



ptc

LIVEWORX

A NEW ERA IN PRODUCT LIFECYCLE INNOVATION

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AR FOR THE DIGITAL INDUSTRIAL WORKFORCE

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VALUABLE RESOURCES ARE UNDERSERVED

- A Forrester study found that **77% of frontline workers** say they don't have access to the technology they **need to be productive.**



VUFORIA AUGMENTS THE PHYSICAL WORLD

DIGITAL
Defines
PHYSICAL



DIGITAL
Controls
PHYSICAL



DIGITAL
Manages
PHYSICAL



DIGITAL
Connects
PHYSICAL



DIGITAL
Augments
PHYSICAL



DIGITAL
Sustains
PHYSICAL



DIGITAL THREAD

Connect workers, information and machines
to improve collaboration and productivity

The **Digital Thread** enables teams to
integrate AR into existing software systems
along the entire product life cycle.

HOW DIGITAL AUGMENTS PHYSICAL



□ Captures



□ Recognizes



□ Virtualizes



□ Guides



□ Supports



BROAD RANGE OF ENTERPRISE AR CUSTOMERS

Aerospace & Defense

Automotive

Electronics & High Tech

Machine Builders

Med Device & Pharma

Retail & Consumer



AR UNLEASHES OPPORTUNITY ACROSS THE ENTERPRISE

A seamless data and model centric workflow that enables data driven decisions to be made throughout the product lifecycle

Service Optimization



Customer Operations



Manufacturing Efficiency



Engineering Excellence



DIGITAL
THREAD

Sales and Marketing



WORKFORCE EFFICIENCY IN THE DIGITAL TRANSFORMATION

Challenge for Manufacturers

77% of frontline workers say that they don't have the right tools to be more productive. Manufacturers are challenged with **increasing complexity, skills gap** and the **macro impact** of uncertainty in the markets.

Digitization of Work Instructions

Vuforia makes **frontline work more efficient** with **AR Work Instructions** – automatically sourced from **existing 3D product data**. Vuforia provides a modern work environment and accelerates knowledge transfer.

Efficiency at Scale

AR Work Instructions **reduce complexity and improve quality** through visual step-by-step guidance in the worker's field-of-view. Authors **source existing product data** from CAD and PLM to **build AR Work Instructions at scale**.

Discrete Manufacturing

Process Manufacturing

Tier 1 Automotive suppliers



Core Use Case:

- End Of Line Inspection

Business Value:

Reduce # of human errors and therefore return campaigns, accelerate quality processes



Automotive OEM / Heavy Equipment



Core Use Case:

- Component Locator and Service Instructions

Business Value:

Reduce search times and increase first-time fix rates to increase service quality



Machine Builders / Industrial Equipment



Core Use Case:

- Machine Operations
- Customer Self Service

Business Value:

Accelerate onboarding and simplify instructions to avoid downtimes



Medical Devices / Pump Manufactures



Core Use Case:

- Product Familiarization

Business Value:

Eliminate/reduce need for expert/technician travel to operate, maintain or repair



Pharma



Core Use Case:

- Line change over
- Line clearance

Business Value:

Speed up line change over and line clearance time to impact topline



THE 3 VUFORIA PILLARS FOR CUSTOMER VALUE

Content at Scale through Connectivity



Differentiated Value through Technology



Accelerated Growth through SaaS



- Automatically source existing product data from CAD and PLM
- Provide AR Work Instructions at scale to improve workforce efficiency
- Digital Thread as "single source of data truth" for manufacturing and service

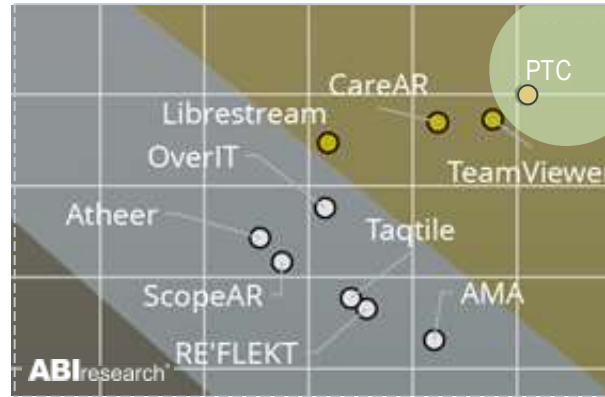
- PTC's Computer Vision technology used by 1M+ creators and users
- Converging AR and AI to automate and improve visual workflows
- GPT-like AR Work Instruction providing the right guidance based on situation

- Easy-to-deploy AR solutions with real-time collaboration for fast user adoption
- Enable frontline workers to build their own instructions and share expertise
- Always updated, pain-free work tools—device and hardware agnostic

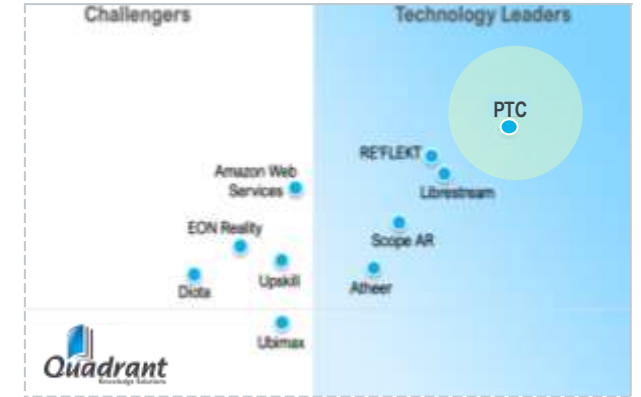
ANALYSTS RECOGNIZE AUGMENTED REALITY LEADERSHIP



2022
PAC RADAR AR Platforms
 for Connected Workers in Europe



2022
ABI Research Augmented Reality Platforms
 Competitive Ranking



2021
Quadrant SPARK Matrix of Enterprise
 AR Platforms



2020
PAC RADAR Open
 Digital Platforms for Connected Workers



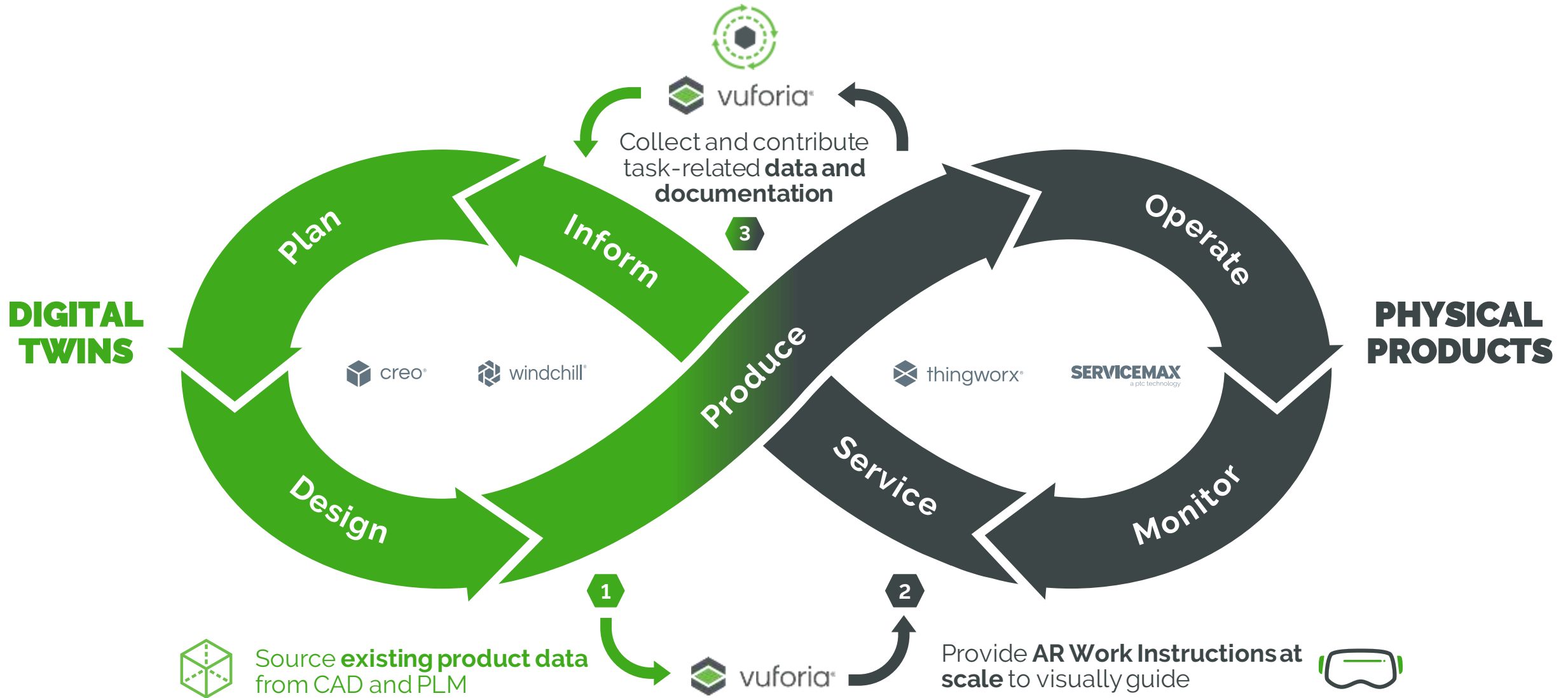
2019
PAC RADAR AR Platforms
 for Connected Workers in Europe



2019
ABI Research Matrix for Augmented
 Reality Platforms

* All chart images are enlarged for clarity. See the full analyst reports on our website: <https://www.ptc.com/en>

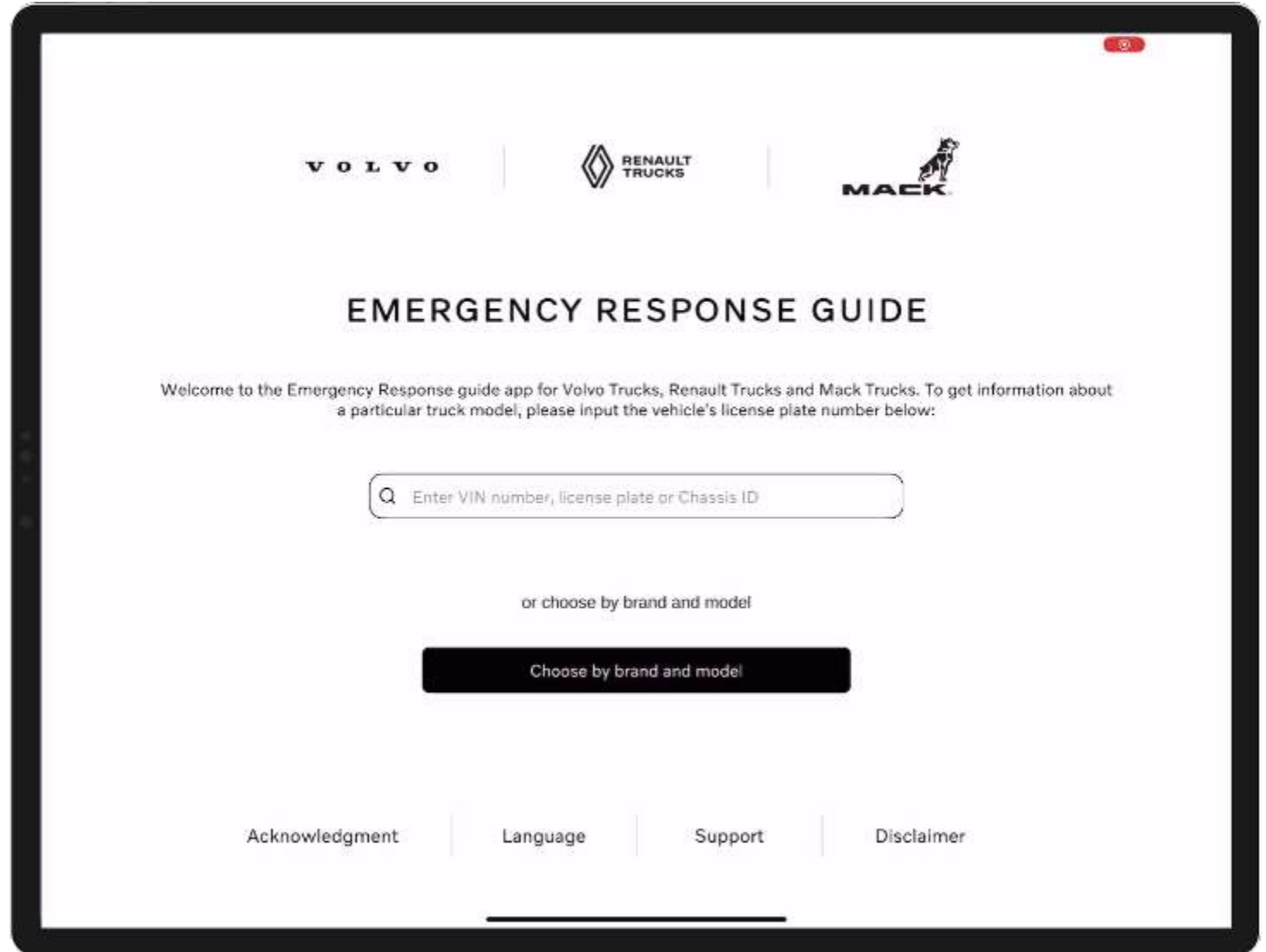
AUGMENTED REALITY IN THE DIGITAL THREAD



VOLVO – GUIDING WORKERS FASTER

How Vuforia helps Volvo:

- AR helps to **improve service and training** of workshop technicians
- **Training time reduced by 60%** through visualization of hidden components
- **\$1,000s saved** per service station
- **Product data sourced** from CAD and PLM and leveraged for service, inspection and training
- Attend the case study **today @ 1:55 pm Room 204**



PACCAR – PRODUCT DATA FOR SERVICE INSTRUCTIONS

How Vuforia helps PACCAR:

- AR helps to ensure customer uptime and improves first-time fix rates
- AR makes it efficient for technicians to find and understand wiring schematics
- Before on 46 paper pages, now easily accessible in AR
- Schematic maps sourced from PLM as part of the Digital Thread



We identified savings of 20 mins per service, and this can go up to 24 hours.

David Yen, AR Tech Product Manager, Peterbilt (PACCAR)



vuforia®

IMPROVE QUALITY CONTROL WITH OUR AI-ENHANCED VISUAL INSPECTION



QUALITY ISSUE DETECTED

REPORT FAILURE

GET INSTRUCTIONS



STEP CHECK AI-ENHANCED VISUAL INSPECTION

EFFICIENT VISUAL INSPECTION

- Naked eye quality inspections, deciding within a few seconds, is **a challenge without the right tool**.
- Step Check makes inspections more efficient by **reducing the risk of error** and **avoiding unnecessary rework**.
- Customers benefit from AI-enhanced inspection solution through **higher quality and customer satisfaction**.

AI-ENHANCED VISUAL GUIDE

- Easier to work by **avoiding manual comparison** of objects with documentation – what you see is what you get.
- **Automatically warns workers** on potentially wrong pass/fail decision using AI-based quality checks.
- **Learns from and with the worker** during daily work for continuous improvement of the inspection.

WHY STEP CHECK

- **No expert knowledge** needed to create inspection checks with AI
- **Automated generation of AI training data** to improve inspection quality
- **Higher accuracy** combining CAD-based object recognition and AI compared to pure geometry-based checks

MERCK – VUFORIA MAKES WORK MORE EFFICIENT

How Vuforia helps Merck:

- Productivity
 - Standardized, contextualized information in real-time for workers
 - minimize human error, and
 - ensure consistent execution
- Training
 - Easy-to-understand, digitized step-by-step training guides help with
 - upskilling workers to ensure high quality
 - reducing intervention and interruption of trainers
- Attend the Merck case study today @ 2:50 pm Room 206

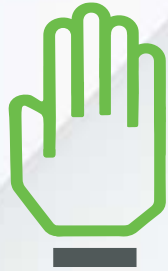


SCHAEFFLER – TRAINING CAPTURED ON-THE-JOB

How Vuforia helps Schaeffler:

- Expert Capture makes AR roll-out easier and lowers cost through SaaS
- Significantly reduced time to create worker trainings
- Tool is self-explaining with quick onboarding for new users
- Workers highlight the ease-of-use in their daily work
- Attend the session **Weds @ 10:15am Room 210C**





QUESTIONS?

Thank you! You can find me at:



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<https://linkedin.com/in/jj-lechleiter/>



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Your feedback provides us with valuable information on how to shape future content strategy for the event!



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THANK YOU

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