Industry 4.0 Metrics

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OUTLINE

- Industry 4.0 Maturity Index
- Demystifying Industry 4.0
- Enterprise 4.0 KPI
- Technology 4.0 KPI

Maturity Model for Industry 4.0 (Roland Berger, THINK ACT, 2014)

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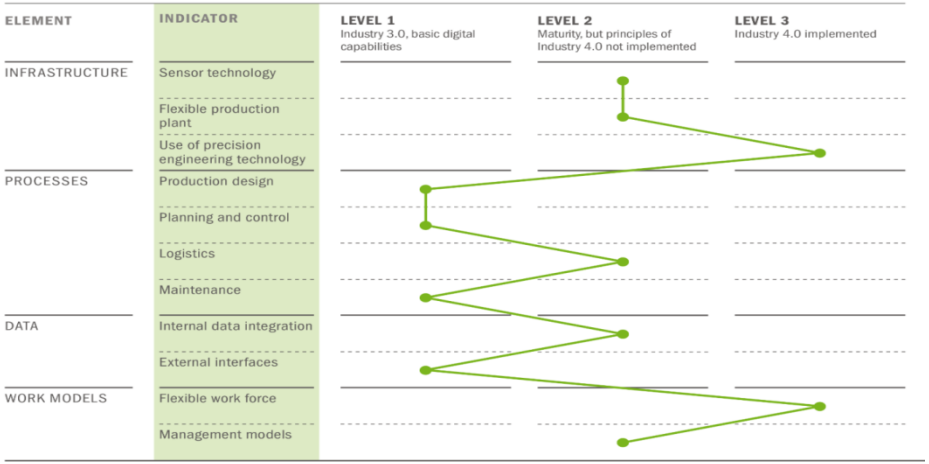
| ROLAND BERGER INDEX |

IS YOUR COMPANY READY FOR INDUSTRY 4.0?

What must companies do to boost their efficiency, quality and speed as they implement Industry 4.0? How can managers tap their company's potential? *On top of its economic maturity index (see p. 39), Roland Berger Strategy Consultants has now also prepared an analytical index for managers and entrepreneurs. The four most important factors are infrastructure, processes, data traffic and work models. These factors enable us to calculate a company-specific maturity index value highlighting how all departments must pull together. Our study is due out at the beginning of 2015.*

COMPANY ANALYSIS BASED ON ROLAND BERGER'S MATURITY MODEL FOR INDUSTRY 4.0
(generic model)



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THINK ACT // COO INSIGHTS
INDUSTRY 4.0

- **Infrastructure**
- **Processes**
- **Data**
- **Work Models**

Industry 4.0 Readiness (VDMA, Germany , 2016)

Leaders (Level 5)

Learners (Level 2)

Newcomers (Level 0)

Industry 4.0 Readiness (VDMA, Germany , 2016)

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Employees

Data-Driven Services

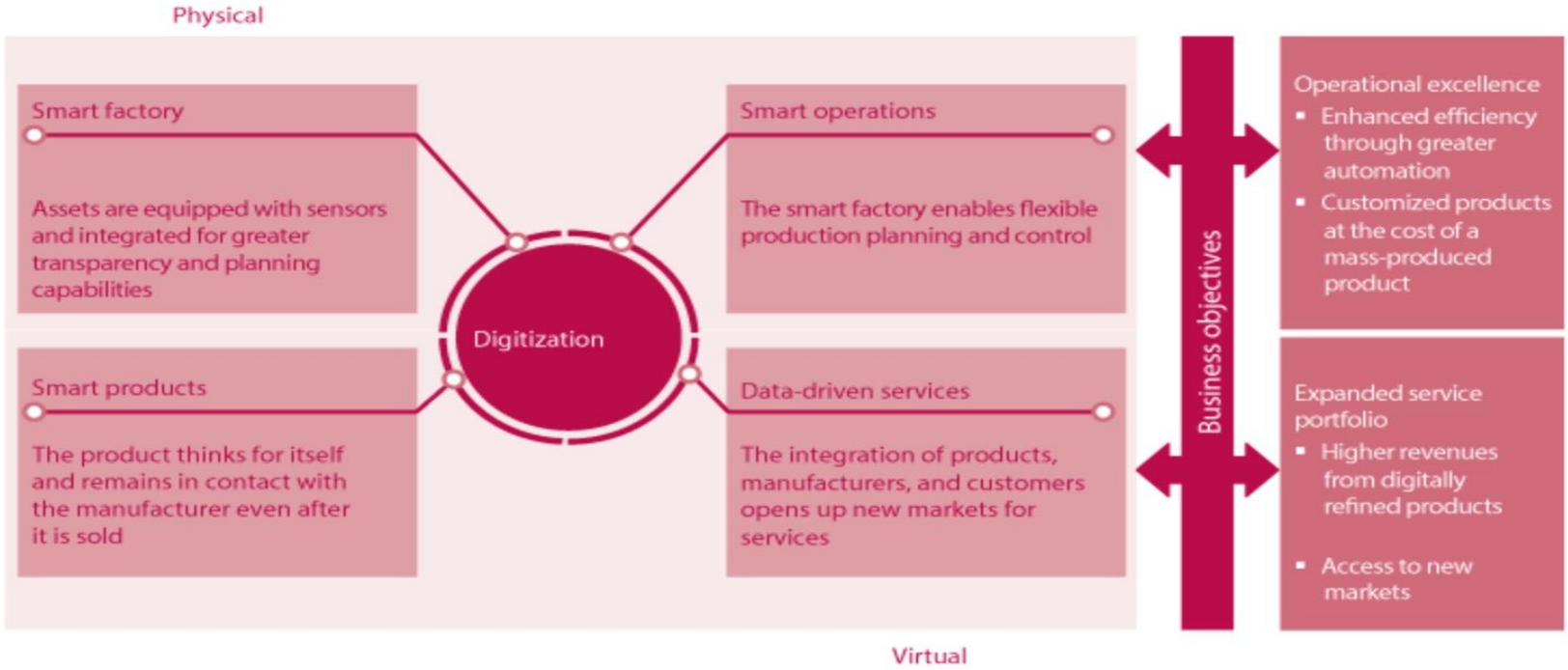
Smart Products

Strategy and Organization

Smart Factory

Smart Operations

Industry 4.0 Readiness (VDMA, Germany , 2016)



Industry 4.0 Factories

P&WC	Digital Enterprise (2000) – ICEMAN (2012)
Germany	Smart Factory (2005)
Siemens	Digital Factory (2012)
GE	Brilliant Factory (2014)
EU	Factory of the Future (2013)
USA	National Network of Manufacturing Innovation (2013)

Industry 4.0 Buzz Words:
Big Data – Internet of Things – Data Analytics – Digital Twin , etc.

Industry 4.0: Factory or Enterprise ?

(AéroMontréal Forum, H. Moustapha, Apr. 26, 2016)

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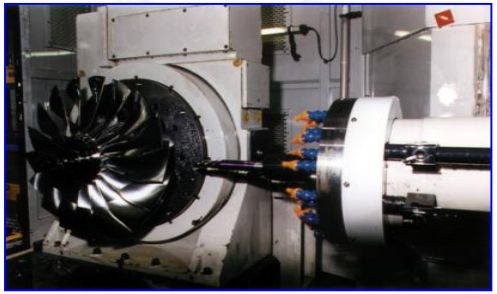
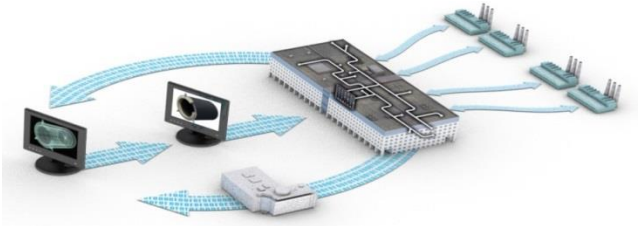
Industry 4.0 is not only about FACTORY



It is the total ENTERPRISE



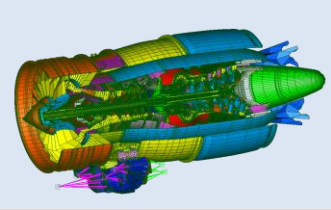
Demystifying Industry 4.0

"Humans, computers, machines and products collaborate digitally and communicate seamlessly through integrated and optimized processes across the total product value stream within an **enterprise**, and upstream and downstream of the **enterprise**"

(Ref. Aérospatiale 4.0, H. Moustapha, Juillet 2016)

Aerospace 4.0™: Addressing the Total Enterprise

Design and Development

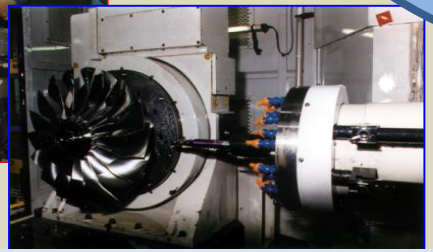


Supply Chain Network

Smart and Digital Enterprise

- Simulation
- Integration
- Optimization

Manufacturing and Production



Maintenance and Customer Support

As Sold, As Designed, As Planned, As Produced, As Maintained

Total Enterprise: "Aerospace 4.0™ KPI"

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Engineering for Aerospace 4.0

1. **Design** Multidisciplinary Design Optimization "MDO" (CAD+)
2. **Development** Simulation Life Management "SLM"
3. **Manufacturing** Multidisciplinary Factory Optimization "MFO" (CAM+)
4. **Product** Product Development Process "PDP"
5. **Resources** Enterprise Resources Planning "ERP"
6. **Customers** Customer Relationship Management "CRM"
7. **Suppliers** Supply Chain Management "SCM"
8. **Enterprise** Product Lifecycle Management "PLM"

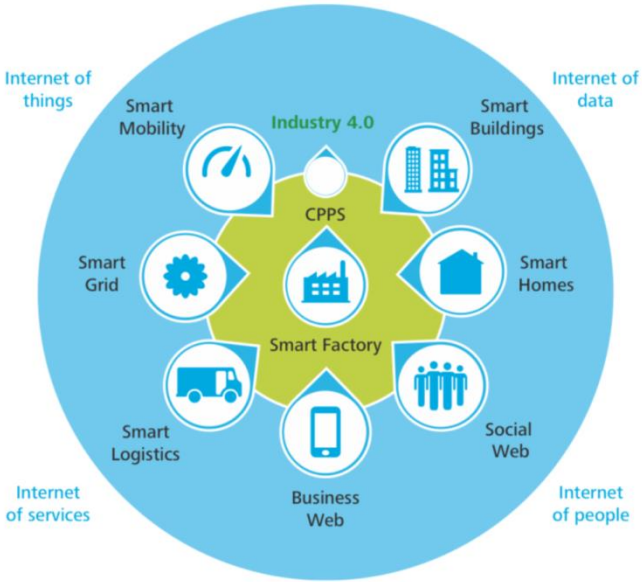
And Workforce

Industry 4.0: Nine Technologies (Germany, 2011)

Technology: "Aerospace 4.0™ KPI"

1. Simulation
2. System Integration
3. Internet of Things
4. Cloud Computing
5. Cyber Security
6. Augmented Reality
7. Big Data
8. Additive Manufacturing
9. Autonomous Robots

And More in the Future



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Thank You

Merci

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