INDUSTRIAL IOT DISCUSSION

thingworx®

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VP, FAD &E for PTC

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OVERVIEW

- Introduction
- IoT/I4.0 Discussion/Thoughts
- Questions

INTRO MAJOR GENERAL H. BRENT BAKER, (RETIRED)

- **Current Role -** V.P. Worldwide Federal Aerospace and Defense, PTC. Strategic planning and business development in the worldwide FA&D market vertical, a $250M+ / year business for PTC (20-25%).

- **Background -** 37 Years in USAF, most recently as Vice Commander US Air Force Materiel Command (AFMC). Oversaw 80,000 people and managed $60 billion annually in research, development, test and evaluation. Oversaw all 3 USAF sustainment centers in UT, OK, GA.

- **Logistician by Trade -** Directed policy and procedures affecting AFMC aircraft maintenance, munitions, supply, logistics plans, transportation and packaging methods, and logistics data systems…both fielded and emerging weapon systems. T-38 one of my key programs.

- **Education** - Bachelor of Science degree in industrial technology from Southern Illinois University and a Masters of Science degrees from Central Michigan University and Air University.

MARKET TRENDS DRIVING INDUSTRIAL DISRUPTION

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WORKER SHORTAGE

Ten million jobs with manufacturing organizations cannot be filled today due to a growing skills gap.

WORLD ECONOMIC FORUM

RISK & COST PRESSURE

Global Manufacturing PMI at lowest level since 2016 due to deteriorating global export orders and business conditions.

J.P.Morgan

DIGITAL DISRUPTION

At the current churn rate, about half of today's S&P 500 firms will be replaced over the next 10 years.

FORTUNE 500

DIGITAL TRANSFORMATION IS ACCELERATING

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The Digital Thread

"Unleashing a seamless flow of data across the value chain that will link every phase of the product life cycle: from design, sourcing, testing, and production to distribution, point of sale, and use." - McKinsey

40%
plan to provide Product as a Service platforms

60%
rely on digital platforms for their ecosystem

35%
Digital Twin CAGR between 2019 and 2023

91%
unify product and manufacturing process data

Sources: IDC, IDC Worldwide Smart Manufacturing 2019 Predictions; Deloitte 2019 Industrial Manufacturing Predictions here

TRANSFORMATION IS NOT AN OPTION

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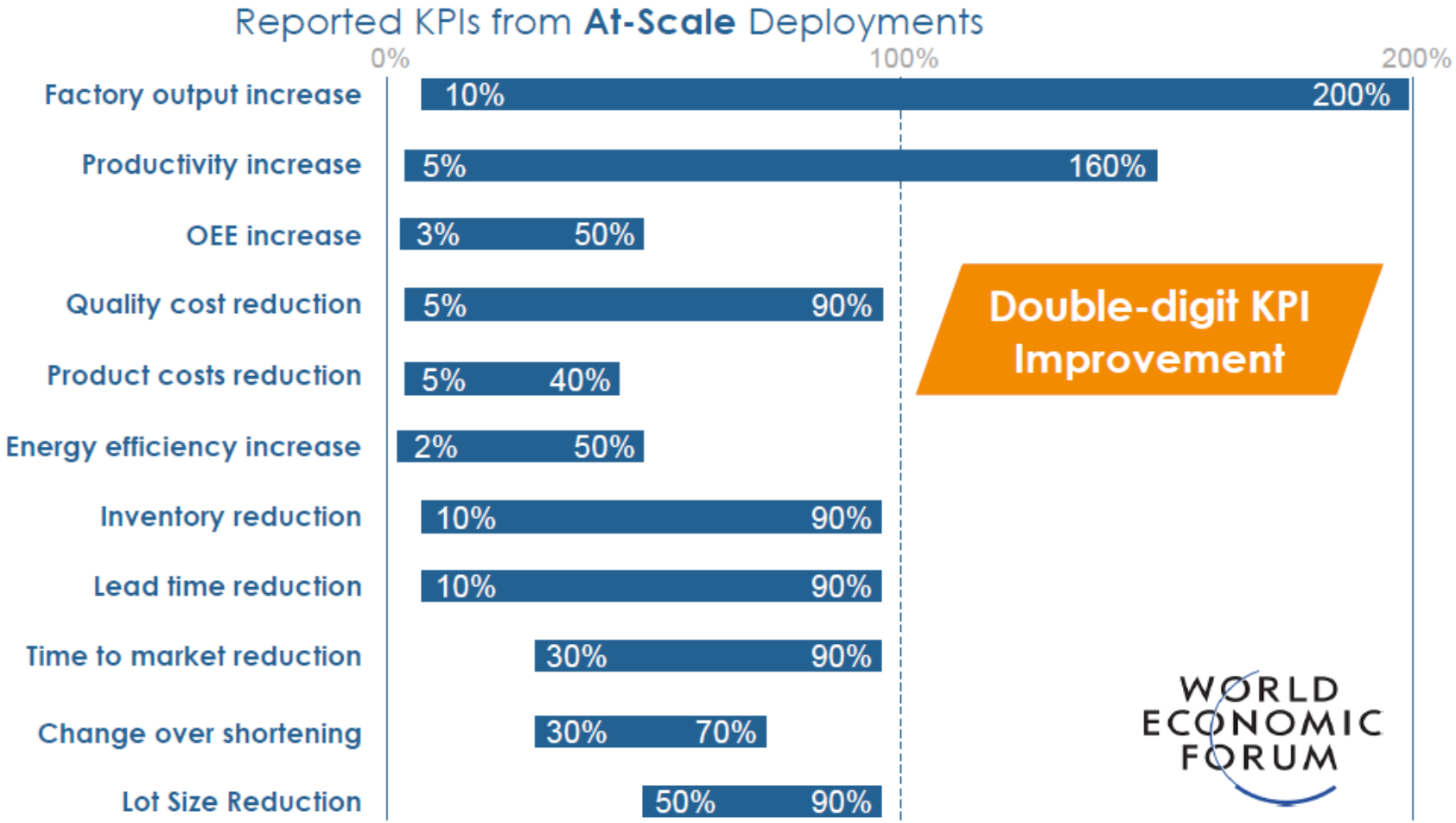
Lighthouse implementations yield MASSIVE impact and…



… failure to act is serious

Over the next 10 years,

1/2

of today's S&P 500 firms will be displaced

STANDARD &POOR'S

* World Economic Forum - Fourth Industrial Revolution Beacons of Technology and Innovation in Manufacturing, Jan of 2019

400+ CUSTOMERS & 2000+ FACTORIES

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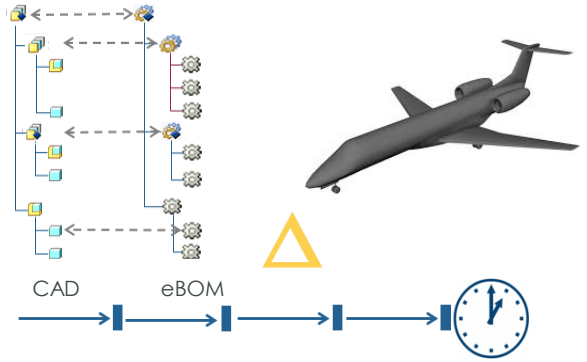
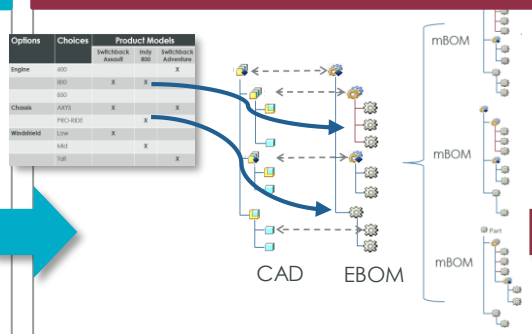
DIGITAL INFRASTRUCTURE FOR PROGRAM MANAGEMENT

BOM & Configuration Mgmt.

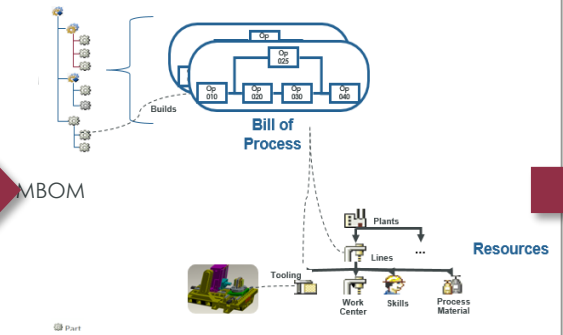


Retrieve CAD/BOM Visualization for EBOM structure

Manufacturing Engineering

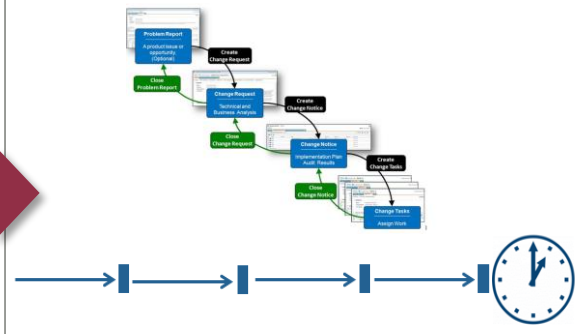


Transform EBOM to MBOM with options and variants



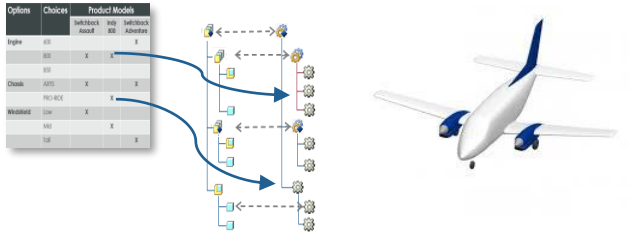
Concurrently Develop Process Plans and Digital Validation

Enterprise Change



Manage change from Eng. to Mfg. and *release to Enterprise*

Requirements Engineering



Manage traceability from requirements to systems modeling to BOM

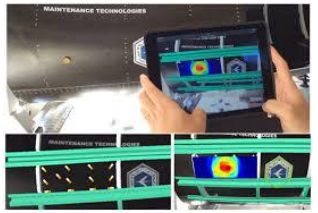
Design Share

Augmented Reality Design Review

Digital Work Instructions

2D/3D Digital Assembly Instructions and Paperless Operations, Augmented Reality Instruction Authoring

Service Experiences



Augmented Reality Service Information

VIA MARKET-PROVEN INDUSTRIAL SOLUTION SUITES

Service Optimization
Improve customer success, reduce service costs, and deliver new value via product performance and world class service

Product & Service Innovation
Develop new products, services, and business models that enable differentiation and new revenue opportunities

Manufacturing Efficiency
Improve operational efficiency, reduce manufacturing costs, accelerate time to production, and ensure quality and compliance

Engineering Excellence
Seamless data and model centric workflow that enables data driven decisions throughout the design and manufacturing process

Sales & Marketing Experiences
Virtual product demonstrations, product companions, "voice of the product" feedback, and augmented experiences

PRODUCTS | PEOPLE | PROCESSES

CREATING AN INTELLIGENT MANUFACTURING PROCESS
A THINGWORX CASE STUDY

ptc

Real-time production monitoring decreased errors & rework, while improving quality & efficiency

AIRBUS

DRIVING OPERATIONAL EXCELLENCE WITH REAL-TIME VISIBILITY

A THINGWORX CASE STUDY WITH KALYPSO

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Deploying a factory of the future with more efficient and flexible production:

- Improving OEE with production KPI monitoring and actionable insights
- Reducing scrap and increasing throughput with visual quality monitoring
- Improving productivity with analytics-based operator scheduling

Autoliv

IMPROVING OVERALL EQUIPMENT EFFECTIVENESS

A THINGWORX CASE STUDY WITH MICROSOFT

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Implemented a cloud-based real-time performance tracking system to accelerate OEE improvements, increase packaging line performance, and gain real-time visibility into factories.

- Deploying enterprise-wide – 1 factory/month since 2018

Carlsberg Group

OPTIMIZING MANUFACTURING PROCESS EFFICIENCY

A THINGWORX CASE STUDY

ptc

Saving an average of $1 per tire with predictive analytics

Global Tire Manufacturer

DRIVING DIGITAL TRANSFORMATION ON THE SHOP FLOOR
A THINGWORX & KEPWARE CASE STUDY

ptc

Created a fully connected shop floor for real-time asset health monitoring and predictive maintenance to improve quality and speed of maintenance, repair, and overhaul services

Lufthansa Technik

CAPITALIZING ON SMART AIRLINE OPERATIONS

A THINGWORX & KEPWARE CASE STUDY

ptc

Leveraging real-time performance of baggage handling & passenger boarding bridges systems, delivering reduced downtime & maintenance costs, increasing fuel savings, & improving customer satisfaction

Southwest®

ENABLING WORKFORCE EFFICIENCY WITH IT/OT CONVERGENCE
A THINGWORX CASE STUDY

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Woodward developed a Manufacturing Information System (MIS) that provides standard digital work instructions with connected tools and visual management in their operations environment:

4,800 hours per year saved eliminating manual documents

Reduced training time from **7.5 to 2.5** days (Rock Cut Pumps Line)

WOODWARD

USECASE: CONDITION BASED MAINTENANCE

OSHKOSH DEFENSE

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VEHICLE MAINTENANCE USING AUGMENTED REALITY

ptc

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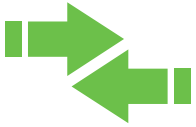
thingworx®

Purpose-Built Platform

Specific functionality designed for industrial IoT, including the connectivity, scalability, and security to grow with your business

Rapid Development, Deployment, and Extensibility

Integrated platform features and functions enable seamless development for quick, easy delivery of apps and AR experiences



Ultimate Flexibility

Options for deployment in the cloud, on premise, or in hybrid environments – including optimizations for Microsoft Azure

Engage and Experience

Build user interfaces with drag-and-drop tools and deploy them for web and mobile applications or AR experiences

Vibrant Ecosystem

Compatible with a wide range of products and services that simplify, accelerate, and enhance manufacturers' processes and strategies

OBJECTIVE:

Collaboratively create a state-of-the-art Industry 4.0 Intelligent Manufacturing Facility

Rockwell Automation

Microsoft

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Endress+Hauser
People for Process Automation

PURDUE
UNIVERSITY


ptc
QUESTIONS
ptc