



## POSITION PAPER

# Automation Depends on People to Make the World a Better Place

Automation is all around us, impacting everything from the food we eat to the devices we use to communicate and the vehicles we travel in. Automation ensures that essential services such as clean drinking water and reliable electricity can be provided; that traffic usually flows efficiently on our roads and in our skies; and that food and pharmaceuticals can be produced and distributed safely.

But while it is clear automation provides immense benefits throughout modern economies, it is not so evident that automation itself depends on a vast and diverse range of skilled humans to make this possible. Highly trained technicians and operators, often with associate degrees or higher, are responsible for operating and maintaining the automation systems needed to run facilities as diverse as a nuclear power station or a retail distribution center. Engineers with degrees design the automation systems and processes needed, which can involve complex math, physics and other high-level skills. Automation suppliers develop solutions based on the latest technology, then sell and maintain these systems. Consultants provide specialized knowledge and advice on subjects such as cybersecurity.

Indeed, automation professionals use the most advanced technologies to enable reliable and safe operations throughout modern economies, from virtual server environments running control systems to the use of augmented reality and artificial intelligence to help with design, construction and maintenance activities.

### **DECISION MAKERS MUST UNDERSTAND THE FULL IMPACT OF AUTOMATION**

The International Society of Automation (ISA), a member association of automation professionals from across the globe, believes it is vital for governments and other decision makers at all levels to understand the full impact and benefits of automation when assessing its value and use in specific applications – recognizing that automation can be employed to help meet many critical needs and objectives, including:

- Helping perform jobs that cannot be filled in the labor shortages that some industries are experiencing
- Helping produce vital goods such as pharmaceuticals at lower costs, making those goods more affordable for people who depend on them
- Helping make goods such as foods and beverages safer for human consumption—and at lower costs

- Helping protect or even remove humans from dangerous work and situations, such as in law enforcement, search and recovery, harsh and hazardous manufacturing operations and the like
- Freeing resources from performing mundane and repetitive tasks, allowing them to be directed to other, more challenging and rewarding activities

Among countless examples that reflect the value and range of automation are the following:

- An estimated cost to land humans on Mars by 2035 is at least \$230 billion USD. In contrast, a robotic rover first arrived on the planet in 1997, with succeeding generations of Mars rovers, all at a fraction of the cost, collecting scientific data ever since – joined in 2021 by the first Mars robotic helicopter.
- One impact of the on-demand economy has been the growth of the warehouse robotics space by more than 15% every year, expected to more than double in size by 2027, hitting over \$23 billion USD in value. According to some industry experts, this is boosting productivity by 200-300%.<sup>1</sup>
- Employers turned to automation to assist their businesses during the COVID-19 pandemic to save on labor costs amid widespread illness and market pressures to onshore supply chains.<sup>2</sup> Despite some concerns, experts believe the long-term trend is that the number of jobs lost will be surpassed by the number of “jobs of tomorrow” created.<sup>3</sup>
- The World Economic Forum estimates that by 2025, automation technologies including artificial intelligence will create at least 12 million more jobs than they eliminate, a sign that in the long run, increasing the sophistication of technology and automation across industries will be a net positive for society.<sup>4</sup>

#### **AUTOMATION DOES NOT ELIMINATE JOBS, IT CHANGES THEM**

With each new innovation in society, we see corresponding headlines and public concern about how that innovation will be responsible for job loss.

#### **The More Things Change...**

US Congress held hearings on “Automation and Technological Change” and associated impact on jobs... not this year, and not even last year, but in October 1955. Chief among the findings: “[The] nation is faced with a threatened shortage of scientists, technicians, and skilled labor.”<sup>7</sup>

This has been true of the printing press, the automobile, and the computer – and any newspaper you open today likely has a similar story about automation, robots, or artificial intelligence.<sup>5</sup>

As the examples above show, automation does not simply eliminate jobs as some believe, but rather repurposes existing jobs and creates new ones.<sup>6</sup> Manufacturing and industrial work is no longer as dirty, monotonous, or dangerous as it once was. And all that human intelligence, creativity, and capacity that used to be at risk can be valued in new ways that make work and life safer and more efficient.

Moreover, automation is critical in balancing the workforce skills shortage seen in many manufacturing sectors by enabling greater productivity. Indeed, without employing automation, it will be difficult to fill the gap in workforce skills faced across critical infrastructure and manufacturing industries.<sup>8</sup>

### **WHAT DECISION MAKERS CAN DO WITH THAT UNDERSTANDING**

Armed with this understanding, governments and other decision makers – including businesses – can help to deliver the many benefits of automation more effectively to their constituencies through several key steps, including:

- Supporting the ongoing development of industry standards addressing key aspects of people, process and technology in automation systems
- Encouraging educational institutions to increase the availability of courses and training aligned to prepare future automation professionals
- Supporting the adoption of certification and certificate programs to strengthen the skills and knowledge of the automation professionals on whom we all depend

### **CONCLUSION**

Additional advances in manufacturing, technology, sustainability and safety will all depend upon automation technologies and people working together to bring the most creative and innovative solutions to bear. As a society, our focus should be on preparing our workforce to meet the need for engineers and technicians.<sup>9</sup> This demand for qualified staff is already high and will only continue to grow as technologies progress. We must educate enough people to be well versed in automation technologies, as well as the industry standards and conformance programs that support the automation field.

As part of its commitment to the education and certification of automation professionals, ISA actively supports global efforts to establish training and competency programs. An example is the Automation Competency Model<sup>10</sup> developed by the US Department of Labor. This model defines the key skills, knowledge, and abilities that automation professionals need from entry level to advanced career level and is updated regularly to ensure that emerging technologies are included, recognizing that the automation profession is constantly evolving.

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## ABOUT ISA

The International Society of Automation (ISA) is a non-profit professional association founded in 1945 to create a better world through automation. ISA empowers the global automation community through standards and knowledge sharing, driving the advancement of individual careers and the overall profession. ISA develops widely used global standards; certifies professionals; provides education and training; publishes books and technical articles; hosts conferences and exhibits; and provides networking and career development programs for its members and customers around the world.

## RESOURCES

- [isa.org/standards](https://isa.org/standards) 138+ standards for automation, cybersecurity, and more
- [isa.org/training](https://isa.org/training) Unbiased, real-world training courses, personnel certifications, and certificates that help engineers and technicians take the next step in their automation career
- [isa.org/join](https://isa.org/join) Membership in ISA offers unparalleled access to technical discussions and resources
- [isa.org/events](https://isa.org/events) Network, hear best practices, and be part of the automation community dialogue at ISA events – both in person and virtual

## WORKS-CITED

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