



## POSITION PAPER

# Automation Enables Digital Deglobalization Efforts

### DIGITAL DEGLOBALIZATION

Supply chain disruptions, geopolitical instability and protectionism, inflationary pressures and demands for increased corporate social responsibility and environmental social governance have all worked in recent years to drive a trend toward deglobalization. The trend is seen in data showing a reduction in the volume of world trade,<sup>1</sup> businesses re-shoring manufacturing<sup>2</sup> and others focusing on diversification and growth closer to home.<sup>3</sup> The aims are clear: businesses seek to secure themselves from uncertainty, increase resilience and mitigate risk. At the same time, businesses need to deal with the consequences of digital deglobalization and meet demands from investors and the public to improve environmental and social responsibility.

### CONSEQUENCES OF DIGITAL DEGLOBALIZATION

While digital deglobalization can help to mitigate supply chain risks and increase resilience, it carries several downsides:

- Increased demands to store and process data within national borders can make information sharing more challenging — especially against a constant backdrop of cybersecurity threats.<sup>4</sup>
- Restrictions on the transfer of technology can slow technological innovation.
- Diverging regulatory approaches and standards across national borders can make it more challenging for businesses to operate globally.
- Deglobalizing can reduce international trade and cross-border investment and make it harder to transfer productivity gains from one country to another. This can reduce prosperity, especially in smaller, open economies that can benefit the most from international trade.<sup>5</sup>

### ENVIRONMENTAL AND SOCIAL RESPONSIBILITY

A previous position paper from the International Society of Automation (ISA), ["Achieving Sustainability Goals with Automation,"](#) pointed out that "over the past decades, many corporations have pledged their commitment to sustainability development goals (SDGs), with some making further commitments toward science-based targets, carbon neutrality and net-zero emissions targets. Shareholders and boards are demanding sustainability and social responsibility as key corporate values in addition to profitability, and Industry 5.0 looms large as the next strategic direction for industry and government."<sup>6</sup>

Businesses committed to sustainability and environmental protection are implementing energy-efficient technologies, adopting circular economy principles and driving the use of sustainable materials and processes. Many of the same businesses are also committed to social responsibility, such as the safety of their employees and people in their communities.

These businesses are implementing governance processes that enable data-based decision making around these goals.<sup>7</sup>

Since increased digital deglobalization can bring consequences such as reduced prosperity in some regions, many businesses recognize they must commit further to support local economies and help increase access to education if they are to sustain themselves. For example, the European Union (EU) has experienced “profound transformations in their occupational and industrial structures, transforming labor demand.”<sup>8</sup> In essence, globalization has shifted employment from manufacturing to services. Technology — in particular automation — has worked to shift employment from routine manual tasks to higher-skilled roles. As pressures for deglobalization grow, businesses — wherever they operate — will find themselves increasingly dependent on finding a reliable source of highly educated workers.

A 2022 survey by ABB revealed that digital deglobalization is at risk “from [the] global education gap in automation.” The survey noted that 80 percent of education professionals said robots and automation would shape the future of employment over the next ten years, yet only one in four education institutions use robots in teaching programs.<sup>2</sup>

#### **RESILIENT SUPPLY CHAINS**

Another ISA position paper, [“Automation Drives the Global Quest for Resilient Supply Chains,”](#) described how businesses who are deglobalizing are seeking to shorten and strengthen their supply chains, increase production uptime and enhance agility and capacity expansion using modular facility design and improved demand forecasting and planning. The paper further noted that contract manufacturing is a growing trend, requiring close collaboration with vendors.<sup>9</sup>

#### **HOW AUTOMATION CAN HELP**

Automation technology and techniques implemented by knowledgeable and skilled automation professionals can help businesses optimize their digital deglobalization efforts in many ways, including:

- Supporting global energy production, storage and transmission trends such as changes in energy mix, energy performance tracking, decentralized and distributed generation, storage technology through smart grids, digital communication and control and demand-response programs.<sup>10</sup>
- Helping reduce harm to the environment by capturing and processing waste materials and maintaining safety systems to reduce the likelihood and consequence of any loss of containment.<sup>5</sup>
- Recognizing and following industry standards that facilitate interoperability, support environmental regulatory compliance and enhance safety throughout supply chains.
- Supporting access to education for all using collaborative technologies such as artificial intelligence (AI), virtual and mixed reality (V/MR) and digital twins, examples of which are discussed in ISA’s Podomation podcast episodes, “Secure Seas: Navigating Maritime Cybersecurity” and “Global Impact on Student Access to New Technology.”<sup>11</sup>

## **CYBERSECURITY RESILIENCY**

Underlying all manufacturing businesses and supply chains is the need to manage the ever-present risks of cyber intrusions. Significant damage can result from compromises of technology that underlie the infrastructure businesses depend on — including any, or all, of the following:

- Harm to employees and the public
- Loss of critical services
- Damage to critical operational machinery or components
- Major economic losses
- Loss of proprietary or confidential information
- Violation of regulatory requirements
- Harm to the natural environment

## **WHAT DECISION MAKERS CAN DO**

Decision makers — including those in industry, government and academia — can help to deliver the many benefits of automation to businesses in the process of deglobalizing, including:

- Supporting the ongoing development and adoption of industry standards addressing key aspects of people, processes and technology in automation systems.
- Encouraging educational institutions to increase the availability of degree programs, 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 upon whom we all depend.

ISA recommends that governments looking to secure their supply chain infrastructure should:

- Encourage the adoption of the ISA/IEC 62443 series of consensus standards<sup>12</sup> addressing the security of industrial automation and control systems.
- Direct their regulations toward ensuring that critical infrastructure owner-operators apply a formal risk-based approach to cybersecurity management.

ISA further recommends that organizations looking to secure their supply chain infrastructures should:

- Support their front-line engineers by fostering a cybersecurity culture within their organizations, which prioritizes cybersecurity alongside other fundamental workplace tenets like efficiency and safety.
- Provide ample opportunities for engineers to be trained and certified on the specific requirements of cybersecurity of industrial automation and control systems.
- Involve the experienced engineers as part of working committees to establish related standards and practices.

## **WHERE TO START**

As a non-profit, international professional association, ISA develops safety and performance standards for automation; provides education, training, and certification programs for automation professionals; publishes books and technical articles; and provides networking and career development programs for automation professionals worldwide.

ISA is the primary developer of a widely used series of international consensus standards addressing the security of industrial automation and control systems. The ISA/IEC 62443 standards provide a flexible and comprehensive framework to address and mitigate current and future security vulnerabilities in those systems. These standards are among numerous ISA standards and guidelines that support manufacturing and supply chain efficiency and safety.<sup>13</sup>

ISA created the ISA Global Cybersecurity Alliance (ISAGCA) to advance cybersecurity readiness and awareness in manufacturing and critical infrastructure facilities and processes. The Alliance brings end-user companies, automation and control systems providers, IT infrastructure providers, services providers, system integrators and other cybersecurity stakeholder organizations together to proactively address growing threats. ISA also offers the leading conformity assessment program for industrial cybersecurity products and systems — ISASecure — which certifies against the ISA/IEC 62443 series of standards.

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 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.

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## RESOURCES

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

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