

**Industry 4.0**

The birth of the smart factory

## What is industry 4.0?

The marriage of advanced manufacturing techniques with information technology, data, and analytics is driving another industrial revolution, one that invites manufacturing leaders to combine information technology and operations technology to create value in new and different ways. Industry 4.0 connects embedded system production technologies and smart production processes to pave the way to a new technological age which will radically transform industry and production value chains and business models. The new era of interconnectivity and digitalisation provides manufacturing leaders with the opportunity to explore new means to achieve their business objectives.

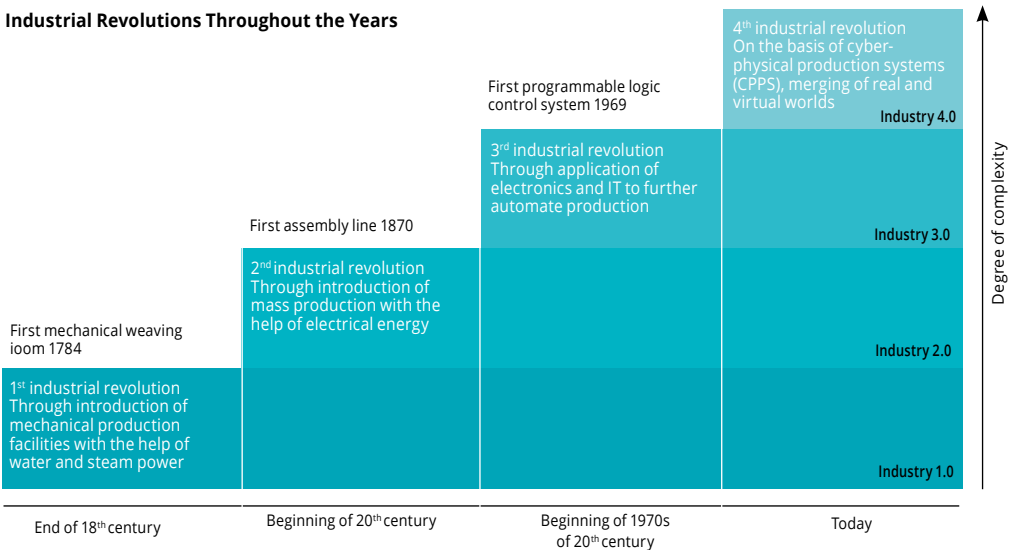
### Definition and development

The term industry 4.0 refers to a further developmental stage in the organisation and management of the entire value chain process involved in manufacturing industry. Another term for this process is the 'fourth industrial revolution'.

The concept of industry 4.0 is widely used across Europe, particularly in Germany's manufacturing sector. In the United States and the English-speaking world more generally, some commentators also use the terms the 'internet of things', the 'internet of everything' or the 'industrial internet'.

What all these terms and concepts have in common is the recognition that traditional manufacturing and production methods are in the throes of a digital transformation. For some time now, industrial processes have increasingly embraced modern information technology (IT), but the most recent trends go beyond simply the automation of production that has, since the early 1970s, been driven by developments in electronics and IT.

### Industrial Revolutions Throughout the Years



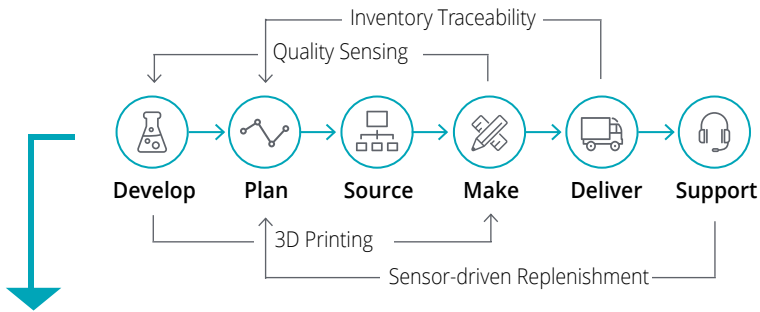
## Digital Supply Networks

### What are Digital Supply Networks (DSN)?

Innovative and disruptive technologies can enable supply chains to transform into digital supply networks, which can serve as a powerful competitive weapon.

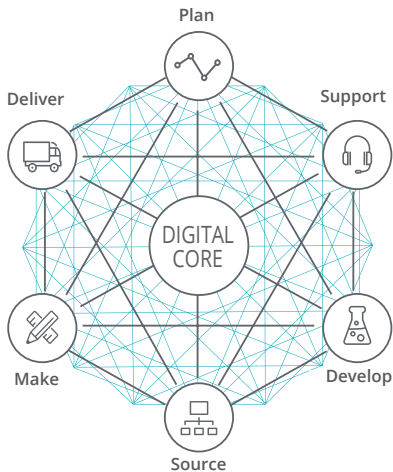
### Traditional Supply Chain

Traditional, linear supply chain nodes are collapsing into a set of dynamic networks, allowing dramatically increased differentiation.



### Digital Supply Networks






These networks can be enabled and capitalized on via a “digital thread” built to flow information, goods, and services through physical and digital channels.





- 1 **Physical to digital**  
Capture signals and data from the physical world to create a digital record.
- 2 **Digital to digital**  
Exchange and enrich information using advanced analytics, artificial intelligence, and machine learning to drive meaningful insights.
- 3 **Digital to physical**  
Deliver information in automated and more effective ways to generate actions and changes in the physical world.

### DSN characteristics

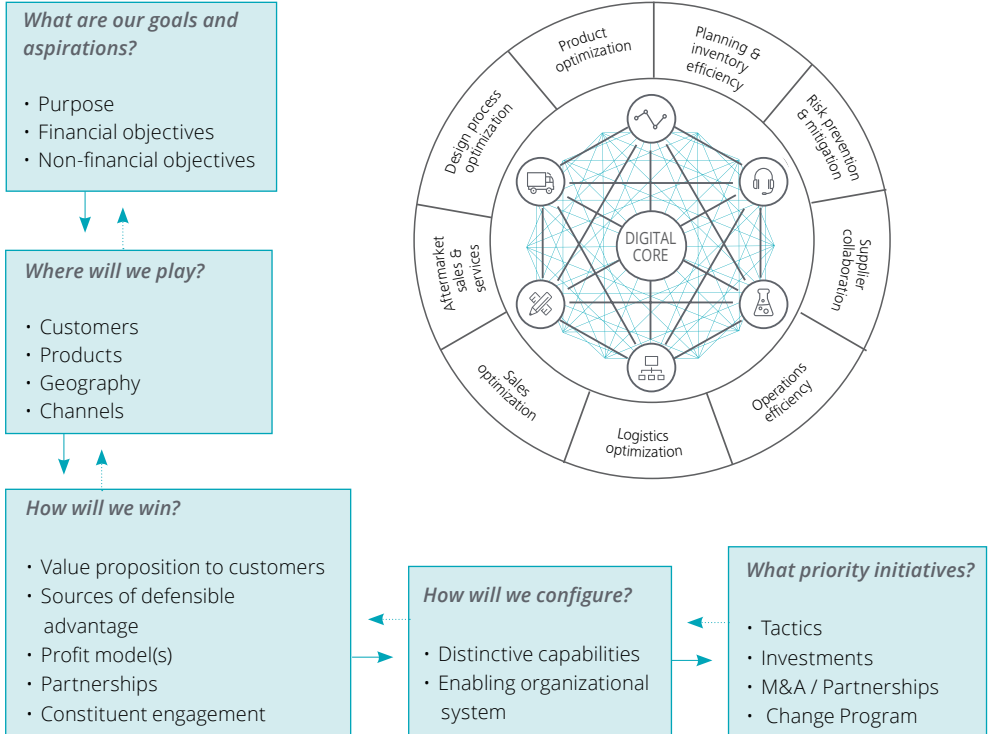
Digital Supply Networks are “Always-On” – dynamic, integrated networks characterized by a continuous flow of information and analytics.

	Characteristic	Description
	<b>“Always-On” Agility</b>	DSN’s continuously pull traditional datasets along with new sensor-based and location-based datasets in order to enable integrated views of the supply network and rapid, no-latency responses to changing situations.
	<b>Connected Community</b>	Real-time, seamless, and multi-modal communication enables improved collaboration with suppliers, partners, and customers. The entire value chain benefits from centralized, standardized, and synchronized data.
	<b>Intelligent Optimization</b>	The collaborative relationship between machines and humans creates a continuous and bi-directional loop of learning, which is coupled with data-driven analytics to optimize decision-making and outcomes.
	<b>End-to-End Transparency</b>	Sensors and location-based services provide instant visibility into critical aspects of the supply network, enabling material flow tracking, schedule synchronization, balance of supply and demand, and financial benefits.
	<b>Holistic Decision Making</b>	Transparency of information across all functional silos allows for better decision-making for the network as a whole, such as around performance optimization, financial objectives, and trade-offs.

Implications	
	Companies can achieve new levels of performance, improve operational efficiency and effectiveness, and create new revenue opportunities.
	As companies leverage their full supply networks, the traditional barriers of time and space shrink.

## How to “Turn-On” Your Digital Supply Networks

Companies must choose specific supply chain transformations and execute priority initiatives to meet their competitive objectives.



## How to prepare

Companies will need to prepare for the following areas of disruption within their organization.

- 1  
New Workforce Skills and Capabilities**

New skills and capabilities are required to understand and engage with all aspects of Digital Supply Networks. These are skillsets which are already in short supply and you will face a new host of competitors in the talent acquisition process
- 2  
Data Analytics Opportunities**

The digital 'mirror' that reflects the physical world creates enormous amounts of data, which must be safely stored, easily accessed and dynamically analyzed to gain new insights and drive the right decisions.
- 3  
Cyber Security Risk**

The interconnectedness of Digital Supply Networks creates exposure to data breaches, which can be detrimental (possibly catastrophic) to operations and create a negative brand association.
- 4  
Reliance on Ecosystem of Supply Chain and Technology Partners**

Creating Digital Supply Networks requires reliance on a broader set of collaborators and technologies, which increases value opportunities but also complexity within the supply ecosystems.
- 5  
Agile Systems Development & Deployment**

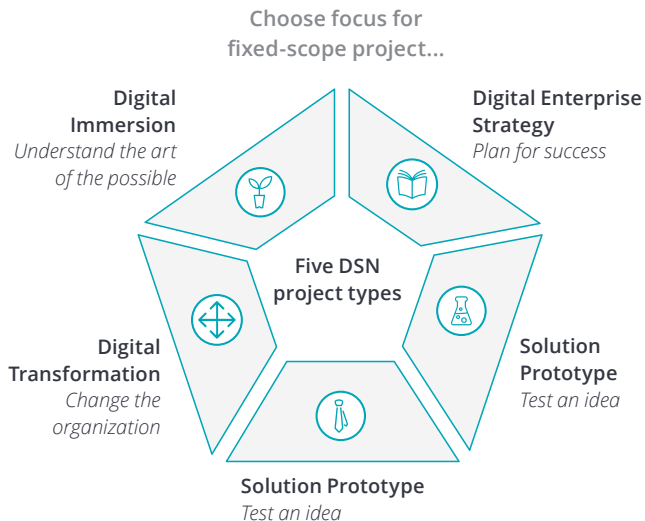
Many companies have organizations and processes in place for implementing technology systems. These processes are often robust, as they include a long timeline of designing, testing, building an on premise solution.



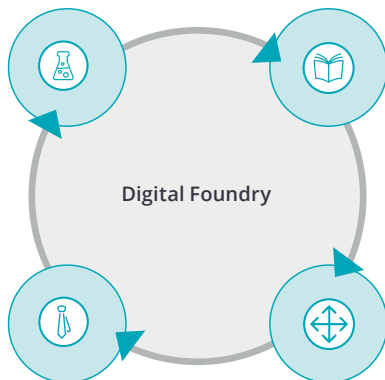
## How to get started

### From one-day immersive experiences to multi-year transformation

It is important to understand that digitization is already occurring, to some extent, within all supply chains. The first steps in getting started are to think big in terms of innovation and the ecosystem, start small in terms of scaling the edge of your business, and act fast to provide proof of concept.



...Or choose capacity services and customize agile delivery



*The Digital Foundry is a scalable, agile delivery model that rapidly ideates, prototypes, and implements digital tactics*

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