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ACCELERATING AI SKILLS

PREPARING THE WORKFORCE FOR JOBS OF THE FUTURE

AWS STUDY ON AI SKILLS IN THE UNITED STATES

aws

Access Partnership

CONTENTS

Important Notice on Contents

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INTRODUCTION

Artificial intelligence (AI) taps into the power of computers and machines to mimic the problem-solving and decision-making capabilities of the human mind. To better understand emerging AI usage trends in the workplace and the skills workers need to be successful in the future, Access Partnership collaborated with Amazon Web Services (AWS) to survey 3,297 employees and 1,340 organizations in the United States (US) across industries.

The survey shows that AI is already transforming the workplace – from how businesses operate to how work gets done. What's more, the pace of change is startling, with more than 90% of surveyed employers predicting that they will use AI-related solutions in their organizations by 2028. This study also found the applications of AI-enabled technology are expected to transcend jobs, tasks, and departments, enabling teams across organizations and driving significant benefits to individuals, businesses, and the broader economy.

FIVE KEY TAKEAWAYS

1 **Most organizations will use AI by 2028.** Artificial intelligence (AI) is expected to significantly alter how business is done in the foreseeable future. More than 90% of surveyed employers expect to use AI-related solutions in their organizations by 2028. In fact, almost all believe AI will positively impact their organization to some degree. In addition, the benefits of AI will be spread across the organization. While most employers (92%) believe their IT departments will be the biggest beneficiary of AI, they also believe most other departments, from sales and marketing (85%) to human resources (78%), will derive significant value from it as well.

2 **Generative AI will transform how we work.** Over 90% of both employers and employees expect to benefit from generative AI, which refers to an advanced form of AI that can create new content and ideas. 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. Recent breakthroughs in generative AI technology already promise to drastically change how workers, creators, and students approach content development. AI will be used across levels of technical knowledge, with 61% of 'tech-specialists' expecting to use it significantly, followed by 40% of 'tech-adjacent' workers, and 23% of 'non-tech' workers.

3 **Acquiring AI skills will boost pay and create other career benefits for employees.** 84% of employees indicate that AI could have some positive impact on their careers, mirroring the views of employers. The benefits of acquiring AI skills could be substantial for workers. Employers estimate that workers who acquire AI expertise could see their paychecks jump by 35% or more, depending on their departments with IT (47%) and sales and marketing (48%) seeing the highest bumps. Survey data also indicates that interest in acquiring AI skills transcends generations to advance their careers. Roughly two-thirds of workers over the age of 55 express an interest in doing so.

FIVE KEY TAKEAWAYS

4 **The productivity payoff from an AI-skilled workforce could be immense.** Surveyed employers believe that AI could boost productivity by 47%, with large-sized organizations expecting the highest boost (49%). Employees, too, expect AI to boost their productivity, indicating that it will help them complete tasks 41% more efficiently. Interestingly, 88% of workers expect to use AI in their daily work by 2028, and of those, one in four (25%) expect to be using it "extensively" or in over 60% of their job tasks.

5 **The AI skills gap can be reduced through more awareness of training programs.** Employers rank AI as the most important technology skillset a job candidate can possess, outranking others such as digital marketing, application development, and use of cloud-based tools. 42% of surveyed employers are actively looking for people with AI development qualifications today, and this will rise to 51% in the next five years. However, the rapid transition to an AI-enabled workforce has created a labor market shortage for AI talent. Nearly three out of four (75%) of employers who consider hiring talent with AI skills as a priority for them today report having difficulty finding qualified candidates. The study also found a training awareness gap. Close to 82% of employers said that they don't know how to implement an AI training program. Similarly, nearly 80% of employees say that they aren't sure what AI training programs are available to them.

DETAILED FINDINGS

INSIGHT 1

Most organizations will use AI by 2028

AI is expected to significantly alter how business is done for the foreseeable future. In fact, 92% of surveyed employers expect to use AI-related solutions in their organizations by 2028, stating that these will positively impact their organization's productivity to some degree.

Where do employers believe AI will be used in their organizations? Not surprisingly, most employers (92%) believe their IT departments will be the biggest beneficiary of AI. However, more than three in four employers (78%) also think other departments – from human resources to sales and marketing – can also benefit (Exhibit 1). In terms of the specific benefits AI could bring to their various operations, employers highlight automation of tasks (64%), improving workflows and outcomes (58%), and enhancing communication (54%) as among the top three benefits they expect from the use of AI in their organizations (Exhibit 2).

> **92%** of surveyed businesses expect to use AI-powered solutions across their organisations by 2028.

EXHIBIT 1

BENEFITS OF AI ACROSS THE ORGANIZATION

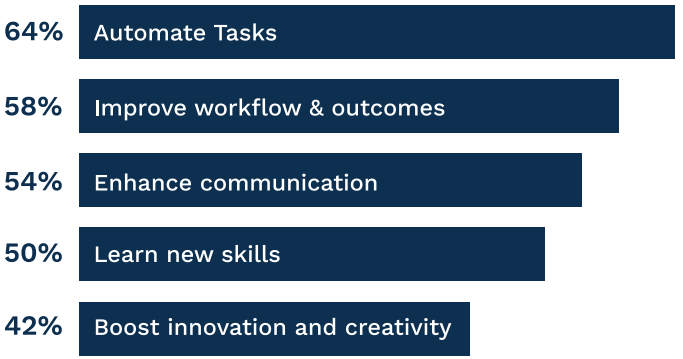
Share of employers that expect AI to be important in changing work, by department[1]

SOURCE: Survey of 1,340 employers in the US
1. The number features the share of employers that select AI as "very important" or "moderately important" in changing the way work is done in this department.

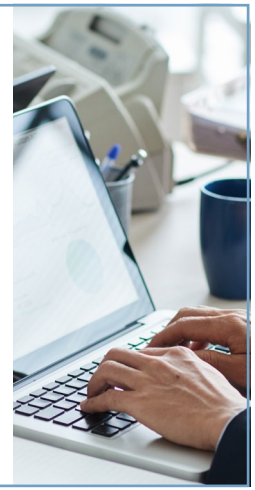
EXHIBIT 2

HOW AI WILL HELP EVERYDAY WORK TASKS

Share of employers selecting each area as key productivity improvement[1]



SOURCE: Survey of 1,340 employers in the US
1. The number features the share of employers selecting each of these tasks as benefits of AI.



INSIGHT 2

Generative AI will transform how we work

Generative AI refers to a type of AI that can create new content and ideas. 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. Recent breakthroughs in generative AI technology already promise to drastically change how workers, creators, and students approach content creation.

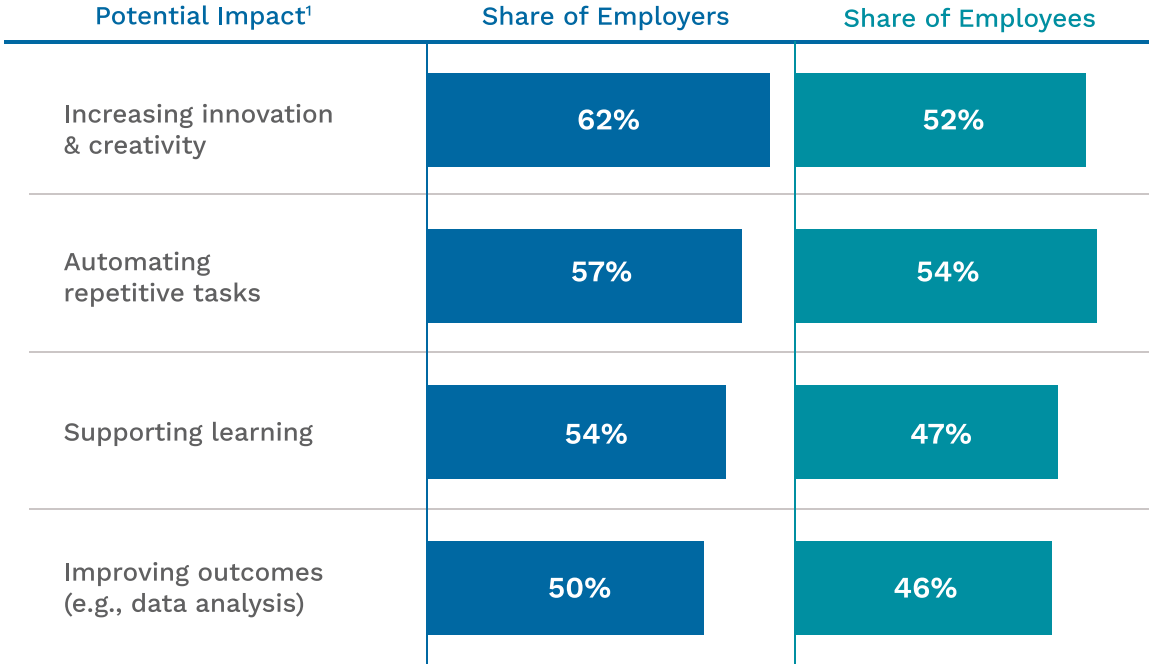
Over 90% of respondents believe that generative AI can benefit them at work in at least one way. Both employers and employees expect generative AI to improve innovation and creativity at work and support learning (Exhibit 3). This is potentially because of the creative use-cases that have emerged from generative AI showcases the technology's ability to create novel content, as well as its utility in surfacing information.

EXHIBIT 3

EXPECTED BENEFITS OF GENERATIVE AI IN THE WORKPLACE

Share of employers and employees who mention area as a major potential benefit of generative AI for their work

Those reporting at least one benefit from using generative AI	97%	91%

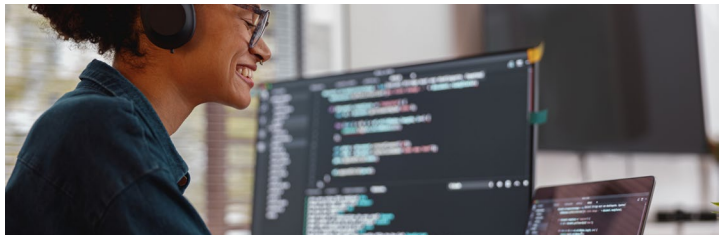


SOURCE: Survey of 1,340 employers and 3,297 employees in the US
1. The number features the share of employers and employees selecting each area as a potential impact of generative AI.

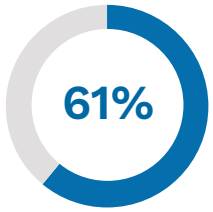
EXHIBIT 4

FUTURE ADOPTION OF GENERATIVE AI IN FIVE YEARS

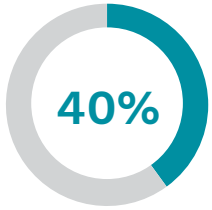
Share of employees who will use generative AI "significantly" by 2028 by type of worker[1,2]

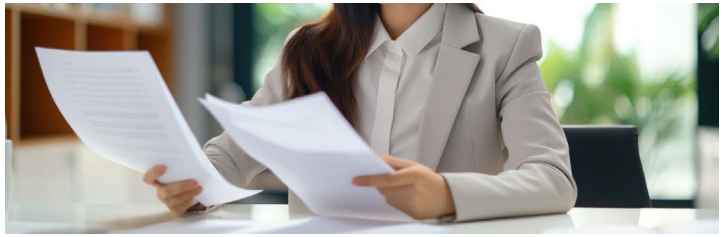


TECH SPECIALISTS

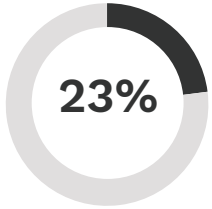


TECH ADJACENT





NON-TECH



SOURCE: Survey of 3,297 employees in the US

1. Respondents were offered the following options for their usage of generative AI tools in five years: "significantly" or across a range of work functions, "somewhat" or in select work functions, "not at all", and "don't know".
2. Three types of workers were surveyed: (1) Tech-specialists: employees who develop new technologies and use specialized tech knowledge, (2) Tech-adjacent workers: employees dealing with technological products and services, and (3) Non-tech workers: employees who do not require advanced tech knowledge and skills.

It is therefore unsurprising that the vast majority of employers (93%) and employees (86%) expect to be using generative AI in the workplace in five years' time. 45% of employers and 37% of employees expect to be using it "significantly", or across a range of work functions. A further 48% of employers and 49% of employees expect to be using it "somewhat", or in specific functions.

Employees in more technical roles expect greater use of generative AI tools in five years' time. 61% of 'tech specialists', or those in roles that require specialized tech knowledge such as software developers or data scientists, expect to use generative AI significantly in five years' time (Exhibit 4). This is 20% more than their colleagues in 'tech-adjacent' roles, including IT support or product management, where employees use specialized tech products regularly without necessarily requiring specialized knowledge. Individuals in 'non-tech' roles such as administrators and customer service executives also expect to use generative AI in some way, with 23% predicting they will use it in five years' time. This points to the extent to which generative AI has captured widespread interest today and its broad applications, which many predict will have staying power in the workplace across job types.

INSIGHT 3

Acquiring AI skills can boost pay and career benefits

Surveyed employees anticipate AI will have some positive impact on their career (84%). Moreover, nearly eight in 10 workers (79%) are interested in developing AI skills to advance their careers. The top three reasons employees cited a desire to learn AI skills are: improved job efficiency (51%), higher salary (44%), and faster career progression (42%).

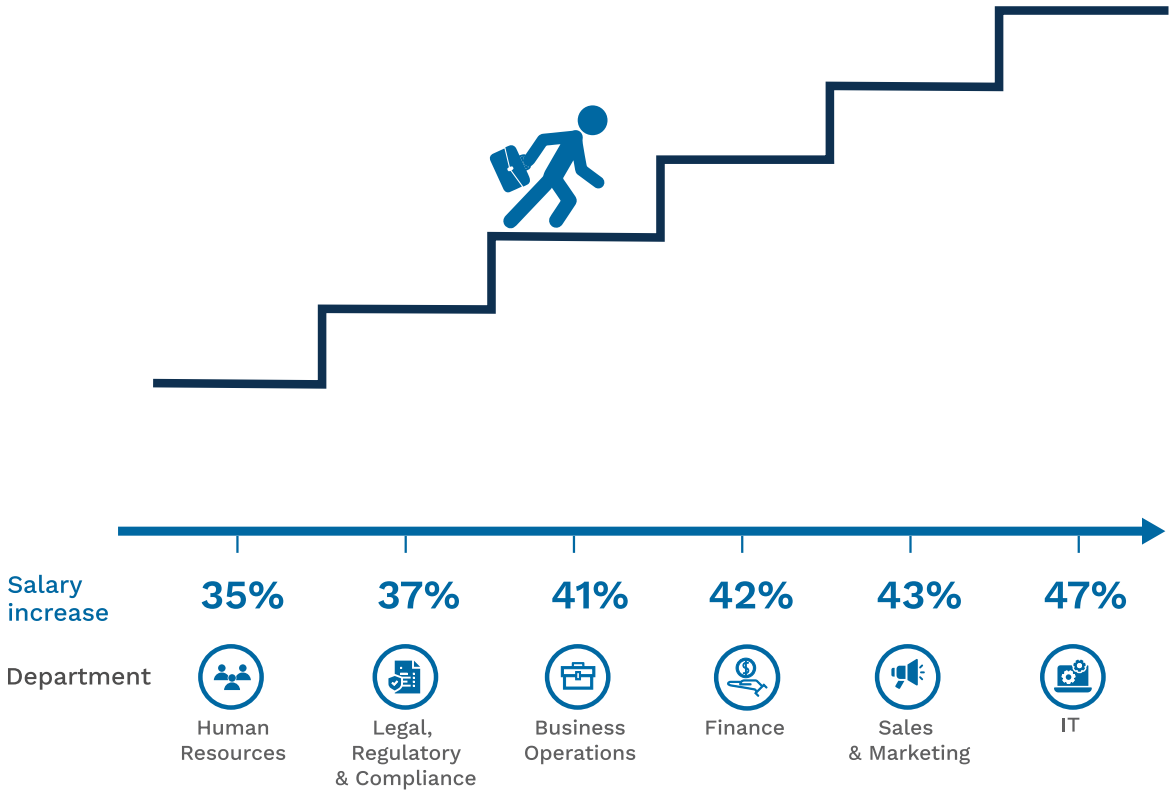
Employers indicate they would pay a salary premium for workers with AI skills. This wage premium could be at least 30% and varies by department (Exhibit 5). Notably, although IT workers would see the greatest pay increase (47%), employers said that workers across the organization could see a pay boost if they acquired AI skills, including: sales and marketing (43%), finance (42%), business operations (41%), legal (37%), and human resources (35%). The anticipated pay premiums across departments is because AI's key benefits – automating tasks, boosting creativity, and improving outcomes – have dispersed applications across departments and tasks. Employers anticipate that workers with AI skills will be able to drive additional productivity and higher-quality work, which would command a salary increase.

EXHIBIT 5

SALARY BOOST TO EMPLOYEES ACQUIRING AI SKILLS, BY DEPARTMENT

Salary boost to employees acquiring AI skills, by department[1]

Weighted average percentage increase in salary indicated by employers



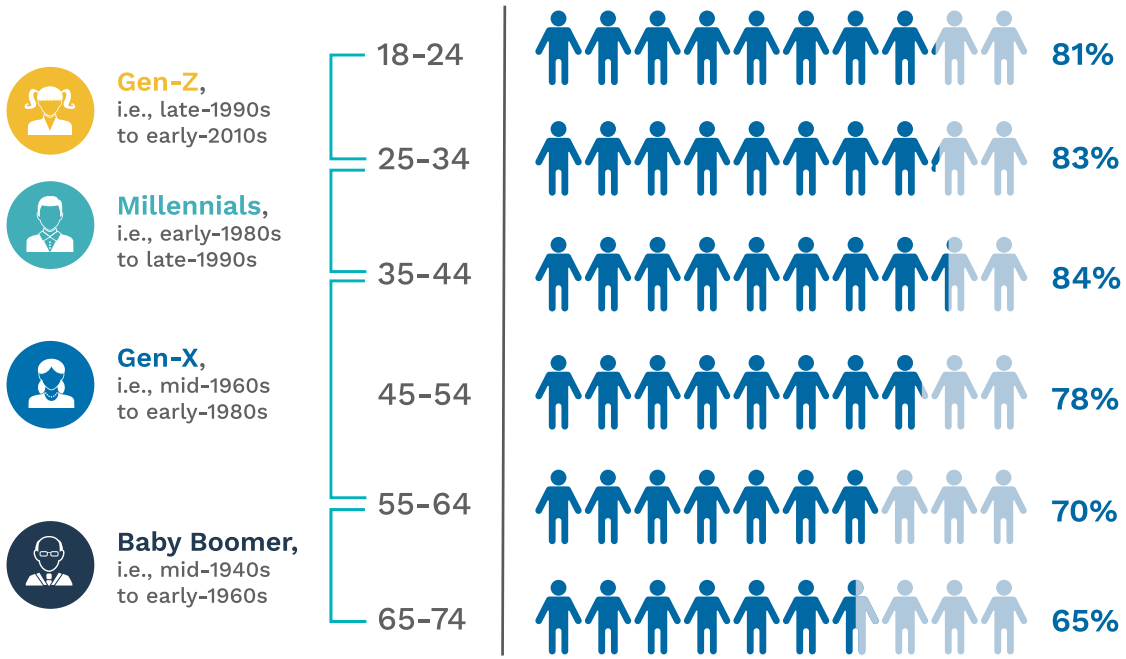
SOURCE: Survey of 1,340 employers in the US

1. Employers responding to this survey were offered a range of expected salary increase to choose from for each of the departments. A weighted average share of salary increase is presented here.

EXHIBIT 6

THERE IS STRONG INTEREST IN AI TRAINING ACROSS GENERATIONS

Share of employees interested in developing AI skills to advance careers by age[1]



SOURCE: Survey of 3,297 employers in the US

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

As organizations experience this lift in productivity across departments, employers are keen to reward their top contributing employees. The expected salary bump is proportional to the productivity gains employers expect their organization to see as a result of implementing AI across their organization (around 47%). This is discussed further in Insight 4.

Survey data also suggests interest in AI transcends generations and is strong from Gen-Z to Boomers and everyone in between. Over 80% of younger employees, including Gen-Zs and Millennials, are interested in picking up AI skills. Gen-Z's top reported motivations are the desire for a higher salary, Millennials' are to advance careers. Similarly, even with retirement in sight, roughly two-thirds of workers over the age of 55 – Boomers – indicate they would enroll in an AI course if offered by their company, with their top motivation being to increase job efficiency.

INSIGHT 4

The productivity payoff from an AI-skilled workforce could be immense

Studies show AI can dramatically improve worker efficiency – when they are trained to use it. Specifically, AI solutions help elevate analytical judgment, bias detection and handling, and emotional intelligence. In fact, in several sectors, AI has delivered up to a 72% boost in productivity for certain tasks. Not surprisingly, surveyed employers believe that AI could potentially boost their organization's productivity by 47% if utilized to its full potential across all functions, with some variation by firm size (Exhibit 7).

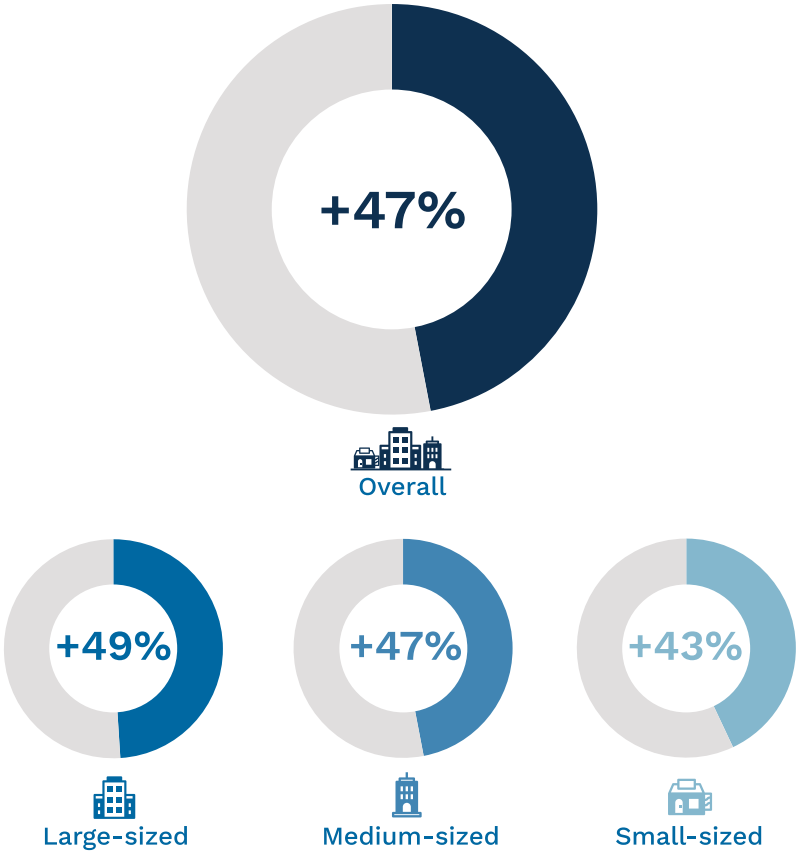
> Employers believe that AI could boost productivity by **47%** if utilized fully, while employees believe doing so would make their tasks **41%** more efficient.

EXHIBIT 7

AI-DRIVEN PRODUCTIVITY GAINS

Expected AI productivity boost[1]

Percentage increase in productivity by organization size



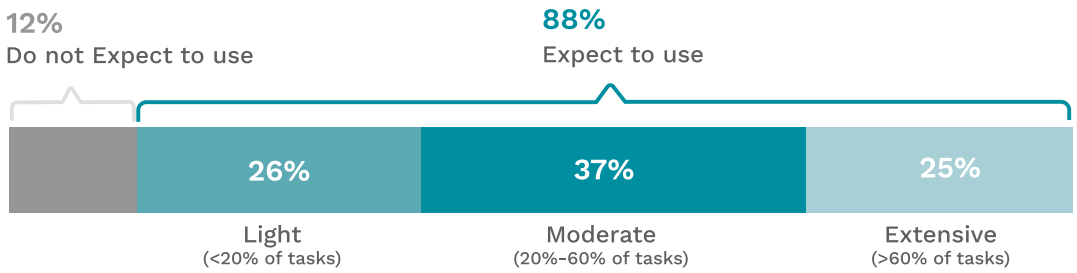
SOURCE: Survey of 1,340 employers and 3,297 employees in the US

1. Large-sized firms refer to organizations that have 1,000 or more employees, medium-sized firms refer to organizations that have 100-999 employees and, small-sized firms refer to organizations that have fewer than 100 employees. Numbers here refer to employer's expected increase in firm productivity from full AI utilization.

EXHIBIT 8

THE VAST MAJORITY OF EMPLOYEES EXPECT TO USE AI-POWERED TOOLS IN THEIR JOBS IN FIVE YEARS' TIME

Share of employees who expect to use AI-powered tools in their job by 2028, by extent

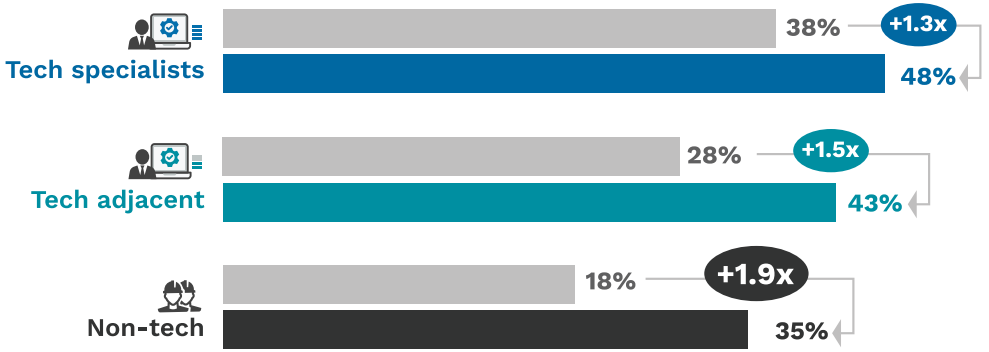


SOURCE: Survey of 3,297 employees in the US

EXHIBIT 9

PRODUCTIVITY GAINS BY LEVEL OF TECHNICAL KNOWLEDGE

Average share of job tasks performed with AI by type of worker[1,2]



SOURCE: Survey of 3,297 employees in the US
1. Respondents were asked to indicate the share of job tasks they would complete using AI-powered tools in 2023 and 2028.
2. Three types of workers were surveyed: (1) Tech-specialists: employees who develop new technologies and use specialized tech knowledge, (2) Tech-adjacent workers: employees dealing with technological products and services, and (3) Non-tech workers: employees who do not require advanced tech knowledge and skills.

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

Boosting innovation and creativity, including using AI tools to generate ideas and to design graphics, videos, and images.

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

Automating repetitive tasks, including using AI tools to schedule meetings, filter emails, generate code, generate reports, and create invoices.

The full extent of the AI productivity boost could be felt across the economy in five years' time, with employees expecting to use AI in greater numbers. For instance, nine in 10 (88%) employees expect to use AI in their daily work by 2028 (Exhibit 8). What's more – roughly one in four of these employees (25%) expect to use AI "extensively", or in over 60% of their job tasks. And it's 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 a third of their job tasks by 2028 (Exhibit 9). In fact, 'non-tech' workers will experience the highest jump in the use of AI in their jobs – nearly doubling in five years'. From customer service reps using AI to streamline requests, to administrative assistants using generative AI to write better emails, AI can significantly enhance productivity in key tasks for 'non-tech' workers.

INSIGHT 5

The AI skills gap

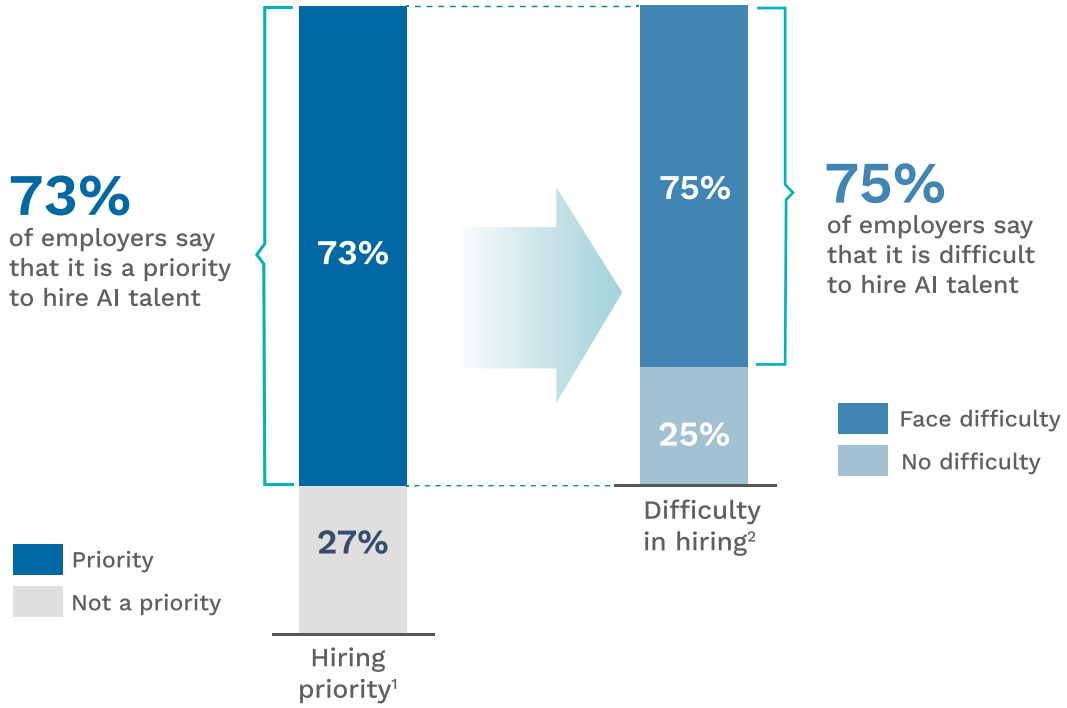
Surveyed employers rank AI as the most important technology skillset a job candidate can possess. The survey presented employers with 27 "technology skills" that are commonly listed on jobs platforms such as LinkedIn as critical for jobs that involve the use or interpretation of AI.[1] When asked to forecast the top five tech skills among these 27 that they will look for in their employees, 51% of employers ranked AI development in the top five demanded skill in five years time, on average ranking as the top demanded skill as well. This was followed by advanced digital marketing in second place, with 31% of employers ranking this in their top 5 demanded skill, application development in third (27%), and basic digital marketing in fourth (25%).

However, the rapid transition to an AI-enabled workforce has created a labor market shortage for AI talent. In fact, nearly three out of four (73%) of surveyed employers who consider hiring AI talent as a priority are having difficulty finding qualified candidates (Exhibit 10).

EXHIBIT 10

MEASURING THE AI TALENT GAP

Employer's opinions on needs and hiring for AI talent



SOURCE: Survey of 1,340 employers in the US
1. Employers responding to this survey were tasked to evaluate to what extent their organization prioritized hiring AI talent: 31% indicated "major priority" and 43% indicated "somewhat a priority".
2. Employers responding to this survey were tasked to evaluate how difficult it was to hire AI talent in their organization: 27% indicated "very difficult' and 48% indicated "some difficulties".

EXHIBIT 11

CRITICAL AI SKILLS

Top skills needed in 2028 to use AI well[1]

Rank	Skill	Share of employers ranking skill in Top 3 for AI in 2028
1	Critical thinking/problem solving	61%
2	Creative thinking/design	52%
3	Technical (e.g., coding)	47%
4	Ethics and risk management	39%
5	Communication	30%
6	Math	20%
7	Teamwork and interpersonal	18%
8	Management	17%
9	Writing	16%

SOURCE: Survey of 1,340 employers and 3,297 employees in the US
1. Employers that responded to this survey were offered 9 skills to rank in order of importance to develop AI skills today and in 2028.

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, other skills such as critical thinking and problem solving are considered even more important (Exhibit 11). Critical thinking is essential to evaluate the accuracy and relevance of AI outputs, while problem-solving helps optimize the capabilities of AI systems by defining and structuring analyses appropriately on available data. Ethics and risk management is also ranked as the fourth most important skill needed to use AI effectively. That's because while AI can mimic many human skills and competencies, it still falls short in other areas, like emotional intelligence, contextual understanding, common sense, adaptability, ethics, and intuition. Ethics and risk management is therefore critical to guard against potential AI risks, including algorithmic bias,[2] lack of accountability, compliance challenges, and the need for transparency and safety measures.[3] The implications for organizations and their workers are clear – taking advantage of AI is going to require a far broader set of skills than just coding.

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

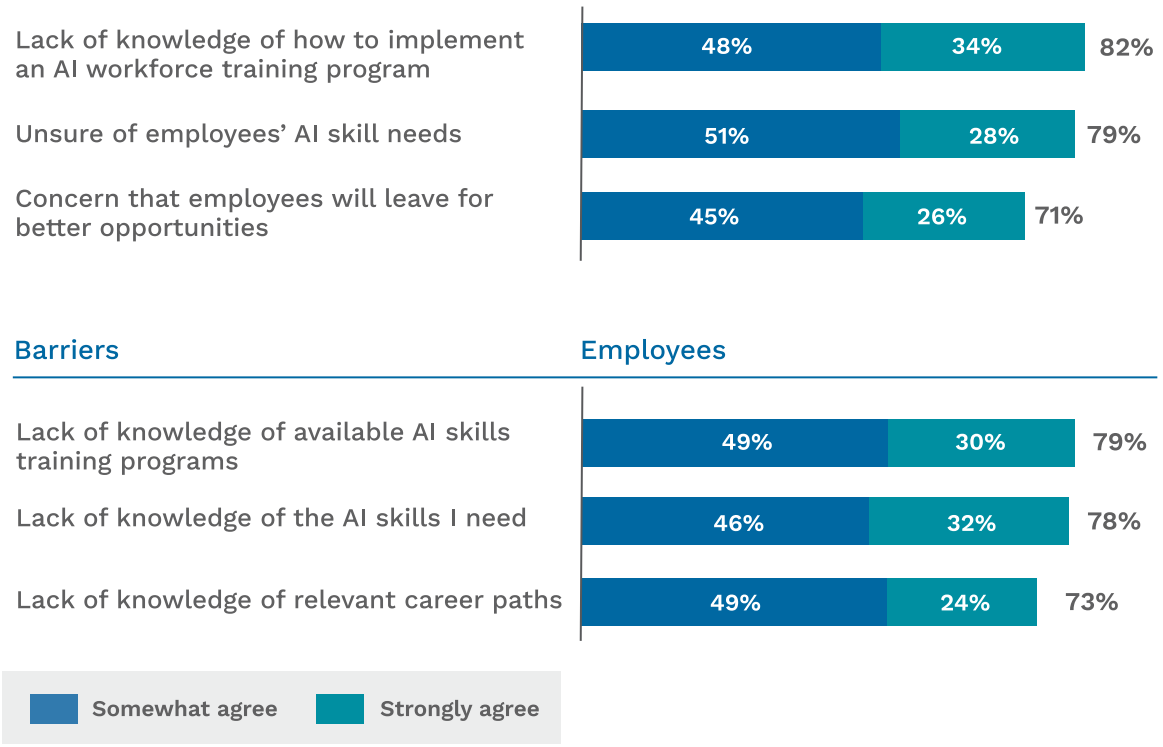
Compounding the skills gap is a lack of AI skills training. More than 90% of surveyed employers and employees reported facing at least one barrier to accessing adequate AI skills training for their organizations or themselves. This is consistently high across regions and sectors. Exhibit 12 shows which barriers among employers and employees pose the most significant challenge. For example, 82% of employers admitted that they aren't sure what AI skills are needed in their organizations. Nearly 80% of respondents from both groups, meanwhile, said they don't know what kind of AI training is out there or how to implement an AI workforce training program.

> Over **90%** of respondents face at least one barrier in providing or accessing relevant AI skills training.

EXHIBIT 12

BARRIERS TO ACQUIRING AI SKILLS

Share of employers and employees selecting each option as a barrier[1]



SOURCE: Survey of 1,340 employers and 3,297 employees in the US
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

APPENDIX: METHODOLOGY

SURVEY METHODOLOGY

Two surveys on AI skills were conducted as part of this study in the US – one for employers and one for employees. Pools of respondents in both surveys drew on those organizations and workers that utilize at least some tech skills, ranging from basic skills such as using word processing software to advanced skills such as software development.

The surveys were conducted online in August and September 2023. They asked respondents for their views on the following: (1) Current development of and future need for technology skills; (2) Perceived benefits of AI, including generative AI; and (3) The current and future state of AI skills training, including barriers to acquiring AI skills training.

A total of 4,637 individuals participated in the survey, including 1,340 employers and 3,297 employees across industries. This was a nationally representative sample that also included additional sampling in: California, Ohio, Seattle, and Tennessee; and in four sectors: Government services, Financial services, Healthcare, and Education. Exhibit 13 contains detailed statistics on the respondent profiles for the employer and employee surveys respectively.

For the employer survey, a minimum of 200 respondents at the regional and sectoral levels were targeted to ensure statistically significant results at a 90% significance level and 5% margin of error. For the employee survey, a minimum of 500 respondents at the national and regional levels were targeted to ensure statistically significant results at a 95% significance level and 5% margin of error. At the national level, results were not assigned weights per state contributions.

RESPONDENT PROFILES

EXHIBIT 13A

US EMPLOYER SURVEY: RESPONDENT PROFILES

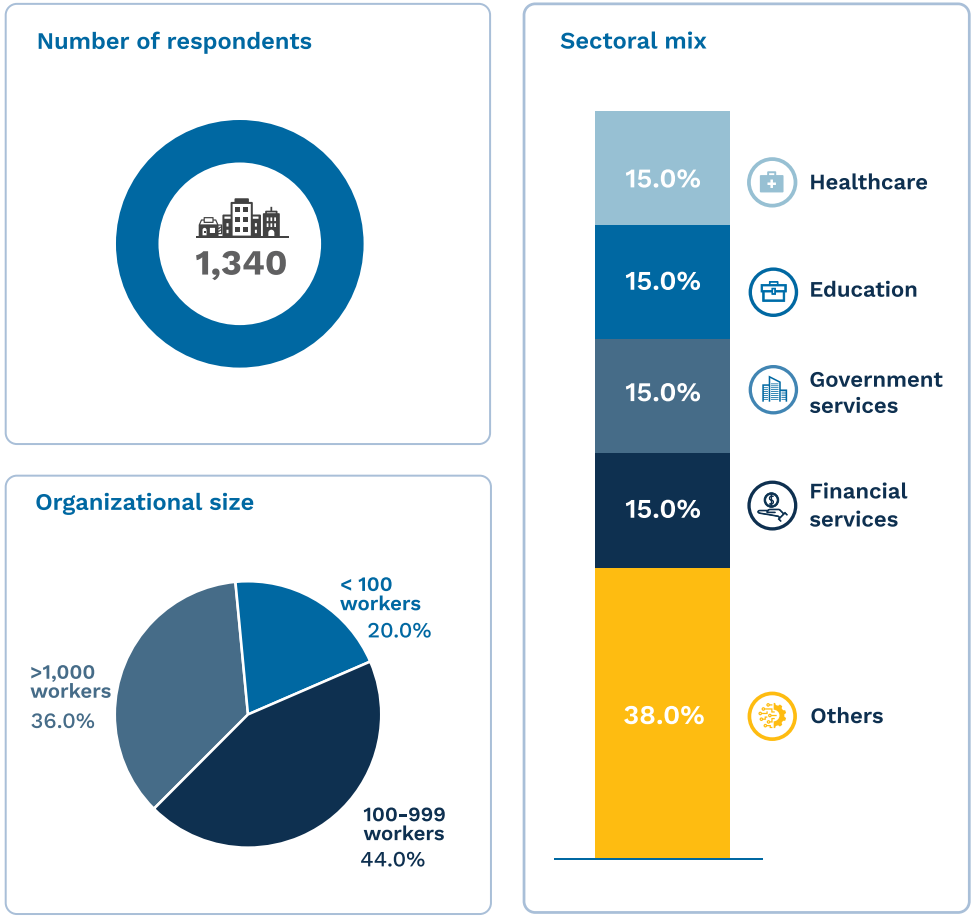
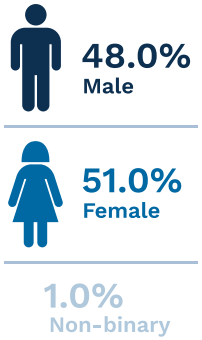


EXHIBIT 13B

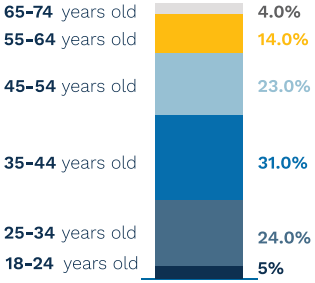
US EMPLOYEE SURVEY: RESPONDENT PROFILES

Number of respondents

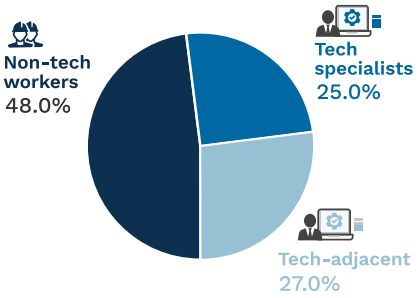
Gender



Age range



Tech focus job role[1]



1. Tech specialist: Workers that typically develop new technologies or technological applications, and/or use specialized tech knowledge to deliver the organization'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 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.

SOURCES

1. This list also builds from past work on digital skills, including AlphaBeta and AWS (2022), Building Digital Skills for the Changing Workforce in Asia Pacific and Japan (APJ): AWS APJ Digital Skills Study, https://accesspartnership.com/building-digital-skills-for-the-changing-workforce-in-asia-pacific-and-japan-apj-aws-apj-digital-skills-study/
2. David Leslie (2019), "Understanding artificial intelligence ethics and safety: A guide for the responsible design and implementation of AI systems in the public sector", Available at: https://doi.org/10.5281/zenodo.3240529
3. Selin Akgun and Christine Greenhow (2022), "Artificial Intelligence in Education: Addressing Ethical Challenges in K-12 Settings.", Available at: https://doi.org/10.1007/s43681-021-00096-7.

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