Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin

LAIDLAW SCHOLARS

Investigating the key barriers preventing small and medium enterprises in Ireland from adopting artificial intelligence tools in their workflows

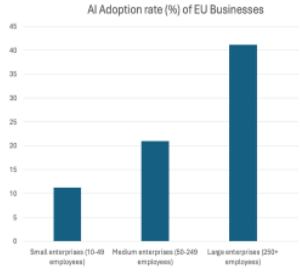
Liam Power Supervisor: Dr. Gaye Stephens School of Computer Science and Statistics

Introduction

Artificial intelligence (AI) are computer systems that can perform tasks which typically require **human-level intelligence**. AI is able to automate dull, repetitive work so that people can concentrate on **complex and creative tasks.**

Small and medium enterprises (SMEs) make up most of the **European economy**, representing **60% of the employees in Europe**. Despite their size, **SMEs** lag behind their larger counterparts since **large businesses** enjoy **four times** the rate of adoption compared to their small counterparts.

It is essential that **businesses adopt AI solutions** due to their productivity/ operational benefits to remain **competitive**.



Method

A **literature review** was conducted with the aim of identifying any relevant **barriers** discouraging **SMEs** from adopting **AI tools**. Using **Google Scholar** (for its wide, multidisciplinary coverage), I applied specified inclusion/exclusion criteria to **string-guided searches** and screened the text. I extracted data through a **structured sheet** and conducted **thematic analysis** using the data collection sheet, coding themes and accordingly. I then carried out **13 interviews with Irish SME decision-makers** across 10 locations to examine how the barriers identified in the literature are manifested in practice, here in Ireland, and to determine those which are **hardest to address** and available for **policy intervention.**

Literature Review Overview

This **review** takes into account **22 studies** of the **adoption of AI** among **small and medium-sized enterprises**. Most of the papers utilise **systematic literature reviews** (most using **PRISMA**), as well as **bibliometric**, **mixed-method**, **quantitative**, and **conceptual approaches**, and some use a combination of these for a more nuanced view. The research is extremely up-to-date, with **eight** studies being published in **2025** and **seven** in **2024**. The sizes of the studies range from **very large reviews** (for example, 383 articles) to **target collections** (for example, 34 articles), and **international coverage is guaranteed**, with frequent reference to **German SMEs** and coverage from the **sub-Saharan** countries.

The emphasis is on **AI**, **machine learning**, and **natural language processing**, with examples spanning from simple tools like **chatbots** to advanced **AI-powered automation**. The emphasis is on **business application** in use and making operations more efficient, with a clear shift towards integrating AI into other **digital technologies** and offering tools through **low-code/no-code platforms**. Barriers and enablers are **categorised** into five different types - **technological**, **organisational**, **environmental**, **financial**, and **ethical** - illustrating that the key to success lies in **moving on many fronts**. Later studies focus more on ethical and **responsible AI**, and also recording developments on more **affordable solutions.**

Literature Review Findings

Growing Insight

Earlier studies (Odesanya, 2022; Lu et al., 2022) were focused on **very specific use cases** like **ML/DL in cybersecurity,** due to cost and complexity barriers. Current studies (Aish et al., 2025) take a much more **broad view of drivers of adoption**, noting the growth of low-code/no-code platforms and how it is making **AI more accessible to SMEs**.

Comparative Regional Analysis

Yusuf et al. (2024) uncover mixed trends in adoption:

1. **Developed world:** Growing adoption, slowed by **absence of AI plan** and **talent shortage.**
2. **Emerging countries**: Face **financial difficulty**; perceive AI as **cost saving** and scalability imperative.
3. Overall, **poor infrastructure and skills weaknesses** reduce the adoption levels in **Africa and parts of Asia**.

Application Domains

AI spans a number of SME functions:

1. **Cybersecurity** (Odesanya, 2022): Rides on current **staff shortages**.
2. **Customer service** (Kedi et al., 2024): Hampered by expertise, resources, and cultural conservatism.
3. Production (Briatore et al., 2025): Focuses on domain-specific challenges that are unique.

While **broad support** (e.g., government subsidies) helps in adoption, there's a need for **special solutions in each field**.

Influencing Factors

Expert-based analysis (Aish et al., 2025) identified **14 influential factors**. The most significant were:

1. Support from Management (5.000)
2. Organisational Culture (4.800)
3. Financial Means (4.733)
4. Trialability (4.665)
5. Perceived Compatabilitly, Organisation Size, Training & Development (4.600)

b of the top seven point towards **organisational barriers**, which highlights the importance of leadership and culture over entirely technological matters in AI adoption.

Interview Overview

Research used **semi-structured 30-minute interviews**, conducted remotely or in person under ethics approval. Participation was **voluntary**, with **signed consent** and optional audio recording. Data was **pseudonymised** (e.g., "SME-0001"), stored securely, and could be withdrawn at any point.

Interviews began with **business context** and **digital maturity**, moved to **AI awareness**, barriers (**financial**, **technical**, **organisational**, **external**), **current/desired supports**, and finished with **recommendations** and **future plans**.

Table 1: Interview Summary Table - SME Businesses

SME ID	Business Type	Industry	Business Size
SME-001	Small legal practice; construction law specialist within wider PI/med-negligence firm	Legal services	7 solicitors + 7–8 support staff (≈14–15 staff)
SME-002	Media startup	Media / publishing	3 core employees now; ≈ 5 soon incl. VA and writer
SME-003	Not-for-profit enterprise support organisation	Advisory and training	11-50 staff
SME-004	General practice (GP)	Healthcare / primary care	~3 full-time medical staff
SME-005	Pottery studio and retail shop	Arts & crafts retail / ceramics manufacturing	Owner + 3 part-time staff (potter 2 days/week, two casual retail staff)
SME-006	Structural engineering design consultancy	Engineering / construction	~10 people
SME-007	Private secondary school	Education	~50 staff
SME-008	Small law firm	Legal services (property, litigation, mental health law)	2 solicitors + remote contractors/reception
SME-009	Optician practice and eyewear retail store	Health retail / optometry	9 staff including owner
SME-010	Regulatory consultancy for pharma/biopharma	Pharma/biopharma consulting	1 core consultant + ~5 associates

Interview Findings

AI awareness was **5.4/10** (median 5.5), varying significantly by industry and role:

1. High consciousness (**≈7-8/10**): Tech-native and science/engineering firms use AI every day in content, prototyping, and reporting but keep safety-critical processes separate.
2. Middle range (**≈5-6.5/10**): Service businesses, schools, healthcare have selective pilots (admin automation, diagnosis, compliance-focused trials).
3. Low awareness (**≈1.5 -4/10**): Smaller law firms state confidentiality, liability, fraud risk, and lack of trustable tools.

Primary Barriers

- **Risk**, **regulation**, and **compliance**: Accuracy, **GDPR**, **confidentiality**, industry regulations (courts, pharma verification, engineering safety) **restrict sharing and automation**. **Errors nullify** time savings, leaving companies to offline tools.

- Skills and capacity: SMEs **lack time**, **sector-specific training**, and practical instruction. **Generic guidance damages trust,** and governance and leadership transparency are not satisfactory in **larger organisations**.

Conclusion

Irish SMEs' greatest shortage is **skills, not funds**: **access** and **time-saving support** are needed to overcome the barriers to AI adoption.

Practical, **sector-specific training workshops** with **SMEs** given room to experiment tools in a **safe environment** with test data and unbiased coaching received the most interest from interviewees. Desires for features include:

1. **Training** and hands-on "**try it before you buy**" credits
2. **Accuracy** and **GDPR checklists**
3. Industry sector and **peer delivery** (regarded as more reliable than government)

Limitations

This is a **small set of interviews** conducted under a **limited timeframe**, so insights are self-reported, and may miss quieter or harder-to-reach voices. Securing a **truly non-random** sample was **impractical** during the timeframe, leading to sector and role skew plus interviewer and transcription effects, so results are indicative of a **small sample size** rather than **truly statistically representative**.

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