Data Analytics &
De Maakindustrie
PRODUCTION TECHNOLOGY & MECHATRONICS

- Machine tools
- Gears and transmissions
- Pumps and accessories
- Compressors
- Industrial automation
- Civil engineering machinery
- Ubelma
- Agricultural & horticultural machinery
- Textile machinery
- Machinery for food, packaging and pharmacy
- Industrial furnaces
- Food equipment

TRANSPORT SYSTEMS & SOLUTIONS

- Cars, trucks, buses and coaches
- Trailers, semi-trailers and bodywork
- Automotive suppliers and service providers
- Construction and repair of freight containers
- Railway and tramway
- Ship building and repair
- Cycles, cycle parts and accessories

BUILDING TECHNOLOGY

- Building structure
- Heating, refrigeration & ventilation
- Domotics & electrical installation equipment
- Office, shop & warehouse design
- Elevators
- Security
- Fire safety
- Lighting
- Green building platform
<table>
<thead>
<tr>
<th>Company</th>
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<tr>
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<td>Everis</td>
<td>RealDolmen</td>
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<td>Exquando</td>
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<td>Custodix</td>
<td>Real Impact Analytics</td>
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Big Data = ?

*Philip Ashlock*, the chief architect of Data.gov, said:

“While the use of the term is quite nebulous and is often co-opted for other purposes, I’ve understood ‘big data’ to be about **analysis for data that’s really messy or where you don’t know the right questions or queries to make** — analysis that can help you find patterns, anomalies, or new structures amidst otherwise chaotic or complex data points.”
# Data challenges

<table>
<thead>
<tr>
<th>Volume</th>
<th>Velocity</th>
<th>Variety</th>
<th>Veracity</th>
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<tbody>
<tr>
<td>Data at rest</td>
<td>Data in motion</td>
<td>Data in many forms</td>
<td>Data in doubt</td>
</tr>
<tr>
<td>Terabytes to exabytes of existing data to process</td>
<td>Streaming data, milliseconds to seconds to respond</td>
<td>Structured, unstructured, text and multimedia</td>
<td>Uncertainty due to data inconsistency and incompleteness, ambiguities, latency, deception and model approximations</td>
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</tbody>
</table>
• DATA DRIVEN PRODUCT DESIGN

• DATA DRIVEN FACTORY

• DATA DRIVEN SUPPLY
**MODEL 1**
- Solid bars
- Traditional design
- Weight: *10.3 kilograms*
- Displacement: *0.8 micrometers*

**MODEL 2**
- Uniform lattice
- Smart design with ALM
- Weight: *4.1 kilograms*
- Displacement: *4.2 micrometers*

**MODEL 3**
- Evolved lattice
- Evolutionary design with ALM
- Weight: *2.9 kilograms*
- Displacement: *6.1 micrometers*
• DATA DRIVEN PRODUCT DESIGN
• DATA DRIVEN FACTORY
• DATA DRIVEN SUPPLY
From Industry 1.0 to Industry 4.0: Towards the 4th Industrial Revolution

1. Industrial Revolution
   - End of 18th Century
   - Through introduction of mechanical production facilities powered by water and steam

2. Industrial Revolution
   - Start of 20th Century
   - Through introduction of mass production based on the division of labour powered by electrical energy

3. Industrial Revolution
   - Start of 70ies
   - Through introduction of electronics and IT for further automation of production

4. Industrial Revolution
   - Today
   - Based on Cyber-Physical Production Systems

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AGORIA
no future without technology
• DATA DRIVEN PRODUCTION

• DATA DRIVEN ENERGY MANAGEMENT

• PREDICTIVE / PRESCRIPTIVE MAINTENANCE
Source: McKinsey & Company -
http://www.mckinsey.com/insights/operations/how_big_data_can_improve_manufacturing
The Internet of Things and Services as a Basis for the Smart Factories in the Industry 4.0
Products with Integrated Dynamic Digital Storage, Sensing, and Wireless Communication Capabilities

⇒ The product as an information container
  – The product carries information across the complete supply chain and its lifecycle.

⇒ The product as an agent
  – The product affects its environment

⇒ The product as an observer
  – The product monitors itself and its environment

I was produced on 30 April 2010 and shipped on 3 May 2010

Grasp at the middle

2 mins open
Please close!
Advanced Industrial Assistant Systems Based on Augmented Reality Technologies

Industrial Environment

Industrial Worker with Google Glasses

Tools

Mobile, Interactive and Situation-Aware Tutoring

AGORIA

no future without technology
• DATA DRIVEN PRODUCTION

• DATA DRIVEN ENERGY MANAGEMENT

• PREDICTIVE / PRESCRIPTIVE MAINTENANCE
• DATA DRIVEN PRODUCTION

• DATA DRIVEN ENERGY MANAGEMENT

• PREDICTIVE / PRESCRIPTIVE MAINTENANCE
WINTELL Infrastructure

- SCADA: Production data
- CMS: Reliability data
- CMMS: Maintenance & Asset mgt
- WEATHER: Modelling & Forecasting
- Storage: Historian
- Web Portal
- Simulation Tool
- Datamining

AGORIA: no future without technology
• DATA DRIVEN PRODUCT DESIGN

• DATA DRIVEN FACTORY

• DATA DRIVEN SUPPLY
Impact of Plant and/or Enterprise 'Big Data' on Manufacturing Performance Improvements

- Better forecast products / production: 46%
- Understand plant performance across multiple metrics: 45%
- Service and support customers faster: 39%
- Real-time alerts based on analyzing manufacturing data: 38%
- Correlate manufacturing and business performance information together: 36%
- Correlate performance across multiple plants: 36%
- Mine combinations of manufacturing and other enterprise data: 31%
- Perform predictive modeling of manufacturing data: 31%
- Improve interactions with suppliers: 31%
- Don't know: 29%
- Understand customer requirements for new products: 24%
- I don't think they will use plant 'big data': 6%

Source: LNS Research and MESA International
SUPPLY CHAIN MANAGEMENT & BIG DATA
Thank you!

Contact:

ferdinand.casier@agoria.be