



Augmented Reality's Role in your Organization's Future:

Smarter Operations | Smarter Maintenance





Today's business and industrial landscape is being increasingly driven by new technologies that are enabling business leaders to improve processes, safety, customer satisfaction, and profitability.

The list of innovations that are accelerating change also have some accompanying challenges that are well-known across the business landscape. Analytics? Powerful insights, but you better be prepared to have a rigorous data quality program. Process automation? A potential game-changer for numerous industrial and business processes, but without change management, you are not likely to see the business value from an initiative like this that would risk becoming purely about technology. Geospatial systems? Really cool, but getting the field data accurately represented in the system can be quite a challenge.

While no technology or application is without its challenges, one innovation with great promise that is just now making its way into the mainstream in the asset and maintenance management world is augmented reality, or "AR." From its beginnings at Harvard University in 1968 with the first head-mounted display, through numerous technological advances through the 1980s and 1990s (how about that yellow first down line for televised football games – how did we ever get by without this?) to AR applications for the military and aerospace, AR's technical and business value is meeting the challenges in a number of rigorous environments.

Indeed, after being initially viewed as a curiosity or as a technology associated with gamers just a few years ago, AR is now being leveraged as a tool helping process-driven business operations across many vertical industries. With benefits that include cost savings, improved safety, quality improvements, and faster and improved training processes, this is an advantageous time to take a deeper look at AR in the asset and maintenance management space and consider its applicability in different business settings and use cases.

Where is AR making an impact?

As noted above, AR is starting to have an impact across the business and industrial spectrum, but where is this happening, and what are its implications? Below are three examples of how AR is impacting business challenges.

The US Department of Labor reports that turnover rates among employees have been as high as 57% over the last three years. Even if that number is lower, as it often is, there are still significant costs associated with employee turnover. These costs will continue to hit a business's bottom line, particularly as baby boomers continue to retire and now as Gen Xers also begin to retire, and this is before considering the impacts of the "great resignation" in the aftermath of the global pandemic.

A global industrial products and services provider saw these demographic changes hitting their business and was beginning to see the adverse business impacts. Perhaps the most acute impact is the loss of volumes of institutional knowledge walking out the door. This was particularly problematic in their maintenance and asset management practices across their nearly 200 manufacturing facilities. Seeing these challenges and wanting to get ahead of them, management looked to AR to help capture and transfer valuable knowledge from seasoned professionals as new employees entered their workforce. .

This knowledge capture and transfer process starts with equipping employees with a headset-based tool that captures a senior technician's expertise while working on specific equipment and assets. This information is then shared with the more junior technicians as they perform these tasks. The information that has been captured is stored digitally and can be edited to fit specific tasks or processes. This AR in a digital



video format is then linked with a technician armed with a smart phone or a tablet when he or she is out in the field or in a facility performing various asset maintenance tasks.

The business benefits in this example include faster timelines for training new technicians and upskilling the workforce without long training cycles. These add up to improved business performance reflected in less downtime with better continuity of operations and improved equipment and process reliability. A second example of AR improving business processes and outcomes is with a leading automotive manufacturer's services business. Maintaining and repairing cars has become more complex over time, with required skill sets ranging from traditional electrical and mechanical systems expertise to digital technology acumen.



This, of course, requires constant training and certifications for technicians, and when there are thousands of these technicians deployed across hundreds of dealers, training costs and time can be astronomical...a use case begging for improvement. Enter AR.

Training and certifications have traditionally taken place at a centralized corporate training center. The technicians fly in for training that typically lasts a few days to a few weeks, and much of this training is paper-based, with a hands-on component with a vehicle. The company is now moving to using AR to complement, and in some cases, replace the traditional training courses. The cost and time savings from this are huge. Savings in just the travel cost and time alone will be in the millions of dollars.

An example of AR's business impact with this company is in one specific, critical part of an engine that required a lot of warranty work. The "old way" of addressing this was to ship the part to a corporate repair facility for inspection and repair, as a lot of the issues with this part were being misdiagnosed in the field. These errors and the accompanying shipping times and expenses were costing the company millions of dollars, not to mention the opportunity cost of not being able to apply technician time to more fundamental maintenance and repair tasks. By utilizing AR for this specific problem, the company saw an improvement to its bottom line, reduced vehicle downtime, and vast improvements in diagnostic accuracy in the field.

Finally, there is the AR journey that a large consumer products manufacturer is taking. While they are very early in moving forward with AR, their focus at this stage is primarily on two areas: content development and how they want the technology to work for their employees. On the first of these, content development, they are making a concerted effort to have their content "ready for prime time" when they go live, most likely in 2024. This prudent approach is similar to other technology implementations where having the data in good shape is imperative before expecting any systems to produce the desired results.

On the technology side of their development, they are considering some of the implications of how AR will impact their business and, importantly, how employees will use the AR technology. An example of how they view this journey is in what they call "assisted reality" as a step towards true AR. The "assisted reality" is more of a static display of data that a technician can use on various asset management and maintenance tasks. They see AR as including a more dynamic use to the technology, like having a headset interact with the user's body and head position for better and faster results across a myriad of operations and maintenance tasks in their manufacturing facilities.

One final takeaway from this organization is that while this approach is very technology-centric in these early stages, IT executive leadership has spent a great deal of time working with the business side of the organization to ensure that they are “in lock-step with the direction of the technology to support their operations.” Change management is recognized as being integral to the success of their AR initiative.

How should an organization move forward with AR?

With these great success stories in mind, there is a real impetus to jump into the AR world with both feet. This is a good thing, but some thoughtfulness on the front end of an AR initiative will go a long way towards ensuring success and preventing a lot of frustration throughout the AR journey.

When starting on an organization’s AR journey and as with other technology projects, defining success is a big step and one of the first to be taken. Wayne Edwards of PTC, a leading digital transformation services provider, noted their experience in this crucial step:

“Understanding the project goals at a high level is a start, but identifying specific, measurable goals along the journey is critical. For instance, what are the 90-day, six-month, and twelve-month goals, and are these quantifiable? Be sure that these goals are on the table and that you have the systems in place to enable measurement. For example, are you prepared to measure the targeted financial improvements and error/scrap reduction?”

-Wayne Edwards
PTC



A second consideration is around data and content in all of its forms that will be required to support an AR initiative. Questions to ask around the data side of an AR initiative include:

- Is there any existing data and content that can be used? This might include existing training videos or perhaps some manuals that are in a digital format and can be incorporated into the AR ecosystem.
- Is your organization able to generate and manage the content? This gets into data and content issues like revision control, distribution, connecting seamlessly to different devices, and governance and compliance for all of this data and content.
- Will the application that will be deployed be available 24/7, and is it scalable with an intuitive interface and simple to use across a wide base of users with varying degrees of skills?

Finally, there are some more strategic considerations that should include senior management's input and support. First is to make a decision to move AR into a broader project in its early stages. This is not the norm in most organizations today. When not incorporated early in a project there is typically more cost and time for AR benefits to be realized. AR can often be implemented in parallel with other projects, like Maximo or other Enterprise Asset Management applications, for instance.

Another strategic consideration to address is "who should be providing AR capabilities for our needs?" One school of thought is that equipment manufacturers should be providing AR capabilities as part of their total solution, and that operations and maintenance leaders should be pushing their vendors to provide these capabilities. While this paper has focused more on organizations developing AR capabilities organically, this is an interesting approach that:

1. Could result in a faster growth in the use of AR technology across the O & M spectrum, and
2. Is likely to result in a hybrid approach where manufacturers do provide AR capabilities, especially in more complex O & M tasks, while the end users implement their own AR solutions to improve maintenance operations and capture valuable knowledge as key staff retires.



The road ahead is pervasively augmented

The AR future is bright. In considering how to make AR part of your organization's strategy to improve asset and maintenance practices, and ultimately to improve business performance, the following are some dynamics to be mindful of when considering an organization's AR journey. First, recognize that the ability to perform tasks with digital content that captures best practices will continue to improve as technology improves and becomes more pervasive. As the number of sensors in a facility grows and as the digital infrastructure is built out, the operating environment will become smarter and enable more AR-centric business processes.

Second, device and machine technology will continue to improve. Examples here include "smart" glasses that will become smaller and easier to work with, and equipment and machines that will continue to become smarter and faster.

A third area to keep an eye on will be how artificial intelligence ("AI") will shape the future of AR-based asset inspections and maintenance practices. Michael Hayes, Director of Lab Services at Aquitas Solutions notes a real-world example of AI's impact that he has observed in the field:

"Consider how to get optimal performance and an extended life of an asset, like a pump at a food manufacturing plant, for example. That pump might run at 100% and then be turned on and off, repeating this cycle many times. All of this on/off creates a lot of wear and tear that might be avoidable or greatly reduced. If this asset is modeled with sensor data using AI, perhaps in a digital twin environment, that pump might have the same performance running at 75% but without all of the on/off cycling, lengthening the usable life of the asset."

**-Michael Hayes,
Aqitas Solutions**

A final consideration is the workforce. As new technicians and staff come into an organization, using “cool” technology is likely to be viewed favorably by prospective employees, with its use becoming a requirement for attracting, hiring, and retaining the next generation workforce. AR can also be part of the interview process to show the potential new employee what they’ll be working on and to test their aptitude.

After its introduction and early trials from the 1960s through the 2000s, augmented reality has seen its evolution accelerate. AR can provide a low bar for fast business improvement with measurable improvements that are particularly strong in the asset and maintenance management space. The time is now for AR to help drive your organization forward.

WANT TO LEARN MORE?

For more information please contact:



www.Aqitas-Solutions.com
info@aqitas-solutions.com

ABOUT AQITAS SOLUTIONS

Aqitas Solutions is a leading provider of EAM and IoT solutions that optimize asset intensive industries. The company has a long history of delivering faster, smarter solutions at a competitive rate to help clients streamline internal processes.

Aqitas Solutions is a registered Service Disabled Veteran Owned Small Business (SDVOSB), proud supporter of Women in Reliability Asset Management (WIRAM). The Company has received several awards since expanding into the IoT space including a 2018 CRN® Top IoT Innovators Award, 2019 Solution Award for Work Execution Management, and MaximoWorld Awards for Best IoT Implementation and Best Data Alignment to Business Processes.

