FIND YOURS.

*Industry 4.0:*
LEVERAGING THE VALUE OF DATA THAT’S EVERYWHERE

Presented by:
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Presenter

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I4.0 Business Consulting
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Objectives

• DEFINED: Understanding Industry 4.0

• VALUE: What can Industry 4.0 do for me

• DATA: Data is everywhere

• JOURNEY: What is the path to achieving value
HOW OUR WORLD (HAS) WILL CHANGE DIGITAL EVERYWHERE IN OUR LIVES

Digital Natives
Generation Online

- online access from everywhere
- configurable and personalized
- immediate availability
HOW OUR WORLD (HAS) WILL CHANGE
DIGITAL EVERYWHERE IN OUR FACTORIES

Digital Natives

Smart Manufacturing

➢ Connectivity - access from everywhere
➢ Immediate or Analytical
➢ Diagnostic / Predictive / Prescriptive
INDUSTRY 4.0
THE FOURTH INDUSTRIAL REVOLUTION

1st
Mechanization, water power, steam power
Late-1700’s

2nd
Mass production, assembly line, electricity
Late-1800’s

3rd
Computer and automation
1970/80’s

4th
Cyber Physical Systems
Early-2000’s

Graphic source: https://en.wikipedia.org/wiki/Industry_4.0
The use of computer systems to optimize the manufacturing process. This would be aligned with the 3rd industrial revolution.

**I4.0**
A trend in industrial automation that involves the assembly and connectivity of technologies in a manufacturing environment to support flow and exchange of data. The I4.0 term originates in Germany used to define high-tech strategy promoting computerization of manufacturing.

**IoT**
The Internet of Things represents technology and devices in our lives that are connected and allows interaction and the exchange of data.

**IIoT**
The Industrial Internet of Things is a sub-set of IoT and represents the technology and devices that are networked/connected within manufacturing industries.

**Digital Manufacturing**
The use of computer systems to optimize the manufacturing process. This would be aligned with the 3rd industrial revolution.

**Smart Factory**
A physical facility that is highly automated and incorporates I4.0 concepts.

**Smart Manufacturing**
A broad term that provides an umbrella definition to the optimization of the manufacturing processes via the use of automation supporting the use of data throughout the product lifecycle. Often used in the U.S. interchangeably with the term Industry 4.0.
TERMINOLOGY SIMPLIFIED

**Smart Manufacturing**
Umbrella term used in U.S.
Flow of DATA throughout product life-cycle

**Industry 4.0**
Term originates in Germany
Assembling + Connecting technology
Flow + Exchange of DATA!

**IIoT**
Subset of IoT
"Industrial" things that are on the Internet!

**IoT**
Things that are on the Internet!

**Digital Manufacturing**
Computerization / 3rd Industrial Revolution

**Smart Factory**
Facility incorporates I4.0 concepts
I4.0 GLOBAL INITIATIVES
SAME BUT DIFFERENT

- Smart Manufacturing
- Industrie 4.0
- Innovate UK
- Industrie du Futur
- Produktion 2030
- China Manufacturing 2025
- Manufacturing Innovation 3.0
- Industrial Value Chain Initiative (IVI)
- Make In India

Industry Associations
# I4.0 GLOBAL INITIATIVES

SAME BUT DIFFERENT

<table>
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<tr>
<th>Smart Manufacturing (USA)</th>
<th>Industrial Value Chain (Japan)</th>
<th>Industrie 4.0 (Germany)</th>
<th>China Manufacturing 2025</th>
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<td>Cloud Based Open Architecture</td>
<td>Mutually Connected Architecture</td>
<td>“Securing the future of German manufacturing industry”</td>
<td>“Transform China into a world-leading manufacturing power”</td>
<td>“Promote India as the most preferred global manufacturing destination”</td>
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<td>Open Standards</td>
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<td>Collaboration</td>
<td>Novel Business Model Social Infrastructure</td>
<td>Ten Priority Sectors Pilot Projects</td>
<td>Domestic Supply-Demand Gap Ease of doing business</td>
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<td>Vertical &amp; Horizontal Integration</td>
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<td>N/A</td>
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SMART MANUFACTURING
DATA IN THE SUPPLY CHAIN

R&D → Product
- Item Num
- Product Specs
- Raw Materials

Create → Product
- Status
- Quality
- OEE
- Machine Setup

Store/Move → Product
- Inventory
- Orders
- Delivery

Sell → Product
- Product
- Price
- Profile

Data Flows Thru The Supply Chain

RAW MATERIALS → SUPPLIER → MANUFACTURER → DISTRIBUTOR → RETAILER → CONSUMER
HARNESSING THE VALUE
DATA + INDUSTRY 4.0

• PRODUCTIVITY

• COMPLIANCE

• RELIABILITY

• PREVENTATIVE MAINTENANCE
• **4.1% cost reduction** (manufacturing efficiencies and improved value chain management)

• **3.0% revenue increase** (driven by customized products, predictive maintenance, and additional services)

• Most assume a **two-year full Return on Investment (ROI)** and enormous long-term gains
“the Industry 4.0 market is projected to reach $214B by 2023”

“the Industry 4.0 revolution will be driven by an ensemble of emerging technologies, such as Industrial Internet of Things (Industrial IoT), Big Data analytics, advanced industrial robots, Artificial Intelligence (AI) and predictive maintenance.”

• 63% of the respondents stated that their business future depends on the Industry 4.0 Transformation

• 88% of the respondents agreed that delaying the Industry 4.0 transformation of their enterprises may risk their business future

• 12% of the respondents have already implemented some Industry 4.0 conversion and reported clear improvements in their value chain performance

What are we waiting for?
A major barrier for Industry 4.0 is the general lack of clarity.

### McKinsey & Company
- Business Justification
- Expertise
- Understanding
- Data Security

### Gartner Research
- Business Justification
- Expertise
- Understanding
- Data Security

### The Mechanical Engineering Industry Association
- Business Justification
- Expertise
- Understanding
- Data Security

Many will find an Industry 4.0 partner to help guide the way!
DATA
IT’S ABOUT THE DATA! (INFORMATION IS KEY)
DATA
CONNECTIVITY IS CRITICAL

company level

production level

process management level

machine level

field devices

Cloud

ethernet

PLC

fieldbus

sensor
• Already today, support for networked machines and industrial processes
• Extensive possibilities for self- and process diagnostics
• Integrated logic functions for signal processing directly in the sensor
• Higher efficiency and lower costs
INDUSTRY 4.0 DATA
BIG DATA

<p>| Sheer amount of raw data (i.e. gigabytes, zettabytes, etc) |
| Structured and Unstructured |
| Density of inbound data (milliseconds) |</p>
<table>
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<tr>
<th>DIAGNOSTIC</th>
<th>PREDICTIVE</th>
<th>PRESCRIPTIVE</th>
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<tr>
<td>What is Now</td>
<td>What is Next</td>
<td>What to do about it</td>
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</table>

**INDUSTRY 4.0 DATA**
WHAT TO DO WITH ALL THIS DATA

**DECISIONS ACTIONS**
INDUSTRY 4.0
USE CASE

What has been completed
Efficiency
Status: Achieving Goals

Key Environment Variables
Safety Metrics

Industry 4.0 Data
Industry 4.0 Data

Find Your Wow
INDUSTRY 4.0 MESSAGE
WHAT’S THE FOCUS

- Understand the Goals
- Define the Value
  - What data is needed
  - What is the art of the possible (use cases)
- Make a Plan
- Partnership
INDUSTRY 4.0
THE JOURNEY

Assess + Understand
Confirm Value (use cases / data)
Identify / Prioritize Opportunities
Roadmap
Design / Spec

Implementing solutions that achieve desired outcomes = value
INDUSTRY 4.0
THE JOURNEY

Business + I4.0 Readiness Assessment
Assess + Understand

Technical Consultation
Design / Spec

Cross-Functional Team

Implementing solutions that achieve desired outcomes = value

Confirm Value
(use cases / data)

Identify / Prioritize Opportunities

Roadmap
INDUSTRY 4.0: PULLING IT TOGETHER

The journey insures alignment between business objectives and I4.0 initiatives.

Alignment helps to identify the data (information) that enables business + operational decisions that support desired outcomes.

Implementing solutions that achieve desired outcomes = value
Key Takeaways

• I4.0 is about **Data**

• I4.0 = effectively assembling + **connecting** automation

• Align **business objectives** with I4.0 solutions

• Realize the **value**!
For More Information

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