Human–Machine Cooperation

SUMMARY: Though many forecasts include substantial job losses due to automation—and such losses are indeed already occurring—many jobs will rely on cooperation between humans and machines. While less disruptive than total automation, human-machine cooperation will be a massive shift, with entire work processes becoming machine-oriented and humans learning to complement automation's role.

Forecasts

- Work automation will proceed for the foreseeable future, mostly by taking over tasks within a job rather than by taking over entire jobs. Humans will handle the remaining tasks in ways that complement what automation can do.
- The ratio of automated work to human work will vary substantially by industry, job, and workplace. Employers will embrace automation to the extent that they can, attracted not only by lower labor costs but also by higher quality and greater output.
- The human side will often be about planning and decision making, managing and developing people, or creative work—tasks that are all hard to automate with current technologies.
- An emerging breed of artificial intelligence-driven employers will add a new dimension to job displacement: startup companies whose business models rely on AI, rather than humans, from the very beginning.

Key Uncertainties

The speed of development and adoption of automation technologies

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The speed at which organizational leaders learn to redefine roles and processes

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The ratio of automatable tasks versus human tasks in a given work process

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Regulatory and societal reaction to automation

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People's tolerance for working with machines, including as managers

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Rates of progress in machine learning, affective computing, and natural-language capabilities—each of which will significantly extend the kinds of work machines can do

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Supporting Trends

- **Human-machine hybrid work.** As intelligent systems permeate the work world, semi-autonomous systems that collaborate with humans—rather than fully autonomous systems—are likely to spread.
- **Limits to automation job loss.** Automation-caused job loss may be less than worst-case forecasts, given the difficulty of automating highly interpersonal or creative tasks.
- **Emotional intelligence in the age of AI.** In the age of artificial intelligence, humans will remain relevant not by knowing but by thinking, listening, relating, and collaborating at the highest levels.
- **Learning from machine learning.** While the focus of machine learning has been on what machines can do, early applications are showing that humans are learning from AI as well.
- **Affective computing.** The pace of development of affective computing—which integrates emotion detection and simulated psychological sensitivity into computers—will be an important variable in how much and what kinds of work can be automated.
- **Machine learning usability.** Machine learning, which involves teaching computers how to "think" more like people, is getting easier and cheaper as new tools come online, and this will enable computers to take over more human roles.

Related Drivers of Change

- Automating Work
- New Forms of Work
- More Human Humans

Notable Data Points

LESS MANUAL LABOR

48% of work hours
for North American and European manufacturing jobs
rely chiefly on physical labor;
by 2030, that share is expected to drop to 35%.

Source: World Economic Forum, 7 charts on the future of automation

STILL SCALING UP

Among U.S. organizations that are automating their processes,
17% are in the pilot phase and 14% are at proof of concept.

Source: Capgemini, Reshaping the Future: Unlocking Automation's Untapped Value

NEW THREAT TO JOBS?

One forecast projects that
10% of the U.S. workforce will be disrupted by startups that build business models around algorithms,
not humans—job loss that is often excluded from other estimates.

Source: Kai-Fu Lee, "Estimates of job loss due to automation miss one big factor," Quartz, Nov 28, 2018.

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Strategic Insights

- Understanding that much of work automation will in fact be human-machine cooperation—rather than machines eviscerating entire occupations—will put associations in a stronger position to help their members navigate the sea changes ahead.
- In many industries, tensions could run high if employers see strong motivations to automate while workers and activists see only threats to livelihood. Associations can walk that fine line, advocating the benefits of automation while addressing the challenges confronting both workers and employers. Sticking to a practical focus will help all parties achieve more fruitful outcomes: What skills will workers need to stay competitive? How can employers design and execute the smoothest transition possible?
- Over the next few years, more and more workers will need to modify their skills to collaborate with and/or manage smart machines. Associations can serve as thought leaders, providing expertise and best practices specific to their industries.
- More analysis is emerging of how automation is likely to affect specific industries. Associations need to identify which of their constituents are most at risk within the industries they support, and tailor services to fit.
- Keep an eye on "ground-up disruption" from AI-centric startups that bypass human jobs from the outset, threatening to disrupt entire industries. Examples include Smart Finance (which employs no human loan officers), F5 Future Store (a Chinese convenience-store chain with no in-store employees), and Toutiao (a news app with no editors).

Timing

- **Stage:** Growth, as more fields and occupations engage with automation and learn how to complement it with human skills
- **Speed:** Rapid, accelerating over the next decade and beyond as automation becomes a competitive imperative

Potential Alternative Futures

- **Tortoise and hare industries:** Progress toward automation is fast in some domains (e.g., finance, healthcare) and much slower in others (e.g., those that are high-touch).
- **Human thriving:** Societies discover that human-machine cooperation can not only free human workers from dull, routine tasks but—by showing how to optimize work tasks—it can help humans work at a higher, more gratifying, and potentially even better-paid level.
- **Going too far:** Some business leaders overestimate the potential of automation and ignore crucial human elements, leading to devastating failures.

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Take Action

- **Automate the processes people want automated.** People are willing to accept doing a wide range of customer transactions on their own in the rest of their lives. Likewise, automation can help associations handle high-volume, routine tasks with 24-7 machine capabilities. Just make it easy to reach a human when the machine can't deliver the service needed.
- **Automate your high-volume, repetitive transactions.** Good database systems can expedite routine member transactions like member renewals, registrations, and purchases, bringing them closer to the one-click experience the e-retail powerhouses like Amazon offer. Examine other work processes for opportunities such as chatbots to answer frequently asked questions and machine scoring for credentialing applications and resume review. Think mobile to serve members and staff wherever they may work.
- **Ease the burden out of chapter leadership.** Chapter volunteer leaders might welcome the chance to automate filing the many required reports. They may grow frustrated if processes are still manual long after they could have been streamlined to make their lives easier.
- **Lead the human factors design for human-machine interface.** Introducing technologies into complex human workflows is not trivial where quality, health, and safety are essential. Bring users together with technology providers to identify issues and design solutions.
- **Focus your training on the jobs machines can't do as well.** Prepare people to be the creators, decision makers, and human development experts. Where machines can play a supporting role, teach people how to use the technologies to free the time for the human touch.

Keyword Search

To continue researching this change driver, use these search terms:
artificial intelligence, AI, work automation, affective computing, machine learning, robotics, robots, taskification, behavioral computing

Who Will Be Affected

Some associations will not have the money or capacity to implement these technologies immediately. Still other associations will have members that won't tolerate slow adoption of innovative technologies. And some members may be unwilling or unable to use automated systems. The technology providers helping automate businesses will be a growing target for membership, exhibiting, and sponsorship.

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- regularly updated action briefs;
- tools for applying insights from the research in your association;
- guidance in performing environmental scans; and
- opportunities to engage with peers around the research.

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