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Building a Responsible and Inclusive AI Ecosystem for UK SMEs: A Sustainable Model for Digital Transformation

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Abstract

Small and Medium Enterprises (SMEs) play an important role in the UK economy, they do accounting for more than 99% of all registered businesses, and they greatly contribute to employment, regional innovation, and economic stability (GOV.UK, 2023). Artificial Intelligence (AI) is widely viewed as a revolutionary force in competitiveness, helping to make data-based decisions (Y. Dwivedi et al., 2019), automate (L. Dwivedi et al., 2022), and innovate (Floridi & Cowls, 2022). However, even in the case of policy writing, the adoption of AI by UK SMEs is disorganized and inconsistent (Department of Science Innovation and Technology, 2025).

The obstacles to adopting AI are insufficient digital infrastructure (Tawil et al., 2024), a lack of AI skills (Chaudhuri et al., 2022), challenges in data-management (Khan et al., 2024), and financial and regulatory uncertainty (Hunady, 2025). The SMEs often have the legal frameworks that are not governed properly to fit the new regulatory frameworks, including the UK AI Regulation White Paper (Department of Science Innovation and Technology, 2025) and the EU AI Act (GOV.UK, 2023). Furthermore, the principles of Responsible AI such as transparency, fairness, and accountability are well-established (Bianchini & Lasheras Sancho, 2025) but cannot be implemented on the SME level due to limited resources and vague guidance (Jobin et al., 2019).

Fragmentation is also a challenge to the innovation ecosystem in the UK. Academia, government, and industry work in silos on a regular basis, which undermines the collaborative infrastructure needed to support the inclusion of digital transformation (Floridi & Cowls, 2022). The application of the Triple Helix model of innovation that encourages the collaboration of universities and industries with government has not been remarkably cash in on, despite its proven advantages to the diffusion of technology and responsible governance (Etzkowitz & Leydesdorff, 2000) . Although programs like BridgeAI by Innovate UK assist in AI innovation, their adoption in smaller businesses is still scarce (Bianchini & Lasheras Sancho, 2025; Floridi & Cowls, 2022; Jobin et al., 2019).

In the modern literature, the most of the studies focus on either the technical or ethical side of AI, and do not integrate or context-sensitive approaches that suit the needs of SMEs (Arroyabe et al., 2024; Schwaeke et al., 2025). There is also a significant lack of empirical studies that can reconcile responsible innovation, sustainability and policy alignment (Arroyabe et al., 2024; Cooper, 2025; Hunady, 2025). As a result, SMEs have a widening gap between innovation potential and ethical awareness.

The proposed research presupposes the creation of a Responsible AI Ecosystem Framework (RAIEF) specific to the UK SMEs that will combine ethical governance, collaboration in innovation, and compliance with regulations. Based on the principles of the Triple Helix and the Responsible Research and Innovation, the RAIEF is designed to provide a sustainable model that will bridge the gap between policy and practice and thus help to support the United Kingdom in its goal of leading inclusive and responsible, AI-driven digital transformation (Chaudhuri et al., 2022; Khan et al., 2024).

AI and SME Transformation

The artificial intelligence offers the small and medium-sized firms the unprecedented opportunities with regards to efficiency, productivity, and the ability to innovate (Dwivedi et al., 2022). However, its use is still inadequately low, particularly by companies that are not located in metropolitan centres (Tawil et al., 2024). The contributing factors include deficits in digital skills, ambivalence towards the payoff, data acquisition limitations, and a deep-seated culture of resistance to change (Y. Dwivedi et al., 2019).

Responsible AI Principles

An emerging body of research on the topic of Responsible AI (RAI) (such as the frameworks suggested by Floridi & Cowls, (2022); Jobin et al., (2019) highlights the principle of transparency, the principle of fairness, the principle of accountability, the principle of privacy, and the principle of human agency. However, most SMEs lack the internal mechanisms of governance that could facilitate the implementation or adherence to these normative standards (Bianchini & Lasheras Sancho, 2025).

Ecosystem Coordination and Triple Helix

The Triple Helix paradigm as introduced by Etzkowitz & Leydesdorff, (2000) views that the synergetic interaction between universities, industry and government is the key to sustainable innovation. The available literature thus exposes a strong lack of context-sensitive ecosystem models that integrate technical, ethical, and policy aspects with a particular focus on small business (Cooper, 2025; Ransbotham et al., 2022).

Significance of the Study

The research has significant contributions in academic, political and practical spheres. It serves a major gap in the research to suggest an ecosystem-based approach to the responsible use of AI among SMEs in the UK. The model combines ethics, systems of innovation, and policy-aspects that have been neglected in the previous studies (Arroyabe et al., 2024; Hunady, 2025; Schwaeke et al., 2025). Therefore, when applied to the Triple Helix framework (Etzkowitz and Leydesdorff, 2000), it explains how the presence of collaboration between academia, industry and government can foster ethical and sustainable change in AI. Politically, the research supports the UK National AI Strategy (2021) and the AI Regulation. It provides practical recommendations that can be used to develop inclusive and SME-cantered governance (Chaudhuri et al., 2022). The Responsible AI Ecosystem Framework (RAIEF) is, practically, a

scalable tool offered to SMEs. The framework assists organisations to operationalise ethical AI and enhance digital readiness and improve governance (Hunady, 2025).

In this study, we aim to adopts a mixed-methods research design, which combining quantitative survey data with qualitative inquiry to capture both the breadth and depth of AI adoption challenges among UK SMEs. Firstly, the primary data will be gathered through a structured survey of 150–200 SMEs, semi-structured expert interviews with stakeholders like policymakers and innovation stakeholders, further in-depth case studies of three to four SMEs at varying stages of AI adoption. The study is structured across four phases 1) secondary policy analysis, 2) SME survey and expert interviews, 3) case study-based framework development, and 4) stakeholder validation workshops

Expected Outcomes

The following will be the results of this research:

Responsible AI Ecosystem Framework (RAIEF) - a model that is practical and flexible and specific to businesses in the UK, small and medium size.

Policy brief placing the RAIEF in the context of the UK National AI Strategy (2021) and the AI Regulation White Paper (2023).

Academic research contributing on digital policy, SME innovation and AI ethics addressed towards journals.

Deliverables such as infographics and toolkits, which are knowledge-sharing products, are aimed at networks of SMEs, Local Enterprise Partnerships (LEPs) and regional innovation hubs.

Keywords:

Responsible Artificial Intelligence; Small and Medium Enterprises; Sustainable Model for Digital Transformation; Responsible AI Ecosystem Framework (RAIEF);

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