What is a
smart factory
and how do I get one?

A question-and-answer session with **two industry experts** on the **smart factory of the future**

Introduction

Creating and running a smart factory requires **smart decisions**. We spoke to two experts and asked them what a smart factory looks like, the **challenges** in creating one, and which **technologies** to prioritize as you digitally transform.

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VP of Manufacturing Solutions
AT&T Business

Clara Hustad
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AT&T Business

# Q: Describe your ideal smart factory of the future.

Ande:
This will be a **connected factory**, providing valuable data to help manufacturers make intelligent decisions about how to respond to changes in their market. Through connectivity solutions like **IoT, Video Intelligence and 5G**, you can use predictive analytics to make informed decisions, forecast demand, and prevent downtime. My ideal factory would also have an **effective cybersecurity strategy** that extends beyond the factory to remote workers, third-party vendors, and suppliers to help protect vulnerabilities that hackers may target.

Clara:
I envision a **control center** that's like a movie experience. You can move virtually through your factory floor and adjust settings in real time. So the production floor is **immediately responding** to purchases or client needs and has insights into inventory, transportation, and sale of goods by location or region.
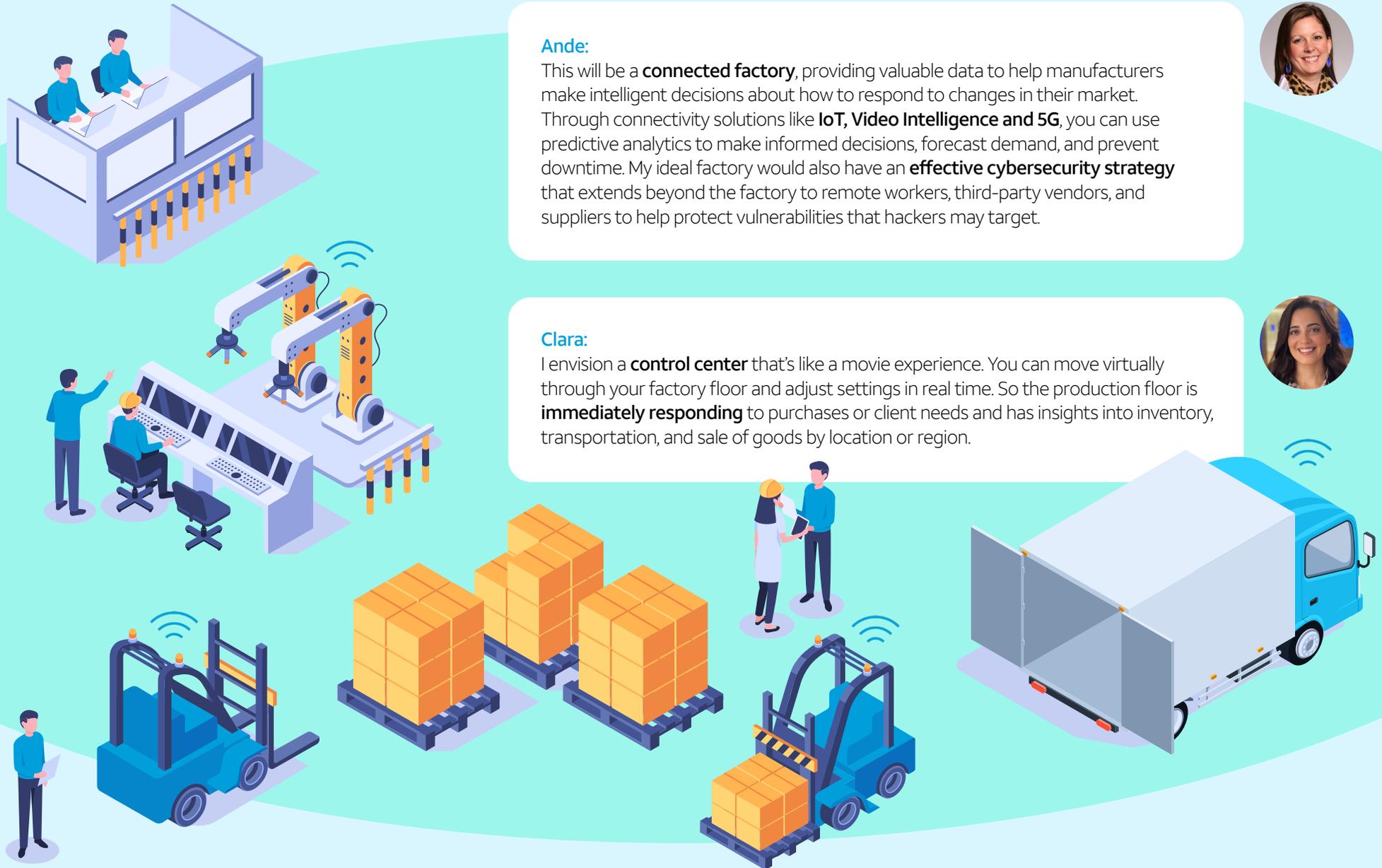
Q: What are the biggest challenges for those with legacy manufacturing processes and infrastructure?

Clara:
For brownfield factories (those with mostly legacy infrastructure, both physical and virtual), **upgrading their existing machinery or retro-fitting it** to gather insights and data seems to be the toughest. Also, just because you have data doesn't mean you can act on it. There is a sophistication in how you process and decipher the data.

HELP WANTED

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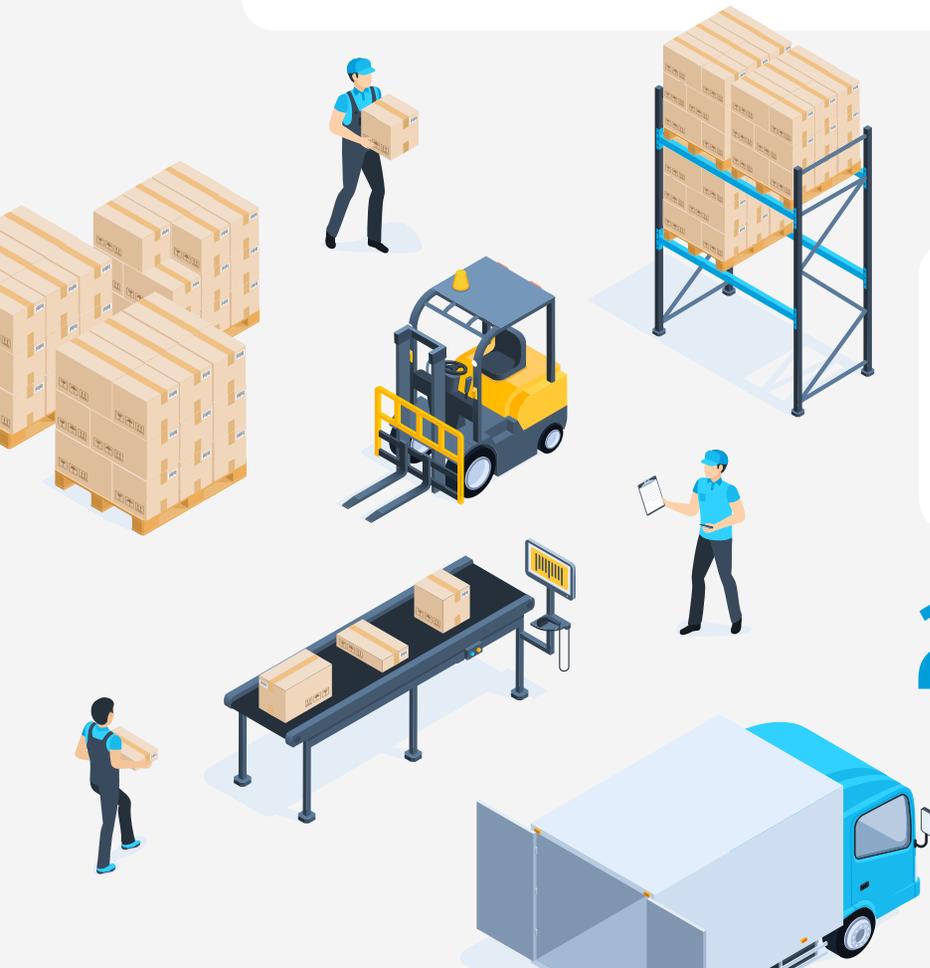
Ande:
Three things: equipment, labor, and supply chain. From a legacy equipment perspective the key is keeping it running consistently and efficiently. On the labor market front, a lack of skilled workers has reached epidemic levels in North America. And regarding the supply chain, its fluctuations have everyone on edge.

2.1M
Unfilled manufacturing jobs by 2030[1]

$1T
Cost to manufacturers in 2030 alone if 2.1M manufacturing jobs go unfilled[2]

[1] "Creating pathways for tomorrow's workforce today: Beyond reskilling in manufacturing." Deloitte Insights, 2021.
[2] Ibid.

Q: Some manufacturers are at the beginning of the digital transformation journey. Where should they consider investing first?

Ande:
Most industry leaders are faced with several challenges and unsure of where to begin. I recommend **investing in a consulting partner** who can help assess and design technology roadmaps to help plan and implement a digital transformation strategy.

Clara:
For brownfield factories, it's getting legacy machinery to "feel" smarter and provide insightful and actionable data points for line employees. For greenfield facilities (new, under construction facilities with custom-fitted technologies), opportunities are endless, but your budget isn't, so it's picking and choosing where you'll see the largest return on your investment.

Growing efficiency and reducing complexity for both machinery and team members means **more automation**. For that you need **massive connectivity**. So, connectivity infrastructure is a great place to start. Not far behind that is investing in cybersecurity for your infrastructure.

Q: What are the top technology priorities for manufacturers working to build the smart factory of the future?

Clara:

I'd rank **machine learning** and **artificial intelligence** (AI) as #1. The benefits of machine learning are continuous improvement, reducing redundant tasks for employees, and the ability to handle extremely large amounts of data for identification of trends and patterns. Once the technology is in place, it's scalable to other areas of the manufacturing floor.

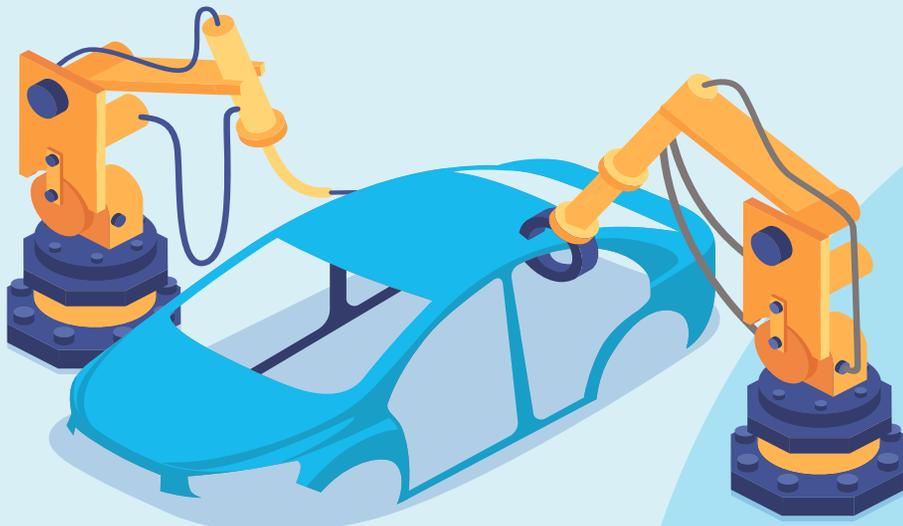**800 hours** the average downtime that every manufacturing business suffers per year[3]

5%-20% loss of productivity for industrial units due to downtime[4]

$3,000,000 how much downtime can cost an auto manufacturer ($50,000 per minute)[5]

Ande:

IoT is huge. It's foundational for much of the smart-factory capabilities business's want. For example, using IoT technology, manufacturers can collect data from their machines to help reduce unplanned outages and to extend machinery life.

Big data and analytics should be another top priority. All that IoT data, along with artificially intelligent video (another top trend) can be analyzed to generate real-time, actionable insights for manufacturers.

[3] Mashum, Mollah. "How Much Does Downtime Really Cost In The Manufacturing Industry?" Real Wealth Business, 21 JAN 2021.

[4] Ibid.

[5] Ibid.

Q: What are some unique ways manufacturers are implementing IoT solutions and sensors within the smart factory and broader supply chain?

Ande:
According to a survey conducted by AT&T Business, **71% of respondents are currently using IoT technology or solutions as part of their manufacturing, logistics, or supply chain processes.**[6] That opens the door for AI and digital twin solutions. Industrial Internet of Things (IIoT) also enhances safety and compliance monitoring; asset condition monitoring, like temperature, humidity, and pressure; asset management solutions; fleet or vehicle solutions; sustainability, like reducing carbon emissions; smart IoT analytics, including AI and machine learning (ML); Video as a Sensor, which uses AI and ML to identify risks via video feeds; asset activity management; and inventory management.
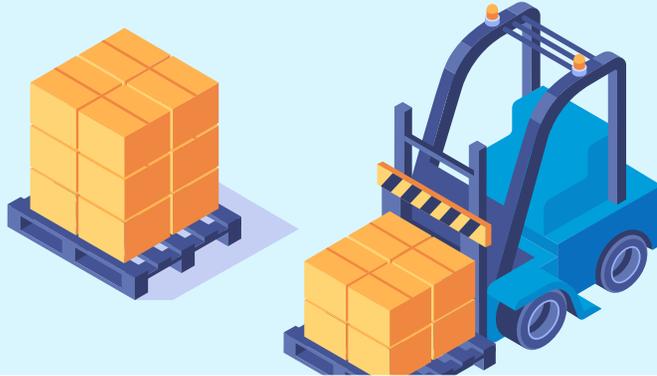
Clara:
Monitoring the **condition of materials** as they move through the supply chain. **Predictive maintenance** of machines and assets. Monitoring **location, hours of use, and operational condition.** Pervasive **indoor and outdoor IoT tracking** supports improved inventory management, while IoT-based **vehicle telematics** provide enhanced governance of driver behavior and vehicle condition. IoT can also support **sustainability initiatives** like reducing fuel consumption and emissions and improving resource efficiency and reducing waste.

71%

of respondents (300 leaders from manufacturing, CPG, and transportation companies) are currently using IoT technology or solutions as part of their manufacturing, logistics, or supply chain processes[7]
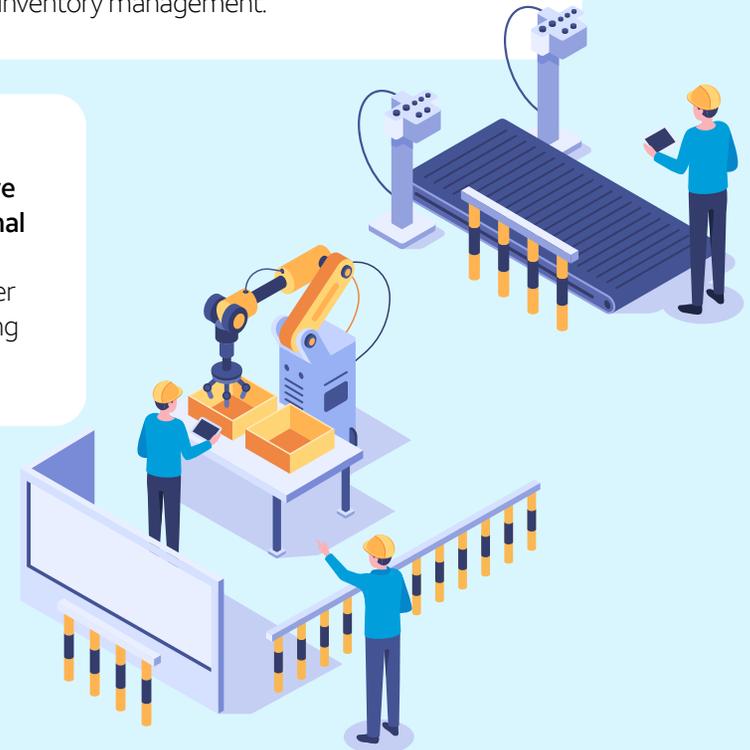
[6] The next-generation supply chain: How emerging technologies are unlocking greater visibility and agility. AT&T Business and Insights Worldwide Business Research.
[7] Ibid.

Q: How important is advanced wireless connectivity to driving operational efficiency within the smart factory?

AT&T Business

Clara:
Wireless is the **perfect way** to prepare for fixed network offload. It's expensive to bring a new Ethernet network to your facility, and mobility radios are getting smaller and more affordable. Smaller factories are starting to consider using them on both public and private networks. In some cases, wireless is a **better option** for facilities with obstructions since mobility signals can be placed higher and can get through to provide continuity where Wi-Fi sometimes fails.

Ande:
Advanced wireless technologies like **5G, edge, or Wi-Fi** can maximize flexibility in connecting data collection end points. Advanced internet solutions such as **business fiber**, create the backbone on which to build advanced wireless technologies at speeds needed for real-time decisioning.
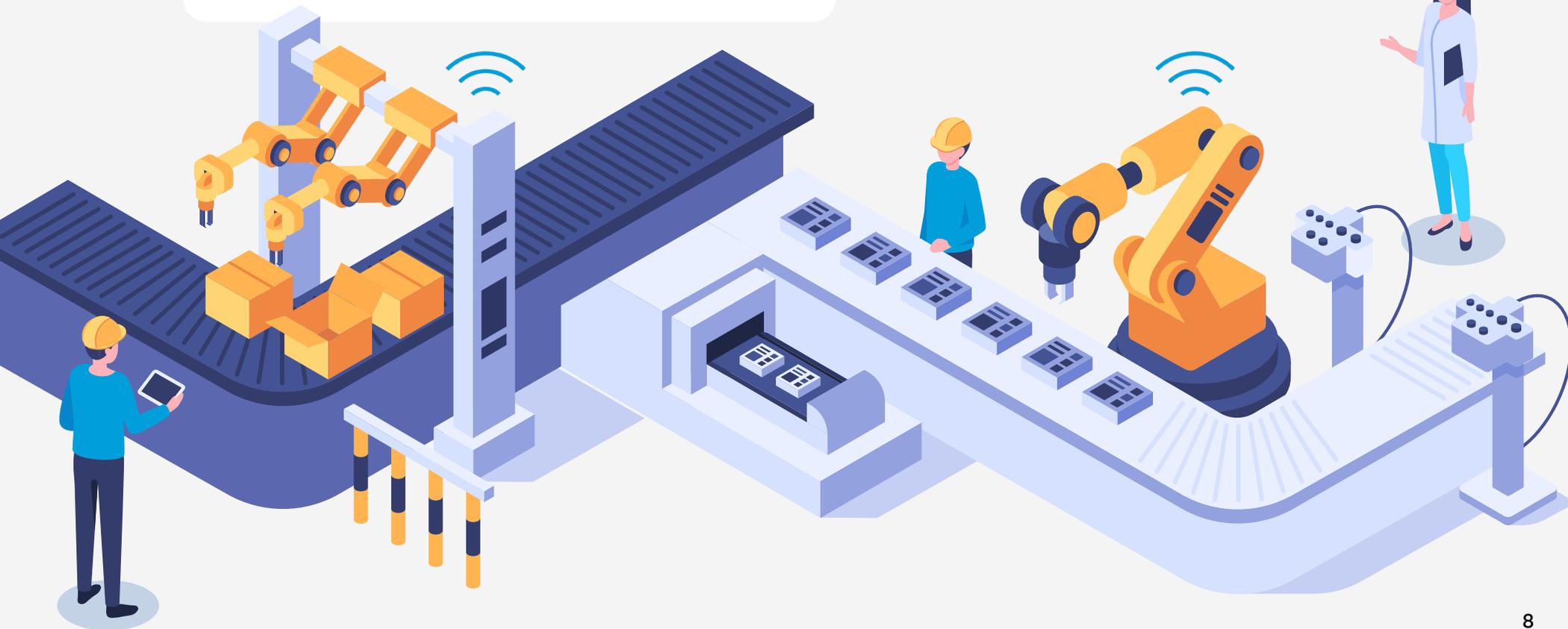
Conclusion

Get smart

How close are you to having your smart factory of the future? Are you…

- …**at the beginning stages** of your journey and needing to consult with experts who can assess where you stand and map your way forward, step by step?

- …**halfway there** and wondering if you're still on the right track?

- …**near the end** with a few loose ends to tie up?

No matter where you are on your transformation journey, we can help.

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