



AUGMENTED REALITY

Provides a Competitive Edge for Manufacturers





is transforming
manufacturing
operations



Enable your workforce
with interactive, 3D
work instructions



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drives measurable business value for manufacturers

As products grow more sophisticated, producing them has become exponentially more complex. Manufacturers need to find innovative solutions to ensure customer satisfaction while driving cost effectiveness and profitability. Augmented Reality (AR) is quickly emerging as the preferred technology to achieve these goals.

In addition to using AR to address traditional manufacturing challenges like unexpected downtime and time-consuming machine maintenance, many organizations are seeing tremendous value in using AR to narrow the skills gap between their retiring workforce and new hires.

Through the power of 3D, interactive work instructions, manufacturers can optimize their most valuable asset – their front-line workers. Whether they are new or experienced, AR provides the right information to the right people at the right time, effectively reducing errors, improving overall factory throughput, and enhancing worker safety.



With the power of AR,
you can expect
nearly zero defects



AR helps improve
assembly timelines by

50%



AR decreases training
time by

60%

Business value of AR for Manufacturing



#1 INCREASE MANUFACTURING THROUGHPUT

The ultimate goal of any factory is to quickly and efficiently produce high-quality products. By providing assembly instructions and remote guidance through interactive AR experiences, your workers will have increased clarity into assembly processes and procedures – boosting productivity and reducing avoidable errors. Plus, you can improve equipment uptime by enabling technicians to perform maintenance and repairs faster with easy-to-follow, step-by-step maintenance instructions.

#2 ACCELERATE TRAINING

According to experts, between 22-25% of manufacturing experts are approaching retirement. With AR, you can capture and share their knowledge to help create a new generation of experts. Plus, unlike traditional training methods and materials, AR is an immersive, interactive technology that provides interactive, in-context instructions and remote guidance – effectively shrinking the learning curve and improving retention. Manufacturers who currently use PTC's AR technology for training are reporting 30% - 50% improvements in the time it takes to ramp up new front-line workers. Plus, you can save money by using virtual product demonstrations and eliminate the need for a dedicated, physical piece of equipment.

#3 REDUCE COSTS

Every manufacturer is looking for ways to improve their bottom line. From maximizing uptime and quality to reducing scrap and unnecessary rework – Augmented Reality can make a measurable impact. AR moves beyond traditional hard copy work instructions to enable your team with easily consumable, in-context, on-the-job guidance that can improve accuracy and reduce the high cost of defects and rework due to human error. Plus, by integrating IoT and predictive analytics data, AR can present real-time performance metrics so your team can virtually dissect equipment, quickly react to problems and even address issues before they occur. AR also improves plant and line flexibility by enabling workers to easily shift to new or unfamiliar tasks without long ramp-up times—improving productivity and reducing the cost of production.

#4 IMPROVE MACHINE OPERATOR EFFICIENCY AND SAFETY

Augmented Reality provides an unprecedented level of clarity around machine health, performance, and assembly procedures. Your front-line workers will have access to clear, up-to-date instructions for everything from machine setup, changeover and maintenance to complex assembly procedures. This increased clarity and understanding will reduce the time spent interpreting written instructions and improve productivity overall. Plus, you can reduce injuries by delivering virtual safety warnings in real time whenever a procedural step could be dangerous.

What makes vuforia® studio™ so special?

**Vuforia Studio allows
you to quickly and cost-
effectively author and
publish scalable AR
experiences without deep
programming or previous
AR expertise.**

vuforia® studio™ differentiators

EFFICIENT

**Speed of content creation
over other solutions:**

create and publish AR
experiences faster and stay
ahead of the competition

USER FRIENDLY

Ease of use at reduced costs:

an intuitive, drag-and-drop
interface enables you to create
AR experiences without any
programming

COST-EFFECTIVE

**Reuse existing 3D content
and animated sequences:**

leverage and extend
your CAD investment

ACCESSIBLE

**Solve problems collaboratively
from almost anywhere**

more efficient real-time,
“see what I see”
remote assistance

REVOLUTIONARY

**Scale your efforts through a
single app viewer:**

access and view all of your AR
experiences at any time, from
anywhere on any smart device

AWARDS AND ACKNOWLEDGEMENTS



PTC is recognized as a global leader in IoT and AR for Industrial Enterprises by
Forrester Research

Company of the Year by Compass Intelligence

Faster-time to
production with
vuforia® studio™

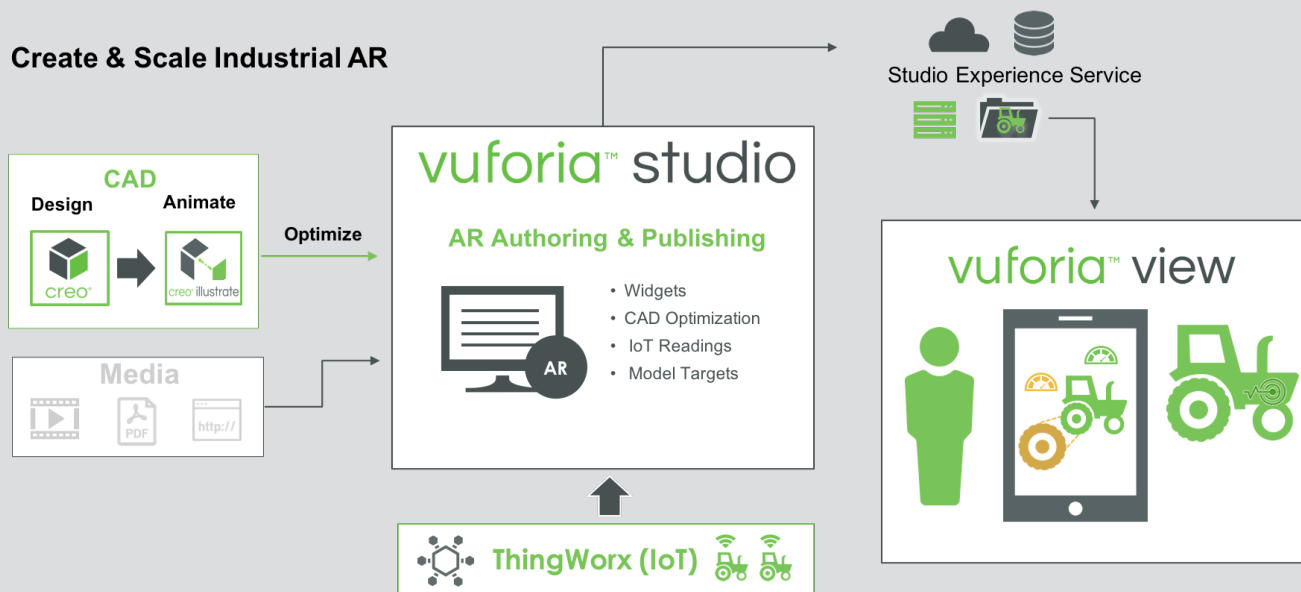


Rapidly achieve results
that used to require large time
and resource commitments

HOW IT WORKS

Create, publish and view AR experiences following these four easy steps:

Create & Scale Industrial AR



vuforia® studio™ in action

Discover how BAE used mixed reality to improve efficiency and reduce training time

BAE SYSTEMS

BAE delivers 3D, interactive work instructions to enhance productivity

THE GOAL

BAE has been innovating in the commercial transportation sector for decades and today have over 8000 Hybridrive bus systems operating around the world. Given the affordability, reliability, and zero-emission nature of their Hybridrive buses, BAE Systems found themselves with a significant orders backlog. In order to keep up with demand, they had to find a technology solution to maximize the efficiency of their factory floor.

THE SOLUTION

BAE realized that there was significant production time lost due to their workers needing to follow static, 2D work instructions. They decided to replace their current PDFs with assembly instructions with immersive, mixed reality experiences delivered through the Microsoft HoloLens. They started working with PTC and use Vuforia Studio to create engaging, easily-updated work instructions that enabled new shift workers to work more efficiently and reduce their backlog.

THE RESULTS

BAE was able to improve assembly time and quality and avoid costly mistakes by delivering reliable and easy-to-understand, 3D work instructions. Fewer steps, easier access to information and greater understanding helped their front-line workers assemble modules more quickly and with greater accuracy. Additionally, the greater situational awareness and hands-free capabilities improved concentration and focus, leading to improved worker safety. Ultimately, BAE was able to improve throughput while lowering the costs associated with bringing new workers up to speed, thereby increasing the profitability of their production process.



Watch the Video

Easily
connect with
remote experts
through
vuforia® chalk™

Vuforia Chalk combines live, over-the-shoulder, remote guidance with precise annotations drawn on real-world environments. Easy to deploy and intuitive to use, Chalk makes it easy for anyone in the enterprise to provide real-time guidance at any time, from anywhere—by simply drawing with a finger.

vuforia® chalk™ differentiators

PRECISION

Eliminate costly communication gaps.

When Chalk users accurately annotate a shared virtual environment, it's easier to highlight details and guide multi-step solutions. Chalk erases the margin of error—and potentially costly mistakes.

SPEED

Get it done right. Now.

Boost employee and customer satisfaction, by empowering your people with “over the shoulder” field support to complete work faster and better.

GROWTH

Scale up your expertise.

Chalk reduces the travel burden on your in-house experts—and gives frontline workers access to experienced service gurus in a fresh, new way.

INTUITIVE

No training required.

When you need on-the-spot troubleshooting or expert guidance for unexpected or unplanned situations, Vuforia Chalk is literally as easy as drawing on a chalkboard.

Deliver AR-enhanced guidance with vuforia® chalk™



Meet and solve problems

anytime, anywhere—in an augmented,
shared-screen experience

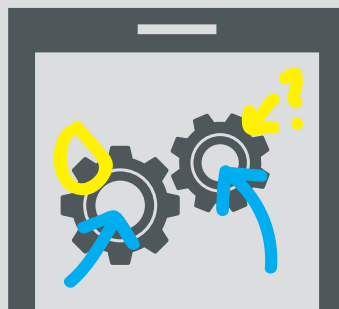
HOW IT WORKS

Two users on a shared Chalk network can collaborate via their touchscreen devices:



Capture

Pairs of Chalk users capture and transmit real-time video of their environment via their smart devices.



Annotate

Draw virtual **chalk marks** that intelligently anchor to objects in 3D. Chalk marks remain tethered as you move through your environment, or pause the app.



Share

Users enjoy a shared view and an engaging new way to deliver expert service, share feedback, and collaboratively solve problems.



PASSIONATE ABOUT MANUFACTURING INDUSTRIAL INNOVATION IS IN OUR DNA

Augmented reality is transforming manufacturing operations and driving measurable ROI. Through the power of AR, leading manufacturers are experiencing higher productivity, better product quality, faster training times for new employees and improved worker safety.

Don't get left behind.

Discover for yourself how Augmented Reality can transform your business.

Contact an expert at PTC to learn more about the power of AR for Manufacturing

Register for a free trial of Vuforia Studio and start creating AR experiences for your organization!

Sign up for a Vuforia Chalk evaluation and provision out Chalk to up to 50 service professionals today.

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