



# **BUSINESS CONTINUITY:** *Support Your Strategy with **Augmented Reality***

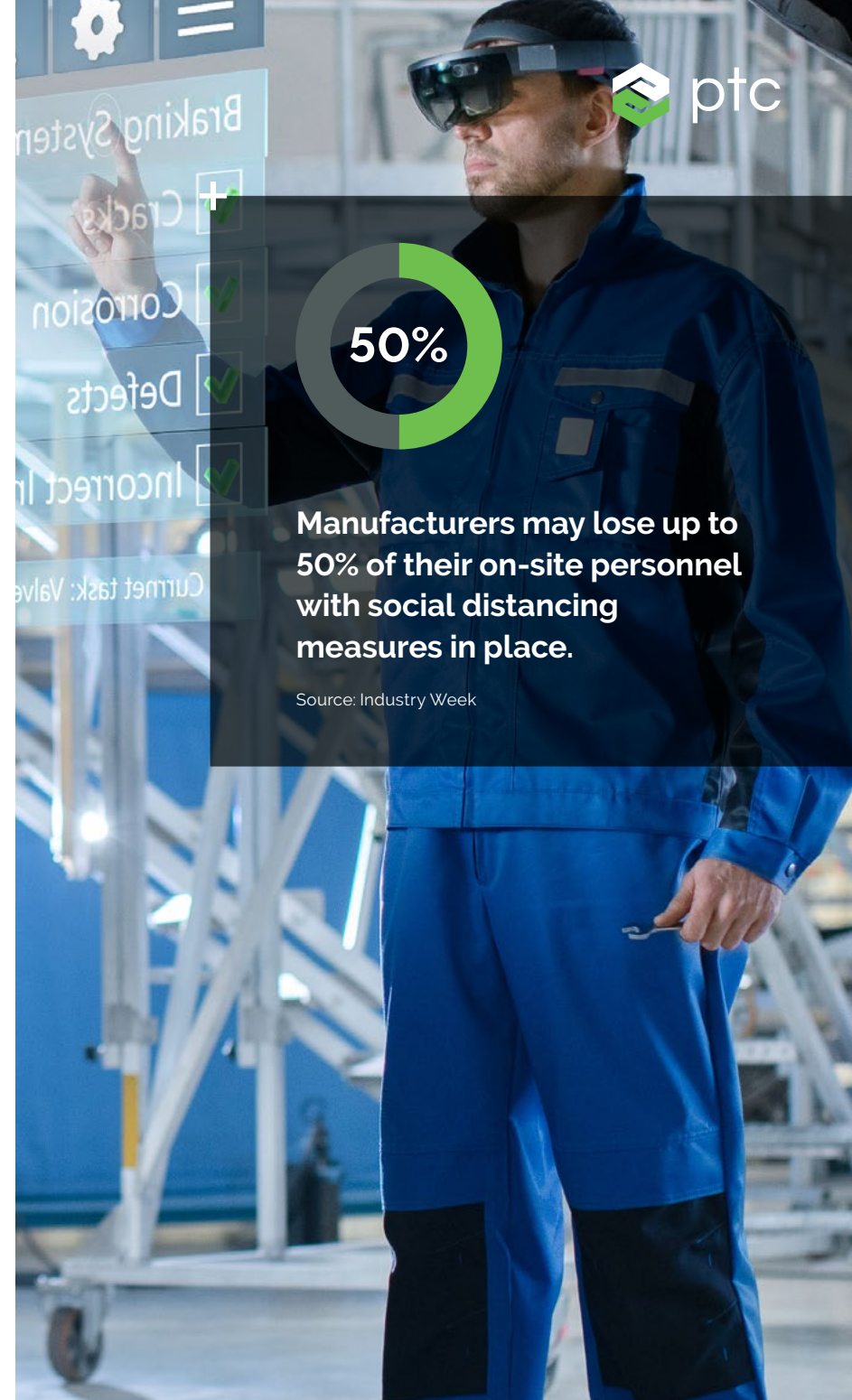
Recover Quickly from Disruptions by Increasing  
the Resiliency of Your Workforce



The recent pandemic has been an unfortunate but eye-opening example of the impact that spontaneous disruptions can have across daily enterprise operations. Organizations around the world have had to contend with global supply chain shortages and overall financial uncertainty as they've witnessed spending fluctuate drastically between markets. Some industries have experienced unexpected surges in demand, while others have seen entire revenue streams evaporate as a result of facility closures or budget constraints.

Above all, every business has had to find an appropriate balance between keeping their employees healthy and safe and maintaining operational continuity across their facilities and the field. For industrial organizations that rely on the productivity of frontline employees to fulfill production orders, engage with potential buyers, and deliver field service to customers, social distancing guidelines and travel restrictions have created a unique set of challenges:

- ✚ Shop floor layouts have needed reconfiguring to ensure physical space between employees
- ✚ On-site personnel have been reduced to skeleton crews to minimize the spread of the virus
- ✚ Drastic, sudden reductions in demand and productivity create pressure to lower costs
- ✚ Frontline workers have had to learn new processes and technologies on the fly
- ✚ Service technicians and field sales reps have had to shift to a more hands-off approach
- ✚ Digital technologies that enable remote work are being more heavily relied on
- ✚ At-risk senior employees are considering retirement sooner than expected





# Unexpected Disruptions are Not a One-Off Challenge

There are many situations or events that can unexpectedly disrupt operations and business norms. Natural disasters, extreme weather, or power outages, for example, can suddenly shut down entire factories or showrooms. If your business isn't prepared to weather these storms and adapt immediately to different ways of working and meeting the demands of customers, then the consequences – as we have seen most recently – can be severe.

It's important, now more than ever, to make your on-site and field-based operations more resilient so your business can maintain continuity in the face of significant disruptions. We don't know how long the effects of the current situation will ultimately last, but it could be for an extended period as the world begins to right itself. Taking these steps today will ensure that your organization not only adapts to new ways of working in the short term, but that it can also sustain operations and sales in the long-term as well.

## HOW TO ADAPT

- 1** Evaluate digital technologies that improve the agility and resiliency of your workforce
- 2** Look for better ways to preserve and extend the knowledge of your essential employees
- 3** Reconsider when, where, and how your business delivers onboarding and training materials
- 4** Empower your sales and marketing teams to engage with potential buyers virtually/digitally
- 5** Provide real-time visibility into your products and operations with easily consumable insights from IoT data
- 6** Provide over-the-shoulder troubleshooting and enable customers to resolve problems quickly
- 7** Enable customers to avoid downtime and optimize operational efficiencies through self-service experiences










## Overcoming Logistical Challenges and Workforce Productivity Losses

Workforce productivity goes down and cost cutting pressures go up as a result of the challenges created by unexpected business disruptions. Around the globe, industrial organizations are adjusting to the "new normal" by rebalancing their operations and leaning on innovative digital technologies that extend the capabilities of their workforce.

Leading manufacturers have seized opportunities to display their agility and compassion by pivoting to produce life-saving items like ventilators and personal protective equipment. Service teams have identified innovative ways to help their customers minimize equipment downtime – without travelling on-site. The common thread between initiatives like these has been an ability to scale mission-critical knowledge and expertise across the enterprise and into the field, in near real-time.

**Rapid changes to frontline operations as a result of unexpected disruptions can also exacerbate workforce challenges that industrial organizations are already familiar with:**

-  Knowledge is rapidly exiting the workforce
-  On-site experts are increasingly unavailable
-  Absenteeism is high among frontline employees
-  Downtime is costly in factories and the field
-  Manufacturing and service workflows are increasingly complex
-  Work instructions and training materials are not intuitive



## Visualizing Procedural Knowledge with Augmented Reality

Augmented reality (AR) is an easily accessible technology that overlays information like digital work instructions, virtual training curriculum, and expert knowledge onto the context of the real-world. By looking at their work instructions in their physical environment on a mobile device or AR headset, frontline AR users can visualize and interpret the information from their own first-person perspective – helping them to accurately comprehend unfamiliar manufacturing workflows or service procedures up to 50% faster.

AR content can be delivered to end users in a variety of formats, from full-scale 3D product demonstrations to over-the-shoulder help via video teleconferencing with digital annotations. The need to streamline knowledge transfer and best practices to frontline workers is what drives each individual AR experience. As a business application, AR empowers frontline users with step-by-step procedural knowledge and relevant information, so they can carry out complex manual tasks with ease and develop new skillsets significantly faster. When disruptions occur or on-site expertise becomes unavailable, AR can fill the knowledge void by delivering on-demand subject matter expertise and step-by-step instructions and training to wherever it's needed across the enterprise.





## Building an On-Demand Knowledge Base

In times when hands-on expertise is hard to come by, and even harder to share with colleagues or customers, out-of-the-box AR SaaS solutions provide an effective shortcut for transferring critical information, competencies, and on-the-job skills. Subject matter experts can use AR to deliver their own personalized walk-through instructions or offer real-time over-the-shoulder guidance to somebody that's already on-site. Upon receiving those instructions, the on-site collaborator can immediately visualize exactly what they need to do, as well as how to do it correctly.

For industrial organizations, the clarity and scalability of AR is proving to be a significant improvement over more conventional work instructions or SOP documentation. Instead of delivering hard copy documentation that employees must read and interpret, the same information can be delivered as an interactive visual experience on a headset or mobile device. As a visual medium, AR requires far less interpretation or translating in order to guide employees as they are performing physical work – regardless of their language or skill level.





## Digitizing the Customer Experience

Social distancing has significantly disrupted how consumers learn about products and how buyers navigate the sales cycle. Product showrooms have seen a sharp decline in visitors and activity, and many have shut their doors completely. Industry events have largely been cancelled or postponed. Despite these obstacles, businesses still need to engage with potential customers to continue to make money and keep the lights on.

AR enables your organization to digitize the customer experience and deliver full-scale virtual renditions of your products. Marketers can build highly interactive product demonstrations with AR, or create 3D promotions that can be viewed anywhere, anytime using a mobile device or tablet. Sales teams can use AR to remotely demonstrate customized, large, complex, or really any products on the fly to continue to engage with customers and meet sales quotas. With the purchase journey becoming an increasingly virtual experience, AR can provide real value and competitive differentiation.

## THERE ARE SEVERAL FRONTLINE STAKEHOLDERS THAT CAN BENEFIT FROM USING AR:



### ESSENTIAL FACTORY EMPLOYEES

Providing on-site employees with access to high quality work instructions and remote "over the shoulder" collaboration and support makes it easier for industrial organizations to overcome disruptions or pivot resources when needed. AR helps essential factory employees safely get the information they need, in the time and place they need it, by bringing hands-on step-by-step instructions directly to their fingertips.

- + **Manufacturing agility:** AR reduces employee training time by up to **50%**
- + **Work quality:** AR reduces scrap and rework by up to **25%**
- + **Employee safety:** AR reduces on-the-job safety incidents



### VALUABLE SENIOR EXPERTS

The exclusive procedural knowledge that tenured employees accumulate over their career is critical for navigating demand fluctuations, optimizing operational efficiencies, and improving new hire ramp-up. AR makes it easier for industrial organizations to retain and protect this highly valued employee demographic, as well as the knowledge they possess, by facilitating more flexible work arrangements and providing an easier way to capture expert knowledge.

- + **Job satisfaction:** AR makes mentoring, guiding, and assisting frontline personnel easier
- + **Knowledge capture:** AR reduces SOP authoring time by up to **50%**
- + **Scalable expertise:** AR minimizes the need for aging employees to travel



### FIELD SALES REPRESENTATIVES

The ability to engage potential customers virtually has become critical to winning new business, especially as showrooms shutter and in-person events like tradeshows are cancelled. AR gives sales representatives a better way to showcase products in the form of full-scale virtual 3D demonstrations.

- + **Customer experience:** AR lets customers experience product demonstrations at their convenience
- + **Purchase confidence:** AR empowers customers to make purchase decisions quickly
- + **Product customization:** AR enables faster reconfiguring of built-to-order products



### AFTERMARKET SERVICE

With travel restrictions and social distancing keeping field technicians across the globe grounded, service organizations need effective work arounds to help them fulfill aftermarket service contracts. As a virtual knowledge transfer tool, AR has opened the door to faster service delivery by empowering customers to self-service products and equipment – through remote guidance from a service tech or by following step-by-step AR-enabled instructions provided by the OEM.

- + **Customer satisfaction:** AR helps service customers minimize equipment downtime
- + **Service costs:** AR reduces costs associated with aftermarket service and product ownership
- + **Brand differentiation:** AR offers an innovative way to become more customer-centric



# Rebounding from Disruptions by Scaling Expertise



Implementing technologies like AR can help you maintain business continuity now and support new business and workforce strategies moving forward, so you will be better prepared to manage future disruptions. Many industrial organizations have experienced significant changes in the past few months, these applications of AR can help your frontline operations rebound with improved speed, agility, and safety.

Use Case	CAPTURING AND OPTIMIZING CRITICAL WORKFLOWS	EXPERT COLLABORATION AND REMOTE SUPPORT	WORKFORCE TRAINING AND INSTRUCTION	VIRTUAL PRODUCT DEMONSTRATION
<b>What is it?</b>	Intuitive method to capture, edit, and publish step-by-step procedures and document SOPs from subject matter experts.	Out-of-the-box solution for transferring subject matter expertise and delivering over-the-shoulder support on demand.	Pre-authored digital work instructions and training curriculum that safely and accurately guides employees through hands-on procedures.	Innovative way for marketers and sales representatives to showcase products and virtually engage with customers.
<b>What is required?</b>	<ul style="list-style-type: none"> <li>Hands-free AR headset</li> <li>Procedure-capturing and content creation software</li> <li>Subject matter expert</li> </ul>	<ul style="list-style-type: none"> <li>Mobile device, tablet, or desktop</li> <li>"See-what-I-see" AR app</li> <li>Subject matter expert</li> </ul>	<ul style="list-style-type: none"> <li>Mobile device or AR headset</li> <li>AR content creation software</li> <li>Subject matter expertise, 2D technical documentation and/or pre-existing 3D CAD data</li> </ul>	<ul style="list-style-type: none"> <li>Mobile device or AR headset</li> <li>AR authoring software</li> <li>CAD data</li> </ul>
<b>How does it work?</b>	<ul style="list-style-type: none"> <li>Subject matter experts record and capture the relevant procedural knowledge they have using an AR headset.</li> <li>The captured content is easily edited and published to a variety of devices.</li> <li>On-site frontline employees view the recording while following the steps that the SME laid out.</li> </ul>	<ul style="list-style-type: none"> <li>On-site person calls a remote expert to share a live video feed of a work issue they're experiencing.</li> <li>Offsite subject matter expert draws AR smart annotations over the live video, pointing out steps to resolve the problem.</li> </ul>	<ul style="list-style-type: none"> <li>Content creators build training materials or step-by-step work instructions</li> <li>A variety of methods can be used including: Capturing subject matter expertise, leveraging pre-existing CAD and IoT data, 2D diagrams, pdfs, video and animated sequences.</li> <li>End users easily access and view the pre-authored AR experience overlaid onto their surrounding environment.</li> </ul>	<ul style="list-style-type: none"> <li>Existing CAD data is used to build an AR experience of a virtual product demonstration.</li> <li>Potential buyer views the AR experience to learn about the special features of the product they're interested in.</li> </ul>
<b>What are the benefits?</b>	<ul style="list-style-type: none"> <li>Faster ramp up and a more competent and agile workforce</li> <li>Increased quality and precision from frontline employees</li> <li>Lower documentation and training costs</li> <li>Accessibility to a library of documented knowledge</li> </ul>	<ul style="list-style-type: none"> <li>Faster issue resolution for customers and on-site employees</li> <li>Greater access to subject matter experts that are increasingly vital and scarce</li> <li>No technological learning curve for users</li> </ul>	<ul style="list-style-type: none"> <li>Faster ramp up and a more efficient, engaged and agile workforce</li> <li>Increased safety and accuracy for frontline employees</li> <li>Lower documentation and training costs</li> <li>Support customer demands</li> <li>Continue vital business operations</li> </ul>	<ul style="list-style-type: none"> <li>Accelerated sales cycles for complex industrial products</li> <li>Buyers understand the features that differentiate products faster</li> <li>Higher purchase confidence and customer satisfaction</li> </ul>
<b>Real-world example:</b>	A consortium of major UK industrial, technology, and engineering businesses produced thousands of ventilators amidst a global shortage by using Vuforia Expert Capture and Microsoft HoloLens to reconfigure their factories and reskill their workers.	<b>Toyota</b> improved safety and communication in their manufacturing plants by using Vuforia Chalk to connect subcontractors with remote expert employees, eliminating the need for employees to go on-site to resolve issues.	<b>BAE Systems</b> reduced training time by more than 30% by leveraging Vuforia Studio to create interactive mixed reality training and assembly instructions that new employees can view through the Microsoft HoloLens.	<b>W Motors</b> helped potential buyers visualize available customizations for their rare Lykan HyperSport super car using Vuforia Engine to overlay an interactive AR experience over a single physical car on the show floor.

# Expecting – and Preparing For – the Unexpected

This recent disruption has triggered the ultimate stress test for businesses around the world. Operational preparedness has been a key differentiator for how industrial organizations have fared, with frontline employees facing new, unfamiliar challenges along the production line and in the field. The impact of the pandemic will continue to be felt, both today and in the long-term, by businesses that are ill-prepared for change. Implementing new strategies, technologies, and business models now will be key to surviving – and thriving – through an uncertain future.

As your business continues to adjust to the new normal, it's important to identify ways to support faster knowledge transfer, safer workflows, improved training and instruction delivery, and better communication and collaboration between on-site and offsite personnel. Augmented reality has helped frontline employees around the globe to overcome knowledge gaps and learn essential new processes and information on the fly. Subject matter experts are using AR to scale their expertise as they adapt to more flexible working arrangements. Customers are minimizing equipment downtime themselves by using 2D or 3D instructions, delivered ad-hoc or pre-loaded onto an AR device, to self-perform critical service procedures.

**It's impossible to know when your business will be impacted by significant disruptions, but technologies like AR can help your workforce become better prepared to face challenges head-on, so you can sprint out of the gate when things return to normal. Is your organization ready to overcome the challenges that tomorrow brings?**



**PREP YOUR WORKFORCE WITH AR →**

**Evaluate PTC Vuforia solutions with our Industrial Augmented Reality Buyer's Guide.**

© 2020, PTC Inc. All rights reserved. Information described herein is furnished for informational use only, is subject to change without notice, and should not be taken as a guarantee, commitment, condition or offer by PTC. PTC, the PTC logo, and all other PTC product names and logos are trademarks or registered trademarks of PTC and/or its subsidiaries in the United States and other countries. All other product or company names are property of their respective owners.