Reducing **Service Costs** with

AUGMENTED REALITY

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WHY IS SERVICE SO IMPORTANT TO INDUSTRIAL MANUFACTURERS?

In many industrial sectors, original equipment manufacturers (OEMs) face a challenging and uncertain future. Input prices have fallen in recent years and growth in emerging markets has slowed. New equipment sales are declining in industries ranging from oil and gas, to agriculture, to commercial aerospace. With margins from product sales taking a hit, manufacturers are facing greater pressure to **deliver profit streams** and **provide competitive differentiation** through service.

The complexity of today's products and the rapid evolution of technology have created an imperative for organizations to develop new service strategies tailored to customer needs. For most industries, the headroom for growth and efficiency gains is significant. To succeed, service organizations need to put the **right people** with the **right technical skills** in the **right places** — with an eye towards increasing service margins. Unfortunately, service leaders face significant challenges that prevent service efficiency and drive up service costs.

CHALLENGES IMPACTING SERVICE EFFICIENCY

Skilled labor shortage
One of the biggest challenges field service leaders now face is driving growth from a shrinking pool of workers.

70% The Service Council reported **70% of service organizations will be burdened** by the knowledge loss of a retiring workforce.

Increasing product complexity
Products are becoming more complex due to customer requirements around configurations and customization.

The service information required to support products has also become more complex

Increased customer demands
Customers increasingly demand more stringent uptime requirements.

Service contracts are now mandating aggressive equipment readiness SLA targets.

SERVICE COSTS

Service-driven revenue holds promise, but creating a profitable business model is easier said than done due to the steep cost of service delivery. Moreover, service organizations can avoid downtime, maintain equipment performance, and reduce costs by avoiding expensive on-site visits.

Service costs can be broken down into four key categories:

LABOR AND TRAINING COSTS

SERVICE DISPATCH COSTS

DOWNTIME AND SLA PENALTIES

SAFETY AND COMPLIANCE COSTS

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🪖 Labor and training costs

With a surging number of Baby Boomers retiring each day, and a 31.5% average turnover rate amongst younger demographics, today's service organizations allocate a significant percentage of their revenue and resources towards recruiting and onboarding new technicians.

Technician training can be expensive and time consuming. It often involves mentoring, which removes expert mentors from their "day job" to spend time with new recruits, and doubling up on technicians until new staff are self-sufficient. However, the most substantial cost comes from hourly compensation for technicians enrolled in off-site training that are not yet contributing to the active workforce.

Employers need to retain a significant percentage of technicians to make the most of their HR investments, but many face an uphill battle due to their inability to offer meaningful training and career development opportunities.

57% of service leaders reported the workforce & talent shortage as a top challenge.

-Source: Service Council™, July 17, 2019

57%
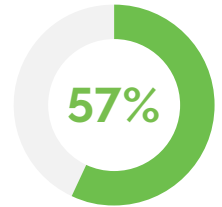
5-20% of expert time is spent documenting procedures and training new hires.

5-20%

"A poll reports that among employees with poor training opportunities, **41% planned to leave within a year**. Only 12% planned to leave among those who considered their company's training opportunities to be excellent, resulting in a retention rate more than two-thirds higher than average companies."

-Louis Harris & Associates

41%
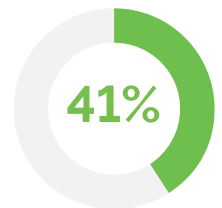
TRAINING AND ONBOARDING COSTS

Direct cost:
New hires require intensive training before service organizations can deploy them in the field. Service organizations can benefit by accelerating time-to-productivity for this segment of employees, but to do so they must speed up training times and improve knowledge retention.

Opportunity cost:
Technicians that graduate from their training program still lack real-world experience and on-the-job problem-solving skills. Mentorships can help new technicians overcome these knowledge gaps, but they also disrupt more valuable employees from their daily work.

Operational cost:
In addition to wages that trainees are owed, service organizations must cover living expenses and reimburse for travel to off-site training facilities. They also finance the physical training resources – such as practice equipment, training facilities, and printed manuals.

Attrition cost:
Technicians develop competencies and skills during training that will benefit them throughout their career, but it's unlikely that they'll spend the entirety of their career with one employer. If an employee leaves, the company loses the investment it has made into them.

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🚚 Service dispatch costs

Dispatches occur when a customer cannot service equipment themselves, causing them to contact the OEM or service provider and request on-site assistance from a technician. What happens on-site can potentially impact profit margins, customer satisfaction, and brand loyalty.

On-site visit costs

A single dispatch can cost anywhere in the range of **$150 – $1000** due to the technician's familiarity with the product. Those costs can multiply when they cannot immediately resolve the issue – nearly a quarter of service calls (23% on average) require repeat visits, and some require multiple technicians on-site. Issue resolution delays can quickly spiral into extra costs and downtime, so metrics like FTFR and MTTR remain a priority for continuous improvement.

52%   **40%**   **35%**

Service leaders reported **first-time fix rate (52%)**, **service revenue (40%)**, and **response time (35%)** as the three most important metrics for 2019.

-Source: Service Council™

Call center costs

Many service organizations also employ a team of call center technicians to field incoming requests and escalate customer issues before a truck roll occurs. While they're mostly dedicated to end-customers, they can also serve field technicians by identifying models or spare parts and providing other technical expertise when needed.

Service leaders expect a **57% increase** in remote service activities in the next 12 months.

-Source: Service Council™, July 17, 2019

57%

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⬇ Downtime costs and breaches of service contracts

Service contracts act as a safeguard against unplanned downtime, but technician errors frequently lead to contract breaches that slow resolution times. Most contracts stress this delicate relationship by carrying hefty penalties and fines. Furthermore, multiple contract breaches may weaken customer loyalty and hurt contract renewals.

33%
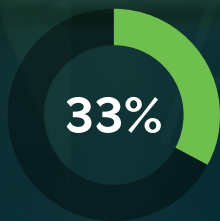
"33% of enterprises report that one hour of downtime costs their firms $1 million to over $5 million."

- ITIC

SERVICE DOCUMENTATION COSTS

Field technicians traditionally rely on instructions from printed repair manuals to complete procedures. Accurate documentation is a prerequisite for an effective service model, but scaling standard operating procedures (SOPs), work instructions, and regulatory documentation for a global workforce can be expensive and logistically challenging.

Providing accurate service documentation
OEMs must first author precise step-by-step work instructions for their products. This typically involves collaborations between subject matter experts and highly-compensated technical writers.

Localizing service documentation
Service instructions often need to be translated for use in different regions. The cost of localizing documentation can vary, but organizations need to account for the expense of third-party translators on top of the initial documentation authoring costs.

Maintaining accurate service documentation
New versions or iterations of products may require updates to existing documentation. Product enhancements can drastically alter service workflows, so OEMs with multiple product variants must account for documentation upkeep costs.

✋ Safety and compliance costs

Lastly, while technicians try their best to prevent mistakes, the combination of workforce inexperience, ambiguous work instructions, and the global scale of operations makes a level of human error somewhat inevitable.

Workplace accidents

Property damage and injuries that result in workers' compensation claims can become unexpected but substantial expenses if safety procedures aren't well documented and enforced by employers. Businesses that put their employees at increased health and safety risk may face regulatory fines, poor morale, lower productivity, and a damaged reputation. While most service organizations prioritize health and safety, many lack the necessary tools to visually incorporate safety tips into their workflows.

Compliancy violations

In process-driven environments like service and manufacturing, employers must closely adhere to strict safety and compliance standards or risk facing harsh penalties from regulatory agencies. Service technicians encounter daily occupational hazards, so non-compliant processes that put them at increased risk can lead to stiff fines or punishments.

THE IMPORTANCE OF SAFETY AND COMPLIANCE ADHERENCE

❯ **313 million**
annual work-related accidents

❯ **2.3 million**
annual work-related deaths estimated

❯ **$92 billion**
The estimated total cost to U.S. manufacturers annually for compliance to OSHHS regulations

# WHY IS AUGMENTED REALITY IMPORTANT FOR SERVICE? +

Service providers are increasingly leveraging augmented reality (AR) to provide their technicians with a more efficient way to access the information and resources they need, so they have better context and clarity in training scenarios and on-the-job.

WHAT IS AUGMENTED REALITY?

AR overlays digital information onto your view of the physical world, so you can "see" things like product data, work instructions, and hidden components while simultaneously interacting with your surrounding environment. AR devices such as smart glasses, wearable headsets, and even tablets and mobile phones deliver AR experiences to connected workers, providing them with real-time or pre-authored guidance from subject matter experts.

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Driving digital transformation with AR

Poor service documentation and workforce inexperience hamper technicians' ability to reach peak productivity, while handcuffing service organizations with high operational costs and low contract renewals. Service organizations are solving these challenges with AR.

10-20%

15-25%
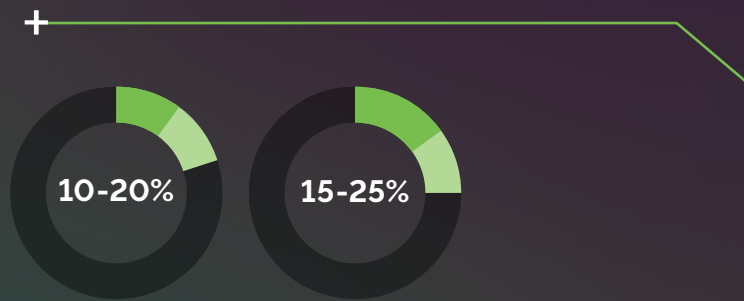
Well-executed services businesses can increase customer satisfaction by **10 to 20 percentage points** and reduce costs by **15% to 25%**.

- McKinsey & Co.

AR is improving workforce productivity by:

- Empowering frontline workers with contextual and relevant information superimposed on their work environments, precisely when and where they need it most

- Replacing outdated, inaccurate or non-existent hardcopy instructions with up-to-date, real-time augmented information

- Providing a compelling alternative to traditional printed manuals that lets technicians fully concentrate on their tasks

- Facilitating communication, knowledge transfer, and training from retiring experts to the new and existing workforce

The role of IoT data

The ability to visualize real-time IoT data within service workflows further increases the value of augmented reality. Insights from IoT data can help operators and technicians prevent failures and downtime and keep equipment running as efficiently as possible.

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How does AR reduce service costs?

Providing technicians with AR-powered service instructions and remote access to experts dramatically reduces repair times and costly errors, while also minimizing the threat of personal injury.

Improved training and workforce efficiency

AR delivers tremendous value for training use cases with visual, highly-engaging training experiences that have been proven to improve comprehension, retention, safety and time to worker productivity with fewer errors.

> AR equips on-site technicians with easy-to-access visual aids and service instructions.

> AR improves traditional training methods with visual content that employees can quickly consume and understand..

> AR allows service organizations to create virtual training curriculums that lower the costs associated with off-site training facilities, travel expenses, and offline resources.

Cognitive science has shown that AR helps trainees understand material faster while improving knowledge retention, so new hires need less on-the-job mentoring. As a result, expert workers spend less time training and more time performing their jobs.

> AR reduces the cost of creating, maintaining and translating training materials

> AR provides a more cost-effective way to update existing service and instructions

> AR reduces costs associated with training through faster time-to-productivity for new or redeployed workers.

Higher FTFR and lower travel costs

AR helps technicians follow step-by-step work instructions more accurately by providing them with information in the context of the physical task they're performing. Technicians using AR resolve issues faster and complete a higher number of jobs per shift, so **fewer repeat visits and on-site technicians** are needed per dispatch.

When a field technician requires assistance, an SME (regardless of location) can view the situation and provide instructions remotely, which further reduces truck rolls and safety incidents.

Lower safety risk

AR minimizes cognitive load, so technicians are more alert and focused while on the job. Service providers can build visual cues and safety tips directly into digital work instructions, which technicians view through AR experiences, in-context of the safety hazard and at the time of need. This reduces the likelihood of a technician forgetting about the hazard and getting hurt when working in an unsafe environment.

AR experiences can also incorporate safeguards and checklists to prevent workers from moving forward with a dangerous procedure without acknowledging the safety instructions.

▶ High clarity of AR instructions improves accuracy and safety

▶ AR helps technicians keep their eyes on the work itself, without having to glance or read through a static document

▶ AR helps distribute institutional knowledge, which in turn helps technicians adhere to safety and compliance standards

50%
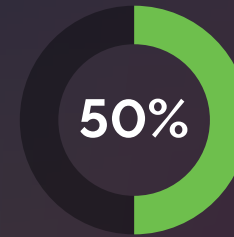
Organizations experienced a 50% decrease, on average, in time-to-productivity for their new workers trained with Vuforia AR experiences.

- The Total Economic Impact™ Of PTC Vuforia, a July 2019 commissioned study conducted by Forrester Consulting on behalf of PTC

10-12%
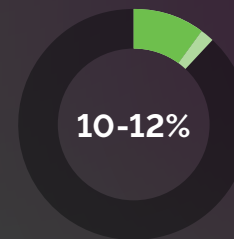
Vuforia AR improve field service quality and productivity, reducing overtime spend by 10% to 12%.

- The Total Economic Impact™ Of PTC Vuforia, a July 2019 commissioned study conducted by Forrester Consulting on behalf of PTC

Less downtime and SLA penalties

Combining AR with IoT insights provides a level of detail to the operator or service tech that was not easily accessible before, including predictive insights which help reduce the cost of downtime.

Better self-service opportunities

AR makes following step-by-step work instructions so foolproof that OEMs can now enable their customers to self-service their own products. By including pre-authored AR experiences or remote assistance as a part of product ownership, OEMs can both show and tell customers how to service and troubleshoot equipment – resulting in less call center inquiries, fewer truck rolls, increased uptime, and higher contract renewals.

61%
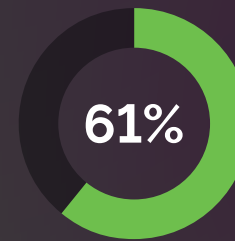
Service leaders expect a 61% increase in assisted service or self-service activities in the next 12 months.

-Source: Service Council™, July 17, 2019

PTC Vuforia is the leading AR platform for service providers

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In a competitive assessment of enterprise AR platforms, ABI Research named PTC Vuforia a decisive leader due to high scores for platform breadth, use case applicability, IoT synergy, computer vision technology, and customer footprint. Service providers can use a variety of Vuforia solutions to improve service quality and delivery.

vuforia® studio™

Publish step-by-step work instructions that incorporate real-time IoT data and animated sequences with a simple drag and drop AR authoring interface.

vuforia® expert capture™

Visually capture SOPs and work instructions in real-time to turn knowledge and expertise into procedural guidance for other employees.

vuforia® chalk™

Guide end customers and on-site technicians through unfamiliar configurations by making live annotations in a shared-view mobile app.
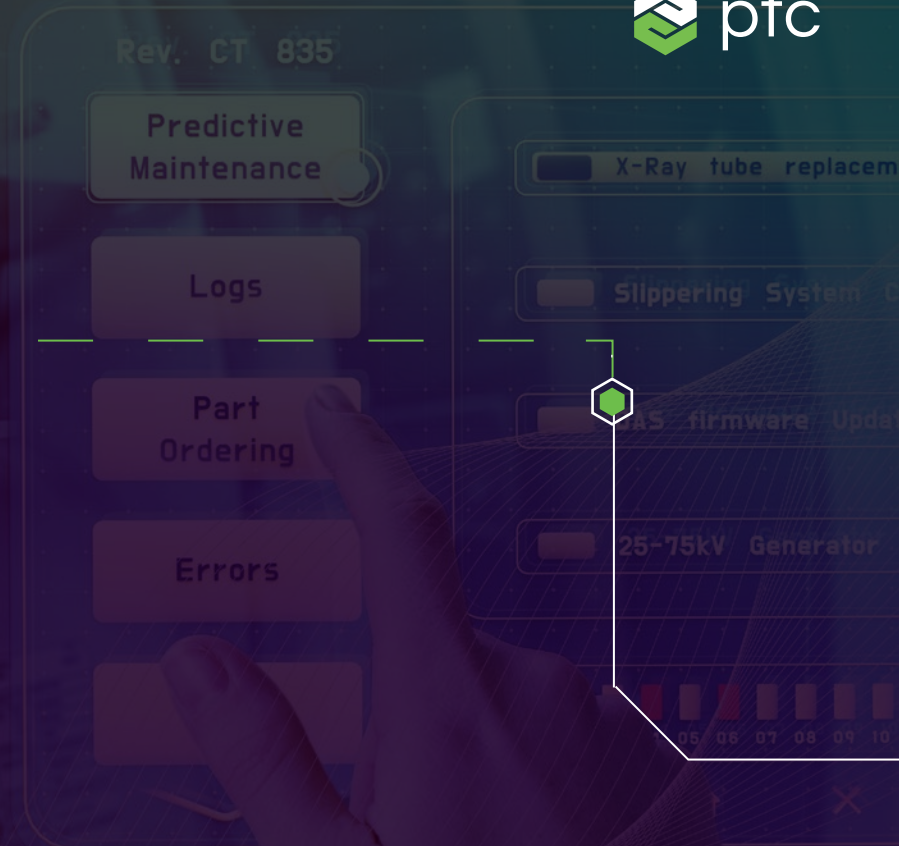
Real OEMs are Reducing Service Costs with AR

Companies like Howden and Sysmex are using AR to completely change the perspective on what it's like to own their products.

> Learn how **Howden** is providing a better end user experience for customers by providing invaluable insight into their equipment in a visual and easily consumable way.

> "With technologies such as Vuforia Studio and Microsoft HoloLens, we found unique enablers that complement our digital twins and help us transform our customers' experience of owning Howden equipment."
>
> – Maria Wilson, Ph.D., Global Leader Data Driven Advantage, Howden Group

> Discover how **Sysmex** is maximizing uptime by leveraging their existing CAD data to create interactive step-by-step 3D work instructions that provide their technicians with real-time, up-to-date information.