta's (2025) arguments on collective awareness, where smart office technologies provide feedback that makes ecological impact measurable, aiding value internalization.

The repositioning of human roles in intelligent offices challenges assumptions that automation leads to dehumanization. Instead, AI promotes skill upgrading toward more strategic capacities. Routine administrative tasks are automated, while employees shift to analytical, supervisory, and data-driven decision-making roles. This shift demands "dual intelligence," namely digital literacy and ethical-environmental sensitivity, as emphasized by Triono and Wijaya (2025). Thus, successful smart office implementation is determined by human adaptivity rather than technology alone, aligning with managerial commitment prerequisites outlined by Syafi'i *et al.* (2023).

Overall, the integration of AI, smart office systems, and green management forms what can be conceptualized as an Adaptive Organizational Ecosystem characterized by responsiveness to environmental change through real-time data, inclusive and barrier-free work environments supported by technology, and ecological sustainability treated as a performance metric equal to profitability. These findings affirm that in modern management, technological and sustainability strategies can no longer operate independently; they must be jointly designed to address market complexity and rising global ethical demands.

CONCLUSIONS

This study aims to examine the role of Artificial Intelligence (AI) in transforming office management toward a sustainable smart office model, and the findings show that AI integration fundamentally enhances efficiency, resource optimization, and environmental sustainability. AI and IoT reduce energy consumption, support automation, and enable data-driven decision-making, while GHRM strengthens the cultural foundation needed for sustainable practices. Although AI offers substantial benefits, its effectiveness depends on infrastructure readiness, employee digital competencies, and strong governance to address challenges such as privacy risks and resistance to change. Overall, AI–IoT–GHRM synergy provides a strategic framework for developing adaptive, efficient, and environmentally responsible office management systems. The integration

of AI with the Internet of Things (IoT) fundamentally repositions the office from a passive administrative space into an autonomous intelligent system capable of analyzing data, automatically adjusting environmental conditions, and optimizing resource usage in real time. This ontological shift emphasizes that the role of AI is not merely a tool for efficiency but a vital catalyst for achieving sustainability objectives. The application of AI in smart offices empirically contributes significantly to carbon footprint reduction through energy optimization and process digitalization that minimizes physical waste, while simultaneously enhancing the quality of the work environment. However, the optimal deployment of this technology remains contingent upon human factors, wherein Green Human Resource Management (GHRM) plays a strategic role in shaping an adaptive and ecologically oriented organizational culture. Nonetheless, implementation challenges persist, encompassing critical issues related to infrastructure readiness, data security, and cultural resistance among employees, underscoring that the success of digital transformation requires a holistic, inclusive, and ethically governed managerial strategy. Overall, this research asserts that the synergy among AI, IoT, and GHRM forms a future-oriented office management model that is efficient, adaptive, and environmentally sustainable, providing a foundation for organizations to design sustainable strategies amid global competitive dynamics.

ACKNOWLEDGMENT

The author extends sincere gratitude to Prof. Dr. Harmon Chaniago, M.Si., as the lecturer of the Office Management course, for his guidance, direction, and invaluable insights throughout the preparation of this article. Appreciation is also conveyed to Dra. Sri Surjani Tjahjawati, M.Si., as the academic advisor, for her continuous academic support and motivation during the course of study. Furthermore, the author expresses appreciation to Abdul Malik Sayuti, S.Fil., M.B.A., Head of the Diploma Program in Business Administration at Politeknik Negeri Bandung, for providing facilities, opportunities, and an academic environment that supported the completion of this article. With deepest gratitude, the author sincerely thanks all parties for their assistance, support, and guidance throughout this process.

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