Beyond The Buzz

Developing the AI Skills Employers Actually Need

Translating Labor Market Trends Into Actionable Training and Strategy

Lightcast

Contents

On the cover: The images in this report were generated with a combination of AI tools including OpenAI Sora and Adobe Firefly.

Beyond The Buzz: Developing the AI Skills Employers Actually Need

The global labor market stands on a precipice, right as artificial intelligence is making the jump from a niche technological innovation to a widespread function of everyday work. This raises difficult questions for those entrusted with preparing the workforces of tomorrow: How do I make sense of all the new information and disruption happening so quickly? And how can I craft a workforce strategy in response?

Decisions about how and where to invest in AI training should require data-based evidence, not guesswork and luck.

In a market overwhelmed with disruption and hype, real-world job postings provide clear insights for the next step forward.

In a skills-driven economy where capabilities matter more than credentials, the organizations that can identify and develop the right AI skills won't just adapt to the future—they'll define it.

This report cuts through the noise with hard data from millions of job postings, identifying new patterns in demand for AI. Instead of providing life hacks or hot takes like "Five Questions To Ask ChatGPT" or "How The Google AI Overview Is Reshaping Communication," these findings have been observed and studied in real-world job postings, documenting which specific AI skills employers actually pay premiums for, which roles require them most urgently, and how different roles are adapting at dramatically different speeds. In particular, we have studied how AI has grown beyond tech jobs, producing a significant impact on career areas across the labor market.

As we use trends in job postings to analyze demand for AI across the labor market, we're aware of their limitations: even the most up-to-date collection of job postings lag behind actual labor market uses.

Millions of workers today are using AI even though AI was not included in their job description when they were hired. Even so, a job posting is a clear signal of momentum, indicating the kind of worker an employer wants to build their future around. So when we say that over 80,000 job postings in 2024 listed Generative AI skills, we know that more than 80,000 workers are using them. **Instead of trying to create a point-in-time assessment of AI use, the job postings tell us which way the wind is blowing.** When we know which skills are increasing most in demand, especially looking within specific career areas, educators can teach those skills to learners, L&D can develop them in their employees, and HR leaders can create a workforce strategy that includes AI skills in future roles. In short: by knowing how AI demand is moving, you can learn where you should direct your energy.

PREVIEW

Part 1: AI In The Real World—Understanding Its Impact

In this section, we demonstrate the growth of AI across the labor market, in order to establish its importance and to provide a context so that you understand why and how AI skills are needed in your organization.

Using real-world job postings, we establish how demand for AI is growing throughout the labor market broadly, not limited to a few specific use cases, and we also show jobs that include AI skills demand a salary premium over comparable roles that do not. Job postings also allow us to quantify how much AI has permeated each career area, identify how fast different fields are incorporating AI skills, and study that growth over time. For example, the career area of IT and computer science posts many AI jobs, and has done so for years, which means that field needs a different workforce strategy than sales, which has posted few AI jobs historically but is increasing that share rapidly.

Every career area is adopting AI differently. We analyze them based on the demand and growth of AI skills, and also provide data-informed strategies for each of them in order to help you build a future-ready workforce.

PART 1 KEY FINDINGS:

1

“AI Job” Does Not Mean “Tech Job”

In 2024, over half of job postings requesting AI skills were outside IT and Computer Science.

2

AI Skills Mean Higher Salaries

Salaries for postings that mention AI skills are 28% higher than postings that do not, representing roughly $18,000 more per year.

3

Every Career Area Is At A Different Stage On Its AI Adoption Journey

Organizations need to be aware of the rapid changes happening to their career area. Here, we provide specific insights for where your organization falls.

PREVIEW

Part 2: The AI Skills Disruption Matrix—Which Skills Should You Teach Now?

While Part 1 covers big-picture key findings, useful for understanding the overall shape of AI in the labor market, Part 2 provides clear insights about which skills workers need to acquire, so that both educators and corporate learning and development teams can provide that training.

After establishing the top skills required for AI jobs throughout the entire labor market, this section dives deep into a few selected career areas to examine what skills are most in demand, which skills provide the most value, and how practitioners in those fields can anticipate AI's impact and prepare accordingly.

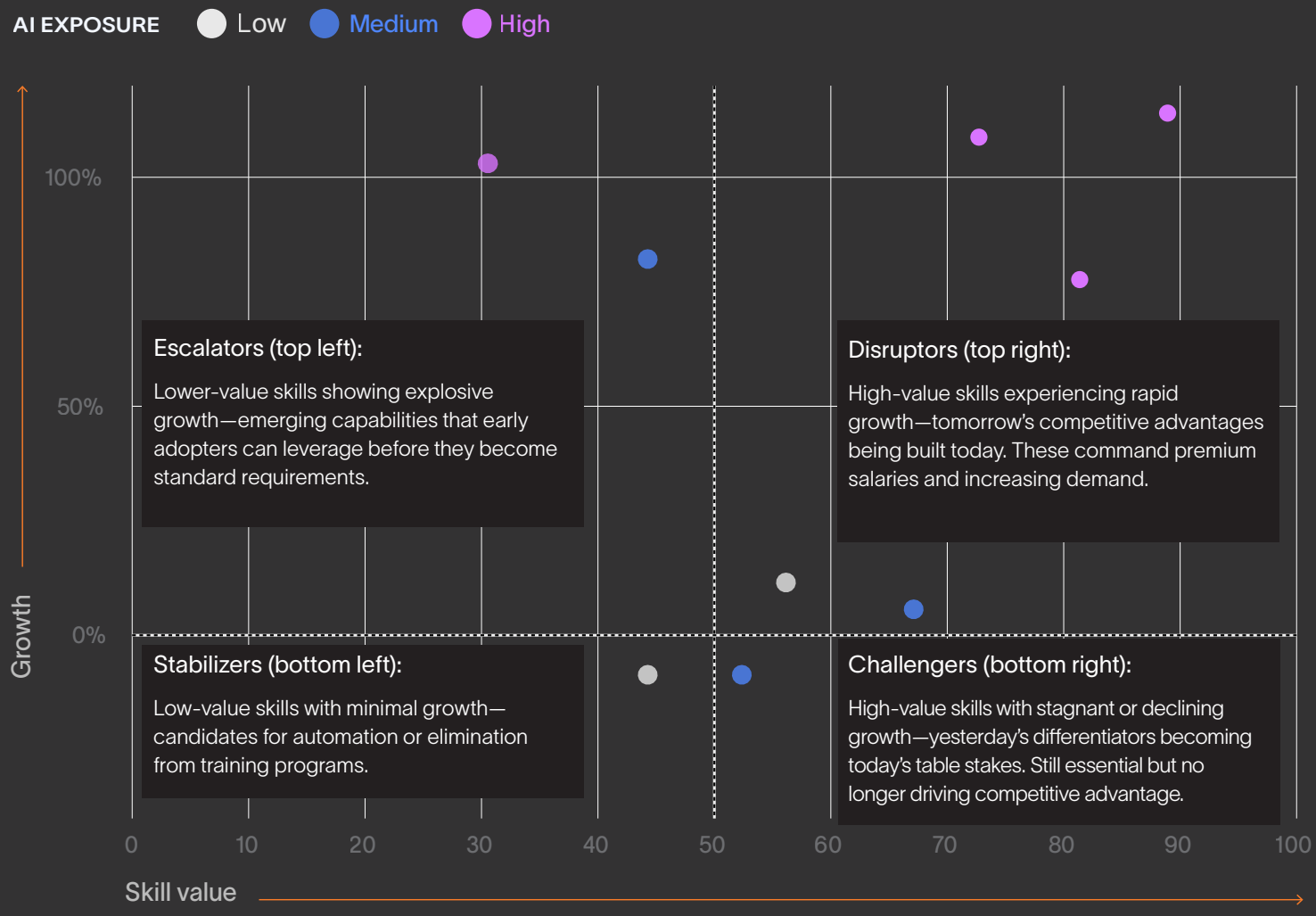
SECTIONS INCLUDE:

Skills Overview

Career Area Deep Dives

Introducing the AI Skills Disruption Matrix

The career area deep dive sections include a unique matrix for each of the career areas we study. We evaluate skills needed in that field across three metrics: its rate of growth, its overall importance, and its exposure to AI. This produces four quadrants:



We then overlay AI exposure levels **(high, medium, or low)** to reveal which skills face disruption versus which remain fundamentally human. This three-dimensional view—value, growth, and AI exposure—transforms vague anxiety about AI into precise intelligence about where to invest training resources.

Here's an example of what this matrix could look like.

This would be an industry facing a high degree of disruption from AI. In this example, the AI-exposed skills (in purple) are growing fast. The skills on the upper right side of the chart (Disruptors) are already valuable, and should be prioritized, while those in the upper left are accelerating in adoption and may see their importance rise very quickly.

The lower two quadrants show lower growth, and if you're looking for skills to add, you likely won't find them here. The only exception would be if your organization had somehow missed a skill in the "Challengers" quadrant, which have low growth but have established their value to the career area—but most skills in that quadrant are unlikely to be surprises. "Stabilizers" present a different course of action: these skills, with low growth and low value, should not be prioritized. These could be options to remove from curricula or training strategies in order to make room for others, or this could just be a guide that shows you what to avoid.

Career Areas, Job Functions, and Program Areas: Terminology Overview

AI disruption affects the entire labor market—and that includes parts of the labor market that use different names to refer to similar ideas. For example, a university would consider “Marketing and PR” a program area, while a business would refer to the same field as a job function. Throughout this paper, we use the term “Career Area” as an umbrella term to encompass both meanings. Education and enterprise-specific language is also used throughout the paper when those audiences are directly addressed.

Defining AI Skills and Jobs

Lightcast has identified nine skill clusters within the broader umbrella of AI, These categories were created to support our research alongside the Stanford Institute for Human-Centered AI and its annual AI Index Report. Those clusters are: AI Ethics, Governance, and Regulation; Artificial Intelligence; Autonomous Driving; Generative AI; Machine Learning, Natural Language Processing; Neural Networks; Robotics; and Visual Image Recognition. Across those nine clusters, Lightcast experts have identified a total of over 300 skills, and a job posting is considered an AI job if it includes one of those skills within the text of the job listing.

Defining a Generative AI Skill

Generative AI is one of the nine AI skill clusters that Lightcast uses to conduct the most granular and accessible analysis of AI possible. The Generative AI skill cluster includes:

Adobe Sensei, ChatGPT, CrewAI, DALL-E, image generator, generative adversarial networks, generative AI agents, generative artificial intelligence, Google Bard, image inpainting, image super-resolution, LangGraph, large language modeling, Microsoft Copilot, multimodal learning, multimodal models, prompt engineering, retrieval-augmented generation, Stable Diffusion, text summarization, text to speech (TTS), variational autoencoders (VAEs).

The full methodology for this paper is provided on page 54

PART 1:

AI In The Real World

Countless predictions have tried to guess what impact artificial intelligence will have on jobs, but the labor market is not waiting around for an answer. The speed of this transformation is unprecedented: Lightcast data shows that the average job has seen 32% of its skills change in just three years, with AI driving more disruption than any other trend. In such a rapidly evolving landscape, staying competitive requires real-time workforce intelligence—the kind of continuously updated data that captures skill changes as they happen, not months or years after the fact.

Employers are already posting jobs that require specific AI capabilities, offering substantial salary premiums for these skills, and doing so across every career area from retail to research. These aren't speculative forecasts or consultant projections—they're documented requirements extracted from millions of actual job postings from the Lightcast database, revealing exactly how AI has moved from Silicon Valley curiosity to mainstream business necessity.

“AI Job” Does Not Mean “Tech Job”

AI exists at the leading edge of technological development. It powers cars that drive themselves. It enables users with no development experience to create websites and apps in minutes. It offers increasingly personalized experiences for consumers online. These are high-tech developments, created by software companies in Silicon Valley using the latest and most powerful computer chips available—which might feel intimidating for those far from the tech industry. This sophistication may seem so foreign as to be irrelevant. AI might feel like it is exclusively the realm of people who know what it means when they read a headline like “Asynchronous Code Testing Marks The Evolution of GitHub Copilot as an Agent.”

But while that perspective might be tempting, it is not supported by the data.

Lightcast data indicates that the majority of job postings mentioning AI skills are now outside tech, and the ratio of tech AI job postings to non-tech AI job postings has been declining steadily over several years. Since 2022 and the launch of ChatGPT, postings mentioning generative AI skills specifically are up 800% for jobs outside IT and Computer Science.

The data presents a clear conclusion: AI has expanded beyond the tech industry, and shows no sign of reversing course.

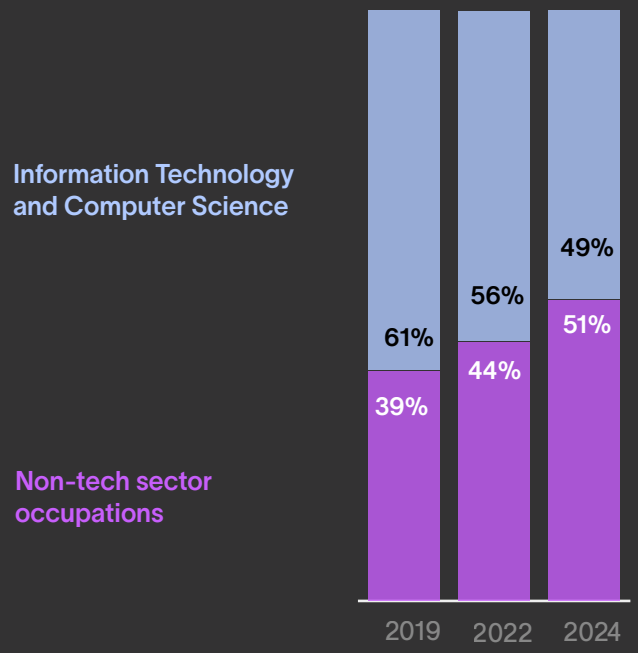
Most AI Job Postings Are Outside Tech

There are now more job postings asking for AI skills outside the tech sector than in the tech sector.

In 2019, 61% of job postings requiring AI skills were in IT and computer science occupations. The data from 2022 (a pre-ChatGPT baseline) shows a decrease in that share, creating a consistent trend that has continued in the years since.

In 2024, the share is now 49%, and **51%** of job postings requiring AI skills are actually outside IT and computer science occupations.

Distribution of job postings requiring AI skills by occupation group in the US



Source: Lightcast job postings data

The Explosive Rise Of Generative AI

Within the overall increase for AI postings, generative AI postings in particular have seen an even faster rise. This is an example of job posting data mirroring real-world trends: even as AI technologies like machine learning and driverless cars have developed significantly over the past several years, generative tools that produce text and images have multiplied much faster.

In 2024, over 80,000 job postings mentioned generative AI skills. Breaking this down by type of role offers more detail about how widespread this rise has been.

From 2022 to 2024:

Job postings for generative AI engineers are up

7x

from 1,620 to 11,160

Job postings requiring generative AI skills in other IT roles are up

35x

from 1,120 to 39,230

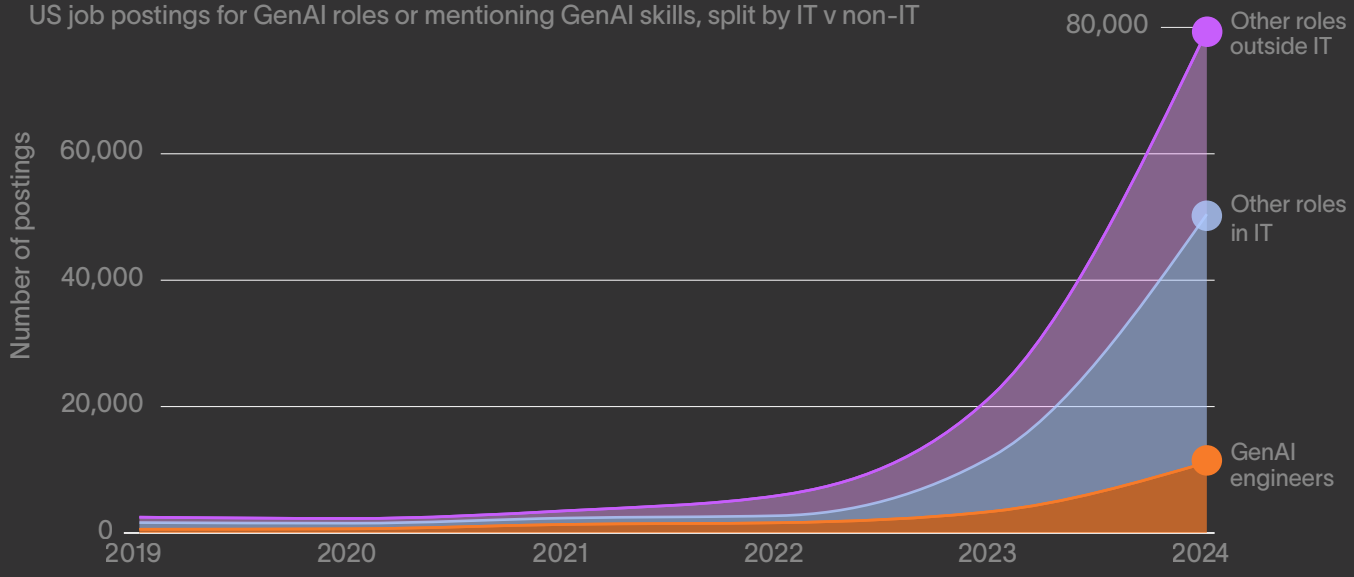
Job postings requiring generative AI skills in non-IT roles are up

9x

from 3,220 to 29,045

Which roles are employers actively hiring for that require GenAI skills?

US job postings for GenAI roles or mentioning GenAI skills, split by IT v non-IT



Source: Lightcast job postings data

This demonstrates how generative AI skills have seen extraordinary growth both within and outside of the tech industry. The section above described how the majority of *all* AI skills were requested in non-tech roles, so while this shows that the majority of *generative* AI postings are still in tech, the entire job market is feeling the effects.

Tracking AI's Growth Across Career Areas

One way to evaluate the growing demand for AI skills would be to measure the share of job postings within a career area that request AI skills, then track that measurement over time. In other words, if x percent of all Marketing and Public Relationships jobs request AI skills in 2019, and by 2024 x has doubled, that would show us, at a glance, how much disruption that career area has experienced.

In fact, that's exactly what happened. The share of AI jobs in Marketing and PR has doubled over five years, as they also have for Design, Media, and Writing; other career areas including HR and Education have seen exponential growth.

Breaking down the ratio of AI postings to all postings also shows us, at a glance, several key insights about the growing demand for AI skills over the past decade:

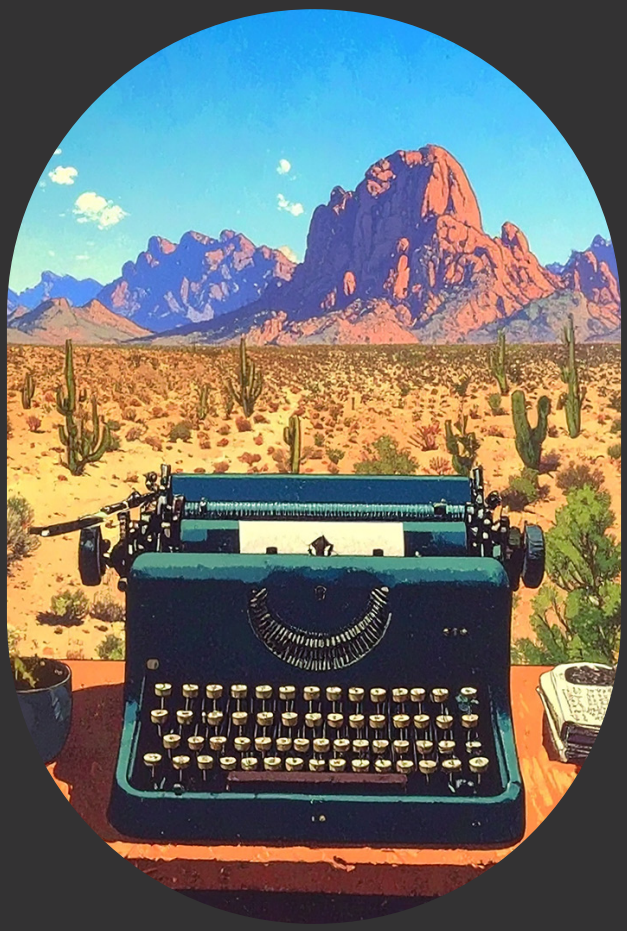
- **The share of jobs requiring AI skills has grown across every job function and program focus.**
- **In 2016, only five career areas mentioned AI skills in at least 1% of job postings. In 2024, that number is now 13.**
- **While the actual percentages of AI postings remain small in many of these career areas, the year-to-year difference indicates significant growth and momentum.**

AI skills are now increasingly in-demand in a range of career areas / functions

Share of postings in each occupation area mentioning AI skills %

	2016	2018	2020	2022	2024
Information Technology and Computer Science	4.33%	7.55%	9.02%	11.06%	14.00%
Marketing and Public Relations	2.27%	3.58%	4.76%	5.25%	8.11%
Science and Research	2.63%	3.86%	4.13%	5.49%	6.16%
Social Analysis and Planning	2.02%	2.29%	3.42%	3.87%	4.01%
Engineering	1.85%	2.74%	3.06%	3.83%	3.80%
Design, Media, and Writing	0.97%	1.16%	1.57%	1.78%	3.06%
Military	0.53%	0.79%	0.88%	2.11%	2.18%
Human Resources	0.79%	1.36%	1.15%	1.53%	2.00%
Performing Arts	0.50%	0.69%	0.58%	1.00%	1.65%
Business Management and Operations	0.54%	0.81%	0.74%	1.03%	1.40%
Education and Training	0.71%	0.73%	0.79%	1.10%	1.34%
Finance	0.45%	0.70%	0.62%	1.01%	1.33%
Customer and Client Support	0.46%	0.64%	0.57%	0.87%	1.04%
Law, Compliance, and Public Safety	0.36%	0.52%	0.41%	0.69%	0.95%
Sales	0.20%	0.43%	0.46%	0.61%	0.76%
Maintenance, Repair, and Installation	0.21%	0.39%	0.49%	0.41%	0.65%
Clerical and Administrative	0.26%	0.36%	0.31%	0.56%	0.56%
Manufacturing and Production	0.26%	0.37%	0.32%	0.46%	0.52%
Community and Social Services	0.33%	0.38%	0.29%	0.35%	0.43%
Healthcare	0.14%	0.20%	0.24%	0.28%	0.37%
Agriculture, Horticulture, & the Outdoors	0.40%	0.61%	0.46%	0.37%	0.35%
Construction, Extraction, and Architecture	0.16%	0.18%	0.18%	0.29%	0.30%
Transportation	0.10%	0.15%	0.13%	0.16%	0.20%
Personal Services	0.10%	0.11%	0.10%	0.16%	0.17%
Hospitality, Food, and Tourism	0.09%	0.09%	0.06%	0.07%	0.10%

Source: Lightcast job postings data



WHAT DOES THIS MEAN FOR LEARNING AND DEVELOPMENT?

While leaders debate whether AI training is necessary, the job market has already decided.

When over half of AI job postings fall outside tech, the traditional approach of treating AI as a high-tech specialty becomes a strategic liability. The 800% surge in non-IT generative AI postings since 2022 signals that AI capabilities are becoming table stakes across functions—from marketing teams using AI for content creation to HR professionals leveraging predictive analytics for talent acquisition. As AI adoption grows across career areas, the the dramatic transformation suggests a systemic market shift, not isolated trends.

Companies that continue treating AI as a niche technical skill will find themselves competing for talent with organizations that have embedded AI literacy across their entire workforce.

Case Study: Leveraging Labor Market Data for Strategic AI Workforce Planning

Cisco Networking Academy recognized that the rapid advancement of artificial intelligence was fundamentally reshaping technology roles and needed data-driven insights to guide their training programs. Rather than making assumptions about AI's impact, Cisco partnered with Lightcast to conduct a comprehensive analysis of how emerging AI technologies would affect ten critical ICT roles across Cybersecurity, Networking, IT Support, and Data Science. This strategic approach allowed Cisco to move beyond industry speculation and base workforce development decisions on concrete evidence extracted from over one billion job postings.

Using Lightcast's proprietary labor market data, Cisco identified precisely which skills within each role would be augmented, displaced, or remain essential in the AI era. **The analysis revealed that while all ten roles would experience 15-52% time savings from AI integration**, the impact varied dramatically by function. Engineers, developers, and data analysts faced the highest near-term disruption, with **30% of their skills being augmented and 35% at risk of displacement**. In contrast, Cybersecurity and Network Engineering roles are uniquely positioned to harness the benefits of AI augmentation. These fields present exciting opportunities for students and professionals, as AI technologies enhance—not replace—their capabilities, enabling greater efficiency and innovation while maintaining the critical human oversight required for high-stakes environments.

These insights empowered Cisco to design targeted training strategies that integrate advanced AI capabilities with essential human skills. While generative AI excels at tasks like writing and coding, uniquely human abilities—such as communication, management, innovation, and complex problem-solving—are becoming even more valuable in the AI era.

Through the Cisco Networking Academy program, which reached over 4.7 million students annually across 191 countries in fiscal 2024, these findings are translated into impactful learning experiences. Courses like Introduction to Modern AI equip learners with cutting-edge skills such as prompt engineering, AI literacy, and large language model (LLM) architecture, while also strengthening the interpersonal and critical thinking competencies that set them apart in an AI-augmented workforce.

This data-driven, global approach ensures that Cisco's training programs are grounded in real labor market demand—empowering students and professionals worldwide to thrive in the evolving world of work.

AI Skills Mean Higher Salaries

Salary data for job postings that include AI skills tell a compelling story. **Postings that mention at least one AI skill advertise salaries 28% higher than those who do not**. This is equivalent to roughly **$18,000 per advertised annual salary**. For postings that mention at least two AI skills, the premium jumps even higher, up to 43%.

AI skills carry a premium across career areas. The three fields with the largest premium are Customer and Client Support, Sales, and Manufacturing and Production.

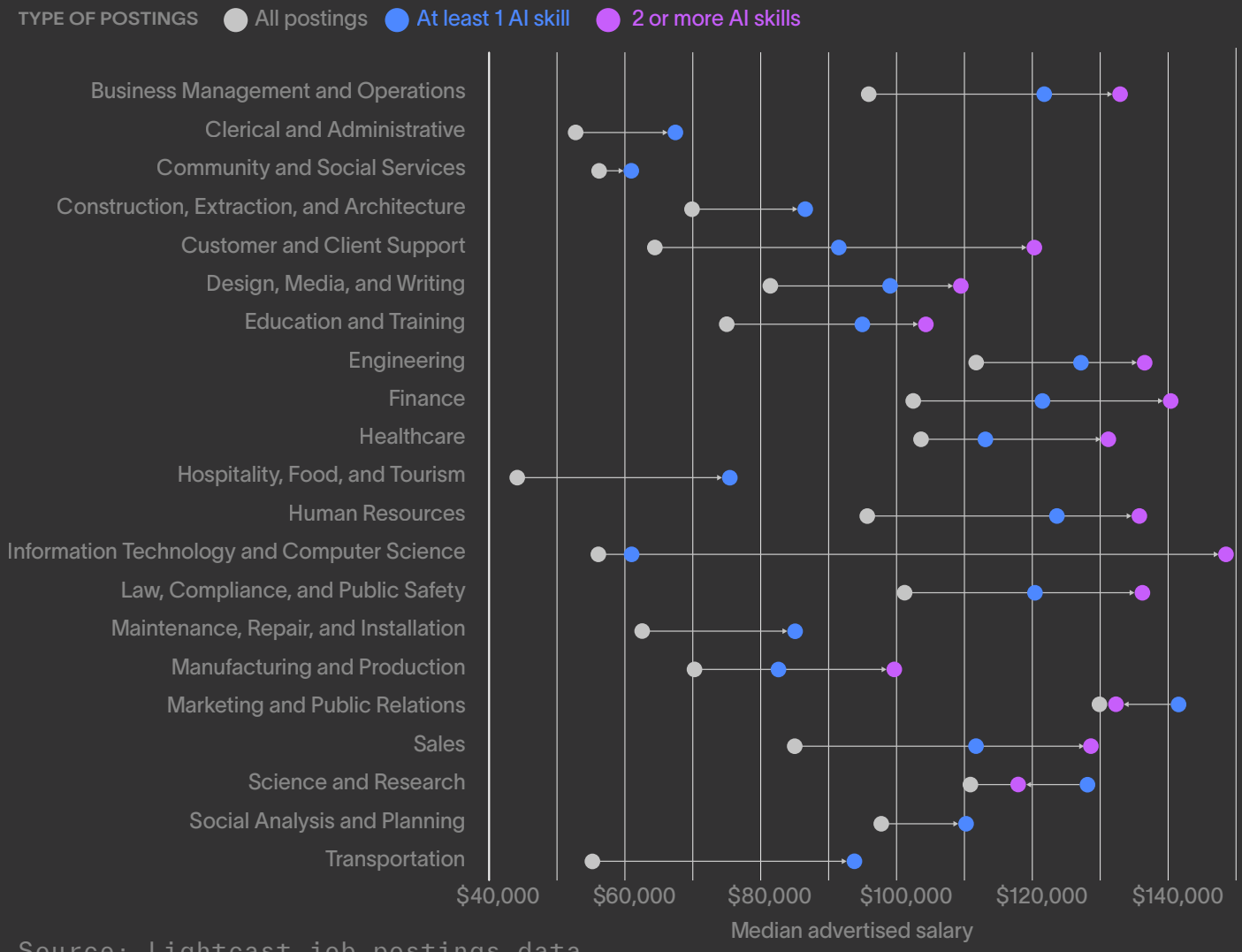
The current discourse around AI often deals in hyperbole and hype, trading on unrealistic promises about what's around the corner. What this data provides is real evidence to support the claim that this technology matters and demands to be taken seriously.

What's going on in Marketing & Public Relations and Science & Research?

In those fields, you may notice that the salary bump for one AI skill is larger than the boost for two or more. Sample sizes for job postings with salary data become much smaller when filtering for roles requiring 2+ AI skills, which can create noise in salary calculations. Also, roles requiring multiple AI skills may skew toward more specialized or junior positions in certain fields, while single-skill requirements often appear in senior roles where AI supports existing expertise rather than defining the position.

AI mentions come with a real salary premium

Median advertised salary by job function / program area overall and with AI skills



Source: Lightcast job postings data

WHAT DOES THIS MEAN FOR LEARNING AND DEVELOPMENT?

Investing in AI training creates measurable value.

The biggest value jump happens with the first AI skill—a 28% premium that represents immediate, quantifiable ROI. While additional skills do increase value further, the primary competitive advantage comes from ensuring every employee has at least one relevant AI capability. Corporate training initiatives can provide AI upskilling that makes employees significantly more valuable, while employees who already have those skills may be underpaid, creating a retention risk.

For educational institutions, this data provides a powerful enrollment tool. Programs can now promise concrete financial outcomes to prospective students, by making sure there is a promise for teaching market- relevant AI in every part of their curriculum.

The question isn't whether AI training pays off—it's whether your organization can afford not to provide it.

Guild

Case Study: Guild Drives Value By Identifying Which Skills Matter

Guild is a talent development company that connects employees to education and skilling programs—so when a business wants to invest in learning and development for its people, Guild makes sure that those outcomes are connected to overall organizational success. And Guild uses Lightcast skills data to make that possible. Guild's solution leverages the Lightcast Skills Taxonomy to ensure their Learning Marketplace of 2,000+ programs teaches capabilities that employers actually demand.The process works by identifying skills within Guild's educational offerings, then validating these against Lightcast's comprehensive database.

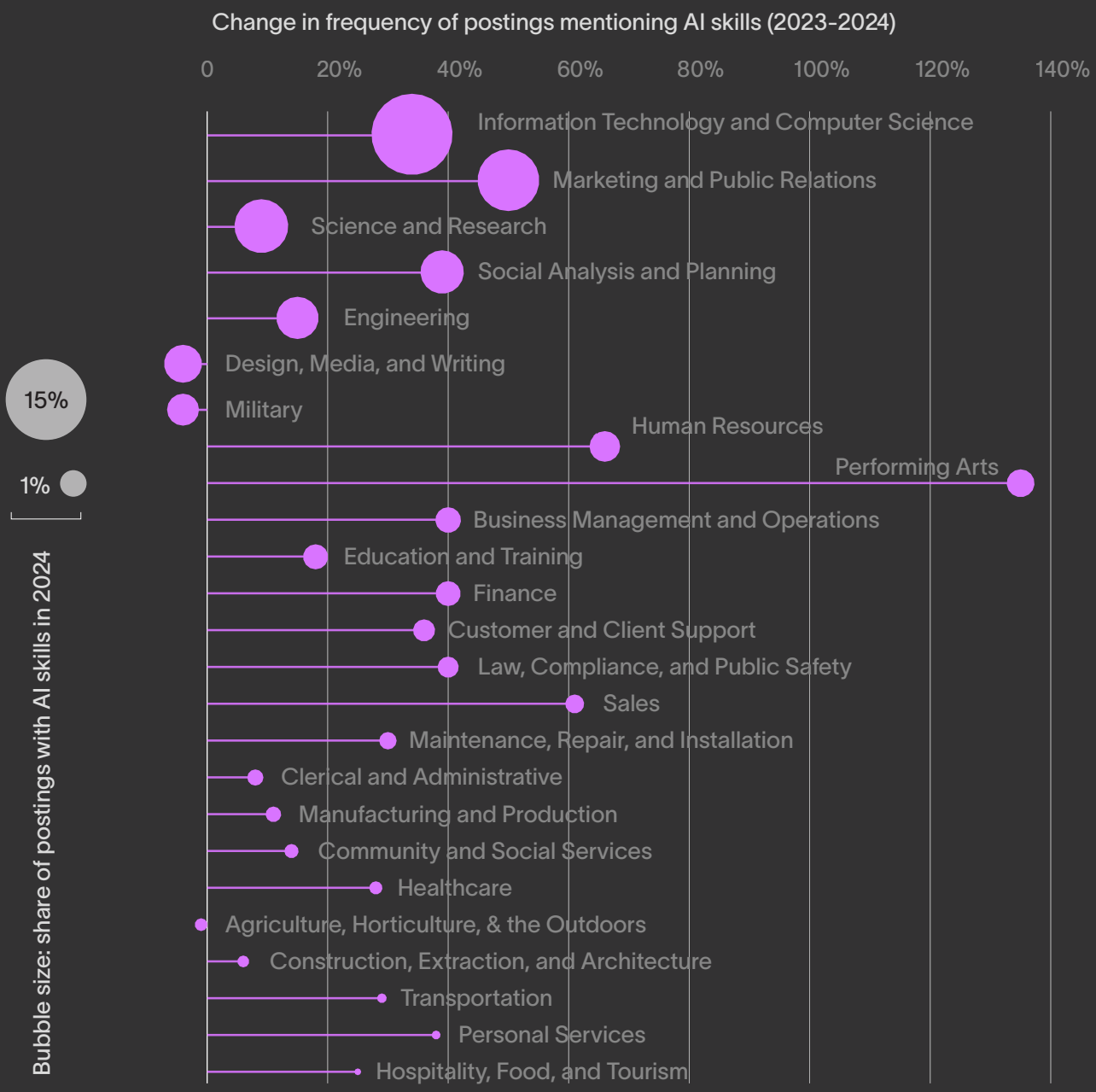
This creates transparent visibility for employers who can track exactly which marketable capabilities their employees are developing throughout their learning journey. This same approach proves especially valuable for AI skills training. Guild research has found that more than half of the available AI education programs require a bachelor's degree and they're designed for either engineers or executives, creating a risk that "AI skills swiftly concentrate at the top, and what was a skills gap rapidly turns into a skills chasm." Lightcast has identified over 300 AI skills across nine clusters—from machine learning and neural networks to generative AI and robotics—allowing for a clear analysis of the specific AI capabilities employers need most. By speaking the language of skills to communicate exactly what employers need and what workers can provide, educators and workforce training leaders can help ensure every learning investment delivers measurable workforce value.

Different Career Areas Are At Different Stages Of AI Adoption

This chart shows the diversity of AI adoption and growth across career areas. Lightcast data shows no clear correlation between how fast a career area has grown its AI adoption and how much it requires AI overall. This requires unique, specialized strategies for every job function and program area.

Because this chart shows the change in postings from 2023 to 2024, it has produced results that may seem counterintuitive. AI skills in the career area of Design, Media, and Writing saw a high rate of growth from 2022-2023, so its negative growth here is likely a regression to the mean, while its high rate of AI adoption shows that artificial intelligence is still highly prized for these roles.

Current demand for AI and change over the past year by career area / job function in the US



Source: Lightcast job postings data

PART 1 CONCLUSION:

The Cost Of Doing Nothing

The numbers tell a simple story. Over half of all AI job postings now fall outside technology roles. Workers with **AI skills earn 28% more** than those without them. Career areas from performing arts to finance show triple-digit growth in AI job requirements. The labor market has made its decision about AI—not as a future possibility, but as a present necessity.

Most organizations remain unprepared. They're frozen in a state of indecision, or looking for perfect AI-competent employees instead of training their existing workforce, while their competitors are building AI into their existing workforce strategies and hiring practices. Some career areas have adapted quickly: marketing teams now routinely use AI for content creation, HR departments deploy predictive analytics for talent acquisition. Others lag behind, treating AI as someone else's problem. **The gap between early adopters and the reluctant field widens each quarter.**

The solution requires precision, not philosophy. Employers want specific AI capabilities, like computer vision for manufacturing roles, text analytics for customer service positions, predictive modeling for finance teams. Educational institutions and corporate training programs that identify these exact skill requirements and teach them systematically will prepare workers for the economy that exists today. This requires using granular, actionable insights, using the language of skills to reduce ambiguity and promote clarity across the labor market.

The organizations that master this transition—the educators and HR leaders that can identify which AI skills matter most for their context and deliver targeted training that creates measurable value—will lead their industries and avoid falling behind.

Talent Transform: In A Disruptive Market, Build A Job Architecture That Can Adapt

AI is changing every job, and changing every job differently. Because over half of AI job postings in 2024 were outside IT, that means marketing, HR, finance, and sales roles are rapidly adopting AI skills while your static skill libraries still reflect pre-AI job requirements. Talent Transform creates the dynamic skills architecture you need to navigate this disruption: it builds and stores skill profiles in a structured, role-aligned way, normalizing messy job titles into a clean taxonomy and linking them to a standardized skill set.

Skills Agent, a new automation capability within Talent Transform, makes this even easier. It provides real-time updates to the skills in demand for your roles—no more manual mapping, outdated spreadsheets, or expensive consultants slowing down your skills-based initiatives. So when Lightcast labor market intelligence sees that an AI skill is becoming relevant for an occupation, Skills Agent identifies how the role can evolve to keep up.

The labor market is changing faster and faster. AI is the force driving that acceleration, and commanding a 28% salary premium. Responding to this disruption will require a structured system that can adapt and scale, a proactive view of what skills should be part of every occupation, and alignment between your HR function and and what's needed in the market. Talent Transform with Skills Agent provides all three.

Build An AI-Ready Job Architecture with Talent Transform →

PART 2:

The AI Skills Disruption Matrix—Which Skills Should You Teach Now?

We've established that AI skills are essential across the labor market, and vital for modern education and training providers to be invested in. Now comes the practical question: which specific skills should your organization prioritize? Job postings reveal precise intelligence about what employers actually need, moving beyond general "AI literacy" to actionable training targets.

This section examines the skills landscape in detail, identifying the AI capabilities most in demand across the labor market and drilling into specific career areas to understand their unique requirements. The analysis reveals both universal AI foundations that every worker needs and specialized skills that create competitive advantage in particular fields. Detailed sector deep dives for Marketing and Public Relations, Human Resources, Finance, Science and Research, and Education and Training provide specific guidance for these critical areas.

AI skill requirements vary dramatically by function. Marketing roles prioritize generative AI and natural language processing, while manufacturing positions demand robotics and computer vision capabilities. Yet universal foundational skills exist alongside these specialized capabilities, and perhaps most surprisingly, human skills become more valuable, not less, in AI-intensive roles. While these insights provide valuable direction at the career area level, every organization operates with unique contexts, specific role requirements, and distinct strategic priorities. The most effective AI training programs combine these broad market insights with granular analysis of individual occupations and organizational needs. By deploying this specialized intelligence, organizations can transform general awareness into competitive advantage.

Which AI Jobs Require Which AI Skills?

Different career areas don't just sit at different stages of their AI journey—they also require fundamentally different types of AI skills. Analysis of job postings data reveals distinct patterns in which AI skill clusters employers seek across functions, creating a detailed map of where specific AI capabilities matter most.

Transportation roles lead in autonomous driving skills, appearing in 40% of AI job postings, while maintenance positions prioritize robotics capabilities at 24%. Science and research positions demand the full spectrum of advanced AI—machine learning appears in 60% of postings, neural networks in 17%, and visual image recognition in 15%, reflecting the field's role as an AI innovation center. Information technology shows the broadest requirements, with machine learning in 71% of AI job postings and neural networks in 15%.

40%

of job postings in transportation mention autonomous driving skills

24%

of jobs in maintenance mention robotics skills

Content-driven career areas cluster around different capabilities entirely. Marketing and public relations roles emphasize generative AI (16% of postings) and natural language processing (19%), essential for content creation and audience engagement. Design, media, and writing follow similar patterns, with generative AI appearing in 17% of AI job postings. Customer service roles lean heavily on natural language processing (17%) for communication automation and chatbot development. Meanwhile, physically-oriented career areas prioritize automation technologies—engineering roles show high demand for autonomous driving (22%) and robotics (18%), while manufacturing emphasizes robotics (14%) and visual image recognition (6%) for quality control and process automation.

AI skill requirements vary by career areas

Share of AI postings requiring a given set of AI skills

	AI Ethics, Governance and Regulations	Artificial Intelligence	Autonomous Driving	Generative AI	Machine Learning	Natural Language Processing	Neural Networks	Robotics	Visual Image Recognition
Business Management and Operations	1%	63%	5%	8%	33%	9%	1%	1%	2%
Clerical and Administrative	0%	59%	3%	6%	17%	20%	0%	1%	2%
Community and Social Services	0%	70%	1%	2%	10%	20%	0%	1%	0%
Construction, Extraction, and Architecture	0%	41%	12%	1%	17%	8%	9%	14%	3%
Customer and Client Support	0%	69%	1%	7%	20%	17%	1%	1%	1%
Design, Media, and Writing	0%	62%	5%	17%	17%	23%	1%	1%	2%
Education and Training	1%	60%	5%	10%	36%	12%	4%	2%	4%
Engineering	0%	36%	22%	4%	37%	3%	4%	18%	9%
Finance	1%	56%	1%	8%	48%	8%	2%	1%	1%
Healthcare	0%	49%	2%	2%	18%	16%	1%	15%	6%
Hospitality, Food, and Tourism	0%	46%	5%	3%	38%	11%	0%	2%	1%
Human Resources	0%	62%	2%	8%	29%	19%	1%	1%	1%
Information Technology and Computer Science	1%	51%	5%	16%	71%	14%	15%	2%	6%
Law, Compliance, and Public Safety	1%	60%	6%	8%	30%	12%	1%	1%	3%
Maintenance, Repair, and Installation	0%	20%	38%	5%	11%	4%	0%	24%	4%
Manufacturing and Production	0%	45%	8%	3%	34%	7%	1%	14%	6%
Marketing and Public Relations	0%	60%	1%	16%	38%	19%	2%	0%	2%
Sales	0%	68%	3%	11%	28%	11%	2%	1%	3%
Science and Research	1%	43%	14%	10%	60%	11%	17%	2%	15%
Social Analysis and Planning	1%	41%	11%	6%	49%	11%	1%	0%	4%
Transportation	0%	39%	40%	4%	19%	4%	2%	2%	4%

Source: Lightcast job postings data

These differences fundamentally reshape training strategy. A marketing professional doesn't need deep expertise in robotics, just as a maintenance technician has limited use for generative AI capabilities. Programs that allocate equal time to all AI skill clusters will produce graduates with broad but shallow knowledge—impressive on paper but ineffective in practice.

The opposite approach is also flawed: it would not be beneficial for a team to designate one AI expert so that nobody else needs to be competent with the tools. Education institutions should not try to craft something like an "AI Concentration" degree, nor should employers try to hire one AI role and let everyone else think AI is that person's problem. Instead, existing programs and occupations should be augmented to include AI skills.

Successful training identifies the two or three AI skill clusters most relevant to target roles and builds genuine competency in those areas while providing awareness-level exposure to others. This data provides the roadmap for these decisions, showing exactly which AI capabilities create value in which career contexts.

What Other Skills Do Employers Want Most In AI Roles?

Across all job postings that mention at least one AI skill, a clear hierarchy of capabilities emerges. The data reveals which skills employers consistently value when they're building AI-enabled teams, providing crucial intelligence for training programs about where to focus their efforts.

The pattern is striking: only two of the top ten skills are actually AI-specific capabilities.

Human skills dominate even in roles explicitly seeking AI expertise, challenging the assumption that AI jobs are purely technical endeavors.

Research appears more frequently in AI job postings than in the general labor market, indicating that analytical thinking grows in importance as AI handles routine tasks. The prominence of Customer Service and Writing suggests that AI amplifies rather than replaces human communication needs—workers must interpret AI outputs, explain complex systems to stakeholders, and maintain human connections in increasingly automated environments.

This skills profile reveals the fundamental nature of AI-enabled work. Technical AI capabilities provide the foundation, but success depends on workers who can apply these tools strategically, communicate insights effectively, and solve problems requiring both human judgment and machine capability. Training programs that focus exclusively on technical AI skills while neglecting communication, leadership, and analytical thinking will produce workers who can operate AI tools but cannot integrate them effectively into overall business processes, or use them to create lasting careers.

Top Skills Required For AI jobs

SKILL	DESCRIPTION
Communication	Communication is the ability to effectively interact, convey information, and collaborate with others in a clear and understandable manner.
Artificial Intelligence	This skill encompasses the development of algorithms and models that enable machines to perform tasks such as learning, reasoning, problem-solving, and understanding natural language.
Management	Management is a set of skills that involve a variety of tasks, such as planning, organizing, leading, and controlling resources to achieve specific goals.
Operations	Operations is a fundamental skill that involves managing and overseeing the day-to-day activities of a business or organization.
Leadership	Leadership is a skill that involves the ability to motivate and guide a team towards achieving common goals.
Research	Research is a skill that involves gathering and analyzing information to answer questions or solve problems. It involves identifying reliable sources of information, evaluating the credibility of those sources, and synthesizing the information to draw meaningful conclusions.
Machine Learning	Machine Learning is a subset of artificial intelligence that involves the development of algorithms and statistical models that enable systems to perform tasks without explicit instructions.
Customer Service	Customer service is a necessary and common skill in almost every field and industry. It involves effectively communicating with customers to understand their needs, answering their questions or concerns, and providing them with excellent support and service.
Writing	Writing is a skill that involves putting thoughts and ideas into words through the use of language. It is an essential communication tool used to convey messages, express thoughts and emotions, and share information.
Problem Solving	Problem solving is the process of identifying, analyzing and resolving problems that cwan arise in any situation. It involves identifying the root cause of a problem, generating possible solutions, evaluating those solutions and implementing the best one.

What Does This Mean For Learning And Development?

The skills data indicates a clear training priority: **when eight of the top ten skills for AI-enabled roles are human capabilities, programs that focus exclusively on technical AI training are missing the mark**. Employers need workers who can effectively integrate AI tools into existing workflows, communicate AI-generated insights to stakeholders, and manage teams that include both human workers and AI systems.

This suggests a practical training approach. Build foundational AI literacy around artificial intelligence and machine learning concepts, but allocate substantial time to communication, leadership, and analytical skills that determine how effectively workers can apply AI capabilities. Specialized technical training in specific AI clusters—generative AI for content roles, robotics for manufacturing, natural language processing for customer service—should complement rather than replace this human skills foundation.

The insight for educational and L&D leaders is straightforward: AI amplifies existing human capabilities rather than replacing them. Programs that develop both technical AI knowledge and the communication, management, and problem-solving skills needed to apply that knowledge strategically will produce graduates who can create value in AI-enabled roles.

Organizations that treat AI training as purely technical education will find their workers can operate AI tools but struggle to integrate them meaningfully into business processes or explain their outputs to colleagues and customers. This is even more important because of how fast AI develops: a technical skill related to these models is likely to fade out of date quickly, while the soft-skill foundations like communication, organization, and teamwork will remain valuable. This is what sets human workers apart.

Part 1 established how necessary AI skills are across the labor market. A closer look reveals that they are not sufficient on their own.

Career Area Deep Dives

The analysis above shows broad patterns across AI skills, but smart training decisions need sector-specific details. Different career areas face different AI timelines, skill needs, and competitive pressures that require targeted approaches rather than one-size-fits-all solutions.

The following Career Area Deep Dives examine five key career areas—Marketing and Public Relations, Human Resources, Finance, Science and Research, and Education and Training.

EACH DEEP DIVE INCLUDES THE FOLLOWING:

Strategic Insight

A short overview of the career area, including which jobs need AI training most urgently and unique adoption patterns that distinguish it from others.

Current AI Adoption

Breakdown of AI skill requirements across job postings, showing percentage of roles requiring AI capabilities and growth trajectory.

Most-Requested AI Skills

The top 5 AI skills employers are seeking, with descriptions and applications.

The AI Skills Disruption Matrix

Lightcast analysis identifying which existing skills are experiencing the highest AI exposure alongside their growth rates and strategic value.

Training Priorities

Implications for education and L&D.

These insights reflect patterns at the career area level based on job postings analysis. Within each function, individual jobs may face different AI impacts depending on company needs and role requirements. Every sector has its own AI story, its own timeline, and its own opportunities for competitive advantage.

Want to see this analysis for your career area? Lightcast experts use world-class labor market data to answer challenging questions about your specific workforce trends. We help organizations identify exactly which AI skills create competitive advantage in their context.

Create A Customized Workforce Strategy With Lightcast →

Understanding the AI Skills Disruption Matrix

The AI Skills Disruption Matrix is not one chart, but a series of several. They represent an analysis that we can run for every career area. After studying Lightcast skills for each career area, we plot them based on their rate of growth and their overall value in the field. We then also color-code them based on their exposure to AI: white for low exposure, blue for medium exposure, and purple for high exposure.

By seeing where skills sit on this matrix, we can transform training decisions from guesswork to strategic investment. When you see skills with high value and high growth in the Disruptors quadrant, you know exactly where to concentrate training resources. Conversely, identifying skills with high value but low AI exposure—like consulting in finance or pedagogy in education—reveals where human expertise remains irreplaceable, preventing organizations from over-automating or abandoning critical capabilities.

This intelligence enables precise decisions: which skills to teach now versus later, which require deep expertise versus basic literacy, and crucially, which human skills become more valuable as AI handles routine tasks. Rather than chasing every AI trend or ignoring the technology entirely, organizations can build training programs that prepare workers for the actual jobs employers are posting today while anticipating the skills that will matter tomorrow.

Methodology Overview:

Skill value = the salary premium associated with the skill normalised from 0 to 100. The higher the number, the higher the salary gain from the skill.

Growth = growth in frequency with which the skill is mentioned in job postings for the program area / job function requiring AI skills between 2021 and 2024.

Exposure level = created by ChatGPT using three categories: low, medium and high, based on a prompt readapted from a paper published by researchers at Harvard Business School journal which uses Lightcast data. The prompt used is available in the methodology notes at the end.

Quadrant categories:

1. **Disruptors:** skills with high value and growth
2. **Challengers:** high value and no growth / decline
3. **Escalators:** low value but high growth
4. **Stabilizers:** low value and no growth / decline

Lightcast Professional Services: Tailored Insights To Navigate Unprecedented Disruption

The AI Skills Disruption Matrix in this report reveals critical insights for broad elements of the labor market—but what about your industry? What about your specific roles, your geographic market, your unique workforce challenges? While we've mapped the AI transformation for these major career areas, every organization faces distinct disruption patterns that require customized analysis. Generic industry reports miss the nuanced skill shifts happening in your sector, leaving you to guess which AI capabilities will drive competitive advantage and which human skills remain irreplaceable.

Lightcast Professional Services creates your personalized AI Skills Disruption Matrix, analyzing any career area, occupation set, or job posting collection specific to your organization. Our economists plot your skills against growth rates, salary premiums, and AI exposure levels—revealing exactly where to concentrate training resources and which capabilities to protect from over-automation. We transform the same methodology behind this report into decision-ready intelligence for your workforce: which skills to teach now versus later, which require deep expertise versus basic literacy, and crucially, which human skills become more valuable as AI handles routine tasks.

The labor market is evolving at unprecedented speed, and generic solutions can't keep pace with the complexity of modern workforce challenges. Whether you need custom AI skills analysis, talent gap assessments, economic impact studies, or strategic workforce planning, Lightcast Professional Services transforms world-class labor market data into decision-ready intelligence tailored to your organization. Our team of economists and analysts have delivered over 3,000 projects, helping leaders navigate everything from program alignment to capital investment decisions in rapidly changing markets.

Solve Your Workforce Challenges with Custom Analysis →

Marketing and PR

Strategic Insight:

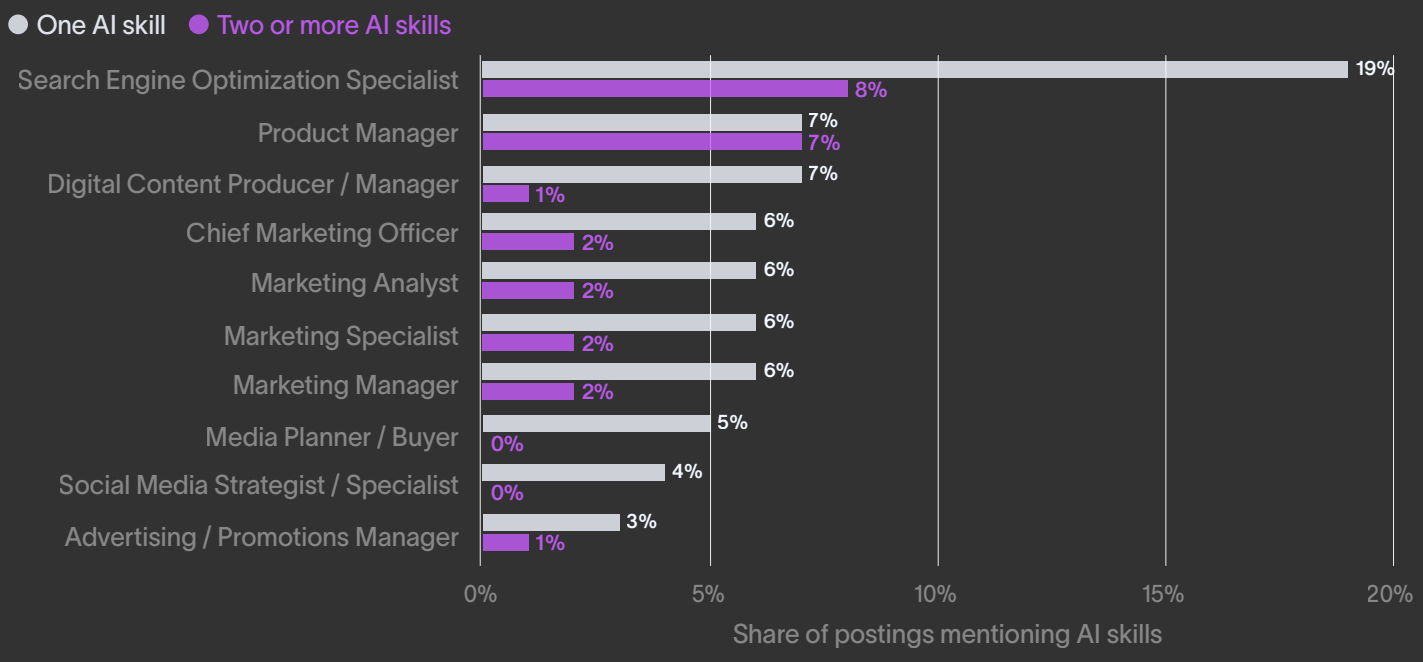
Marketing faces immediate AI transformation, with SEO specialists and product managers requiring the most sophisticated AI capabilities. Organizations must prioritize generative AI training across all marketing roles while building advanced multi-skill competency in technical positions.

Current AI Adoption:

AI skills are required in 8% of marketing job postings, with 50% growth in the past year, highlighting how fast the field is changing. SEO specialists lead adoption at 19% of postings requiring at least one AI skill and 8% requiring multiple capabilities. Product managers show balanced demand (7% single skill, 7% multiple skills), indicating sophisticated integration needs.

Marketing & Public Relations - Demand for AI by occupation

Share of postings mentioning AI skills, 2024 (%)



Source: Lightcast job postings data

Most-Requested AI Skills:

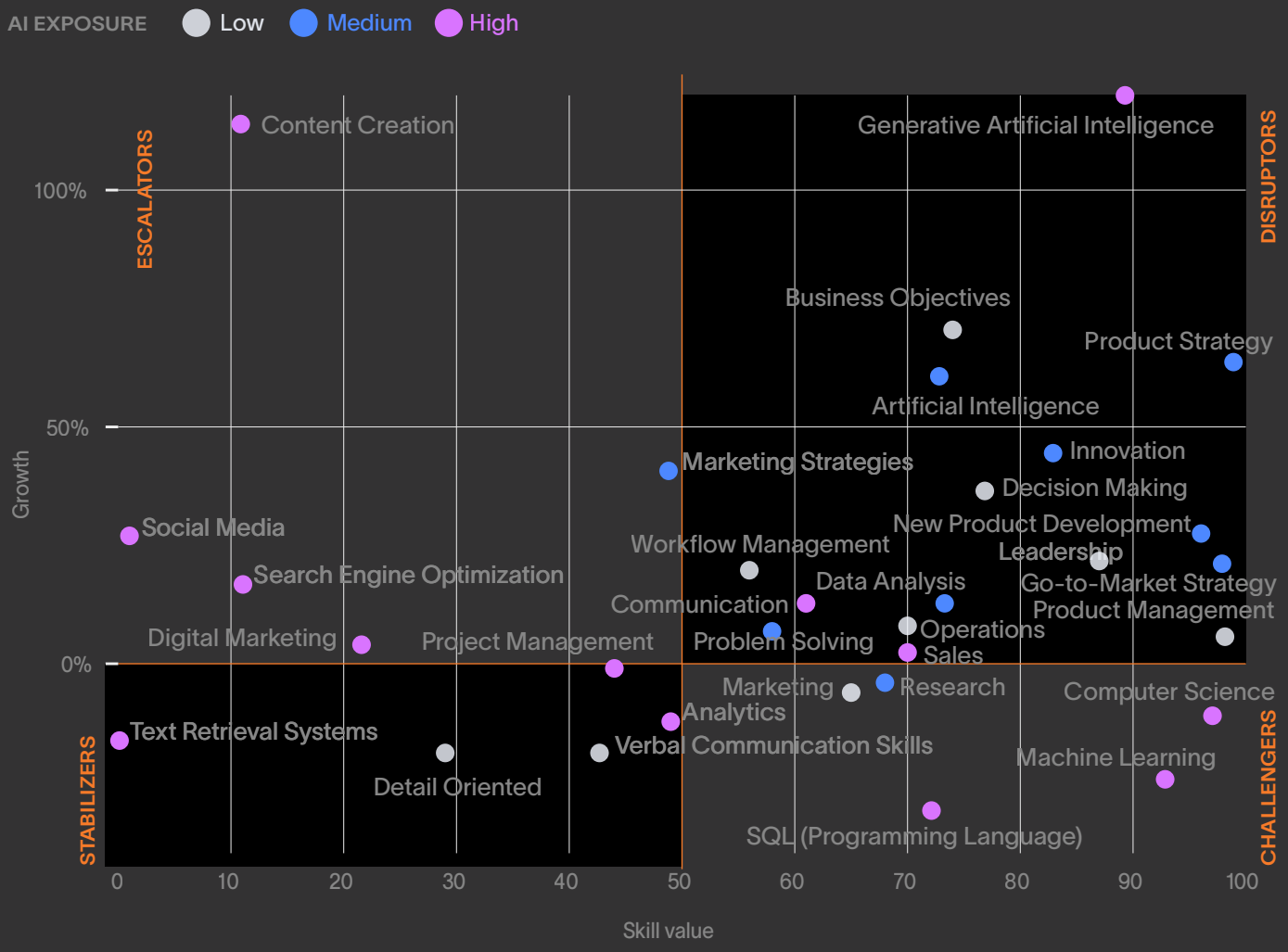
SKILL	DESCRIPTION & APPLICATION
Artificial Intelligence	This skill encompasses the development of algorithms and models that enable machines to perform tasks such as learning, reasoning, problem-solving, and understanding natural language. **In marketing, AI powers chatbots for customer service, automates campaign optimization, and enables personalized content recommendations at scale.**
Machine Learning	Machine Learning is a subset of artificial intelligence that involves the development of algorithms and statistical models that enable systems to perform tasks without explicit instructions. **Marketing applications include audience segmentation, dynamic pricing optimization, and automated A/B testing that improves campaign performance over time.**
Generative Artificial Intelligence	Generative AI is a type of artificial intelligence that can create new content—such as text, images, audio, or code—by learning patterns from existing data. **Marketing teams use generative AI to produce ad copy, social media content, email campaigns, and visual assets rapidly while maintaining brand consistency.**
Text Retrieval Systems	Text Retrieval Systems refer to computational frameworks designed to store, index, and retrieve relevant text-based information from large datasets based on user queries. **These systems power content management platforms, enable efficient competitive analysis, and support customer insights research across large data volumes.**
Predictive Modeling	Predictive modeling is the process of using statistical algorithms and machine learning techniques to analyze data and make predictions about future outcomes. **Marketing and PR professionals use predictive models to forecast customer lifetime value and optimize spend allocation across channels.**

AI Skills Disruption Matrix:

Generative AI shows explosive 120% growth with high salary value, making it the essential training area for all marketing roles. Product Strategy (64% growth) and Market Research (61% growth) represent high-value growth areas for strategic positions. Content Creation shows 114% growth across skill levels. Most of the skills needed overall in this field have high exposure to AI; however, the “Disruptors” quadrant, with the highest growth and highest value, is still dominated by skills with low AI exposure.

Job function / program: Marketing and Public Relations

AI skill disruption matrix



Source: Lightcast job postings data

Training priorities

1

Immediate focus

SEO specialists and product managers need comprehensive AI training including multiple skill areas

2

Universal requirement

Generative AI literacy for all marketing roles given exceptional growth trajectory

3

Strategic balance

Combine AI technical training with enhanced human capabilities like communication, leadership, and decision-making that maintain high salary value but low AI exposure

For curriculum designers

This data indicates marketing programs should restructure around generative AI as a core competency while maintaining specialized tracks for SEO and product management roles that require multi-skill AI proficiency. Programs that treat all marketing students identically will miss the occupation-specific skill demands that drive hiring decisions.

Strategic workforce planning insight

Marketing's AI landscape changes over the course of weeks, not years—generative AI wasn't even tracked in job postings two years ago. Static industry reports miss these rapid shifts, but job postings data reveals exactly when new AI capabilities become hiring requirements. Companies who track these trends in real time can build marketing specific AI competency before competitors recognize the skill gap, giving your team, people, and company a scalable edge.

HR

Strategic Insight:

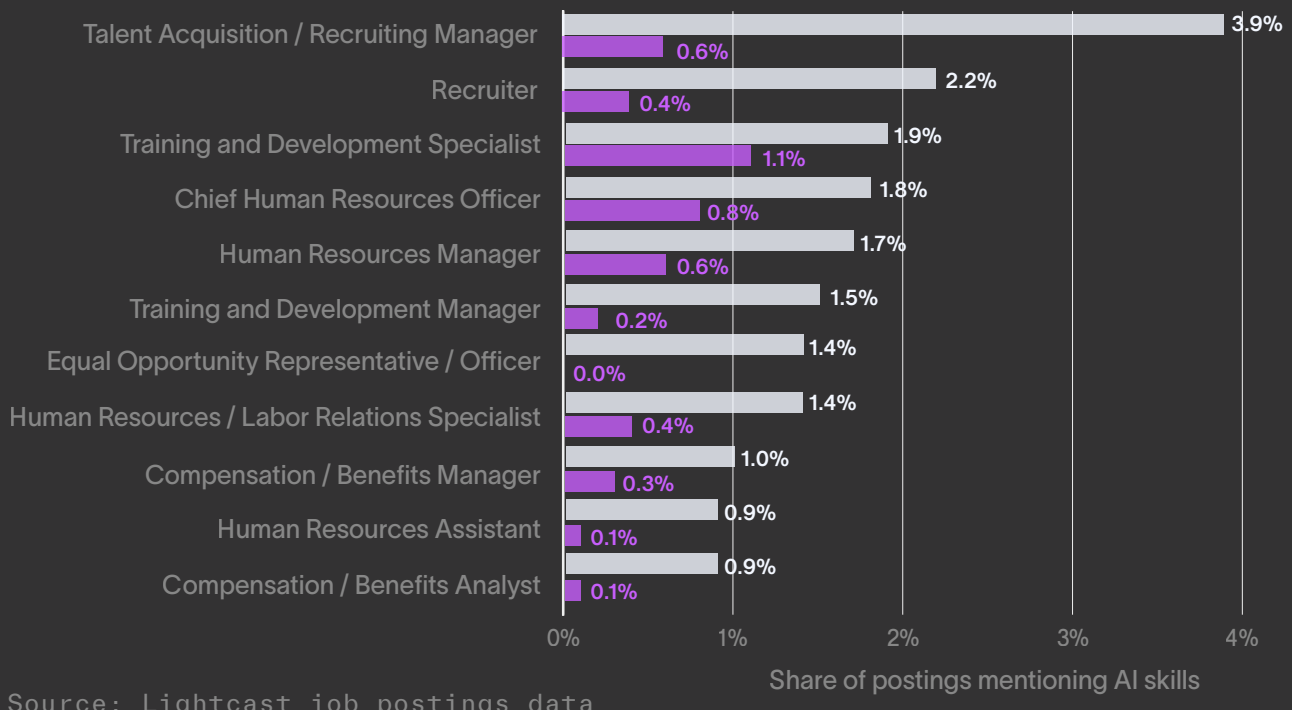
HR shows the fastest AI growth among hotspot sectors at 66%, driven primarily by frontline roles rather than management positions. Unlike other functions where AI adoption flows from leadership down (with high demand for managers and lower demand for less-senior workers), HR's transformation is more balanced. AI demand is concentrated in operational roles like recruiting and training, requiring immediate capability building at the practitioner level.

Current AI Adoption:

Only 2% of HR job postings require AI skills, but growth outpaces all other hotspot sectors. Talent Acquisition and Recruiting Managers lead adoption at 3.9% for single AI skills and 0.6% for multiple capabilities. Training and Development Specialists follow, with 1.9% demand for one AI skill. Traditional HR support roles like compensation analysts and HR assistants show minimal AI requirements, indicating selective rather than universal automation.

Human Resources - Demand for AI by occupation

Share of postings mentioning AI skills, 2024 (%)



Source: Lightcast job postings data

Most-Requested AI Skills:

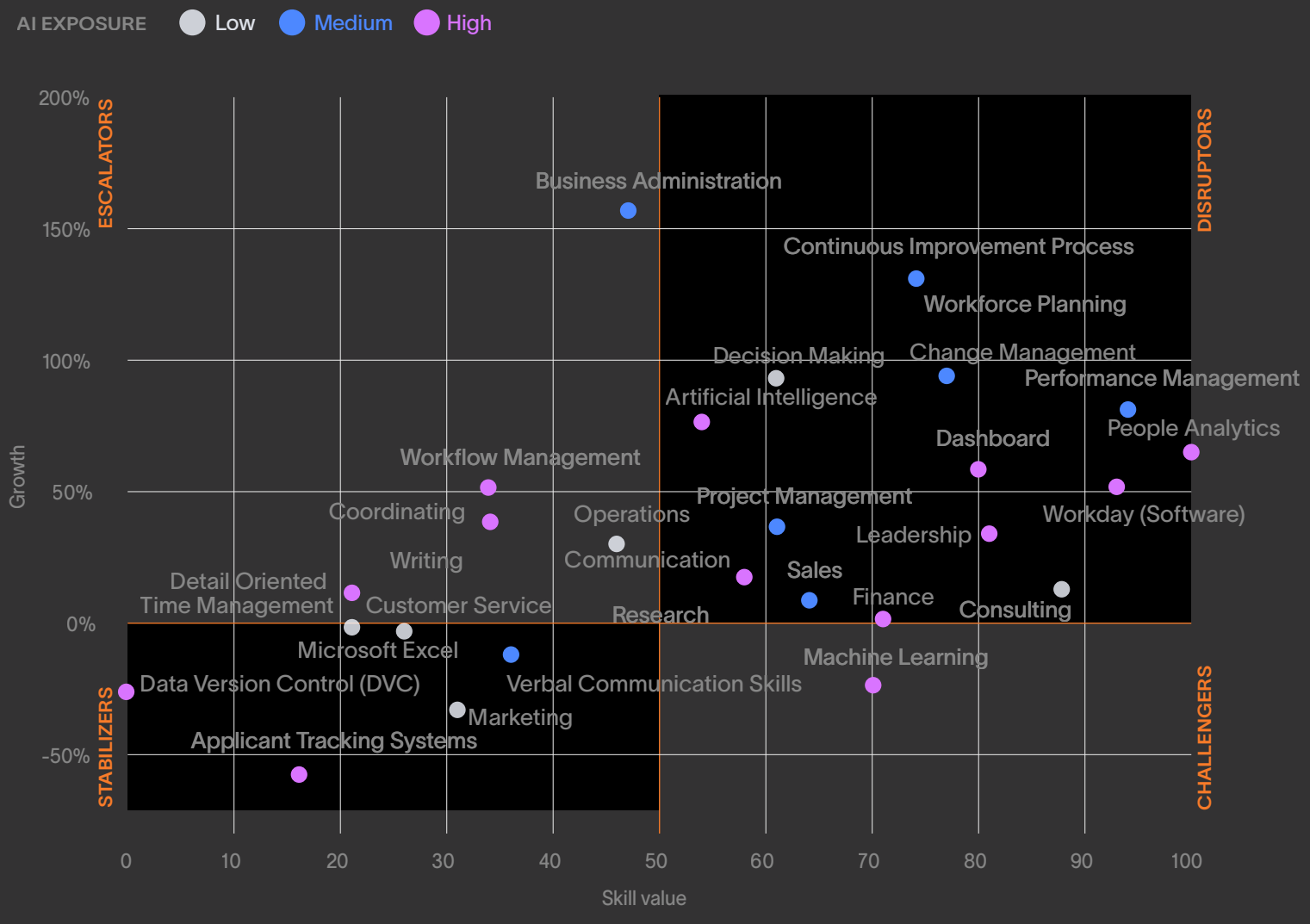
SKILL	DESCRIPTION & APPLICATION
Artificial Intelligence	This skill encompasses the development of algorithms and models that enable machines to perform tasks such as learning, reasoning, problem-solving, and understanding natural language. **HR professionals use AI to automate resume screening, conduct initial candidate assessments, and provide employee self-service support through chatbots.**
Machine Learning	Machine Learning is a subset of artificial intelligence that involves the development of algorithms and statistical models that enable systems to perform tasks without explicit instructions. **Machine learning powers predictive analytics for employee retention, identifies high-potential candidates, and optimizes compensation benchmarking.**
Text Retrieval Systems	Text Retrieval Systems refer to computational frameworks designed to store, index, and retrieve relevant text-based information from large datasets based on user queries. **HR teams use these systems to search candidate databases efficiently, analyze employee feedback patterns, and retrieve relevant policy information quickly.**
Predictive Modeling	Predictive modeling is the process of using statistical algorithms and machine learning techniques to analyze data and make predictions about future outcomes. **Applications include forecasting turnover risk, predicting training needs, and modeling workforce planning scenarios for strategic decision-making.**
Generative Artificial Intelligence	Generative AI is a type of artificial intelligence that can create new content—such as text, images, audio, or code—by learning patterns from existing data. **HR uses generative AI to create job descriptions, develop training materials, and draft personalized employee communications at scale.**

AI Skills Disruption Matrix:

Core HR skills such as talent management, talent acquisition and workforce planning have medium or low exposure to AI because they still require a significant input from humans. However, operational and analytical skills show high AI exposure, with People Analytics (65% growth, 100 skill value) and Performance Management (81% growth, 94 skill value) leading transformation.

Job function / program: Human Resources

AI skill disruption matrix



Source: Lightcast job postings data

Training priorities

1

Highest priority

Talent acquisition and training specialists need comprehensive AI training, particularly in predictive modeling and text retrieval systems

2

Operational automation

Build AI literacy around candidate screening, employee analytics, and workflow automation for frontline HR roles

3

Strategic integration

Combine AI technical capabilities with enhanced human skills like decision-making (93% growth) and change management that amplify AI effectiveness

For curriculum designers

This data indicates HR programs should prioritize AI training for recruiting and L&D specializations while maintaining human-centered approaches for strategic HR roles. Programs should emphasize the integration of AI tools with relationship management and strategic thinking rather than treating AI as a separate technical competency.

Strategic workforce planning insight

HR's unique bottom-up AI adoption pattern—with 70% of AI demand in non-managerial roles—requires organizations to train practitioners before executives, reversing traditional change management approaches. Companies that recognize this operational-first adoption pattern can build AI capability where it creates immediate value rather than where hierarchy suggests it should start.

Finance

Strategic Insight:

Finance represents a high opportunity training investment among all sectors, with 40% growth from a low 1.3% baseline creating significant early-mover advantage. Demand for AI is higher per capita among managerial roles, but the volume of postings for non-managerial roles is much higher, which means non-managerial roles account for over 70% of all AI job postings.

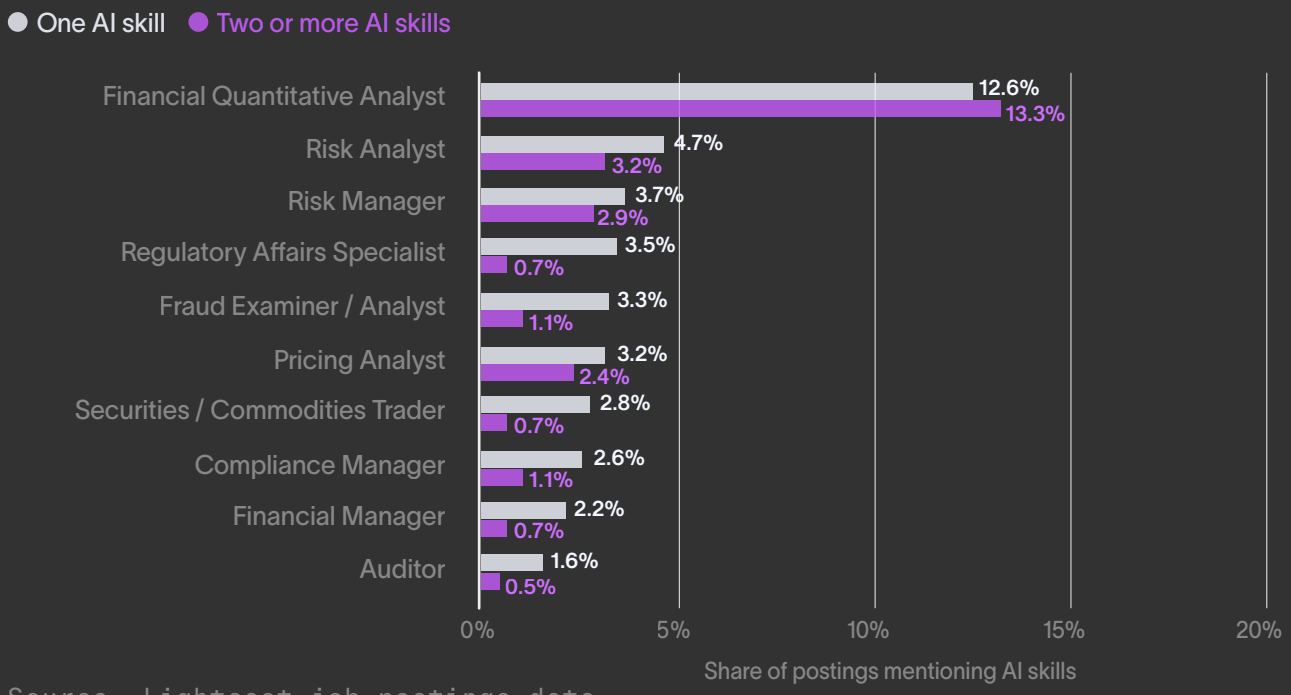
Financial quantitative analysts lead adoption with sophisticated multi-skill requirements, while traditional accounting roles remain largely unaffected, indicating strategic rather than universal transformation.

Current AI Adoption:

Demand is accelerating, with 40% annual growth overall, despite only 1.3% of finance job postings currently requiring AI skills. Financial quantitative analysts dominate with 12.6% single-skill and 13.3% multi-skill requirements—the highest concentration across all analyzed occupations. Risk analysts and managers follow at 4.7% and 3.7% respectively. Traditional roles like payroll specialists (0.3%) and accounting clerks (0.4%) show minimal AI demand, revealing selective automation focused on analytical rather than transactional functions.

Finance - Demand for AI by occupation

Share of postings mentioning AI skills, 2024 (%)



Source: Lightcast job postings data

Most-Requested AI Skills:

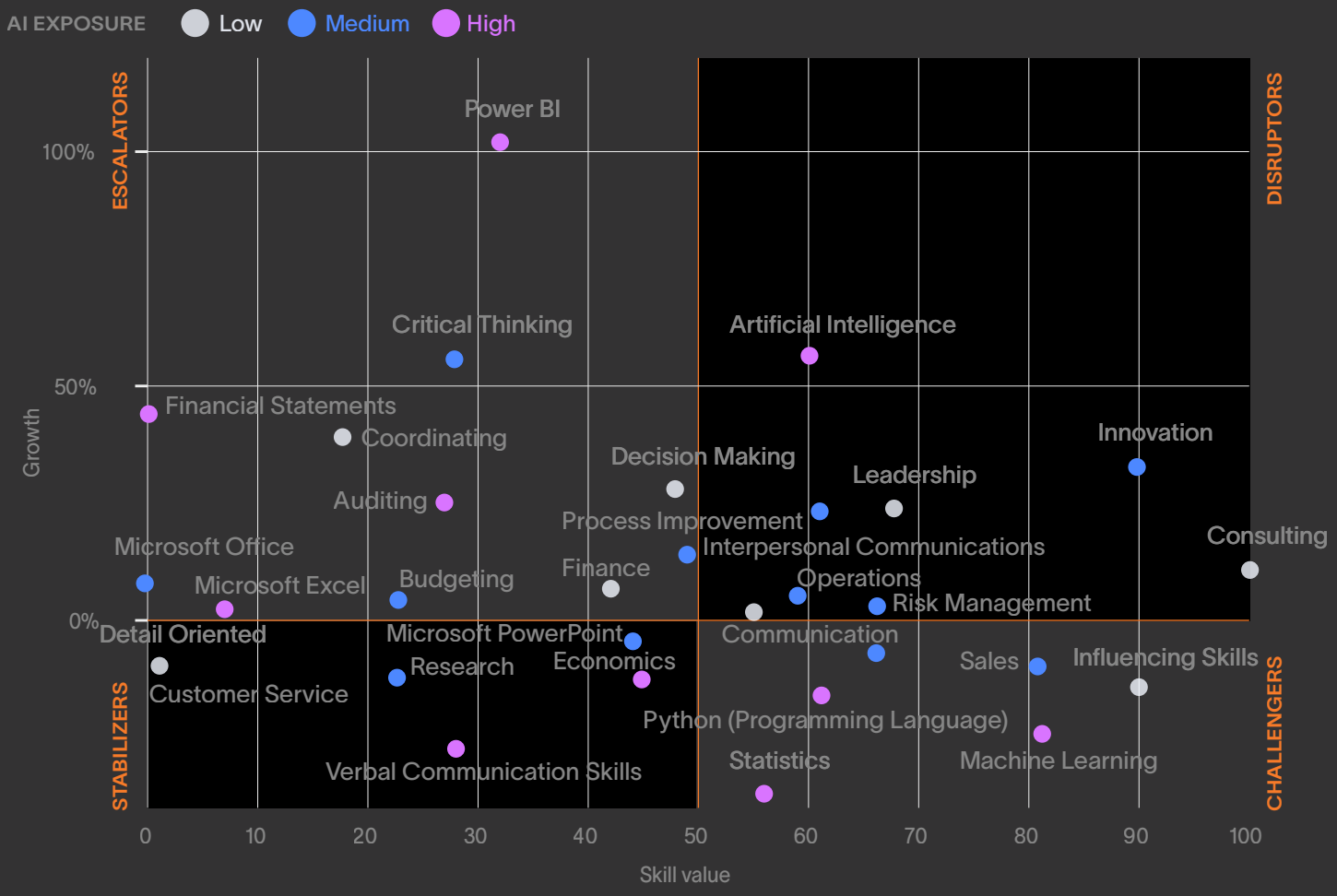
SKILL	DESCRIPTION & APPLICATION
Artificial Intelligence	This skill encompasses the development of algorithms and models that enable machines to perform tasks such as learning, reasoning, problem-solving, and understanding natural language. **Finance professionals use AI for fraud detection, regulatory compliance monitoring, and automated financial reporting analysis.**
Machine Learning	Machine Learning is a subset of artificial intelligence that involves the development of algorithms and statistical models that enable systems to perform tasks without explicit instructions. **In finance, machine learning powers credit risk assessment, algorithmic trading strategies, and portfolio optimization models.**
Predictive Modeling	Predictive modeling is the process of using statistical algorithms and machine learning techniques to analyze data and make predictions about future outcomes. **Finance teams use predictive models for market forecasting, credit default prediction, and financial planning scenario analysis.**
Generative Artificial Intelligence	Generative AI is a type of artificial intelligence that can create new content—such as text, images, audio, or code—by learning patterns from existing data. **Finance applications include automated report generation, regulatory filing preparation, and client communication personalization.**
Apache Spark	Apache Spark is an open-source distributed computing software framework that is used for processing large datasets. **Spark can be used for real-time transaction processing, large-scale risk calculations, and high-frequency trading data analysis.**

AI Skills Disruption Matrix:

Operational finance skills show high AI exposure, with Power BI (102% growth), Critical Thinking (56% growth), and Financial Statements (44% growth) leading transformation. However, strategic skills like Consulting (100 skill value, low AI exposure) and Governance (74 skill value, low AI exposure) indicate human-centered value.

Job function / program: Finance

AI skill disruption matrix



Source: Lightcast job postings data

Training priorities

1

Quantitative specialists first

Financial analysts and risk managers need comprehensive AI training in machine learning and predictive modeling

2

Early preparation advantage

Build foundational AI literacy across analytical roles before sector-wide adoption accelerates

3

Strategic differentiation

Combine technical AI capabilities with high-value consulting and governance skills that maintain low AI exposure

For curriculum designers

This data indicates finance programs should create specialized AI tracks for quantitative and risk management concentrations while maintaining traditional approaches for accounting and operational finance. Early AI integration in analytical coursework will position graduates ahead of industry-wide skill requirements.

Strategic workforce planning insight

Finance's emerging frontier status creates a narrow window for competitive advantage—organizations that build AI capability now can recruit top talent before demand drives up costs and competition. The fact that a high share of quantitative analyst jobs require AI suggests that this valuable finance role will need deep rather than superficial AI competency, making early comprehensive training essential for talent retention and competitive positioning.

Science and Research

Strategic Insight:

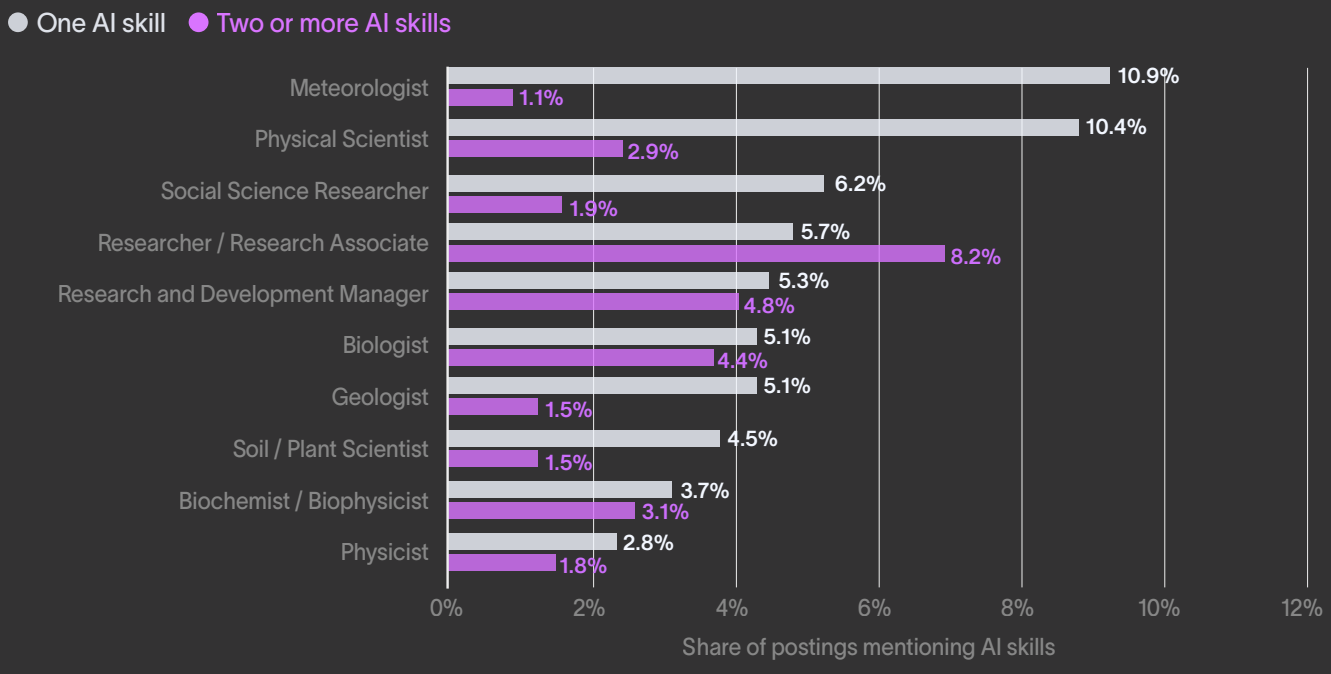
AI integration within Science and Research is relatively mature, and many research occupations require two or more AI skills. Unlike other sectors where AI adoption varies dramatically by role, research demonstrates consistent AI capabilities as fundamental tools, requiring advanced technical training rather than basic literacy programs.

Current AI Adoption:

Six percent of science and research job postings require AI skills with steady 9% annual growth, indicating established rather than explosive adoption. Researchers and research associates lead with 5.7% single-skill and 8.2% multi-skill requirements, demonstrating sophisticated AI integration. Physical scientists and meteorologists follow with over 10% single-skill demand. The pattern reveals AI as essential infrastructure for modern research rather than emerging technology.

Science & research - Demand for AI by occupation

Share of postings mentioning AI skills, 2024 (%)



Source: Lightcast job postings data

Most-Requested AI Skills:

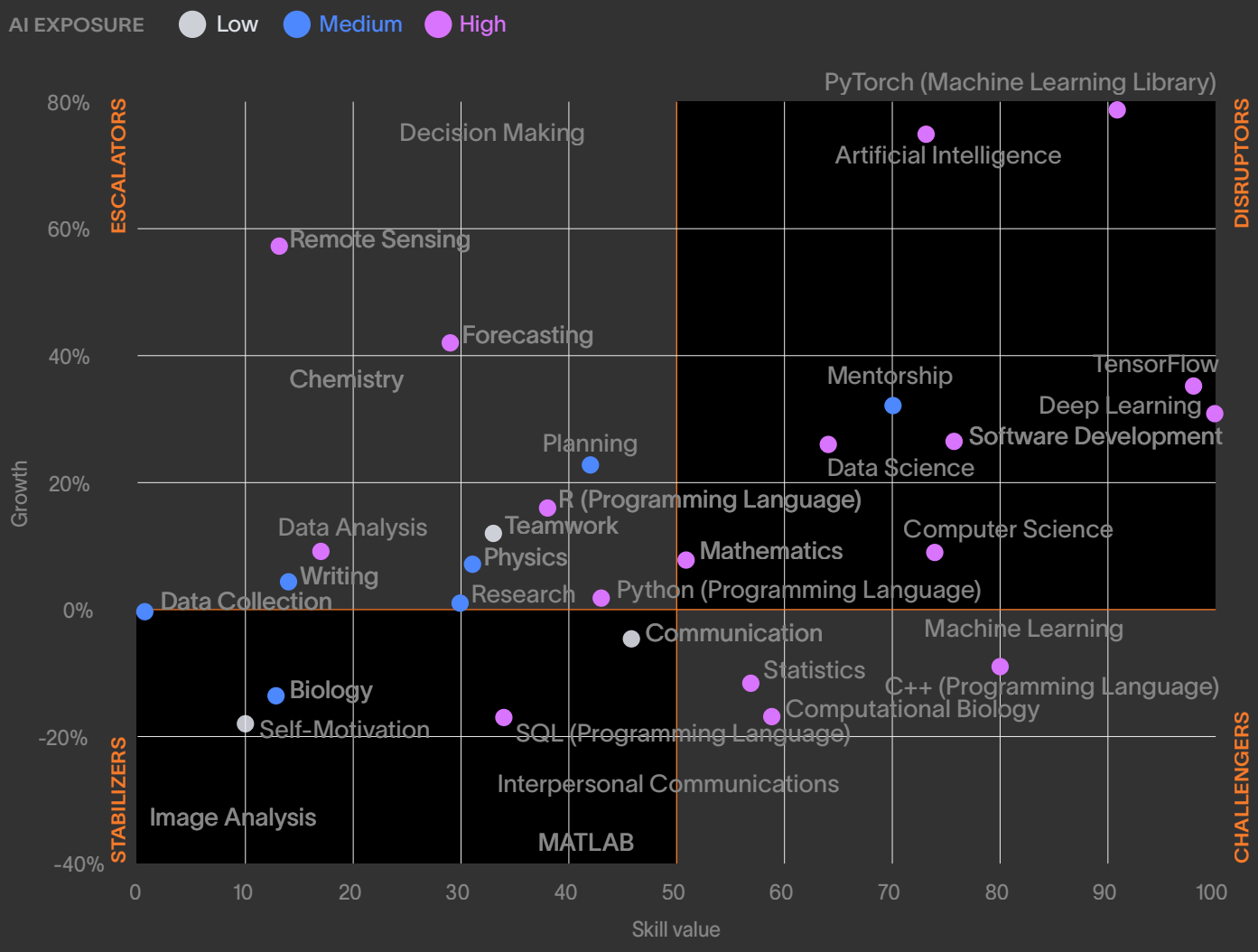
SKILL	DESCRIPTION & APPLICATION
Machine Learning	Machine Learning is a subset of artificial intelligence that involves the development of algorithms and statistical models that enable systems to perform tasks without explicit instructions. **Researchers use machine learning for pattern recognition in large datasets, automated hypothesis generation, and predictive modeling in experimental design.**
Artificial Intelligence	This skill encompasses the development of algorithms and models that enable machines to perform tasks such as learning, reasoning, problem-solving, and understanding natural language. **Science teams apply AI for literature analysis, research proposal optimization, and automated data interpretation across disciplines.**
Deep Learning	Deep Learning is a branch of Artificial Intelligence that involves the use of neural networks to enable machines to learn from data and make decisions based on that learning. **Deep learning powers image analysis in medical research, molecular structure prediction, and complex simulation modeling in physical sciences.**
Remote Sensing	Remote Sensing refers to the acquisition of information about an object or area from a distance, typically using satellite or aerial imagery. **Environmental and earth scientists use remote sensing for climate monitoring, ecosystem analysis, and geological survey automation.**
PyTorch (Machine Learning Library)	PyTorch is an open source machine learning library based on the Torch library, used to develop and train deep learning models. **Research teams use PyTorch for custom neural network development, experimental model prototyping, and collaborative AI research projects.**

AI Skills Disruption Matrix:

Advanced AI skills dominate the disruptors quadrant, with PyTorch showing 79% growth and 91 skill value, and TensorFlow at 35% growth with 98 skill value. Deep Learning (31% growth, 100 skill value) represents the highest-value capability. Human-centered skills like Leadership and Decision Making maintain low AI exposure but high value.

Job function / program: Science & research

AI skill disruption matrix



Source: Lightcast job postings data

Training priorities

1

Advanced technical focus

Researchers need deep competency in machine learning libraries like PyTorch and TensorFlow rather than introductory AI concepts

2

Discipline-specific applications

Build specialized AI training around domain expertise — remote sensing for earth sciences, computational biology for life sciences

3

Research methodology integration

Combine cutting-edge AI capabilities with enhanced leadership and decision-making skills for research direction and team management

For curriculum designers

This data indicates science programs should treat AI as fundamental research infrastructure, integrating advanced machine learning and deep learning throughout curricula rather than offering separate AI courses. Programs should emphasize hands-on experience with research-grade AI tools and discipline-specific applications.

Strategic workforce planning insight

Science's established AI integration means competitive advantage comes from depth rather than breadth—organizations need researchers with sophisticated AI expertise, not general AI awareness. The high multi-skill requirements across research roles suggest successful science teams can set themselves apart based on their AI technical capabilities, making advanced AI training essential for research competitiveness and funding success.

Education And Training

Strategic Insight:

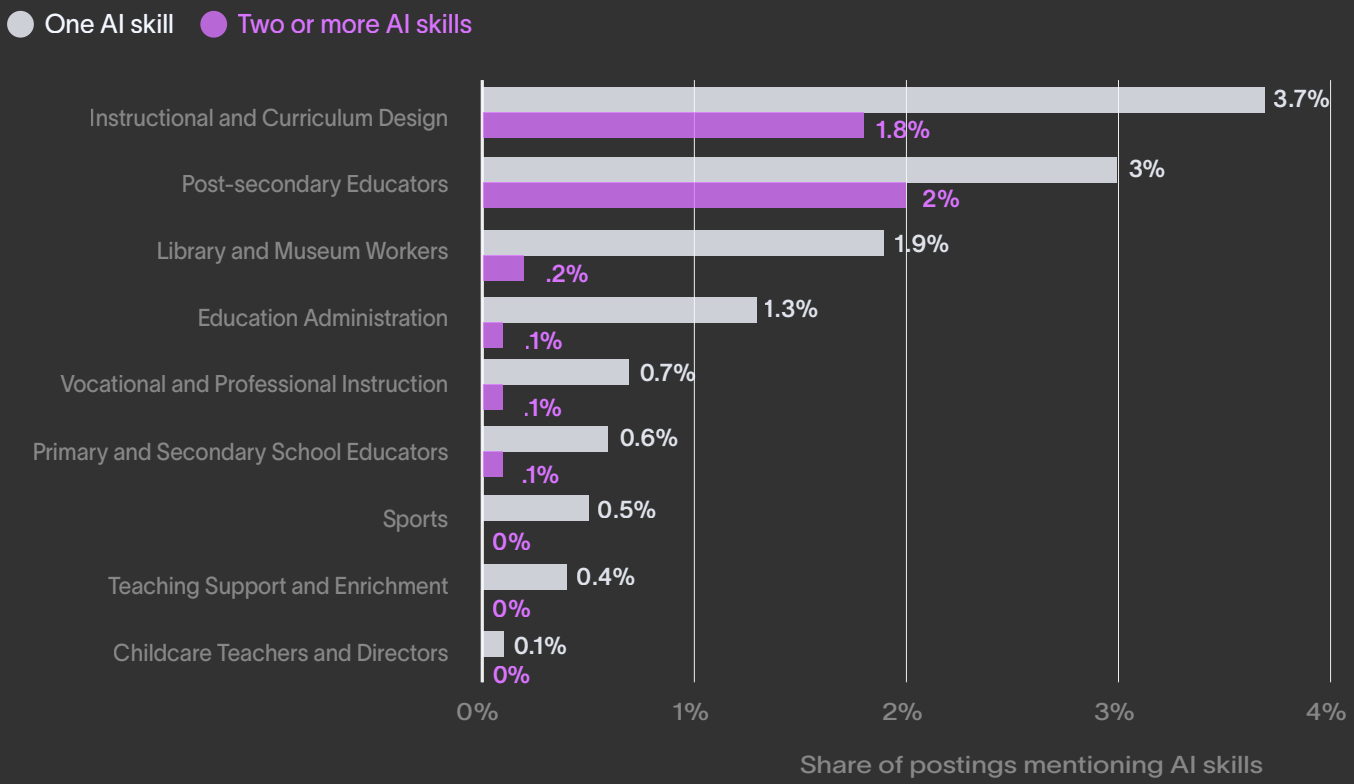
Education represents the sector with lowest current AI adoption but shows significant internal variation, with instructional designers and post-secondary educators leading transformation while K-12 roles remain largely unaffected. This selective adoption pattern suggests AI will enhance educational delivery methods rather than replace core teaching relationships. Because AI use is more contentious among educators than those in other career areas, the burden is especially high to show that its costs outweigh its benefits.

Current AI Adoption:

Education shows 1.3% of job postings requiring AI skills with 18% annual growth—the lowest adoption across our selected sectors. Instructional and curriculum designers lead with 3.7% single-skill and 1.8% multi-skill requirements, followed by post-secondary educators at 3.0% and 2.0% respectively. Primary and secondary educators show minimal AI demand (0.6%), indicating technology adoption concentrates in curriculum development rather than direct instruction.

Education & training - Demand for AI by occupation

Share of postings mentioning AI skills, 2024 (%)



Source: Lightcast job postings data

Most-Requested AI Skills:

SKILL	DESCRIPTION & APPLICATION
Artificial Intelligence	This skill encompasses the development of algorithms and models that enable machines to perform tasks such as learning, reasoning, problem-solving, and understanding natural language. **Educators can use AI for personalized learning path creation, automated assessment feedback, and adaptive curriculum design based on student performance data.**
Machine Learning	Machine Learning is a subset of artificial intelligence that involves the development of algorithms and statistical models that enable systems to perform tasks without explicit instructions. **Educational applications include student success prediction, learning pattern analysis, and automated content recommendation systems for personalized instruction.**
Data Version Control	Data Version Control (DVC) refers to a system for managing and versioning datasets, machine learning models, and related artifacts in a reproducible and collaborative manner. **Instructional designers use DVC for educational content management, curriculum version tracking, and collaborative course development projects.**
Generative Artificial Intelligence	Generative AI is a type of artificial intelligence that can create new content—such as text, images, audio, or code—by learning patterns from existing data. **Education professionals could use generative AI for lesson plan creation, educational material development, and customized assessment generation at scale.**
Deep Learning	Deep Learning is a branch of Artificial Intelligence that involves the use of neural networks to enable machines to learn from data and make decisions based on that learning. **Advanced educational applications might include intelligent tutoring systems, automated essay scoring, and complex learning analytics for institutional research.**

AI Skills Disruption Matrix:

Education shows considerably lower AI exposure across most skills compared to other sectors, with human-centered capabilities like Teaching, Mentorship, and Pedagogy maintaining low AI exposure but high skill value. However, Generative AI shows explosive growth at 200%, and Instructional Design demonstrates 64% growth, indicating selective but significant transformation in content creation and delivery.

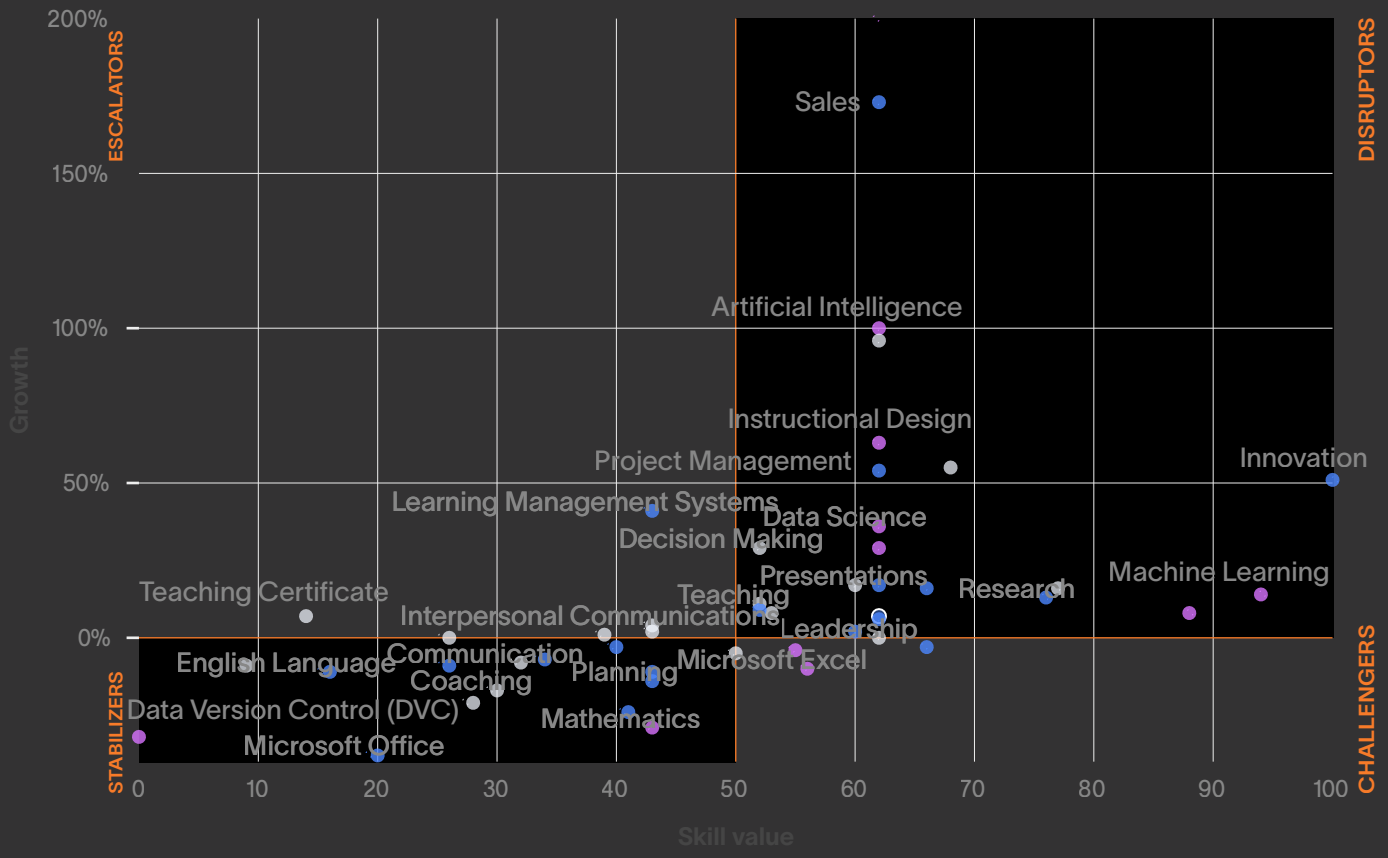
Job function / program: Education & training

AI skill disruption matrix

AI EXPOSURE Low Medium High

Generative Artificial Intelligence

Because of its very low baseline, Generative Artificial Intelligence has seen growth far beyond what this chart could legibly show.



Source: Lightcast job postings data

Training priorities

1

Instructional design focus

Prioritize AI training for curriculum developers and instructional designers who can integrate AI into educational delivery systems

2

Generative AI literacy

Build comprehensive generative AI capabilities for content creation, assessment development, and personalized learning materials

3

Human skill enhancement

Strengthen pedagogical and mentorship capabilities that maintain high value despite low AI exposure, ensuring technology enhances rather than replaces educational relationships

For curriculum designers

This data indicates education programs should concentrate AI training in instructional design and educational technology tracks while preserving human-centered approaches in traditional teaching preparation. Programs should emphasize AI as a tool for enhancing educational effectiveness rather than replacing core pedagogical skills.

Strategic workforce planning insight

Education's cold zone status may be temporary as the 200% growth in generative AI adoption suggests rapid change ahead. Educational institutions that build AI capability in instructional design and content creation now can lead pedagogical innovation before AI becomes an industry standard, positioning themselves as early adopters in educational technology transformation while competitors remain focused on traditional teaching methods. Specialized analysis can help clarify specific use cases and their ROI, which is valuable in a field that is largely skeptical of AI.

AI Is Disrupting Every Program Area. Are You Teaching Skills That Actually Get Jobs?

Your business curriculum covers “data analysis” while finance roles now demand predictive modeling expertise. Your education program focuses on “instructional methods” while schools need faculty who understand AI-powered content creation. Skillabi exposes these dangerous misalignments. Personalized to your institution’s programs, Skillabi measures how well your academic programs compare to real-world labor market data.

Stop guessing at which AI skills matter for your specific programs. Lightcast data shows which skills are being requested for every occupation, so Skillabi can provide occupation-specific intelligence that matches your students’ actual career paths. As the training priorities for curriculum designers throughout this report show, every program area and job require different skills, and Skillabi enables precise, personalized insights that can connect every program to successful careers.

Your curriculum is racing against a market that changes weekly, not yearly. Generative AI wasn’t even tracked in job postings two years ago—now it’s driving hiring decisions and salary premiums across sectors. Skillabi tracks these rapid shifts in real time, so you can fix program misalignments before your graduates discover them the hard way. With education that’s tailored to the jobs and skills employers need now and in the future, students will be prepared for careers that flourish—no matter what disruption lies ahead.

Start Creating Future-Aligned Programs with Skillabi →

Conclusion

AI has already rewritten the rules of workforce value. When a single AI skill commands a **28% salary premium—close to $18,000 per year**—the market has delivered its verdict with brutal clarity. This isn't speculation about future disruption; it's documented reality extracted from millions of job postings across every career area.

Marketing teams that once competed on creativity now lose deals to competitors whose AI-enhanced campaigns operate at ten times the speed. Financial analysts without predictive modeling capabilities watch their peers command premium salaries. The divide between AI-literate workers and everyone else isn't emerging—it's here, it's widening, and it's measurable in dollars.

The pace defies conventional workforce planning. Generative AI grew 800% in non-tech roles since ChatGPT's launch—a transformation that took email a decade happened here in under three years. By the time your annual planning cycle completes, the skill requirements for key roles will have shifted again. SEO specialists now need multiple AI competencies. HR departments require predictive analytics for basic talent acquisition. Even education, one of the slowest-growing career areas, shows 200% growth in generative AI demand. Organizations still looking around and waiting whether to invest in AI training are competing against companies whose workers already deploy these capabilities daily.

Your competitors aren't waiting for perfect strategies or comprehensive frameworks. They're using real-time labor market intelligence to identify which AI skills matter most for their specific context—not generic industry reports, but granular data showing exactly which capabilities drive value in which roles. They know that financial quantitative analysts need deep expertise in PyTorch and TensorFlow, while marketing roles prioritize generative AI and natural language processing. They understand that HR's AI transformation happens bottom-up through recruiting and training specialists, not top-down through executives. Every career area from customer service to science research now requires AI capabilities, with adoption accelerating rather than plateauing.

The organizations thriving in this environment share one characteristic: they stopped treating AI as a future consideration and started treating labor market data as essential infrastructure. When skills change this rapidly—32% in three years, with AI accelerating that pace—historical planning methods guarantee obsolescence. They track skill emergence in real-time, adjust training programs monthly rather than annually, and build AI capabilities before job postings make them mandatory. They recognize that staying competitive requires continuously updated workforce intelligence, not static reports that become outdated before they're implemented.

The window for early-mover advantage closes faster than most organizations can make decisions. Finance shows 40% year-over-year growth in AI skills from a low baseline—a year from now, the same AI capabilities that create differentiation today will be table stakes. Marketing's 50% growth trajectory means agencies without generative AI fluency won't win clients.

The question no longer is whether your organization needs AI skills. The question is whether you'll build these capabilities using precise, real-time intelligence about which skills create value in your specific context, or whether you'll discover these requirements the hard way: through lost talent, lost customers, and lost ground you'll never recover. The organizations that come out ahead will be those with the best data, moving fastest.

Create A Future-Ready AI Strategy.
Start with Lightcast →

Methodology

METHODOLOGY - DETAILS

Data

The analysis was built using Lightcast proprietary job postings data. Lightcast job postings library is made of billions of job postings collected across the world since 2012, including 1.3 billion job postings collected in the US alone.

These job postings are scraped on a daily basis from thousands of job boards, newspapers and employers sites. They are then cleaned and deduplicated to ensure only one posting is counted for each opening - regardless of how many places it is advertised in. The job postings are then classified by location, industry, occupation, skills required and any other type of relevant information that can be extracted from the ad, using a combination of official and proprietary taxonomies.

The advantage of using online job postings data is that they provide a granular, almost real time, picture of what employers actually need, directly from the source. The downside of using job postings data is that the quality of the insights is based on the quality of the information published online and included in the postings - meaning coverage varies by industry and geography, and skills that may be deemed implicit by employers may not be included in the ads.

It is important to note that job postings are not necessarily the same as job vacancies. There is a correlation, but many recruitment practices make this relationship imperfect. Job postings are a measure of recruitment marketing by employers purportedly looking to fill job vacancies.

Defining AI

To measure demand for AI by employers, this report leverages one of the key advantages of online job postings data - its granularity - to take a skills-driven approach and identify a list of AI skills from Lightcast Skills Taxonomy. This taxonomy includes over 32,000 different skills, knowledge and abilities (in short referred to as 'skills' throughout the report) which are organised hierarchically in 400 subcategories (skill clusters) and 32 categories. These skills are updated regularly to capture emerging trends. They are extracted from job ads by taking into consideration the context in which words are used, to isolate skills information from other information provided in the ad, such as company descriptions.

As part of this process, over 300 AI skills were identified, in relation to nine different skill clusters (groups of skills): AI ethics, governance & regulation; Artificial intelligence; Autonomous driving; Generative AI; Machine learning; Natural language processing; Neural networks; Robotics; Visual image recognition.

Job postings mentioning at least one of these AI skills were considered to be AI jobs. As a posting typically has several skills, it therefore can also have several skill clusters. As such, when the analysis compares demand for different AI skills or clusters, postings are counted several times - once for each skill cluster or skill that is mentioned in the job text.

This custom definition of artificial intelligence has been widely used in academic and policy publications, including in the Stanford AI Index report, published each year by the Stanford Institute for Human-Centered Artificial Intelligence. The OECD also used this methodology to explore trends in AI in labor markets across the world and Economics Nobel Prize winner of 2024 Daron Acemoglu was one of the pioneers of this approach with a paper published in 2019.

AI exposure

The analysis on AI exposure for the AI Skills Disruption Matrix was carried out by starting from and adapting a methodology first introduced in a working paper published by researchers for Harvard Business School in 2025: "Displacement or Complementarity? The Labor Market Impact of Generative AI".

In the paper, the researchers used a prompt to ask ChatGPT to classify skills based on their level of exposure to Generative AI. Starting from there, the prompt has been adapted to ask about the level of exposure to all AI technologies, not just GenAI, and classify skills in just three categories: "Low", "Medium", "High", keeping into account the job function / program area the skill was assessed for.

The prompt used

You are an expert in AI and technology skill analysis with a deep understanding of all fields of AI and their applications across various industries, job functions and career areas. Your task is to analyze a list of skills most in demand in each job function / program area and classify each into one of three categories:

1. "High Exposure" - These are skills that are either software and technical skills directly related to the development, deployment, or application of AI technologies or automated skills that can be entirely undertaken by AI, with minimal or no human interaction necessary. Examples include: AI ChatBot, AI KIBIT, ANTLR, Apertium, Artificial Intelligence, Automatic Speech Recognition (ASR), Caffe Deep Learning, Framework, Chatbot, Computational Linguistics, Computer Vision, Decision Trees, Deep Learning, Google Cloud Machine Learning Platform, Keras, Latent Dirichlet Allocation, Lexical Semantics, Machine Learning, Microsoft Cognitive Toolkit, MLPACK, image and content generation, data sorting and categorization, forecasting, language translation, simple graphic design, and basic trend spotting.

2. "Medium exposure" - Augmented skills that are "fundamentally human," but can be enhanced by AI. Examples include analytical thinking, problem solving, creativity, research, data visualization, strategic planning, predictive analysis, and rapid prototyping.

3. "Low exposure" - Limited impact skills that require a human touch, such as complex judgment or nuanced decision-making, that AI cannot accomplish. Examples include persuasion and negotiation, motivational leadership, ethical judgment and integrity, compassion, building human relationships, and physical dexterity.

In your classification, consider both the current state of AI and emerging trends that might influence the relevance of certain skills in the near future. Provide the results in a table with the name of the skill, category and a column with a brief explanation.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