FIELD SERVICE AND AUGMENTED REALITY IS A PERFECT MATCH

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⊕ TeamViewer

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INTRODUCTION

Augmented Reality (AR) and enterprise digitization have been paired increasingly often over the past few years. With numerous proven, high-value applications like remote assistance, training, and step-by-step instruction and documentation, smart glasses serve users with valuable content hands-free. Real-time digital content can be invaluable on its own, as evidenced by the uptake of smartphones and tablets as dedicated enterprise mobility devices; adding hands-free interaction and point of view visualization takes that value a step further.

Smart glasses are expected to reach more than 25 million shipments in enterprise sectors in 2027, growing from fewer than 2 million in 2022. Combined with AR-capable mobile devices, the AR-ready device installed base grows into the hundreds of millions. Markets that see the most disruption and highest costs from downtime and training events show the strongest AR adoption through 2027: manufacturing, automotive, energy & utilities, and logistics were the earliest AR adopters and have shown steady growth in adoption over the past 5 years.

Remote assistance, for example, needs only a two-way connection for an offsite expert to communicate with an onsite user—adding AR capabilities, spatial tracking, and Three-Dimensional (3D) annotations can make that remote assistance session more complete, but the core value remains in the remote communication first of all. Universally, AR remote assistance brings faster troubleshooting, reduced downtime, and greater operational efficiency overall. Training and guided workflow scenarios are similar, with the hands-free data access intrinsically valuable no matter the device, but added spatial tracking and accurate visualization can present greater opportunity within a use case.

These use cases have proven universally valuable for companies, especially those with frontline workers, retiring high-expertise workers, and operations vulnerable to downtime. This can be said for most companies, but especially for those highlighted above, expectedly leading to higher AR adoption across mobile device and smart glasses over the next 5 years. That being said, a handful of horizontal use cases span markets and verticals for which AR can deliver value quickly and reliably.

KEY USE CASE: FIELD SERVICE

Field service is one of these horizontal use cases. Frontline workers are at the forefront of AR usage for good reason—the most essential and high-impact maintenance, training, and expert knowledge are found at the worksite. That worksite is highly variable as well and includes oil rigs, wind turbines, factory floors, data centers, etc. This presents some barriers, as well as accelerators, for AR in the field. These can shift parameters around Return on Investment (ROI) and time to value depending on the company and product/service type, working environment, level of existing digital maturity, and desire for integration into existing systems. These all have both benefits and drawbacks in the grander ROI conversation.

Device type broadly splits between smart glasses and mobile devices. Smartphones and tablets that are relatively modern with cameras are able to run AR content. Smart glasses add hands-free capability and more advanced visualization and tracking features, but are also more expensive. The right device comes down to a combination of budget and target use case.

### MANUFACTURING FIELD SERVICE AUGMENTED REALITY ACTIVE USERS BY DEVICE TYPE

(Source: ABI Research)
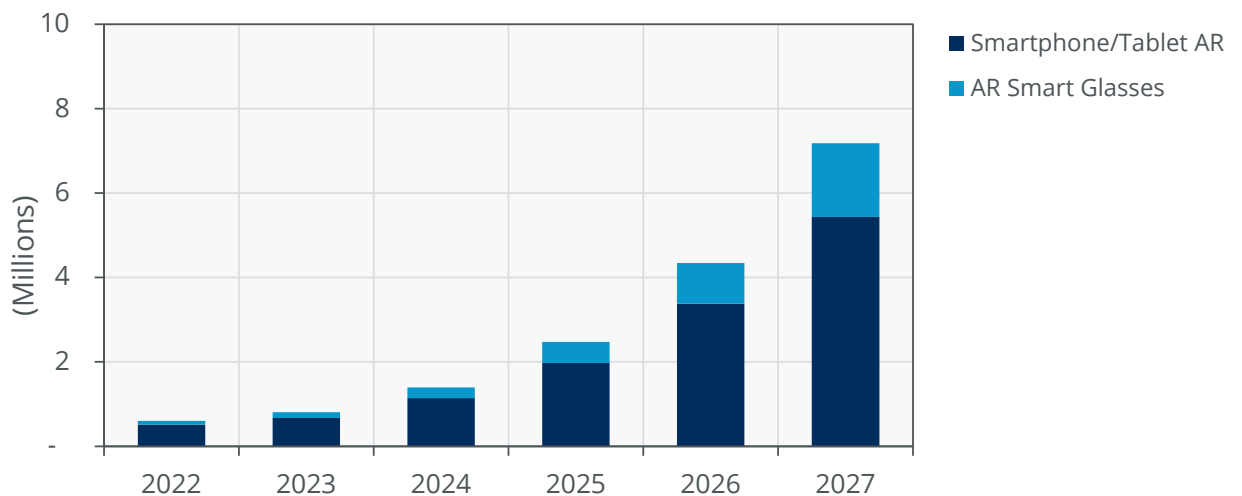
Thankfully, AR across device types almost universally proves value quickly and can save money early in a product lifecycle. Take a remote assistance session using one pair of smart glasses; if that session saved a round trip flight and accommodation for a remote expert, chances are that AR device has already paid for itself. If the session does not require smart glasses and can use a mobile device, then that value return is seen immediately and even more significantly. That is ignoring any benefits onsite, such as reduced operational downtime, which can be astronomical for some operations.

ENTERPRISE REMOTE ASSISTANCE AUGMENTED REALITY ACTIVE USERS BY VERTICAL

(Source: ABI Research)
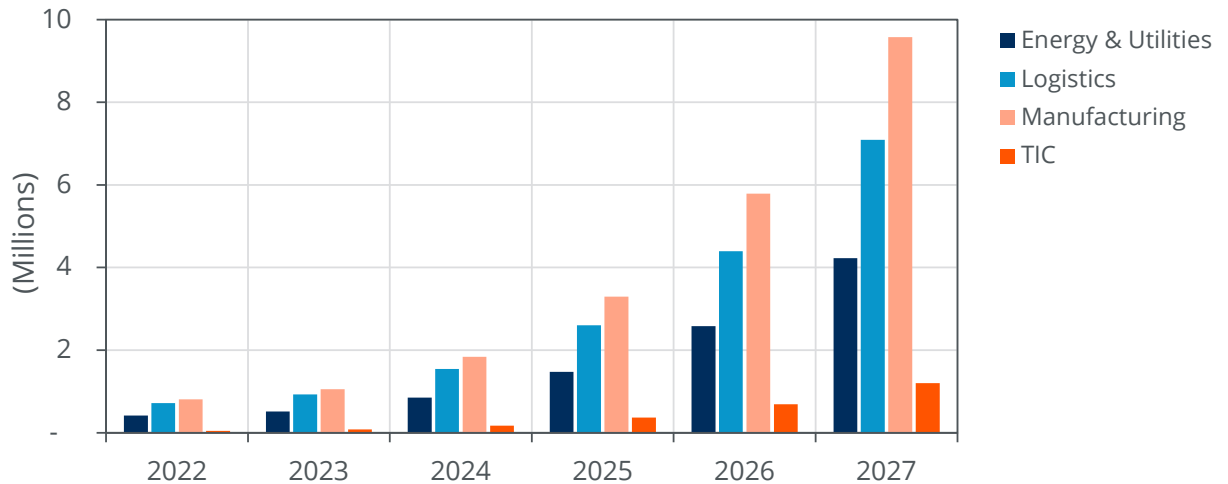
For more robust AR implementations, with many devices across a workforce and across use cases, both Capital Expenditure (CAPEX) and Operational Expenditure (OPEX) can be scary, even with volume pricing and customer-friendly implementation timelines. The value of AR scales linearly with use, though, so assuming devices are not collecting dust, that quick ROI is also guaranteed to scale.

In industry, field service often overlaps with post-sales support, Quality Assurance (QA), training, and assembly; it is more a matter of perspective (seller versus customer), but the usage is similar. Going back to downtime reduction and uninterrupted workflow, AR post-sales support can guarantee both. Time to repair is reduced onsite. Post-sales support for heavy machinery, as an example, can include AR through AR-enabled manuals, checklists, object recognition, real-time checklists, verification, and more. As part of a bundle with the product (machine), content access is not a problem, as the AR content and product are from the same source. Assembly, training, troubleshooting, and maintenance guidelines can be bundled with the purchase, helping to ensure operations for the product, and customer satisfaction and relationships.

While much focus is put on AR hardware, software and supporting platforms are more important than AR hardware specifics. Those ROI parameters—company, product, environment, digital maturity, and integration—are all variables in what would ideally be a packaged solution between a customer and the provider. Many AR providers have realized this and prioritized not only individual product capabilities, but cohesive portfolios.

TeamViewer, for example, has built out its Frontline platform to support major enterprise needs:

- **xPick** for inventory and picking use cases, such as in spare parts logistics

- **xMake** for assembly instructions, QA, and training across markets

- **xInspect** for training, guided maintenance, service, diagnosis, and troubleshooting

- **xAssist** for remote support, after sales support, training, and live troubleshooting, universally applicable

Field service tends to favor a product like xAssist due to the universal value of remote assistance in the field, but more dedicated training, guidance, and documentation solutions like xInspect can also play a role. Training content, by default, can be leveraged in many stages of a service operation, and even combine with remote assistance for a full-featured, live-guided service session. TeamViewer's foundation is in remote connectivity, and so tapping into other TeamViewer products with Frontline can expand worker enablement beyond the frontline as well. Additional products in remote access create a complete portfolio for a company, whether buying into AR first or through other enterprise requirements.

Case Study: Tecnogen is an Italian company specializing in power generators. Like most complex machinery, generators are vulnerable to lengthy planned and unplanned maintenance downtime events. To improve existing phone support methods for customers, the company launched its Quick Remote Assistance (QRA) support solution using TeamViewer's Frontline xAssist solution and Vuzix M400 smart glasses. Tecnogen leverages AR markers, multi-user support, and real-time translation in QRA to reduce field service response times and overall cost through fewer required support trips, with a knock-on increase in overall productivity thanks to that time and resource reduction.

DATA POINT: ABI RESEARCH ESTIMATES THERE WILL BE 11 MILLION MONTHLY ACTIVE USERS OF AR FIELD SERVICE IN 2027. THIS GROWS FROM FEWER THAN 1 MILLION MONTHLY ACTIVE USERS IN 2022.

Case Study: Deyaar Facilities Management provides integrated facilities management solutions in the United Arab Emirates (UAE). Using TeamViewer's Frontline xAssist and smart glasses, Deyaar highlights features like live pointer and remote camera control to streamline collaboration, along with screen and file sharing in real time. The company's success story looks similar to many others in field service and beyond: significant response time reduction (often instantaneous), reduced downtime, reduced or eliminated travel costs, and overall efficiency increases across the service pipeline for its customers, expectedly leading to improved customer relations and retention.

SUSTAINABILITY

Most conversations around AR, and really any new technology for enterprises, start with ROI. How much will this cost, and when will it pay off? While a valuable and necessary data point, there is a secondary effect of AR usage that is beginning to garner more attention: sustainability.

Sustainability, so far, has been a very region-dependent conversation. In Europe, thanks to government mandates and a more environmentally-sensitive population overall, sustainable solutions have been at the forefront of enterprise digitization for a few years at least. However, this is not true globally, with North America and Asia-Pacific, especially, lagging behind in both messaging and action around sustainability.

This is changing, however. Not only are governments becoming more vocal and stringent around sustainable activity, so are companies. AR, by default, can be a significant tool for improving sustainability for a company.

Air travel is incredibly common for field service to get experts onsite, with many flights being necessary today—80% of Carbon Dioxide (CO_2) emissions are from flights longer than 1,500 Kilometers (km) (Source: ATAG). This is notable, because in these cases, there is no practical alternative to air travel. Simply not flying has not been an option—those personnel are needed onsite as machine experts, trainers, managers, etc.

There are so many variables to consider, so to get an idea of actual environmental impact of a flight saved, it can be helpful to first take an averaged scenario as a baseline example of emissions and potential reduction. The following estimates use data from the U.K. Government Department for Business, Energy, and Industrial Strategy Greenhouse Gas (GHG) reporting for 2022.

Consider a single travel event for one employee on an international round-trip flight with an average ticket class (averaging economy, business, and first class) and 4,000 km of total travel. CO_2 emissions traced to that single traveler are approximately 400 Kilograms (kg). If that single travel event can be avoided using assisted reality or AR, then an instant emissions reduction of 400 kg can be expected. Extrapolating additional travelers, trips, and/or distance can give a reliable estimate of additional emissions and potential emissions reduction.

Travel reduction has some obvious environmental benefits, but so does the increased operational efficiency through decreased downtime and maintenance events. Scrap rates can be cut dramatically with efficient field service, reducing or eliminating unplanned downtime events leading to scrap. Efficient service can also lead to more efficient machines overall, reducing the energy footprint. As the world moves to renewable energy, and the novel machinery and processes to create and harvest that energy, AR again is valuable for training both novice and seasoned workers on these new elements.

Expect more sustainability discussion, both specific to AR and more broadly with enterprises, in the coming year. Regions that have lagged behind Europe will begin to catch up, while Europe continues to push efforts further. Companies realize that sustainability can also be used for marketing purposes, which is a win-win for those adopting AR. There is some concern around "green-washing" in this vein, with companies claiming sustainability efforts, while really targeting ROI alone, but it is likely that even ROI-focused AR implementations will still be environmentally beneficial for the reasons above.

SUMMARY AND RECOMMENDATIONS

Field service is one of the most complete examples of AR delivering value for a company. Machines and products break down, and the experts for these are often scattered. Bringing that expertise to the worksite has been a necessity in the past, but AR creates an alternative.

Remote assistance, training, and guided workflows, including documentation, present a triplet of high-value AR usage, which field service can leverage extensively. Saving a single expert travel event can cover the cost of smart glasses—use that device multiple times, which would always be the case, and the return can grow exponentially. AR-enabled smartphones and tablets present a fully-capable AR experience (for some use cases) at a lower upfront cost. Both enable increased worker and operations efficiency thanks to more effective field service procedures. Add to that sustainability benefits in an increasingly environment-conscious world and AR delivers value on three fronts.

RECOMMENDATIONS:

- Understand how often workers travel today, and how many of those travel events can be eliminated with AR. Not every downtime or training event can use AR immediately—there are absolutely use cases, environments, machines, products, etc. that require an expert to be hands on. However, there are many that do not require that expert in person, and that is where the value is delivered. Understanding exactly where and when to use AR will create a more accurate cost savings picture and reduce potential disappointment around time to value or overall ROI potential.

- As field service can pose challenging network environments, identify how the location of compute can impact usage and network requirements, and whether offloading compute is necessary or helpful. Remote assistance and other high-value field service use cases can vary dramatically in network requirements. Locally stored and processed content will remain an option for pre-created content, such as training and step-by-step content. For two-way solutions, such as real-time remote assistance, the network onsite has to be reliable, while low-bandwidth modes of existing solutions facilitate connectivity. Cellular networks, public or private, can help fill connectivity gaps, and do not necessarily require smart glasses to have cellular connectivity onboard thanks to device tethering and hotspot offerings.

- Recognize that device management plays a more significant role going forward thanks to the increase in devices, users, device types, and content. For field service, being able to keep devices updated and connected in shifting connectivity environments means maximizing the potential return of these devices that can be expensive.

- Partner when necessary, but understand what already exists in the organization. Most companies have some level of existing digital infrastructure, such as the Internet of Things (IoT), device management, Customer Relationship Management (CRM), Product Lifecycle Management (PLM), etc. While integrating AR with these solutions can be incredibly valuable, it can also be an integration challenge. This is where a System Integrator (SI) partner can assist, but specific platform companies are also prioritizing seamless integration for this reason. Recognize what solutions are required to connect with AR and which would only be nice to have, and then focus on the necessities to maximize ROI.

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