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KOGNITIVNA PROIZVODNJA IN INDUSTRIJA 4.0

IBM Innovation Center Ljubljana

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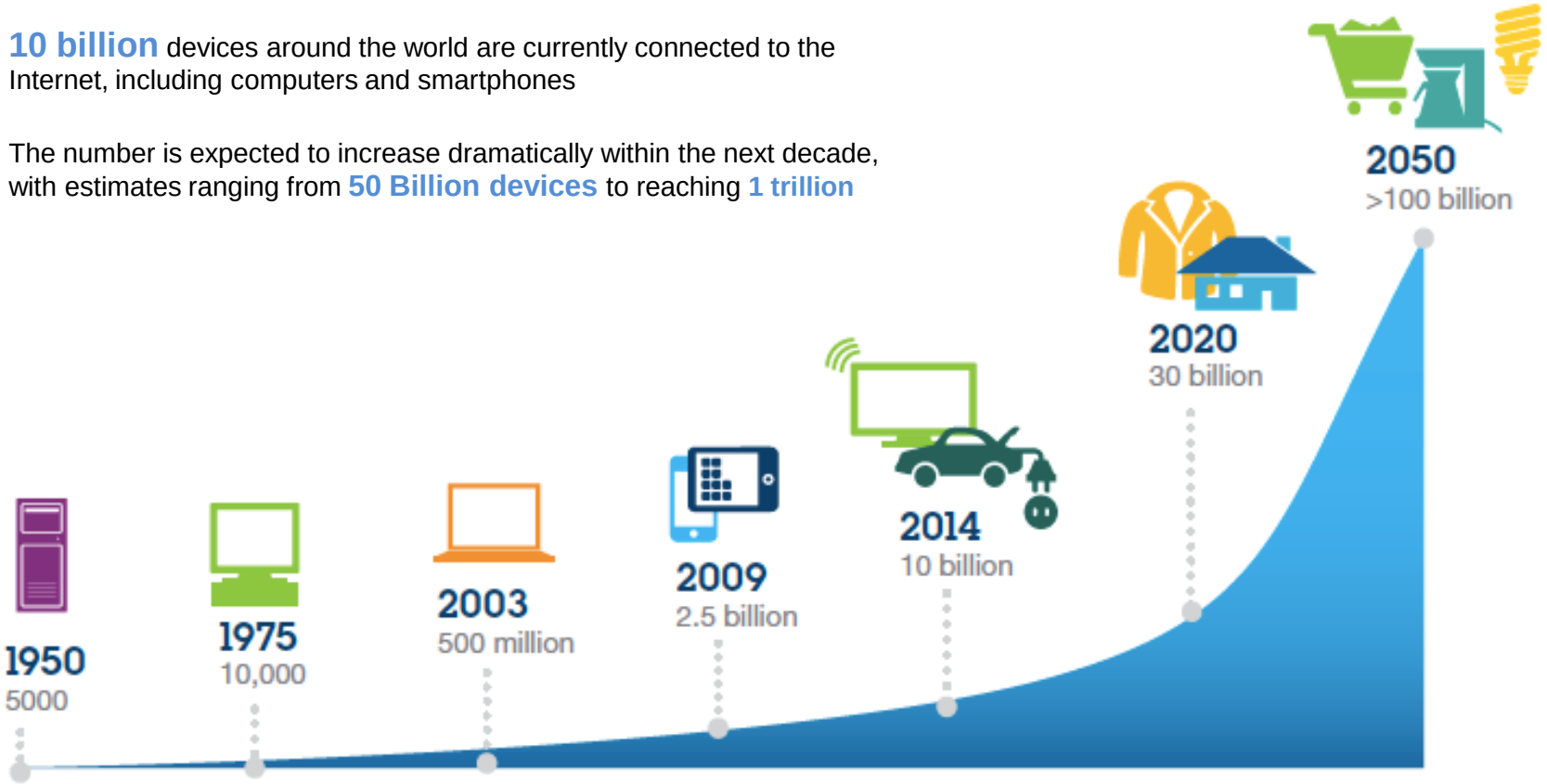
We are on the threshold of massive explosion of connected things

10 billion devices around the world are currently connected to the Internet, including computers and smartphones

The number is expected to increase dramatically within the next decade, with estimates ranging from **50 Billion devices** to reaching **1 trillion**



The Internet of Things has the potential to create economic impact ***of $2.7 trillion to $6.2 trillion*** annually by 2025

How does this apply to manufacturing?

First Industrial Revolution

based on the introduction of mechanical production equipment driven by water and steam power

First mechanical loom,1784

Second Industrial Revolution

based on mass production achieved by division of labor concept and the use of electrical energy

First conveyor belt, Cincinnati slaughterhouse, 1870

Third Industrial Revolution

based on the use of electronics and IT to further automate production

First programmable logic controller (PLC) Modicon 084,1969

Fourth Industrial Revolution

based on the use of cyber-physical systems

TODAY

Degree of complexity

Fourth

Third

Second

First

1800

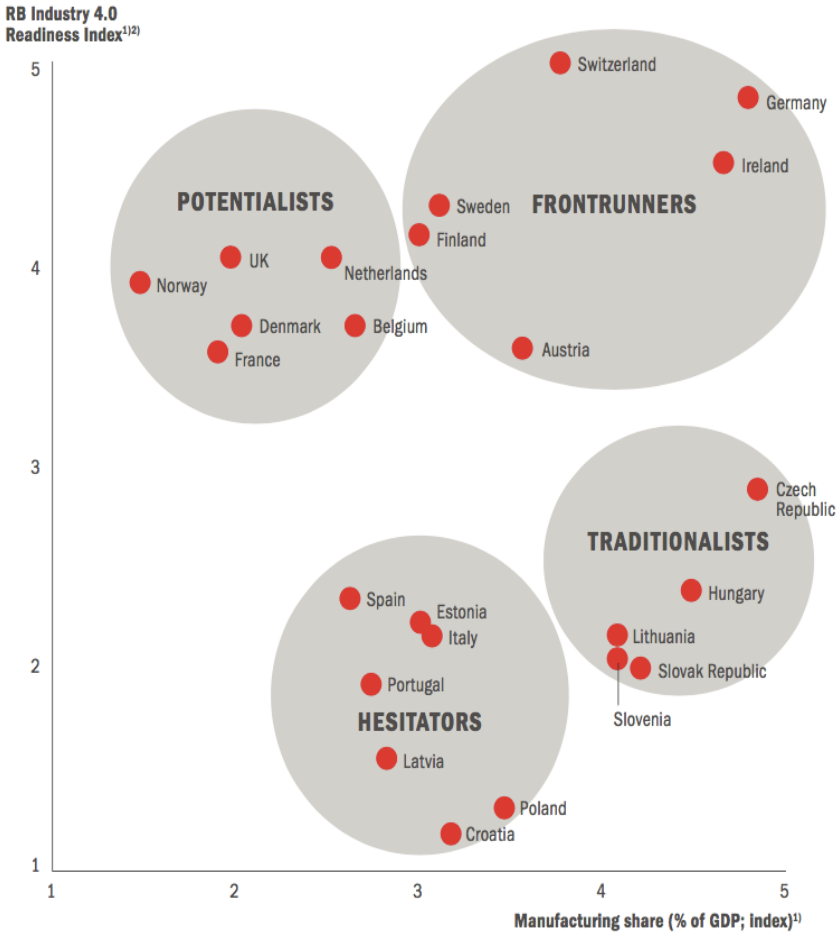
1900

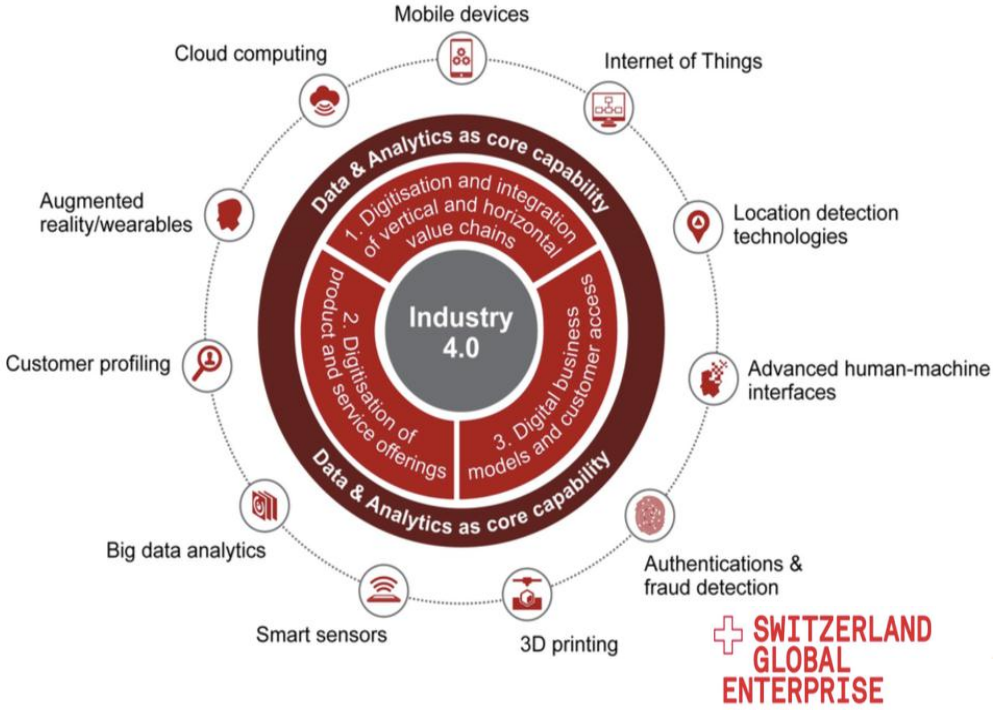
2000

Data, Code, Cognition … Industry 4.0

Are we ready for the Industry 4.0?

Industry 4.0 is a journey towards value chain transformation driven by new technologies and new collaborative business models





SWITZERLAND GLOBAL ENTERPRISE

Whitepaper – Opportunities for the Swiss Export Industry, April 2016

Source: https://www.rolandberger.com/publications/publication_pdf/roland_berger_tab_industry_4_0_switzerland_20150526.pdf

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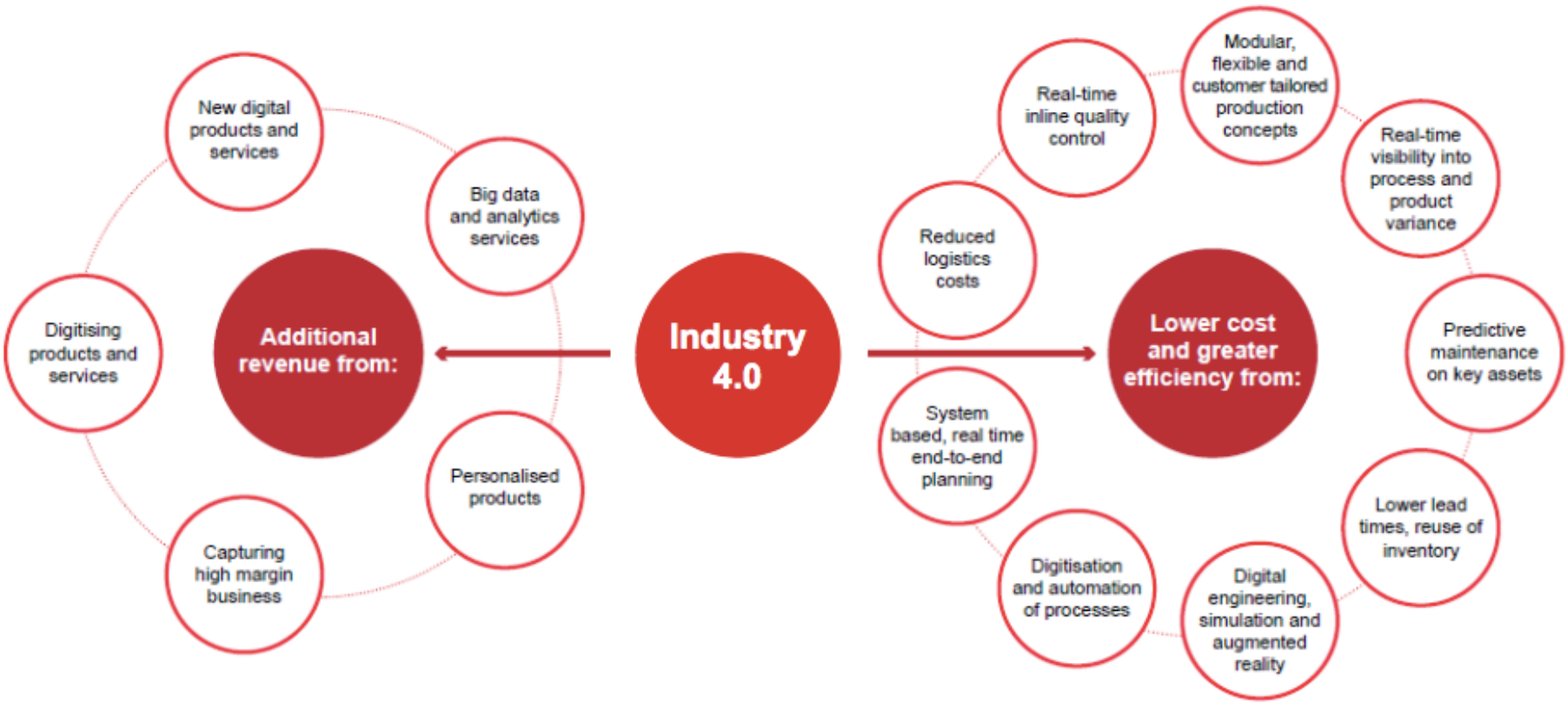
Industry 4.0 is delivering revenue, cost and efficiency gains

The window of opportunity is short, but exporting Swiss SMEs are used to adapt quickly



Source: PwC Strategy&

Unlocking the potential of the Internet of Things

McKinsey&Company
Digital McKinsey

McKinsey Global Institute

- Operations and equipment optimization in the factory setting can generate up to $3.7T of value in 2025
- IoT has a total potential economic impact of $4 trillion to $11 trillion a year by 2025.

pwc **strategy+business**

In the **PwC study of Industry 4.0**, the most commonly cited difficulty in **building an analytical capability** was **the lack of people with the expertise** to conduct the analysis.

Other prominent concerns:

- poor data quality,
- lack of access to the right data
- lack of top-level support

If you can't make sense of that data and use it to boost efficiency, grow closer to your supply chain partners, and develop products and services your customers actually want, …

… much of the **effort is wasted.**

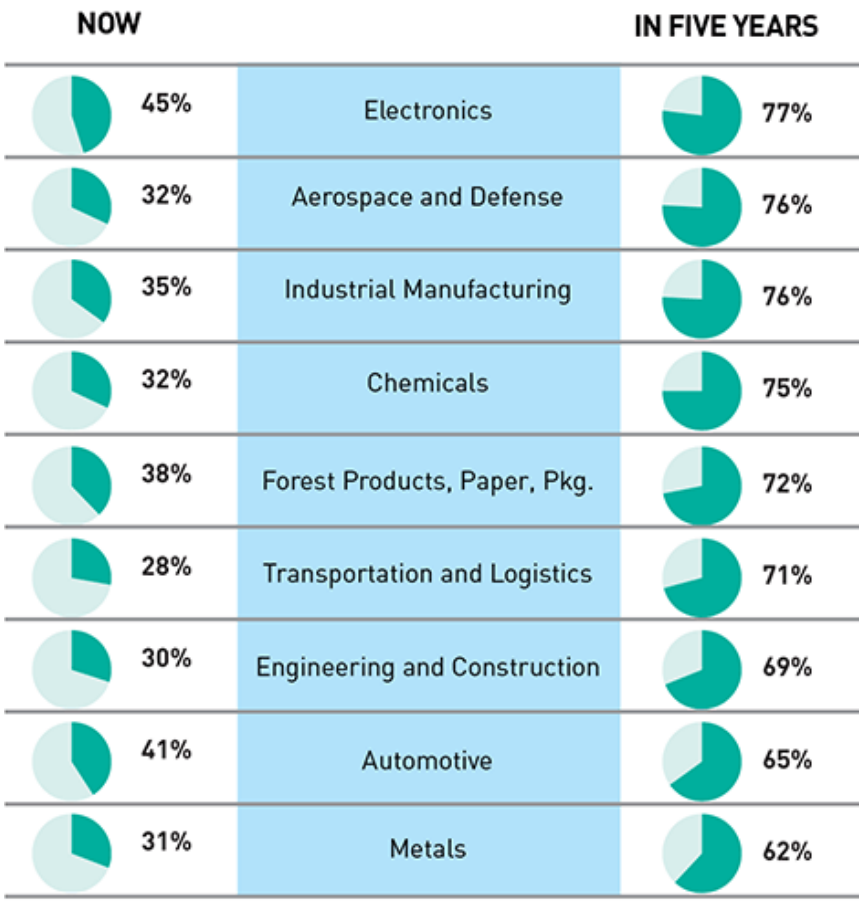
Cognitive Computing

- understands structured and unstructured data
- reasons to create hypotheses
- learns from collaboration
- interacts with humans in natural way

IBM Watson

Exhibit 1: **Adoption of Industry 4.0, by Sector**

Respondents were asked: "How would you classify the current level of digitization and integration [in operations, supply chain, and related activities] in your company? What levels are you expecting in the next five years?"



Source: "Industry 4.0: Building the Digital Enterprise," PwC

www.strategy-business.com/article/A-Strategists-Guide-to-Industry-4.0?gko=7c4cf

Cognitive is driving new capability. . .

Watson IoT

Cognitive Systems Can…

Understand

Adapt and make sense of all data; “read” text, “see” images and “hear” natural speech with context

Reason

Interpret information, organize it and offer explanations of what it means, with rationale for the conclusions

Learn

Accumulate data and derive insight at every interaction, perpetually

Cognitive Manufacturing is powered by IBM Watson IoT.

IBM Watson

Secure, scalable, and open platform where leaders everywhere can build and innovate with cognitive

Connect and experiment in a matter of minutes. Watson IoT provides companies and organizations with simple connectivity elements and flexible building blocks to bring sophisticated new ideas to reality.

Sophisticated edge and predictive analytics combined with cognitive IoT technology

Watson IoT combines the the data ingestion power of internet of things with advanced analytics in our applications and the problem solving system of Watson to analyze, reason and learn on a scale that we never thought possible.

Expertise in industries and professional domains to every cognitive endeavor.

As a leading industry solution provider, we help clients apply advanced technologies such as IoT and cognitive within the context of an industry or profession to produce meaningful outcomes.

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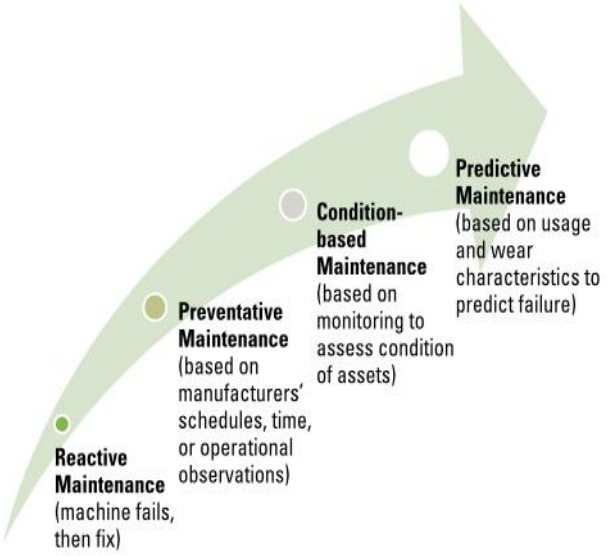
Predictive maintenance and quality

Predicting asset failure and extending life

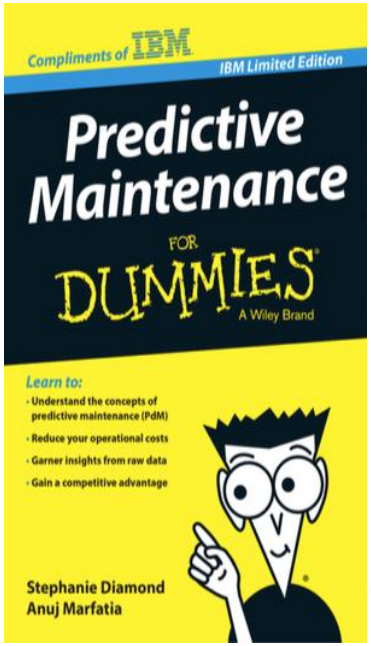
- Optimize maintenance intervals
- Minimize unplanned downtime
- Uncover in-depth root cause analysis of failures
- Enhance equipment and process diagnostics capabilities
- Determine optimum corrective action procedures

Predicting part and production quality

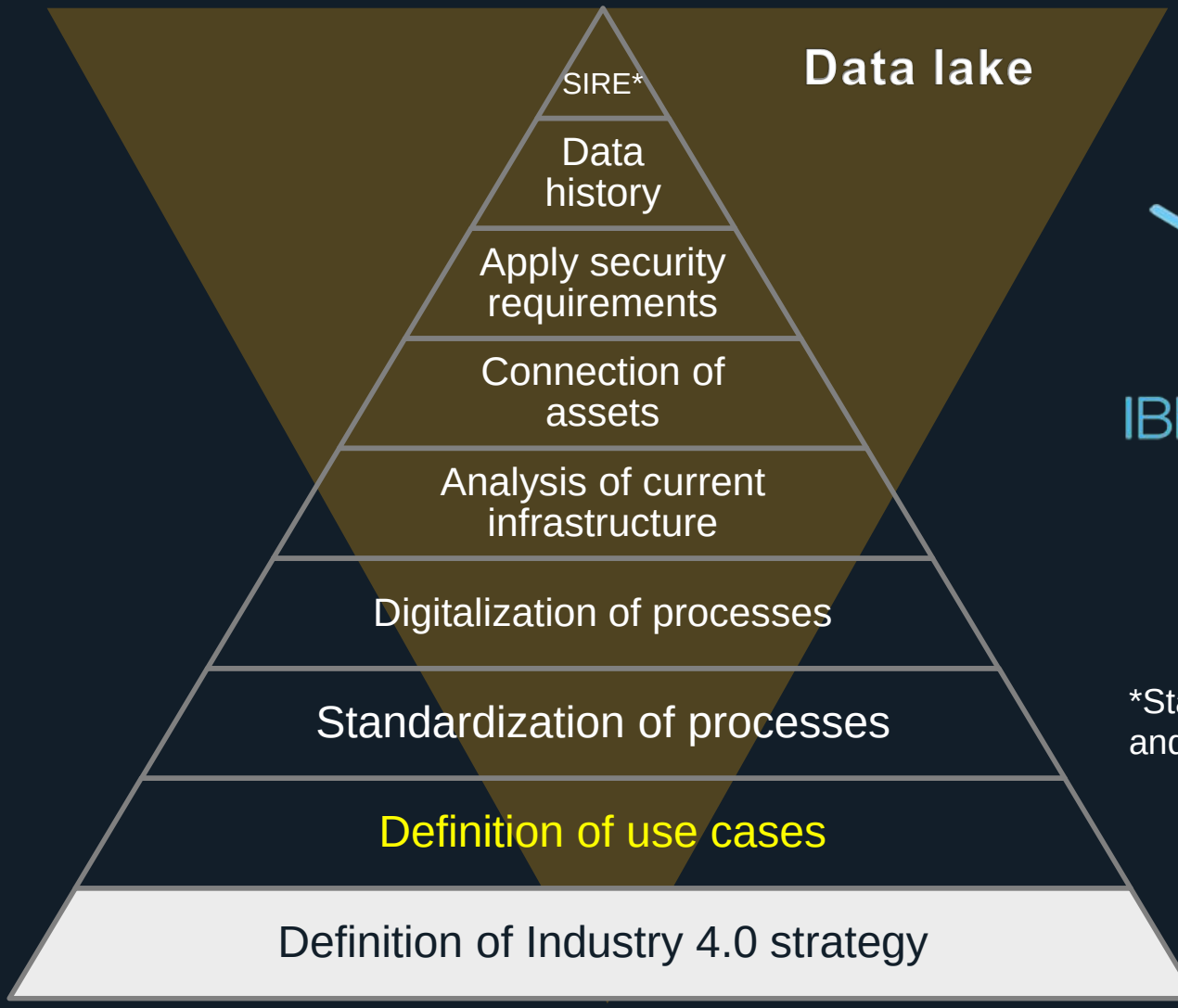
- Reduce part inspection frequency and lot size requirements
- Understand, monitor, predict, and control process variability
- Reduce scrap and rework
- Identify production uniformity issues
- Identify supplier part anomalies impacting yield



While organizations may be focused on **reducing costs** with PMQ, by improving maintenance and quality, they can inherently **increase customer satisfaction**.
Products are produced with **high quality**, get out the door on time with fewer production failures, and **lead to increased revenues**.
Ultimately, PMQ provides a benefit to both sides of the profit equation.



Cognitive transformation process



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*Statistical Information and Relation Extraction

IBM BUSINESS PARTNERS SOLUTIONS FOR INDUSTRY 4.0

Catalogue: ibm.biz/ind40now
Enrollment: ibm.biz/ind40enroll

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Partnered Innovation

Open ecosystem
Device partnerships
Embedded security
Edge Analytics
Industry 4.0 solutions

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Data Integration

Weather data
Social data
Application data
Platform of platforms

IBM Cloud

Advanced Analytics

Predictive Analytics
Real-time Analytics
Data Mining
Optimization

IBM Cloud

Cognitive Technology

Natural Language Processing
Machine Learning
Textual Analytics
Video/Image Analytics

IBM Cloud

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QUESTIONS?

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