

DIGITAL TRANSFORMATION: THE “JOURNEY” TO THE INDUSTRY 4.0

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ptc

Market Leadership



30,000
Total active customers



1,150
Active IOT customers



500+
IOT partners & resellers

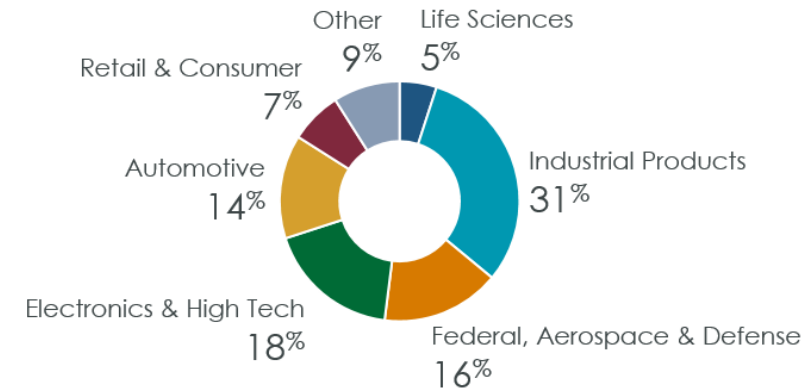


250,000
IOT/AR ecosystem
developers

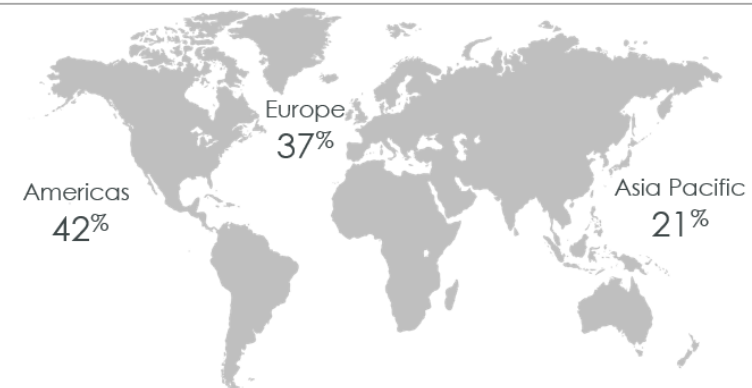


> US\$1 Billion
Fiscal Year 2016
Revenues

Key Verticals



Global Scale & Distribution



A WAVE OF TRANSFORMATION IS COMING TO MANUFACTURING



Smart Manufacturing

Industrie 4.0

Made in China 2025

33% (majority) of IoT economic value will come from the “factories” setting

- McKinsey Global Institute, 2015

Manufacturing operations is the IoT use case that will see the largest investment

- IDC, 2017

50B IoT Devices by 2020

THINGS ARE CHANGING



CROP VALUE

25% UP

PRODUCTION RATE 24.1

High 19.25.6
Low 18.72.5

365 RPM

14 3451 km

GOOD SPACING

14 16 18

GPS

Lat: 40.2271941
Long: -94.1249189

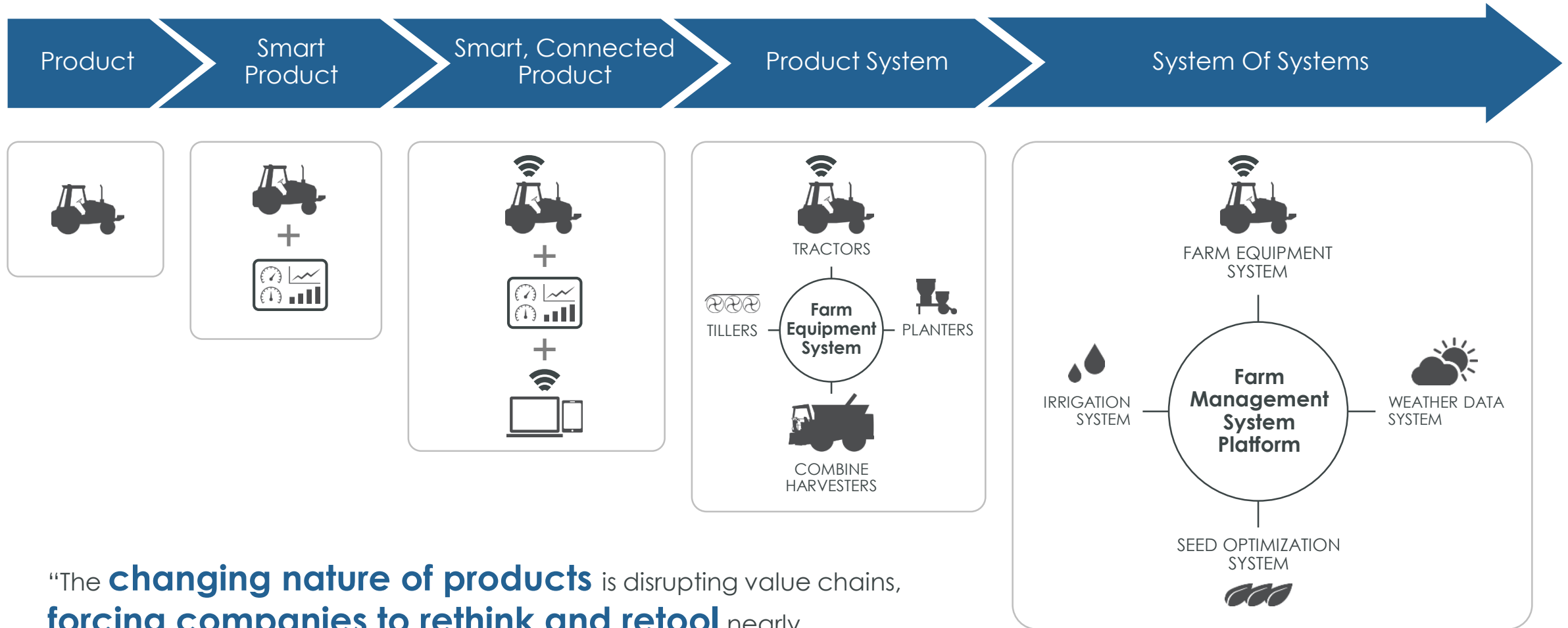


HYDRAULICS 43.3 psi

MOISTURE

14.0%

THINGS ARE CHANGING



“The **changing nature of products** is disrupting value chains, **forcing companies to rethink and retool** nearly everything they do.”

PLATFORM



ptc

Unlock the value created by the convergence
of the physical and digital worlds

SOLUTIONS

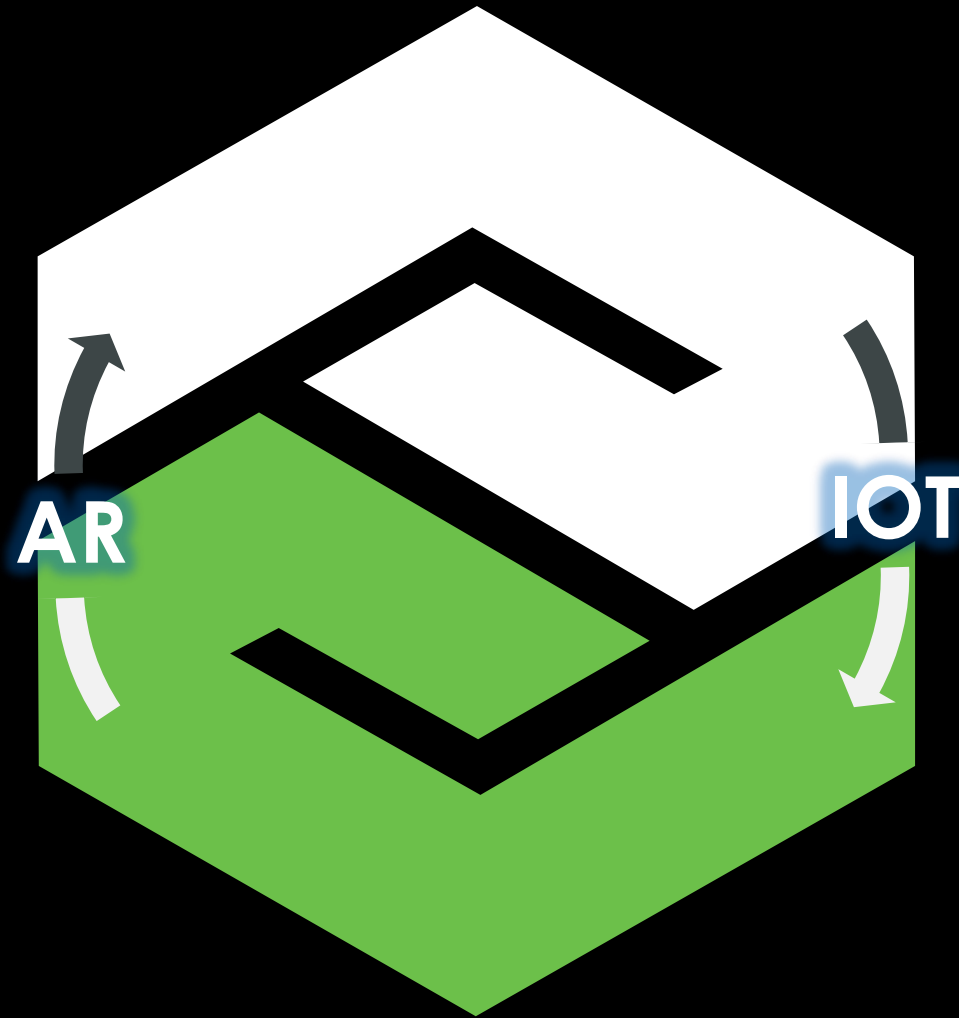
PTC AT A GLANCE



PHYSICAL WORLD

\$1B Invested
to Build Leading
AR and IOT Brands

- IoT & ANALYTICS | thingworx®
- AUGMENTED REALITY | vuforia™
- INDUSTRIAL CONNECTIVITY | kepware®



- CAD | creo®
- PLM | windchill®
- ALM | integrity™
- SLM | servigistics®

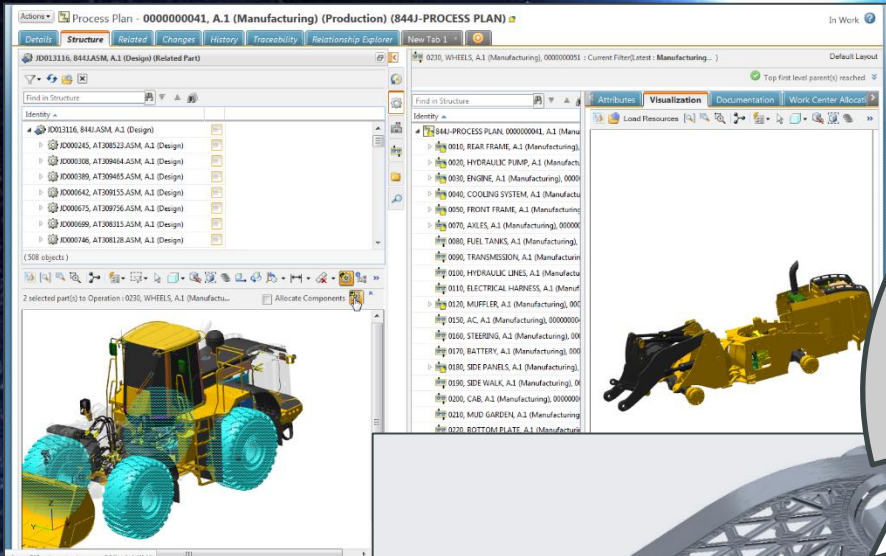
DIGITAL WORLD

30 Years Pioneering
the Digital Twin

PHYSICAL AND DIGITAL WORLDS

DIGITAL

Proven solution enterprise capabilities

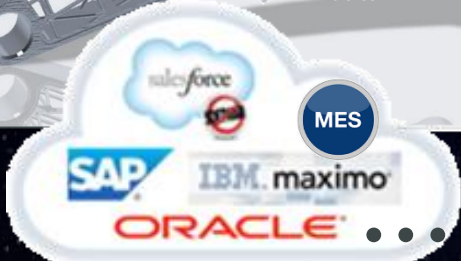
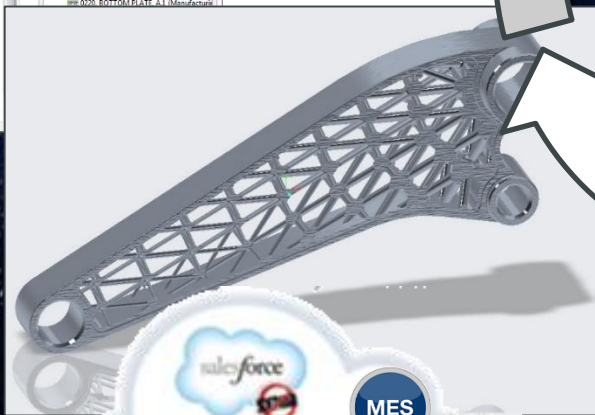


CAD |  **creo**

PLM |  **windchill**

ALM |  **integrity™**

SLM |  **servigistics™**



Any other business application

SPEED & FLEXIBILITY

PHYSICAL

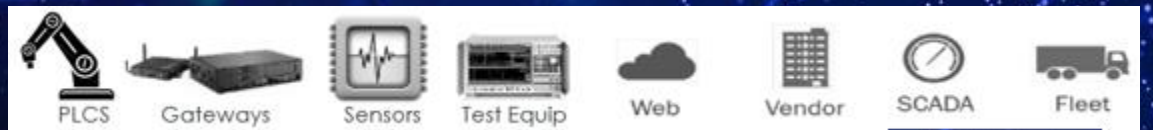
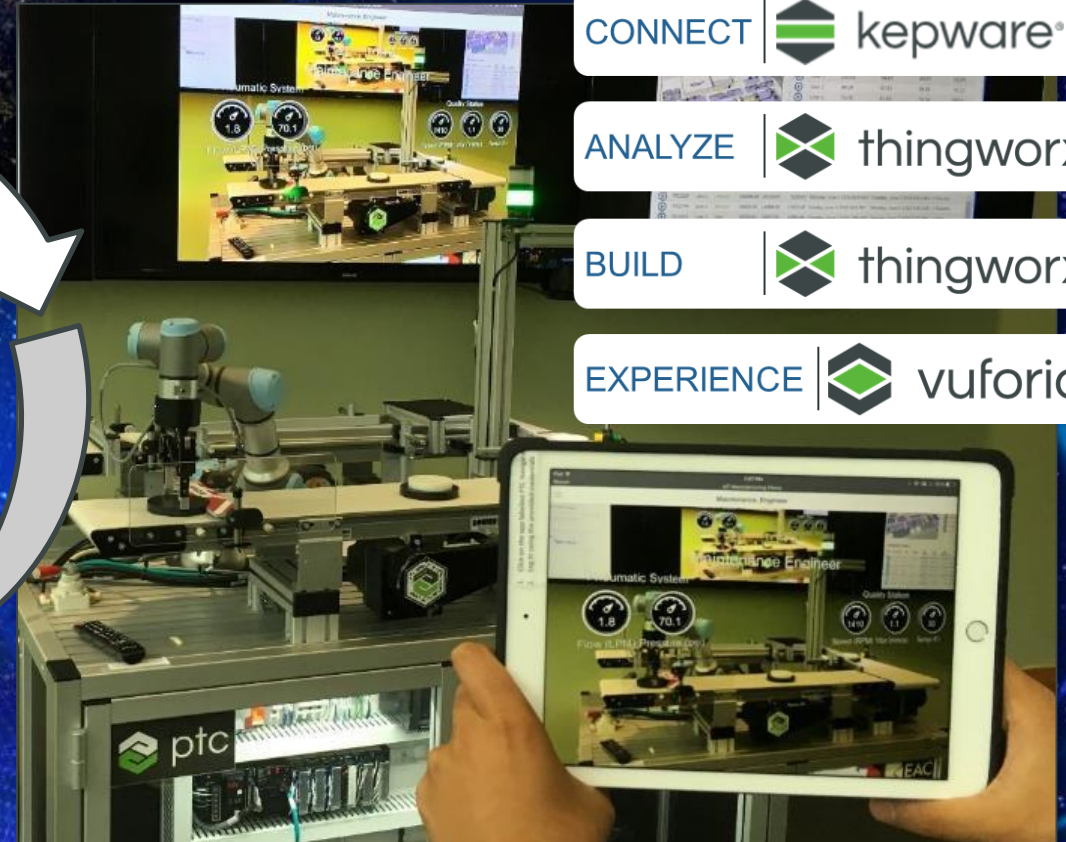
Complete IIoT Platform for the factory

CONNECT |  **kepure**

ANALYZE |  **thingworx®**

BUILD |  **thingworx®**

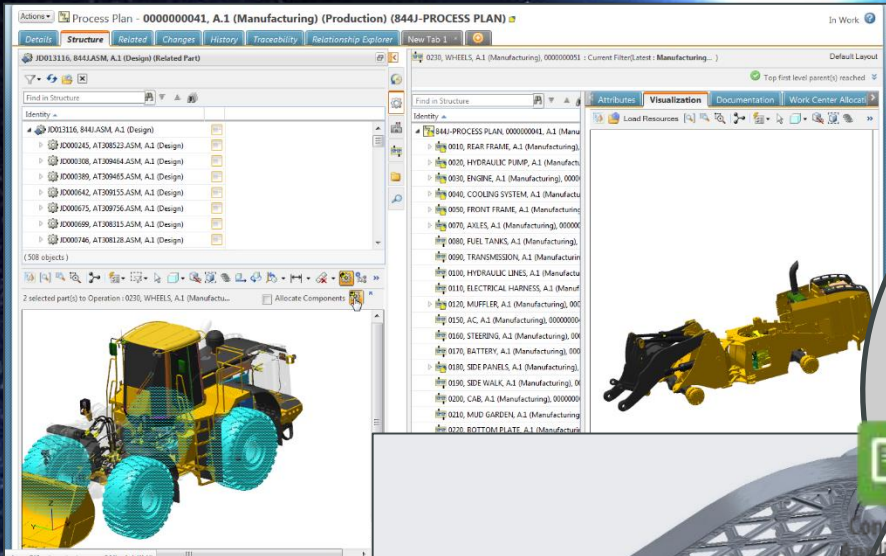
EXPERIENCE |  **vuforia™**



PHYSICAL AND DIGITAL WORLDS

DIGITAL

Proven solution enterprise capabilities



- CAD | **creo**
- PLM | **windchill**
- ALM | **integrity™**
- SLM | **servigistics™**



PHYSICAL

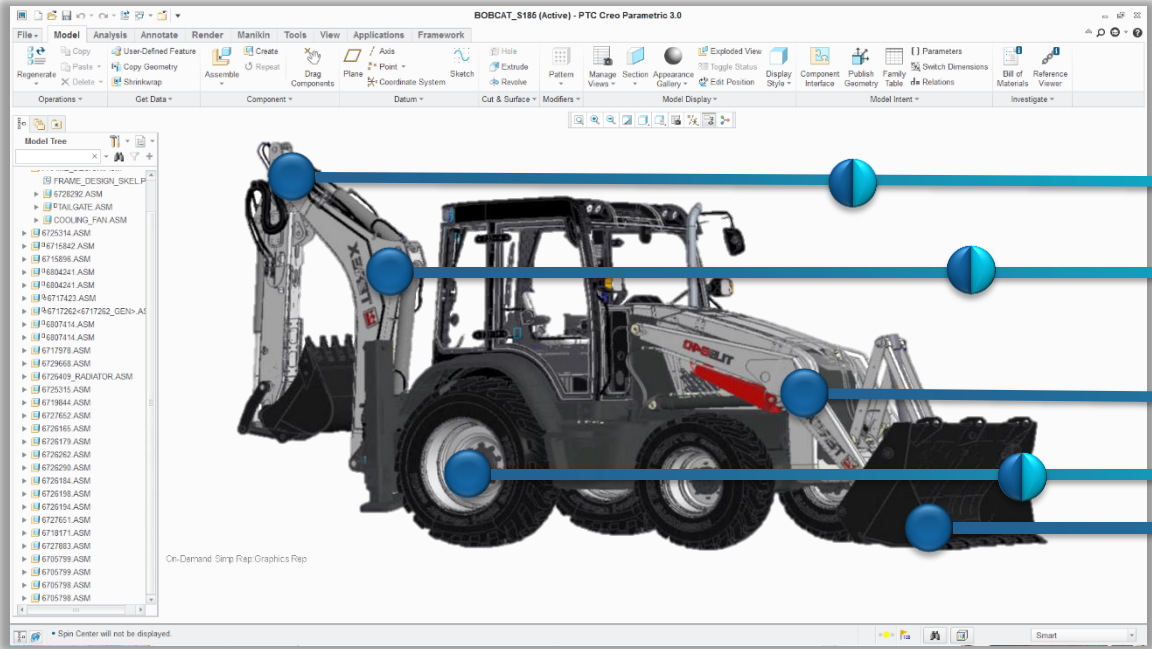
Complete IIoT Platform for the factory



- CONNECT | **kepware**
- ANALYZE | **thingworx®**
- BUILD | **thingworx®**
- EXPERIENCE | **vuforia™**

PTC Partner Ecosystem





ThingWorx
A PTC Business

Digital Twin

A purpose built digital representation of a specific asset or set of assets in the field, combined with the physical experience(s) of the asset(s)

DIGITAL TWIN OPPORTUNITIES

OPERATE



Worksite Setting



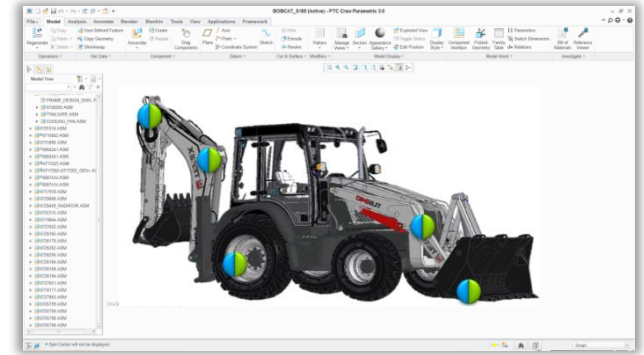
On-Machine

Digital Twin



CREATE

Engineering & Manufacturing



Engineer's Desktop



SERVICE



Field & Remote Service



SELL

Sales & Marketing



MFG



Digital/SC Manufacturing

THE MOST COMPLETE INTEGRATED IoT PLATFORM ON THE MARKET

ThingWorx



Connect

- Edge Connectivity
- Native Device Cloud
- 3rd Party Device Cloud Support
- Protocol Adaptors



Build

- Rapid Development Tools
- Mobile App Development
- Enterprise Extensions and process management
- 3rd Party System Connectors
- “Thing” Management and Optimization
- 3D “Thing” builder



Analyze

- Automated Machine Learning Technology
- Rules, Alerts & Notifications
- Pattern & Anomaly & Signal Detection
- Automated Predictive Modeling & Scoring
- Prescriptive Intelligence



Experience

- Leverage rich 3D animation and IoT data for experience creation
- **Digital Twin Experience**
- Market leading Augmented Reality technology - Vuforia



Manage/Collaborate

- Visual Alert & Rules Mgmt
- Asset Provisioning Mgmt
- Software & Content Mgmt
- Developer Community
- Developer Zone
- Marketplace



SCALE

- **Enterprise-ready Deployment Architecture**
- Millions of connected devices



SECURE

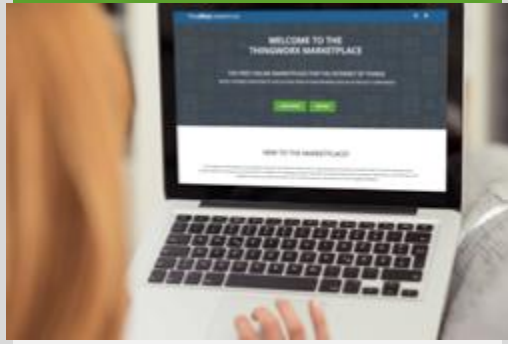
- Advanced Device Identity and Authentication
- Platform-Wide Identity Management

THE MOST COMPLETE INTEGRATED IoT PLATFORM ON THE MARKET

ThingWorx[®]



Connect



Build



Analyze



Experience



Manage/Collaborate



thingworx[®]

Industrial Innovation Platform

thingworx® studio

thingworx® view



Author & Publish
Experiences

Access & View
Experiences

Faster AR Authoring
Rapidly create content
without programming

Geared For 3D
Reuse existing models
& animated sequences

Real-Time Insights
Easily integrate IoT and
business systems data

Cutting-Edge Scalability
View experiences on smart
devices across the enterprise



Author AR
without Writing
Any Code



Easily Re-use
Existing 3D
Content



Present
Compelling AR
Sequences



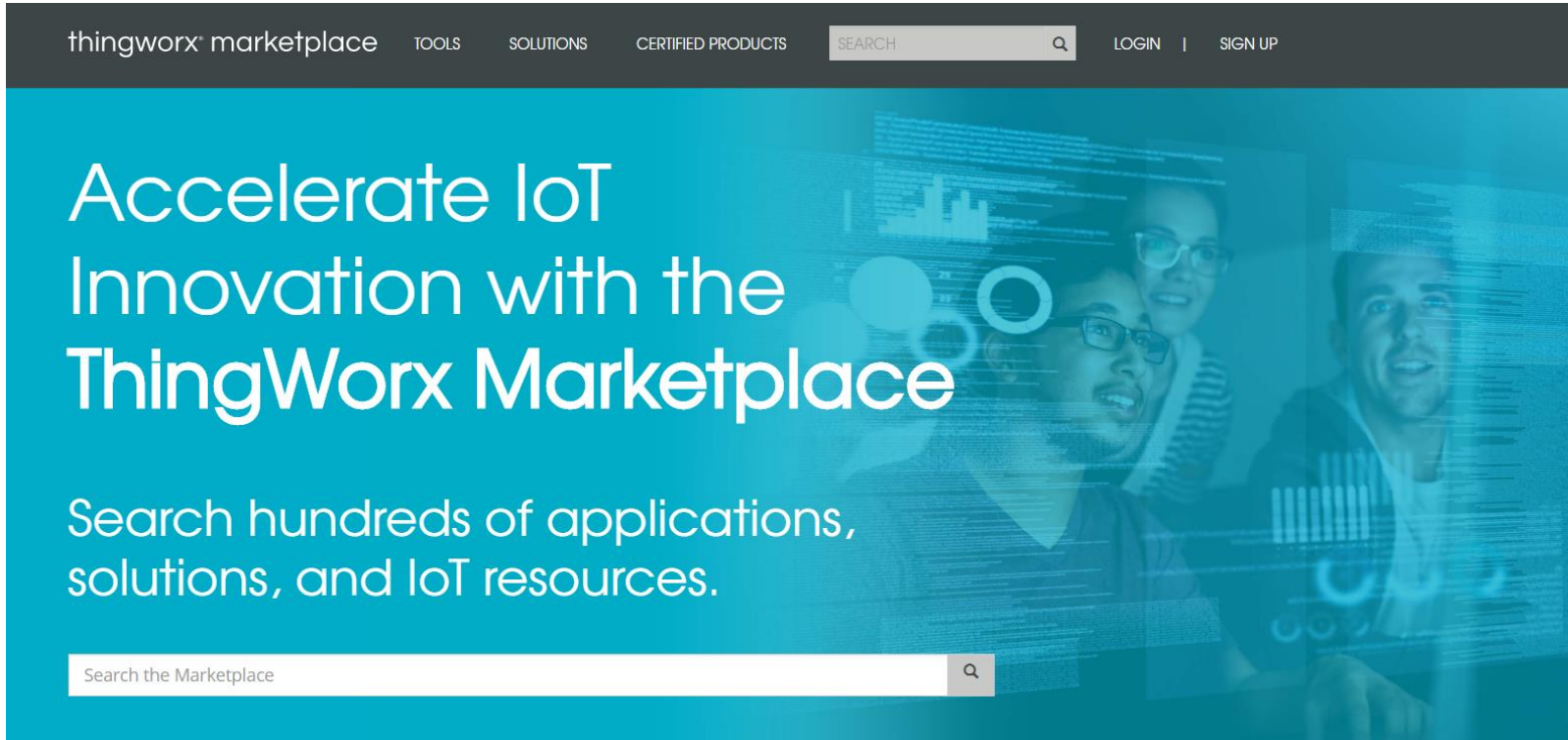
Accelerate
Delivery IoT
Data



Single App
Experience
Viewing



STARTER APPS TO ACCELERATE TIME TO VALUE



Find the Resources You Need to Accelerate



Build Your Own IoT Applications



Find Market-Ready Solutions

Have Resources to Offer on the Marketplace?

Promote your applications, services, and technologies to a community of solution builders and buyers.

Promote your IoT Solutions



Purpose Built

- ✓ For a role...
- ✓ To complete a task

Just the information needed

- ✓ From all the owning systems
- ✓ Aggregated together

Easy to consume

- ✓ On the device that is convenient
- ✓ With no need for training



Production Role



Purchasing Agent



Quality Inspector




Service Planner



thingworx navigate™ View Part Structure Administrator


Back To Search

PART DETAILS



Number: 000000329
 Name: 32053047pHl_a0007n23...
 Version: A.3 (Design)
 State: In Work
View in Windchill

SELECTED PART



Number: 0000002657
 Name: housing_assy_lh_abutment...
 Version: A.3 (Design)
 State: In Work
View in Windchill

PART STRUCTURE

Number	Name	Quantity	Unit	In Work	State	Version
000000329	32053047pHl_a0007n23				In Work	A.3 (Design)
000000311	a0007n2333.asm	1	each		In Work	A.3 (Design)
000000400	brake_pad_ob_washer_p1		each		In Work	A.3 (Design)
000000066	bracket_assy_lh_bracket1		each		In Work	A.3 (Design)
000000358	housing_assy_lh_screw_1		each		In Work	A.3 (Design)
000000317	brake_pad_ob_pad_assy1		each		In Work	A.3 (Design)
000000447	housing_assy_lh_abutmi1		each		In Work	A.3 (Design)
000000289	housing_assy_lh_housin1		each		In Work	A.3 (Design)
000000163	housing_assy_lh_seal_ip1		each		In Work	A.3 (Design)
000000081	guide_bolt_1_partbody_1		each		In Work	A.3 (Design)
000000383	housing_assy_lh_bleed_1		each		In Work	A.3 (Design)
000000216	brake_pad_ob_pad_assy1		each		In Work	A.3 (Design)
000000290	brake_pad_ib_pad_assy1		each		In Work	A.3 (Design)
000000245	bracket_assy_lh_exclude1		each		In Work	A.3 (Design)
000000315	brake_pad_ib_rivet_par1		each		In Work	A.3 (Design)
000000327	brake_pad_ib_washer_pu1		each		In Work	A.3 (Design)
000000145	housing_assy_lh_actuatc1		each		In Work	A.3 (Design)
000000242	bracket_assy_lh_guide t1		each		In Work	A.3 (Design)



THINGWORX MANUFACTURING APPS

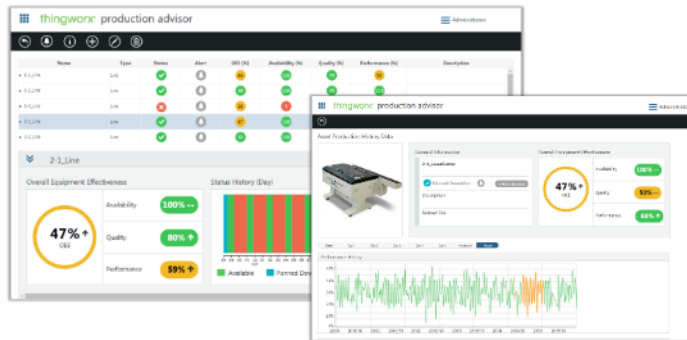


Transform your performance by giving your operations teams unprecedented capabilities to see, understand and act in real time. ThingWorx manufacturing apps accelerate your time-to-value and offer unmatched flexibility.

ThingWorx Production Advisor



Plant Manager



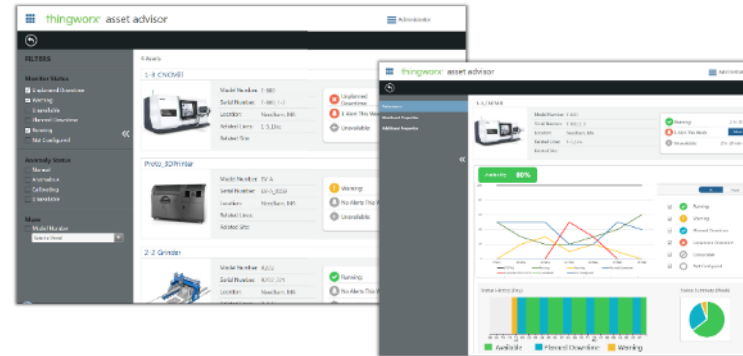
Optimize Production Performance

Real-time monitoring of production status and critical KPI's. Detect and react instantly to production schedule and quality issues.

ThingWorx Asset Advisor



Maintenance



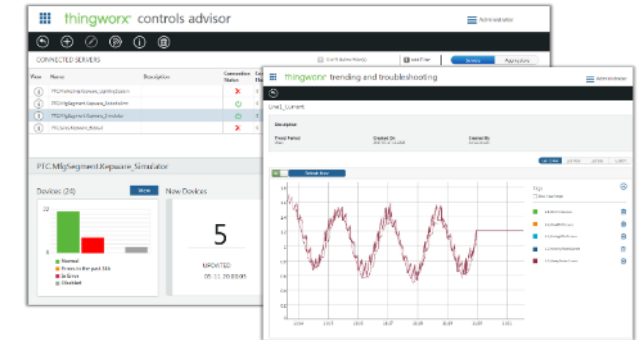
Reduce unplanned downtime

Real-time monitoring of the status and health of critical production assets. Detect anomalies to identify potential issues that could result in unplanned downtime.

ThingWorx Controls Advisor



Controls Engineer

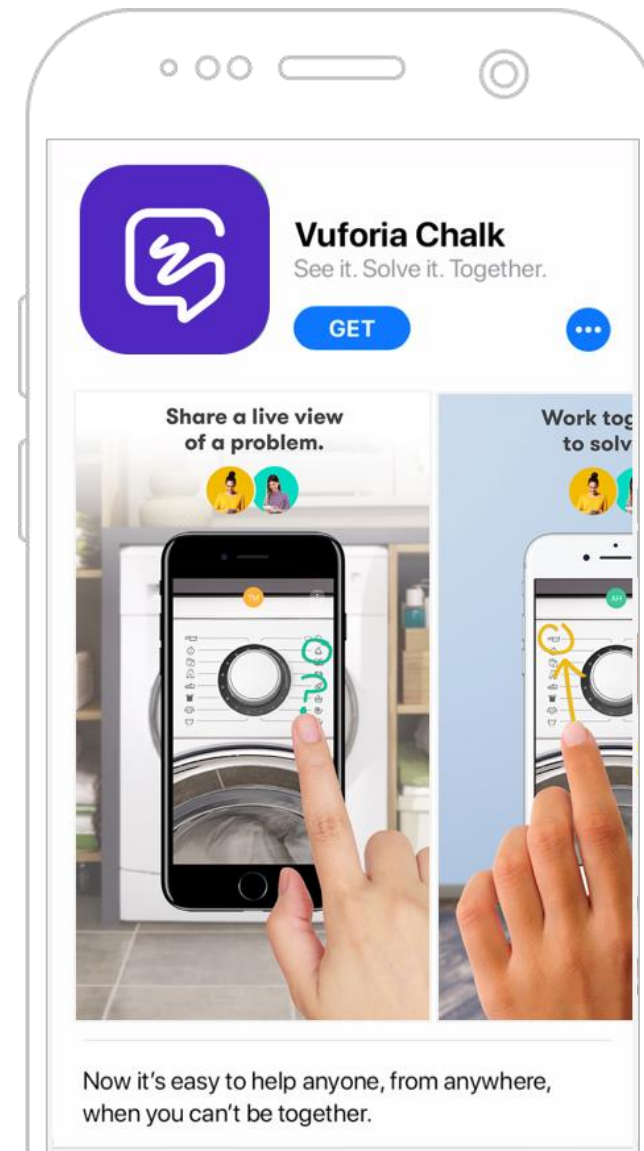


Ensure OT Network Data Quality

Unified real-time monitoring of all connected end points and related data elements on the OT system network. Rapidly and flexibly trend data to troubleshoot issues

vuforia™ chalk

Download on the
App Store



thingworx® view



“Combining HoloLens volumetric tracking with **Vuforia’s** ability to **recognize** and **interact** with **objects** helps create unique AR experiences.”



Steven Guggenheimer, Microsoft

“There is **nothing like** ThingWorx Studio from any other software vendor. With **ThingWorx Studio**, Microsoft HoloLens customers can get to production **incredibly faster.**”

Kevin Collins, Microsoft

VALUE OF AUGMENTED REALITY ACROSS THE ENTERPRISE



 <p>DESIGN</p>	 <p>MANUFACTURE</p>	 <p>SELL & MARKET</p>	 <p>SERVICE</p>	 <p>TRAIN</p>	 <p>OPERATE</p>
<p>Collaborative Design Review</p>	<p>Maintenance Work Instructions</p>	<p>Virtual Product Companions</p>	<p>Service Manual & Instructions</p>	<p>Job-specific Training</p>	<p>Head-up Display</p>
<p>Digital Design Review</p>	<p>Performance Dashboards</p>	<p>Augmented Brand Experience</p>	<p>Service Inspection & Verification</p>	<p>Safety & Security Training</p>	<p>Augmented Operator Manual</p>
<p>Augmented Interface</p>	<p>Operator & Assembly Work Instructions</p>	<p>Retail Space Optimization</p>	<p>Remote Expertise</p>	<p>Expert Coaching</p>	<p>Augmented Interface</p>
					

VALUE DRIVERS

MANUFACTURE
Improve Process Efficiency



90%

Better Quality

30%

Faster Assembly



SELL & MARKET
Increase Sales Revenue



“Sales and Marketing ... it just not about providing a graphic, you can provide customers with [virtual] products that have yet to be manufactured and not having to send a unit to location, but still have a to-scale examples that you can walk around and see all the information.”

– Sandra Humphreys
FUJITSU

SERVICE
Decrease costs



- ✓ Reduce Service Event Time
- ✓ Improve Quality of Service
- ✓ First-Time Fix Rate





November 2014

“Smart, connected products will give rise to the next era of IT-driven productivity growth at a time when the impact of earlier waves of IT has largely played itself out.”



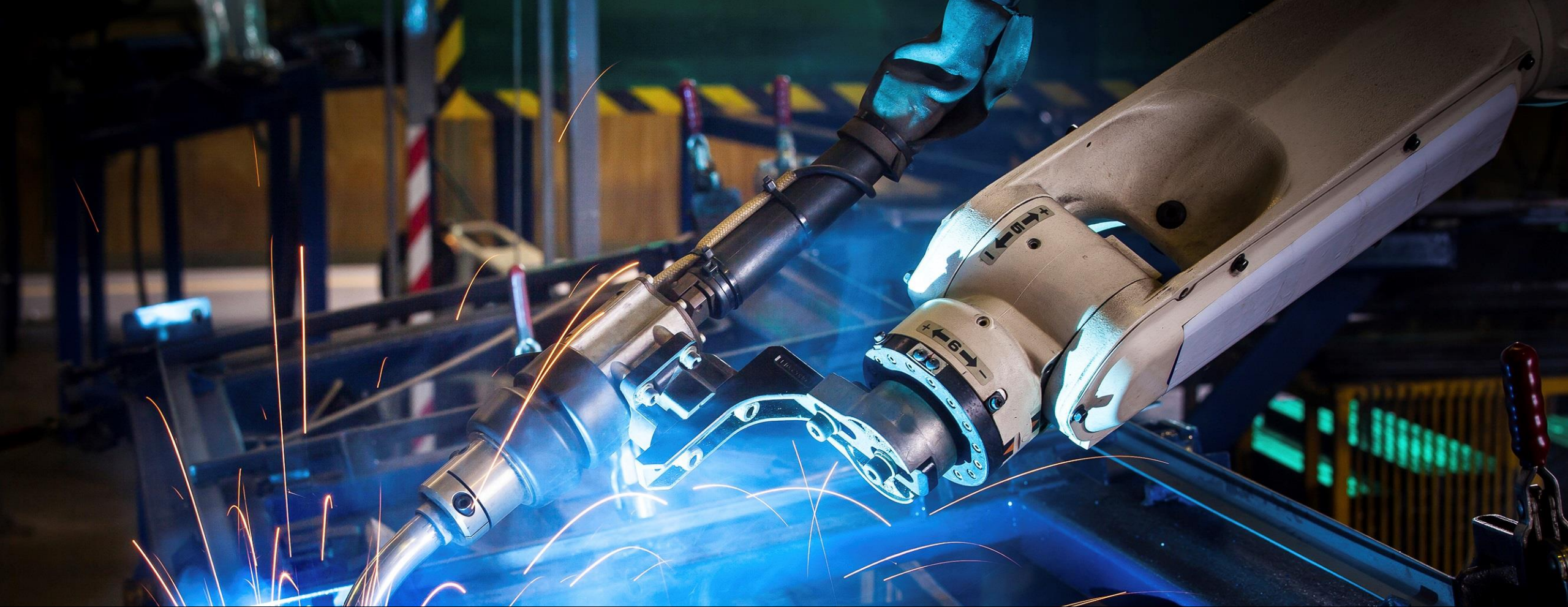
October 2015

“Data now stands on par with people, technology, and capital as a corporation's core assets.” “Data now stands on par with people, technology, and capital as a corporation's core assets.”



November 2017

“There is a fundamental disconnect between the wealth of digital data available to us and the physical world in which we apply it.”



Transforms how companies create, manufacture and service things, and enables an ecosystem to develop the applications and experiences for those things.

THANK YOU