

Exploring the use of Artificial Intelligence by SMEs in EU countries. A comparative analysis

In the era of digitalisation, the accelerated development of Artificial Intelligence (AI) is profoundly changing the way businesses operate, regardless of their size. While AI adoption offers substantial opportunities for improving operational efficiency, innovation capacity, and market competitiveness, small and medium-sized enterprises (SMEs) face considerably greater structural and resource-related constraints compared to large firms. This study aims to examine the extent to which small and medium-sized enterprises in EU member states use AI-based tools. More specifically, it provides a comparative analysis of the degree of use of AI by businesses, depending on their size and sector of activity, highlighting structural disparities both within and between countries. Based on information obtained from the Eurostat database, the paper uses a research methodology that combines analysis based on key indicators on the use of AI with cluster analysis to highlight progress in the use of AI, discrepancies in the use of AI by categories of enterprises, and to identify both similarities and differences between EU member states. In addition, through our analysis, we comparatively identify how EU countries position themselves from the perspective of the use of AI by SMEs. The findings reveal significant cross-country heterogeneity in AI uptake, alongside persistent gaps between SMEs and large enterprises within the same national contexts. The results demonstrate that AI diffusion in the EU remains uneven, reflecting differences in digital maturity, sectoral structure, and national innovation ecosystems. By systematically mapping these disparities, the study contributes to the literature on digital transformation by offering an updated, comparative, and data-driven perspective on SME AI adoption at the EU level. Given the central role of SMEs in the EU economy, the paper argues that targeted policy interventions at European, national, and regional levels are essential to reduce structural barriers and accelerate AI diffusion. Strengthening SME access to AI capabilities is critical not only for firm-level performance but also for enhancing overall EU competitiveness in the global digital economy.

Keywords: Artificial Intelligence, Small and Medium Enterprises, Digital technology, Digital transformation

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