

Wearables in Field Service: Leveraging AR Smart Glasses to Close the Skills Gap, Boost Performance, & Increase Profitability

Field service organizations are turning to remote support to address a widening productivity and workforce skills gap, maintain margins, and create a competitive advantage.

In this white paper, we explore the importance of augmented and assisted reality and AI to field service organizations striving to maintain and grow their competitive advantage and examine the specific areas leading field service teams are realizing ROI.

AR in Field Service

The digitalization of field service operations is advancing at warp speed. For forward-thinking field service organizations, this digital transformation is an opportunity to improve productivity and reduce service costs using technologies including:

- **Assisted reality (aR)**—Enables a user to view a screen within their immediate field of vision, hands-free.
- **Augmented reality (AR)**—A computer-generated image is superimposed on the user's view of their physical environment, creating an enhanced, interactive experience. AR devices can be hand-held or wearable/hands-free.
- **Artificial intelligence (AI)**—The ability of a computer system to simulate human intelligence to perform tasks and solve problems.

These three technologies can be combined into one platform, such as an AR wearable device. AR technology enables users to enhance real-world objects with superimposed data and images, allowing users safe access to the data and knowledge they need in the field.

AR wearable technology also supports assisted reality and AI functions, making it a 3-in-1 tool. Just as with assisted

reality technology, with an augmented reality (AR) device, a service technician can connect with an off-site supervisor or seasoned technician who can view what the on-site technician is seeing and walk them through the needed repair or maintenance steps via video. This "see-what-I-see" capability decreases repair times and reduces truck rolls. AR technology can also be integrated with AI, allowing service technicians to quickly review repair history or customer notes to spot trends and better understand customer needs, improving first-time fix rates (FTFRs) and the customer experience.

Within field services, **wearable AR devices like smart glasses are particularly valuable as they allow field service technicians to access the benefits of AR while keeping their hands free and heads up to maximize work efficiencies and improve safety.**

Market leaders are embracing AR wearables to overcome widespread skilled labor challenges and rising service costs:

- Centralized, remote experts can help to overcome the expected **73.5K** US heavy equipment technician shortage by 2025[i]
- **7% year-over-year (YoY) increase** in service costs and cost per resolution[ii]
- **63%** of best-in-class organizations are now using AR in daily operations[iii]

AR deployment is transforming how field service teams train employees, interact with customers, manage their workflows, define success and, ultimately, holds the key to an organization's ability to remain competitive.







Vuzix M400™ and Blade 2™ smart glasses are the most common devices used among field service teams

The Business Case for AR in the Field

Revenue Growth

AR deployment yields companies **62% higher growth** in annual revenue compared with companies not using AR.[iv]

"[With Vuzix AR glasses,] we're able to better utilize our engineering staff. This means we can take on more work since we can support more projects simultaneously."

— David LaPointe, VP of Engineering, CH Four Biogas

Cost Savings

Improvements in first-time fix rates were **127% greater** and service costs **decreased by 92%** more in organizations using AR.[iv]

"[Vuzix AR glasses are] like a sort of tool to enhance customer engineer capabilities. It would be possible to get similar support with a smart phone, but with smart glasses, both your hands are free."

— Suzuno Fumiharu, Group Manager for Remote Support, Promotion, & Development, RICOH Japan

Scalability

Businesses using AR have a **42% higher YoY** increase in profitability.[v]

"Vuzix gave us the ability to be in multiple places at once, and vastly extended the power of our small team. All these things help us to better support our partners, which is our number one priority."

— David LaPointe, VP of Engineering, CH Four Biogas

Creating a Competitive Advantage with AR

The Digital Transformation of Field Services

Over the last decade, field service organizations prioritized digitalization, converting analog data to a digital format, and incorporated technology throughout their teams' workflows. The Covid-19 pandemic accelerated this move as field service teams were forced to take the leap into remote services to continue to serve customers, maintain and strengthen relationships, and remain profitable. Today, many organizations have easy access to reams of rich data but lack the ability to incorporate it into daily operations and use it to provide value across the organization. Augmented reality (AR) wearable devices with integrated assisted reality and AI capabilities are fast becoming a primary solution to this challenge, helping to:

- Escalate issues to an experienced, **centralized technician. (Assisted Reality [aR])**
- Guide fast and efficient service with how-tos and "digital twin" **3-D models** of the equipment being worked on. **(AR)**
- Troubleshoot effectively and access **information on demand.** AR devices with AI integration can detect technical problems with 98% accuracy. **(AI)**

The Value Proposition of AR Deployment in Field Service

(Companies using AR vs. non-users)

50%
saw an increase in their total number of customers[vi]

1.3x
higher customer satisfaction[iv]

1.6x
greater annual revenue

4x
increase in customer retention

3x
growth in customer lifetime value

$1B
10% increase in customer satisfaction can increase revenue by as much as $1 billion for larger companies and double the revenue of smaller companies within 36 months.[vii]

Sources: Service Council. Building Momentum With an AR-Enabled Digital Transformation. Feb. 2023 & Aberdeen Strategy & Research. Augmented Reality in Service: Enrich CX Delivery to Lower Costs & Delight Customers. Jan. 2022.

Improving Margins through Productivity Gains

Economic Uncertainty and Soaring Field Service Costs

While the field service management market is expected to grow from $5.21 billion to $25.26 billion by 2030, the economic forecast is uncertain. Over the past several years, costs have increased across almost every facet of field operations, taking a significant chunk out of profit margins. Since 2021, field service labor costs have gone up by 8% and are rising. With a significant portion of work being maintenance-driven and tied to Service Level Agreements (SLAs) that have stringent responsiveness windows, pay rates are pushed further upward.[viii] Additionally, ongoing supply chain disruptions have caused the cost of parts to continue their upward trajectory.

First Time Fix Rate Improvements No Longer the Magic Bullet

In 2022, the average cost for field service operations increased 7%, despite an overall improvement in performance across service organizations, including an increase in First Time Fix Rate (FTFR) of 2.34%—this is astounding given that for years FTFR was often the only key performance indicator (KPI) organizations used to determine if they were successful.[ii]

Companies have long depended on increases in FTFR to boost their bottom line, but reliance on FTFR alone is not enough to overcome today's cost pressures. Given ongoing inflation and supply chain disruption, cost containment remains a top priority.

Bridging the FTFR-Cost Gap

Field service is a "people and parts" business—labor comprises 60% of total field service costs, while spare parts expenditures are responsible for an additional 22%.[ix] Inflationary surges dampen field service revenue generation as a result. While economic forces are outside the control of field service organizations, leaders *can* control how they respond to these challenges and create conditions for success.

To be successful in today's competitive business environment, cost cutting alone is not enough.

Organizations that are moving now to make strategic investments in technology like AR wearables will experience long-term gains across KPIs; those that do not will sacrifice their competitive edge.



AR Deployment Cost Savings

2 OUT OF 3
reported better-quality field service engineer training

80%
saw decreased problem resolution times[x]

85%
report AR has helped them reduce costs and improve service KPIs

75%
of AR users reported greater ability to resolve customers' problems without having to dispatch a technician[vi]

$20M
Companies that have deployed digital technologies like AR in their field service operations see annual cost savings of up to $20 million.[xi]

Sources: Service Council. Building Momentum With an AR-Enabled Digital Transformation. Feb. 2023 & WBR Insights. Future Applications of AR in Field Service. 2021.

Effective AR Deployment in Field Service

Augmented reality (AR) may sound like a futuristic technology that can be implemented sometime down the road; however, **63% of Best-in-Class companies are already using AR in their daily business processes, and 33% of Best-in-Class companies are making plans to implement AR soon.**[iii] These companies have found that AR optimizes their day-to-day field service operations and improves process capabilities.

AR integration enables field service organizations to:

- Overcome workforce shortages and skill gaps.
- Upgrade the customer experience while cutting costs.
- Build business agility and boost profitability.

Overcome Workforce Shortages and Skill Gaps

Over 10,000 baby boomers are leaving the workforce each day. As a result, the U.S. labor market is projected to have a shortage of approximately 8.2 million workers by 2027, and within just the manufacturing industry, a shortage of 2 million workers by 2025 is expected.[xii] Organizations are grappling with a significant loss of skills and domain knowledge that cannot be easily transferred to new employees and increasing costs due to these resulting skill gaps. AR deployment can help address these challenges.

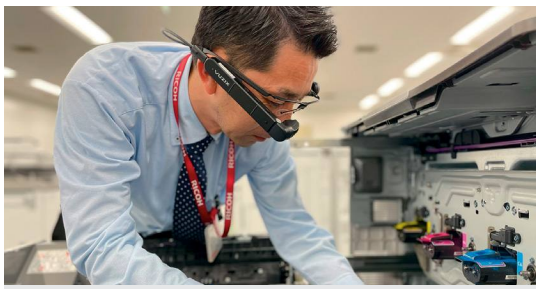
Cost of the Workforce Skills Gap

The workforce skills gap is one of the main obstacles to meeting growth goals and KPIs for field service operations. 46% of the field technicians in North America are over 50 years old. For each of these technicians that leave the workforce, 3-4 new workers must be hired to bridge the skill gap created.[xiii] Technician knowledge gaps have a direct impact on performance and costs: increasing truck rolls, wrong parts ordered, and declines in customer satisfaction and retention.

"Service organizations must invest in the right technology. Organizations that don't invest in the right tools to monitor and train their workforce will not be around in five years due to the rapidly increasing cost of service."

— Edward Pahk, VP of Growth, Aquant

Overall, a company's poorest-performing employees cost 67% more than their highest-performing employees.[ii] To begin to close the skills gap, companies need to assess the extent of the gap that exists between their top-performing employees and their bottom-performers and make informed decisions on how to utilize resources, such as AR, to bring poorer-performers up to speed. This assessment becomes even more important as more field service teams bring on third-party service providers, with 86% of companies now outsourcing at least a portion of field service tasks to third-party field technicians.[xiv] Organizations that put the effort into boosting employee performance, reap the rewards—if middle-of-the-pack performers built skills that moved them closer to top-tier performers, service costs would reduce by 13% and, if all field service employees had the skills to perform at the level of those in the top 20%, **service costs would decrease by 21%.**[ii]



Case Study

Ricoh Japan Corp., which handles the sales and maintenance of multi-function devices and printers manufactured by its global technology parent company Ricoh Co., Ltd., was facing challenges with training and upskilling its new customer engineers and ensuring the transfer of knowledge from veteran engineers to new hires.

With the help of Vuzix, the company integrated AR smart glasses into its new hire training program.

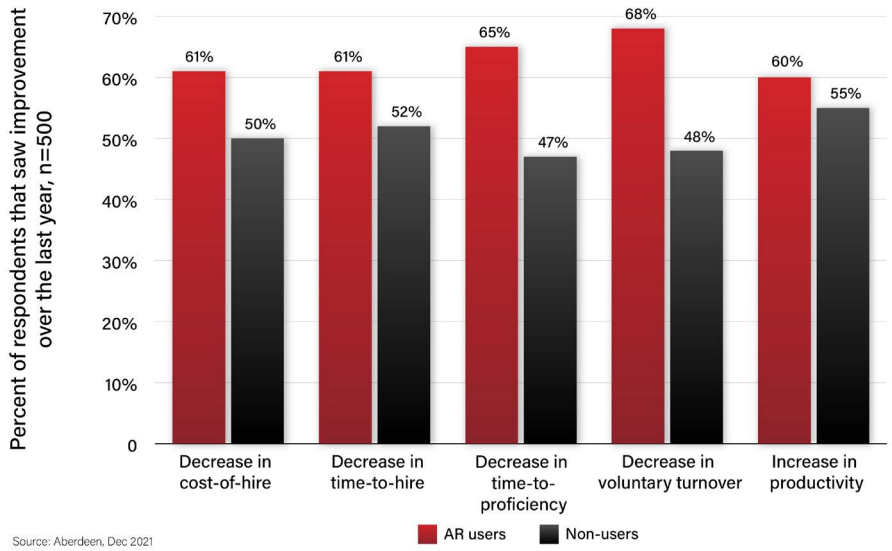
This cut service times by hours, reduced people needed on-site, and helped Ricoh meet its safety and sustainability goals.

Train & Upskill Workers Using AR

Augmented reality (AR) deployment in field service operations decreases the learning gap between new hires and senior-level technicians and engineers by facilitating real-time knowledge transfer and collaboration. When AR capabilities are delivered in a hands-free form factor like smart glasses, with voice command and built-in streaming camera features, technicians in the field gain heads-up access to workflow databases and can connect with remote experts when needed with both hands available to work. The remote expert can see what the on-site technician is seeing and walk them through the needed steps for set up or maintenance—making every field service technician an expert. **65% of organizations that employ AR benefit from a decrease in time-to-proficiency for their new employees (Figure 1).**[v] Getting new hires up to speed rapidly yields gains in overall productivity, with **60% of companies utilizing AR seeing year-over-year increases in productivity (Figure 1).**[v]

Equipped with the capability to train new hires more quickly and the ability to easily leverage remote experienced workers when needed, companies that utilize AR are freed from having to hire only those candidates that already have extensive skill sets—making it possible to further leverage third-party service providers and reducing the amount of time and money it takes to fill open positions. **61% of organizations using AR experienced year-over-year improvements in their cost-of-hire and time-to-hire performance (Figure 1).**[v] In addition, the added flexibility for seasoned employees and highly visual, immersive training experience that appeals to younger employees mean higher retention: **68% of companies using AR see a decrease in annual voluntary turnover (Figure 1).**[v]

Figure 1: AR Impact on Workforce Management KPIs



Source: Aberdeen, Dec 2021

Upgrade the Customer Experience While Cutting Costs

Companies that want to remain competitive and profitable in today's business environment must offer products and services that separate them from the crowd. Customers expect excellence, personalization, and consistency in their touchpoints across departments, and businesses must adapt to meet these demands. Organizations need strategies and technologies that will allow them to leverage their knowledge and resources to differentiate themselves from the competition with outstanding efficiency, accuracy, and skillful management of the customer experience. AR not only supports service technicians in completing product maintenance more efficiently, resulting in an improved customer experience, it also empowers self-service.

Did you know? A failed first service visit results in an average of **1.75 more visits** to fix the problem and adds about **13 days** to Mean Time to Resolution.[ii]



Performance and Customer Satisfaction Gains With AR

Businesses that have already incorporated augmented reality (AR) into their service processes are expanding their operational efficiencies while decreasing costs and increasing revenue. AR makes it possible for companies to increase their field service productivity by diagnosing problems remotely and deploying the right technician and parts to complex jobs when needed.

Integrated AI in smart glasses can also enable:

- Intelligent scheduling
- Intelligent dispatching
- Inventory management
- Route optimization

AR-integrated organizations see a decrease in annual service costs almost double that seen by companies not utilizing AR in their field service operations (Figure 2).[iv]

Increased product complexity and outsourcing to third-party service providers make easy access to real-time data critical for field service technicians. Field service technicians using wearable AR have real-time access to schematics, diagrams, step-by-step instructions, and historical service data and can quickly connect with supervisors and more experienced technicians for additional assistance when needed. Compared with companies not currently using AR in field service, **companies that employ AR see a 12.7% year-over-year increase in FTFR; an improvement of more than 2x that of organizations not using AR (Figure 2).**[iv]

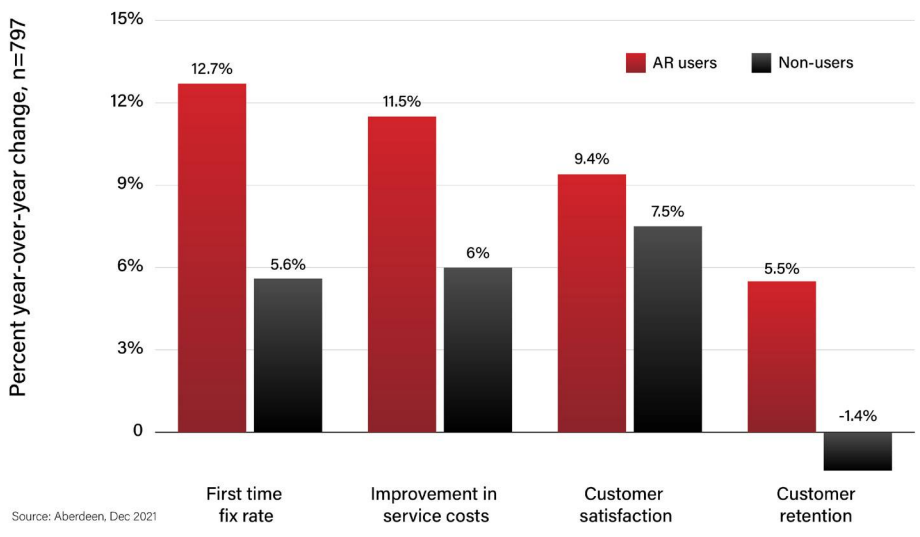
Currently, the field service industry still widely employs a break-fix approach to operations—it is not until disruption occurs due to asset failure that a technician is deployed to do repairs. IoT-enabled sensors, however, are causing a shift from reactive to proactive and predictive repairs—field service professionals can now get ongoing updates on the equipment they are monitoring through their AR devices and address problems before they cause a shutdown. Large-scale, critical repairs are minimized and when combined with the other efficiencies created by AR use, the result is more satisfied customers. Customer experience has become critical to a company's success, surpassing price and even product as the key way that best-in-class companies distinguish themselves from the rest of the pack. In comparison with companies not currently using AR in field service, **companies that employ AR are seeing higher growth in customer satisfaction at 9.4% vs. 7.5%. In fact, companies not utilizing AR experience an erosion of their customer base of 1.4% annually, while those that have adopted AR increase their customer retention rates by 5.5% (Figure 2).**[iv]

"The use of collaborative tools like AR will become the standard by which customers evaluate and measure field service performance."

— Michael Blumberg, President, Blumberg Advisory Group



Figure 2: AR Impact on Costs and Customer Experience



Source: Aberdeen, Dec 2021

Case Study

CH Four Biogas, a leading producer of anaerobic digestion and alternative energy installations, needed a new way to complete time- and labor-intensive plant inspections when travel was restricted during the 2020 pandemic.

The company turned to Vuzix® smart glasses to enable their field operators to perform inspections remotely.

CH Four Biogas saved $70,000 USD in travel expenses when pandemic restrictions were in place and inspection times were reduced from as much as a week to only a few hours, allowing them to scale to support more projects.

Build Business Agility and Boost Profitability

Field service organizations are increasingly recognized for their role in the customer experience and sales. Field service technicians are one of the few (or only) employees regularly at a customer's business. This gives field agents the opportunity to intimately observe and understand a customer's business environment, making them an excellent source for valuable insights that can be leveraged by the organization's business intelligence platform to support better fact- and insight-based decisions. This connection with the customer also puts field technicians in an ideal position to respond effectively with right-fit product and service recommendations when there are shifts in a customer's needs.

Leverage Field Service Insights to Expand Existing Customer Accounts

Field service leaders have recognized that identifying and leveraging opportunities within their existing customer base is one of the most effective ways to fuel growth. **The success rate of selling to new customers is only about 5-20%, but the success rate of selling to existing customers is an impressive 60-70%.**[xiv] Equipped with deep customer understanding and thorough knowledge of an organization's offerings, field service technicians are moving beyond solely fixing and maintaining equipment to becoming a customer's trusted advisor and consultant. This position of trust enables field service technicians to discuss upselling and cross-selling with a customer without the feel of an unwanted sales pitch. In a 2022 Deloitte survey of 100 businesses with substantial field service organizations, **22% of global executives said they already utilize their field service technicians to cross-sell and upsell to their existing customer base. 70% are or will soon be equipping their field service team with upsell and cross-sell capabilities.**[xiv]

> Year-over-year annual revenue growth is **1.6x greater** for companies that employ AR in their field service processes[iv]



Maximize Field Service Sales With AR

Field service sales revenue comes from warranties, contracts, parts, and services. Field service agents can upsell or cross-sell to current customers by:

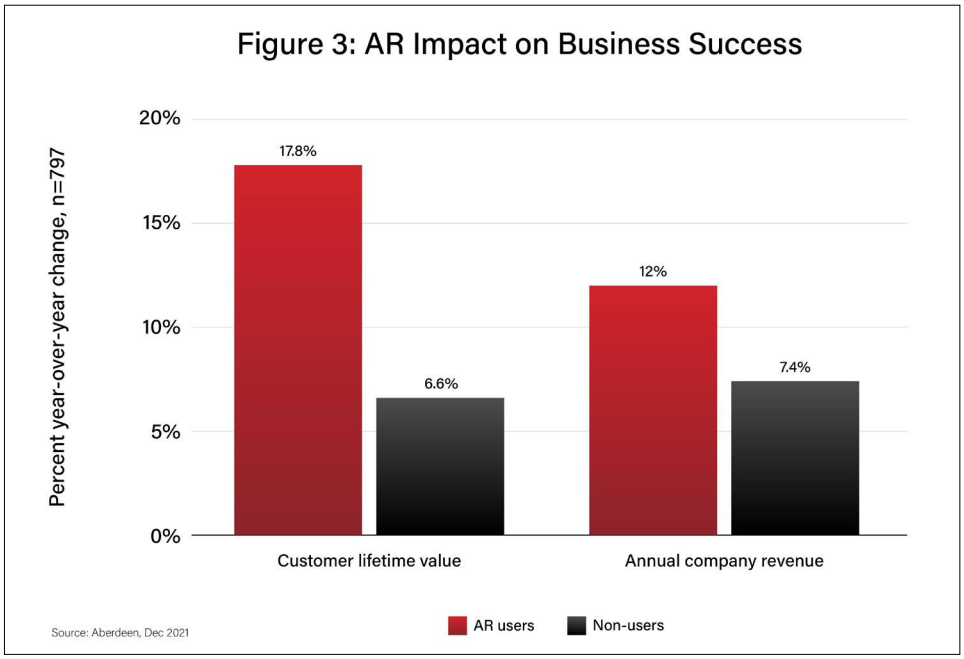
- Selling extended warranties or contracts that encompass additional field service work.
- Automatically suggesting parts and/or additional billable services.
- Providing quotes for billable parts and/or services.
- Placing orders for billable parts.

Field service organizations are finding that augmented reality (AR) simplifies the inclusion of upselling and cross-selling activities into their workflow. AR supports field service sales activities with:

- Fast, real-time access to a customer's current warranties and contracts and upsell or cross-sell right fit options.
- Alerts to notify the field technician when no warranties or contracts are in place.
- Automatic suggestions for parts to upsell or cross-sell based on the customer's needs and priorities.
- The ability to showcase parts and products in a more realistic and immersive format.

Of the 100 companies surveyed in Deloitte's 2022 study, **52% said they are using automatic product recommendations generated by technologies like AR and AI to increase their field service team's ability to upsell and cross-sell.**[xiv]

The strategic implementation of AR is paying off for these companies—**businesses that have employed AR in their field service operations experience a year-over-year increase in customer lifetime value of 17.8%, a rate 3x that of organizations that have yet to implement AR (Figure 3).**[iv] In total, the improvements in costs, service quality, customer satisfaction, and sales yield **annual revenue growth for companies using AR of 12.0%—1.6x higher than non-users (Figure 3).**[iv] Companies that integrate AR into their service organization enjoy a distinct competitive advantage.





Key Takeaways

For organizations today, finding new ways to scale with fewer field service technicians is essential. Field service costs are rising, while pressure is increasing for field service operations to advance revenue growth. Equipment is becoming increasingly complex, and new hires must be rapidly brought up to speed. Experienced workers are leaving the workforce in large numbers—capturing and sharing their know-how is critical to the success of not just the incoming, inexperienced technicians, but also to the success of the business. At the same time, customer demands for immediate responsiveness, fast problem resolution, and personalized service are increasing.

Leaders who deploy augmented reality (AR) wearables in their field service operations to address these challenges are finding that the value of hands-free, heads-up access to real-time expert knowledge and training, needed information, and AI-driven insights into customer needs and preferences translates into a:

- 4x larger increase in customer retention and 3x greater increase in customer lifetime value.
- 62% advantage in YoY revenue growth.
- 127% greater decrease in FTFRs and 92% greater reduction in field service costs.
- 42% larger YoY increase in profitability.

Field service organizations that have not incorporated AR into their operations are missing out on a crucial tool for creating a competitive advantage. AR wearables make it possible to bridge the workforce shortage and skills gap, increase operational efficiency and productivity, and enhance the customer experience while maximizing customer value and driving growth across the organization.

Did you know?

Field service organizations using AR improve customer retention by **2x** and employee retention by **68%.**



VUZIX: Heads-Up, Hands-Free AR for Field Service & Beyond

Vuzix® augmented reality (AR) smart glasses help connect technicians in the field to AI databases and remote specialists, providing them with heads-up, hands-free support and training that cuts costs and improves overall productivity.

Connect With Us to See What You've Been Missing.

VUZIX M400™



Vuzix M400™ smart glasses

Lightweight and durable, our field service smart glasses are the most wearable, powerful, and ergonomically versatile headworn computer on the market.

References

[i]Association of Equipment Manufacturers. *4 Ways to Address the Industry's Technician Shortage.* Mar. 2023. https://www.aem.org/news/4-ways-to-address-the-industrys-technician-shortage

[ii]Aquant. *Measure What Matters: The 2023 Service Intelligence Benchmark Report.* 2023. https://discover.aquant.io/2023-service-benchmark-report

[iii]Aberdeen Strategy & Research. *Augmented Reality: A Revolutionary Tool for Manufacturers to Manage Change.* Aug. 2020. https://www.aberdeen.com/blog-posts/blog-manufacturing-engineering-ar-change-management/

[iv]Aberdeen Strategy & Research. *Augmented Reality in Service: Enrich CX Delivery to Lower Costs & Delight Customers.* Jan. 2022. https://aberdeen.canto.com

[v]Aberdeen Strategy & Research. *Close the Skills Gap and Usher-in Industry 4.0 With Augmented Reality and Real-time Data.* Dec. 2021. https://aberdeen.canto.com

[vi]Service Council. *Building Momentum With an AR-Enabled Digital Transformation.* Feb. 2023.

[vii]Forrester. *Improving Customer Experience by One Point Can Drive More Than a Billion Dollars in Revenue.* Jan. 2020. https://www.forrester.com/blogs/improving-customer-experience-by-1-point-can-drive-more-than-a-billion-dollars-in-revenue-in-2019/

[viii]Field Technologies Online. *Why Are Field Service Costs Skyrocketing?* Aug. 2022. https://www.fieldtechnologiesonline.com/doc/why-are-field-service-costs-skyrocketing-0001

[ix]Technology & Services Industry Association. *The State of Field Services: 2023.* Jan. 2023. https://www.tsia.com/resources/the-state-of-field-services-2023

[x]WBR Insights. *Future Applications of AR in Field Service.* 2021.

[xi]Kearney. *Field Services Races Toward Digital.* June 2017. https://www.kearney.com/digital/article/-/insights/field-services-races-towards-digital-article

[xii]Blumberg, M. *The Impact of Impending Labor Shortages on Field Service.* https://www.qgdigitalpublishing.com/publication/?i=498961&article_id=3095503&view=articleBrowser&ver=html5

[xiii]Field Nation. *Addressing the Labor Shortage With On-Demand Labor.* Mar. 2023. https://fieldnation.com/resources/addressing-labor-shortage

[xiv]Deloitte. *Working at the Edges: The Opportunities and Challenges of Using Field Service to Generate New Sources of Revenue.* May 2022. https://www.deloittedigital.com/us/en/offerings/customer-led-marketing/digital-customer/field-service.html