



Why aren't factories as smart as they could be?

How edge computing accelerates the
journey to a remarkable factory

Remarkable factory outcomes

Data is revolutionizing manufacturing. Combined with powerful tools like artificial intelligence/machine learning and streaming analytics, real-time data is enabling new levels of innovation and the rise of smarter factories. Forward-leaning enterprises are pairing operational technology (OT) with edge computing to enable use cases that deliver remarkable benefits.

- Real-time control over logistics and warehousing
- Minimized downtime
- Optimized asset and inventory management

- Maximum equipment effectiveness
- More efficient use of raw materials
- Enhanced worker safety and productivity

These use cases are made possible by advances in enterprise edge architectures using enterprise-grade infrastructure, which help manufacturers accelerate transformation on their path to creating the remarkable factories of the future.

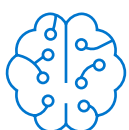
The common characteristics of these factories are connectivity, data-driven intelligence and flexible automation:



Connectivity of OT increases visibility and delivers valuable insights across the value chain.



Data-driven intelligence supports event recognition and decision-making.



Flexible automation responds to changing circumstances based on parameters determined by the manufacturing automation team.

Inside the remarkable factory



Workers don't go looking for parts.
Parts find workers.



Machines predict potential problems
and schedule their own repairs.



Products can be easily reconfigured and
customized to meet customer demands.



Sub-assemblies arrive at a vehicle assembly
exactly when needed.



Production ramps down when energy is scarce
and prices are high.



Digital twins help deliver unprecedented
efficiencies and innovation.



Production lines minimize environmental impact
by making the best possible use of energy and
raw materials.



Blockchain enables factory owners to auction
excess production capacity.



Extended reality and neuro-haptic
communications empower workers, increasing
safety and productivity.

Held back by “accidental architectures”?

The benefits of smart manufacturing come not from making individual machines smarter, but from gaining continuous insights into, and control over every process, from the start of the supply chain to the end customer.

A first step that enterprises take toward digital transformation is often proof-of-concept initiatives focused on just one or two use cases. Unfortunately, these applications may be built on “accidental architectures” that have evolved over the years on the factory floor. These architectures are not engineered for efficiency, manageability and scalability, so they prevent enterprises from driving innovation forward. As a result, their factories are not as smart as they could be.

What is left on the factory floor is an unfulfilled opportunity to increase safety and profitability.

The journey to competitive advantage

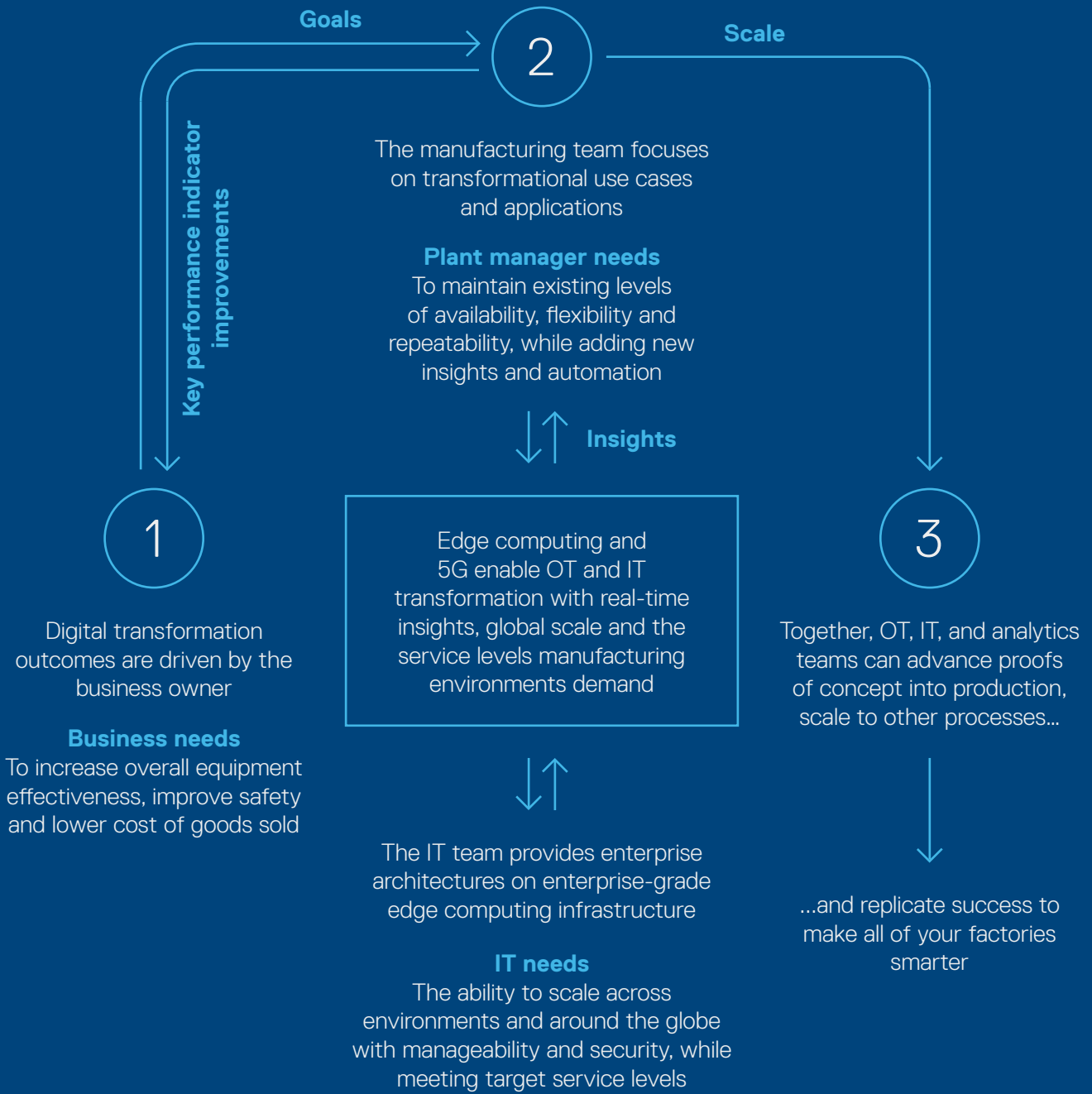
Eliminating the constraints of accidental architectures enables enterprises to advance their transformational applications efficiently and effectively into production. These applications can then be deployed repeatably across the modern factory and around the globe.

Enterprises must think holistically beyond today's proof-of-concept use cases, to all the use cases they need to implement to become remarkable. The manufacturing team must collaborate with their IT team, which can deliver the architectures and infrastructure required to handle the expanding number and sophistication of use cases over time. With enterprise-grade, IT- and OT-friendly edge computing and 5G infrastructure, smart manufacturing initiatives can be planned, implemented, evaluated and scaled out in a far more agile and strategic way.

How does this work?



Smart factory journey with edge computing and 5G



In response to rising cost pressures, increasing competition and changing customer demands,

81%

of manufacturers plan to increase their edge deployments by 2023.

Source: According to a survey conducted by 451 Research, a division of S&P Global Market Intelligence, July 2020, Commissioned by Dell Technologies.

The impact of edge computing on manufacturing

When asked about how they view the edge in the future, respondents recognized its transformative potential. The results below are responses to the question: “Thinking about the edge (compute, storage, networking and sensors), in the next 3-5 years, to what extent do you agree or disagree with the following statement?”

We will be able to predict machine downtime with close to 100% accuracy using an industrial edge.



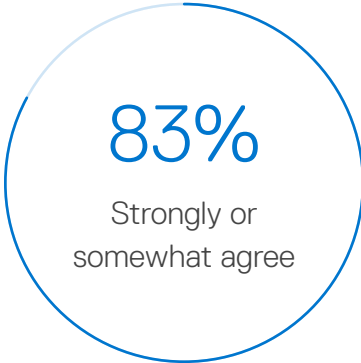
Edge will make data from the Industrial Internet of Things more secure and less hackable.



Identifying production line errors immediately will make product recalls a thing of the past.



Edge will be one of the biggest computing transformations in manufacturing history.



Source: Dell Technologies Research, July 2020

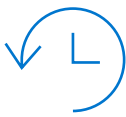
The transformative role of 5G

5G networks will help manufacturers get past accidental architectures and solve the logistical challenges of gathering real-time data from a multitude of sensors and devices.

The power of 5G for manufacturing is realized through:



Increased bandwidth, network slicing capabilities and improved security to enable data flows.



Ultra-low latency ideally suited to applications demanding immediate response.



Flexible reconfiguration capability without being limited by wired connections.

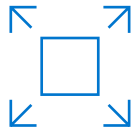


Connectivity for remote and hazardous locations that are difficult or very expensive to hard wire.



How IT can enable smarter factories

Manufacturers can move more quickly along their transformation journey by enabling analytics and intelligence on modern hyper-converged infrastructure that helps them to:



Extend and accelerate the results of proof-of-concept initiatives by providing a scalable, repeatable platform for intelligent applications



Evaluate and expand to new initiatives without the risk of creating “accidental architectures”



Deliver real time insights so the workforce can be safer and more productive.

IT can make this journey possible with infrastructure that enables consolidation, intrinsic security and insights.



Consolidate workloads and infrastructure as edge devices and data increase in volume, to reduce hardware and data silo proliferation and associated management challenges.



Bring **intrinsic security** to the edge by providing appropriate access to a secure operational environment.



Enable manufacturing to generate immediate, valuable **insights** wherever they need them to continuously improve on their key performance indicators.

Simplify the edge to make your enterprise as smart as it can be.

Creating an enterprise edge computing environment that leverages artificial intelligence, automation and 5G empowers manufacturers to make smart factories as smart as they can be.

Act while you have the advantage.

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