



**Rockwell
Automation**

Powering the future

vuforia® studio™
Augmented Reality

Gearbox GT315 Step 2
Assembly Order
Output Shaft Assembly
Show More

G712-1

G612-1

Gearbox GT315

Experts foresee an augmented reality-powered future for improving KPIs

“Among the best-in-class service professionals, we’re already seeing movement towards an AR-powered future.”

**ABERDEEN
GROUP**

Enterprises find value with the physical, digital and human convergence created by augmented reality (AR).

AR is a critical factor in helping companies unlock the value of digital transformation.

“By implementing augmented reality (AR) solutions on the factory floor, manufacturers have established an entirely new avenue for improving the key performance indicators of manual assembly and maintenance operations.

ARC Advisory Group
ARCweb.com

There continues to be significant research on the impact of AR in industrial settings. Industry analysts such as ARC Advisory Group and Aberdeen Group provide insight into the importance of AR on improving service and manufacturing processes in the industrial enterprise.

Overcome pressures in industrial markets

In this transformative time, industries experience the challenges of retiring experts, new paradigms in the workspace with quality and agility, and new technologies driving complexity as customer expectations skyrocket.



Worker Skill Gap

31% turnover rate¹
2.4 million positions unfilled
between 2018 and 2028
Ongoing skills upgrading



Complex Products and Workspaces

Service and maintenance
challenge, configurations
Information access and
content creation



Increased Customer Demands

Expectations of immediacy
Fiercely competitive
and shifting marketplace

1. Aberdeen, Tom Paquin, Best-in-Class Augmented Reality Studies. September 2018. 2. 2018 Deloitte skills gap and future of work in manufacturing study

Augmented Reality = The digital transformation of people, practices and production

Augmented reality solutions provide opportunities across the value chain to address your challenges. Whether it is enabling an early career workforce to ramp up quickly and correctly, transferring valuable knowledge across the enterprise, accessing employees remotely from anywhere in the world, developing new products and services to market rapidly, and providing the best customer experience through easy access maintenance and service – AR is the solution you need.

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



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

Manufacturing Efficiency

Improve operational efficiency, reduce manufacturing costs, accelerate time to market and increase worker productivity, safety quality and compliance



PRODUCTS | PEOPLE | PROCESSES

New approaches deliver critical information to front-line workers



Augmented 3D Work Instructions

Immersive step-by-step instructions boost worker efficiency, accuracy and safety



Augmented Expert Guidance

Fast and easy knowledge capture and sharing improves productivity, quality and compliance



Augmented Remote Assistance

Real-time access to subject matter experts improves communication and speeds problem solving



Augmented Training and Demonstration

Virtual product demonstration and in context instructions reduce training time and costs

Efficient, scalable augmented reality authoring and publishing

Vuforia Studio is a rapid AR authoring environment that enables industrial content creators to efficiently create and share scalable AR experiences to empower front-line workers.

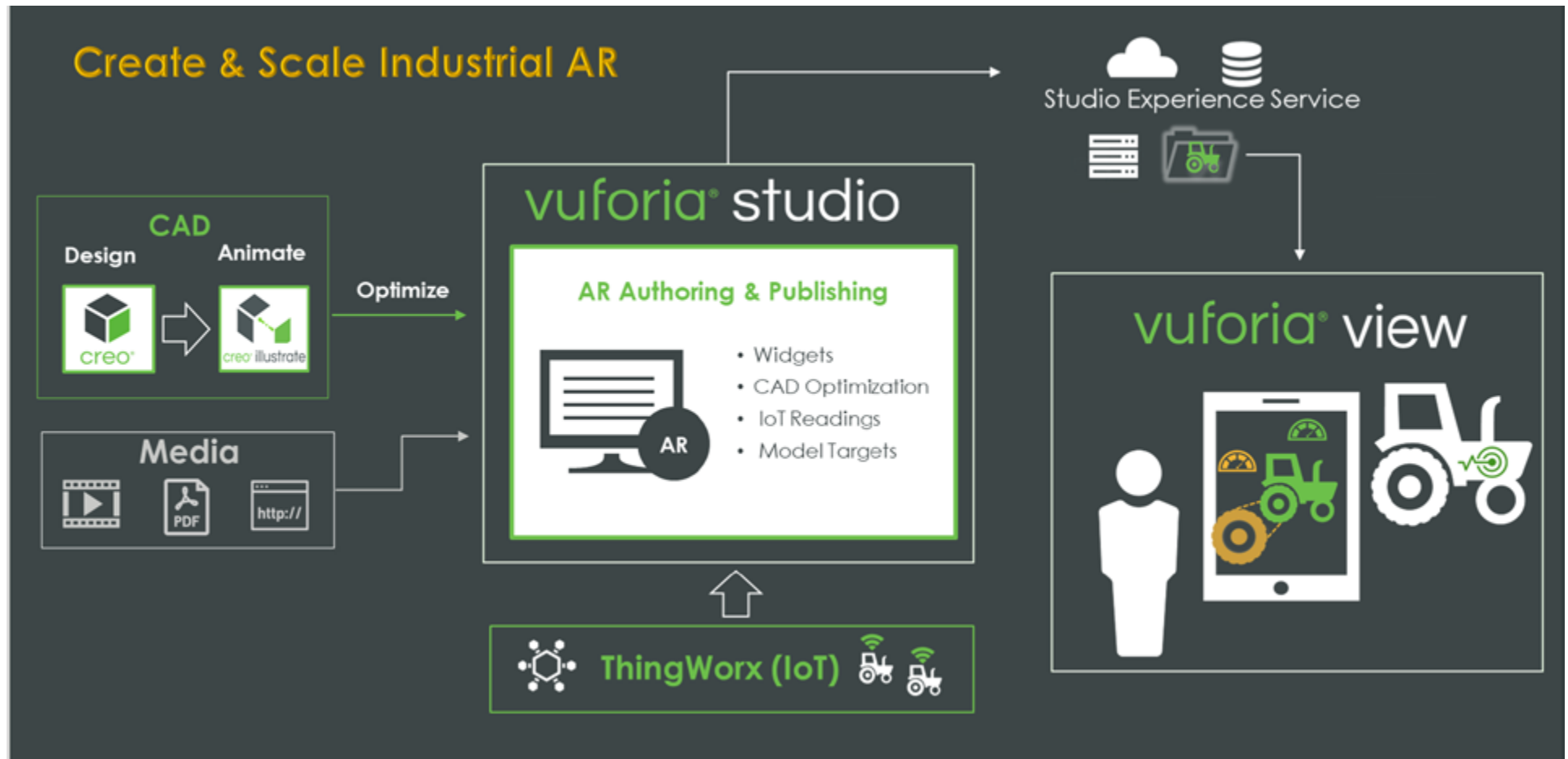
The easy reuse of existing 3D geometries and animated sequences with Vuforia Studio reduces the costs and complexity of content creation for compelling AR experiences. The acceleration of real-time, contextualized IoT data from the ThingWorx Platform fuels AR experiences for better and faster data-driven decisions.

Experiences authored in Vuforia Studio are accessed via Vuforia View, a single, enterprise-wide viewer application built with Vuforia Engine, that delivers rich, 3D user experiences for smart phones, tablets and wearable devices. Vuforia View is free to download and available for Windows, iOS and Android devices.

- **Boost** workforce safety and performance
- **Improve** assembly, quality & inspection
- **Increase** revenue & customer satisfaction
- **Accelerate** time-to-value
- **Deliver** actionable Internet of Things (IoT) insights
- **Streamline** enterprise scalability
- **Precisely Display** information

vuforia® studio™

Working together to create and scale industrial augmented reality



Augmented 3D work and training instructions



vuforia® studio™

Author & Publish
AR Experiences

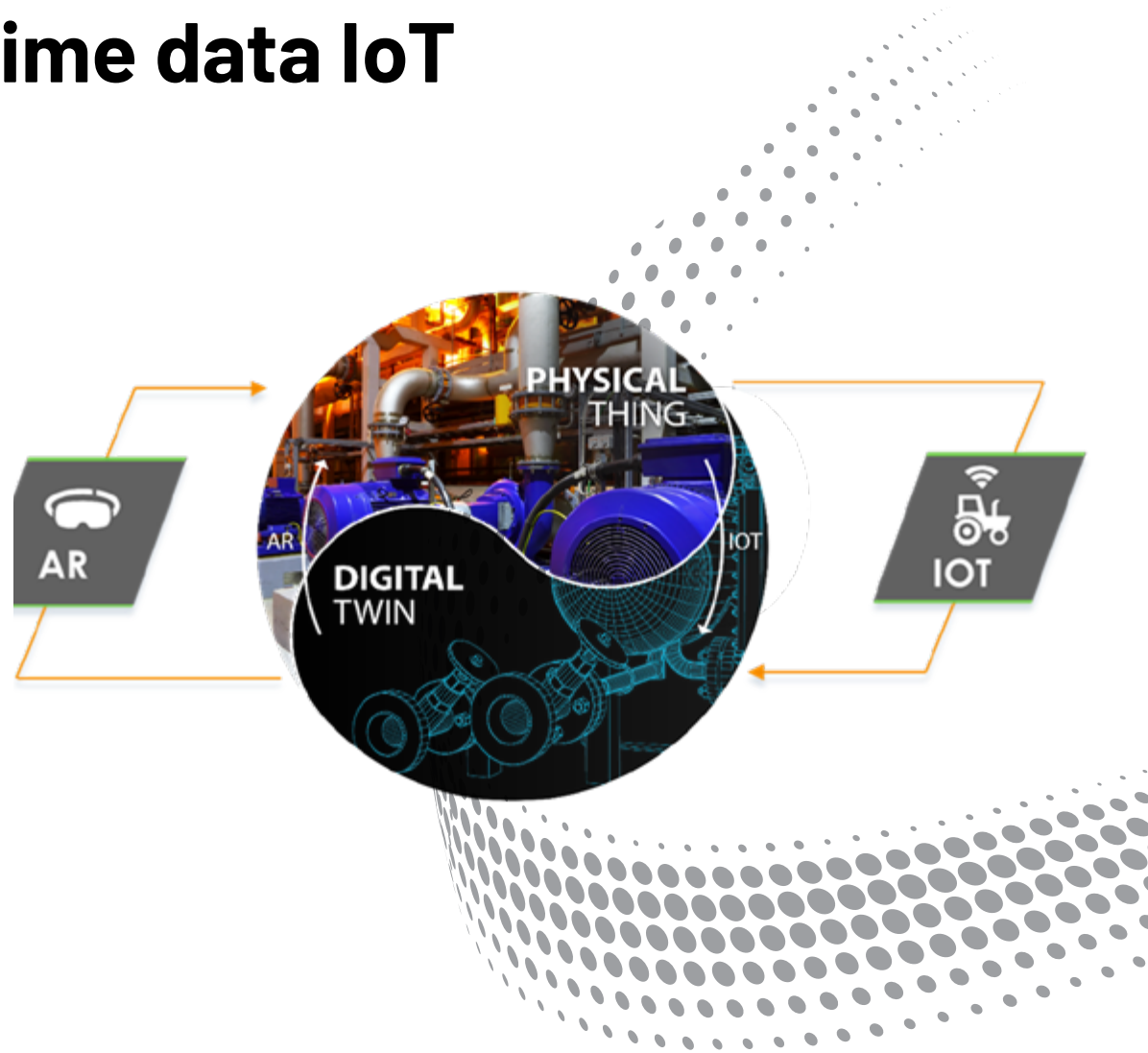


vuforia® view

Access & View
AR Experiences

Augmented reality experiences offer value with **real-time data IoT**

- Customers can monitor, maintain and service equipment in a new way
- Helps improve technician understanding, efficiency and safety
- Identifies potential failures before they happen to reduce downtime
- Enables customers to keep equipment running at peak performance



View experiences on your favorite device



Mobile

Enhance user experiences

Leveraging a variety of innovative tracking methods

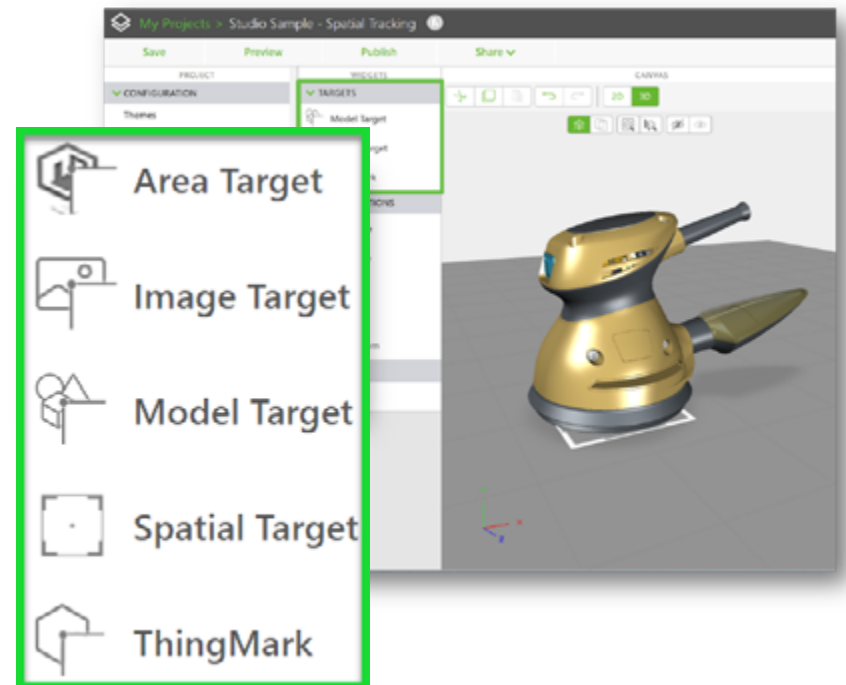
Area Target - Allow users to easily navigate to the appropriate content using spatial clues, ultimately improving operational efficiency and work safety

Image Target - Allow users to use an image as your tracking method

Model Targets - Recognize objects based on shape to improve service and operator efficiency

Spatial Targets - Place 3D virtual products into real-world environments for customers and engineers

ThingMarks - Identify individual products and experiences for precise overlay instructions



Advanced Tracking with vuforia® studio™

Improve the efficiency of your service technicians

Quickly and easily create experiences for head-mounted, tablet-style devices

- Include **step-by-step instructions** in work procedures and workflows
- Quickly display **2D reference material** on-demand
- Provide **checklists** that can also save and store records of task/job completion



Assisted Reality

Project Type



Mobile



3D Eyewear



2D Eyewear

Reduce costs and errors, increase efficiency and safety

- Immersive 3D instructions clarify complex procedures to **reduce costs and errors**
- Real-time, in-context IoT data **increase worker efficiency and safety**
- Virtual product demos **accelerate training** and **sales** cycles
- Scalable AR content **empowers workers** across the enterprise



Delivering business value



Cannondale

Use case – Differentiated Sales and Service

Challenges

- Multiple, similar forks with similar components
- Difficulty configuring equipment for optimal use

Results

- Augmented reality experiences
- Easily Identify components for replacement parts order
- Improved user experience with configuration information (air pressure)
- Better engagement with dealer sales and customers

Source: <https://www.ptc.com/en/products/vuforia/vuforia-studio>



Challenge: Data-driven Advantage (DDA) is one of the key growth strategies for Howden. DDA achieves value through multiple capabilities enabled by inexpensive data collection, storing and processing technologies, with a clear goal to drive differentiation and deliver value to existing products and platforms.

Solution: Scalable Mixed Reality solutions from Microsoft and PTC now empower Howden's first-line workers in comprehending the physical and digital worlds, quickly build new skills and safely perform tasks with greater accuracy, efficiency and confidence.

Customers can now better prevent the challenges and costs associated with unplanned downtime and better-align overall maintenance strategies previously based only on conjecture and after-the-fact analysis. Ultimately, these innovations save Howden's customers a significant amount of time and cost.

Results: The service area has seen vast improvements in response time and customer satisfaction. For instance, a situation that previously took one to two hours to resolve as well as travel time and expense by expert technicians, can now be resolved on the first trip in less than 20 minutes.

Source: <https://www.ptc.com/en/products/vuforia/vuforia-studio>



BAE SYSTEMS

As a global defense leader, BAE Systems is dedicated to solving the most complex problems using innovative ideas, concepts and technologies. With a market shift towards more electric vehicles solutions, its business is ramping to meet demand by implementing new technology that will help drive zero-defects and on-time delivery operational excellence goals. The production needs for their innovative battery cells has increased by 350% as a result of the immense popularity of their HybriDrive® buses.

Challenge: BAE Systems needed to accelerate the complex battery assembly process to reduce backlog and achieve on time delivery to customers.

Solution: Using Vuforia Studio, subject matter experts created immersive 3D MR work instructions in hours without hiring a team of developers and at a dramatically reduced cost.

These immersive, step-by-step work instructions enabled the company to reduce training time and increased production throughput for new front-line workers while maintaining zero-defect quality standards.

Results: The PTC/Microsoft solution helped BAE improve efficiency and effectiveness in the manufacturing and assembly of complex battery cells for their HybriDrive® buses.

BAE trained workers **30%** more efficiently and battery assembly time was reduced by **50%**

Source: <https://www.ptc.com/en/products/vuforia/vuforia-studio>



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