Connected factory
Digital solutions on the manufacturing floor
Dawn of 4th industrial revolution

The marriage of advanced manufacturing techniques with information technology, data, and analytics is driving another industrial revolution – one that enables manufacturing leaders to combine information technology and operations technology to create value in new and different ways.

**Late 18th century**
- Water and steam power
- Mechanisation

**Early 20th century**
- Mass production
- Electricity

**1970s – 2000s**
- Computing and automation
- Internet

**Industry 4.0**
- Digital development
- Digital operations
- Connected customer

Optimise traditional objectives... by better managing

- Cost
- Innovation
- Service
- Quality
- Safety
- Flexibility
- Revenue
- Visibility
- Variability
- Volume
- Velocity
Fuelled by technology and connectivity

Digital technologies have changed dramatically in recent years, driven largely by three key developments: lower computing costs, cheaper storage, and less costly bandwidth. This has accelerated the adoption of disruptive technologies.

Exponentially decreasing costs are accelerating the adoption of key disruptive technologies.

- Bandwidth <$10
- Storage <$0.01
- Computing <$0.06
- Storage <$569 per GB
- Bandwidth <$1,245 per Gbps
- Computing <$222 per million transistors
Collapsing the supply chain

Embracing the power of these new technologies allows a traditional linear supply chain to become a set of dynamic and integrated networks: Digital Supply Networks.

Traditional supply chain

1. Develop
2. Plan
3. Source
4. Make
5. Deliver
6. Support

Digital Supply Networks (DSN)

1. Synchronised planning
2. Connected customer
3. Connected factory
4. Intelligent supply
5. Dynamic fulfillment
6. Digital development
Connected factory

Disruptive technologies can impact and transform the heart of manufacturing, creating the Connected factory.
A Connected factory has the ability to fundamentally change the production process to enable end-to-end product visibility and predictive analytics to support and optimise decision making.

**Connected**
- Continuous pull of traditional datasets along with new sensor and location-based datasets
- Real-time data enabling collaboration with suppliers and customers
- Collaboration across departments (e.g. feedback from production to product development)

**Transparent**
- Live metrics & tools to support rapid but effective decision-making
- Real-time linkages to customer demand forecasts
- Transparent customer order tracking

**Optimised**
- Reliable, predictable production capacity
- Increased asset uptime and production efficiency
- Highly automated production and material handling with minimal human interaction
- Minimised cost of quality and production

**Proactive**
- Predictive anomaly identification and resolution (e.g. using augmented reality for maintenance)
- Automated restocking and replenishment
- Early identification of supplier quality issues
- Real-time safety monitoring

**Agile**
- Flexible and adaptable scheduling and changeovers
- Implementation of product changes to see impact in real-time
- Configurable factory layouts and equipment
Value from the Connected factory

The Connected factory can drive a broad range of benefits.
Value creation can begin with, and scale from, a single asset to a complete factory or network of Connected factories.

**Typical transformation journey for a manufacturer**

- **Single asset**: Maximising the performance of a single asset (e.g. machinery, tools, inventory, equipment, people).
- **Production line**: Improving the performance of a series of dependent assets (i.e. production line or manufacturing cell).
- **Factory**: Optimising the performance of an individual plant by better connecting and utilising assets.
- **Factory network**: Maximise network performance by sharing capacity across sites in real time and connecting to the entire supply chain and product development cycle.
Applying this to your business

To maximise value and reduce risk, successful manufacturers are adopting a number of techniques as they adopt Industry 4.0 concepts.

Think big
- Identify opportunities and current challenges
- Determine direction and roadmap

Start Small & Act Fast
- Select and implement pilots
- Assess business value based on pilots

Scale
- Set foundations
- Scale pilots
- Measure success and continue to prioritise

Enablers
- Multi-disciplinary teams and ways of working
- Value focus and prioritisation
- Reusability
- Talent and change management
- Data management and security

Connected factory | Digital solutions on the manufacturing floor
Partnership

The Connected factory immersive experience brings together leading organisations to support manufacturers on the topic of digital manufacturing transformation.

AMRC
World-class centre for industry-focused research and development of technologies used in high-value manufacturing sectors

The University of Sheffield

Global leader in Digital Transformation with specific expertise in strategy and implementation of Industry 4.0 across multiple industries

Deloitte.

Global provider of leading IoT and AR platform, and field-proven solutions

ptc

Connected factory | Digital solutions on the manufacturing floor
Contacts

Deloitte.

Nick Davis
UK Industry 4.0 Lead
+44 (0)7798 924574
nickdavis@deloitte.co.uk

Ben Morgan
Head of Factory 2050
+44 (0)1142 224991
b.morgan@amrc.co.uk

Paul Haimes
VP Pre-Sales
+44 (0)7768 921758
phaimes@ptc.com

AMRC Factory 2050
Europa Avenue
Sheffield
S9 1ZA (for Sat Nav please use S9 1XZ)

Download the PTC ThingWorx View app on your phone or tablet and point it to this ThingMark for further information.
Notes
Notes