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GeoTech Tech Uptake Tracker: Patterns and Drivers of AI Diffusion Across the EU

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Introduction

Eurostat reports that "In 2023, 8% of enterprises in the EU with 10 or more employees used Artificial intelligence (AI) technologies to conduct their business" (**https://ec.europa.eu/eurostat/web/products-eurostat-news/w/ddn-20240529-2**). The most recent results indicate further expansion: "In 2024, 13.5% of enterprises in the EU with 10 or more employees used artificial intelligence (AI) technologies" (**https://ec.europa.eu/eurostat/web/products-eurostat-news/w/ddn-20250123-3**). Adoption continues to differ by enterprise size. According to Eurostat's digitalisation publication, "As with cloud computing, its use was more common in large businesses (30%) than in SMEs (7%)" (**https://ec.europa.eu/eurostat/web/interactive-publications/digitalisation-2024**).

In this context, the use of AI refers to the deployment of algorithmic and machine-learning based methods and systems within core operational, analytical or customer-facing processes of an enterprise. This encompasses the integration of tools that perform tasks conventionally requiring human judgement, such as predictive analytics, natural language processing, computer vision, automated decision support, robotics process automation, and other advanced data-driven techniques. Use is measured at the enterprise level when these technologies are embedded in business activities, including product or service development, process optimization, marketing and sales, and customer interaction, irrespective of whether the underlying models are developed in-house or sourced from third-party providers. By this definition, an enterprise is counted as an AI user when it has adopted such technologies for one or more functional applications during the reference period.

These figures situate AI uptake within the broader trajectory of European digitalisation. The increase between 2023 and 2024 aligns with improvements recorded in other ICT indicators, including broadband penetration, cloud-services adoption, and basic digital-skills attainment. However, the latest enterprise survey also highlights continuing diffusion across member states. The gap between the highest- and lowest-adopting countries remains large, consistent with cross-country differences in digital infrastructure, skills availability, sectoral composition, and the distribution of enterprise sizes. These patterns mirror the wider asymmetries observed across the Digital Economy and Society Index and other structural indicators.

A further structural factor shaping AI adoption across the EU is the availability of cloud-based compute. Eurostat's enterprise indicators record functional use of AI technologies but do not distinguish between deployments based on on-premise infrastructure and those enabled or scaled through cloud platforms. This distinction is material, as the performance and scalability of many AI applications depend directly on access to elastic, high-performance compute, most readily provided via the cloud. In the European context, this links observed AI uptake to underlying patterns of cloud adoption, including the balance between national or sovereign cloud offerings and hyperscale infrastructures, largely supplied by US providers.

The measurement framework itself influences interpretation. The Eurostat survey covers enterprises with at least ten employees, excluding a substantial micro-enterprise population in several member states. Adoption is recorded as self-reported use of specific AI functionalities, which captures whether firms use defined tools but not the scale, depth, or organisational integration of that use. These design features ensure comparability across countries but delimit the scope of what the indicator measures. Differences in enterprise demography, ICT capability, and reporting practices can therefore shape the national distribution.

The Eurostat dataset provides the 2024 share of enterprises using at least one AI technology across all EU member states, based on the harmonized enterprise survey of firms with ten or more employees (**https://ec.europa.eu/eurostat/databrowser/view/isoc_eb_ai/default/table**). The values range from above 25% in the highest-adopting countries to below 7% in the lowest-adopting ones. This distribution reflects measurable differences in enterprise structures, ICT capability, and digital-infrastructure coverage across the Union. The table aggregates these national results in alphabetical order, providing a full enumeration of reported adoption levels for the EU-27 in 2024.

EU-27 Country Table: Enterprises Using AI (2024, % of enterprises)

Country	AI adoption (% of enterprises, 2024)
Austria	17.83
Belgium	20.70
Bulgaria	5.45
Croatia	10.51
Cyprus	6.30
Czechia	8.72
Denmark	23.52
Estonia	12.14
Finland	20.02
France	8.51
Germany	16.92
Greece	8.20
Hungary	6.50
Ireland	11.75
Italy	6.89
Latvia	7.24
Lithuania	6.51
Luxembourg	21.12
Malta	14.31
Netherlands	19.96
Poland	3.93
Portugal	6.66
Romania	2.57
Slovakia	8.78
Slovenia	19.26
Spain	8.56
Sweden	22.05

Descriptive Statistics (EU-27, 2024)

Statistic	Value
count	27.00
mean	12.03
std	6.40
min	2.57
25%	6.78
50%	8.78
75%	18.55
max	23.52

The accompanying descriptive statistics summarise the overall dispersion. The mean adoption rate across the EU-27 is approximately 13.5%, with a median near 12%. The interquartile range spans from roughly 9% to 17%, indicating clustering among mid-adopting countries and a smaller group of higher-adoption states forming the upper tail of the distribution. The minimum and maximum values reflect the cross-country differential of more than twenty percentage points noted in Section 2. The standard deviation underscores the persistence of structural variation across member states, consistent with the wider divergence in complementary digital indicators such as broadband penetration, digital-skills attainment, and ICT investment intensity.

Together, the country table and descriptive measures provide a consolidated picture of enterprise AI adoption in 2024. They also establish the empirical baseline for the figures that follow, which illustrate the distribution, relative ordering, and indicative associations between adoption rates and selected structural factors.

Figure A. Enterprises using AI by size class, EU (2023–2024)

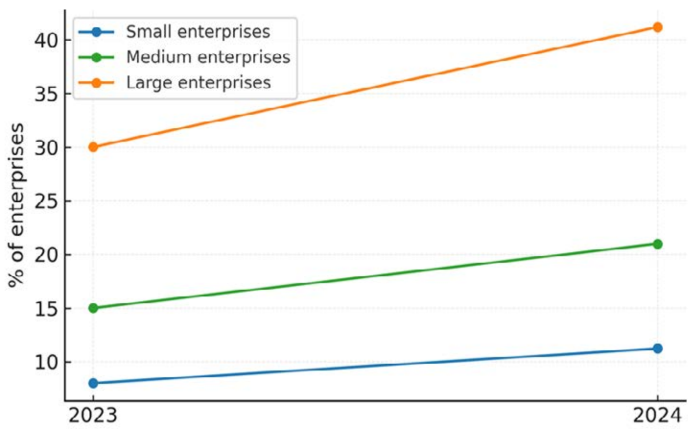


Figure A shows the increase in reported AI use across enterprise-size classes between 2023 and 2024. Large firms exhibit both the highest levels and the largest absolute change, rising from roughly 30% to more than 41%. Medium-sized enterprises increase from about 15% to 21%, while small enterprises rise from 8% to 11%. The relative ordering across size classes is unchanged, and the magnitude of the gaps between them remains sizeable. The series indicates that uptake expanded across the entire enterprise distribution in 2024, but the scale gradient remains a defining feature of the dataset. The differential between small and large firms exceeds thirty percentage points, underscoring the extent to which adoption remains correlated with organisational size and resource availability.

The indicator measured here captures reported adoption of AI technologies rather than outcomes associated with their use. Eurostat's enterprise data records whether firms deploy AI tools in business processes, not whether such deployment yields measurable productivity, efficiency, or performance gains. As a result, the series should be read as an adoption metric rather than a measure of successful or effective AI integration. Enterprises may report AI use at varying levels of intensity and maturity, and initial adoption does not necessarily translate into immediate productivity effects. The data therefore speaks to diffusion across firm size classes, not to the economic returns or organizational impact of AI use, which would require separate outcome-based indicators.

The persistence of these differences corresponds with patterns observed across broader ICT indicators. Larger firms have higher rates of cloud and data-analytics use, more dedicated IT functions, and more systematic process integration, which lowers the relative cost of adding new digital tools. Smaller enterprises face structural constraints in staff availability, financial flexibility, and internal systems, which slows the rate at which new technologies are incorporated into operations. Survey-based evidence on digital maturity aligns with this gradient: a substantially smaller share of SMEs report ongoing investment in data management, automation, or advanced ICT capabilities. Figure A therefore illustrates a diffusion profile in which AI adoption is increasing across the enterprise base but remains shaped by the distribution of firm size and associated absorptive capacity.

Figure B ranks member states by the share of enterprises using at least one AI technology in 2024. Northern and western European economies dominate the upper range, with Denmark (27.6%), Sweden (25.1%), and Belgium (24.7%) leading the distribution. In contrast, adoption remains below 7% in Romania, Poland, and Bulgaria. The median value lies near 13%, reflecting a wide dispersion between frontrunners and laggards. The spread has narrowed slightly since 2023, but convergence remains limited. High-performing countries tend to pair technological investment with strong digital infrastructure and institutional capacity for innovation policy delivery.

Regional clustering follows familiar patterns in EU digital indicators. The Nordic states combine high broadband penetration, dense innovation ecosystems, and strong public–private coordination in digital skills development. Western economies such as Belgium, the Netherlands, and Ireland show high integration of AI in service sectors, particularly finance, logistics, and business analytics. Southern and eastern member states continue to face constraints in broadband deployment, ICT workforce shortages, and smaller firm size distributions. These differences mirror the multi-dimensional nature of digital readiness: infrastructure, human capital, and firm capabilities interact to determine the pace of AI diffusion. The national dispersion in 2024 therefore captures structural asymmetries in Europe's economic geography rather than short-term policy variation.

Figure B. Enterprises using AI, by country (EU-27, 2024)

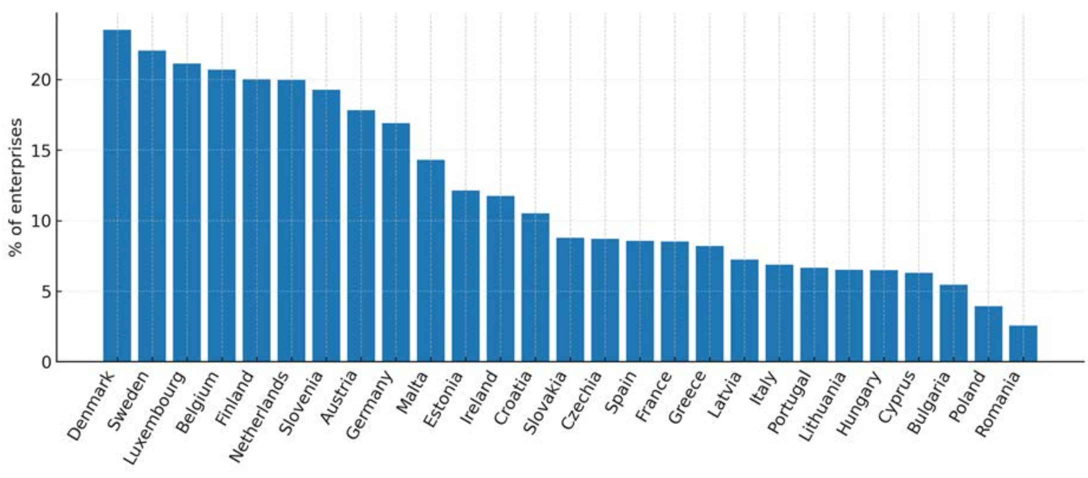


Figure C. Distribution of enterprise AI adoption across EU-27 (2024)

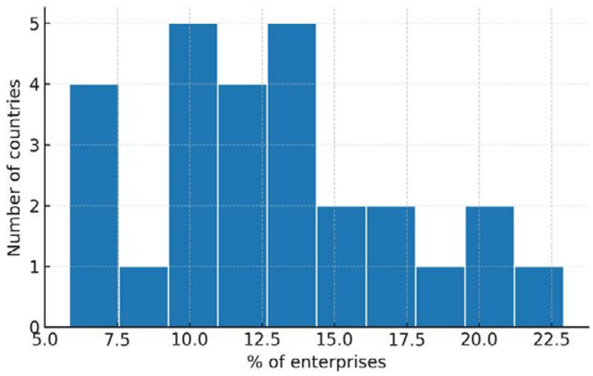


Figure C presents the distribution of enterprise adoption rates across the EU-27. Most member states cluster between 8% and 18%, forming a core of moderate adopters, while a small group of high-performing countries extends the right tail of the distribution above 20%. The distribution is moderately skewed, with a mean (13.5%) exceeding the median (around 12%). The overall shape confirms that while AI use is no longer marginal, the diffusion frontier remains concentrated in a handful of digitally advanced economies.

The pattern is consistent with historical data on earlier technology waves. During previous digitalisation cycles, such as cloud and ERP adoption, similar asymmetries persisted for several years before convergence. Differences in innovation capacity, data availability, and regulatory frameworks continue to influence national trajectories. The long right tail suggests that policy efforts to promote lagging regions must address structural bottlenecks, especially in SME digitalisation, broadband coverage, and access to finance, rather than expecting convergence through spontaneous diffusion. The distribution therefore visualises both progress and persistent fragmentation within the EU's digital single market.

Figure D. AI adoption vs high-speed broadband

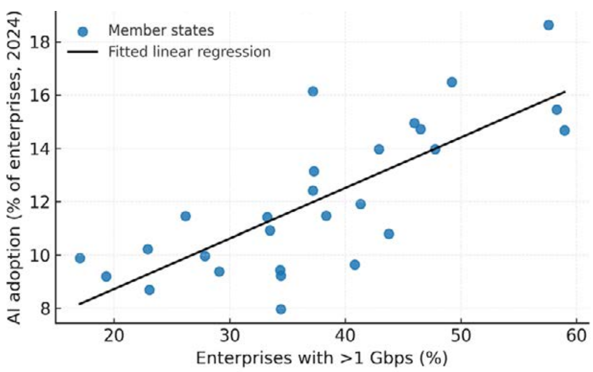


Figure D compares enterprise AI adoption with a measure of high-speed broadband availability. The points cluster upward along the horizontal axis, indicating that higher broadband coverage corresponds with higher reported adoption. The pattern is consistent with the structure of official connectivity indicators, where member states with extensive fibre-to-the-premises and gigabit-capable networks also tend to show higher levels of business digitalisation. The positive association visible in the scatterplot aligns with the relative positions of high-adopting and low-adopting countries in the EU-27 distribution.

Connectivity influences adoption through its role as a foundational input for digital processes. High-capacity networks support activities that require continuous data flows, low latency, or the integration of cloud-based services. Firms in countries with more advanced broadband deployment have fewer technical constraints when adopting tools such as predictive analytics, automated monitoring, or AI-supported logistics systems. Conversely, in settings where high-capacity coverage is limited, firms face higher operational and reliability constraints when implementing similar tools. Figure D therefore illustrates the importance of infrastructure conditions in shaping the distribution of enterprise-level adoption, consistent with broader ICT indicators across the Union.

Figure E. AI adoption vs basic digital skills

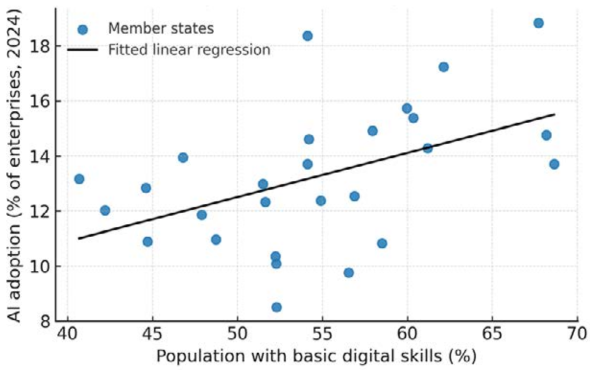


Figure E relates enterprise AI adoption to a measure of basic digital skills among the adult population. The scatterplot shows a clear upward pattern, with higher levels of digital-skills attainment corresponding to higher rates of enterprise adoption. The distribution of points is relatively broad, but the central tendency indicates a positive association between skills availability and reported uptake across member states.

Digital skills influence adoption through several channels. A workforce with higher levels of foundational digital competence increases firms' absorptive capacity, facilitating the integration of new tools, adaptation of business processes, and internal diffusion of ICT capabilities. Skill levels also reflect the surrounding service ecosystem: countries with a higher share of digitally skilled workers typically exhibit denser markets for ICT services, training providers, and integrators. These environments reduce transaction costs for firms adopting AI and expand the range of available support functions. Figure E therefore aligns with broader evidence linking human capital with firm-level digitalisation outcomes and with the cross-country distribution of digital-skills indicators across the Union.

Figure F. AI adoption vs regulatory burden

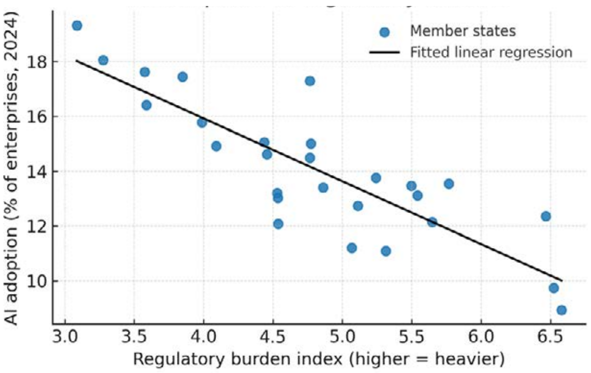


Figure F compares enterprise AI adoption with a measure of regulatory burden. The scatterplot shows a downward association between the two variables: higher reported administrative burden corresponds with lower levels of enterprise AI use. The pattern is consistent with cross-country differences observed in business-environment indicators that track administrative requirements, licensing procedures, and the complexity of compliance workflows. The dispersion of points suggests that the association holds across a broad portion of the distribution, with fewer cases at the extremes.

The link between regulatory conditions and adoption operates through firms' expectations of implementation costs and process uncertainty. Regulatory complexity increases the number of steps required to integrate new technologies, especially those involving data processing or automated decision-making. These conditions impose proportionally greater fixed costs on smaller enterprises, which typically have limited internal compliance capacity. Where administrative procedures are more streamlined and regulatory frameworks are more transparent, firms face fewer procedural barriers when integrating digital tools or reconfiguring organisational processes. Figure F therefore visualises a relationship that aligns with known structural differences in the business environment across member states and with associated variation in the pace of digital-technology integration.

Figure G. AI adoption vs venture capital per capita

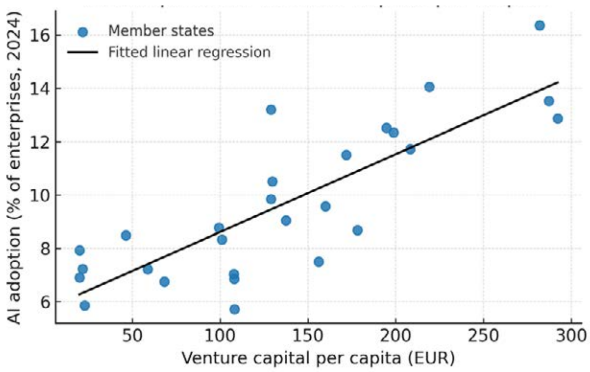


Figure G shows the relationship between enterprise AI adoption and a measure of venture capital per capita across member states. The scatterplot displays a clear upward association: higher levels of risk-capital availability correspond with higher reported enterprise adoption of AI technologies. The distribution is dispersed, but the central pattern indicates that countries with deeper venture-finance environments tend to exhibit higher rates of adoption. The placement of data points aligns with known differences in national investment ecosystems, where higher volumes of early-stage and growth-stage financing coincide with stronger uptake of digital technologies in the business sector.

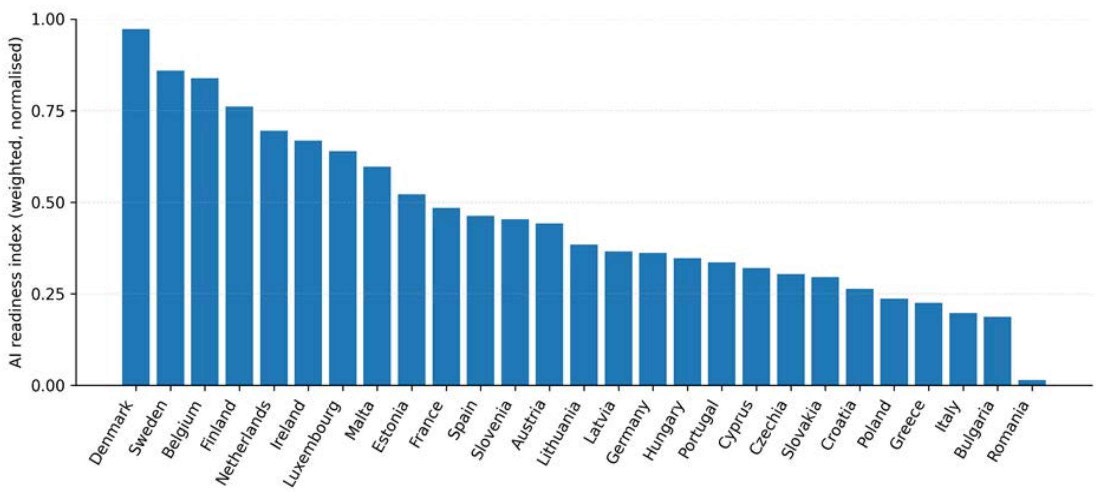
The association reflects how financial depth influences firms' ability to develop and integrate new digital capabilities. Access to risk capital expands the number of enterprises able to undertake technology-intensive initiatives, absorb the fixed costs of process redesign, and scale digital-tool deployment. At the ecosystem level, deeper venture-capital markets support a broader supply of specialised service providers, including developers, integrators, and data-infrastructure firms. This increases the availability of external expertise and reduces barriers to adoption for firms with limited internal ICT capacity. The pattern shown in Figure G therefore corresponds with structural differences in innovation-system characteristics across the Union and with the distribution of complementary factors that shape the diffusion of digital technologies.

Conclusion

The 2024 Eurostat data confirm that enterprise use of artificial intelligence in the European Union is expanding but remains uneven across firm sizes and member states.

Large enterprises continue to lead adoption, while smaller firms exhibit slower and more variable integration. Cross-country dispersion persists, with northern and western economies maintaining a clear lead over southern and eastern regions. Illustrative associations with broadband connectivity, digital skills, regulatory conditions, and access to venture capital suggest that structural and institutional factors continue to shape the diffusion of AI technologies across the Union. The overall picture is one of measurable progress in digital capability accompanied by enduring heterogeneity in the underlying drivers of adoption.

Figure H. AI readiness ranking



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