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Adopting Artificial Intelligence in Small and Medium-Sized Enterprises: A Practical Framework for Readiness, Governance and Value

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ABSTRACT

Small and medium-sized enterprises (SMEs) increasingly have access to artificial intelligence (AI) through affordable cloud services, yet many struggle to move from experimentation to lasting value. This review brings together established models of technology adoption — the Technology Acceptance Model, the Technology–Organisation–Environment framework and the diffusion of innovations — and relates them to the specific constraints of smaller firms: limited capital, thin specialist expertise, fragmented data and close owner involvement in decisions. It proposes a five-stage practical framework (purpose, readiness, pilot, governance and scale) and discusses the governance obligations that are emerging from international principles and the European Union's Artificial Intelligence Act. The article concludes that SMEs gain most when AI is tied to a clearly defined business problem, introduced through small measurable pilots, and supported by simple governance that addresses data quality, transparency and human oversight from the start.

Keywords: artificial intelligence; SMEs; technology adoption; digital transformation; AI governance

1. Introduction

Artificial intelligence (AI) has moved from research laboratories into everyday business software. Text generation, document classification, demand forecasting, customer-service assistants and image recognition are now offered as subscription services that require no in-house data-science team. For small and medium-sized enterprises (SMEs), which make up the overwhelming majority of firms in most economies, this lowers the entry barrier considerably. Yet lower cost does not automatically translate into value. Many smaller firms experiment with AI tools, see promising early results, and then fail to embed them into routine operations.

This review asks a practical question: what does a sensible path to AI adoption look like for an SME? It draws on well-established theories of technology adoption, relates them to the distinctive characteristics of smaller organisations, and proposes a staged framework that managers can apply without specialist resources. The article is a conceptual synthesis; it does not report new empirical data.

2. Theoretical foundations

2.1 Individual acceptance

The Technology Acceptance Model (Davis, 1989) explains the intention to use a technology through two beliefs: perceived usefulness and perceived ease of use. In an SME, where the owner-manager and a small team often both choose and use the tools, these beliefs carry unusual weight. A system that is useful in principle but awkward in daily work is quickly abandoned, because there is rarely an IT department to absorb the friction.

2.2 Organisational context

The Technology–Organisation–Environment (TOE) framework (Tornatzky & Fleischer, 1990) widens the lens. Adoption depends on the technology itself (its relative advantage, compatibility and complexity), on the organisation (size, resources, structure and management support) and on the external environment (competitors, customers, suppliers and regulation). For SMEs the organisational dimension is usually the binding constraint: budgets are limited, data are scattered across spreadsheets and separate applications, and specialist skills are scarce.

2.3 Diffusion over time

Diffusion of innovations theory (Rogers, 2003) reminds us that adoption is a social process. Innovations spread when they offer relative advantage, are compatible with existing values and practices, are not too complex, can be tried on a limited basis (trialability), and produce visible results (observability). Trialability and observability are especially relevant to AI in small firms: low-risk trials and visible early wins build the internal confidence that wider adoption requires.

3. Distinctive constraints of SMEs

Four characteristics distinguish SMEs from large enterprises in the context of AI.

- **Resource scarcity.** Capital and management time are limited, so every initiative competes directly with day-to-day operations.
- **Data fragmentation.** Useful data often exist, but in inconsistent formats, without clear ownership, and with gaps that reduce the quality of AI outputs.
- **Skills concentration.** Knowledge tends to sit with a few individuals; when they leave, capability can disappear.
- **Owner-centred decisions.** Decisions are fast but depend heavily on the owner-manager's understanding and attitude to risk.

These features are not only weaknesses. Short decision chains, close contact with customers and flexible processes allow SMEs to test and adjust new tools faster than larger organisations can.

4. A five-stage framework

Building on the theories above, the following framework is proposed as a practical guide.

Stage 1 — Purpose

Adoption should start from a business problem, not from the technology. Managers should name one or two processes where time, cost, errors or customer waiting are visibly high — for example answering routine enquiries, preparing quotations or reconciling invoices — and describe what a better result would look like in measurable terms.

Stage 2 — Readiness

A short readiness review covers data (Is the relevant information available, accurate and lawfully usable?), people (Who will own the tool and who will use it?), processes (Where exactly will the tool fit?) and suppliers (What does the vendor do with the firm's data?). This review need not be long; its purpose is to surface obstacles before money is spent.

Stage 3 — Pilot

A pilot of a few weeks, limited to one process and a small group of users, provides evidence at low cost. Success criteria — time saved, error rates, customer response times or staff satisfaction — should be agreed in advance and compared with the situation before the pilot. This applies the principles of trialability and observability directly.

Stage 4 — Governance

Before scaling, the firm should set simple rules: which data may be entered into AI tools, who checks AI-generated output before it reaches customers, how errors are recorded and corrected, and how customers are informed when they interact with an automated system. International principles such as the OECD Recommendation on Artificial Intelligence (OECD, 2019) emphasise transparency, robustness, accountability and human oversight. In the European Union, the Artificial Intelligence Act (Regulation (EU) 2024/1689) adds risk-based obligations, with the strictest requirements reserved for high-risk uses such as certain employment and credit decisions. Most SME uses — drafting, summarising, scheduling — fall into lower-risk categories, but transparency obligations and the duty to use systems responsibly still apply.

Stage 5 — Scale and review

Where a pilot meets its criteria, the tool can be extended to related processes. Scaling should be accompanied by training, documentation of how the tool is used, and a periodic review — for example every six months — of costs, benefits, risks and vendor terms.

5. Practical implications

Three implications follow for managers. First, value comes from integration rather than from the tool alone: a model that produces good drafts is only useful if the drafts flow into the firm's real workflow. Second, data housekeeping — consistent customer records, clear file structures, documented processes — is often the most valuable preparatory investment, because it improves every later initiative. Third, skills should be spread deliberately: pairing an enthusiastic early user with colleagues reduces dependence on a single person.

For policy makers and support organisations, the framework suggests that short practical programmes — readiness checklists, pilot templates and model governance policies — may help SMEs more than general awareness campaigns.

6. Limitations and future directions

This article is a conceptual review and the framework has not yet been tested empirically. Future research could follow SMEs through the five stages, compare sectors, and examine which governance practices are proportionate for very small firms. The rapid development of AI services also means that the balance of costs and risks will continue to change.

7. Conclusion

AI offers SMEs real opportunities, but value depends on disciplined adoption. Linking AI to a clearly defined problem, testing it through small measurable pilots, and adopting proportionate governance from the start allows smaller firms to benefit from AI while managing its risks.

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