Exploring the Role of Responsible AI in Knowledge Management for Sustainability Outcomes: A Systematic Literature Review

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Abstract. *Organisations increasingly adopt artificial intelligence (AI) to enhance decision-making, increase organisational efficacy and build sustainable organisations. In this context, AI is reshaping how organisations create, store and use knowledge towards achieving sustainable outcomes. This study addressed this context by conducting a systematic literature review (SLR) of 64 peer-reviewed publications. Thematic analysis identified five themes: AI-KM-sustainability integration, responsible AI governance, KM-sustainability mechanisms, organisational and human enablers, and AI capability and environmental outcomes. The findings indicate that sustainability outcomes emerge when AI capability is mediated by KM processes, moderated by governance structures, and enabled by human–organisational factors. The study proposes a sociotechnical conceptual model to operationalise the findings.*

Keywords. artificial intelligence, responsible AI, knowledge management, sustainability, ESG, governance, socio-technical systems

1 Introduction

Artificial intelligence (AI) is reshaping how organisations create, store, and use knowledge (Haan, 2026). Indeed, 72% of businesses have adopted AI for at least one business function (Haan, 2026). This considerable increase in a short period is perpetuated by the launch of popular large language models, such as *ChatGPT* (Mishra, 2025). Nevertheless, the rapid diffusion of AI has not been without friction. Privacy violations and environmental costs have emerged as pressing ethical and societal concerns. Simultaneously, global sustainability imperatives compel organisations to embed sustainability into their core operations (Zucker, 2026). These imperatives are driven by the United Nations' Sustainable Development Goals (SDGs) (United Nations, 2015), environmental, social, and governance (ESG) regulations, and stakeholder pressure (Zucker, 2026).

Papagiannidis et al. (2022) suggest that AI could accelerate the acquisition, processing, and application of knowledge in ways that support measurable sustainability outcomes. However, more than just the technology adoption alone is necessary to realise that potential. AI should be deployed responsibly within knowledge management (KM) practices that are aligned with sustainability goals. The combination of responsible AI, KM, and sustainability thus formed the focus of this study, exploring the following research question: *What is the role of responsible AI in KM for achieving sustainability outcomes*?

In this way, the study spans three distinct but intersecting streams of literature. Alavi et al. (2001) posit that knowledge management has evolved from early ideas of organisational memory and knowledge codification towards more dynamic, capability-based perspectives that highlight acquisition, sharing, and integration as core organisational KM competencies (Santos et al., 2025). Recently, the integration of AI into organisational processes has further transformed KM, enabling automated capture and real-time synthesis of large datasets (Davenport et al., 2018). Moreover, sustainability has emerged as a critical factor for organisations, with researchers beginning to examine how knowledge (and thus data and information) processes and AI capabilities can be harnessed to advance ESG goals (Kumar et al., 2025; Halbusi et al., 2023).

The remainder of the paper is organised as follows: Section 2 reviews the literature background on responsible AI, KM and sustainability; Section 3 presents the research method; Section 4 describes the findings of the research; Section 5 discusses the themes of the findings in relation to the research question; and Section 6 concludes the research and recommends future research possibilities.

2 Background

The term "responsible AI" is used increasingly in literature and industry, yet it is an inconsistently defined concept (Jobin et al., 2019; Theodorou & Dignum, 2020). The differences lie in the emphasis between ethical principles, governance mechanisms, and operational practices (Papagiannidis et al., 2025). In this study, responsible AI is defined as AI systems that are "accountable, human-centric, technically robust, transparent, fair and promote societal and environmental well-being" (Papagiannidis et al., 2025). Papagiannidis et al. (2025) specifically outline the governance dimensions of accountability, transparency, robustness and human-centricity, and demonstrate their positive impact on knowledge-management capabilities and competitive performance (Al Halbusi et al., 2024; Papagiannidis et al., 2022).

Al Halbusi et al. (2023) define knowledge management as the "organisational processes of creating, storing, retrieving, sharing and applying knowledge" across an organisation. Thus, KM is reframed as a strategic capability rather than as infrastructure, since it directly affects how organisations learn, adapt, and deploy knowledge to achieve organisational goals. The Knowledge-Creating Company (Nonaka & Takeuchi, 1995) is the foundational KM work that describes knowledge as a dynamic, socially embedded process instead of just a finite organisational resource. AI increasingly affects KM within modern organisational contexts as it rises in popularity (Mishra, 2025). AI systems enhance the capturing, processing, and dissemination of large volumes of knowledge, thus transforming KM from a primarily human-driven process into a hybrid human–machine system (Santos et al., 2025; Alzeiby et al., 2026).

Santos et al. (2025) define sustainability as "the capacity to meet present needs while protecting the environment, advancing social equity and maintaining economic resilience in the long term". A widely adopted framework for operationalising sustainability is the Triple Bottom Line (TBL), introduced by John Elkington (1994). The TBL framework emphasises that organisational performance should be evaluated across environmental (planet), social (people), and economic (profit) outcomes that are interconnected (Elkington, 1994).

In contextualising such gaps, Makarius et al. (2020) propose a sociotechnical-system (STS) framework that combines the novelty of AI and its scope with an organisational socialisation process to build "sociotechnical capital". Drawing on sociotechnical theory, organisational performance is shaped by the joint optimisation of both social and technical systems (Alzeiby et al., 2025; Janse, 2022).

3 Research methodology

This paper aimed to identify how AI could be used responsibly to improve knowledge management for sustainability outcomes. The researchers conducted a systematic literature review (SLR) to achieve this outcome by synthesising the current body of knowledge relating to the concepts at hand (Boland et al., 2014). The SLR was executed by applying the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, and was conducted across four databases: *ScienceDirect*, *SpringerLink*, *Scopus*, and *MDPI*. These databases were chosen based on existing literature that demonstrated complete coverage of the topic (Okoli, 2015). The topic spans AI, KM, and sustainability, of which the relevant literature is dispersed across information systems, management, environmental studies, and engineering, providing broad coverage of the interdisciplinary topic (Okoli, 2015).

Before applying the search string, the study had already gathered four relevant papers, one from each database. These papers directly addressed the research question and served as anchor studies to confirm that the chosen databases were relevant and appropriately scoped. The following search string was used for *ScienceDirect* due to a limit of eight Boolean operators: ("Artificial Intelligence" OR "machine learning" OR "deep learning" OR "neural networks" OR "NLP" OR "intelligent systems") AND ("knowledge management") AND ("sustainability" OR "sustainable development" OR "environmental sustainability" OR "circular economy" OR "ESG" OR "SDGs") AND ("responsible AI" OR "ethical AI" OR "AI governance" OR "algorithmic transparency" OR "explainable AI" OR "trustworthy AI"). The review included English-language, peer-reviewed journal articles, conference papers, and books published between 2023 and 2026 that explicitly addressed at least two of the three core constructs (AI/responsible AI, knowledge management, sustainability), while excluding duplicates, papers without full-text access, and studies focused solely on technical AI architecture or non-organisational contexts.



Figure 1. Total number of papers extracted and analysed

Initially, 406 papers were obtained from the databases (*ScienceDirect* = 152, *Scopus* = 12, *Springer* = 209, *MDPI* = 33). An additional four records were identified through other sources, as shown in Fig. 1.

After removing duplicates, 399 records remained. Following specific screening, 88 records were excluded for not being in English, not being relevant to the research topic, or for lacking full-text access. Thereafter, 247 full-text articles were excluded for either being introductory or entirely about technical aspects of AI, or for only discussing AI, KM, or sustainability in silos, with 64 publications remaining for inclusion in the SLR. The PRISMA flow diagram (Fig. 1) provides a visual summary of the process.

Thematic analysis synthesised the extracted data and identified patterns across the 64 included papers. Thematic analysis is a qualitative analytical method used to identify, analyse, and report recurring patterns and themes within data, enabling the systematic organisation and interpretation of complex datasets (Braun & Clarke, 2006). It is particularly suited to SLRs in information systems and management research where the aim is to construct interpretive themes from heterogeneous sources rather than to aggregate statistical findings (Okoli, 2015; Kitchenham, 2004). Thematic analysis is designed to answer how or why questions, thus making it appropriate for this study about how responsible AI can be used to improve KM for sustainability outcomes.

4 Findings

Based on the core keywords, the thematic analysis identified six themes, as shown in Table 1.

Table 1. Identified themes

Main Themes	Sub-Themes	Author (Research Paper)
1. AI, KM, and Sustainability Integration	1.1 AI applications and KMS	Halbusi et al. (2023) Papagiannidis et al. (2022)
	1.2 Carbon mitigation	Che et al. (2026) Song (2026) Sohail et al. (2025) Mohieldin et al. (2025)
	1.3 GenAI (ChatGPT pioneers)	Hu et al. (2023) Li and Yuan (2026) Witkowski and Wodecki (2026) Dai et al. (2026)
	1.4 Integration mechanisms	Alzeiby et al. (2026) Matsumoto et al. (2025) Santos et al. (2025)
2. Responsible AI Governance for Knowledge Management	2.1 Principles and transparency	Papagiannidis et al. (2025) Akbarighatar (2025) Bughin (2025) Trier et al. (2023) Behera et al. (2023) Ehrlinger and Naumann (2025)
	2.2 Digital transformation	Fei et al. (2025) Uren and Edwards (2023) Molina-Carmona and García-Peñalvo (2025) Craciunn et al. (2025)
	2.3 Public sector	Ruvalcaba-Gomez and Garcia-Benitez (2025) Daud et al. (2024) Nascimento et al. (2025) Sundberg and Holmström (2024)
	2.4 Decision-making	Papagiannidis et al. (2023) Trier et al. (2023) Fernández-Fernández et al. (2026) Xia et al. (2026)
3. Knowledge Management Mechanisms for Sustainability Outcomes	3.1 Green KM	Kumar et al. (2025) Wang and Zhang (2024) Al Halbusi et al. (2025)
	3.2 Moderating effects	Al Halbusi et al. (2025) Zhang and Yang (2024) Li and Ding (2026)
	3.3 Mediating relationships and productivity paradox boundary condition	Marvi et al. (2025) Santos et al. (2025) Zhang and Yang (2024) Khalil et al. (2025)
4. Organisational and Human Enablers of Responsible AI Adoption	4.1 Employee factors	Yin and Hoang (2026) Seema and Saini (2026) Xu et al. (2026) Li and Ding (2026)
	4.2 Leadership factors	Chang et al. (2026) Awan et al. (2026)
	4.3 Knowledge sharing	Bejinaru (2026) Sposato (2025) Matsumoto et al. (2025)
5. AI Capabilities for Sustainability Outcomes	5.1 AI Capability	Kumar et al. (2025) Al Halbusi et al. (2025) Shahzad et al. (2026)
	5.2 Environmental sustainability performance	Zhang and Yang (2024) Che et al. (2026) Marongiu et al. (2025)
	5.3 Green technology innovation	Huang et al. (2025) Fei et al. (2025) Wang and Zhang (2025)

Theme 1: AI, KM, and sustainability integration

The literature consistently positions knowledge management as the mechanism through which AI capabilities are translated into sustainability outcomes. Halbusi et al. (2023) find in a survey of Iraqi firms that knowledge management systems (KMS) significantly increase business sustainability. The study also reports that AI adoption moderates the relationship between KMS and sustainable business. Papagiannidis et al. (2022) find in a survey of 144 Nordic firms that responsible AI governance practices positively impact knowledge management capabilities. Raina et al. (2026) find in a systematic review that the integrated consideration of AI management, knowledge creation, and sustainable business outcomes aligned to the SDGs remains an underdeveloped research area. Beyond knowledge creation, integration mechanisms such as knowledge systems and collaborative digital environments appear to connect AI technologies with sustainable business models (Alzeiby et al., 2026). Collectively, these findings suggest that AI does not contribute directly to sustainability, but rather through its integration with organisational knowledge processes, highlighting a need for more holistic frameworks that link AI, KM, and sustainability.

Theme 2: Responsible AI governance

Responsible AI governance emerges as a foundational condition for effective knowledge management and sustainable AI deployment. Papagiannidis et al. (2025) outline structural, relational, and procedural governance practices and find that transparency is the most frequently cited principle across 67% of studies reviewed. Ehrlinger and Naumann (2025) highlight data quality as foundational, arguing that poor data quality undermines explainability and corrodes trust in AI-driven KMS. Papagiannidis et al. (2022) report unintended consequences of AI-based decision-making in the absence of governance mechanisms, including reduced transparency, eroded trust, and diminished knowledge sharing. Overall, the literature suggests that responsible AI governance provides the institutional conditions necessary for AI-generated knowledge to be accepted, shared, and applied in support of sustainability objectives.

Theme 3: KM mechanisms for sustainability

Kumar et al. (2025) report that AI capability positively affects green technology innovation and that green KM strengthens this relationship. Al Halbusi et al. (2025) find that KM systems strengthen the pathway between AI capability and sustainable performance. The literature consistently positions KM as a mediating and moderating mechanism through which AI contributes to sustainability outcomes. Al Halbusi et al. (2025) utilised an artificial neural network (ANN) analysis to rank KMS as the third most important predictor of sustainable performance (59% normalised importance), behind competitive pressure (100%) and AI capability (73%). Zhang and Yang (2024) additionally confirm that absorptive capacity partially mediates the impact of AI adoption on corporate environmental and social performance. Rather than acting as an independent driver of sustainability, KM appears to function as the organisational capability through which AI-generated value is converted into measurable sustainability outcomes. This recurring pattern positions KM as the central linkage between responsible AI governance and sustainability performance.

Theme 4: Organisational and human enablers

The successful integration of AI into knowledge management is influenced by organisational and human factors as much as technological capability. Across the literature, employee readiness, leadership support and knowledge-sharing cultures are repeatedly identified as conditions that enable responsible AI adoption. Matsumoto et al. (2025) propose a Human–AI Collaboration SECI model, arguing that human–AI collaboration transforms each stage of organisational knowledge creation. These findings align with socio-technical perspectives, indicating that sustainability outcomes depend not only on AI capabilities but also on the organisational environment in which those capabilities are embedded.

Theme 5: AI capabilities for sustainability outcomes

The literature demonstrates a positive relationship between AI capability and sustainability performance, particularly in environmental contexts. Che et al. (2026) find that AI significantly enhances green management innovation efficiency, while Song (2026) reports that AI adoption is associated with a reduction in carbon emissions per unit of output. However, these benefits are rarely achieved through technological capability alone. Instead, the findings indicate that AI capabilities generate the strongest sustainability outcomes when supported by effective governance structures and knowledge management practices. Kumar et al. (2025) report that AI capability explains 54% of the variance in green technology innovation, while GTI explains 47% of the variance in environmental sustainability performance. Al Halbusi et al. (2025) find that AI capability and green innovation together explain 63% of the variance in sustainable performance. Wang and Zhang (2025) find that ethical anxiety negatively moderates the relationship between employees' AI digital adoption and green innovation performance, indicating that responsible governance is necessary to mitigate employee uncertainty. This suggests that AI capability represents a necessary but insufficient condition for sustainable organisational performance.

5 Discussion

This study sought to identify how AI could be used responsibly to improve knowledge management for sustainability outcomes.

Responsible AI
The findings show that responsible AI governance is consistently associated with stronger KM capabilities. Accountability, transparency, robustness, and human-centricity emerged as the governance dimensions most frequently linked to trustworthy AI-enabled knowledge processes.

Knowledge Management
KM functions as the organisational mechanism through which AI-generated knowledge is validated, shared, and applied. The literature positions KM as both a mediator and a moderator between AI capability and sustainability performance.

Sustainability
Sustainability outcomes are most commonly framed through ESG goals, green innovation, and environmental performance. AI contributes most effectively to these outcomes when embedded within governed and knowledge-intensive organisational systems.

Socio-technical perspective
From an STS perspective, sustainability outcomes depend on the alignment of the technical system (AI capability), governance measures, organisational culture, human capabilities, and KM processes (Makarius et al., 2020). The productivity paradox appears socio-technical rather than technological, since governance, KM, and human adaptation are required to ensure that AI indeed increases productivity and sustainability performance (Khalil et al., 2025). This model differentiates from prior work by positioning KM as a central socio-technical mediator rather than an independent antecedent, and by reconceptualising governance as a moderating organisational capability rather than a compliance mechanism.

AI literacy and AI self-efficacy (AISE) significantly advance knowledge utilisation, but implementations fail when employees experience algorithmic anxiety or resist unlearning outdated knowledge structures. This socio-technical friction highlights why cognitive flexibility and strategic adaptability from leadership are required to support responsible AI deployment. Consequently, organisations should prioritise human–AI collaborative workflows over full automation. Practical execution must focus on establishing cross-functional AI–KM governance committees, implementing targeted AI literacy training workshops, and integrating rigorous ethical AI reporting mechanisms to monitor ESG impacts.

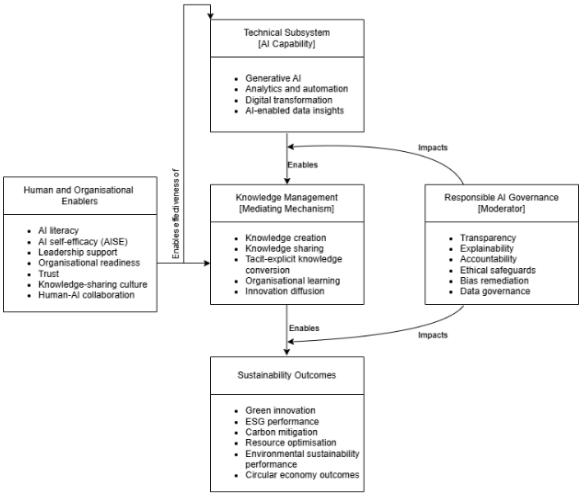


Figure 2. Socio-technical operationalisation of how responsible AI enables KM, which enables sustainability outcomes, supported by human and organisational factors.

Fig. 2 presents a conceptual model to operationalise the findings, highlighting responsible AI governance dimensions (accountability, transparency, robustness and human-centricity) and positively influencing KM capabilities, including knowledge acquisition, sharing, integration, and application. These KM capabilities then support sustainability outcomes across environmental, social, and governance dimensions, while organisational and human enablers strengthen the integration process. However, the model is not strictly linear, as sustainability outcomes might reinforce future AI adoption, governance maturity, and KM development through organisational learning feedback loops.

6 Conclusion

This study addressed the fragmentation between responsible AI, knowledge management, and sustainability by synthesising 64 recent publications into an integrated conceptual framework. The findings indicate that responsible AI governance strengthens KM capabilities, which, in turn, supports measurable sustainability outcomes. Study limitations included selecting a short publication window (2023 to 2026), restricting papers to those written in English, searching limited databases, and not empirically testing the conceptual model. Future research should empirically test the proposed conceptual model across industries and national contexts, particularly examining how governance practices influence AI-enabled KM and ESG performance over time.

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