Manufacturing in the Age of Experience

Dassault Systèmes

a **Scientific** company

Serving **Science, Technology** and **Art** for a sustainable society

11,000 passionate people

- 106 nationalities
- One global R&D/34labs
- A **unique** software platform

170,000 enterprise customers

- 12 industries in 140 countries
- >10 million on premise users
- >100 million online users

3,500 partners

- Research & Education
- Software & Technology
- Sales & Services

Long-term driven

- Majority shareholder control
- **Revenue**: **$ 2.6 Bn***
- Operating margin: 31.6%*

** Non-IFRS*

DELMIA APRISO

DASSAULT SYSTEMES | **IF WE** ask the right questions we can change the world.

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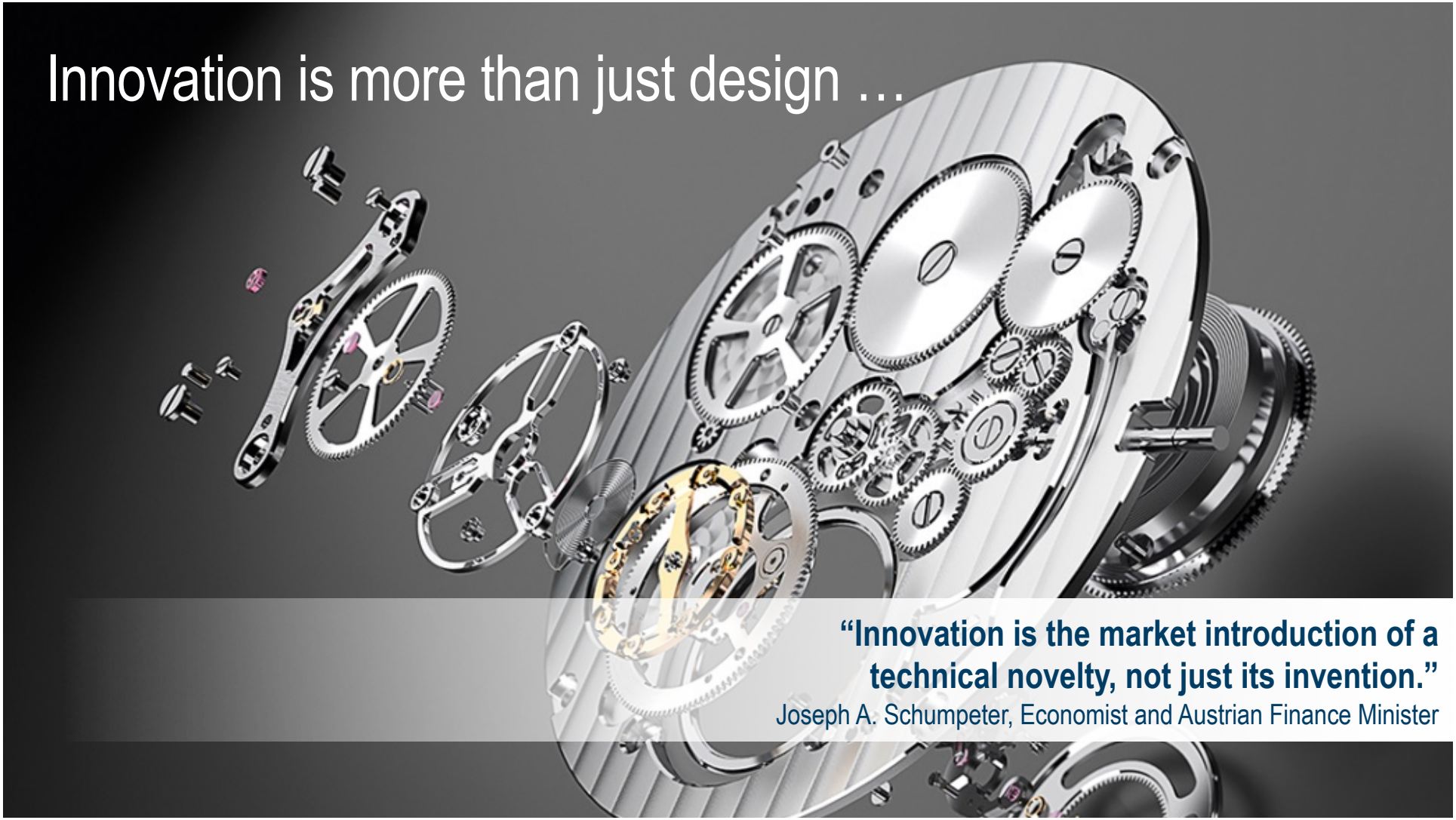
Innovation is more than just design …



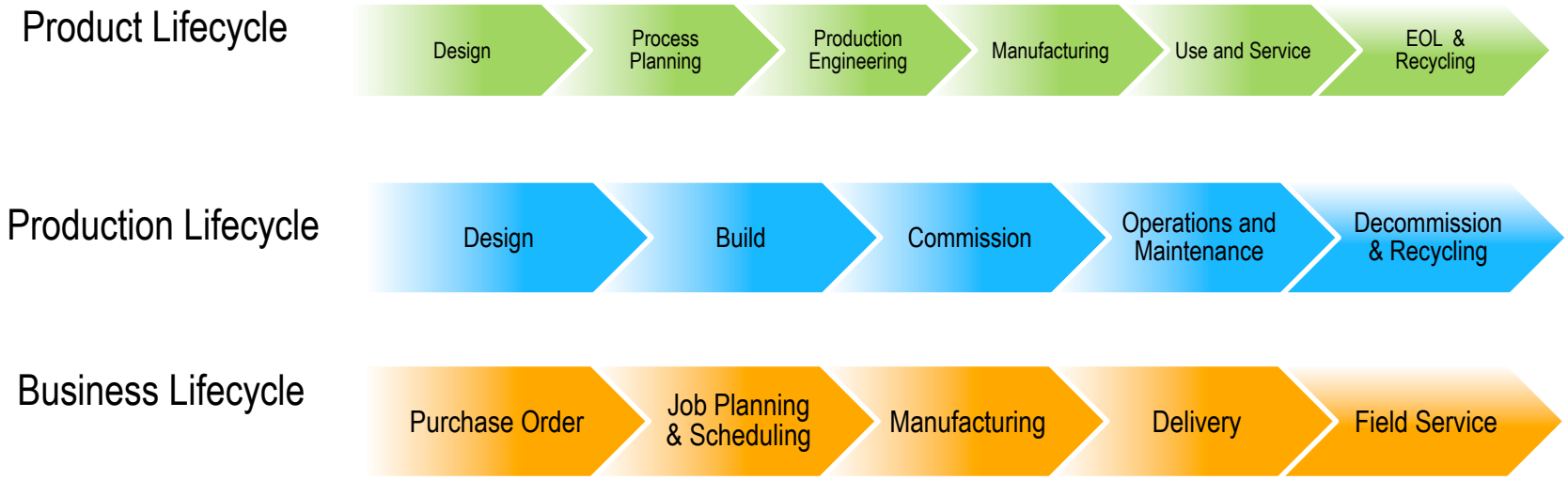
“Innovation is the market introduction of a technical novelty, not just its invention.”

Joseph A. Schumpeter, Economist and Austrian Finance Minister

Delivering innovation requires a perfect launch

Delivering innovation requires operational excellence

Day in the Life of a Manufacturing…



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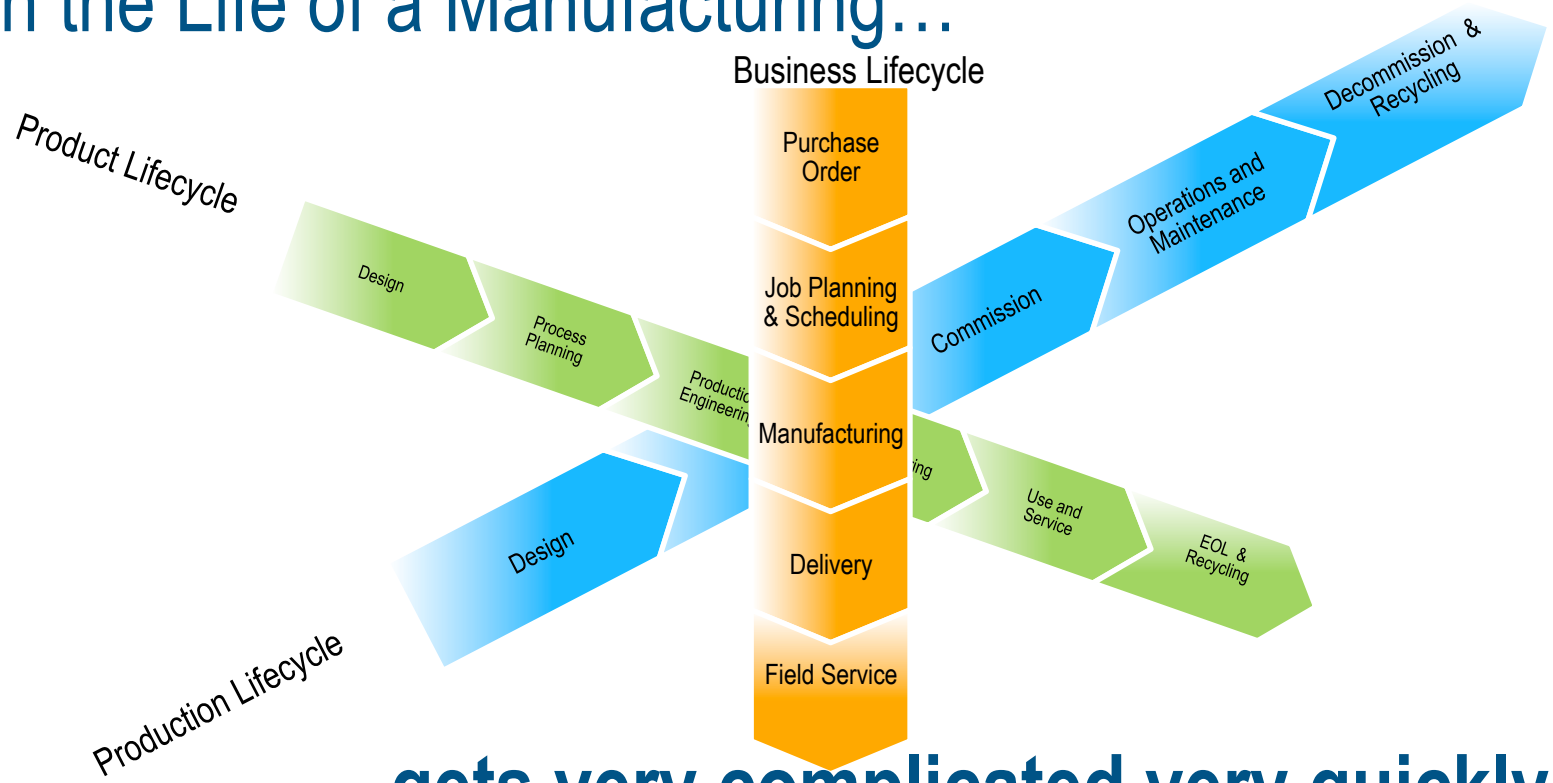
Day in the Life of a Manufacturing…



… gets very complicated very quickly.

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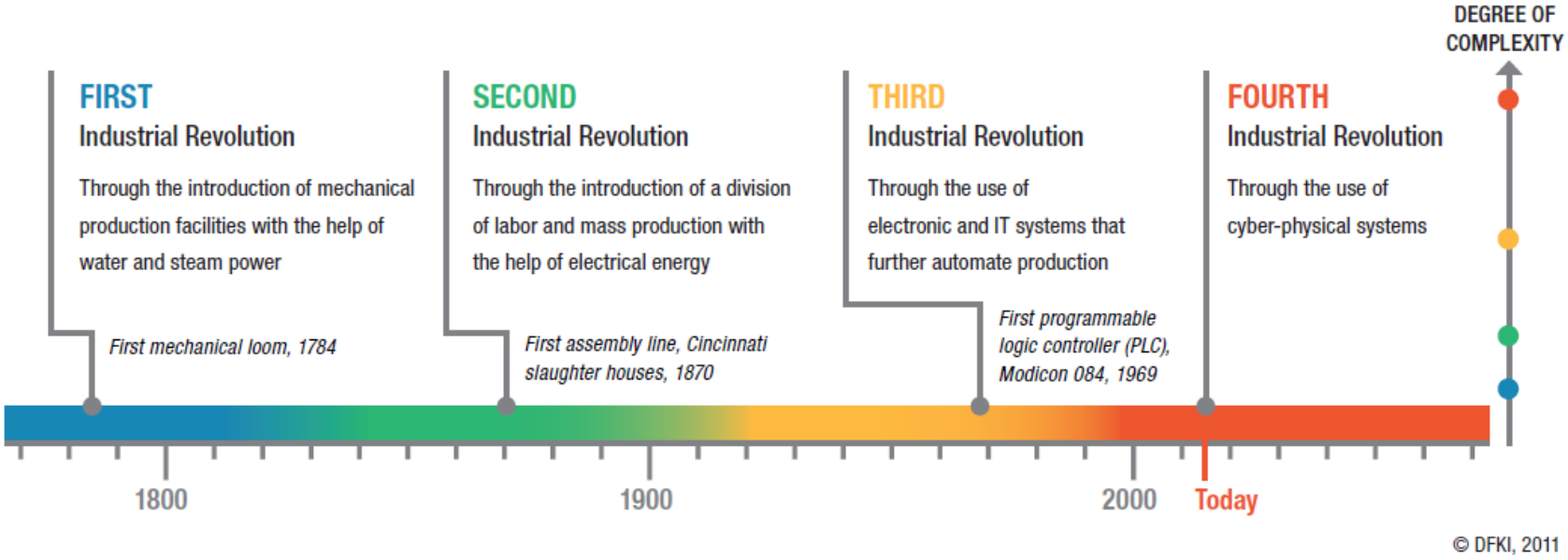
Delivering innovation requires continuous improvement

“Everyone has a plan until they get punched.”
Mike Tyson, Heavyweight Boxer

Deliver what your customer (will) demand…

… simultaneously mastering the perfect launch, operational excellence and continuous improvement.

Enter the Fourth Industrial Revolution



By 2020 we will live in a world where ~ 100 billion “smart” connected devices will be capable of controlling manufacturing operations and distribution

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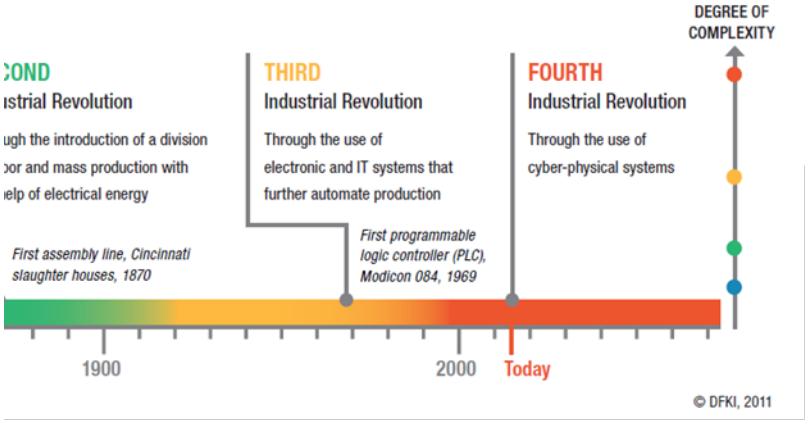
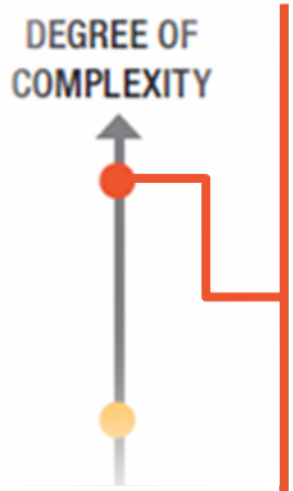
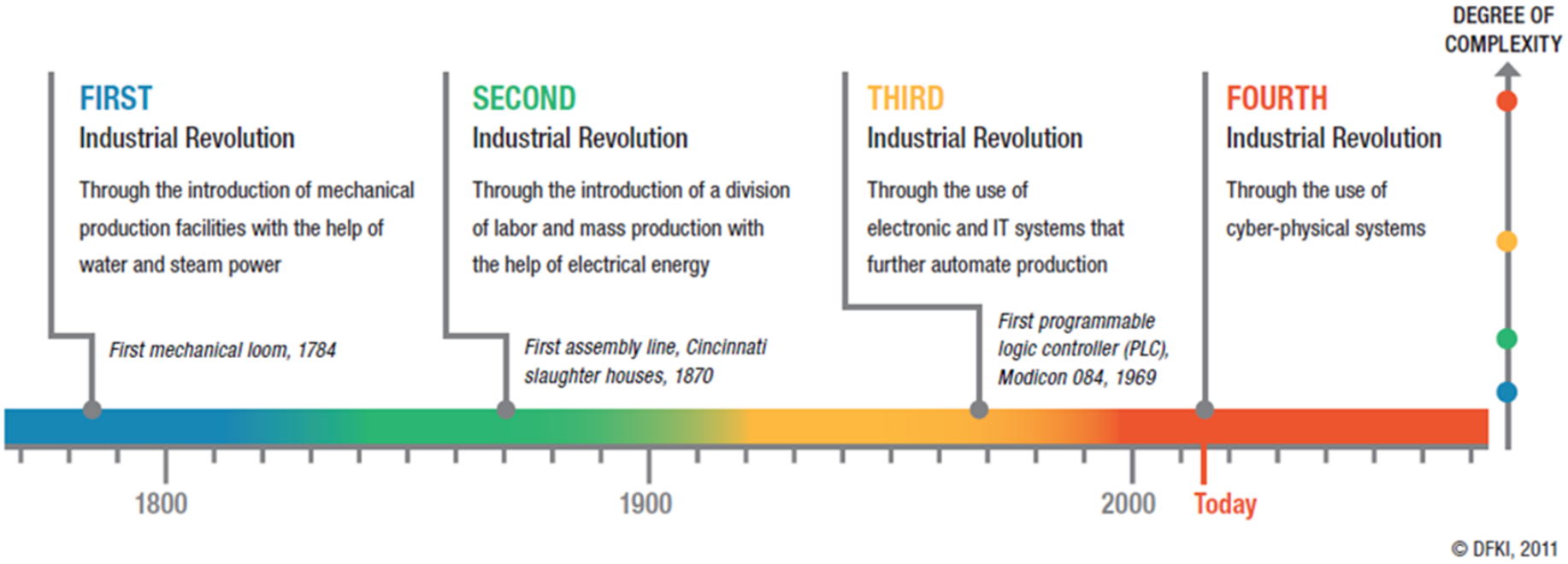




- *Pace of change accelerating*
- *Product proliferation*
- *Know your Supply network*
- *Ever increasing quality expectations*
- *Intensifying profit squeeze*
- *Manufacturing attractiveness & skills drain*
- *Global demand with local responsiveness*
- *What's next in technology*

Enter the Fourth Industrial Revolution



By 2020 we will live in a world where ~ 100 billion "smart" connected devices will be capable of controlling manufacturing operations and distribution

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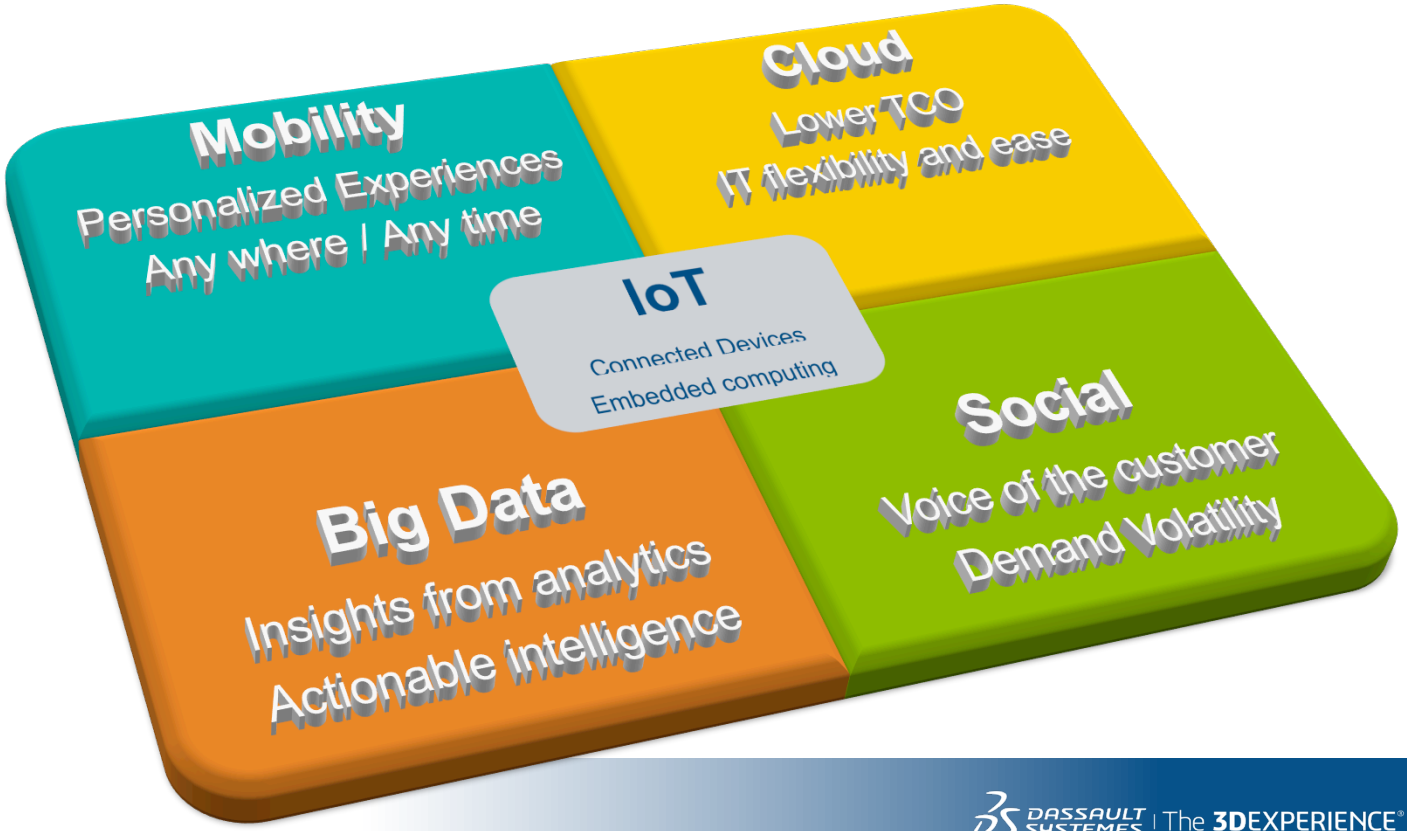
5 tech trends impacting manufacturing



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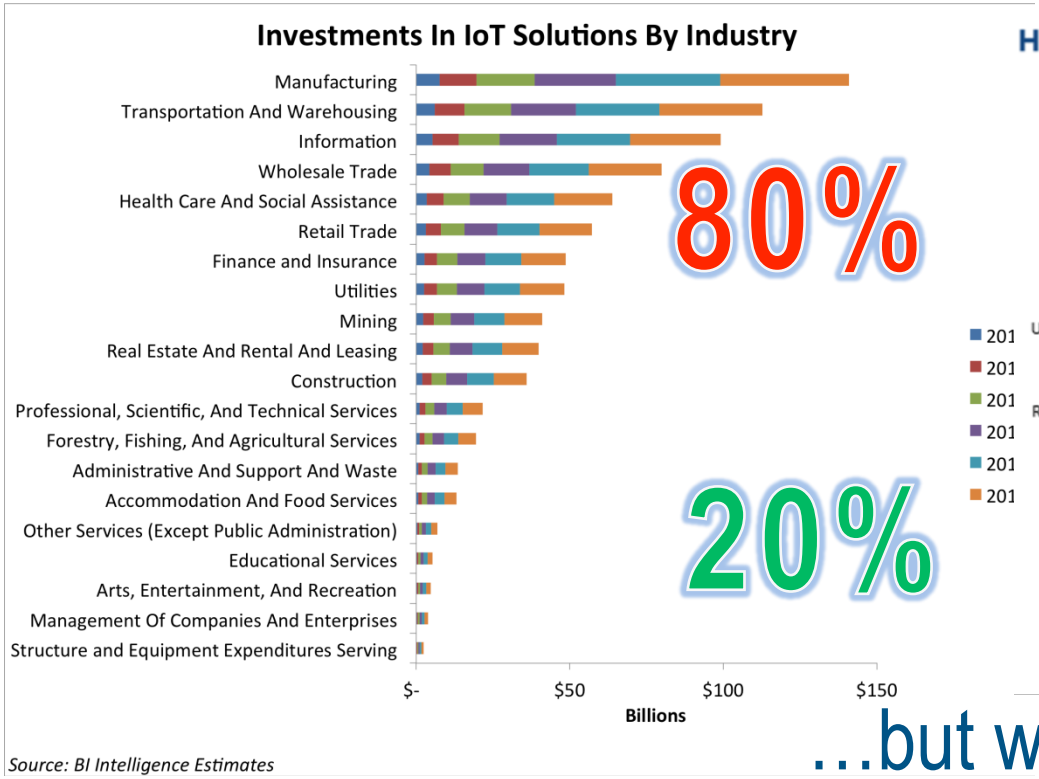
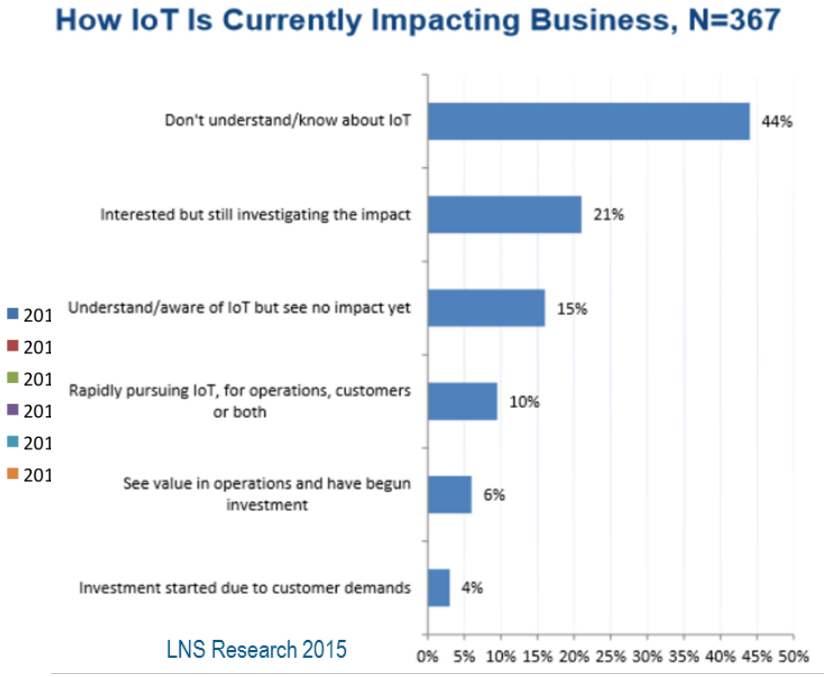
We already know how to connect to things…



Source: BI Intelligence Estimates



…but we have a long way to go.

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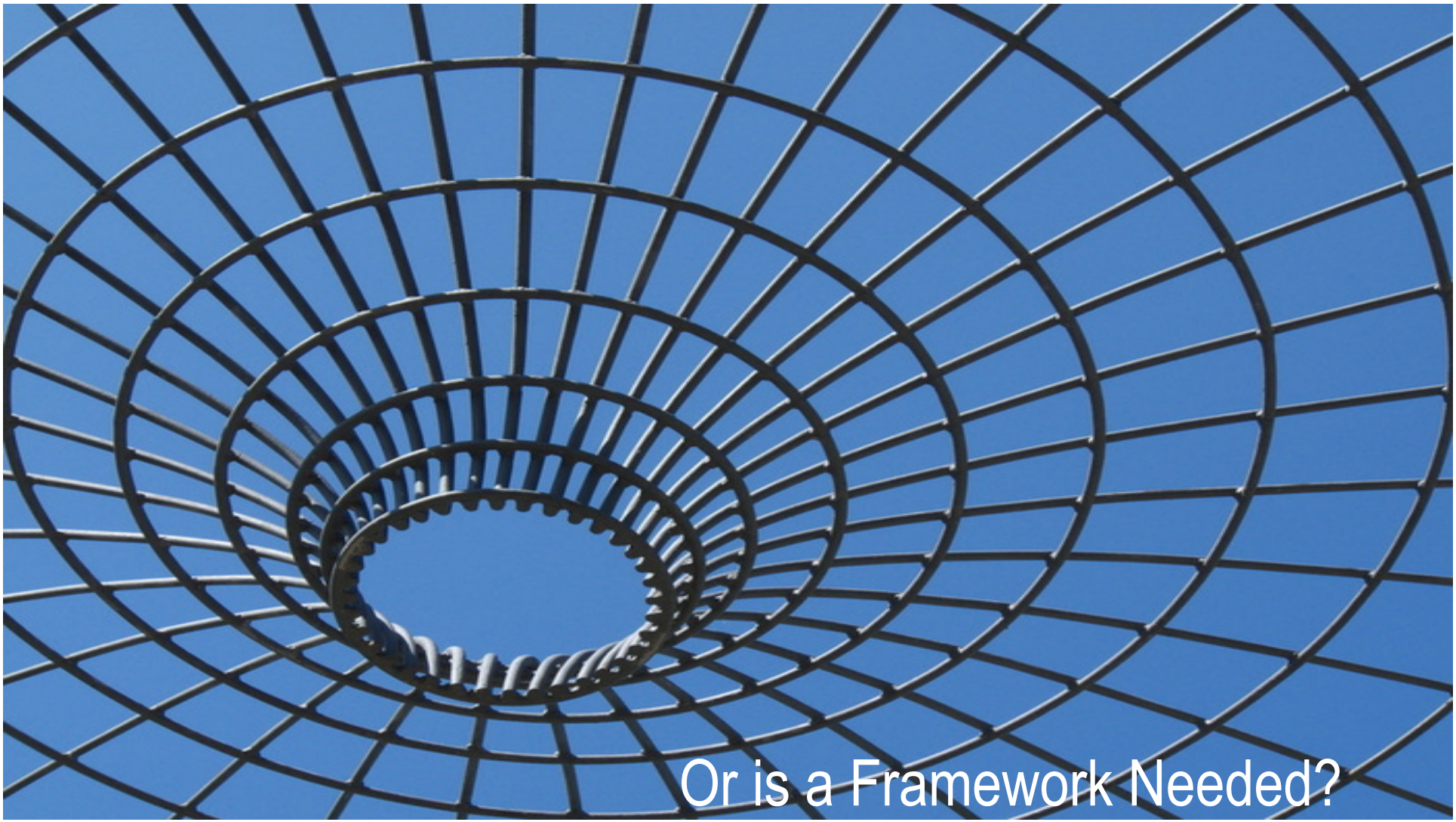
Do we need an infrastructure?


Or is a Framework Needed?

What we need is a Manufacturing Platform

IOT (Manufacturing) Platform Checklist

- ✓ **OPENESS, STANDARDS, AND SOA**
  - Open interfaces and standards (i.e. OPC-UA, HTTPS, AMQP, MT Connect)
  - Middleware or shared abstraction
  - Security and scalability
  - Adopt a heterogeneous vision – read multiplayer integration

- ✓ **DATA MANAGEMENT (Collection – Preparation – Integration)**
  - Big Data and an ability to extract value from it
  - Device instances & hierarchies / Events related to devices
  - Semi-structured and unstructured data

- ✓ **EVENT MANAGEMENT with BPM (BUSINESS PROCESS EXECUTION & MANAGEMENT)**
  - Tools to manage wide range of business processes & rules that control "things"

- ✓ **ANALYTICS: (real-time and near real-time)**
  - Historical & Predictive
  - Actionable & Collaborative
  - Self-Service

- ✓ **APPLICATION DEVELOPMENT / MASHUP BUILDER**
  - Tools that can handle different data sources / types / attributes

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Manufacturing: different focus & models at different tiers

1- Supply Chain		*Agile business recomposition*	*Logistics optimization*	*SME ecosystem*
2- Facility		*Ecological footprint*		*Equipment readiness*
3- Line		*Line optimization*		*Line flexibility*
4- Station		*New materials and processes*		*Design for Manufacturing*
5- Resources (Man, Machine, Material)		*Robotics and Cobotics*		*Augmented-Man capabilities*
6- Interface		*Industrial Internet of Things + Cloud*		

DIGITAL INTENSITY

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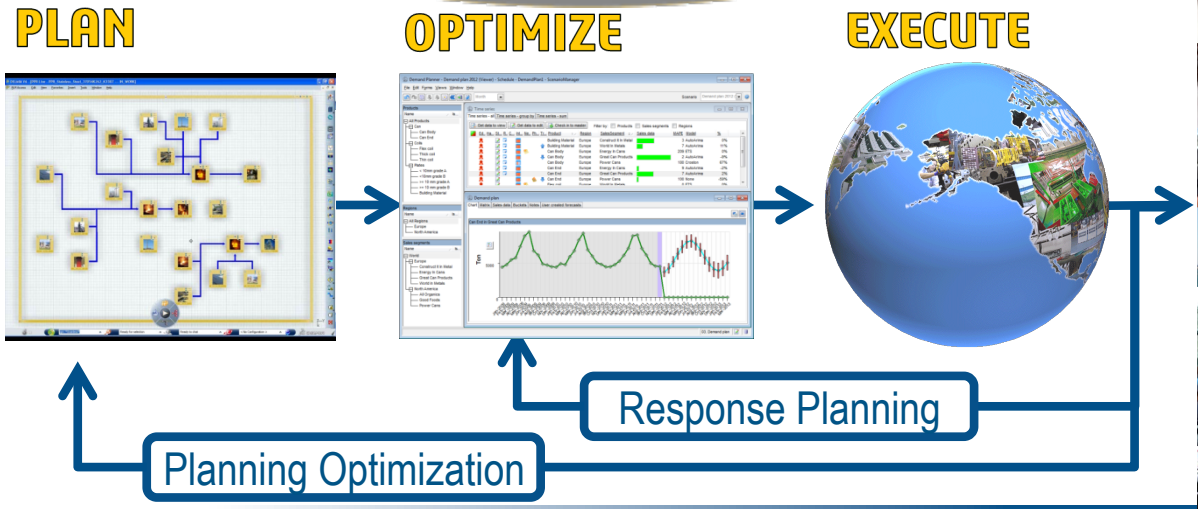
V+R: A new Business Experience for Global Industrial Operations

V+R

GLOBAL INDUSTRIAL OPERATIONS

- Digital Twin
- Demand
- New Product Introduction
- Engineering Changes
- Product Mix
- Reuse of Best Practices
- New / Optimized Process
- New Suppliers
- New Distribution Centers
- New Service offerings



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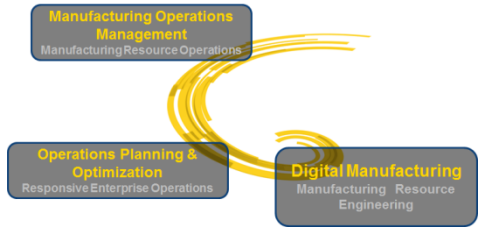
DELMIA Manufacturing Platform

Digitize all activities - Engineering through to Production



Engineering | Manufacturing Engineering | Production

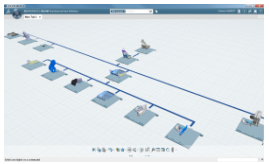
DELMIA Digital Manufacturing

MODEL & SIMULATE

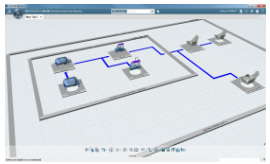
Design

Engineering DMU access
DMU Review

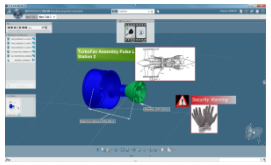
Manufacturing Items
Manuf. Assemblies, Fasteners



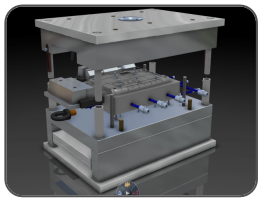
Process Planning
Routings



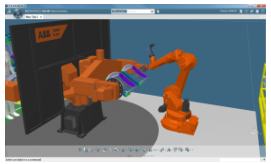
Work Instructions



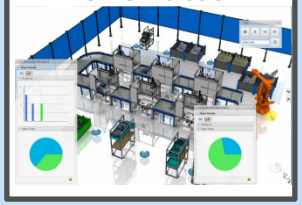
Tooling Design



Robotics& NC Progr



Layout Optimization Flow Simulation



Assembly Validation Ergonomics

ERP

DELMIA Manufacturing Operations Management (MOM): APRISO

OPERATE

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