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Use the industrial IoT to solve the manufacturing skills & talent gap

As older workers retire and fewer younger workers come into the industry, manufacturers face a skills gap crisis that comes at a bad time.

Demand is high, and manufacturers are creating more jobs to meet demand. Yet, they don't have enough people with the technical knowledge for those jobs. Deloitte estimates the U.S. manufacturing industry could experience a shortage of up to 2.4 million workers within the next decade.¹

Manufacturers will be devastated if they can't find a way to address this crisis. They'll see massive profitability losses. They'll miss market opportunities. They'll have less innovation and less new product development. And they may never recover.

How well manufacturers overcome the skills gap depends on their ability to transfer the knowledge and experience from retiring workers to younger workers with cutting-edge technology. By doing this, they'll be better at adapting to the technological shifts required to meet current and future customer demand.

In this white paper, you'll learn:

- What manufacturers need from retiring workers and new, younger workers
- Why digitalization, the industrial Internet of Things (IIoT), machine learning, and automation are so critical for applying worker knowledge
- The gains manufacturers can see once they've successfully combined worker knowledge with technology

What manufacturers need from their workforce

One step manufacturers must take to overcome the skills gap is harnessing the knowledge and experience of retiring workers, while also taking advantage of new workers' technological inclinations. Without this step, they'll see a negative impact on their ability to deliver orders on time, expand production, respond to changing customer needs, leverage new market opportunities and develop new products or innovations.



Retiring workers. They have the approaches, knowledge and experience to increase manufacturing efficiency.

- They've developed their own approaches to work. Manufacturing instructions can't capture the details and knowledge they've gained from spending 30 or more years on the job.
- Their mindset is based on years of experience with trial and error. They've been willing to rethink the status quo in their work.
- Their experience comes from daily life in manufacturing. Every day is different, and hurdles are everywhere in manufacturing processes. They've learned how to problem-solve on the fly and not be frustrated by the inconsistency or chaos that can come with manufacturing.

Challenge for manufacturers:
Create a mentor culture that incentivizes retiring workers to share best practices.

Younger workers. They have the technical, multidomain knowledge and the mentality to help manufacturers implement the technology that will meet current and future demand.

- Younger workers understand how to implement the changing variants in a manufacturer's product mix by having different domains work together, including mechanical, electrical, programming and electronics.
- They're comfortable with technology and can adapt to technological change. They've been exposed to a landscape with applications and platforms since childhood. They're also the most willing to find the optimal technical integration of electronics, software and IoT.
- They have a "fail fast" mentality. Manufacturers won't adopt technology that isn't battle-tested. Younger workers are willing to test different technological mixes and make mistakes along the way to find the best way forward.

Challenge for manufacturers:
Begin embracing "fail fast," and give younger workers the space and resources they need to adopt technology most effectively.

Use digitalization to implement crucial worker knowledge

Workers are critical to solving the skills gap, but it isn't enough to simply put more people in the workforce. Combining worker knowledge and IoT technology will enable manufacturers to adopt *and* adapt faster and more efficiently.

The events of 2020 are a perfect example of why manufacturers need this combination. They can't enhance their supply chain or move toward no-touch manufacturing without automation and the IoT. They also need humans who understand how these technologies should be used in production so manufacturers can adapt despite challenging circumstances.

To accomplish this, manufacturers need digitalization as part of their approach. The industrial IoT – which combines analytics, machines and people – helps manufacturers digitalize operations and enable smarter maintenance, advanced machine learning and powerful automation capabilities.

When all this comes together, manufacturers are better equipped to meet growth targets and gain a competitive advantage.

How does flexible automation technology support manufacturers' priorities?

Digitalization

The process of connecting digitalized information via digital twins and the digital thread

- Receive detailed insights to transform business processes, find innovative opportunities



Machine learning

When combined with artificial intelligence, offers recommendations to improve smarter maintenance

- Consistently achieve efficiency gains



IoT

A network of Internet-connected devices that link, interact and exchange data to constantly monitor sensors from machines in production lines

- Identify problems before they occur, leading to better automation processes



Automation

Takes over time-consuming manual tasks to increase overall productivity, efficiency and quality

- Leaves more time for innovation



What manufacturers gain from combining knowledge and technology

When manufacturers join their workers' knowledge with industrial IoT technology, they'll gain more actionable insights, have better interactions with equipment on the factory floor and adapt to the rapid pace of change customers expect to see. This powerful combination will allow manufacturers to:



Connect and constantly analyze machine performance to automate maintenance and production. Smarter maintenance becomes possible because monitoring capabilities and a digital twin can uncover layers of causation when issues arise.

Example: If a motor's temperature is rising, workers can go into the machine's simulation model, run analyses and see what could cause the rise, addressing the issue before it causes machine failure.



Employ the closed-loop digital twin to lessen manhours in simulation and prototyping. The closed-loop digital twin brings live performance data back into the product and production digital twins, helping workers strengthen the connection between cause and effect, shorten delivery time and find issues before customer delivery.

Example: Machine builders are programming code into machines to do certain tasks. If there are glitches and they can't fully simulate that code in the digital twin to catch those glitches, future coding changes that seem small, such as an update to sensors, can create production delays.



Use low-code application development to create new efficiencies. Manufacturers can't be successful with the industrial IoT if they can't leverage data the way they specifically need to. Using an application they can build themselves, manufacturers can leverage the digital twin to bring data in from different places within the business and digitalize their processes.

Example: When a manufacturer sends a service technician to a machine, an app built with low-code gives them a digital service report. They know which machine to visit. They upload pictures of the machine's state. They interact with data coming from the machine. They report on machine performance and diagnostics before beginning maintenance. When they're done, they use the app to push back all data from their visit into the service report.



Improve customer relationships with value-added maintenance services. Manufacturers can predict when to send a service tech, and which parts to send with them, before machines go down.

Example: If a manufacturer wants to offer a "performance as a service" model, it will require IoT, analytics and service operations. Using the digital twin, reliable service and a monitoring and management system, they can be more specific in what they sell to customers. They know if a bearing will last for 10,000 revolutions based on data from the field.



Provide machinery that can perform at high levels with reduced human interaction. Manufacturers must be confident their machinery will perform as promised. And, reduced human interaction is particularly important now as factories accommodate social distancing to keep floor workers safe and healthy. They can accomplish both with this combination of worker knowledge and industrial IoT technology.

Example: If a machine exhibits behavior that indicates imminent failure, the manufacturer will receive an alert and can send a service tech before failure occurs. Workers on the factory floor don't have to take on troubleshooting or maintenance, and production lines stay up and running.



Increase production levels with automated lines. Automated lines aren't new, but as manufacturers include multiple machinery pieces into those lines, each piece depends on the others to work. Manufacturers must monitor every line as a whole, as well as see what's happening at each individual machine.

Example: Workers need to quickly turn around a new product on a line. Using simulation and the digital twin, they determine the most efficient setup and prevent machine incompatibility, which increases production rates.

Start closing your skills gap

Manufacturers are facing a serious skills crisis, but they have the power to begin closing that gap.

They have the capacity to leverage the know-how and experience from their retiring workers and younger workers. They also have access to powerful capabilities that can be unlocked with digitalization and the industrial IoT.

When manufacturers combine these things together, they'll find new opportunities to respond to customer needs, to innovate, and to gain that competitive edge in the market.

Want to learn more about the
industrial IoT?
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