



How artificial intelligence contributes to competitiveness and workforce planning

AI skills demand in the EU

Fact Sheet #14

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Introduction

More and more companies in Europe are using artificial intelligence (AI) technologies. In 2025, one in five companies in the EU with 10 employees or more used at least one major AI technology, up from 8% in 2023 (Eurostat, 2026a). However, there are large regional differences in AI usage rates between EU Member States. Denmark, Finland, Sweden, Belgium and Luxembourg are the leading countries, with AI usage rates of 34% to 42%, whereas only 5% of companies in Romania used AI in 2025. Several aspects could explain these regional differences. For example, tech-savvy sectors like IT could be over-represented in some EU countries and therefore drive AI usage rates. Conversely, a lack of AI skills could be an obstacle for companies if they intend to implement AI, but the local labour market does not have enough people with AI skills. Therefore, it is important to analyse not only the AI usage rate of companies, but also the demand for AI skills to better understand companies' readiness to adopt AI comprehensively.

Measuring AI skills demand in the EU

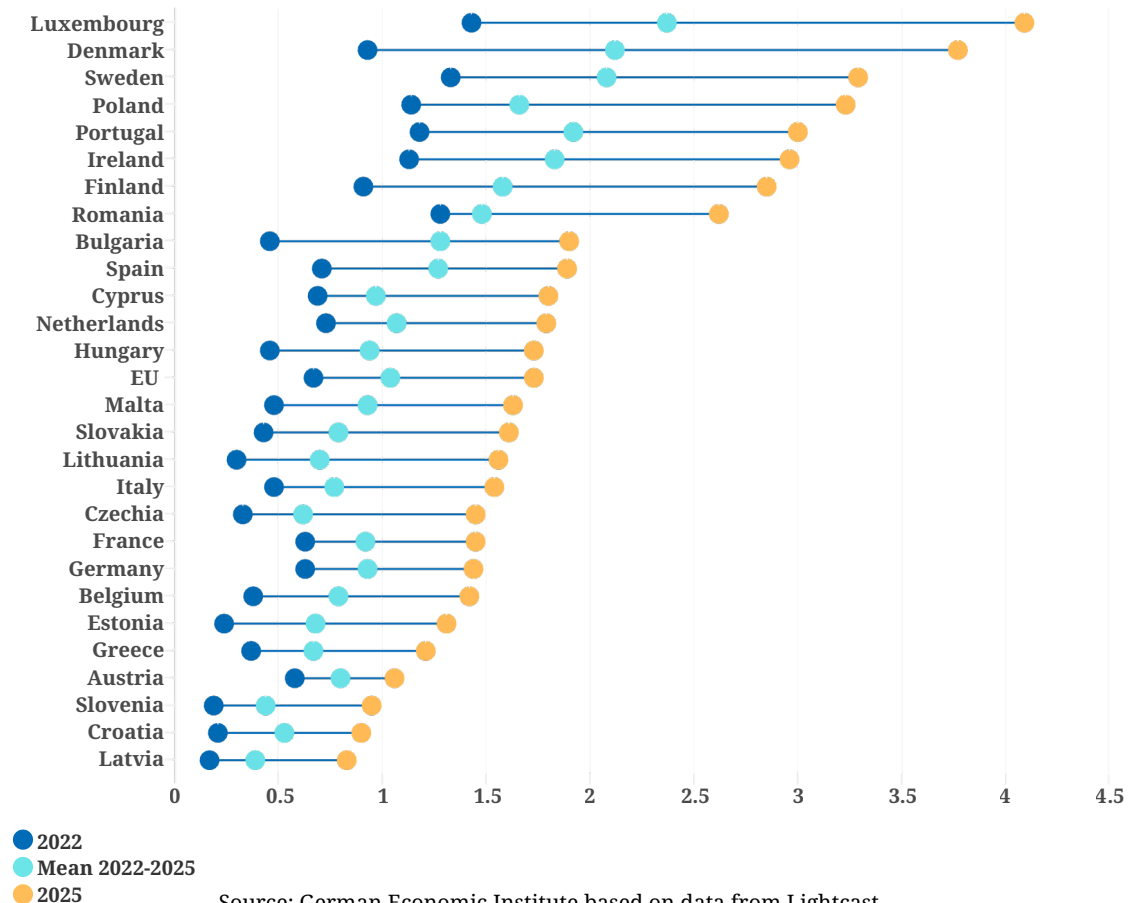
The aim of this fact sheet is to analyse the in-depth AI skills demand in all 27 EU Member States and to draw conclusions about the number of highly AI-exposed employees in these countries. There could be a significant gap between in-depth knowledge of AI technologies and general AI knowledge. While general AI knowledge is a basic prerequisite for using AI applications effectively, more in-depth AI knowledge enables employees to develop their own AI applications, for example. In-depth AI skills demand can be measured precisely via data on online job advertisements that reflect the demand side of the labour market. However, the demand in job postings should be viewed only as a lower bound of actual demand, as skill needs can also be met through corporate training or by consulting external IT service providers, for example. Our assumption is that AI skills explicitly mentioned in job postings indicate that AI plays a central role for the tasks to be performed in that job, beyond simply using easily accessible AI applications that do not require in-depth knowledge. For the analysis, we used a dataset from Lightcast (2026) that collects the full texts of online job advertisements for all 27 EU Member States from 2022 to 2025. In total, the dataset includes approximately 182 million unique job postings. To analyse the data, a multilingual rule-based model was developed that classifies job postings based on whether they require in-depth AI skills. The model performs very well across all EU countries (see Büchel et al., 2026).

However, the Lightcast data systematically overrepresents management, professional and ICT occupations relative to their actual employment share, while underrepresenting elementary, agricultural and construction occupations – a pattern documented across multiple national and EU-wide benchmarking studies (Napierala et al., 2022; Tsvetkova et al., 2024). This bias arises because employers typically rely more heavily on formal online advertising for hard-to-fill, skill-intensive positions – reflecting both recruitment-channel preferences and persistent skill shortages in occupations such as ICT – whereas occupations with high internal promotion rates or informal hiring practices are advertised online far less frequently (Napierala, 2023). Overall, this results in a biased, non-representative sample. Analysing the data without correcting for this bias would be likely to overestimate AI job posting shares (Green/Lamby, 2023). To correct for this, post-stratification weights were applied. These weights were derived from actual country- and year-specific employment shares per occupation (Eurostat, 2026b). For each occupation, country and year, we calculated a weight equal to that occupation's true employment share divided by its observed share in the Lightcast sample. Consequently, occupations overrepresented in job postings received a lower weight and underrepresented ones a higher weight – bringing the sample's occupational structure back in line with actual employment.

AI skills demand in EU countries

The analysis provides findings on in-depth AI skills demand across all EU Member States from 2022 to 2025 (Figure 1).

Figure 1: Share of AI-related job vacancies, 2022-2025



Source: German Economic Institute based on data from Lightcast

In the EU-27, the share of AI-related job postings has more than doubled from 0.7% in 2022 to 1.7% in 2025. As the absolute number of AI job postings has also increased from roughly 529,000 in 2022 to 771,000 in 2025, this finding indicates that the demand for AI skills is growing fast in Europe. By 2025, approximately 1 in 60 job advertisements was explicitly related to AI. However, the AI job posting share was relatively flat from 2022 to 2023, before rising significantly from 2023 onwards. One likely explanation for the acceleration could be the introduction of generative AI that took place at the end of 2022. After this, many companies adopted generative AI applications or developed their own AI solutions tailored to their specific needs, and therefore searched for skilled employees able to support the introduction of AI within the company.

AI skills demand varies significantly across EU Member States. In 2025, the share of AI job postings was highest in Luxembourg (4.1%), Denmark (3.8%) and Sweden (3.3%). It was lowest in Croatia (0.9%), Slovenia (0.9%) and Latvia (0.8%). While countries in Eastern and Southern Europe often lag behind, they are catching up fast. For example, although the AI job posting share in Luxembourg was five times higher than in Latvia in 2025, Latvia and other Eastern European countries (Croatia, Slovenia, Estonia, Czechia and Lithuania) have more than quadrupled their shares since 2022, starting from very low values. The AI job posting share in Eastern Europe increased by a factor of 4.2 from 2022 to 2025, compared to 3.2 in Northern European countries, 3.0 in Southern Europe and 2.6 in Western Europe.

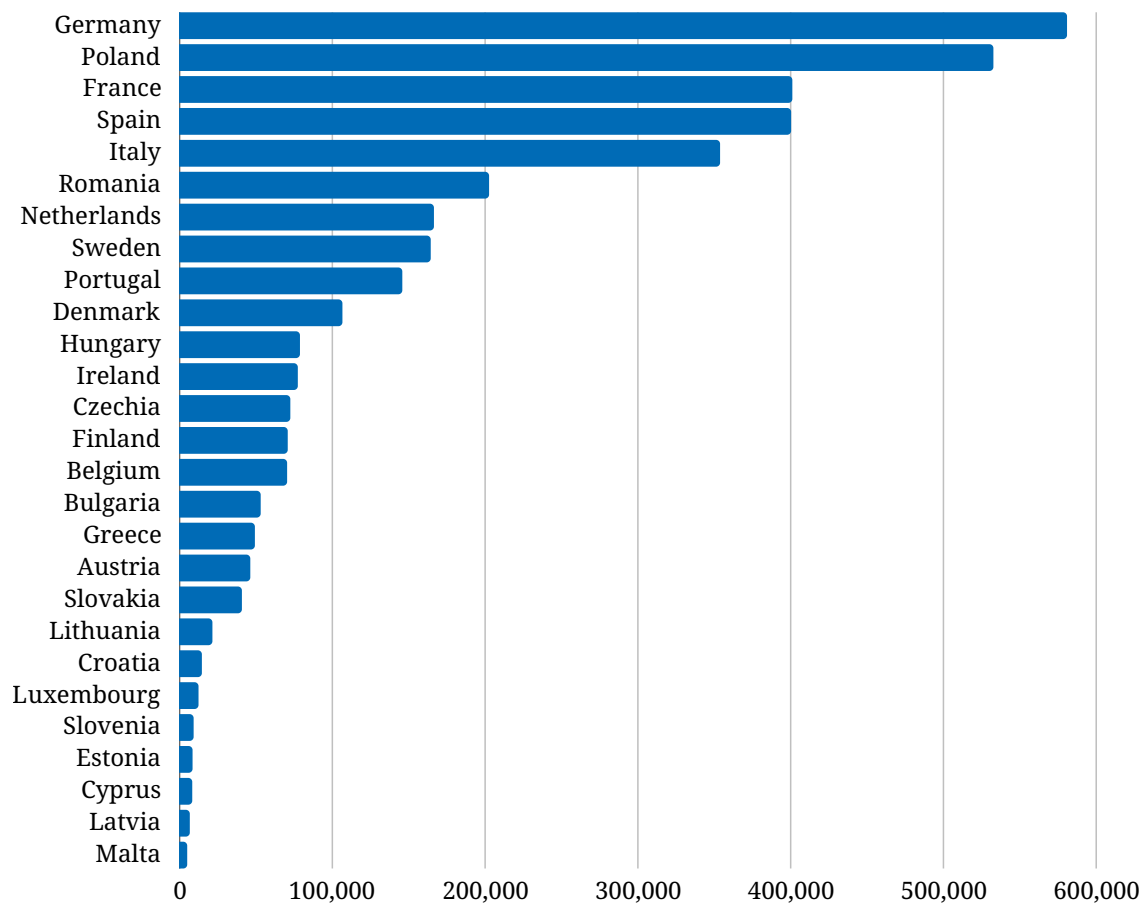
However, Luxembourg, for example, has a relatively small labour market with many international companies. Therefore, the relative share of AI job postings alone does not provide a complete picture. In an economy with a large labour market, there could be many AI-related job postings in absolute terms, even if the country's AI job posting share is relatively low. Therefore, the implications on the absolute number of highly AI-exposed employees should be considered as well to provide a complete picture of in-depth AI skills in the EU.

The number of highly AI-exposed employees in the EU

Simply comparing the absolute number of AI job postings among EU countries would introduce another bias: Lightcast's data collection relies on a different mix of job portals in each country. Hence, the share of the national labour market it captures varies independently of a country's actual size. This portal-coverage asymmetry distorts raw job posting volumes between countries. To correct for the bias and to enable a valid comparison, the AI job posting shares were multiplied by the actual country-specific employment numbers per occupation (Eurostat, 2026b) to estimate the number of highly AI-exposed employees. Hence, the AI job posting shares within each occupation were used as a proxy for the within-occupation shares of the workforce with in-depth AI skills. An important assumption when moving from a flow variable (job postings) to a stock variable (employment with in-depth AI skills) is that the skill distribution by occupation is the same (Green/Lamby, 2023).

On the one hand, this approach could overestimate the actual number of highly AI-exposed employees because it presumes that every job posting corresponds to a filled vacancy. Especially in the case of an existing shortage of skilled employees in IT professions as in Germany (Flake et al., 2023) and with AI as a new dynamic technological trend, it might be difficult for companies to find suitable candidates. Therefore, labour demand and supply could be unbalanced in the market for employees with AI skills. On the other hand, hiring new employees is only one of several strategies to develop AI skills among the workforce. Continuing education or informal formats are further strategies that are widespread in the context of AI skills (Arntz et al., 2026). Therefore, the number of highly AI-exposed employees could be even higher than the AI job posting share suggests. Overall, our estimates represent an approximation of the country-specific stock of employees with in-depth AI skills (Figure 2).

Figure 2: Estimated number of highly AI-exposed employees, 2025



Source: German Economic Institute based on data from Lightcast

In 2025, the estimated count of highly AI-exposed employees in the EU was approximately 3.7 million employees. The number more than doubled within 4 years, starting from 1.4 million in 2022, which was driven predominantly by the large economies. Not surprisingly, the number of highly AI-exposed employees was highest in the most densely populated EU countries like Germany, Poland, France, Spain and Italy which also have the largest labour markets. In contrast, Luxembourg, with the highest AI job posting share, contributed only marginally to the overall number of highly AI-exposed employees in the EU.

As the estimation was derived from AI job posting shares, it focuses on employees with in-depth AI knowledge. Consequently, it does not provide an estimate for the whole AI workforce including employees with general AI knowledge. Such knowledge might not be worth mentioning in job postings from the perspective of employers. However, an EU-wide survey shows that 30% of employees used AI tools such as chatbots powered by large language models in 2025 (Gonzalez Vazquez, 2025). Combining the employee AI usage share of 30% with the EU's total employment number of approximately 202 million employees in 2025 (Eurostat, 2026b) results in a rough estimate of an AI workforce of around 61 million employees in the EU in 2025. This shows that the overall AI workforce is far beyond the estimated count of 3.7 million highly AI-exposed employees. Nevertheless, both the overall AI workforce and the number of highly AI-exposed employees offer valuable insights. They not only show the overall AI penetration among the workforce but also uncover differences compared to the number of specialised employees with in-depth AI knowledge, who enable companies to use AI intensively or to develop their own tailored AI applications.

Conclusion

In 2025, 1.7% of job postings in the EU were AI-related and the estimated count of highly AI-exposed employees was 3.7 million. The growth rate in absolute numbers since 2022 (+2.3 million employees) far exceeds what can be explained by labour market expansion alone – it rather reflects a genuine shift in skills demand towards AI.

Against this background, it will be important in the future to analyse specific AI skills requirements in more detail and to monitor AI skills demand continuously. This can reveal valuable implications for the education system and for vocational training. Understanding precisely the AI skills requirements of companies in the EU is imperative to balance AI skills demand with the supply of suitably skilled employees and to achieve the overall objective of boosting the implementation of AI in Europe.



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