

INTELLIGENCE UPDATE

AI adoption in data centers: an insight into job displacement



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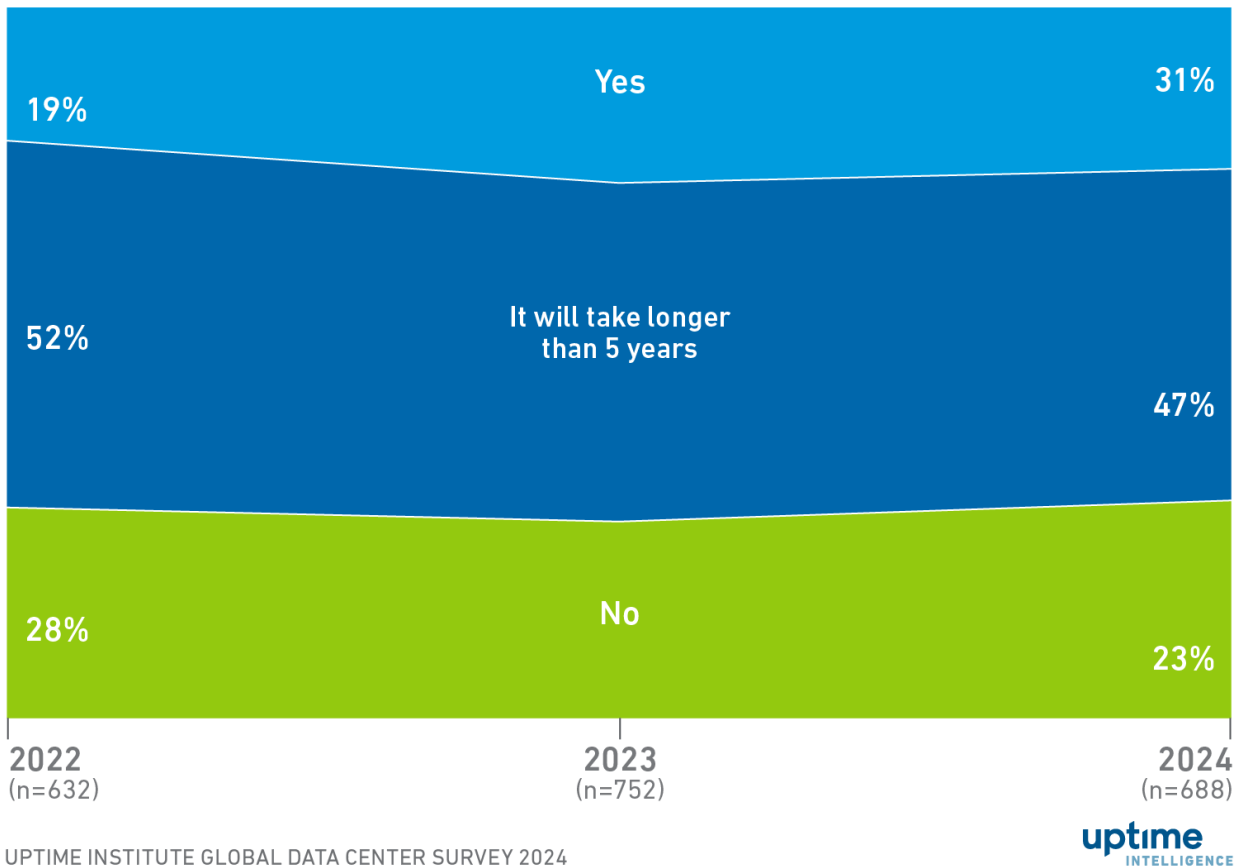
There has been considerable speculation across the data center industry that AI and automation will help reduce current staff shortages. In reality, data center operators remain distrustful of AI (see [Building trust: working with AI-based tools](#)) and have been slow to deploy more automation — and it is unlikely it will result in displacement of current employees.

Many data center roles are not easily replaced with AI — yet anxieties for personnel in the industry persist. Despite the mass layoffs in the technology industry in 2023 and 2024, related to AI and automation, the situation for data centers is more complex.

When asked whether they believe AI technologies will reduce their data center operations staffing levels in the next five years, 23% of respondents to the Uptime Institute Global Data Center Survey 2024 indicated it would happen the next five years and 47% thought it would take longer. These percentages are largely unchanged from 2022, when the same survey question was presented (see **Figure 1**).

Figure 1. Operators believe that AI will decrease staffing levels

Do you believe AI will reduce your data center operations staffing levels in the next five years?



The data suggests that data center managers do not see staffing and the use of automation as interrelated issues. In a separate question in the 2024 survey, more than half of all respondents (51%) reported finding it difficult to source qualified staff. Again, this percentage has remained largely unchanged over the past three years.

AI and automation can replace some low-skilled work or narrowly defined tasks, dependent on the specific requirements of the job. However, this effect is often temporary as new job opportunities tend to arise as the market adapts.

To assess the data center industry's position in terms of the impact of AI on the labor market, owners and operators can explore known frameworks that can be applied whenever new automation technologies are deployed.

Factors to consider

There are four known effects of AI and automation on the labor market:

- **Displacement.** The replacement of (some) staff as the capabilities of AI and automation expand.
- **Increased productivity.** The combination of lower labor costs, increased productivity and increased quality associated with AI and automation results in economic growth. This industry growth then creates additional jobs to offset the initial staff displacement.
- **Capital accumulation.** More efficient technology enables higher productivity, higher revenues, and companies can then afford to purchase increasingly advanced

technology.

- **Reinstatement.** Technological advances create new job roles demanding new skill sets, further offsetting displacement.

There are three primary theoretical frameworks for these changes in the labor market:

- **Technological unemployment theory.** Assumes displacement effects will occur in low-skilled work without any buffers to offset job losses.
- **Skill-biased technical change theory.** Assumes that automation will replace many low-skilled jobs, decreasing demand for these positions and driving down wages. AI/automation will simultaneously increase productivity for skilled workers by complementing their roles and increasing demand for these workers.
- **Job polarization theory.** Assumes that automation will cause displacement effects in those medium-skilled positions that include repetitive tasks — driving up demand for high-skilled knowledge-based jobs as well as low-skilled, non-routine manual jobs.

It is difficult to create one framework that captures the impact of introducing automation and AI across all regions and industries. Deployment of AI/automation varies in terms of both scale and speed, and some markets and regions face diverse stages of economic development, as well as varying workforce composition.

The Asia-Pacific region, particularly China and India, has a higher availability of unskilled labor and is more susceptible to the impact of workforce displacement from AI/automation. Regions such as the US and Europe have similar ratios of skilled to unskilled workers — but labor laws in European countries (such as Germany) make layoffs (such as those resulting from AI deployment), a complex, slow and costly process.

When the data from the Uptime Institute Global Data Center Survey 2024 is broken down by region (**Figure 2**), there is evidence that operator opinions about AI and its impact on staffing levels are related to the proportion of skilled roles in that region's labor market. Respondents from regions with fast-growing economies and the highest proportion of unskilled labor, China (which is separate from the Asia-Pacific region for the purpose of the survey) and Africa, were the regions with the highest response to AI reducing staffing levels within the next five years.

Figure 2. Regions with greater low-skilled workforce anticipate faster AI impact

Do you believe AI will reduce your data center operations staffing levels in the next five years?

■ Yes ■ It will take longer than 5 years ■ No

US & Canada (n=127)



Latin America (n=137)



Europe (n=167)



China (n=53)



Asia-Pacific (not China) (n=115)



Africa (n=50)



Middle East (n=38)



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AI adoption in data centers

There is no direct evidence to suggest that AI and automation are replacing employees in data centers. While some aspects of data center roles can be automated, it is unlikely that the current level of technology is advanced enough to cause widespread substitution of staff. The following factors protect data center workers' roles against displacement effects:

- Empirical evidence suggests that the development of AI in most cases has followed the skill-biased technical change framework, with AI replacing low-skilled jobs while increasing productivity for skilled workers. The data center industry is largely an industry requiring specialized skills, with few unskilled roles. In contrast, industries that supply products and services to data centers, such as manufacturing, tend to have a higher proportion of low-skilled workers and are more likely to face disruption as AI and automation evolve. As manufacturers increase productivity more economically due to the use of AI, data centers may encounter a higher quality, less expensive supply chain.
- According to another theory, the routine-biased technological change hypothesis, repetitive work in controlled settings (where working conditions that are essential for daily operations are guaranteed not to change) is highly susceptible to automation regardless of skill level. This applies to both physical and cognitive labor. Although many data centers staff perform repetitive, routine tasks, factors such as grid stability and human error mean that the data environment can be unpredictable. Staff need to be ready to adapt quickly and make crucial, informed decisions when an unexpected situation arises. An automated system may be less able to alert staff to an unusual situation if its detection parameters are set incorrectly. A human has the contextual

knowledge to diagnose the issue manually, and the critical thinking skills to reassess automated detection parameters.

- There are currently few applications for AI in data centers beyond predictive maintenance, anomaly detection and efficiency optimization. While AI may help staff perform certain tasks, physical interaction and a flexible range of skills are still required.
- Even if there is the potential to automate staff tasks, some data center managers may be averse to adopting the AI software. According to the 2024 Uptime Institute data center survey only 58% of operators would trust an adequately trained AI system to make operational decisions in their facility — 18 percentage points down from 2022.

At present, AI-based tools do not have the capability to impact staffing levels significantly. Data center staff can use generative AI to streamline schedules, optimize workloads, or even assess labor redundancy. While this could possibly lead to staff reductions, these tools exist in a worker shortage context and restructuring is more likely than a reduction in the data center industry.

The Uptime Intelligence View

The data center industry is in a good position to reap the benefits of AI, more so than other sectors, but managers should continue to focus on preparing their teams for this transition. AI and automation can increase overall productivity, but they will not necessarily resolve the issues around ongoing data center staff shortages. Continuous training not only ensures that skilled staff will be ready to step into new roles — but will also provide employees who are distrustful of AI with a sense of perceived control in an evolving technological environment.

ABOUT THE AUTHOR



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About Uptime Institute

Uptime Institute is the Global Digital Infrastructure Authority. Its Tier Standard is the IT industry's most trusted and adopted global standard for the proper design, construction, and operation of data centers – the backbone of the digital economy. For over 25 years, the company has served as the standard for data center reliability, sustainability, and efficiency, providing customers assurance that their digital infrastructure can perform at a level that is consistent with their business needs across a wide array of operating conditions.

With its data center Tier Standard & Certifications, Management & Operations reviews, broad range of related risk and performance assessments, and accredited educational curriculum completed by over 10,000 data center professionals, Uptime Institute has helped thousands of companies, in over 100 countries to optimize critical IT assets while managing costs, resources, and efficiency.