Developing the future of 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

- **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

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**

- **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.
- **Lack of knowledge about relevant tech partners**: 15% of all US companies identify lack of knowledge about suitable providers as their biggest obstacle.
- **Difficulty managing and attracting digital talent**: 21% of all US companies face a talent war as their biggest obstacle.

**Our core beliefs about creating value from Industry 4.0**

- It is important to develop a tailored digital roadmap, but companies can generate returns today by piloting easily implementable solutions with low capital requirements.
- Business leaders need to understand which technology solutions address their core business problems as well as the right criteria for evaluating solution providers.
- To supplement new hiring, companies need to build capabilities in-house; experiential learning is the most effective way to build capabilities quickly.
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 the Digital Manufacturing and Design Innovation Institute (DMDII); 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

The DCC Chicago produces compressors commonly used in many household devices.
Digital operator assistant
Learn how real-time, adaptive work instructions with data capture can improve quality, reduce variability and training time, and facilitate best practice sharing. Understand how guidance can be optimized and adapted based on product specifications and individual operator requirements.

Wearables and augmented reality on the shop floor
See, touch and experience how smart digital devices can exchange data between the network, operator and other connected devices. Understand how this reduces time to repair, reduces skill variability between technicians, and improves machine reliability. Recognize which solutions fit in which environments.

Digital performance management
Learn how performance and health data can be aggregated, analyzed, and shared in real-time to draw actionable insights and improve performance. See how root cause problem solving is accelerated by having data and expertise at your fingertips on a digital whiteboard.

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

Examples of initial learning modules below; others to be added over the course of 2017
Access to our 40+ tech ecosystem partners will give you a competitive edge in implementing the latest thinking in digital manufacturing and supply chain.

You can gain access to a wide network of industry leading members and research projects facilitated at DMDII. DMDII is a network of hundreds of partners collaborating to address the most intractable manufacturing challenges and make U.S. manufacturing more competitive. A UI LABS collaboration, DMDII plays the role of a catalyst for co-development of industrial technologies.

Select DMDII 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

2-day deep dive workshops
- Focus on key Industry 4.0 themes to understand the supporting technology, where it’s 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
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08:30 - 09:00 am | Welcome, safety & logistics share, and introductions
09:00 - 09:30 am | Why is digital manufacturing important?
09:30 - 10:45 am | Diagnosing the digital need in a lean line
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

- **Chicago, USA**
  - **Key institutional partnership**: DMDII
  - **Manufactured product**: Compressor
- **Aachen, Germany**
  - **Key institutional partnership**: RWTH Aachen University
  - **Manufactured product**: Woven wristband
- **Venice, Italy**
  - **Key institutional partnership**: FIAT
  - **Manufactured product**: Compressor
- **Beijing, China**
  - **Key institutional partnership**: Tsinghua University
  - **Manufactured product**: Ice tea, gearbox and valve
- **Singapore, Singapore**
  - **Key institutional partnership**: EDB
  - **Manufactured product**: Gearbox

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

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