Digital Capability Center
Chicago

Developing the future of manufacturing and supply chain

McKinsey&Company
Digital Manufacturing

Industry 4.0

Industry 4.0 is the new source of substantial productivity gains

"Industry 4.0" spans an exciting array of digital technologies that are set to change industrial and commercial operations beyond recognition.

~50 Bn machines vs ~1 Bn people

machines connected- compared to ~1Bn people today

$1.2 to $3.7 Tn value from IoT in factories

process optimization and predictive maintenance

~8-9X increase in GDP

for established economies if impact matches 1st industrial revolution, as anticipated

Industry 4.0 offers many ways to create value and remain competitive

Discrete

Continuous

Semiconductors
90% redeployment of operator FTE and 30-50% production ramp-up
through automated real-time dispatching

Automotive
Reduced machine downtime and 10-20% quality cost reduction
using real-time data analytics

Aerospace
4 weeks shorter LTA cycle and 2-3% higher revenue
using advanced analytics to forecast demand for aircraft components

Consumer
20-50% reduction in inventory management cost
through smart inventory and automated ordering

Mining
3% increase in mining yield
using advanced analytics

Power
45% reduction in maintenance costs
using predictive maintenance

Oil & Gas
30-50% redeployment of FTEs
through digitization of oil drilling, field development and operations

Source: McKinsey analysis

Companies must overcome multiple challenges along the digital transformation journey

McKinsey interviewed 400 qualified manufacturers and suppliers in four key markets (United States, Germany, Japan and China) and found:

Key challenges mentioned	Our core beliefs about creating value from Industry 4.0
Lack of clear vision and strategy Roughly 50% of US companies admit to not having a systematic roadmap or toolbox for easy rollout of digital manufacturing solutions	It is important to develop a tailored digital roadmap, but companies can generate returns today by piloting easily implementable solutions with low capital requirements
Lack of knowledge about relevant tech partners 15% of all US companies identify lack of knowledge about suitable providers as their biggest obstacle	Business leaders need to understand which technology solutions address their core business problems as well as the right criteria for evaluating solution providers
Difficulty managing and attracting digital talent 21% of all US companies face a talent war as their biggest obstacle	To supplement new hiring, companies need to build capabilities in-house; experiential learning is the most effective way to build capabilities quickly

Source: McKinsey Digital Manufacturing Global Expert Survey 2017

Digital Capability Center Chicago

Digital Capability Center (DCC) Chicago provides a holistic solution to help you tackle real-life production challenges and try out new technologies to support your digital journey

An innovative capability building facility founded by McKinsey and MxD; the DCC Chicago showcases the future of Industry 4.0 and provides end-to-end training on digital capabilities that drive bottom-line impact.

The center brings digital manufacturing to life through a functioning production line that makes a real-world product. You will observe the transformation of the line from its non-digital, lean “current state” to a higher-performing, digitally-transformed “future state.”

At the DCC Chicago:

Build a blueprint for an implementation roadmap at your company

Experience what a digital transformation looks like on the model factory floor

Access cutting-edge innovations through our technology ecosystem partners

DCC Chicago offers a world class, global curriculum covering 20+ experiential learning modules for digital operations

Digital Essentials

- IoT stack configuration, platform and tools
- Cybersecurity for integrated network
- End-to-end digital thread and data visibility
- Digital Transformation Program – key components and maximizing impact

Operating system

Resources
- Yield, energy, and throughput optimization

Processes
- 3D printing
- Process and layout design using digital twin
- Line balancing and smart routing in real time

Asset utilization
- Predictive, remote, and self-guided maintenance
- Use of wearables, augmented reality and virtual reality support

Labor
- Digitally supported line leveling, cycle time, and variability analysis
- Advanced intralogistics with picking robots and automated guided vehicles (AGVs)
- Human-robot collaboration
- Workforce management
- Wearables and augmented reality

Quality
- Optimization of equipment working parameters
- Adaptive quality assistance

Inventory and planning
- Digital supply chain
- Real-time inventory and planning process design
- Demand forecasting using advanced analytics
- Intelligent material storage
- End-to-end product tracking and tracability
- Agile network optimization

Management infrastructure

- End-to-end digital performance management
- Real-time root cause analysis
- Digital standard work
- Digitally supported learning
- Digitally supported workforce management

Mindsets and behaviors

- Digital organizational health management
- Abilities to work with new digital elements, e.g., collaborative robots
- Adaptation to fast-changing environment

You will be able to explore the business impact of cutting edge industrial technologies

Select featured learning modules

Digital operator assistant

Understand how to improve labor productivity by providing the right information at the right time to empower your workforce

Wearables and augmented reality

Experience first-hand how smart devices can empower and improve manufacturing and warehousing operations

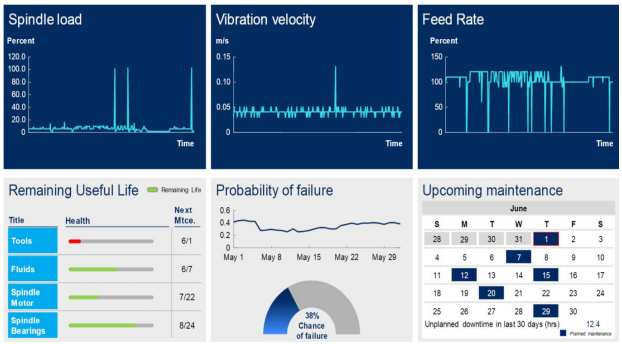
Digital performance management

Create a single source of truth using real-time, integrated performance management to drive improved operations

Real-time root cause analysis

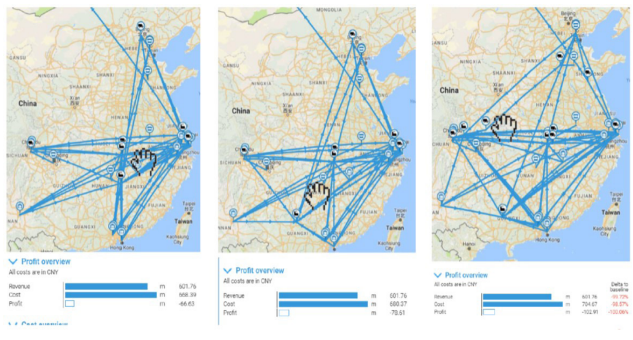
Discover the power of a real-time information to accelerate solving daily manufacturing and supply chain issues

Predictive maintenance



Understand how to improve asset utilization using advanced analytics to drive predictive maintenance

Agile network optimization



Experiment with a real-time network optimization tool to optimize profit and manage the ever-changing demand landscape across geographies

Access to our 50+ tech ecosystem partners will give you a competitive edge in implementing the latest thinking in digital manufacturing and supply chain

Our industry leading tech partners span the end-to-end value chain

We partnered with MxD to set up the DCC Chicago

You can gain access to a wide network of industry leading members and research projects facilitated at MxD

MxD is a network of hundreds of partners collaborating to address the most intractable manufacturing challenges and make U.S. manufacturing more competitive. MxD plays the role of a catalyst for co-development of industrial technologies.

Select MxD members

- Industry leaders
- Governments and agencies
- Leading universities
- DCC technology partners

The DCC offers a tailored curriculum for every level of your organization

The DCC offers workshops on Industry 4.0's latest technologies and how to evaluate their potential in your company.

Half-day workshops for CEOs	Create a vision for what's possible with digital and how it could enable your operations
1-day workshops for CxOs	Envision your company's digital future state and begin to develop a digital transformation roadmap tailored to your business needs
Deep dive workshops	Focus on key Industry 4.0 themes to understand the supporting technology, where its relevant and how to implement

Key workshop takeaways

1. Understand the bottom-line impact of digital solutions
2. Identify which technologies are relevant to your operations and how to harness them across your value chain
3. Learn how to start, scale and sustain your digital journey
4. Understand what needs to be in place in your organization to be successful

Carefully designed agendas balance theory with practical exercises

During their time at the DCC Chicago, participants experience a carefully designed mix of theory training by our expert faculty and practical hands-on exercises, designed to bring what they have learned to life. We aim to ensure that all participants spend at least half their time doing, rather than listening.

Sample CxO workshop agenda

Time	Content
08:30 - 09:00 am	Welcome, safety & logistics share, and introductions
09:00 - 09:30 am	Why is digital manufacturing and supply chain important?
09:30 - 10:45 am	Identifying digital opportunities in the operation
10:45 - 11:00 am	*Break*
11:00 - 12:00 pm	Industry 4.0 deep dive
12:00 - 01:00 pm	*Lunch*
01:00 - 02:00 pm	Prioritize and define future state
02:00 - 03:30 pm	Experiencing a digital transformation
03:30 - 03:45 pm	*Break*
03:45 - 04:30 pm	Creating a plan: challenges & expected impact
04:30 - 05:00 pm	Closing

Hands-on exercises included

Theory – Exercise ratio 50 : 50

Our DCC network spans the globe so you can get tailored capability-building support anywhere

Experiential learning
Hands-on exercises to learn-by-doing, that lead to higher retention

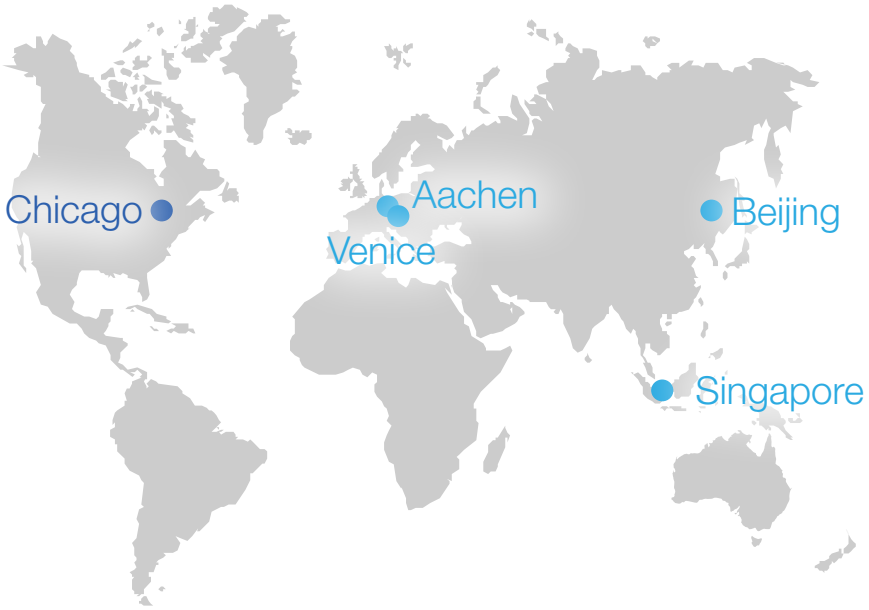
Cutting edge expertise
Distinctive and practical guidance on how to incorporate Industry 4.0 technologies in your company

Accelerated pace of learning
Digital transformation of the line in one day

Risk-free environment
Experiment without concern for impacting ongoing operations

Real production equipment
Tangible, relevant assets for observing applications of Industry 4.0 in manufacturing

Interaction with operators
Frontline operators bring to life mindsets & behaviors



Location	Key institutional partnership	Manufactured product
Chicago, USA	M D	Compressor
Aachen, Germany	ITA | RWTH AACHEN UNIVERSITY	Woven wristband
Venice, Italy	LEAN EXPERIENCE FACTORY	Compressor
Beijing, China	清華大學 Tsinghua University	Ice tea, gearbox and valve
Singapore, Singapore	EDB singapore; A*STAR Advanced Remanufacturing and Technology Centre	Gearbox

Please contact the following McKinsey experts to learn more about DCC Chicago and get an individual solution to your business

Punit Aggarwal
Manager
DCC Chicago

Amy Radermacher
Senior Expert
Digital Manufacturing

Les Kalman
Senior Expert
Digital Manufacturing

Tony Gambell
Partner
Digital Manufacturing

Drew Horah
Partner
Digital Manufacturing

Sumit Dutta
Partner
Digital Supply Chain

Ingrid Millan
Associate Partner
Digital Supply Chain

Mehdi Miremadi
Partner
Technology Ecosystem

Andy Luse
Associate Partner
Technology Ecosystem

DCC_Chicago@mckinsey.com

DCC Chicago
1415 N Cherry Ave
Chicago, IL 60642
USA