ACCELERATING AI SKILLS
PREPARING THE WORKFORCE FOR JOBS OF THE FUTURE
AWS STUDY ON AI SKILLS IN EUROPE
Important Notice on Contents

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INTRODUCTION

Artificial Intelligence (AI) stands as a transformative force, reshaping the way we work and live. By leveraging technology to mimic the problem-solving and decision-making capabilities of humans, AI is driving positive changes in various sectors of the economy. To gain deeper insight into the current, future applications and usage of AI in the workplace, the evolving skills requirements for employees as well as future training needs, Access Partnership worked with Amazon Web Services (AWS) to survey more than 6,500 employees and 2,000 employers across four countries in Europe – France, Germany, Spain, and the United Kingdom.

The findings revealed that AI is rapidly reshaping the future of work, and it is critical for organisations and employees to deepen their understanding of AI technologies to leverage its benefits fully. The use of AI technologies could lead to significant gains in productivity and innovation for organisations. Ensuring that employees can use AI tools effectively would be critical to unlocking these gains. The findings underscore the substantial economic opportunity that can be realised across the European continent through the comprehensive integration of AI into the workplace and reinforce the urgency for policymakers, businesses, and employees to collaborate in realising this opportunity.
Most organisations will use AI by 2028. Employers think positively about the impact of AI on their organisation, and 86% expect to adopt AI tools across their organisations by 2028. While AI is expected to bring the greatest impact to employees in the IT department (82%), other departments, including sales and marketing (75%) and human resources (69%), are also expected to benefit from AI deployment.

Generative AI will transform how we work. Generative AI is expected to become an integral part of the workplace by 2028. 91% of surveyed employers and 86% of surveyed employees expect to see benefits from using generative AI in the workplace. The top benefits are in task automation and supporting greater innovation and creativity. Additionally, usage is expected to be spread out across different levels of tech workers, with 51% of ‘tech specialists’ expecting to use it significantly, followed by 30% of ‘tech-adjacent’ workers, and 17% of ‘non-tech’ workers.

Acquiring AI skills will boost pay and create other career benefits for employees. The majority of employees in Europe believe that AI will positively impact their careers, and six in 10 (65%) are interested in picking up AI skills for career advancement. The acquisition of AI skills could lead to higher wages, with the survey suggesting that employers are willing to offer an average of 27% more in salaries for employees with the requisite AI skills. Employees in the IT (30%), and research and development departments (29%) are expected to see the largest salary increases.
FIVE KEY TAKEAWAYS

4. **The productivity gains from an AI-skilled workforce could be immense.** The survey findings show that employers expect AI technologies to increase their organisations’ productivity by 41% if adopted fully, while employees expect a 39% boost in task efficiency with AI use. All levels of tech-employees are expected to experience significant levels of productivity improvements.

5. **The AI skills gap can be reduced through more awareness of training programs.** According to employers surveyed, AI and Machine Learning (AI/ML) skills are the 10th most important skill for employees in 2023, but in 2028, it will become the 5th most important skill. 60% of surveyed employers see hiring AI talent as a priority today. However, the rapid transition to an AI-enabled workforce has created a labour market shortage for AI talent. Of employers who see hiring AI talent as a priority, eight out of 10 find it difficult to find qualified candidates. The talent shortage is exacerbated by a training awareness gap. 72% of employers said that they don’t know how to implement an AI training program while nearly 70% of employees are unsure of the AI training programs available to them. This suggests that bridging the training gap could potentially strengthen Europe’s gains from AI further.
DETAILED FINDINGS
Most organisations will use AI by 2028

Employers take a positive view of the impact of AI on their organisations and expect to ramp up the adoption of AI in the next five years. 88% of surveyed employers in Europe are optimistic about the impact of AI on their organisations. While only 71% of employers said they use AI-powered tools in various work functions in 2023, 86% say they expect to use such tools across their organisation in 2028. Among the surveyed countries, Spain is expected to lead AI adoption in the next five years, with 92% of employers expecting to use AI-powered tools by 2028. The United Kingdom (UK) shows the largest expected jump in AI adoption between 2023 and 2028 (Figure 1).

86% of employers surveyed in Europe expect to implement AI-powered tools across their organisation by 2028.

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**Figure 1**

Organisations in Europe are optimistic about AI use

Firms across Europe are expected to increase AI usage between 2023 and 2028

Share of firms indicating "somewhat" or "significant" use of AI in each country in 2023 and 2028

1. Note that the difference in 2023 and 2028 figures reported may vary from calculated figures displayed above the bars due to rounding.

**Source:** Survey of over 2,000 employers in four European countries – France, Germany, Spain and the United Kingdom.
Whilst employers are optimistic about levels of AI adoption in 2028, many indicate that there is room to strengthen their understanding of AI. Based on the survey findings, less than 20% of employers in Europe claim to be "advanced" in their grasp of the technology, with most employers indicating only "intermediate" (43%) and "basic" knowledge (35%) (Figure 2), and some indicating "nascent" AI understanding (6%). The proportion of respondents indicating an advanced level of understanding is lowest in the UK at only 12%.

Survey of over 2,000 employers in four European countries – France, Germany, Spain and the United Kingdom.

1. Figures may not always sum to 100% due to rounding.
2. Advanced: The organisation has a detailed understanding of AI and its applications, and how they can be deployed; Intermediate: The organisation broadly understands what AI is and is aware of its applications and benefits; Basic: The organisation is aware of AI but does not know of its specific application and benefits; Nascent: The organisation has no understanding of AI or has not heard of it.
Where do employers believe AI will be used in their organisations? Not surprisingly, most employers (82%) believe their IT departments will be the biggest beneficiaries of AI. However, at least seven in 10 employers (69%) think that other departments – from human resources to research and development can also derive significant value from AI adoption (Figure 3).

In terms of the specific benefits AI could bring to various operations, employers highlighted task automation, improved workplace communication, and improved workflow as the most valuable aspects in which they anticipate productivity boosts (Figure 4). Examples of applications in the workplace include the use of chatbots by customer service personnel to deliver timely support, as well as the use of machine learning algorithms and software to enhance email communication. Predictive email responses greatly reduce time and effort on mundane tasks and free up time for value-adding work. Through these benefits, 71% of all surveyed employers anticipate some productivity improvements from AI adoption.
Generative AI refers to a type of AI that can create new content and ideas, and unlike traditional AI systems that are designed to recognize patterns and make predictions, generative AI creates new content in the form of conversations, stories, images, videos, music, and more. In a study conducted to assess the usage of AI in the workplace, it was found that employers find generative AI to be useful in increasing efficiency, speed, and creativity. One example of generative AI technology is text generation tools—a top AI application in the workplace—which can be used for website content creation, report, and article writing amongst other purposes.

When asked about the potential benefits of using generative AI in one’s job or organization, 91% of employers and 86% of employees indicated at least one benefit from using generative AI. In particular, the top benefits expected are task automation, as well as an increase in innovation and creativity (Figure 5).
Employees in more technical roles expect to find a greater use of generative AI compared to those in less technical roles. 51% of ‘tech specialists’ or those in roles that require specialised tech knowledge, expect to use generative AI significantly in five years’ time. Only 17% of workers in non-tech roles expect to use generative AI significantly (Figure 6). Interestingly, ‘tech specialists’ and ‘tech-adjacent workers’ see increasing innovation and creativity as the top perceived benefit of generative AI, while employees in ‘non-tech’ roles cite increased task automation as their top expected benefit.

Survey of over 6,500 employees in four European countries – France, Germany, Spain and the United Kingdom.

1. Respondents were offered the following options for the usage of generative AI tools in 2028: “significantly”, “somewhat”, “not at all”, and “don’t know”.

2. Three types of workers were surveyed: (1) Tech-specialists: employees who develop new technologies and use specialised tech knowledge, e.g., software developer, data scientist, game designer, computer research scientist; Tech-adjacent worker: employees dealing with technological products and services, and/or talk about them to customers and other employees. They have a detailed understanding of technologies but need to know how they work on a conceptual level, e.g., IT customer support officer, tech marketer, product manager liaising between a developer team and other departments; Non-tech workers: employees that do not require advanced tech knowledge and skills.
Employees of all age groups are keen to develop AI skills. Six in 10 employees surveyed indicated an interest in picking up AI skills for career advancement. However, motivations to pick up AI skills differ across different age groups. Employees aged 18 to 34 see job security as the top motivator while employees aged 35 to 74 years old see efficiency as the strongest motivator to pick up AI skills (Figure 7). This difference could be due to how the labour market is structured in European countries, with a larger number of younger workers in contract jobs as compared to older workers, resulting in a prioritisation of job security for younger workers. In a study conducted by the European Commission in 2022, it was found that individuals in Europe under the age of 30, compared to those of other age groups, were the most affected by job losses following the COVID-19 pandemic. As a result, individuals under 30 are more likely to be in temporary work contracts (45.9% of those employed), compared to individuals of other age groups (10.2%) vi. In Europe, Spain has one of the highest shares of employed people under 30 years of age working as temporary workers (39%); and this corresponds with a much higher share of workers aged 18-34 years old in Spain (77%) desiring to pick up AI skills compared to average levels across all four surveyed countries (71%).

INSIGHT 3

Acquiring AI skills can boost pay and career benefits

Employees interested in developing AI skills’ and motivations

<table>
<thead>
<tr>
<th>Age</th>
<th>Share of employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-24</td>
<td>69%</td>
</tr>
<tr>
<td>25-34</td>
<td>73%</td>
</tr>
<tr>
<td>35-44</td>
<td>71%</td>
</tr>
<tr>
<td>45-54</td>
<td>60%</td>
</tr>
<tr>
<td>55-64</td>
<td>57%</td>
</tr>
<tr>
<td>65-74</td>
<td>61%</td>
</tr>
</tbody>
</table>

SOURCE: Survey of over 6,500 employees in four European countries – France, Germany, Spain and the United Kingdom

1. Share of employees interested in developing AI skills includes respondents who have indicated ‘strongly agree’ and ‘somewhat agree’.

2. Employees were given 6 options to choose from as a motivator for their desire to pick up AI skills, which include higher salary, job security, intellectual curiosity, job satisfaction, career advancement, and efficiency.
AI-skilled workers stand to gain an average of 27% more in wages. The survey suggests that employers are willing to pay up to 30% more in salaries for employees with the requisite AI skills (Figure 8). Having AI skills is expected to give employees in the IT department the largest wage boost.

Employers in Spain are the most willing to pay more for employees with AI skills. For example, employers in Spain are willing to pay up to 33% more for employees with AI skills in the IT department, a significant 7 percentage points higher than that in Germany. This corresponds with the higher expected productivity benefit from AI adoption among surveyed employers in Spain (45%) compared to those surveyed in other countries (average of 41%).

Employers are willing to pay an average salary premium of 27% for talent with AI skills.
Employees surveyed expect AI to increase efficiency by 39%, while employers anticipate a 41% productivity boost. This is aligned with past studies showing that AI and machine learning (ML) solutions help elevate analytical judgment, bias detection and handling, and emotional intelligence, all of which support greater efficiency at work. In fact, the productivity gains could be higher than what respondents think. In a past study conducted to assess the impact of AI on employee productivity, researchers found that employees across job roles can increase productivity by an average of 66% with AI-powered tools.

“Workers believe that AI can make tasks 39% more efficient, while employers believe that AI can boost productivity by 41%.”
The full extent of the AI productivity gain is expected to be felt across the economy in five years’ time, as employees, including non-tech workers, use AI in greater numbers. For instance, eight in 10 employees expect to use AI in their daily work by 2028. (Figure 9). Of these, 17% expect to use AI tools “extensively”, or in over 60% of their job tasks. It is not just ‘tech specialists’ that will be driving the productivity boost – data shows that while they may be using AI to complete nearly half of their job tasks, ‘non-tech’ workers are not far behind, expecting to use AI in nearly a third of their job tasks by 2028. In fact, ‘non-tech’ workers will experience the highest jump in the use of AI in their jobs – nearly doubling in five years (Figure 10).

The top three channels for improving productivity highlighted by both employers and employees in our surveyed sample includes:

- **Automating repetitive tasks** includes using AI tools to schedule meetings, filter emails, generate code, generate reports, create invoices.

- **Enhancing communication** includes using AI tools to facilitate real-time collaboration, provide data insights, and enhancing personalised interactions and feedback loops.

- **Improving workflow and outcomes** includes using AI tools to identify manufacturing quality issues, detect fraud, review medical imaging.

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**FIGURE 9**

81% OF EMPLOYEES EXPECT TO USE AI-POWERED TOOLS IN THEIR JOBS BY 2028

<table>
<thead>
<tr>
<th>Do not expect to use</th>
<th>Expect to use</th>
</tr>
</thead>
<tbody>
<tr>
<td>19%</td>
<td>81%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Light (&lt;20% of tasks)</th>
<th>Moderate (20%-60% of tasks)</th>
<th>Extensive (&gt;60% of tasks)</th>
</tr>
</thead>
<tbody>
<tr>
<td>28%</td>
<td>35%</td>
<td>17%</td>
</tr>
</tbody>
</table>

SOURCE: Survey of over 6,500 employees in four European countries – France, Germany, Spain and the United Kingdom

1. Do note that figures on the right-hand chart may not sum to 81% due to rounding.

**FIGURE 10**

USE OF AI TOOLS BY NON-TECH WORKERS EXPECTED TO DOUBLE BY 2028

**Expected share of job-tasks completed using AI-powered tools, by type of tech worker**

<table>
<thead>
<tr>
<th>Type of tech worker</th>
<th>2023</th>
<th>2028</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-tech</td>
<td>17%</td>
<td>29%</td>
</tr>
<tr>
<td>Tech adjacent</td>
<td>26%</td>
<td>37%</td>
</tr>
<tr>
<td>Tech specialists</td>
<td>36%</td>
<td>45%</td>
</tr>
</tbody>
</table>

SOURCE: Survey of over 6,500 employees in four European countries – France, Germany, Spain and the United Kingdom

1. Type of tech workers refers to (1) Tech-specialists: employees who develop new technologies and use specialized tech knowledge, (2) Tech-adjacent workers: employees dealing with technological products and services, (3) Non-tech workers: employees who do not require advanced tech knowledge and skills.
The AI skills gap

Surveyed employers rank AI/ML skills as amongst the top 5 priority skillsets a job candidate should have in 2028. The survey presented employers with 26 “technology skills” that are commonly listed on job platforms such as LinkedIn as critical for jobs that involve the use or interpretation of AI. When asked to forecast the top five tech skills among these 26 that they will look for in employees, 27% of employers ranked AI development in the top five demanded skills in five years' time. Other skills that were ranked amongst the top five were technical support (33%), Internet-of-things application and deployment (26%), advanced digital marketing (27%), and augmented and virtual reality application and deployment (25%).

Overall, survey findings indicate a demand shift towards AI-related skills in 2028 compared to 2023. As the demand shift towards an AI-driven workforce happens rapidly, it is found that employees are adapting at a much slower pace, which results in a labour market shortage for AI talent. This can be seen by how out of 60% of employers who prioritise hiring AI talent, 81% grapple with the challenge of finding qualified candidates to fill AI roles (Figure 11). This issue is particularly pronounced in France and Germany, where over 85% of surveyed employers face this challenge, slightly higher than the 80% and 71% of employers in Spain and UK respectively who face the same issue.

FILE FIGURE 11

EMPLOYERS FIND IT CHALLENGING TO HIRE AI TALENT

Employers’ opinions on needs and hiring for AI talent

- 60% of employers say that it is a priority to hire AI talent
- 40% of employers say that it is not a priority to hire AI talent
- 81% of employers find it difficult to hire AI talent
- 19% of employers find it not difficult to hire AI talent

SOURCE: Survey of over 2,000 employers in four European countries – France, Germany, Spain and the United Kingdom

1. Employers responding to this survey were tasked to evaluate to what extent their organisation prioritise hiring AI talent.
2. Employers responding to this survey were tasked to evaluate how difficult it was to hire AI talent in their organisation. Note that figures may not sum to 100% due to rounding.
Boosting technical skills, such as coding, is only part of the AI skills challenge. While employers consider technical skills to be important to using AI tools, other skills such as critical thinking and problem-solving are considered even more important (Figure 12). Critical thinking is essential to evaluate the accuracy and relevance of AI outputs, while problem-solving helps optimise the capabilities of AI systems by defining and structuring analysis appropriately based on available data.

Critical thinking/problem solving, creative thinking/design, and technical skills (e.g., coding) will be the **top 3 skills** organisations need to embrace AI.

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**FIGURE 12**

**CRITICAL AI SKILLS**

<table>
<thead>
<tr>
<th>Rank</th>
<th>Skill</th>
<th>Share of employers ranking skill in top 3 for AI in 2028</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Critical thinking/problem solving</td>
<td>51%</td>
</tr>
<tr>
<td>2</td>
<td>Creative thinking/design</td>
<td>47%</td>
</tr>
<tr>
<td>3</td>
<td>Technical</td>
<td>47%</td>
</tr>
<tr>
<td>4</td>
<td>Communication</td>
<td>34%</td>
</tr>
<tr>
<td>5</td>
<td>Ethics and risk management</td>
<td>31%</td>
</tr>
<tr>
<td>6</td>
<td>Teamwork and interpersonal</td>
<td>25%</td>
</tr>
<tr>
<td>7</td>
<td>Math</td>
<td>23%</td>
</tr>
<tr>
<td>8</td>
<td>Management</td>
<td>22%</td>
</tr>
<tr>
<td>9</td>
<td>Writing</td>
<td>20%</td>
</tr>
</tbody>
</table>

SOURCE: Survey of over 2,000 employers in four European countries – France, Germany, Spain and the United Kingdom

1. Employers that responded to this survey were offered 9 skills to rank in order of importance to develop AI skills in 2028.
The biggest barrier hindering AI skilling for employees is the lack of knowledge. The top barrier that employers face is the lack of knowledge on how to implement an AI workforce program (72% selected this as top barrier), whereas the top barrier for employees is the lack of knowledge on available AI training programs (68% selected this as top barrier) (Figure 13). This highlights a major gap in AI skilling and suggests that increased awareness of AI skilling programs among both employees and employers in Europe could potentially strengthen Europe’s gains from AI even further.

### FIGURE 13
**KNOWLEDGE BARRIERS POSE SIGNIFICANT CHALLENGES TO AI TRAINING**

<table>
<thead>
<tr>
<th>Barriers to AI skills¹</th>
<th>Employers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of knowledge of how to implement an AI workforce training program</td>
<td>48%</td>
</tr>
<tr>
<td>Unsure of employees’ AI skill needs</td>
<td>49%</td>
</tr>
<tr>
<td>Unsure of the benefits of employee AI training to organization</td>
<td>44%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of knowledge of available AI skills training programs</td>
<td>46%</td>
</tr>
<tr>
<td>Lack of knowledge of relevant career paths</td>
<td>46%</td>
</tr>
<tr>
<td>Lack of knowledge of the AI skills I need</td>
<td>45%</td>
</tr>
</tbody>
</table>

SOURCE: Survey of over 2,000 employers and 6,500 employees in four European countries – France, Germany, Spain and the United Kingdom

1. Employers and employees that responded to this survey were offered a range of options to select as barriers that hindered them from providing or acquiring AI skills.
2. Figures within bars may not sum to displayed figure due to rounding.
Two surveys on tech and AI skills – one for employers and one for employees – were conducted at the national level in four European countries, including France, Germany, Spain, and the United Kingdom. The surveys were conducted online between September and November 2023. The surveys asked respondents for their views on the following: (1) Current development of and future need for technology skills; (2) Perceived benefits of AI; (3) Perceptions on Generative AI; (4) The current and future state of AI skills training, including barriers to acquiring AI skills training. Employers and employees that were targeted included those who demanded some form of technology skills from their employees. Figures 14A and 14B contain detailed statistics on the respondent profiles for the two surveys.

For the employer survey, a minimum of 500 respondents at the national level were targeted in each country to ensure statistically significant results at a 95% significance level and 5% margin of error. For the employee survey, a minimum of 1600 respondents at the national level were targeted in each of the four countries to ensure statistically significant results at a 95% significance level and 3% margin of error.
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EMPLOYEE SURVEY: RESPONDENT PROFILES

- **Number of respondents**
  - United Kingdom: 1,637 (25%)
  - France: 1,638 (25%)
  - Spain: 1,644 (25%)
  - Germany: 1,626 (25%)
  - Other countries: 6,545 (25%)

- **Gender**
  - Male: 54%
  - Female: 45%
  - Others: 1%

- **Age range**
  - 65-74 years old: 4%
  - 55-64 years old: 14%
  - 45-54 years old: 23%
  - 35-44 years old: 31%
  - 25-34 years old: 24%
  - 18-24 years old: 0%

- **Tech focus job role**
  - Non-tech workers: 48%
  - Tech specialists: 18%
  - Tech-adjacent: 34%

1. Note that figures may not sum to 100% due to rounding.
2. **Tech specialist**: Workers that typically develop new technologies or technological applications, and/or use specialised tech knowledge to deliver the organisation’s objectives, e.g., software developer, data scientist, game designer, computer research scientist. **Tech-adjacent worker**: Workers dealing with technological products and services, and/or talking about them to customers and other employees. They have a detailed understanding of technologies but need to know how they work on a conceptual level, e.g., IT customer support officer, tech marketer, and product manager liaising between a developer team and other departments. **Non-tech or other digitally skilled workers**: Workers that do not require advanced tech knowledge and skills but need some basic tech skills like knowing how to use word processing software and smartphones to do their job, e.g., clerks, administrative assistants, customer service specialists, etc.
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SOURCES

i. Sendgrid (2023). “7 Genuis Ways to Use AI to Write Emails.”, Available at: https://sendgrid.com/en-us/blog/how-to-use-ai-write-emails#:~:text=The%20basic%20role%20of%20AI,strategies%20that%20offer%20bigger%20benefits.


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