

DIGITAL GOLD NUGGETS IN MANUFACTURING?

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Evolution of Data Management Concepts in Operations

- From Scientific Management to Al
 - Time and Motion Study
 - Statistical Quality Control
 - Operations Research
 - Machine Learning
- From transactions to Al
 - Management Information Systems
 - Decision Support Systems
 - Business Intelligence
 - Big Data and Analytics



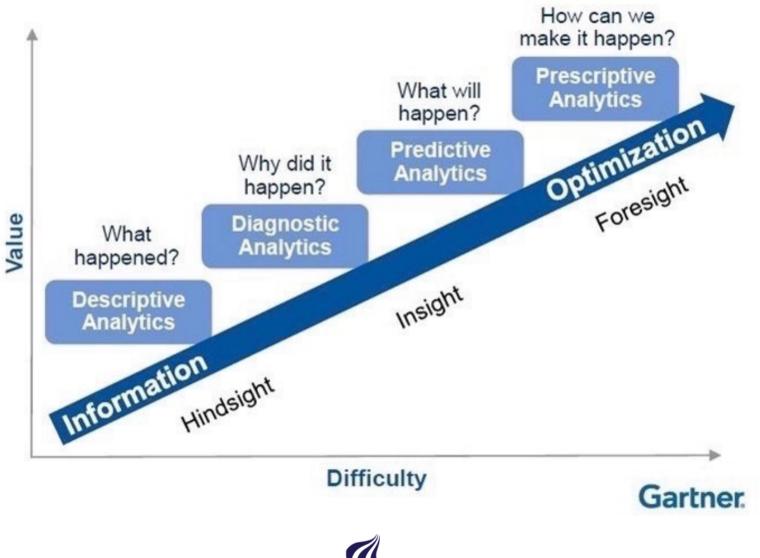
"In God we trust, all others must bring data".

W. Edwards
Demming (1900-93)





Maturity of Analytical Capabilities





The Fourth Industrial Revolution



FIRST Industrial Revolution

 Introduction of mechanical production facilities with the help of water and steam power



SECOND Industrial Revolution

 Introduction of division of labor and mass production with the help of electrical energy



THIRD Industrial Revolution

Use of electronic and IT systems that further automate production

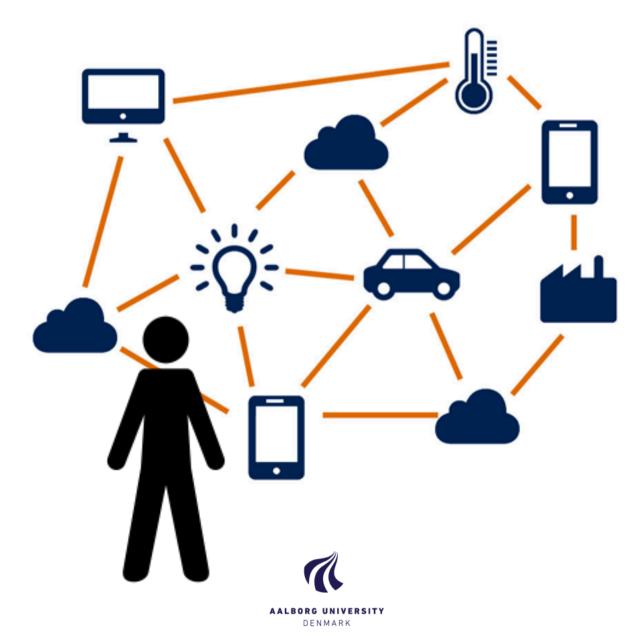


FOURTH Industrial Revolution

Convergent physical, bio and digital systems



Making Sense of Smart Production



Towards Smarter Production Systems

Customer Experience

- Demand driven Manufacturing through IoT
- Connected customers

Intelligent Supply Chain

- Horizontal integration through value networks
- · Connected organizations

Smart Factory

- Vertical integration and networked production systems
- Connected processes

Digital Manufacturing

- Digital integration of engineering across the entire value chain
- Connected products

Empowered Workforce

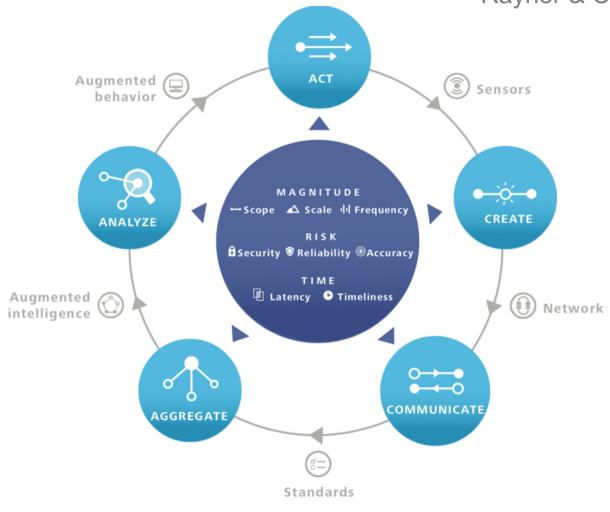
- Empowered workforce from shop floor to the boardroom
- Connected employees

Smart Production



The Information Value Loop

Raynor & Cotteleer, 2015



VALUE DRIVERS

STAGES

TECHNOLOGIES





Operational Innovation

Strategic benefits

- higher customer retention
- •greater market share
- ability to execute strategies
- ability to enter new markets

Marketplace benefits

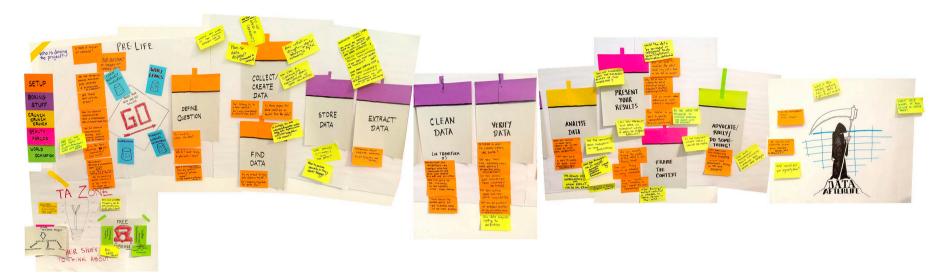
- lower prices
- •greater customer satisfaction
- differentiated offerings
- stronger customer relationsships
- greater agility

Operational benefits

- •lower direct costs
- better use of assets
- •faster cycle times
- increased accuracy
- greater customization or precision
- more added value
- simpler processes



Mode 1: Data-driven Value Exploration

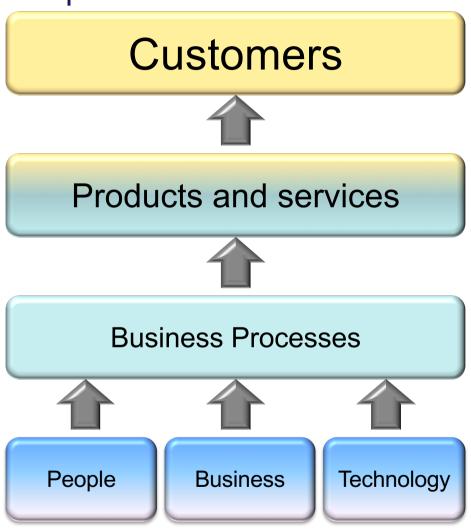


- Starting point
 - Abundance of data
- Value proposition
 - To be investigated
- Cases
 - Business Process Mining, Customer Insight



Mode 2: Business-driven Value Exploration

- Starting Point
 - Business Problem/Issues
- Value Proposition
 - Optimal resource utilization
- Cases
 - Business Process
 Management
 - End-to-end value chain optimization

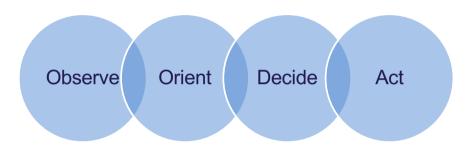




Mode 3: Opportunity-driven Value Exploration

- Starting Point
 - Customer and Competitors
- Value Creation
 - "Getting inside opponents OODA loop"
- Cases
 - Business Process Innovation
 - Lean Startup

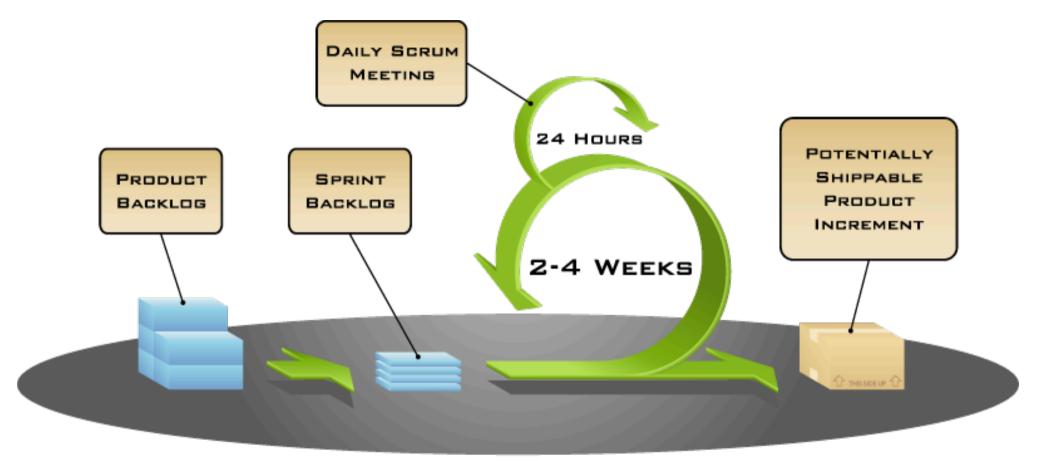
The Essence of Winning and Loosing



The OODA loop is the cycle observe—orient—decide—act, developed by military strategist and United States Air Force Colonel John Boyd.
Boyd applied the concept to the combat operations process, often at the operational level during military campaigns.



Agile Development Process



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Industry 4.0 levers

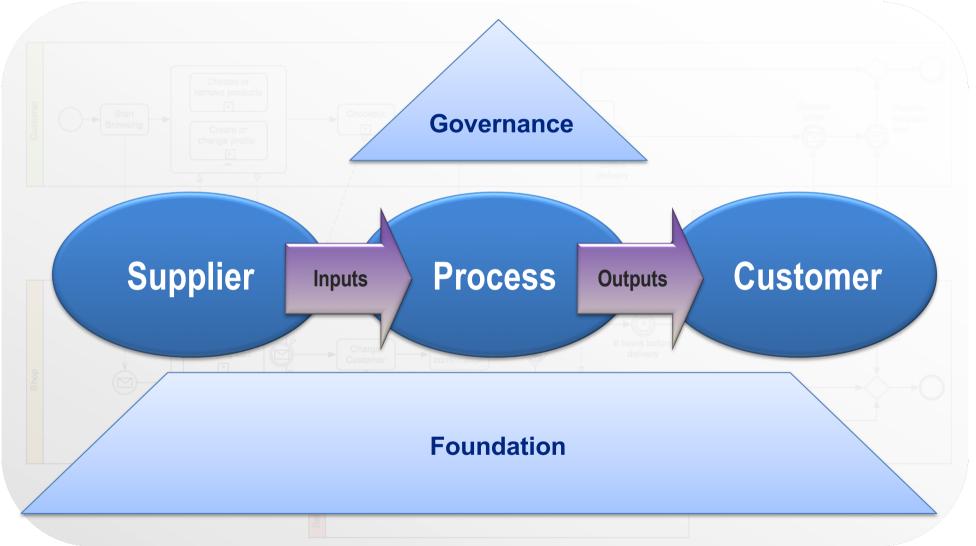
Digital Compass

McKinsey, 2016





Towards Smarter Production...





Summary and Conclusions

- Organizations need to embrace all the three modes of value exploration as well as value exploitation
- This require a proactive and differentiated approach to management
- To capture the gold nuggets require scaling and this comprise a challenge





Reflections from the back of the theater



- Digital transformation is ubiquitous
- Organizational transformations is a prerequisite
- From managing change towards staging change
- We don't want to talk about
 - Failed IT projects
 - Security and trust

