VALUE OF AR IN THE ENTERPRISE

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June 2016

AGENDA

- ❑ HISTORY OF AR
- ❑ WHY AR IN THE ENTERPRISE NOW?
- ❑ DIGITATION OF ENTERPRISE
- ❑ AR VALUE EXAMPLE
- ❑ CHALLNEGES & CAPABILITIES
- ❑ GET GOING

aug·men·ted re·al·i·ty

noun

Superimposing computer graphics onto a live view of the world. Also known as “AR”

HISTORY OF AR ENABLING DEVICES

Ivan Sutherland created the first head mounted display

1968

Battlefield Augmented Reality System (BARS)

1999

The release of the iPhone

2007

Google Glass

2013

JSF Smart Helmet

2014

2016

TOP 15 AUGMENTED REALITY APPLICATIONS (SOURCE: TOMS GUIDE FEB 2016)

Ingress

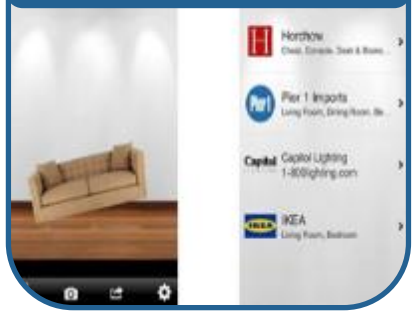
Starwalk

iOnRoad

Crayola Color Alive

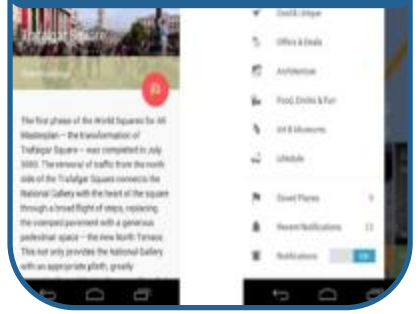
Aurasma

SnapShot

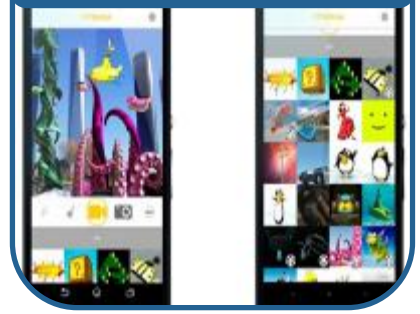


Theodolite

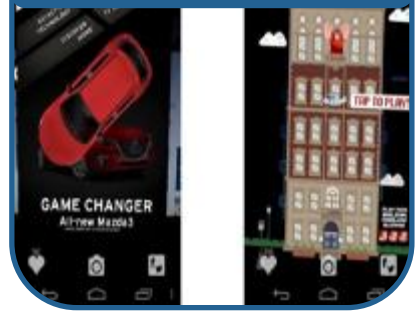
FieldTrip



Mybrana



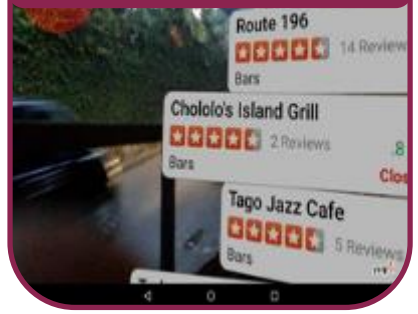
Blippar



Sunseeker

Wikitude

Yelp

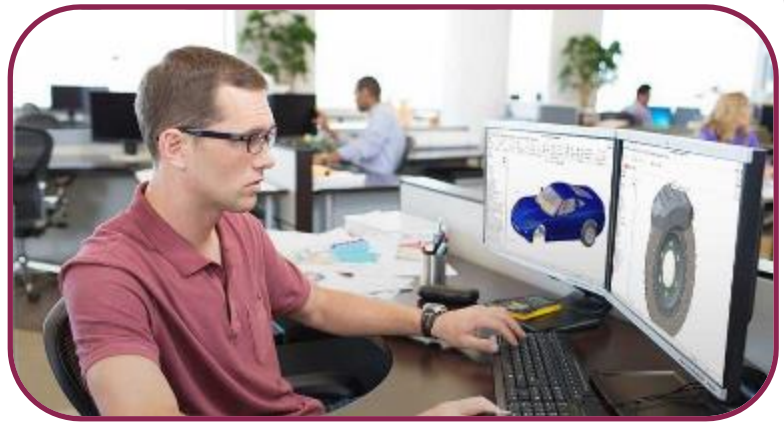


Google Translate

Layar

CONSUMER AR DESIGN VS INDUSTRIAL ENTERPRISE AR DESIGN

Commercial



Industrial

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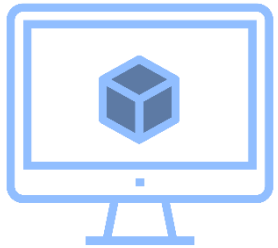
AUGMENTED REALITY IS GROWING

AR IN THE ENTERPRISE

Market & Sell

- *Product visualization & demonstrations* accelerates sales
- *Targeted interactive advertising* increases brand loyalty



Create

- *Virtual design collaboration* connects disparate teams
- *Prototype quality assurance* reduces defects and rework
- *Rapid digital Prototyping* speeds time to market & optimizes portfolio

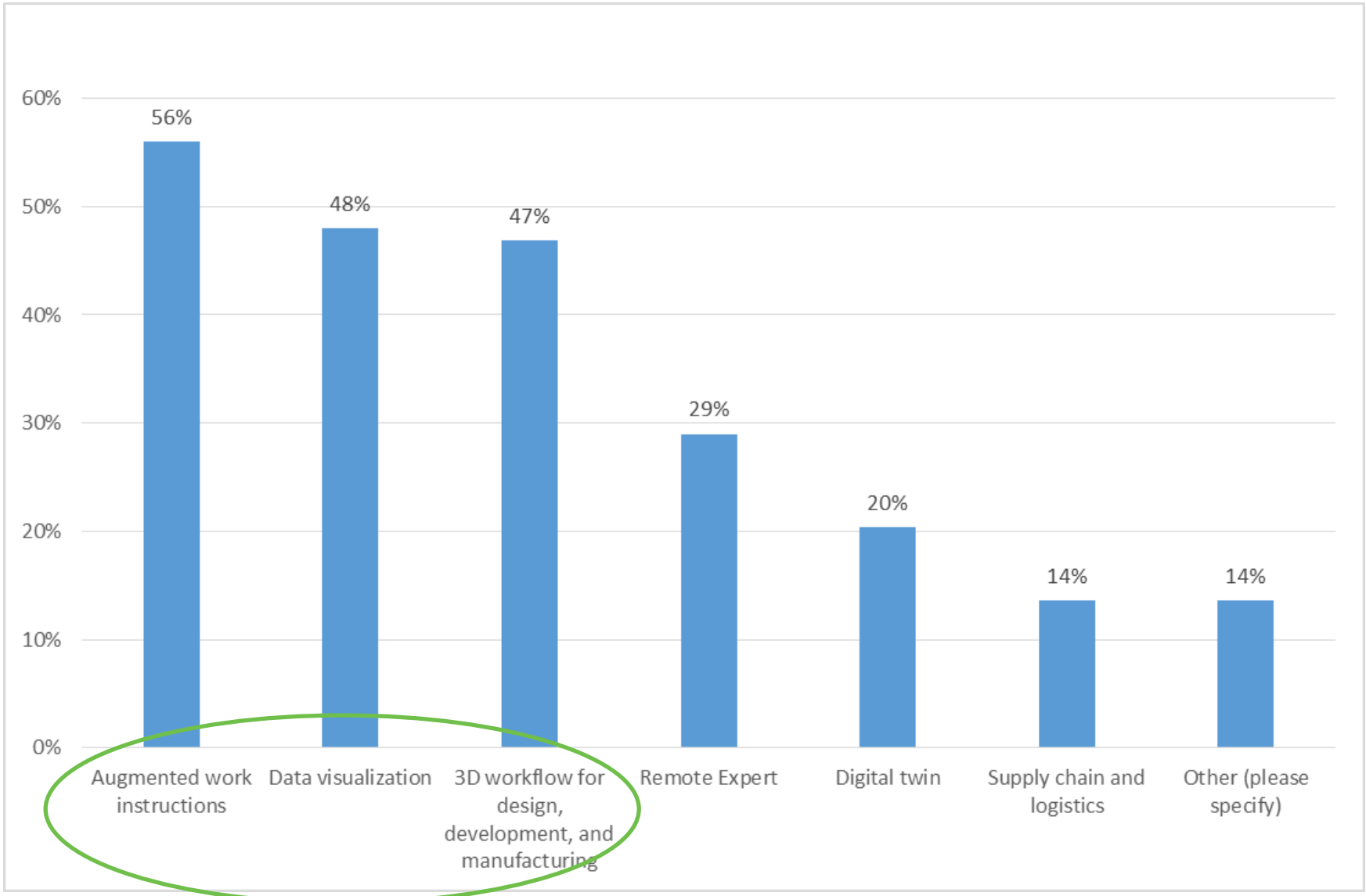
Operate

- *Quality assurance* reduces defects
- *Performance dashboards* provide insights to drive efficiency
- *Real-time work instructions* reduces errors & defects

Service

- *Service dashboards & instructions* improve efficiency and accuracy
- *Customer self-service instructions* reduces costs
- *Remote expertise* reduces travel & training costs

AUGMENTED REALITY ENTERPRISE USE CASES



TOP THREE

- Augmented Work Instructions
- Data Visualization
- 3D Workflow for Design

Recent PTC Survey on use cases for the enterprise.162 responses

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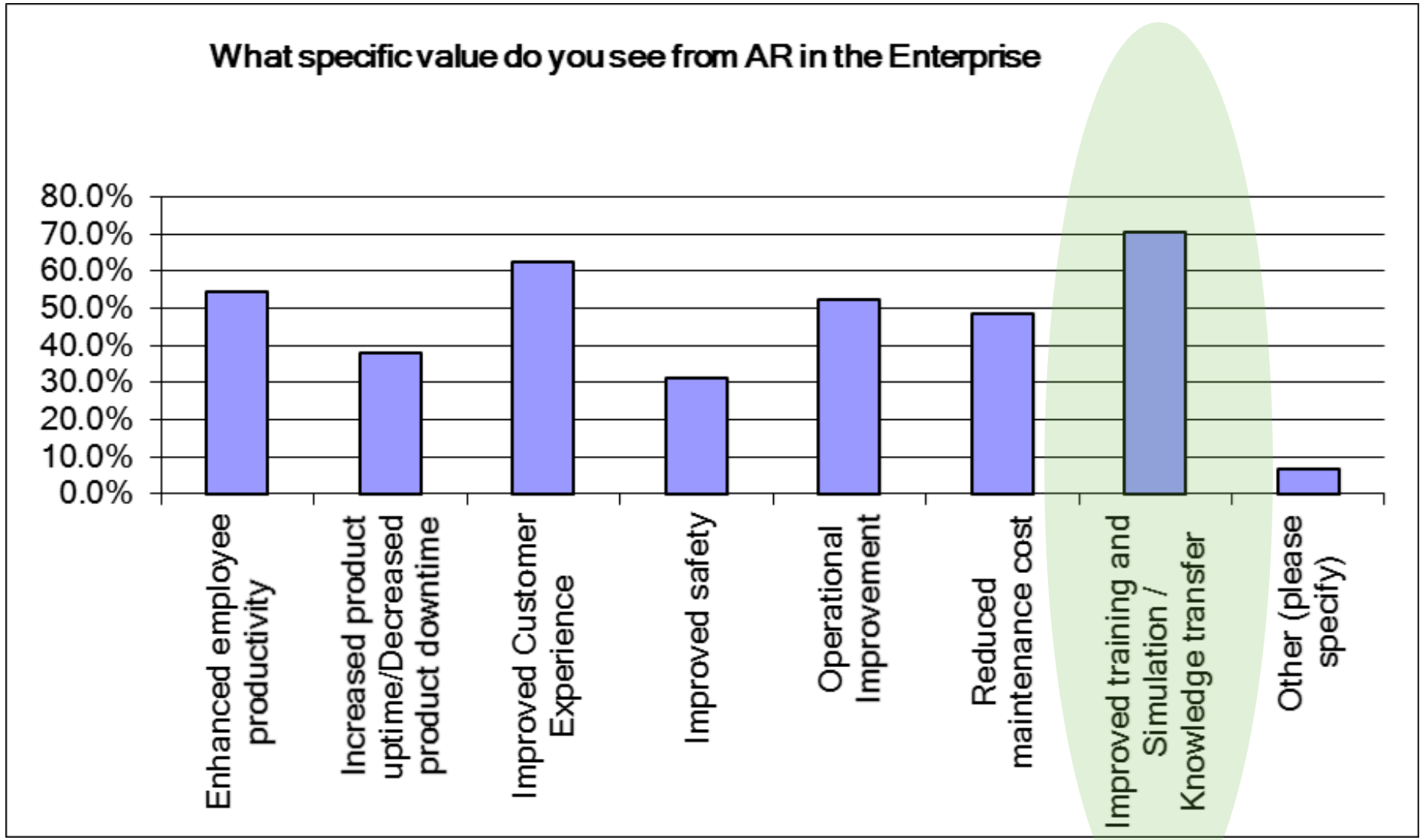

70%

of respondents indicate potential value through AR training

Recent PTC Survey on use cases for the enterprise.162 responses

COMPANIES ARE INVESTIGATING

Recent news from Digi-Capital showed that in the 1st quarter of 2016, investment in Augmented Reality and Virtual Reality grew to $1.1 billion (compared to $700m total in 2015).

In the second augmented reality project, the Rochester Institute of Technology … will make virtual shop floor instruction guides with AR, and capture data to improve future manufacturing processes

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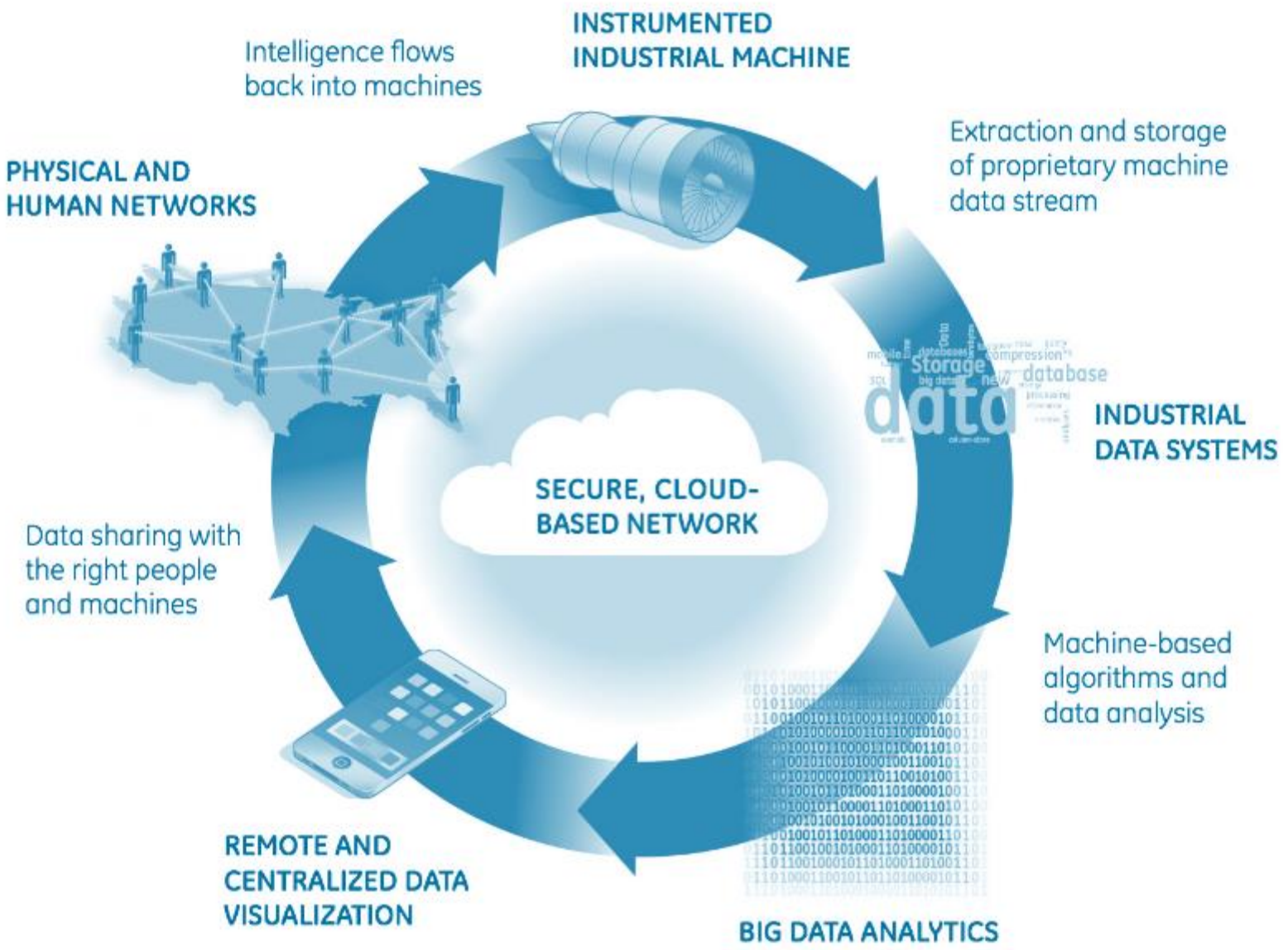
EVOLUTION OF SENSORS

INDUSTRIAL INTERNET OF THINGS

BRILLIANT FACTORY

DIGITIZATION OF THE FACTORY

4TH INDUSTRIAL REVOLUTION



SMART CONNECTED PRODUCTS

INDUSTRY 4.0

INDUSTRIAL INTERNET OF THINGS

(Image courtesy of GE Co.)

AR ENABLES THE VISUALIZATION AND CONTEXTUALIZATION OF DATA

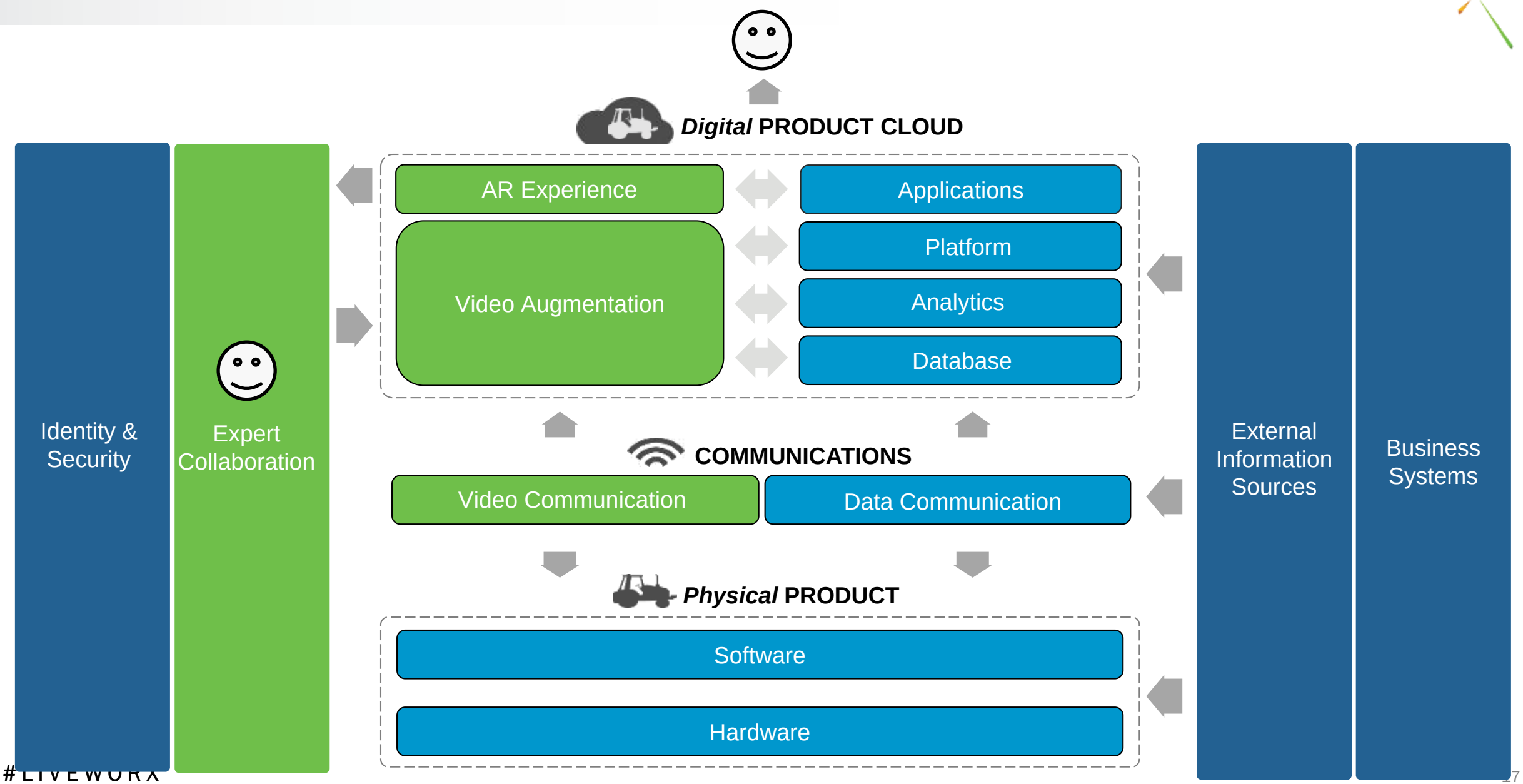
INTERNET OF THINGS

Ability to digitally **talk** to physical things to monitor and control

AUGMENTED REALITY

Ability to **see and experience** the digital attributes of physical things

AR AND SCP TECHNOLOGY STACK



AR WORKFORCE TRANSFORMATION

- **The Manufacturing Industry will likely face an expected shortage of 10 million workers globally**
  - Baby boomer retirements
  - Shortage of adequately skilled replacements
  - Industry expansion

- **AR technologies can mitigate the effects of the skill gap in Manufacturing and other industries**
  - Next-generation training tool; AR guided workforce
  - Digitization of knowledge bases
  - Recruitment appeal for the digitally native workforce

- **Macro implications of AR and the new-gen workforce**
  - Demand for high-skilled and experienced labor decreases
  - Collaboration transforms workforce distribution

AR is well positioned to transfer skills across the organization to a far greater extent than "old-style" training methodologies, such as paper-based manuals and DVDs.

-- Manufacturing Institute, Deloitte, World Economic Forum

AR WORKFORCE TRANSFORMATION

Next-Generation Training Tool

- Augmented reality can improve speed and quality of training
- AR enables intuitive, in-context visualization that create a richer training experience

Digitized Knowledge Base

- Augmented reality can ensure the retention of tacit knowledge through video capture
- Expert insight can be digitally delivered remotely
- AR Solutions will eliminate the dependency on hard copy instruction

Recruitment Appeal

- Appeal to digitally native generation
- New generations of the workforce will expect access to digital information

DATA VISUALIZATION

Ability to **see and experience** the digital attributes of physical things

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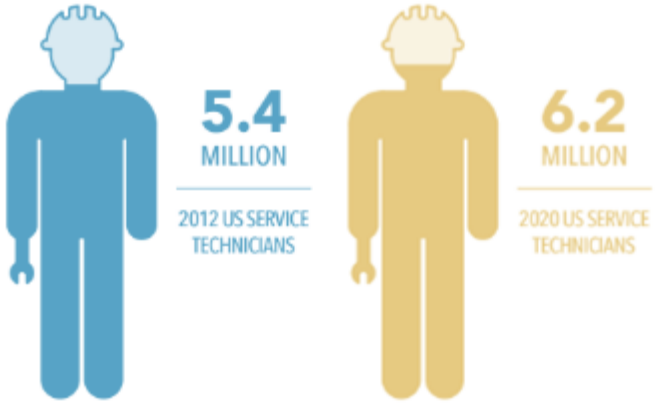
EXAMPLE: VALUE OF AR WITH SERVICE



Services is a growing revenue stream. Skilled labor is a challenge.

The greatest savings in [AR] field service will come from diagnosing and fixing problems more quickly and without needing to bring additional experts to remote sites.

First Time Fix (FTF)
Mean Time to Repair (MTTR)
Mean Time to Service (MTTS)
Mean Time to Install (MTTI)

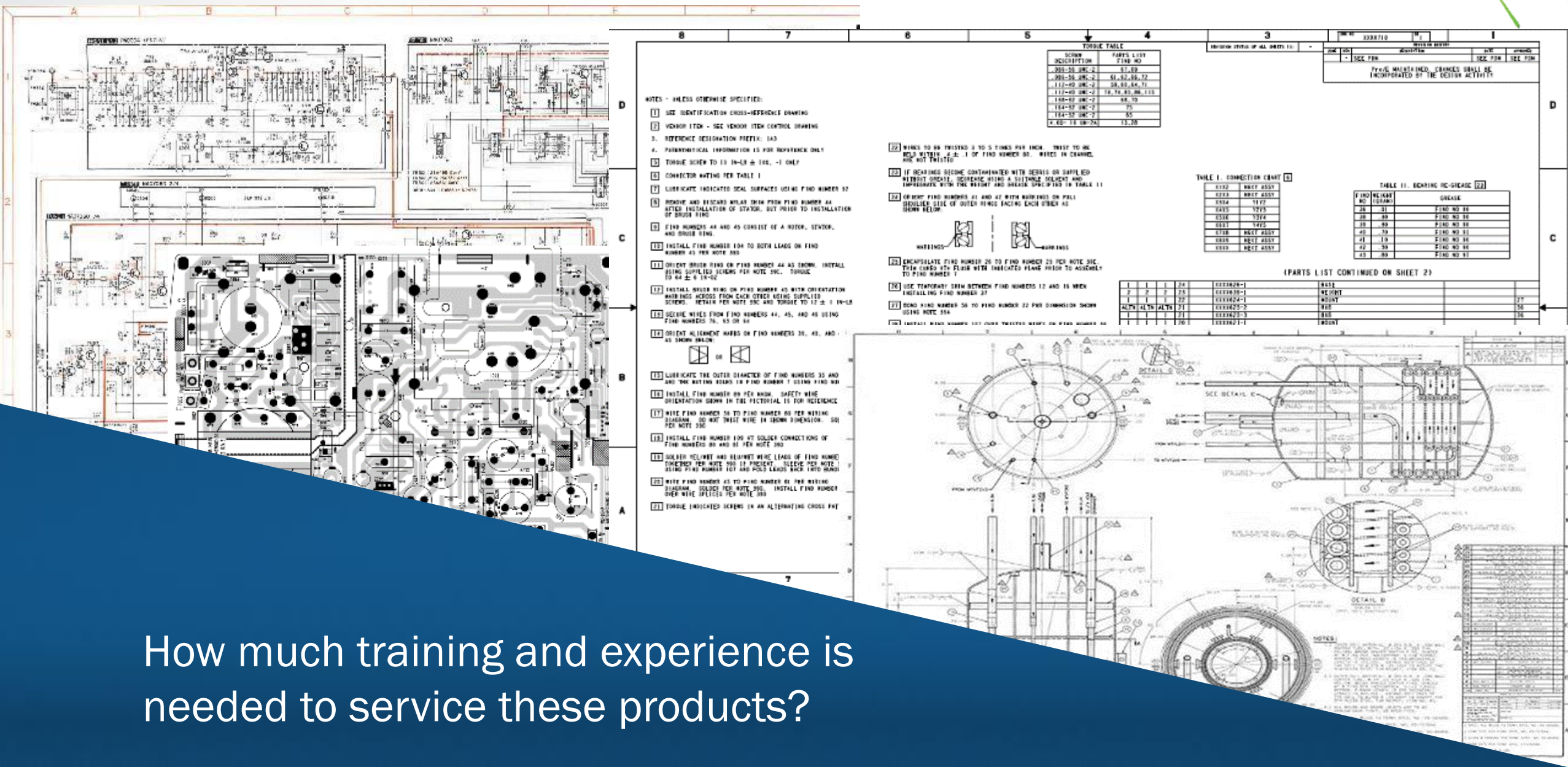
Critical service measurements

In 2017, Smartglasses may begin to save the field service industry $1 Billion per year

~Gartner 2013 (a bit dated but illustrates potential)

http://www.gartner.com/newsroom/id/2618415

SERVICE MANUALS, PRODUCT DRAWINGS & DIAGRAMS?



How much training and experience is needed to service these products?

SERVICE TECHNICIAN & FTF COSTS – TARGET FOR AR

Service

FIRST TIME FIX

Resolve service issues, correctly, the first visit

- SERVICE TECHNICIAN AVG SALARY– ~$55K a Year*
- COMPANY A – 88% FTF Rate | COMPANY B – 63% FTF Rate
- 400 JOBS A DAY
- COMPANY A completes 100 more jobs a day (88% - 63%)* 400
- 250 days a year = 25,000 extra visits to complete work
- Company B needs 25 more people to compete with Company A

→25 * 55K = $1,375,000

AR CAN IMPACT FTF DELIVERING IN-CONTEXT ORGANIZATIONAL KNOWLEDGE

❖ THIS IS A EXAMPLE BASED ON REPORTS FROM SERVICEMAX. OTHER SERVICE METRICS TO INVESTIGATE INCLUDE MTTR, MTTI and SLA contracts. servicemax

❖http://www.payscale.com/research/US/Job=Field_Service_Engineer%2c_Medical_Equipment/Salary#CareerPaths

Value

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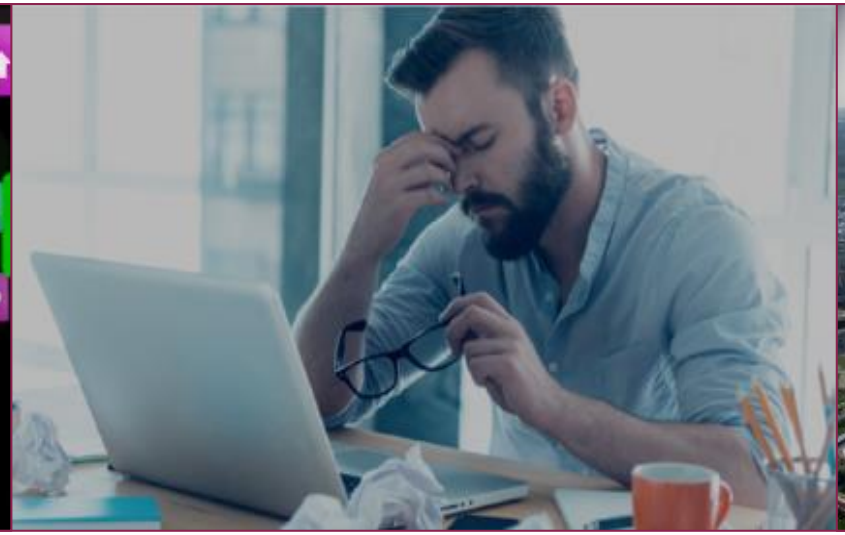
CHALLENGES

Explosion of Purpose-Built “Apps”

Difficulty of Authoring Augmented Reality Apps



Difficulty of Identifying “Things” and the right Apps for those “Things”

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Vuforia Studio

Enterprise

PTC Vuforia Studio is the only Augmented Reality software designed with the enterprise customer in mind.

1 Simple UI Design

Easy to use “drag and drop” user interface environment for ease of authoring in a codeless environment

2 Content Integration

Seamlessly integrate existing 3D Creo content and SLM data for powerful 3D workflow and augmented service work instructions

3 AR Animations

Create animated Augmented Reality experiences quickly and effortlessly with Creo Illustrate

4 Internet of Things

Integrate IoT sensor data and enterprise system data from ThingWorx to enable Augmented Reality data visualization

5 Hardware Agnostic

Can be used with smart phones, tablets, and wearable devices utilizing Android and iOS regardless of vendor.

VuforiaStudio ENTERPRISE

VuforiaExperience Service

VuforiaView ENTERPRISE

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GET GOING!

- Review Opportunities
- Determine ROI
- Define Use Case

Plan

- Design
- Develop
- Test

Pilot

- Deploy
- Measure
- Optimize

Production

Q&A

LIVE
WORX 16™
TAKE A FRESH LOOK AT THINGS
liveworx.com