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Artificial Intelligence in Sustainable Management: Driving Environmental Transitions and Organizational Performance

Onyemaechi Deborah Chinomso¹, Babatunde Olayinka Alege², Banjo Comfort Janet³, AFOLABI IDOWU OLUWATOYIN⁴, Adeyemi Moses Salako⁵, AJEIGBE OPEYEMI TUNMISE⁶

¹ Imo State University, Owerri (onyemaechideborah@gmail.com | ORCID: 0009-0006-7227-2832)

² Ajayi Crowther University, Oyo (alegeobabatunde@gmail.com | ORCID: 0009-0001-6187-9587)

³ University of Lagos (banjoc090@gmail.com | ORCID: 0009-0000-7151-8040)

⁴ Redeemer's University, P.M.B 230, Ede, Osun State (afolabiidowuoluwatoyin03@gmail.com | ORCID: 0009-0002-0950-7185)

⁵ Bayero University Kano (salakoadeyemi8@gmail.com | ORCID: 0009-0008-2001-1707)

⁶ Obafemi Awolowo University, Ile-Ife, Nigeria (opeyemiajeigbe@gmail.com | ORCID: 0009-0006-4300-7706)

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ABSTRACT :

Organizations across many industries are changing how they operate as they try to meet environmental targets while staying profitable. This paper looks at how computer systems that make or support decisions (commonly called artificial intelligence) help firms shift toward sustainable business practices without losing their competitive edge. In human resources, AI tools used for hiring and evaluating performance raise questions about whether employees see these systems as fair. Managers need to think about both how decisions are made (procedural fairness) and how outcomes are distributed (distributive fairness), while also linking their talent management to environmental goals. Using the technology-organization-environment (TOE) framework as a guide, the evidence shows that adopting AI strengthens a firm's ability to sense and act on opportunities for sustainable innovation. These capabilities help companies use resources more efficiently, reduce their environmental impact, and meet environmental regulations. In sectors like banking and telecommunications, AI tools improve customer service and regulatory compliance while also cutting energy use and supporting sustainable risk assessment. The paper concludes that weaving AI into everyday management is necessary for firms that want both strong performance and lasting environmental sustainability.

Keywords: Artificial intelligence; Sustainable management; Environmental transitions; Organizational performance; Technology-organization-environment framework.

1. Introduction

Companies around the world are under growing pressure to adopt more sustainable ways of doing business without sacrificing performance. As environmental rules get stricter, managers have to pay more attention to ecological responsibility alongside financial growth. AI has become an important tool in this shift. By processing large amounts of data and helping streamline complex workflows, AI systems allow organizations to make more informed decisions that also consider the environment.

But bringing these systems into existing management structures is not simple. Adopting AI changes how companies recruit staff, assess performance, and interact with the outside world. To get the most out of these technologies, managers need to balance efficiency with fairness - making sure that technological changes are fair, transparent, and aligned with long-term sustainability goals. This paper examines the connections between AI, organizational management, and environmental improvements across several industries.

2. Literature Review

2.1 Talent Management and Organizational Justice

2.2 The Technology-Organization-Environment Framework

2.3 Cross-Sector Applications and Sustainability

2.4 AI, Green Innovation, and Environmental Performance

2.5 Ethical Dimensions and Worker Autonomy

3. Methodology

This study uses a descriptive and analytical framework based on secondary data and existing organizational management literature. The research draws on the TOE framework, dynamic capabilities theory, and organizational justice theory to evaluate AI adoption across different industries, with a focus on telecommunications, banking, and manufacturing. The methodology examines the causal relationships between AI integration, organizational capabilities, innovation outcomes, and environmental sustainability.

4. Findings

The analysis reveals three main findings about the role of AI in sustainable management:

Enhanced Dynamic Capabilities: Organizations that adopt AI show stronger sensing and seizing capabilities. Wong and Ngai [4] found that TOE factors positively influence dynamic capabilities for AI adoption, which in turn improve operational performance. These capabilities help firms identify environmental risks earlier and implement sustainable innovations faster than competitors.

Green Innovation and Resource Optimization: Across service and manufacturing sectors, AI applications directly support green innovation and reduce waste. Lin et al. [11] found that AI use drives both green product and green process innovation, with green culture strengthening these effects. Liang et al. [19] showed that industrial robot adoption (a key form of AI) significantly improves corporate green innovation by increasing production efficiency, human capital quality, and environmental governance capability. In banking, RPA combined with lean methods reduces processing time and resource consumption [7].

Organizational Justice is Necessary for Success: The success of AI in driving sustainable performance depends on how people perceive and accept these systems. Newman et al. [1] demonstrated that algorithmic decisions are seen as less fair than human decisions, reducing organizational commitment. Bennett and Martin [3] argue that managers must address distributive, interpersonal, informational, and procedural justice concerns when deploying AI in talent management. If hiring and performance systems lack fairness, the resulting drop in employee morale and trust prevents the successful execution of green organizational strategies. Chowdhury et al. [20] found that organizations need to develop not just technical AI resources but also non-technical ones - human skills, leadership support, organizational culture, and governance strategies - to realize the benefits of AI in HRM.

Table 1: AI Capabilities and Sustainable Organizational Outcomes

Operational Area	Sustainable Outcome	Supporting Literature
Dynamic Capabilities	Early environmental risk detection	[4]
Green Innovation & Resource Optimization	Reduced resource consumption & higher efficiency	[7, 11, 19]
Organizational Justice & Talent Management	Workforce trust required for green strategies	[1, 3, 20]

Source: Compiled from Research Findings

5. Conclusion and Recommendations

5.1 Conclusion

AI is not just a tool for cutting costs or boosting profits; it can also help drive environmental improvements. By strengthening dynamic capabilities, supporting green innovation, and streamlining operations, AI allows organizations to meet sustainability goals while staying competitive. But the technology must be managed responsibly. Ensuring fairness in AI-driven talent management is necessary to maintain the workforce trust needed for long-term sustainable success. Organizations also need to invest in complementary resources - human skills, change management capability, and green knowledge management - to fully realize AI's environmental benefits.

5.2 Recommendations

Managers should regularly audit AI hiring and performance systems to ensure procedural and distributive fairness, thereby protecting employee trust and morale [1, 3].

Organizations should use the TOE framework to identify specific areas where AI can reduce energy use and physical waste [4, 5].

Firms should invest in developing both technical AI skills (machine learning, data analytics) and managerial AI skills (strategic understanding of AI applications) to drive disruptive innovation for sustainability [21].

Corporate leaders should align their technology investments with their environmental policies, ensuring that AI is actively used to monitor and improve environmental compliance [8, 9, 10].

Companies should build a green culture and invest in green knowledge management to strengthen the link between AI capabilities and environmental performance [11, 12].

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