

How Manufacturers Can Strategically Empower the Next Generation Workforce

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KEY TAKEAWAYS

- The manufacturing workforce is changing, as employees retire and companies struggle to find new talent.
- The convergence of the physical and cyber worlds is transforming manufacturing work.
- Hyperautomation can create more exciting jobs that attract younger talent.
- To upskill workforce talent, manufacturers must focus on both hiring and training.
- Technology is an enabler that needs to be operationalized in employees' everyday work.
- As connected devices grow on the factory floor, manufacturers must consider what technical infrastructure to deploy.

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How Manufacturers Can Strategically Empower the Next Generation Workforce

OVERVIEW

In light of tight labor markets and an aging workforce, manufacturers are rethinking historical job roles and are adopting novel work methodologies that connect workers and make them more mobile. Industry leaders are leveraging technology to create data-enabled enterprises that streamline decision making for frontline employees. Smart manufacturing creates jobs and empowers the workforce by combining technologies in thoughtful ways. Companies must take a proactive approach to modernizing operations, upskilling employees, and deploying cutting-edge technologies like hyperautomation and private cellular networks.

CONTEXT

The panelists discussed drivers behind changes in the manufacturing work environment, how companies can address employee skill and competency gaps, and how to use new technologies to train, hire, and retain the next generation workforce.

KEY TAKEAWAYS

The manufacturing workforce is changing, as employees retire and companies struggle to find new talent.

Trends affecting the manufacturing work environment include:

- *Very tight labor markets are making it difficult to recruit employees.* Since December 2021, unemployment in the U.S. has been under 4%. The Bureau of Labor Statistics defines full employment as unemployment between 4.1% and 4.7%. Since the number of job candidates is limited, manufacturers are recruiting employees away from other companies or hiring new graduates from tech schools, high schools, or universities.

- *Younger generations are less likely to seek out manufacturing jobs.* They perceive manufacturing jobs as dirty, dull, and unstable. Offshoring of manufacturing in recent decades hasn't helped.
- *Frontline manufacturing workers are aging.* As they retire, they are taking their skills with them.

The convergence of the physical and cyber worlds is transforming manufacturing work.

Companies are using technology to connect their workers and make them mobile. Frontline employees are no longer tethered to a specific spot on a manufacturing line. As a result, their jobs are more flexible, interactive, and interesting.

As this flexibility occurs, more employees are becoming "lone workers" who spend a significant portion of their day alone or at a significant distance from other people. Fortunately, the same network used to connect lone workers can help track their health, safety, and productivity.

"The convergence of the physical and cyber worlds will help balance workloads and attract a new generation of employees into manufacturing. It also increases the value of each worker on the factory floor."

David Hart, Ericsson

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Hyperautomation can create more exciting jobs that attract younger talent.

In a 2022 report, Gartner identified hyperautomation as a top 10 strategic technology trend that enterprises should consider during their strategic planning. Hyperautomation is based on the idea that everything that can be automated should be automated. It results from combining advanced technologies like autonomous mobile robots (AMRs), collaborative robots, the Internet of Things, the application of AI on the edge, and more.

If repetitive manufacturing tasks don't involve decision making, they will be automated. Hyperautomation can also empower workers to make decisions faster, more efficiently, and more accurately. This requires a data-enabled enterprise that leverages technologies like AI and ML to generate insights.

“Hyperautomation is all about using the latest technology to make manufacturing work more rewarding intellectually and technically. If hyperautomation creates more exciting and interesting jobs, we can attract younger talent into manufacturing.”

Vish Kolar, Ericsson

As manufacturing employees shift from repetitive tasks to critical work that requires cognitive capabilities to drive operations, they will need greater digital literacy and dexterity. Manufacturers must provide the tools needed to support the next-generation workforce.

“Smart manufacturing is the combination of technologies that empowers the workforce and is a net job creator.”

Sindhu Laljani, Ericsson

To upskill workforce talent, manufacturers must focus on both hiring and training.

When hiring new employees, it's important to hire for mindset, not skillset. The goal is to find people who are resilient, adaptable to change, curious, and committed to lifelong learning. These individuals are more likely to stay with a company, as the manufacturing sector evolves over time. Remember that it's easier to teach employees skills they may be lacking than to teach a new mindset.

As manufacturers train workers, they must go beyond the current job requirements. Training needs to help employees become more flexible and agile.

Table 1: Employee Training – Three Opportunity Areas for Manufacturers

Foundational Skills	Critical thinking skills Analytical approaches to problem solving Agile or Lean manufacturing processes
Behavioral Competencies	Collaboration Information sharing Lifelong learning
Digital Capabilities	Data literacy Data analysis

It's also important to consider how training can be made more effective. When a simple task is automated, for example, training can be eliminated. If work can be simplified and made more intuitive, it may be possible to minimize training.

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Table 2: Examples of Training Techniques

Standardized Checklists	When embedded in workflows, these can error-proof work
Quickstart Guides	A set of simple steps can help resolve issues in many situations
Videos	Short 30-second vignettes can illustrate tasks, such as restarting an AMR
Augmented Reality (AR)	Short AR stories can support employees as they perform tasks like splicing in a piece of material
On-the-Job Training	This is a good option when new employees require more in-depth learning
Apprenticeships	These are an effective way to convey information about detailed jobs, such as rebuilding equipment or facility maintenance tasks

A blend of both hiring and training is needed to upskill manufacturing employees. Best practices include:

- Identifying skills of strategic importance to the company.
- Taking a thoughtful approach to filling skill gaps.
- Building internal capabilities and external partnerships with universities and manufacturing associations.

“How can you get to a data-enabled enterprise? We want frontline workers to collect data on the factory floor, analyze it, develop a hypothesis about what’s happening, and forward that information to an engineering or process specialist.”

David Hart, Ericsson

Technology is an enabler that needs to be operationalized in employees’ everyday work.

Putting technology to work is the biggest challenge facing manufacturers. Four best practices are:

1. **Identify a sweet spot to automate.** Look for manufacturing processes that cause problems in the organization which can be addressed with technology.
2. **Involve frontline workers.** If employees aren’t involved in the ideation process, companies are unlikely to achieve success with new technologies. Ask frontline workers to guide the use case and how it should be incorporated into operations.
3. **Select a mature technology.** Gartner’s Impact Radar for Hyperautomation clearly lays out mature technologies, as well as those that are still evolving. Computer vision, for example, is a great platform to start with. To maximize their investment, manufacturers can build multiple use cases on the same platform.
4. **Educate frontline workers about the new technology.** Often employees look at new tools differently than consultants.

Ericsson is upskilling its factory workers and embracing digitization.

The leaders at Ericsson’s USA 5G Smart Factory have been deliberate about building a learning and development department and creating industry partnerships to support employee upskilling.

Ericsson has leveraged digitization to shorten the time to competence for frontline employees. Competence assessments were used to build employee profiles. The teams paired that information with operational performance data to evaluate the overall equipment

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effectiveness (OEE) of the manufacturing line. They looked for patterns showing a connection between improved performance and employee competence. The resulting insights have enabled Ericsson to be proactive from a digitization perspective. For example, the company has applied gamification to empower employees to make decisions.

It's crucial to think about technology as a tool and to evaluate which tool makes sense for each job. Every use case is different and not every use case requires real-time data. Often, near-real-time data is good enough and is usually less expensive to access than real-time information.

“The data itself has no value. The focus must be on using the data and empowering people to make decisions faster.”

Carlos Torres, Ericsson

As connected devices grow on the factory floor, manufacturers must consider what technical infrastructure to deploy.

In the next five to 10 years, connected devices in factories will fall into four broad groups:

1. **Mobile devices.** Laptops, tablets, mobile phones, scanners, and more.
2. **Large number of devices.** The volume of connected devices will shift from hundreds to thousands.
3. **Heavy data usage devices.** One example is 4k and 8k cameras.
4. **Process-critical devices requiring low latency.** Adoption is currently low but is expected to grow in the future. Manufacturers must plan for this now.

Connectivity can be supported by Wi-Fi or private cellular networks. Manufacturers must consider the advantages and disadvantages of these technologies.

Table 3: Wi-Fi vs. Private Cellular Networks

	Wi-Fi	Private Cellular Network
Performance and latency under load	Less stable	High performance and predictable Well suited for masses of data devices and heavy data use cases
Reliability and Security	Uses unlicensed spectrum which leads to interference from internal devices and external networks	Very reliable Operates on both CBRS in the U.S. and licensed spectrum Built-in security based on 3GPP standards
Mobility	Difficult to build good outdoor coverage Difficult to tie together indoor and outdoor networks	Built for mobility
Simultaneous Use of 4G and 5G Devices	Not supported	Supported
Future Proofing		Designed with low latency use cases in mind

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ADDITIONAL RESOURCES

- [Connected manufacturing: A guide to Industry 4.0 transformation with private cellular technology](#)
- [IndustryWeek | Ericsson Report: The use of private cellular networks in manufacturing](#)
- [Human-centric manufacturing: Industry 5.0 and the factory of the future](#)
- [XR and 5G: Extended reality at scale with time-critical communication](#)
- [The rise of the smarter, swifter, safer production employee](#)

BIOGRAPHIES



David Hart

Manufacturing Practice Leader,
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David is passionate about technology transformation, manufacturing, and supply chain. His work as Head of I4.0 Transformation at Ericsson's 5G Smart Factory in Texas led to the factory being recognized by the World Economic Forum as a Global I4.0 Lighthouse Factory.

David has held leadership roles in manufacturing, sourcing, and supply chain in consumer packaged goods, food & beverage, and technology companies.



Vish Kolor

Senior Director, Manufacturing
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Vish Kolor is a Senior Director, Manufacturing Solutions, at Ericsson. In this role, Vish leads the development, co-creation, and innovation of Industrial IoT solutions. He has 20+ years of experience in the

Information and Communication Technology industry, managing diverse IT, Telco, and CIO functions including: cloud and IoT solutions, product management, business development, and sales.



Carlos Torres

Head of Industry 4.0 USA 5G Smart
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Carlos H. Torres serves as Head of Industry 4.0 for Ericsson's USA 5G Smart Factory, a World Economic Forum 4IR Lighthouse. In this role, he oversees automation, software systems, architecture & IIOT, data analytics, and 5G industrialization for the factory.

Prior to joining Ericsson, Carlos led advanced analytics, automation, and application development initiatives at BNSF Railway in Fort Worth, Texas.



Sindhu Laljani (Moderator)

Technical Account Manager –
Manufacturing, Enterprise Wireless
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Sindhu Laljani is Technical Account Manager for the enterprise business at Ericsson. She helps businesses understand how private networks using LTE and 5G can address connectivity challenges and allow more value out of their operations and provide insight to their business.

Having worked with the enterprise market to bring public cellular connectivity for sensors/devices, Sindhu understands their challenges and the need for a wider ecosystem to come together. She has 20+ years of experience in the Information and Communication Technology industry with a focus on network transformation, service assurance and cloud and IoT solutions.