

Digital Supply Chains

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Queensland
Manufacturing
Institute



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Strategic
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Australia



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**We have a social responsibility to support
Queensland's manufacturing community,
enabling it to grow and prosper into the future.**

The Queensland Manufacturing Institute connects opportunities available through industry, government and commercial initiatives. We do this by offering programs delivered by our team or our large network of third-party providers.



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Queensland Manufacturing Institute (QMI)

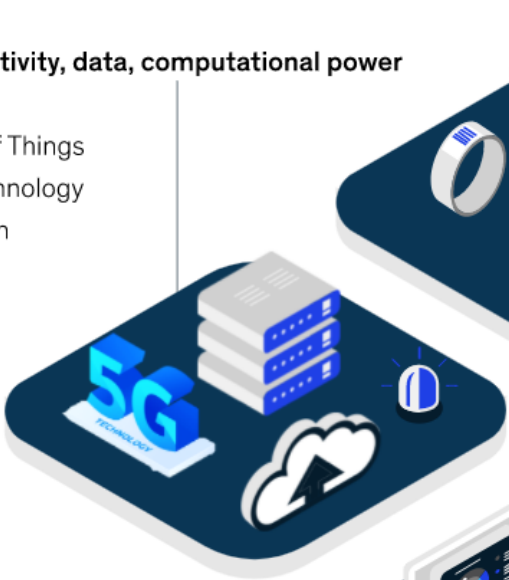
Since 1993 the Queensland Manufacturing Institute has been supporting the Queensland manufacturing community.

- QMI is an independent, non-membership based, not-for-profit organisation.
- We were originally founded by the Queensland Government, TAFE, CSIRO and QUT.
- Our focus is on delivering programs and services that are designed to develop and grow Queensland's entire manufacturing industry.
- Today our focus is to bring contemporary experience of manufacturing business leaders to maximise impact.

Industry 4.0 is characterized by 4 foundational technologies applied along the value chain.

1. Connectivity, data, computational power

Sensors
Internet of Things
Cloud technology
Blockchain



2. Analytics and intelligence

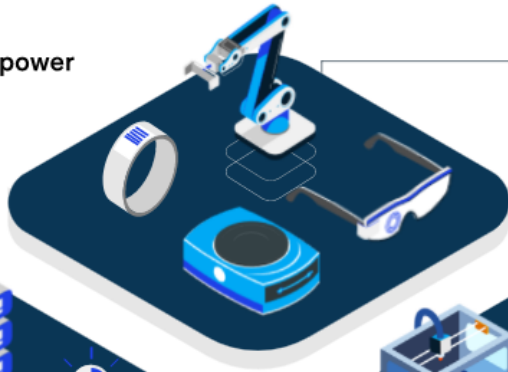
Advanced analytics
Machine learning
Artificial intelligence



¹Autonomous guided vehicles
²Robotic process automation

3. Human-machine interaction

Virtual and augmented reality
Robotics and automation
(collaborative robots, AGVs¹)
RPA,² chatbots



4. Advanced engineering

Additive manufacturing (eg, 3D printing)
Renewable energy
Nanoparticles



Now Adoption is Diverging between Technology haves and have-nots

Manufacturing Transformation

- Rapid Pace of Technological Change
- Digitization
- Production activities are being decentralized
- Competing on value, rather than on cost
- The key to this is innovation – products, components and services
- Workforce Skills is at the center of the transformation
- Business model agility is crucial

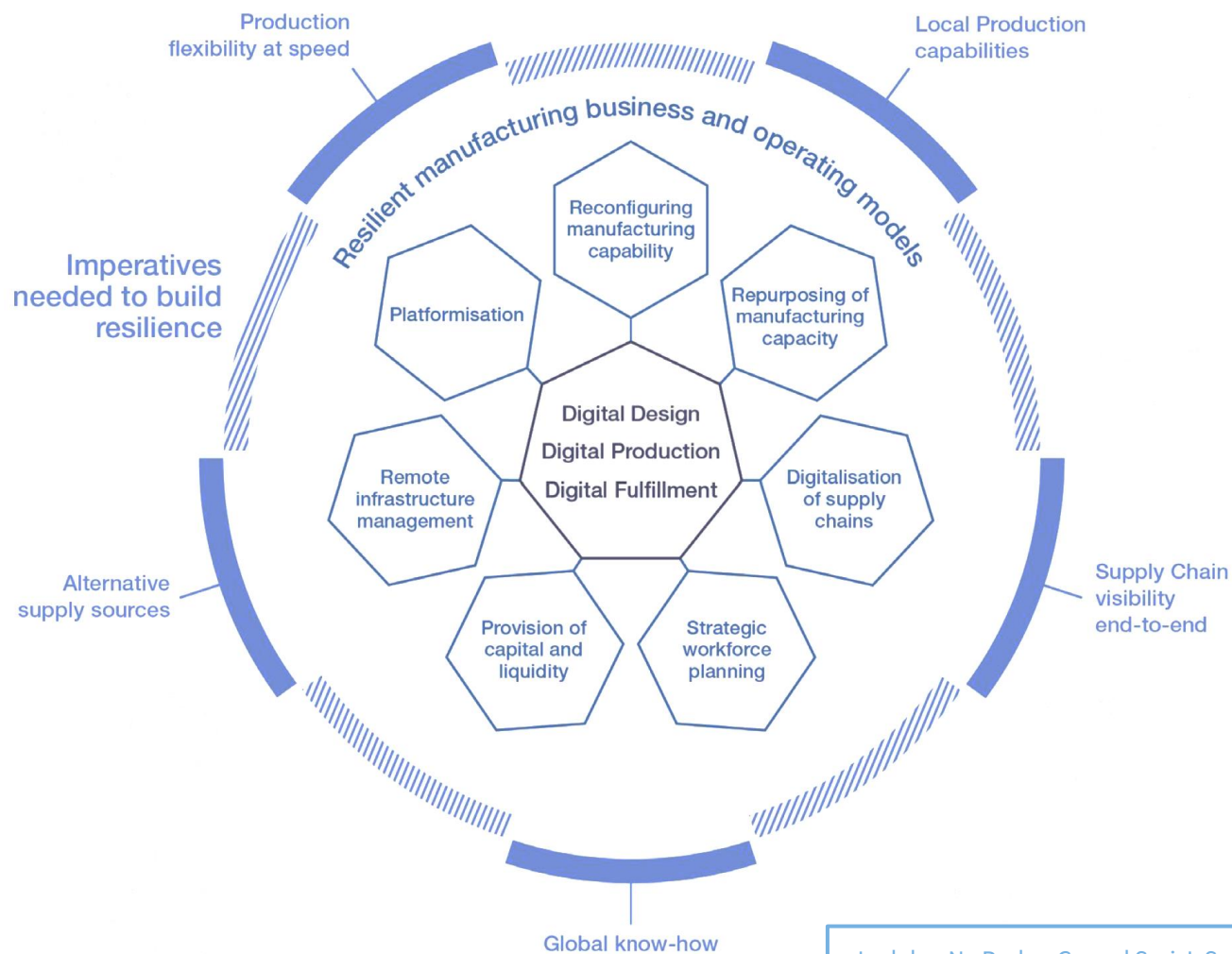


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**The state of manufacturing has changed,
and we need to change with it.**



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Joglekar N., Parker G., and Srari J. S., (2020)

Advanced manufacturing technologies are key to enable resilient manufacturing operating and business models

The diagram illustrates a linear supply chain process. It begins with a blue arrow pointing right, labeled 'Typical Supply Chain'. This arrow points to a horizontal line that branches into five rectangular boxes. Each box contains a step in the process, with a label above and below the box. The steps are: 1. Designing a product (Sourcing and Procurement Raw materials & parts), 2. Estimating Demand, 3. Planning how you will market the product (Manufacturing the Product), 4. Taking Orders, and 5. Arranging Logistics & Sales (Proving customers with visibility of their order). The process ends with a blue arrow pointing right.

Typical Supply Chain

Designing a product

Estimating Demand

Planning how you will market the product

Arranging Logistics & Sales

Sourcing and Procurement Raw materials & parts

Manufacturing the Product

Taking Orders

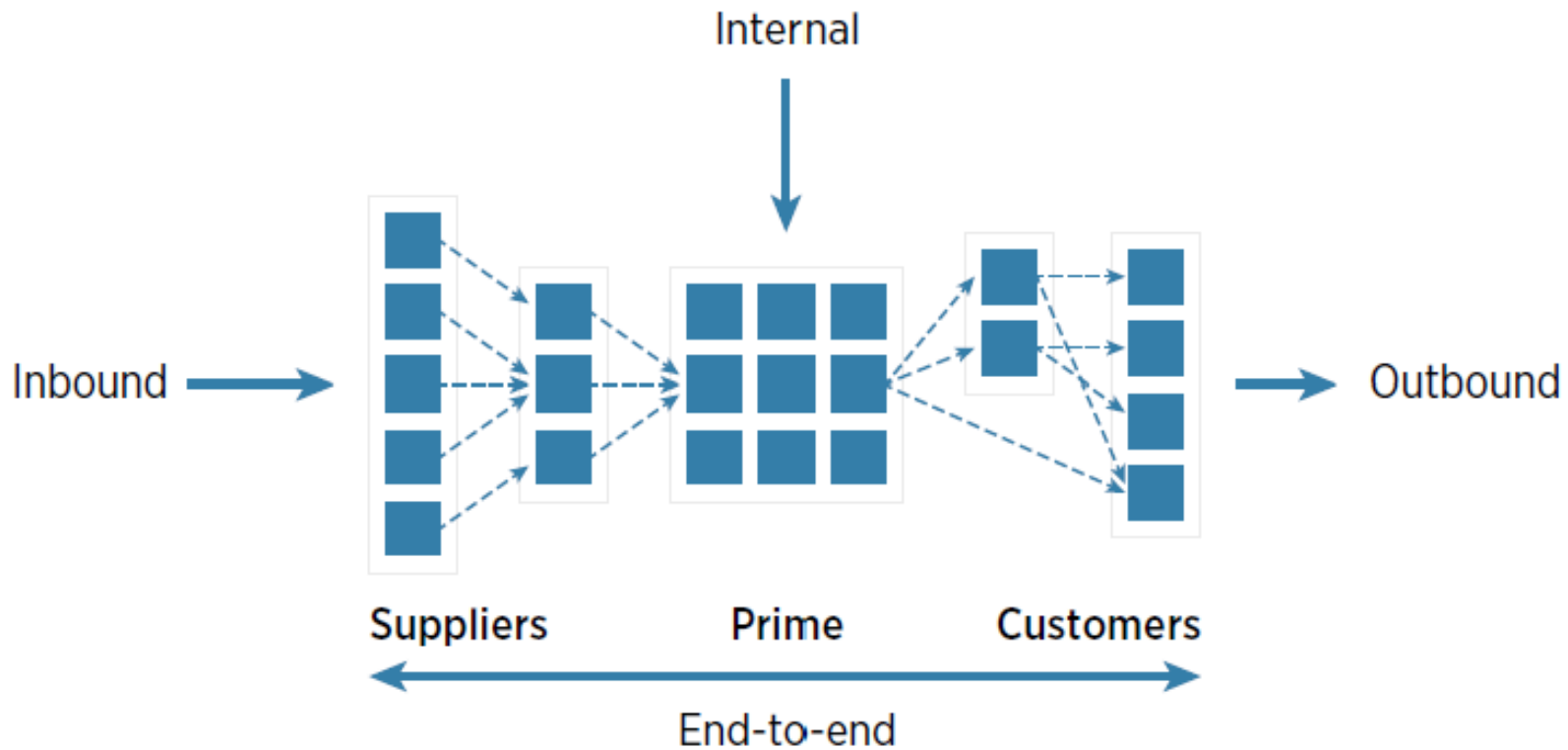
Proving customers with visibility of their order

Typical Supply Chain - A PLAN & REACT approach

Items travel linearly with each step dependent on the previous one

Digital Supply Chains: Predicts & Prescribes Actions

The ability to join inbound, internal and outbound networks with complete real-time visibility



Jagjit Singh Srai (2018)

Digital Supply Chains: Benefits



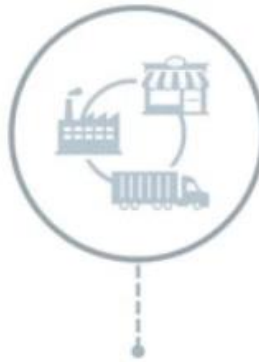
**Accelerate
Innovation**

3x
Return on
Innovation



**Reduce
Time-to-Market**

20%
Reduction in
Time to Market



**Maximize Productivity
and Efficiency**

30% - 50%
Increase Forecast
Accuracy



**Reduce
Costs**

20% - 50%
Decrease
Scrap and Rework



**Improve
Customer Satisfaction**

8%
Increase in
On-Time Delivery

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Source: <https://blogs.oracle.com/scm/changing-the-change-management-approach>

Digital Supply Chains: Risk

We need to go into this transition with a strategic focus on Risk Management

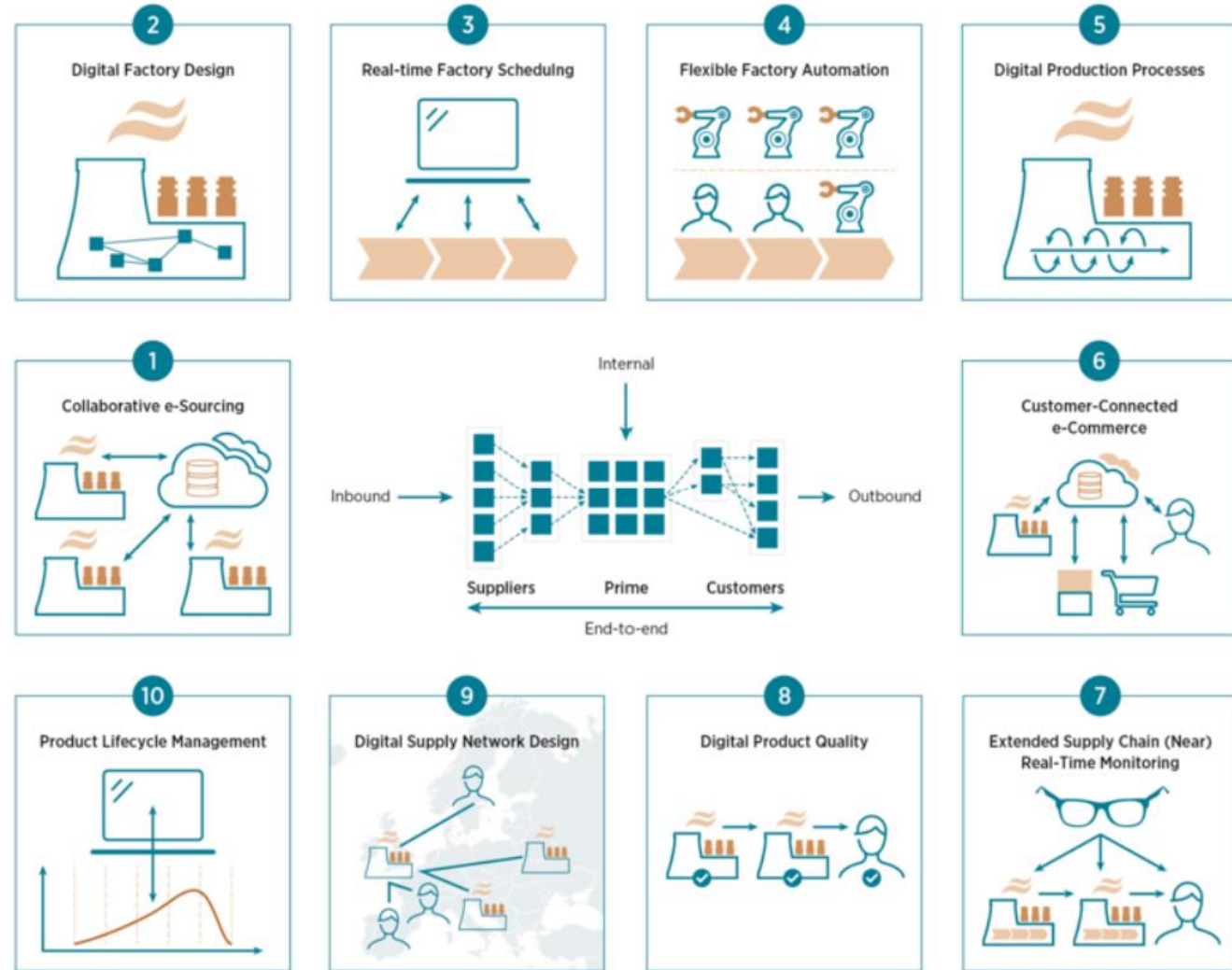
Gartner has identified **digital supply chain risk** as a new security threat and one of its top seven security and risk management trends for 2022. In fact, Gartner predicts that by 2025, 45% of organizations worldwide will have experienced attacks on their software supply chains, a threefold increase from 2021. (Shein 2022)

According to IBM – Manufacturing is the most targeted industry for Cyberattacks. (X-Force Threat Intelligence Index 2022)



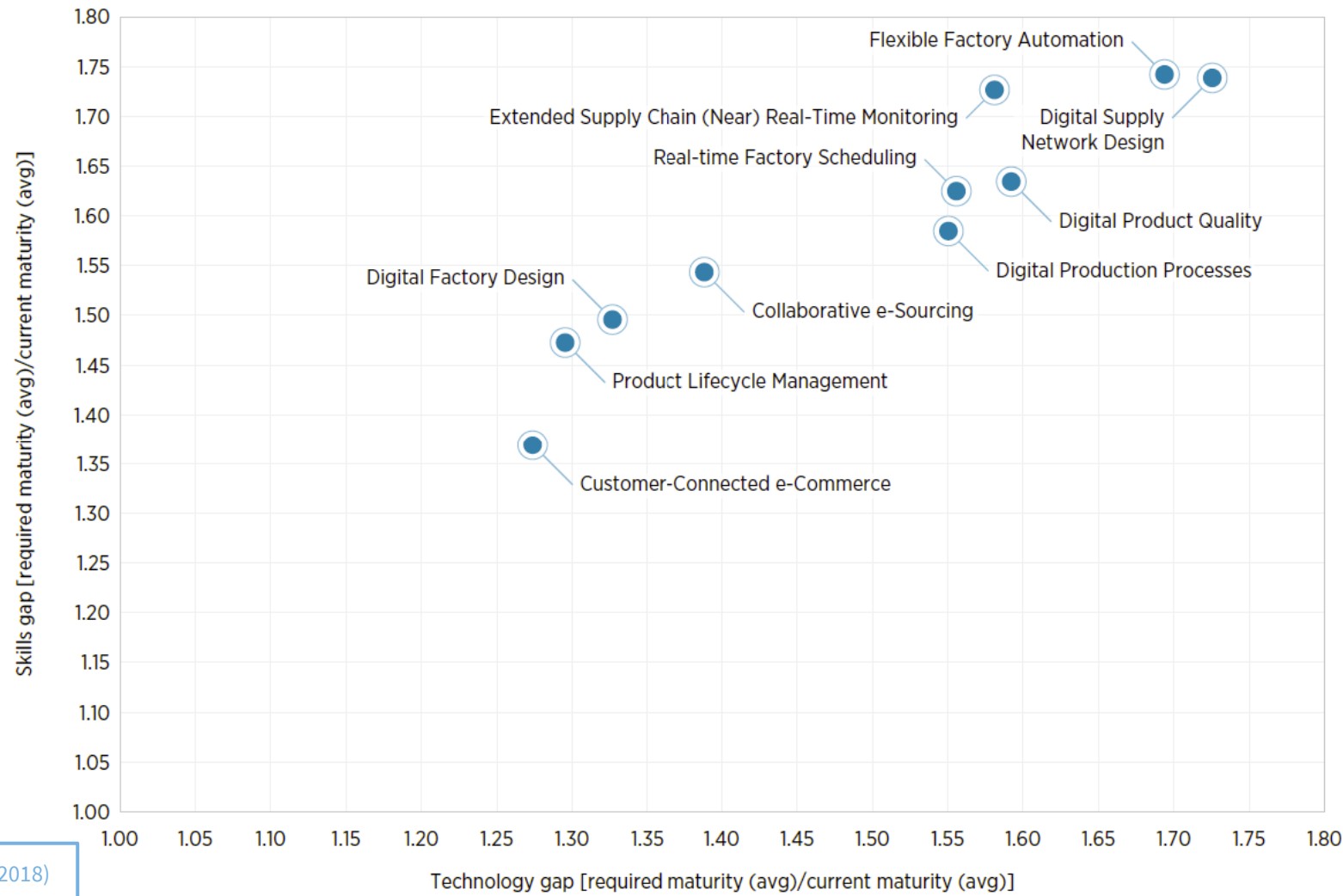
The goal?
To create a more responsive and resilient network that delivers better quality products and services to its customers.

Jagjit Singh Srui (2018)



The challenge?
Technology is not the
overriding problem. The
skills gaps were
consistently higher than
the technology gaps.

Jagjit Singh Srani (2018)



What next? Embrace VUCA as the new normal

- Create a manufacturing digital transformation roadmap – understanding operational vulnerabilities and prioritise them
- Look holistically at your smart factory transformation, look at solving today's problems in conjunction with putting the digital infrastructure in place for future automation
- Make digital transformation a company-wide goal. Every person in the workforce should be able to see the strategy and understand how the systems, processes and equipment will enhance their role.
- Look forward – work towards having a predictive business model. Creating and understanding the “what if” scenarios to anticipate disruption and determine the best course of action in advance.



Thanks !



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