607_AUGMENTED REALITY FOR THE INDUSTRIAL ENTERPRISE

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ThingWorx Studio Product Management

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ptc

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Stuttgart, Germany

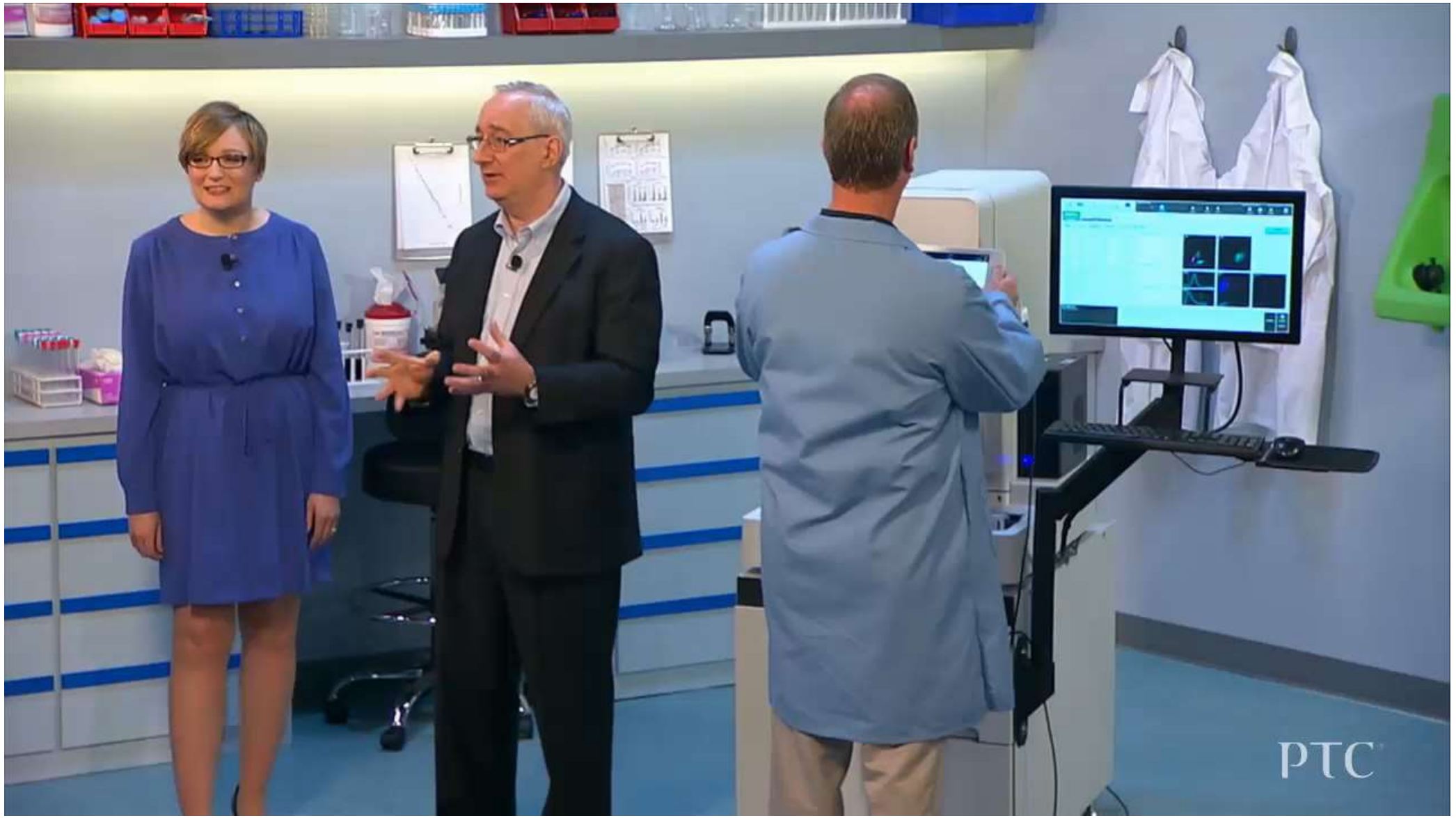
aug·men·ted re·al·i·ty

noun

Superimposing computer graphics onto a live view of the world.

MARKET & SELL – FRANKE

OPERATE - SYSMEX



SERVICE - KTM

VALUE OF 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**

AR ENABLES 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

THE CHALLENGES OF AUGMENTED REALITY IN THE ENTERPRISE

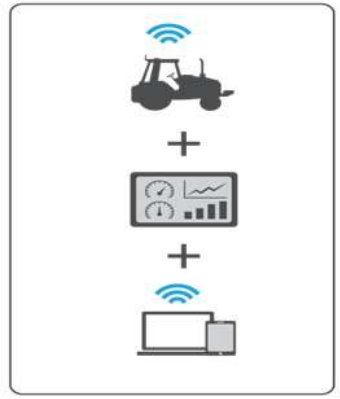
Billions of Things need **billions** of apps, right?

How do I find the right app?

How do I manage those apps?

Time and Skills

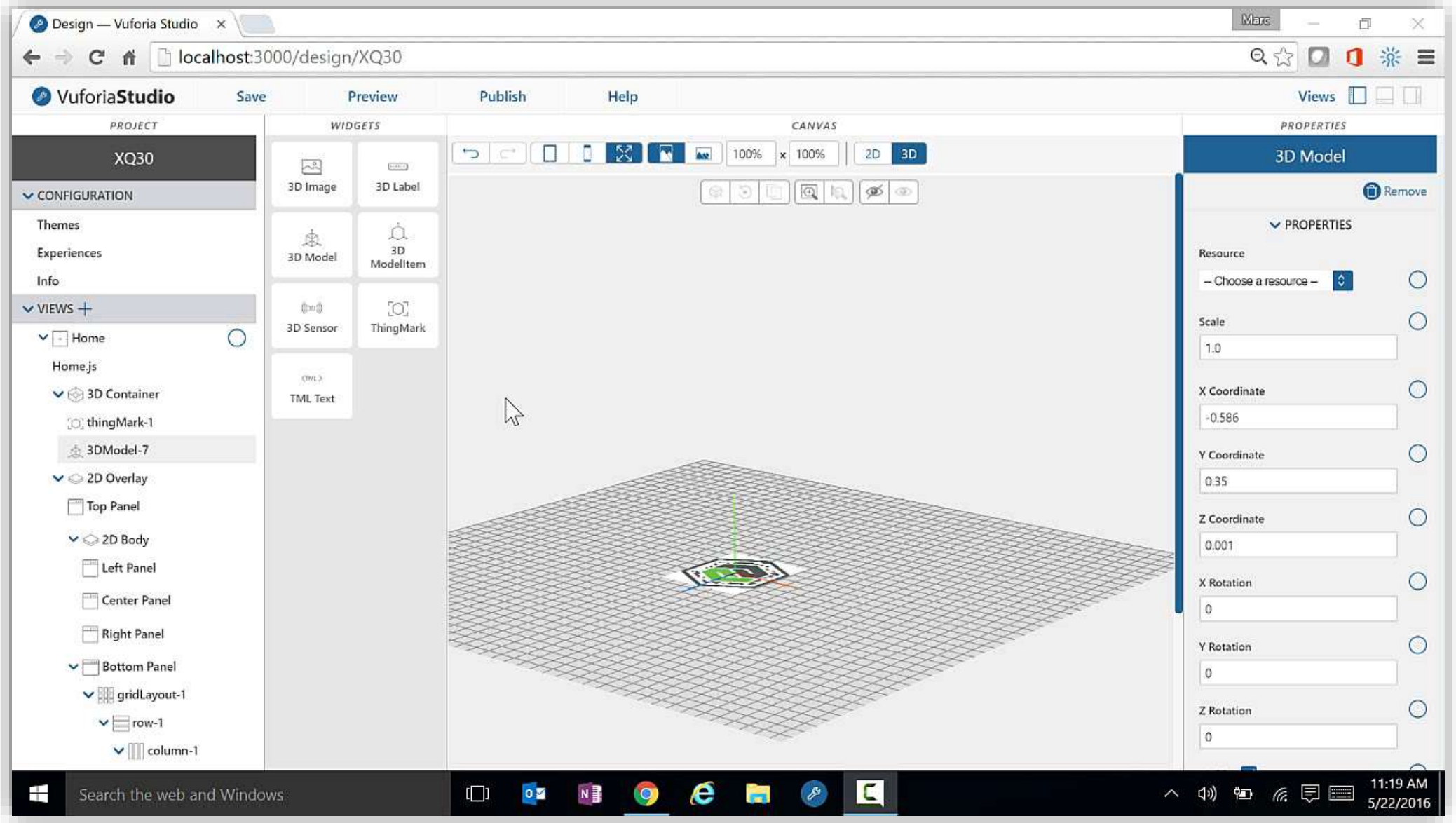
Leveraging IoT data in AR



Reuse existing assets

Right app for the right Thing

WHAT IF YOU COULD CREATE AUGMENTED REALITY EXPERIENCES IN LESS THAN A MINUTE? … WITH YOUR ENGINEERING DATA?



INTRODUCING THE THINGWORX STUDIO SUITE

ThingMark
Identify and track Things

thingworx® studio

Create **Experiences**

thingworx® view

Manage and Deliver **Experiences**

Consume **Experiences**

thingworx® studio

thingworx® view

Create

- Codeless UI
- Import 3D CAD
- Integrate IoT

Publish

- Publish to Cloud
- Saves all experiences
- Access control

Scan

- Unique marker
- Scalable
- Connects ‘Thing’ to Experience

Experience

- Window to the Experience
- One app = All experiences

thingworx® studio

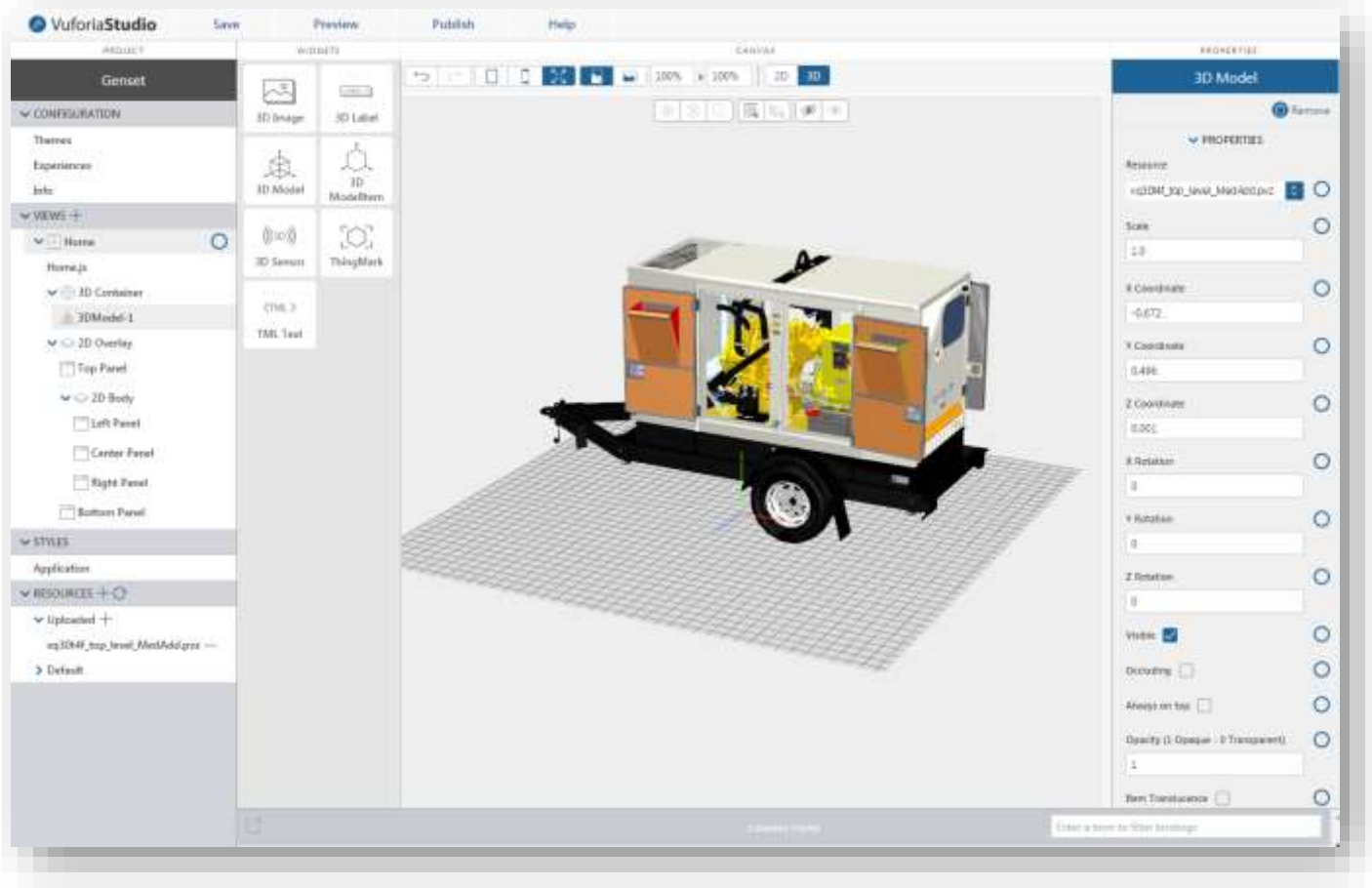
Create experiences
Built-in widgets accelerate experience design to add interactive UI components

Experience preview
Preview UX design prior to publishing

Simplified publishing
Publish your with a single click

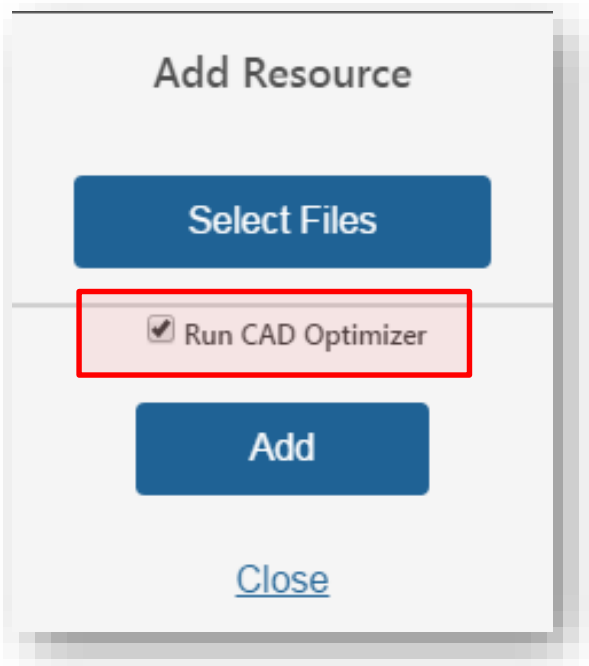
CSS Editing
Create custom Experience styles

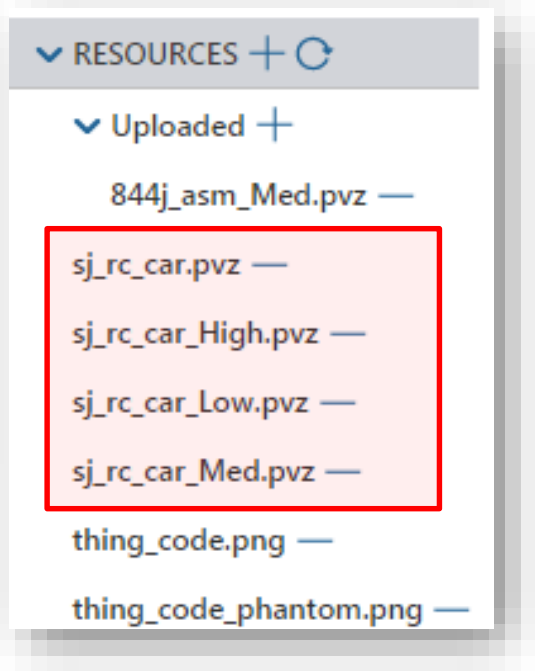
Extend with Javascript
Extend capabilities with embedded Javascript



REUSE, OPTIMIZE AND PROTECT YOUR ENTERPRISE 3D DATA

- Choose from 3 automatically generated derivatives of source data
  - … at various levels of fidelity and size
- Removes IP
  - Strips out accurate CAD B-REP geometry
- Shrinks data
  - 100x + data compression*
  - Speeds delivery. Improves interaction.
- Makes your real-world CAD data work in AR!
  - No remodeling required.





Supports import of multiple 3D file formats such as: PVZ (Creo View), STEP, IGES, STL, OBJ, VRML, DGN, FBX, ASM/PRT (PTC Creo), SLDASM/SLDPRT (SolidWorks)

OPTIMIZATION EXAMPLE

Creo Parametric model size: **695Mb**

Creo View default data size: **88Mb** (8x compression)

“High” Setting
Size: 5.2Mb
133X compression

“Med” Setting
Size: 2.6Mb
267x compression

“Low” Setting
Size: 1.4Mb
496x compression

AUGMENT FROM 3D SCAN DATA

Illustration.c3di - PTC Creo Illustrate

File | Home | Figure | Tools | Sectioning | Animation | Item List | Sequence

Preview Step | Add Step | Duplicate | Edit | Delete | Cut | Copy | Paste | Record Content | Capture Camera | Effects | Restore Location | Transform | Spin Center | Preview Sequence | Notes Page

Controls | Tasks | Record | Views

sBOM | Figures | Step Editor

Step 3

Step 6

Add New Step...

Figure 2

Y
X
Z

Standard: Creo Default | mm | 0 Selected | Smart

Search the web and Windows

12:00 PM
5/22/2016

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Design — Vuforia Studio

localhost:3000/design/XQ301

VuforiaStudio | Save | Preview | Publish | Help | Views

PROJECT

XQ301

CONFIGURATION

Themes

Experiences

Info

VIEWS

Home

Home.js

3D Container

thingMark-1

3DModel-1

3DModelItem-2

2D Overlay

Top Panel

2D Body

Left Panel

Center Panel

Right Panel

Bottom Panel

gridLayout-2

row-2

WIDGETS

3D Image

3D Label

3D Model

3D ModelItem

3D Sensor

ThingMark

TML Text

CANVAS

100% x 100%

2D 3D

PROPERTIES

3D Container

PROPERTIES

Visible

Extended Tracking

File Data Set

TW-VuMark.xml

Persist Map

Id

x-f5411b76-442a-42bd-96d8-14e9bl

Friendly Name

3D Container

Search the web and Windows

12:15 PM

5/22/2016

iPad
1:26 PM
62%
Vuforia View
Chrome
Mail
1
Friday
27
Calendar
Facebook
Photos

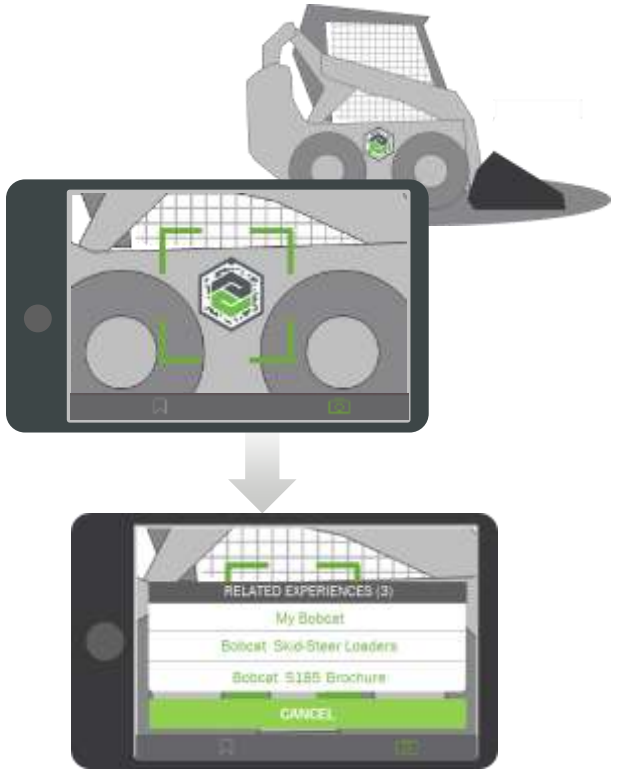
ThingMark

Unique Identifier
Quickly identifies the unique thing and its relevant experiences

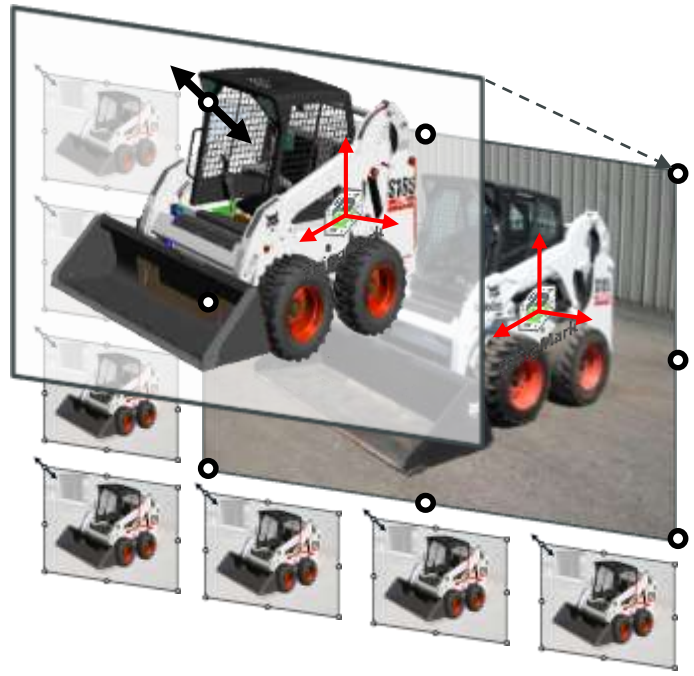
Real World Alignment
Aligns 3D information contextually and spatially

Ability to Scale
Tracking vast numbers of products, dynamically updated in the Cloud

Unique Identifier



Real World Alignment



Ability to Scale

thingworx® view

Free to download
Simple access via App stores

Window to Experience
Display contextualized content and 3D engineering data

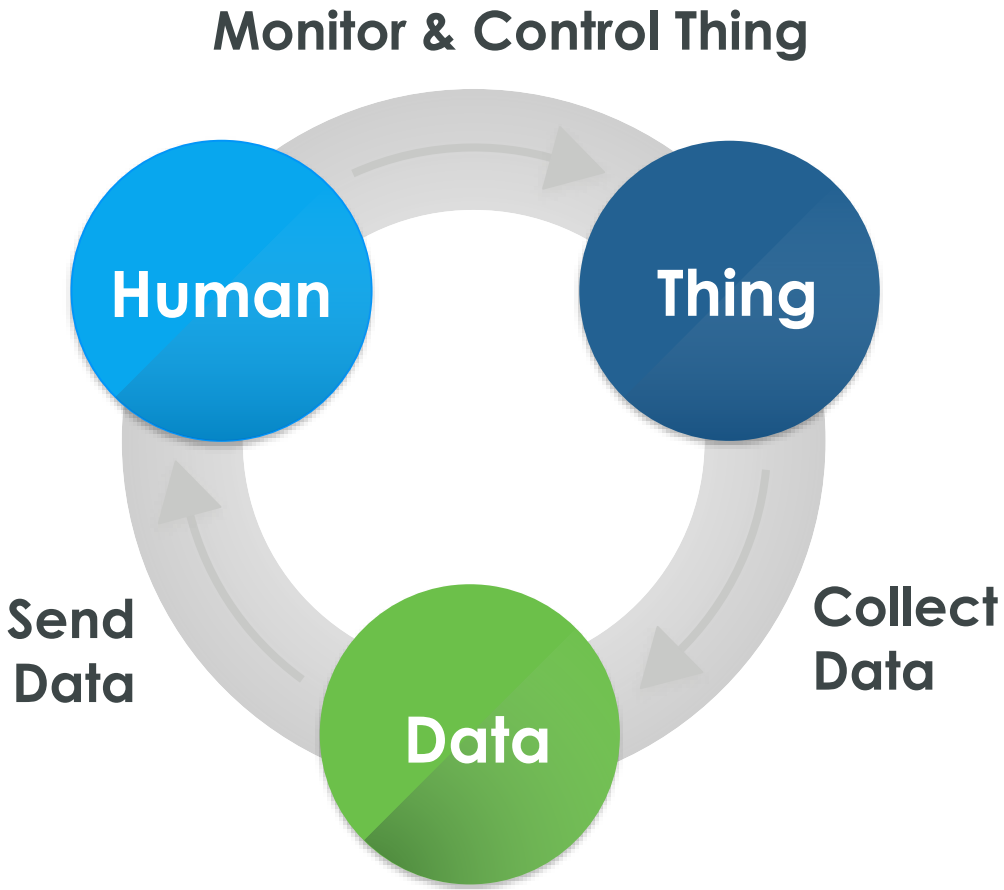
Internet of Things
Display real-time IoT data on your mobile device

Many Experiences
One app enables the deployment of all experiences

AR COMPLEMENTS IOT

IoT : Ability to digitally **talk & listen** to physical things to monitor and control

AR : Ability to **see & experience** the digital attributes of physical things



COMPLETE IOT PLATFORM CAPABILITIES

CONNECT

- Device Cloud Connector SDK
- Industrial Protocol Drivers (Kepware)
- Industrial-to-Application Thing Modeling (Kepware Integration)

ANALYZE

- ThingWatcher
- ThingPredictor
- ThingOptimizer
- Analytics Builder

IMPLEMENT

- UI Builder for Web, Mobile, AR
- Visual Application Modeling
- Run-time Services
- Edge Intelligence

MANAGE

- Asset Provisioning & Management
- Software & Content Management
- Visual Alert & Rules Management

EXPERIENCE

- Compelling visualization for web, mobile and AR
- Leverage rich 3D animation and IoT data for experience creation
- ThingMarks for unique AR experiences for each associated device

SCALE

- Enterprise-ready Deployment Architecture
- Millions of connected devices

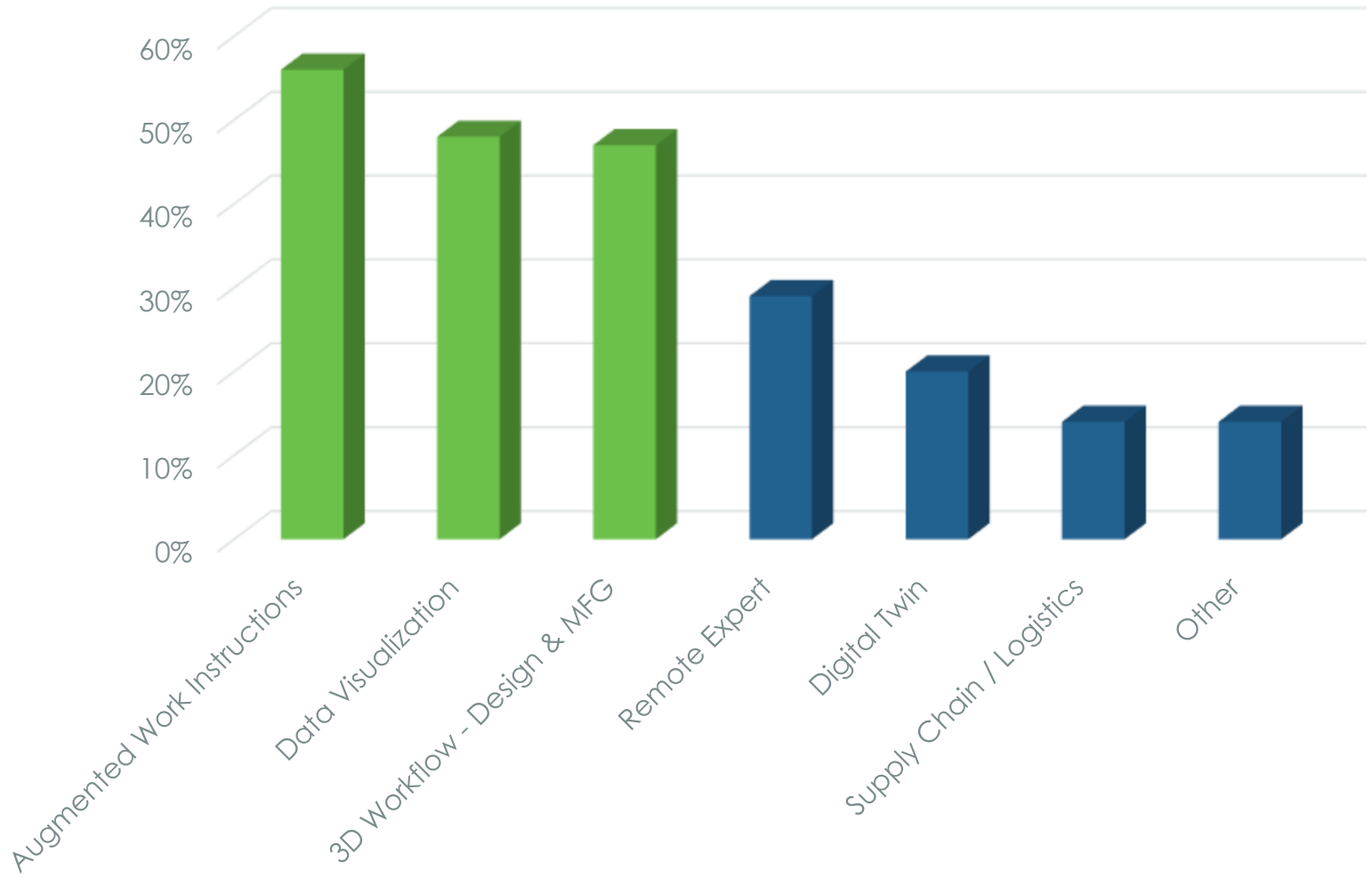
SECURE

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

THINGWORX STUDIO PILOT PROGRAM

500+	20%	35k+
Pilot Customers	Experience # Growth (WoW)	Experiences Consumed

MOST VALUABLE USE CASES FOR AR IN INDUSTRIAL ENTERPRISES



Top Use Cases

1. Augmented Work Instructions
2. Data Visualization
3. 3D Workflow for Design and Manufacturing

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

WHY DOES IT MATTER TO YOU?

You are already 90% there!

The next generation of 3D is in the context of the physical product!

AR REVIEWS FROM CREO AND WINDCHILL

CAPABILITIES

- Publish CAD designs instantly to AR experiences directly from CAD and/or PLM
- Generate 'ThingMark' on demand
- Basic Interaction with AR Experiences
  - Scale
  - Rotate
  - View details (Name, Number, Life cycle, Version, …)

BENEFITS

Better visualize designs by **bringing them to life** in AR

Communicate WIP product designs to solicit **early and frequent feedback**

Collaborate on product designs **securely without sharing** any IP

Review **virtual prototypes frequently** during the design process

AUGMENTED REALITY AND THE INDUSTRIAL ENTERPRISE

AR can improve every aspect of the product and process lifecycle, from Engineering and Manufacturing through Sales and Service.

AR drives workforce transformation, enabling faster, more accurate workers, able to perform more jobs.

ThingWorx Studio unleashes this potential, providing you the fastest, easiest path to the power of Augmented Reality in the Industrial Enterprise.

WANT TO EXPERIENCE MORE?

- Try the Experiences!
- Download **ThingWorx View** and Experience the Gallery
- Come talk to PTC Staff on the Showfloor!
- Talk to your PTC Sales Rep.

- Visit **thingworx.com/platforms/studio** to apply for the Pilot Program

COMING IN 2017 – MICROSOFT HOLOLENS SUPPORT

THANK YOU!

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