



GENERATIVE ARTIFICIAL INTELLIGENCE AND THE WORKFORCE





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EXECUTIVE SUMMARY

Automation is nothing new. In fact, much of the course of economic history since the dawn of the Industrial Revolution has been shaped by successive waves of automation propelled by technological innovation. However, the latest developments in generative artificial intelligence (GenAI) stand out as unique. Unlike in the past, when mechanization replaced physical labor, GenAI will have the greatest impact on high-skilled, professional work—the kinds of roles that define the 21st-century knowledge economy and that have long been considered safe havens from roboticization. As such, the coming transformations are likely to be as unfamiliar as they are profound. The goal of this report, a collaborative effort between The Burning Glass Institute and SHRM, is to enable CHROs and other business leaders to anticipate these repercussions and develop workforce strategies for a new reality.

Key Trends

- GenAI will touch a broad array of roles. In many cases, however, **the impact will be less about automating** away tasks than about **augmenting** workers' productivity and effectiveness or **transforming** the definition of job roles altogether to capitalize on new technologies and new unit economics.
- Workforce reductions could become widespread over the coming decade. But they may be driven less by machines simply replacing humans than by economic growth lagging behind big leaps in worker productivity. **Early adopters of GenAI will see increased productivity as roles are automated, augmented or transformed. However, the surge in output is unlikely to meet a corresponding growth in demand for goods and services, leading to overstaffing in many industries. Business leaders must prepare mitigation strategies (such as hiring freezes) to minimize the disruption.**
- **While those disruptions will carry a high human cost, they are likely to be only temporary.** Corporate profits will increase as firms benefit from decreased payroll costs. In a competitive market, we expect price decreases to follow. Finally, price cuts and new jobs created by GenAI will drive increased demand, and employment will rebound, at least somewhat.



- Investments in AI will be massive. Goldman Sachs estimates that by 2025, nearly \$200 billion will be invested into AI-related technology globally. With so much investment and focus, we expect several major economic shifts:

- **As hiring slows, fresh recruits will become rarer.** The average age of the workforce will increase, which may impact organizations' ability to adapt to further technological disruptions.
- Productivity increases will only accrue to workers who are still employed. Given the broad potential for GenAI to replace human labor, increases in productivity will generate disproportionate returns for investors and senior employees at tech companies, many of whom are already among the wealthiest people in the U.S., **intensifying wealth concentration**. That, in turn, could **drive spending in premium categories, such as luxury goods, fine dining and consumer services**.
- Some of this “wealth effect” can already be seen in financial markets. In April 2023, J.P. Morgan analysts **cited optimism about GenAI as the driver of a \$1.4 trillion increase in market capitalization** across the S&P 500.
- Blue-collar jobs are unlikely to be automated by GenAI. In fact, increased demand for premium goods and services **could even spur greater demand for blue-collar workers**—and a corresponding rise in their income share.
- In the longer term, **research and development will accelerate as GenAI allows researchers to process more data and achieve new discoveries more quickly**.

How GenAI Will Reshape the Economy

The trends we anticipate in this report will not play out uniformly across the economy. To support leaders in crafting effective strategies, we have charted the likely contours of workforce transformation across occupations, economic sectors and even organizations.

Repercussions by Occupation

- GenAI will cause broad transformations across nearly all categories of white-collar roles, while blue-collar work will remain shielded from major disruption. Examples of how AI will place certain occupations at high risk include:

- **Financial analysts, actuaries and accountants** spend much of their time crunching numbers, analyzing market trends and creating predictive models—all tasks that AI can streamline.
- Regulatory compliance, a task overseen by **auditors, compliance officers and lawyers**, demands thoroughness and accuracy. GenAI can facilitate quicker compliance checks with fewer errors.
- For **software developers**, routine tasks—such as generating code, debugging, monitoring systems and optimizing networks—can be either assisted or entirely managed by AI.



- **Administrative roles** involve structured, routine tasks such as data entry, appointment scheduling, documentation management and customer communication—repetitive tasks ripe for AI-based replacement.
- The work of **marketers, writers, journalists** and **graphic designers**, from editing to content creation, has long been manual. However, AI platforms can generate competent copy, including reports, news summaries and even articles.
- **Human resources** may be completely transformed as GenAI automates core tasks such as onboarding and communication of benefits, leaving a smaller cadre of HR professionals to play the roles of coaches to workers and organizational strategists to leaders.

Repercussions by Industry

- Because occupations tend to be concentrated in specific sectors, we anticipate industries to be reshaped accordingly. **The industries most likely to be affected include financial services, law and marketing research.** For example, legal advisors face potential automation in creating standardized documents, while marketing professionals might witness GenAI crafting strategic content. **Business services** and **consulting** industries—rich in data-driven tasks and structured processes—are also notably exposed to GenAI.

Repercussions by Company

- We have similarly mapped the scope of likely GenAI workforce transformations to specific firms based on their hiring mix. Business leaders at these firms must begin planning for GenAI-driven disruption and devise ways to leverage GenAI to their advantage. The companies that will be most affected by GenAI are concentrated in three sectors:
 - Finance and Insurance, most notably **Morgan Stanley, Bank of America** and **Northwestern Mutual**.
 - Professional Services, with particularly significant impacts at **McKinsey & Company, KPMG** and **Deloitte**.
 - Information Systems, led by **Bloomberg, Salesforce** and **Google**.



Repercussions by Region

- **Silicon Valley**, as a major tech epicenter, will see a surge of renewed economic growth due to GenAI. Globally, the U.S. is home to 36 of the top 50 tech behemoths, as well as to cutting-edge academic institutions. Thus, it is perfectly poised to harness the GenAI revolution. As tech becomes a more important part of the global economy, countries that have a comparative advantage in technology will benefit the most.

Takeaways for CHROs and Other Business Leaders

- **Evaluate your organization's composition.** What is your exposure to GenAI? If your company operates in an industry that is at risk of transformation or that has a large share of employees in at-risk occupations, expect disruptions in your organization as GenAI adoption scales up.
- **Evaluate the roles within your organization.** How might these roles be automated, augmented or transformed via GenAI? For each role, how can you prepare workers for these changes? What learning and development investments can you make to build workers' skills in areas that will rise in importance as GenAI adoption accelerates?
- **Consider your current talent pipeline.** Evaluate how GenAI may affect talent shortages or surpluses in markets of interest. Service, manual and other in-person occupations that have been experiencing staffing shortages, such as nursing, are unlikely to be impacted by GenAI, and current labor shortages will remain. Meanwhile, GenAI-fluent tech talent will become highly sought-after, and savvy HR leaders are wise to begin building a pipeline for such talent now.
- **Develop a game plan.** In the coming years, GenAI will both drive massive boosts in productivity and necessitate layoffs. Begin planning ways to leverage GenAI's productivity benefits and prepare for the disruptions to your workforce through a combination of upskilling investments to give workers the skills to remain relevant and reskilling programs to reposition workers in areas of more stable demand.

BACKGROUND

Technological changes are often harbingers of disruption.

Waves of automation, and the subsequent labor market transformations they produce, are nothing new. They often give rise to massive boosts in productivity among some groups and workforce reductions in others. Beginning in the early 1990s, sweeping automation in manufacturing replaced factory workers with robots. More recently, the rise of e-commerce displaced a large number of in-store retail workers.

A new wave, driven by developments in GenAI, is extending and accelerating the ongoing automation of administrative and office support roles over the past 20 years. The GenAI wave is anticipated to automate even more of these jobs. However, a crucial characteristic of this current automation wave is that the tasks now targeted for automation by advanced AI are more sophisticated, encompassing those typically carried out by professionals, as opposed to support workers. This is a novel and significant development in the arena of technological change.

Understanding GenAI

To understand GenAI's impact, understand its strengths and limitations.

GenAI tools excel at certain tasks while lagging human capabilities in others. The jobs most vulnerable to replacement by AI are those requiring tasks and skills that overlap significantly with the abilities of large language models (LLMs), which can generate coherent and grammatically correct text, and other GenAI technologies.

What Tasks Can GenAI Perform Today?

- Streamline interactions with business software. (For example, GenAI enables workers to query enterprise resource systems in plain English.)
- Generate text, answer questions and serve as conversational agents (that is, chatbots).
- Generate code and assist with code debugging and comprehension.
- Generate images, music and videos.
- Refine and enhance the style, coherence and quality of existing content.
- Summarize and classify text.
- Retrieve and present enormous amounts of information quickly.

What Are GenAI's Current Limitations?

- Not especially creative or original; may produce derivative content.
- Limited critical thinking.
- Low emotional intelligence.
- Limited factual accuracy.
- Challenges with mathematical functions.
- Likely to reproduce biases in training data.



IMPACT ON JOBS

While GenAI will automate some roles, it will augment or transform others.

One of the most visible ways GenAI will impact jobs is in the automation of repetitive professional tasks that require low levels of expertise or judgment. Simultaneously, GenAI may augment or transform other roles (see Table 1). GenAI can assist professionals by enhancing their capabilities, making them more effective or efficient rather than replacing them. For instance, doctors could use AI to improve their diagnostic capabilities, leveraging machine intelligence to augment their expertise. Professions such as human resources may be completely transformed as GenAI automates core tasks such as onboarding or communication of benefits while a smaller cadre of human resources professionals serve as coaches and mentors. This will free them to spend more time advising individual employees on their career goals and challenges and to serve as organizational strategists in support of business leaders.

TABLE 1:
Ways GenAI may impact jobs

Jobs Are Automated	Jobs Are Augmented	Jobs Are Transformed
<p>Description: Roles that either do not require expertise or heavily involve tasks that GenAI can do effectively today.</p> <p>Example: Graphic designers focused on revising and contextualizing content, rather than creating it from scratch.</p>	<p>Description: Roles that require substantial expertise but still involve several AI-enhanced tasks or AI-driven productivity gains.</p> <p>Example: Software engineers using ChatGPT to generate and debug sections of code.</p>	<p>Description: Roles whose new unit economics allow for a complete reimagination of the job description.</p> <p>Example: HR professionals transitioning to roles as coaches and strategists.</p>



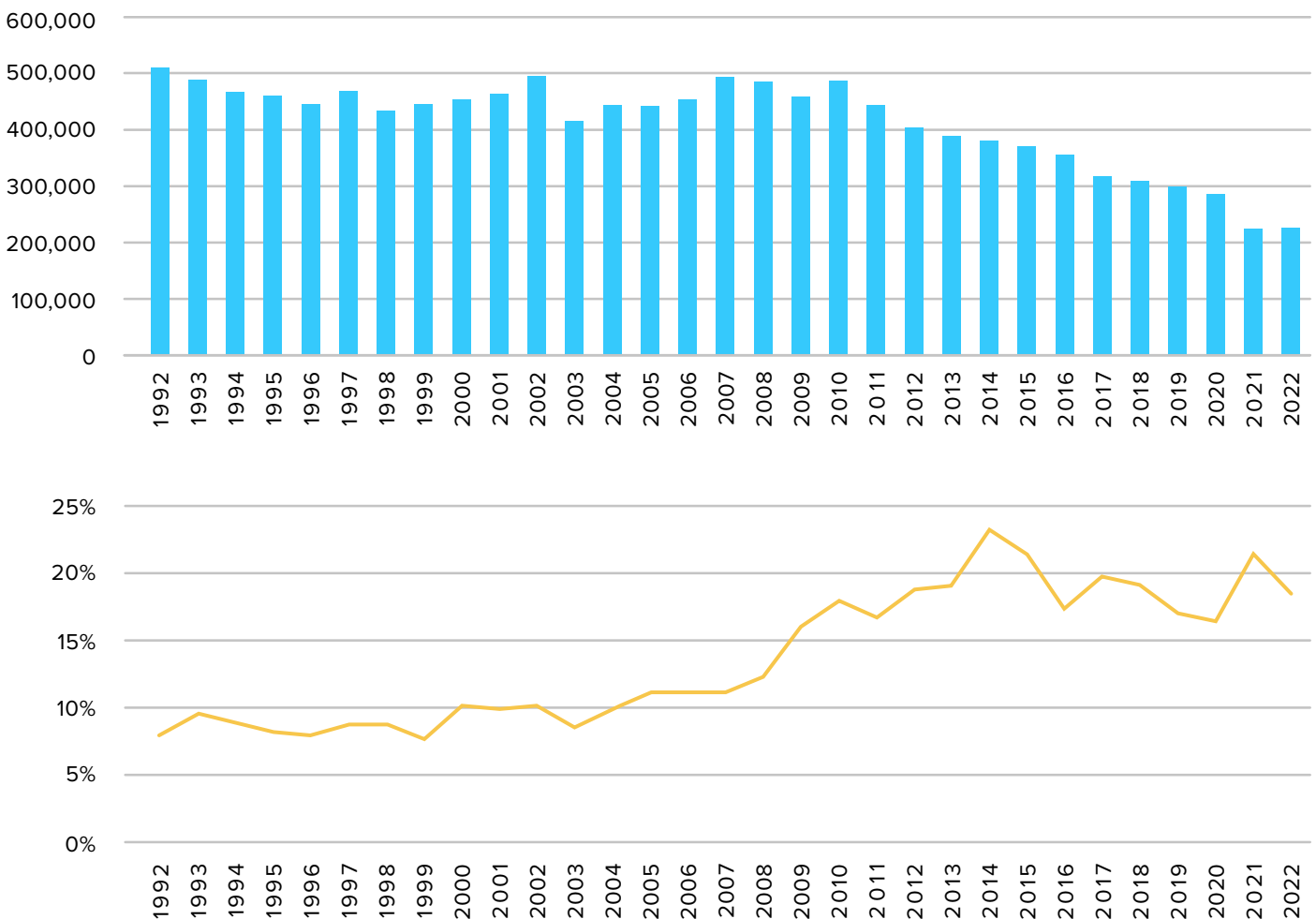
The Effect of Automated Teller Machines on Bank Tellers

When ATMs were introduced in the 1970s, there were widespread predictions that this technology would render the job of a bank teller partially obsolete. After all, an ATM could do many of the tasks that tellers traditionally performed, such as dispensing cash and processing deposits.

Bucking conventional wisdom, however, the number of bank tellers in the U.S. increased during the 1970s and 1980s and did not decline until 2011. In actuality, the introduction of ATMs reduced the cost of operating a bank branch, allowing banks to open more branches. Although each branch had fewer tellers than before, the net effect was an increase in the total number of teller jobs. At the same time, the role of the bank teller evolved. Instead of just handling cash transactions, tellers started to take on more advisory roles, assisting customers with more complex financial services, such as loans, investment products and account issues. Correspondingly, as Figure 1 shows, the proportion of bank tellers with college degrees increased.

The case of ATMs and bank tellers is frequently cited to illustrate that the effect of automation on jobs might be more complex than a simple one-to-one replacement. The experience of bank tellers underscores the idea that, while automation can eliminate specific tasks, it does not necessarily eliminate jobs. Instead, these transformations may lead to fundamental changes in unit economics, which may increase demand in hard-to-predict ways.

FIGURE 1:
Number of U.S. bank tellers (top) and share with bachelor's degrees (bottom)



MACROECONOMIC IMPACTS

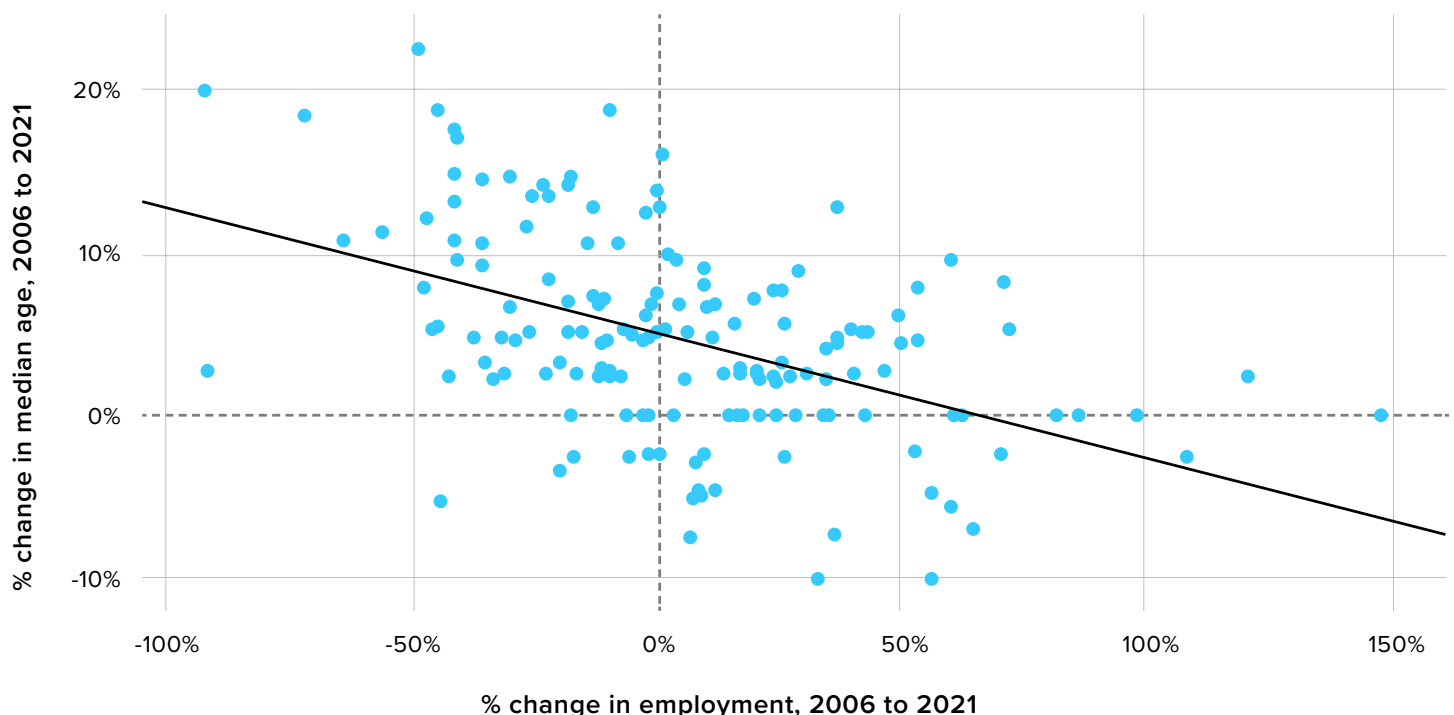
GenAI will drive economic dislocations over the coming decade.

The business landscape will undergo a series of macroeconomic shifts as GenAI adoption increases. Early adopters will experience a leap in worker productivity as AI automates, augments or transforms various job roles. However, the surge in output is unlikely to meet a corresponding growth in demand for goods and services, leading to overstaffing in many industries.

In a competitive market characterized by an oversupply of labor, company leaders will feel compelled to make difficult decisions, the most widespread of which are likely to be workforce reductions. Business leaders must consider mitigation strategies such as hiring freezes or relying on natural attrition (that is, employees retiring or moving to other jobs). The emotional toll of job insecurity in this time of disruption will heighten the need for robust employee support systems, including mental health benefits and transition programs.

As hiring slows, we are likely to see a graying of the workforce. As depicted in Figure 2, there is a marked inverse relationship between employment growth and shifts in median age. Further, shrinking occupations age faster. This shift will challenge organizations across dimensions such as skill flexibility, team vitality and intergenerational knowledge exchange.

FIGURE 2:
Percentage change in median age and employment for occupations, 2006-2021

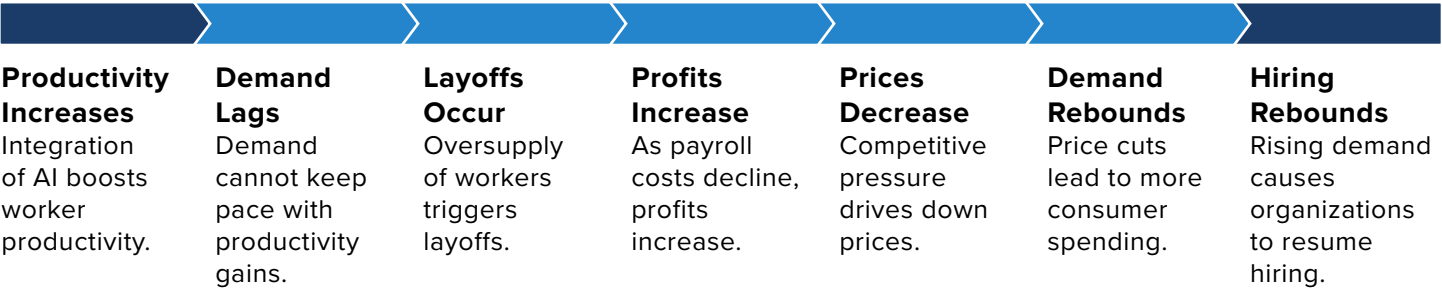


Notes: Each bubble represents a distinct occupation. The years 2006 and 2021 are three-year averages.

Source: [Lightcast Profiles](#) data, The Burning Glass Institute.

These disruptions will carry a high human cost, but they are unlikely to be permanent. Figure 3 illustrates the expected course of transition following the introduction of GenAI. Corporate profits will increase as firms benefit from reduced headcount costs. In a competitive market, firms jockeying for market share are likely to cut prices. As a result, households will see increased disposable income, which in turn will increase consumer spending, including on new categories of goods and services made possible by the unit economics GenAI will enable. This increased demand will cause employment to rebound, at least somewhat. Thus, while GenAI may initially lead to job losses in certain sectors and occupations, other sectors will grow as the economy adjusts. As this business cycle unfolds, perhaps over a decade or more, business leaders can proactively invest in upskilling and reskilling programs to ensure that workers have the necessary skills and training to navigate this period of transition.

FIGURE 3:
Sequence of economic disruptions caused by GenAI



While most of the impacts of GenAI are relatively long-term, the optimism around GenAI platforms has already buoyed financial markets. In April 2023, J.P. Morgan analysts estimated that, in the first four months of 2023 alone, interest in artificial intelligence models had driven \$1.4 trillion in increased market capitalization and a 45% increase in corporate profits. As this trend gains momentum, shareholders, especially those invested in tech-centric stocks, will benefit the most. The “wealth effect” posits that this increase in perceived wealth will drive an increase in consumer spending, and in fact there is a documented increase in consumer expenditures over the past year despite expectations of an economic slowdown. As the value and potential of GenAI become clearer, investment will likely accelerate. Goldman Sachs anticipates that by 2025, global AI investments will approach a substantial \$200 billion.

These investments will drive development and adoption of GenAI, resulting in the productivity improvements described previously. Further, we expect GenAI to enable step changes in research and development timelines and techniques. The time from ideation to product launch will be drastically reduced as GenAI enables researchers to gather and synthesize vast troves of data and information. As a result, innovations that further amplify productivity will be introduced more quickly. The combination of increased investment and improvements in research and development will supercharge economic growth over the long term.



DISTRIBUTIONAL CONSEQUENCES

Dislocations from GenAI will precipitate shifts in wealth distribution.

Increased adoption of GenAI will have deep distributional implications for the U.S. economy. Productivity increases will only accrue to workers who are still employed. Given the broad potential for human labor to be displaced by AI, increases in productivity will generate disproportionate returns for investors and senior employees at tech companies, many of whom are already among the wealthiest people in the U.S. Thus, the U.S. economy, already characterized by high levels of inequality, will see further economic stratification and increased concentration of wealth. As a result, we expect to see rapid growth in consumer spending in luxury categories where the wealthy tend to spend a disproportionately large share of their income (see Table 2).

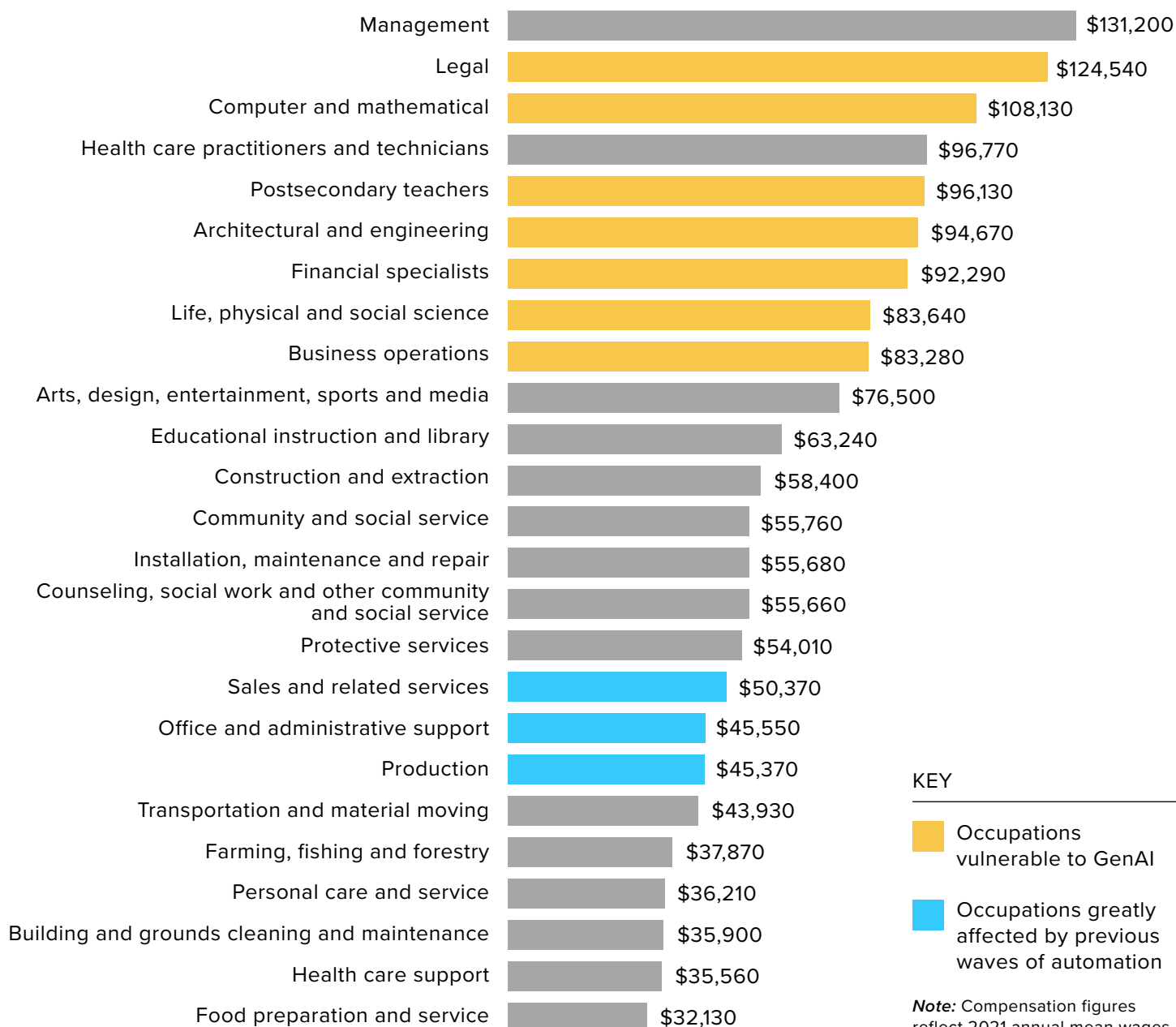
TABLE 2:
Luxury categories on which wealthy consumers spend large shares of their income

Category	Description
Luxury goods	High-end watches, jewelry, handbags, clothing and other fashion items from premium brands.
Real estate	Luxury homes, vacation properties and multiple residences in various parts of the world.
Travel and leisure	First-class and private jet travel, luxury cruises, five-star hotels, exclusive resorts and bespoke travel experiences.
Fine dining and wines	Upscale restaurants and investments in rare wines and spirits.
Art and collectibles	Fine art, antique furniture, rare collectibles and unique items.
Vehicles	Luxury cars, yachts, and private jets and helicopters.
Private education	Private schools, boarding schools and elite universities.
Health and well-being	High-end fitness trainers, wellness retreats, cosmetic procedures, personal physicians and specialized health care.
Home improvement	High-end furniture, home theaters, smart home systems, and landscaping and interior design services.
Philanthropy	Charitable causes, foundations or endowments. (Not traditionally considered consumption.)
Memberships	Exclusive clubs, golf courses and other social institutions.
Personal services	Personal chefs, butlers, house managers and other staff.
Investment opportunities	Access to and participation in ventures such as venture capital or private equity. (Not traditionally considered consumption.)
Security	High-end security systems, personal security personnel and cybersecurity services.
Luxury events	Attendance at or hosting of events such as galas, premieres and private concerts.

As Figure 4 shows, previous waves of automation predominantly affected low-wage occupations (shown with blue bars). The GenAI automation wave is unique in that blue-collar workers may be the least harmed. The reasons for this are both increased demand for these workers due to the growth of premium goods and service categories and the inability of GenAI to perform physical tasks. In fact, the occupations most exposed to GenAI are high-wage, professional roles (shown with yellow bars). The implication is that the GenAI wave could result in greater payroll savings than previous waves did.



FIGURE 4:
Occupations most affected by GenAI compared to previous automation waves



IMPACT BY OCCUPATION

GenAI will impact professional occupations most heavily.

While blue-collar roles will experience minimal disruption, GenAI is expected to have a broad impact across nearly all categories of white-collar work (see Figure 5). To support organizational leaders in crafting effective workforce strategies, we have charted the specific contours of workforce transformation across occupations, sectors and even companies. To estimate the level of exposure of industries and organizations, we started by measuring the degree of overlap between the characteristics of a specific occupation and the capabilities of GenAI. The greater the overlap, the more exposed the occupation is to disruption from GenAI. We then used the occupational makeup of industries and organizations to aggregate the occupational exposure measures into industry- and company-level exposure measures. (See the Methodology for details.)

FIGURE 5:
Occupational sectors and roles exposed to disruption from GenAI

 Business and Legal <ul style="list-style-type: none"> • Purchasing agents • Compensation specialists • Management analysts • Market research analysts • Marketing specialists • Lawyers and paralegals 	 Finance <ul style="list-style-type: none"> • Insurance underwriters • Budget analysts • Accountants and auditors • Personal financial advisors • Credit professionals • Financial analysts • Tax preparers 	 Social Sciences <ul style="list-style-type: none"> • Geographers • Epidemiologists • Survey researchers • Political scientists • Sociologists • Economists 	 Writing and Editing <ul style="list-style-type: none"> • Writers and authors • Reporters and correspondents • Technical writers • Interpreters and translators • Editors
 STEM <ul style="list-style-type: none"> • Programmers and software developers • Web developers • Some types of engineers • Data scientists • Physicists • Medical scientists • Operations research analysts 	 Sales <ul style="list-style-type: none"> • Insurance sales agents • Advertising sales agents • Travel agents • Securities, commodities and financial sellers • Telemarketers 	 Office and Administrative Support <ul style="list-style-type: none"> • Procurement clerks • Credit authorizers, checkers and clerks • Cargo and freight agents • Statistical assistants • Loan interviewers and clerks • Billing and posting clerks 	 Other <ul style="list-style-type: none"> • Postsecondary teachers • Public relations specialists • Interior designers



Examples of the most vulnerable occupations and how GenAI may transform them follow:



Finance: Financial analysts, actuaries and accountants spend much of their time crunching numbers, analyzing market trends and creating predictive models—all tasks that GenAI can streamline. AI can also facilitate faster and more accurate compliance checks, which today can involve teams of auditors, compliance officers and lawyers. Personal financial advisors can also leverage AI to support risk assessments and craft client-personalized investment strategies with greater speed and detail.



Social sciences: With the digital age heralding the era of big data, researchers in fields such as sociology, psychology and political science can leverage AI to process vast datasets more efficiently. AI algorithms can analyze extensive data from social media platforms, deciphering patterns in users' sentiments and behavior, and discerning trends. Moreover, in fields such as economics and political science, predictive modeling enhanced by AI can yield more accurate forecasts of voting patterns, economic shifts and the like.



Writing and editing: Roles involving content creation and editing will undergo a transformation as GenAI enables formerly manual processes to be executed almost instantly. LLMs can quickly generate large volumes of coherent text, including reports, news summaries and articles. Meanwhile, if given the properly structured inputs, other GenAI tools can create compelling visuals, including graphics and even full-length videos.



STEM: Computer programmers are already leveraging GenAI to assist with or entirely manage routine tasks such as code generation, debugging, monitoring systems and optimizing networks. Scientists and engineers across specializations may also soon leverage GenAI to support data analyses, simulations and mathematical models.



Sales: Sales professionals often engage in repetitive administrative tasks, such as recording client interactions, tracking potential leads and analyzing customer behavior; GenAI's ability to streamline these roles will allow salespeople to concentrate on customer interactions. Further, GenAI can help analyze the troves of unstructured data sitting untapped in customer relationship management (CRM) systems, which can then be used to predict customer needs and recommend tailored sales approaches.



Office and administrative support: Administrative roles involving data entry, scheduling and other repetitive tasks are prime candidates for AI augmentation or automation. For instance, appointment management can be entirely automated with GenAI, which can optimize calendars based on pre-configured rules.



Human resources: As discussed, HR roles may be completely transformed as GenAI automates routine tasks, reorienting a smaller team of HR professionals to serve more strategic functions.

CONSEQUENCES FOR INDUSTRIES, ORGANIZATIONS AND REGIONS

Where do we expect to see the greatest disruptions?

We extended the preceding occupational analysis to estimate GenAI exposure across industries, companies and regions. Because higher-paying roles yield larger cost savings if eliminated and greater productivity gains if augmented, we weighted industries by both occupational share and salary to produce a ranking of the most GenAI-exposed industries, shown in Table 3.

TABLE 3:
Selected types of occupations ranked by GenAI exposure score

Sector	Industry	GenAI Exposure Score
Finance and Insurance	Mortgage and nonmortgage loan brokers	3.909
Professional Services	Law offices	3.906
Finance and Insurance	Investment banking and securities dealing and brokerage	3.885
Finance and Insurance	Commercial banking	3.865
Professional Services	Offices of certified public accountants	3.859
Finance and Insurance	Investment advice	3.854
Professional Services	Tax preparation services	3.827
Professional Services	Human resources consulting services	3.825
Professional Services	Marketing research and public opinion polling	3.815
Finance and Insurance	Insurance agents and brokers	3.807
Technology	Data processing, hosting and related services	3.782
Technology	Software publishing	3.780
Professional Services	Advertising agencies	3.778
Technology	Custom computer programming	3.775
Professional Services	Payroll servicing	3.762
Professional Services	Administrative management and general management consulting	3.754
Other	Travel agency services	3.750
Technology	Computer systems design	3.750
Other	Book publishing	3.743
Manufacturing	Computer terminal and other computer peripheral equipment manufacturing	3.736
Technology	Internet publishing and broadcasting and web search portals	3.735
Professional Services	Marketing consulting	3.731
Manufacturing	Semiconductor and related device manufacturing	3.729
Other	Newspaper publishing	3.726
Manufacturing	Electronic computer manufacturing	3.718
Manufacturing	Pharmaceutical preparation manufacturing	3.717
Other	Educational support services	3.714
Other	Television broadcasting	3.712

■ Finance and Insurance
 ■ Professional Services
 ■ Technology
 ■ Manufacturing
 ■ Other

See the Methodology for an explanation of how the GenAI exposure score is calculated.

Because occupations tend to concentrate in specific sectors, occupational changes will profoundly reshape several industries. Financial Services will see the greatest impact, as a range of roles—including financial examiners, personal financial advisors, loan officers, financial analysts, actuaries and accountants—within the sector are transformed. Other knowledge services industries, most notably Marketing Research and Law, are also highly exposed, as many of their outputs (market reports, standardized legal documents, etc.) are highly automatable by GenAI. Business services and consulting industries, rich in data-driven tasks and structured processes, are also highly exposed to GenAI.

Most tangibly, we mapped the scope of likely GenAI workforce impacts to specific firms based on their employee composition. Business leaders at these firms must begin planning for GenAI-driven disruption and devise ways to leverage GenAI to their advantage. As shown in Table 4, many of the most prominent U.S. companies will face GenAI-driven disruption in the coming years. The companies that will be most affected by GenAI are concentrated in three sectors: **Finance and Insurance** (including Morgan Stanley, Bank of America and Northwestern Mutual), **Professional Services** (including McKinsey & Company, KPMG and Deloitte) and **Information Systems** (including Bloomberg, Salesforce and Google).

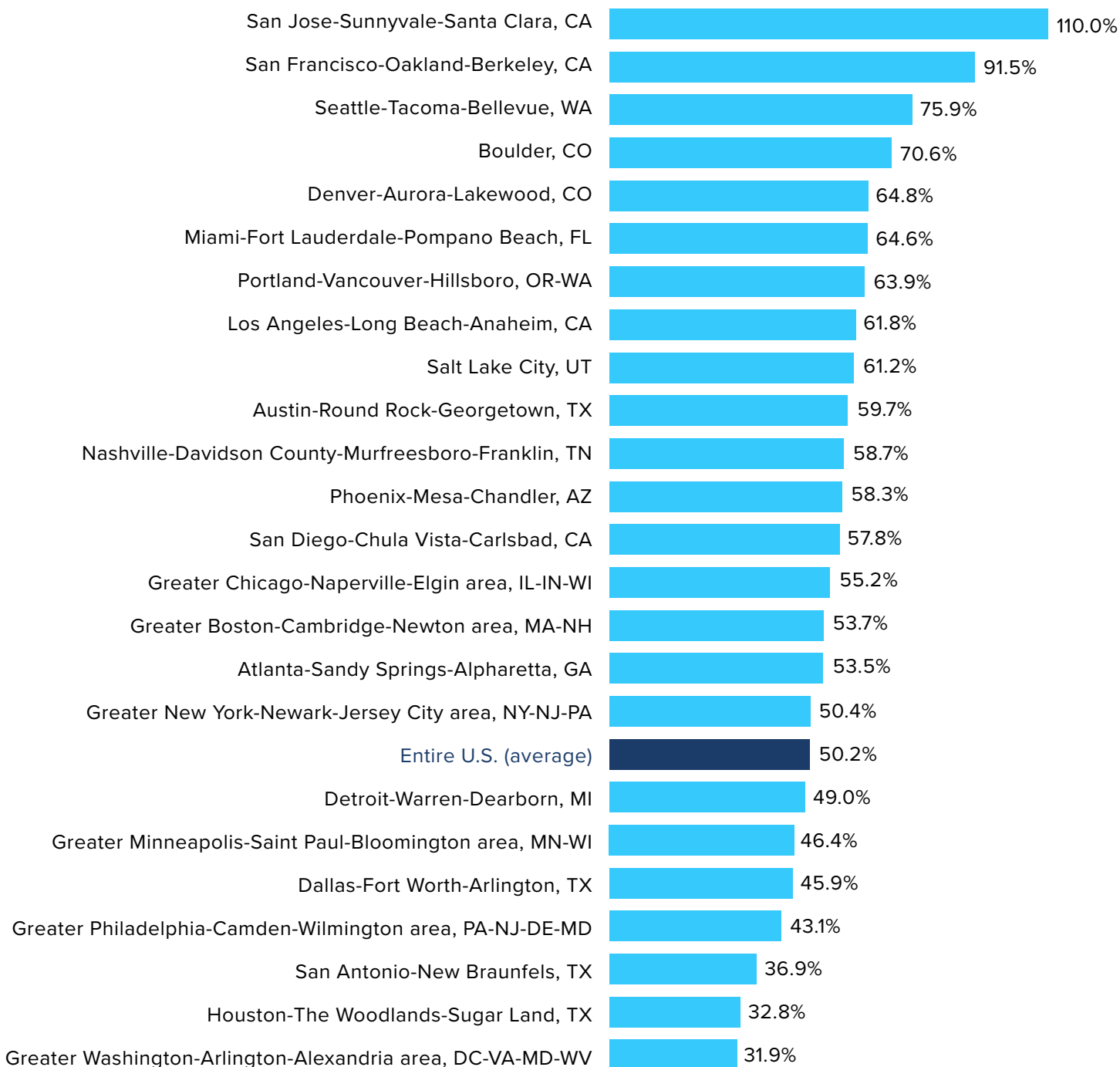


TABLE 4:
GenAI exposure scores for selected large corporations

Company Name	Industry Sector	GenAI Exposure Score
Morgan Stanley	Finance and Insurance	3.913
Bank of America	Finance and Insurance	3.902
Northwestern Mutual	Finance and Insurance	3.884
Goldman Sachs	Finance and Insurance	3.881
Wells Fargo	Finance and Insurance	3.878
J.P. Morgan	Finance and Insurance	3.866
McKinsey & Company	Professional, Scientific and Technical Services	3.862
KPMG	Professional, Scientific and Technical Services	3.858
Fidelity Investments	Finance and Insurance	3.857
American Express	Finance and Insurance	3.845
Robert Half	Professional, Scientific and Technical Services	3.845
Citigroup	Finance and Insurance	3.844
PwC	Professional, Scientific and Technical Services	3.831
Bloomberg	Information	3.818
Salesforce	Information	3.800
Fiserv	Professional, Scientific and Technical Services	3.800
PayPal	Information	3.799
Deloitte	Professional, Scientific and Technical Services	3.798
Google	Information	3.793
Adobe	Information	3.791
LinkedIn	Information	3.788
State Farm	Finance and Insurance	3.785
Oracle	Information	3.781
Johnson & Johnson	Manufacturing	3.780
IBM	Manufacturing	3.779
Microsoft	Information	3.764
Intel	Manufacturing	3.709
UnitedHealth Group	Finance and Insurance	3.699
Apple	Manufacturing	3.688
Amazon	Retail Trade	3.670
General Electric	Manufacturing	3.650
Boeing	Manufacturing	3.646
General Motors	Manufacturing	3.604
Ford	Manufacturing	3.589
Disney	Information	3.555
Walmart	Retail Trade	3.399

As Figure 6 shows, technology hubs, especially Silicon Valley, witnessed impressive growth through 2021, driving both higher salaries for tech workers and increased spending in nearby regions and adjacent industries. GenAI is likely to further accelerate these trends.

FIGURE 6:
Growth in per-capita income for technology hubs, 2011-21



Source: Bureau of Economic Analysis.

More broadly, the U.S. is home to 36 of the top 50 global technology companies (see Table 5), as well as cutting-edge institutions such as MIT and Stanford that boast a thriving venture capital scene and deep investments in AI research. As a result, the U.S. is perfectly poised to harness the GenAI revolution. As tech becomes a more important part of the global economy, countries that have a comparative advantage in tech will see the greatest benefits, and few will benefit more than the U.S.

TABLE 5:

Top 50 technology companies in market capitalization, Aug. 30, 2023

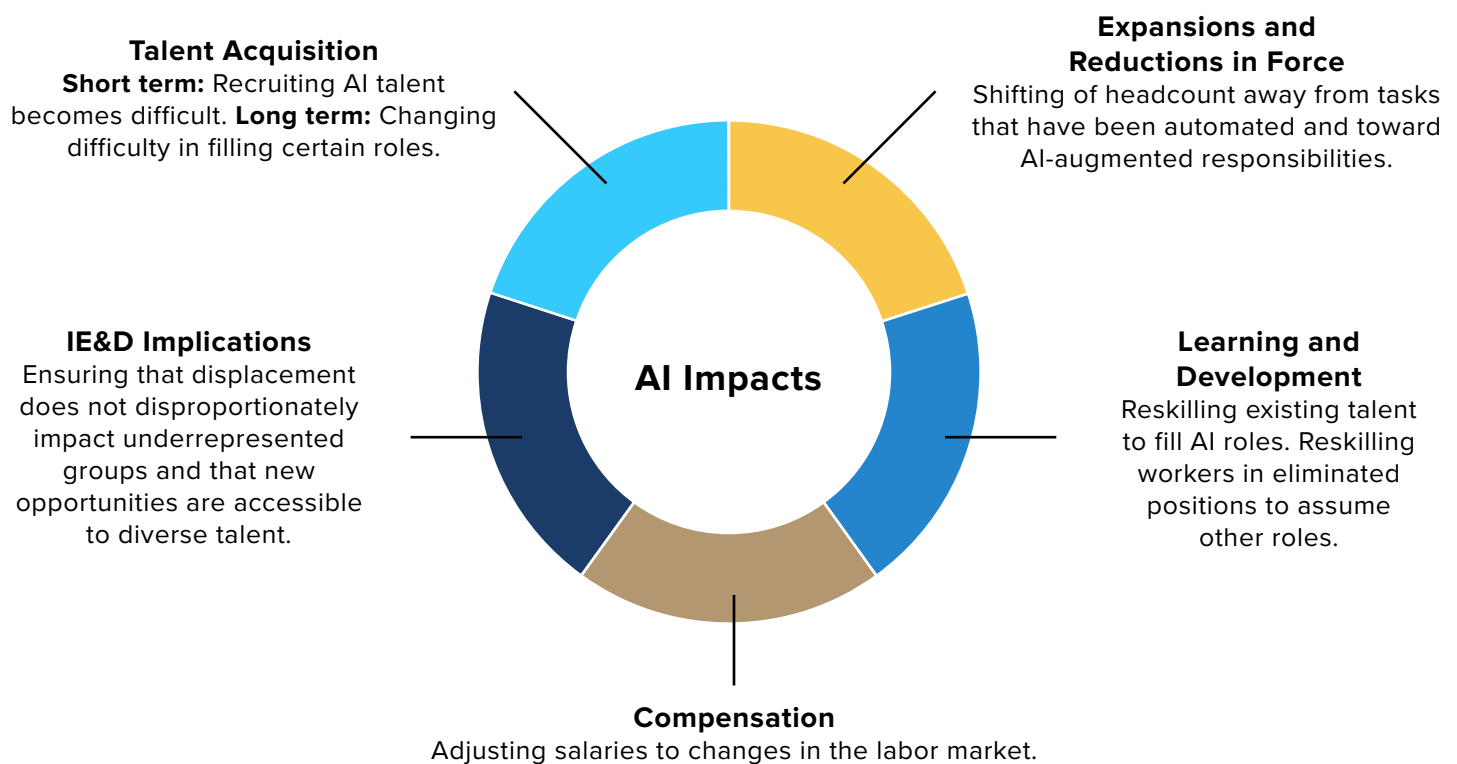
Rank	Company	Headquarters	Market Cap (in \$Millions)
1	Apple	U.S.	2,943,451
2	Microsoft	U.S.	2,432,503
3	Alphabet (Google)	U.S.	1,732,556
4	Amazon	U.S.	1,421,948
5	NVIDIA	U.S.	1,223,564
6	Tesla	U.S.	821,260
7	Meta Platforms (Facebook)	U.S.	770,957
8	TSMC	Taiwan	485,630
9	Tencent	China	395,505
10	Broadcom	U.S.	376,669
11	Samsung	South Korea	333,314
12	Oracle	U.S.	327,095
13	ASML	Netherlands	259,258
14	Adobe	U.S.	253,653
15	Alibaba	China	235,755
16	Cisco	U.S.	233,929
17	Salesforce	U.S.	216,325
18	Netflix	U.S.	192,866
19	AMD	U.S.	171,972
20	SAP	Germany	163,501
21	Texas Instruments	U.S.	153,156
22	Intuit	U.S.	150,065
23	Intel	U.S.	144,989
24	IBM	U.S.	133,617
25	Pinduoduo	China	130,853
26	Applied Materials	U.S.	127,580
27	Qualcomm	U.S.	126,990
28	ServiceNow	U.S.	121,398
29	Booking Holdings (Booking.com)	U.S.	115,032
30	Automatic Data Processing	U.S.	104,801
31	Sony	Japan	102,924
32	Meituan	China	102,311
33	Keyence	Japan	101,341
34	Schneider Electric	France	96,792
35	Uber	U.S.	96,534
36	Lam Research	U.S.	92,869
37	Analog Devices	U.S.	90,701
38	Airbnb	U.S.	84,125
39	Shopify	Canada	83,444
40	Micron Technology	U.S.	76,307
41	Fiserv	U.S.	74,397
42	Palo Alto Networks	U.S.	74,107
43	Equinix	U.S.	73,170
44	VMware	U.S.	72,937
45	Activision Blizzard	U.S.	72,378
46	Synopsys	U.S.	70,195
47	PayPal	U.S.	70,167
48	Tokyo Electron	Japan	69,331
49	KLA	U.S.	68,907
50	MercadoLibre	Argentina	68,333

Source: [Largest Tech Companies by Market Cap.](#)

IMPLICATIONS FOR CHROs AND OTHER BUSINESS LEADERS

In the coming decade, CHROs and other business leaders will need to navigate a host of disruptions as GenAI adoption increases (see Figure 7). The first step is to evaluate the composition of your workforce: How exposed is your organization to GenAI? What are the most prevalent tasks, skills and roles in your organization today, and what tasks, skills and roles will be most important in the future? If your company sits in a highly exposed industry or has functions composed of at-risk roles, GenAI will be especially disruptive. In light of the so-called digital divide in Americans' access to technology, the potential exists for harmful effects to your organization's inclusion, equity and diversity (IE&D) efforts. Use your assessment to support your workforce planning and prepare for GenAI-related disruptions.

FIGURE 7:
Implications of GenAI for HR functions



Reskilling and upskilling workers will become increasingly important as GenAI becomes central to business operations. Many roles will transform, and employees in them will require new skill sets. For example, traditional customer service roles may pivot toward managing chatbots or overseeing automated processes, and data analysts may transition to AI data specialists. In this dynamic landscape, blending in-house training with strategic external hiring will be pivotal to harness the full potential of GenAI innovations. Effective leaders will understand GenAI's potential, its limits and how best to integrate it into existing workflows.



As GenAI transforms roles, the skills that are most important and rewarded will evolve as well. For example, jobs specializing in the creation and management of AI tools may witness rising salaries due to the niche expertise they require. Skills associated with AI research, development and the practical application of AI tools in business settings will also see skyrocketing demand. Conversely, roles that rely on skills that GenAI can replicate will grapple with decreasing demand and pay (see Table 6).

As skill needs shift, employee learning and development curricula will need to evolve in parallel. Educational and training institutions will need to realign their offerings, focusing on fostering AI-centric skills and emphasizing the value of human-AI collaboration. Additionally, as AI disrupts traditional roles, the importance of uniquely human attributes such as critical thinking, empathy and adaptability will become even more pronounced. Businesses can achieve the best outcomes when they leverage both the capabilities of GenAI and the unique strengths of human intelligence. HR leaders can reference the list of skills in Table 6 to evaluate their organization's learning and development capabilities and revise trainings to align with the skills needed for the workforce of the future.

TABLE 6:
Workforce skills that will increase/decrease in importance

Increased Importance

Skill	Description
AI literacy	Being familiar with AI basics, understanding its potential and limitations.
Systems evaluation	Assessing the performance of AI and predicting potential issues.
Data literacy	Interpreting vast amounts of data processed by AI.
Emotional intelligence	Engaging in invaluable human-to-human interactions requiring empathy and interpersonal understanding.
Continuous learning	Adapting to the rapidly evolving landscape of AI.
Critical thinking	Evaluating complex situations and AI-generated content or decisions.
Digital security and privacy	Safeguarding data and understanding the security implications of AI systems.
Creativity	Harnessing human creativity that surpasses AI's generative capabilities.
AI model training	Training, refining and improving AI models.
Neural network understanding	Grasping the intricacies of neural architectures and their applications.
AI optimization	Fine-tuning AI algorithms for efficiency and effectiveness.
Reinforcement learning	Harnessing this AI approach, which enables machines to learn through trial and error.
Natural language processing	Teaching machines to understand human language, a specialization in AI.
Generative adversarial network (GAN) skills	Understanding GANs, which can generate data mimicking real datasets.
Explainable AI (XAI)	Making AI decisions transparent and understandable to humans.

Decreased Importance

Skill	Reason for Decrease
Writing and basic content creation	GenAI can produce routine textual, visual or multimedia content.
Graphic design	AI-driven design tools can suggest color palettes, design logos and lay out webpages.
Research	GenAI can automate preliminary stages, including data gathering and basic analysis.
Web development	AI tools can auto-generate web layouts and produce code for common functionalities.
Coding	GenAI can produce standard code templates, reducing the need for basic coding.
Simple data analysis	AI's prowess in data processing may decrease demand for basic data analysis.

Despite the best efforts of savvy HR leaders, workforce reductions will become increasingly pressing as GenAI transforms the macroeconomic landscape. HR leaders must remember that layoffs are not the only downsizing option available; more subtle strategies, such as implementing hiring freezes and leveraging natural attrition, can be deployed to minimize disruption to employees. Reskilling may also be an effective alternative to laying off displaced employees. Helping these individuals transition to different roles via new tools and training opportunities can ensure continuity of experience and boost workforce morale. In this time of heightened disruption, the emotional toll of job insecurity will underscore the need for robust employee support systems, including mental health and transition programs.

GenAI’s proliferation has varied implications across the labor spectrum. Most clearly, GenAI-fluent tech talent will become highly sought-after. Health care practitioners (including nurses), social workers and other human-centric occupations currently experiencing labor shortages are not conducive to full automation. Meanwhile, information security professionals and actuaries might benefit from AI integration, alleviating labor shortages in these fields. In fields without current labor shortages that are exposed to GenAI, we are likely to see a labor surplus and an overabundance of professionals.

HR leaders must evaluate their talent pipelines to understand where they are currently experiencing talent shortages or surpluses and assess how GenAI may drive changes in supply and demand in those areas (see Figure 8).

FIGURE 8:
Associations between degree of GenAI impact and labor shortages

	Low Labor Shortage	High Labor Shortage
High AI Impact	Labor Surplus Created Business and financial professionals Office and administrative support Web developers University professors Economists Writers, editors, journalists	Labor Shortages Mitigated Information security roles Speech-language pathologists Lawyers Actuaries Data scientists
Low AI Impact	Labor Insulated from Impacts Construction workers Some repair workers Some technicians Laundry and dry-cleaning workers Sewing machine operators	Continued Labor Shortages Health care practitioners Health care support staff Skilled tradespeople Social workers Child care workers

GenAI will challenge HR leaders to maintain a commitment to inclusion, equity and diversity (IE&D). While it will be tempting to leverage AI for HR practices such as sourcing and assessing new hires, leaders must be mindful that GenAI tools are likely to replicate existing biases and may work against IE&D goals. Adjustments in hiring practices and revisions of IE&D metrics may be needed.

GenAI is redefining the landscape of the professional labor market. As we uncover its full implications over the coming years, HR leaders will be at the forefront of navigating the associated challenges and capitalizing on the opportunities GenAI presents. This transformation demands a recalibration of workforce composition and management, especially for companies in the Finance and Insurance sector and Professional Services sector. As organizations evolve, a holistic approach that blends technological innovation with investment in human capital will be paramount for a smooth and successful transition into the future of automated and AI-enabled knowledge work.

M E T H O D O L O G Y

To construct GenAI exposure scores, researchers at The Burning Glass Institute use data made available by [Felten, Raj and Seamans](#). We build an AI exposure measure by linking common AI applications to occupational abilities using a crowd-sourced dataset. Then we aggregate the effect at the ability level to construct a measure that identifies the potential exposure of occupations to AI. We measure an occupation's aggregate exposure to AI by summing this weighted ability-level AI exposure across all abilities in an occupation. In an adjustment to Felten et al.'s (2018) methodology,¹ we scale the aggregated exposure to AI across all abilities by the weighted sum of the prevalence and importance of all abilities used in the occupation to account for the total required ability set within an occupation. This scaling then provides a measure of the relative exposure to AI.

The Burning Glass Institute applies these occupational AI exposure scores to company-level information available in [Lightcast Profiles](#) data. Using company occupational distributions for the years 2021 and 2022, we calculate an average company AI exposure score by multiplying the occupational shares by their AI exposure score. Each occupation is weighted by the share of the occupation's wage in total company wages. The final company score is a weighted average of the standardized occupational AI scores. This means that a score of 0 is considered average, while a score of -1 or 1 can be interpreted as one standard deviation below or above the mean.

We supplement this approach by creating two new measures of GenAI exposure by occupations. In this methodology, we base our assessment of task vulnerability to AI automation on the composition of tasks within an occupation. We use four criteria to evaluate tasks: physical presence requirements, error consequences, cognitive demand and cultural nuance understanding. We then assess tasks using AI tools and categorize them into three risk levels (low, medium, high). We resolve discrepancies using expert judgment and calculate the overall occupational risk by averaging task scores.

This approach, focused on assessing AI's impact on job vulnerability, involves:

1. Creating a list of tasks AI can perform and detailing essential skills for each profession, often from job listings.
2. Breaking down roles into primary tasks and estimating time spent on each task.
3. Comparing AI capabilities with job-specific tasks, determining the level of overlap.
4. Aggregating the vulnerability metrics by various categories and classifying jobs based on their level of risk to displacement by AI, such as high, medium or minimal exposure.



¹Felten, E.W., Raj, M., and Seamans, R. (2018). A method to link advances in artificial intelligence to occupational abilities. *AEA Papers and Proceedings*, 108, 54–57. <https://doi.org/10.1257/pandp.20181021>



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